METRO PLANNING COMMITTEE
OF THE TOWN PLANNING BOARD

MPC Paper No. 13/16

For Consideration by the

Metro Planning Committee on 26.8.2016

Proposed Amendments to

The Approved Chai Wan Outline Zoning Plan No. S/H20/21

MPC Paper No. 13/16
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PROPOSED AMENDMENTS TO THE
APPROVED CHAI WAN OUTLINE ZONING PLAN NO. S/H20/21

1. Introduction

This paper is to seek Members' agreement that:

(a) the proposed amendments to the approved Chai Wan Outline Zoning Plan (OZP) No. S/H20/21 as shown on the draft OZP No. S/H20/21A (**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**) is 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

2.1 On 5.2.2013, the Chief Executive in Council (CE in C), under section 9(1)(a) of the Ordinance approved the draft Chai Wan OZP. On 22.2.2013, the approved Chai Wan OZP No. S/H20/21 (**Attachment I**) was exhibited for public inspection under section 9(5) of the Ordinance.

2.2 On 29.4.2014, the CE in C agreed to refer the approved Chai Wan OZP 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 16.5.2014 under section 12(2) of the Ordinance.

3. Proposed Amendments to the OZP

The proposed amendments are mainly related to:

(a) the rezoning of a site at the junction of Chai Wan Road, Wing Ping Street and San Ha Street for public housing development;

(b) the rezoning of a site at Cape Collinson Road for public columbarium development; and

(c) some technical amendments to the Notes of the OZP.

4. <u>Proposed Public Housing Development at the junction of Chai Wan Road, Wing Ping Street and San Ha Street</u> (Plans 2 to 8)

<u>Background</u>

4.1 The Government has been increasing land supply through a multi-pronged approach with short, medium and long-term measures to achieve the target of providing a total of 460,000 housing units in the coming ten years. As stated in the 2016 Policy Address, housing is still the most important livelihood issue to be addressed. In the short and medium term, the Government will continue to rezone sites, increase development intensity and conduct holistic land use reviews to make optimal use of land.

4.2 Upon a land use review and subsequent confirmation with relevant departments on its technical feasibility, a site at the junction of Chai Wan Road, Wing Ping Street and San Ha Street has been identified for public housing development by the Housing Department (HD) to meet the pressing need for housing land. The site is currently zoned “Open Space” (“O”) on the OZP (**Plan 2**).

<u>The Site and its Surroundings</u>

4.3 The site has an area of about 0.37 ha (net site of about 0.33 ha). It is a piece of Government land currently used as a plant nursery by the Leisure and Cultural Services Department (LCSD).

4.4 The site is located in a neighbourhood comprising mainly of residential and Government, institution and community (GIC) developments. To the east of the site on both sides of the nearby Hong Ping Street are private residential developments, while the public housing estates of Chai Wan Estate and Yue Wan Estate are located to the south-west and north-west of the site respectively.

4.5 The CNEC Lau Wing Sang Secondary School and SKH Chai Wan St. Michael’s Primary School are located to the immediate west of the site, while the Caritas Chai Wan Marden Foundation School and the Precious Blood Secondary School are located to the immediate south of the site. To the north of the site are an existing bus terminus and the ex-bus depot of China Motor Bus Company Limited (the ex-CMB depot), for which planning permission for a proposed comprehensive residential development with a public transport terminus (Application No. A/H20/177) was given by the Board under section 16 of the Ordinance.

<u>The Rezoning Proposal</u>

4.6 It is proposed to rezone the site from “O” to “Residential (Group A)” (“R(A)”) for a public housing development. A building height restriction (BHR) of 120mPD is also proposed, taking account of the surrounding high-rise residential developments which range from 100mPD to 120mPD and to maintain a stepped BH profile gradually decreasing towards the waterfront (**Plan 2**).

4.7 According to HD’s proposal, a public housing block on top of a podium will be developed with a plot ratio of 10 and a building height (BH) not exceeding 120mPD, providing about 800 flats for an estimated population of about 1,830. A Neighbourhood Elderly Centre and a public open space with children’s playground will be provided. A preliminary conceptual layout for the proposed development prepared by HD is shown in **Attachment V**. The proposed development is targeted to be completed by 2021/22.

Land Use Compatibility

4.8 While the site is located in a neighbourhood comprising mainly of residential and GIC developments, the proposed public housing development is generally compatible with the surrounding land uses.

Visual Aspect

4.9 In order to achieve a stepped building height profile from the waterfront, a BHR of 120mPD is stipulated for the site. According to the visual appraisal conducted by HD (**Attachment VI**), although the proposed development would detract from the visual openness of the locality, it is not incompatible with the surrounding developments in terms of scale and height. Mitigation measures such as careful building disposition, maximization of at-grade greening, and use of architectural articulations can be explored at the detailed design stage for better integration with the neighbourhood. Photomontages showing the visual impact of the proposed development at four major public viewing points are provided at **Plans 5 to 8**. The Chief Town Planner/Urban Design & Landscape of Planning Department (CTP/UD&L, PlanD) considers the proposed housing development is not incompatible with the surrounding developments in terms of scale and height. She has no adverse comment on the proposed rezoning.

Traffic Aspect

4.10 According to the Traffic Impact Assessment (TIA) conducted by HD (**Attachment VII**), all critical junctions will operate within their capacities in design year 2025. The proposed housing site is well served by public transport network. However, in view of the demand to be generated by the proposed housing development, the TIA recommends improvement to the bus and green mini bus services to serve the area. HD undertakes to conduct further public transport assessment to propose feasible improvement measures to cope with the additional public transport demand. The TIA also indicates that the additional pedestrian demand arising from the proposed housing development is not significant and the existing footpath in the vicinity will be able to cater for the anticipated pedestrian demand.

4.11 The Commissioner for Transport (C for T) considers that the TIA is acceptable and has no objection to the proposed rezoning of the subject site from traffic point of view.

Air Ventilation Aspect

4.12 An Air Ventilation Assessment – Expert Evaluation for the proposed public housing development was undertaken by HD (**Attachment VIII**). According to the AVA, the proposed public housing development would not significantly affect the ventilation performance of the major breezeway of Chai Wan Road under the annual wind condition. Although localized ventilation impact would be induced at the school sites under annual condition and at Chai Wan Road and planned CDA development under summer condition, with the provision of a 7m tower setback from Chai Wan Road, 18m tower setback from the adjacent SKH Chai Wan St. Michael's Primary School and 10m wide podium level empty bay, the wind environment of leeward side is expected to be alleviated. These mitigation measures would be specified in the Planning Brief to guide subsequent public housing development by HD.

Landscape Aspect

4.13 Approximately 102 trees within and adjoining the site were identified at the initial tree survey conducted in October 2014, all of which were local common species including *Hisbiscus tiliaceus* (黃槿), *Erythrina variegata* (刺桐), *Cinnamomum burmannii* (陰香), *Koelreuteria bipinnata* (複羽葉欒樹) and *Ficus benjamina* (垂葉榕) generally with fair to poor health and structural conditions. No Champion Trees, registered Old and Valuable Trees (OVTs), potentially registrable trees or protected species are recorded. According to HD's Preliminary Landscape Proposal (**Attachment IX**), one tree of higher landscape and amenity value is recommended to be transplanted, and 15 roadside trees outside the site will be retained as far as practicable except those affected by the run-in/out of the proposed public housing development. While most of the existing trees within the site are recommended to be felled, the loss will be compensated with heavy standard trees in accordance with Development Bureau Technical Circular (Works) No. 7/2015 as far as possible. HD also aims to achieve a 20% site coverage of greenery for the public housing development.

Environmental and Infrastructural Aspects

4.14 No insurmountable noise, air and sewerage problem is anticipated for the proposed public housing development. Concerned Government departments have no in-principle objection to/no adverse comment on the rezoning proposal from environmental, drainage and sewerage, and water supply perspectives. HD has submitted a finalised Quantitative Risk Assessment (QRA) Report in June 2016, which took into account the risk posed by the petrol-cum-LPG filling station in the vicinity of the proposed housing development (**Attachment X**). The Director of Electrical and Mechanical Services (DEMS) considers the QRA report acceptable and has no objection to the rezoning.

4.15 HD would carry out relevant technical assessments, such as Environmental Assessment Study (including Air Quality Impact Assessment and Noise Impact Assessment) and Sewerage Impact Assessment for the housing project at the detailed design stage after rezoning of the proposed housing site and would be submitted to relevant Government departments for comment/agreement.

5. Proposed Columbarium Development at Cape Collinson Road (Plans 9 to 16)

Background

5.1 With a growing and ageing population in Hong Kong, the number of deaths and the corresponding number of cremations have been rising gradually year on year resulting in an increasing demand for public niches. Based on past data, the annual average numbers of deaths and cremations in the next 20 years (i.e. from 2016 to 2035) are estimated to be about 57,000 to 54,000 respectively. Currently, there are eight public columbaria managed by Food and Environmental Hygiene Department (FEHD) providing about 214,000 public niches, including the new columbarium at Kiu Tau

Road, Wo Hop Shek, the extension of Diamond Hill Columbarium and the Cheung Chau Cemetery extension completed in 2012 and 2013 respectively. The allocation of the above niches (about 45,000 niches) was completed in March 2016 and there will not be any new supply of public niches until 2018/19.

5.2 To meet the demand for public niches, the Government launched a public consultation on review of columbarium policy from July to September 2010. The Government has been promoting the district-based columbarium development scheme under which the 18 districts would collectively share the responsibility of developing columbarium facilities so as to increase the supply of public niches. According to the consultation exercise in 2010, members of the public are supportive of the district-based columbarium development scheme. The proposed public columbarium development site at Cape Collinson Road is one of the shortlisted sites in the consultation document. The site is currently a Government land zoned "Other Specified Uses" annotated "Funeral Parlour" ("OU(Funeral Parlour)") on the OZP (**Plan 9**), but there is no development programme for the funeral parlour.

The Site and its Surroundings

5.3 The site has an area of about 3,940m^2 (including the columbarium site of about 3,400m^2 and related road works of about 540m^2) and is located at Cape Collinson Road opposite Cape Collinson Chinese Permanent Cemetery Columbarium. It is on a natural slope with height varying from +48.0mPD to +68.0mPD.

5.4 The surrounding land uses include the Wan Tsui Estate Park to its immediate northwest, an extensive piece of "Green Belt" to its immediate north, and the Chinese Permanent Cemetery to its southeast across Cape Collinson Road.

The Rezoning Proposal

5.5 It is proposed to rezone the site from "OU(Funeral Parlour)" to "OU" annotated "(Columbarium)" ("OU(Columbarium)") to take forward the proposed public columbarium development. The current BHR of 5 storeys (excluding any basement floor(s)) covering the site would remain unchanged.

5.6 It is estimated that the proposed public columbarium development would be a 6-storey building (including one storey of basement) providing 25,000 niches. A notional development scheme for the proposed development is shown in **Attachment XI**.

Land Use Compatibility

5.7 The site is located adjacent to the Chinese Permanent Cemetery. The proposed development of a columbarium at the site is compatible with the cemetery.

Traffic Aspect

5.8 A TIA Review was conducted in February 2014 for a columbarium development with 25,000 niches at the site. The TIA Review Report is at **Attachment XII**.

5.9 The TIA Review has confirmed that the proposed columbarium will increase the traffic and pedestrian flows in the vicinity, particularly in Lin Shing Road and recommended the following improvement measures to mitigate the potential impacts (**Plan 12**):

(a) provision of a new pedestrian access route by linking Cape Collinson Road and San Ha Street with escalators and stairway, together with associated footpath and carriageway widening on Cape Collinson Road;

(b) widening of carriageway and footway at the junction of Lin Shing Road and Cape Collinson Road, coupled with the provision of bus lay-bys; and

(c) several other special traffic management measures as detailed in para. 3.2 of **Attachment XII**.

5.10 Architectural Services Department (ArchSD), as an agent of the project proponent (FEHD), agrees to update the traffic and transport assessment review report during the detailed design stage for the proposed development. The C for T and the Commissioner of Police (C of P) have no in-principle objection to the proposed traffic and transport improvement measures, and have no objection to/no comment on the proposed rezoning.

Visual Aspect

5.11 A visual appraisal (**Attachment XIII**) was conducted to assess the possible visual impact of the proposed columbarium development on the surrounding areas. According to the visual appraisal, the proposed development will either be screened off by existing trees or distracted by similar visual resources (i.e. existing cemetery and vegetation). Although the columbarium would unavoidably result in loss of existing vegetation and natural green slopes, the proposed columbarium development is not incompatible with the surrounding visual character in terms of nature and height. With the application of the proposed mitigation measures, the visual impacts experienced by the receivers at key public viewpoints are slightly adverse. Photomontages showing the visual impacts of the proposed columbarium development at four major viewing points are provided at **Plans 13 to 16**.

Landscape Aspect

5.12 A total of 177 trees within and adjoining the site with majority in fair condition and the remaining in poor condition were identified at the tree survey in March 2016. A total of 26 species were identified, 11 of them are exotic species including *Dimocarpus longan* (龍眼) and *Litchi chinensis* (荔枝), and 15 of them are native species including *Macaranga tanarius* (血桐) and *Mallotus paniculatus* (白楸). No Champion Trees, registered OVTs, potentially registrable trees or protected species are recorded. According to the Landscape and Tree Preservation Proposal submitted by FEHD (**Attachment XIV**), 11 trees are recommended to be retained, while the other 166 trees (including four dead trees) are recommended to be felled. Tree planting proposed on-site shall serve mainly for peripheral buffer planting, entrance features and definition of space. The landscape design of the future development will comply with the prescriptive requirements such as Site Coverage of Greenery in accordance with Development Bureau Technical Circular (Works) No. 3/2012. Off-site compensatory planting at available land will also be explored to improve the compensatory planting ratio.

Geotechnical Aspect

5.13 The Site is a natural hillside with a profile varying from +48.0mPD to +68.0mPD. There are two registered geotechnical features in the vicinity of the site that may affect or would be affected by the proposed development. Site formation is required for housing the columbarium, associated drainage facilities, landscaping works, improvement to the existing geotechnical features and widening of access route.

5.14 The Head of Geotechnical Engineering Office, Civil Engineering and Development Department (H(GEO), CEDD) considered that the site is geotechnically feasible for the proposed development. A ground investigation and a geotechnical assessment will be carried out to confirm the ground profile and soil information for the design of slope/foundation works.

Environmental and Infrastructural Aspects

5.15 Concerned Government departments have no in-principle objection to/no adverse comment on the rezoning proposal from environmental, drainage and sewerage, and water supply perspectives. Director of Environmental Protection (DEP) considers that the environmental problems (air and sewerage) for the proposed columbarium development are surmountable. The future project proponent will conduct a Preliminary Environmental Review (PER) for the project at the design stage and agree the findings with the DEP. Drainage and sewerage plans will be submitted by the project proponent at the design stage to demonstrate that there is no unacceptable impact on the public storm-water and sewerage system, together with any necessary mitigation measures to be put in place, if required.

6. Incorporation of ‘Art Studio (excluding those involving direct provision of services or goods)’ in the “Industrial” and “Other Specified Uses” annotated “Business” Zones

With a view to support art development, the feasibility of allowing ‘Art Studio’ in the Industrial-Office (I-O) buildings has been investigated by relevant bureaux and departments. As the key concern is on fire safety, ‘Art Studio’ is considered acceptable in the industrial and I-O buildings if it does not involve direct provision of services or goods (e.g. hobby classes, seminars and sale of goods, art gallery and venue for rehearsal for art performance). The proposal was generally supported by the stakeholders with no objection from concerned Government departments. In this regard, it is proposed to incorporate ‘Art Studio (excluding those involving direct provision of services or goods)’ as a Column 1 use in the “Industrial” (“I”) zone and in Schedule II of the “OU” annotated “Business” (“OU(B)”) zone. As ‘Art Studio’ is subsumed under the ‘Place of Recreation, Sports or Culture’ use, corresponding amendment will also be made to replace ‘Place of Recreation, Sports or Culture’ under Column 2 in the same schedule by ‘Place of Recreation, Sports or Culture (not elsewhere specified)’. Since 2015, similar amendments to the Notes of the “I”, “OU(B)” and “Residential (Group E)” zones for OZPs with I-O buildings have been made when the opportunity arises.

7. Provision of Open Space and GIC Facilities

A table on the provision of major community facilities and open space in Chai Wan area is at **Attachment XV**. Based on a planned population of about 178,510 (including the proposed public housing development under Amendment Item A), there is no shortfall on major GIC facilities, except the primary school classrooms. The existing shortfall of primary school classrooms in the area can be catered by the surplus of primary school classrooms in the surrounding area, in particular in the Shau Kei Wan area within the same school net. Regarding open space provisions in the area, there is an overall surplus of 6.67 ha open space (including both district and local open space). The proposed amendment items will not have adverse impact on major GIC and open space provisions in the area.

8. Proposed Amendments to Matters shown on the Plan

The proposed amendments as shown on the draft Chai Wan OZP No. S/H20/21A (**Attachment II**) are as follows:

Amendment Item A (about 0.37 ha) (**Plan 2**)

(a) Rezoning of a site at the junction of Chai Wan Road, Wing Ping Street and San Ha Street from "O to "R(A)" with the stipulation of a maximum building height of 120mPD.

Amendment Item B (about 3,940 m^2) (**Plan 9**)

(b) Rezoning of a site at Cape Collinson Road from "OU(Funeral Parlour)" to "OU(Columbarium)". The existing restriction of a maximum building height of 5 storeys (excluding any basement floor(s)) remains unchanged.

9. Proposed Amendments to the Notes of the OZP

9.1 Amendments to the Notes of the OZP (**Attachment III**) are proposed as follows:

(a) in relation to Amendment Item B, a new set of Notes for the "OU(Columbarium)" zone is proposed; and

(b) to incorporate 'Art Studio (excluding those involving direct provision of services or goods)' as a Column 1 use in the "I" zone and in Schedule II of the "OU(B)" zone, and to replace 'Place of Recreation, Sports or Culture' under Column 2 in the same schedules by 'Place of Recreation, Sports or Culture (not elsewhere specified)'.

9.2 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 Explanatory Statement of the OZP

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 Plan will be renumbered as S/H20/22.

12. Consultation

Consultation with the Eastern District Council (EDC)

12.1 On 27.6.2016, the Planning, Works and Housing Committee (PWHC) of the Eastern District Council (EDC) was consulted on the proposed OZP amendments. The relevant meeting summary is at **Attachment XVI**. In general, members supported the proposed amendments which would facilitate the provision of public housing units and public columbarium niches. Their main concerns are on the compensation on the loss of "O" site, traffic arrangement of the two sites and potential noise problem arising from the flyover junction between Chai Wan Road and Wing Tai Road affecting the public housing site.

12.2 In response to EDC's concerns on the traffic generated by the proposed public housing development, HD indicated that a public open space with children's playground will be provided at the proposed development. According to the TIA conducted for the proposed development, there would be no adverse traffic impact on the surrounding road network. Parking spaces will be provided in accordance with the HKPSG. On the noise aspect, mitigation measures will be provided through the design of the housing block including the disposition of tower and the provision of noise-reduction balconies. DEP considers that there is no insurmountable noise problem.

Public Consultation

12.3 If the proposed amendments are agreed by the Committee, the draft OZP (to be renumbered to S/H20/22 upon exhibition) and its Notes will be exhibited under section 5 of the Ordinance. Members of the public can submit representations on the OZP amendments to the Board during the two-month statutory public inspection period.

Departmental Circulation

12.4 The proposed amendments have been circulated to the relevant Government departments for comments. The following bureaux/departments have no objection to/no adverse comment on the proposed amendments:

- Director of Housing;
- Director of Food and Environmental Hygiene;

- C for T;
- Secretary for Development;
- Secretary for Food and Health;
- Secretary for Education;
- District Lands Officer/Hong Kong East, Lands Department;
- Chief Building Surveyor/Hong Kong East & Heritage, Buildings Department;
- Chief Architect/Central Management Division 2, ArchSD;
- Director of Agriculture, Fisheries and Conservation;
- Director of Environmental Protection;
- District Officer (Eastern), Home Affairs Department;
- Chief Highway Engineer/Hong Kong, Highways Department;
- Project Manager/Hong Kong Island and Islands, Civil Engineering and Development Department;
- Head of Geotechnical Engineering Office, Civil Engineering and Development Department;
- Chief Engineer/Construction, Water Supplies Department;
- Chief Engineer/Hong Kong & Islands, Drainage Services Department;
- Director of Electrical and Mechanical Services;
- Director of Leisure and Cultural Services;
- C of P;
- Director of Fire Services;
- Director of Social Welfare;
- Director of Health; and
- Chief Town Planner/Urban Design & Landscape, Planning Department (CTP/UD&L, PlanD).

13. Decision Sought

Members are invited to:

(a) agree to the proposed amendments to the approved Chai Wan OZP No. S/H20/21 and that the draft Chai Wan OZP No. S/H20/21A at **Attachment II** (to be renumbered to S/H20/22 upon exhibition) and its Notes at **Attachment III** are suitable for exhibition under section 5 of the Ordinance; and

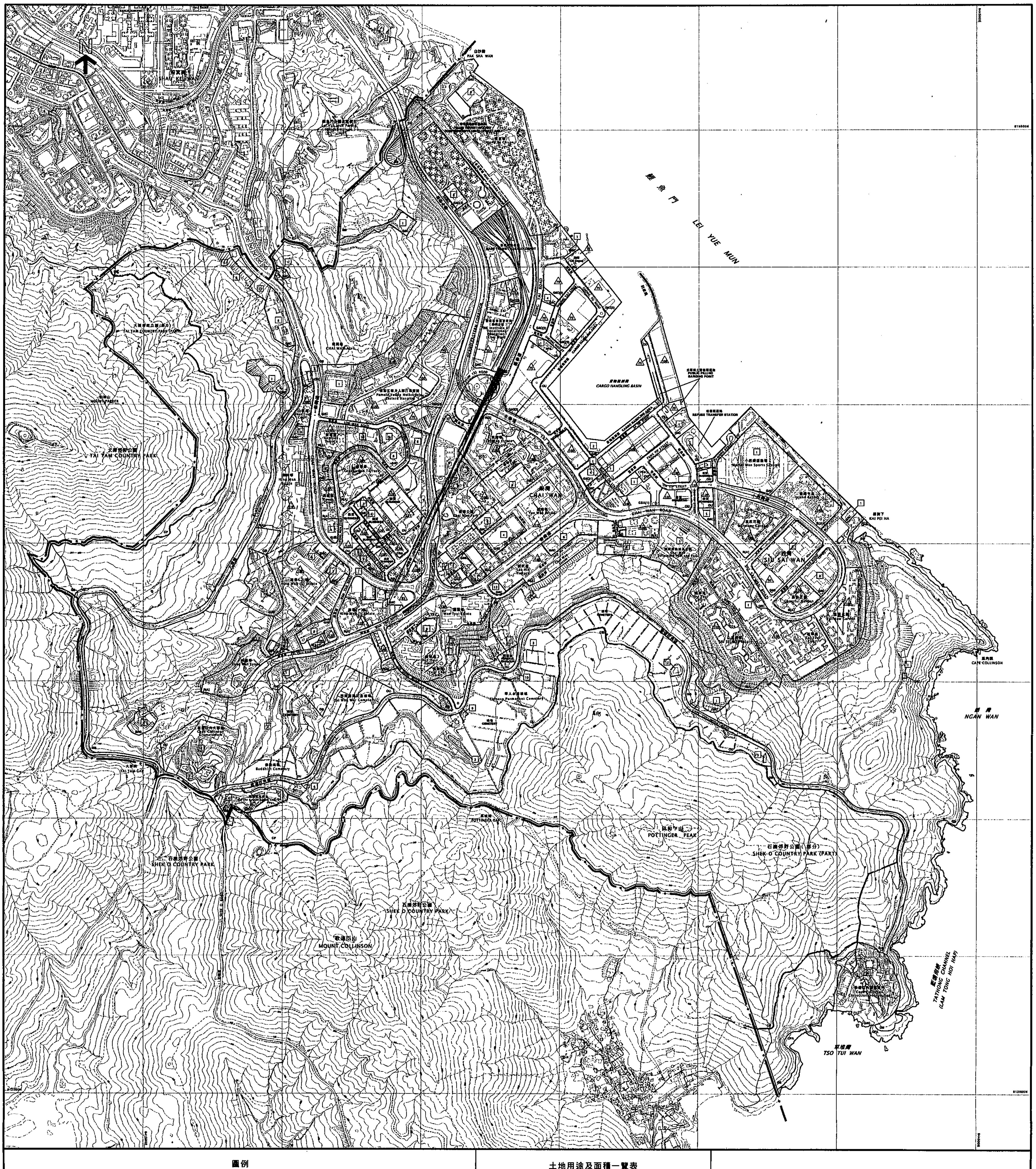
(b) adopt the revised ES for the draft Chai Wan OZP No. S/H20/21A at **Attachment IV** as an expression of the planning intentions and objectives of the Board for various land use zonings of the OZP and agree that the revised ES is suitable for publication together with the OZP.

14. Attachments

Attachment I	Approved Chai Wan Outline Zoning Plan No. S/H20/21 (Reduced Size)
Attachment II	Draft Chai Wan Outline Zoning Plan No. S/H20/21A
Attachment III	Notes of draft Chai Wan Outline Zoning Plan No. S/H20/21A
Attachment IV	Explanatory Statement of draft Chai Wan Outline Zoning Plan No. S/H20/21A
Attachment V	Preliminary Concept Layout for Proposed Amendment Item A
Attachment VI	Visual Appraisal for Proposed Amendment Item A

Attachment VII	Traffic Impact Assessment for Proposed Amendment Item A
Attachment VIII	Air Ventilation Assessment (Expert Evaluation) for Proposed Amendment Item A
Attachment IX	Preliminary Landscape Proposal for Proposed Amendment Item A
Attachment X	Quantitative Risk Assessment for Proposed Amendment Item A
Attachment XI	Notional Development Scheme for Proposed Amendment Item B
Attachment XII	Traffic Impact Assessment Review Report for Proposed Amendment Item B
Attachment XIII	Visual Appraisal for Proposed Amendment Item B
Attachment XIV	Landscape and Tree Preservation Proposal for Proposed Amendment Item B
Attachment XV	Provision of Major Community Facilities in Chai Wan Area
Attachment XVI	Meeting Summary of Meeting of PWHC of EDC held on 27.6.2016
Plan 1	Comparison of the proposed and existing zonings for Amendment Items A and B
Plan 2	Site Plan of Proposed Amendment Item A
Plan 3	Aerial Photo of Proposed Amendment Item A
Plan 4	Site Photos of Proposed Amendment Item A
Plans 5 to 8	Photomontages of Proposed Amendment Item A
Plan 9	Site Plan of Proposed Amendment Item B
Plan 10	Aerial Photo of Proposed Amendment Item B
Plan 11	Site Photo of Proposed Amendment Item B
Plan 12	Proposed Mitigation Measures for Proposed Amendment Item B
Plans 13 to 16	Photomontages of Proposed Amendment Item B

PLANNING DEPARTMENT
AUGUST 2016



圖例
NOTATION

ZONES		地帶
COMPREHENSIVE DEVELOPMENT AREA	CDA	綜合發展區
RESIDENTIAL (GROUP A)	R(A)	住宅（甲類）
INDUSTRIAL	I	工業
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
COASTAL PROTECTION AREA	CPA	海岸保護區
COUNTRY PARK	CP	郊野公園

COMMUNICATIONS		交通
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
BOUNDARY OF COUNTRY PARK / SPECIAL AREA		郊野公園／特別地區界線
BUILDING HEIGHT CONTROL ZONE BOUNDARY		建築物高度管制區界線
MAXIMUM BUILDING HEIGHT (IN METRES ABOVE PRINCIPAL DATUM)	120	最高建築物高度（在主水平基準上若干米）
MAXIMUM BUILDING HEIGHT (IN NUMBER OF STOREYS)	8	最高建築物高度（樓層數目）
PETROL FILLING STATION	P F S	加油站
NON-BUILDING AREA	NBA	非建築用地

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	
COMPREHENSIVE DEVELOPMENT AREA	1.37	0.22	綜合發展區
RESIDENTIAL (GROUP A)	72.61	11.82	住宅（甲類）
INDUSTRIAL	6.19	1.01	工業
GOVERNMENT, INSTITUTION OR COMMUNITY	70.58	11.50	政府、機構或社區
OPEN SPACE	21.35	3.48	休憩用地
OTHER SPECIFIED USES	88.16	14.37	其他指定用途
GREEN BELT	181.32	29.55	綠化地帶
COASTAL PROTECTION AREA	5.88	0.96	海岸保護區
COUNTRY PARK	115.43	18.81	郊野公園
MAJOR ROAD ETC.	50.77	8.28	主要道路等
TOTAL PLANNING SCHEME AREA	613.66	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２０１３年２月５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 5 FEBRUARY 2013

Ms Kinnie WONG 黃潔怡女士
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柴灣（港島規劃區第２０區）分區計劃大綱圖
TOWN PLANNING ORDINANCE, HONG KONG TOWN PLANNING BOARD
HONG KONG PLANNING AREA No. 20 - CHAI WAN - 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/H20/21

Attachment I of MPC Paper No. 13/16

Attachment II of
MPC Paper No. 13/16

圖例
NOTATION

ZONES		地帶
COMPREHENSIVE DEVELOPMENT AREA	CDA	綜合發展區
RESIDENTIAL (GROUP A)	R(A)	住宅（甲類）
INDUSTRIAL	I	工業
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
COASTAL PROTECTION AREA	CPA	海岸保護區
COUNTRY PARK	CP	郊野公園

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
BOUNDARY OF COUNTRY PARK		郊野公園界線
BUILDING HEIGHT CONTROL ZONE BOUNDARY		建築物高度管制區界線
MAXIMUM BUILDING HEIGHT (IN METRES ABOVE PRINCIPAL DATUM)	120	最高建築物高度（在主水平基準上若干米）
MAXIMUM BUILDING HEIGHT (IN NUMBER OF STOREYS)	8	最高建築物高度（樓層數目）
PETROL FILLING STATION	P F S	加油站
NON-BUILDING AREA	NBA	非建築用地

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	
COMPREHENSIVE DEVELOPMENT AREA	1.37	0.22	綜合發展區
RESIDENTIAL (GROUP A)	72.88	11.88	住宅（甲類）
INDUSTRIAL	6.19	1.01	工業
GOVERNMENT, INSTITUTION OR COMMUNITY	70.58	11.50	政府、機構或社區
OPEN SPACE	20.98	3.42	休憩用地
OTHER SPECIFIED USES	88.15	14.37	其他指定用途
GREEN BELT	181.32	29.55	綠化地帶
COASTAL PROTECTION AREA	5.88	0.96	海岸保護區
COUNTRY PARK	115.43	18.81	郊野公園
MAJOR ROAD ETC.	50.77	8.28	主要道路等
TOTAL PLANNING SCHEME AREA	613.55	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/H20/21 的修訂
AMENDMENTS TO APPROVED PLAN No. S/H20/21

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 B		修訂項目B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柴灣（港島規劃區第20區）分區計劃大綱圖
TOWN PLANNING ORDINANCE, HONG KONG TOWN PLANNING BOARD
HONG KONG PLANNING AREA No. 20 - CHAI WAN - OUTLINE ZONING PLAN

SCALE 1:5000 比例尺

米 METRES 100 0 200 400 600 800 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/H20/21A

HONG KONG PLANNING AREA NO. 20

~~APPROVED~~ *DRAFT* CHAI WAN OUTLINE ZONING PLAN NO. S/H20/21*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 building 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 (a) where the uses or developments are specified in Column 2 of the Notes of individual zones or (b) as provided in paragraph (8) in relation to areas zoned "Coastal Protection Area":

(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 areas zoned "Coastal Protection Area",

(a) the following uses or developments are always permitted:

(i) maintenance or repair of plant nursery, amenity planting, sitting out area, rain shelter, refreshment kiosk, road, watercourse, nullah, public utility pipeline, electricity mast, lamp pole, telephone booth, shrine and grave; and

(ii) 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

(b) the following uses or developments require permission from the Town Planning Board:

provision of plant nursery, amenity planting, sitting out area, rain shelter, refreshment kiosk, footpath, public utility pipeline, electricity mast, lamp pole, telephone booth and shrine.

(9) 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:

on-street vehicle park, railway track.

(10) 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.

(11) 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.

HONG KONG PLANNING AREA NO. 20

APPROVED CHAI WAN OUTLINE ZONING PLAN NO. S/H20/21*A*

Schedule of Uses

COMPREHENSIVE DEVELOPMENT AREA

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 Flat Government Refuse Collection Point Government Use (not elsewhere specified) Hospital Hotel House Information Technology and Telecommunications Industries Institutional Use (not elsewhere specified) Library 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 Research, Design and Development Centre Residential Institution School Shop and Services Social Welfare Facility Training Centre Utility Installation for Private Project

Planning Intention

This zone is intended for comprehensive development/redevelopment of the area for residential and/or commercial uses with the provision of open space and other supporting facilities. The zoning is to facilitate appropriate planning control over the development mix, scale, design and layout of development, taking account of various environmental, traffic, infrastructure and other constraints.

(please see next page)

COMPREHENSIVE DEVELOPMENT AREA (cont'd)

Remarks

(1) Pursuant to section 4A(2) of the Town Planning Ordinance, and except as otherwise expressly provided that it is not required by the Town Planning Board, an applicant for permission for development on land designated "Comprehensive Development Area" or "Comprehensive Development Area (1)" shall prepare a Master Layout Plan for the approval of the Town Planning Board and include therein the following information :-

(i) the area of the proposed land uses, the nature, position, dimensions, and heights of all buildings to be erected in the area;

(ii) the proposed total site area and gross floor area for various uses, total number of flats and flat size, where applicable;

(iii) the details and extent of Government, institution or community (GIC) and recreational facilities, public transport and parking facilities, and open space to be provided within the area;

(iv) the alignment, widths and levels of any roads proposed to be constructed within the area;

(v) the landscape and urban design proposals within the area;

(vi) programmes of development in detail;

(vii) an environmental assessment report to examine any possible environmental problems that may be caused to or by the proposed development during and after construction and the proposed mitigation measures to tackle them;

(viii) a drainage and sewerage impact assessment report to examine any possible drainage and sewerage problems that may be caused by the proposed development and the proposed mitigation measures to tackle them;

(ix) a traffic impact assessment report to examine any possible traffic problems that may be caused by the proposed development and the proposed mitigation measures to tackle them;

(x) an air ventilation assessment report to examine any possible air ventilation problems that may be caused by the proposed development and the proposed mitigation measures to tackle them;

(xi) a visual impact assessment to examine any possible visual impacts that may be caused by the proposed development and the proposed mitigation measures to tackle them; and

(xii) such other information as may be required by the Town Planning Board.

(2) The Master Layout Plan should be supported by an explanatory statement which contains an adequate explanation of the development proposal, including such information as land tenure, relevant lease conditions, existing conditions of the site, the character of the site in relation to the surrounding areas, principles of layout design, major development parameters, design population, types of GIC facilities, and recreational and open space facilities.

(3) On land designated "Comprehensive Development Area", 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. The provision for development/redevelopment to the height of the existing building is not applicable to part of the Chai Wan Flatted Factory site which is subject to a maximum building height of 21mPD, as stipulated on the Plan.

(please see next page)

COMPREHENSIVE DEVELOPMENT AREA (cont'd)

Remarks (cond't)

(4) On land designated "Comprehensive Development Area (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 gross floor area of 86,268m^2 and the maximum building height, in terms of metres above Principal Datum, as stipulated on the Plan, or the gross floor area and the height of the existing building, whichever is the greater.

(5) In determining the maximum gross floor area for the purposes of paragraph (4) above, any floor space that is constructed or intended for use solely as car park, loading/unloading bay, plant room, caretaker's office and caretaker's quarters, or 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. Any floor space that is constructed or intended for use solely as public transport facilities, or GIC facilities, as required by the Government, may also be disregarded.

(6) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the building height and gross floor area restrictions stated in paragraphs (3) and (4) 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 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 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 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)" ("R(A)"), 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) On land designated "R(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 the maximum building height, in terms of metres above Principal Datum, as stipulated on the Plan.

(please see next page)

<u>RESIDENTIAL (GROUP A)</u> (cont'd)

<u>Remarks</u> (cont'd)

(3) A minimum 30m wide non-building area to the south of Hing Man Estate shall be provided as stipulated on the Plan. In addition, a minimum 20m wide non-building area shall be provided within Tsui Wan Estate (covering part of Tsui Wan Street), and a minimum 10m wide non-building area shall be provided from the lot boundary of Greenwood Terrace fronting Hong Man Street as stipulated on the Plan.

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

(5) Under exceptional circumstances, for a development or redevelopment proposal, minor relaxation of the non-building area restrictions as stipulated on the Plan or stated in paragraph (3) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

INDUSTRIAL

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 ***Art Studio (excluding those involving direct provision of services or goods)*** Bus Depot Cargo Handling and Forwarding Facility (not elsewhere specified) Eating Place (Canteen, Cooked Food Centre only) Government Refuse Collection Point Government Use (not elsewhere specified) Industrial Use (not elsewhere specified) Information Technology and Telecommunications Industries Office (Audio-visual Recording Studio, Design and Media Production, Office Related to Industrial Use only) 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 Vehicle Repair Workshop Warehouse (excluding Dangerous Goods Godown)	Broadcasting, Television and/or Film Studio Cargo Handling and Forwarding Facility (Container Freight Station, free-standing purpose-designed Logistics Centre only) Concrete Batching Plant Container Vehicle Park/Container Vehicle Repair Yard Dangerous Goods Godown Eating Place (not elsewhere specified) (in wholesale conversion of an existing building only) Educational Institution (ground floor only except in wholesale conversion of an existing building) Exhibition or Convention Hall Industrial Use (Bleaching and Dyeing Factory, Electroplating/Printed Circuit Board Manufacture Factory, Metal Casting and Treatment Factory/Workshop only) Institutional Use (not elsewhere specified) (in wholesale conversion of an existing building only) Marine Fuelling Station Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than Entrances Off-course Betting Centre Offensive Trades Office (not elsewhere specified) Open Storage Petrol Filling Station Pier Place of Entertainment (ground floor only except in wholesale conversion of an existing building) Place of Recreation, Sports or Culture ***(not elsewhere specified)*** Private Club Public Clinic (in wholesale conversion of an existing building only) Religious Institution (ground floor only except in wholesale conversion of an existing building) Ship-building, Ship-breaking and Ship-repairing Yard Shop and Services (not elsewhere specified) (ground floor only, except in wholesale conversion of an existing building and Ancillary Showroom# which may be permitted on any floor) Training Centre Vehicle Stripping/Breaking Yard Wholesale Trade

(please see next page)

INDUSTRIAL (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 use 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:
Eating Place Educational Institution Exhibition or Convention Hall Institutional Use (not elsewhere specified) Off-course Betting Centre Office Place of Entertainment Place of Recreation, Sports or Culture Private Club Public Clinic Religious Institution Shop and Services Training Centre	Social Welfare Facility (excluding those involving residential care)

\# 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.

Planning Intention

This zone is intended primarily for general industrial uses to ensure an adequate supply of industrial floor space to meet demand from production-oriented industries. Information technology and telecommunications industries and office related to industrial use are also always permitted in this zone.

Remarks

(1) On land designated "Industrial", 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 and the maximum building height, in terms of metres above Principal Datum, as stipulated on the Plan, or the plot ratio and the height of the existing building, whichever is the greater.

(please see next page)

INDUSTRIAL (cont'd)

Remarks (cont'd)

(2) In determining the maximum plot ratio for the purpose 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 building height and plot ratio restrictions 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 Mass Transit Railway Depot (for "G/IC(3)" only) Pier 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 Marine Fuelling Station 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 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" ("G/IC"), 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 or number of storeys, as stipulated on the Plan, or the height of the existing building, whichever is the greater.

(2) On land designated "G/IC(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 building height of 4 storeys, except a drill tower up to 9 storeys, or the height of the existing building, whichever is the greater.

(3) On land designated "G/IC(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 building height, in terms of metres above Principal Datum (including roof-top structures) as stipulated on the Plan, or the height of the existing building, whichever is the greater.

(4) On land designated "G/IC(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 a maximum building height of 8 storeys, excluding the Mass Transit Railway depot below, or the height of the existing building, whichever is the greater.

(5) A minimum 30m wide non-building area shall be provided to the north of the Sai Wan Service Reservoir as stipulated on the Plan.

(6) In determining the relevant maximum number of storey(s) for the purposes of paragraphs (1) and (2) above, any basement floor(s) may be disregarded.

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

(8) Under exceptional circumstances, for a development or redevelopment proposal, minor relaxation of the non-building area restriction as stipulated on the Plan or stated in paragraph (4) 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 Field Study/Education/Visitor Centre Park and Garden Pavilion Pedestrian Area Picnic Area Playground/Playing Field Promenade Public Convenience Sitting Out Area Zoo	Barbecue Spot 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 Pier Place of Entertainment Place of Recreation, Sports or Culture Private Club Public Transport Terminus or Station Public Utility Installation 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.

OTHER SPECIFIED USES

For "Business" only

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

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

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
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)

For "Business" only (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

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)*** Bus Depot 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 Cargo Handling and Forwarding Facility (Container Freight Station, free-standing purpose-designed Logistics Centre only) Educational Institution (ground floor 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 Entertainment (ground floor only) Place of Recreation, Sports or Culture ***(not elsewhere specified)*** Private Club Religious Institution (ground floor only) Shop and Services (not elsewhere specified) (ground floor only except Ancillary Showroom* which may be permitted on any floor) Training Centre 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)

<u>OTHER SPECIFIED USES</u> (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 use 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.

<u>Planning Intention</u>

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.

(please see next page)

OTHER SPECIFIED USES (cont'd)

For "Business" Only (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 12, and the maximum building height 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. The provision for development/redevelopment to the height of the existing building is not applicable to an area between Chai Wan Industrial Centre and Minico Building which is subject to a maximum building height of 23mPD, as stipulated on the Plan.

(2) A minimum 3m wide non-building area shall be provided from the lot boundary of 45 Kut Shing Street and 10 Hong Man Street fronting Hong Man Street, and 4m from the lot boundary of 44 Lee Chung Street and 40 Lee Chung Street fronting Hong Man Street as stipulated on the Plan.

(3) In determining the relevant 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.

(4) Where the permitted plot ratio as defined in the 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.

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

(6) Under exceptional circumstances, for a development or redevelopment proposal, minor relaxation of the non-building area restriction as stipulated on the Plan or stated in paragraph (2) 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 "Cargo Handling Area" only

Cargo Handling Area Public Convenience	Government Use Public Utility Installation Utility Installation for Private Project

Planning Intention

This zone is intended to reserve land for cargo handling area use.

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 maximum number of storey(s) 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 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 "Cemetery" only

Columbarium	Place of Recreation, Sports or Culture
Crematorium	Public Transport Terminus or Station
Funeral Facility	Public Utility Installation
Government Use	Religious Institution
Grave	Shop and Services
Public Convenience	Utility Installation for Private Project

Planning Intention

This zone is intended to reserve land for cemetery use.

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 maximum number of storey(s) 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 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 "Columbarium" only

Columbarium ***Garden of Remembrance*** ***Government Use***	***Public Utility Installation*** ***Utility Installation for Private Project***

Planning Intention

This zone is primarily for land intended for columbarium and garden of remembrance use.

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 maximum number of storey(s) 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.

(please see next page)

<u>OTHER SPECIFIED USES</u> (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

<u>For "Mass Transit Railway Comprehensive Development Area" only</u>

Column 1	Column 2
Ambulance Depot Eating Place Educational Institution (in a commercial building or in the purpose-designed non-residential portion+ of an existing building only) Exhibition or Convention Hall Flat Government Use (not elsewhere specified) House Mass Transit Railway Depot Library Market Off-course Betting Centre Office Place of Entertainment Place of Recreation, Sports or Culture Private Club Public Clinic Public Transport Terminus or Station Public Utility Installation Public Vehicle Park (excluding container vehicle) Residential Institution School (in a free-standing purpose-designed school building, in a commercial building or in the purpose-designed non-residential portion+ of an existing building only) Shop and Services Social Welfare Facility Training Centre Utility Installation for Private Project	Broadcasting, Television and/or Film Studio Commercial Bathhouse/Massage Establishment Educational Institution (not elsewhere specified) Government Refuse Collection Point Hotel Institutional Use (not elsewhere specified) Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than Entrances Petrol Filling Station Pier Public Convenience Recyclable Collection Centre Religious Institution School (not elsewhere specified)

\+ Excluding floors containing wholly or mainly car parking, loading/unloading bays and/or plant room.

<u>Planning Intention</u>

This zone is intended to demarcate the Heng Fa Chuen residential site and its adjoining area.

(please see next page)

OTHER SPECIFIED USES (cont'd)

For "Mass Transit Railway Comprehensive Development Area" only (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 the maximum building height in terms of metres above Principal Datum as stipulated on the Plan, and a maximum gross floor area of 425,000m^2 for residential use and 26,750m^2 for commercial use, or the height and gross floor area of the existing building, whichever is the greater.

(2) In determining the maximum gross floor area 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 or caretaker's office and caretaker's quarters or 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. Any floor space that is constructed or intended for use solely as rail depot and station, public transport facilities, and GIC facilities, as required by the Government, may also be disregarded.

(3) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the building height and gross floor area 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 "Refuse Transfer Station" only

Refuse Transfer Station	Government Use (not elsewhere specified) Public Utility Installation Utility Installation for Private Project

Planning Intention

This zone is intended to reserve land for the purpose of a refuse transfer station.

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 maximum number of storey(s) 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 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 All Other Sites (Not Listed Above)

As Specified on the Plan	Government Use Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than Entrances Public Utility Installation Utility Installation for Private Project

Planning Intention

This zone is intended to identify land reserved for purposes as specified on the plan.

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 or number of storeys as stipulated on the Plan, or the height of the existing building, whichever is the greater.

(2) In determining the maximum number of storey(s) 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 restrictions 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 Country Park* 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 Barbecue Spot Broadcasting, Television and/or Film Studio Burial Ground 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 Funeral Facility Government Refuse Collection Point Government Use (not elsewhere specified) Holiday Camp House Marine Fuelling Station Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than Entrances Petrol Filling Station Pier 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

*Country Park means a country park or special area as designated under the Country Parks Ordinance (Cap. 208). All uses and developments require consent from the Country and Marine Parks Authority and approval from the Town Planning Board is not required.

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.

COASTAL PROTECTION AREA

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 (other than Plant Nursery) Nature Reserve Nature Trail On-Farm Domestic Structure Picnic Area Wild Animals Protection Area	Barbecue Spot Field Study/Education/Visitor Centre Government Use Holiday Camp House (Redevelopment only) Pier Public Convenience Public Utility Installation Radar, Telecommunications Electronic Microwave Repeater, Television and/or Radio Transmitter Installation Tent Camping Ground Utility Installation for Private Project

Planning Intention

This zoning is intended to conserve, protect and retain the natural coastlines and the sensitive coastal natural environment, including attractive geological features, physical landform or area of high landscape, scenic or ecological value, with a minimum of built development. It may also cover areas which serve as natural protection areas sheltering nearby developments against the effects of coastal erosion.

There is a general presumption against development in this zone. In general, only developments that are needed to support the conservation of the existing natural landscape or scenic quality of the area or are essential infrastructure projects with overriding public interest may be permitted.

Remarks

No redevelopment, including alteration and/or modification, of an existing house shall result in a total redevelopment in excess of the plot ratio, site coverage and height of the house which was in existence on the date of the first publication in the Gazette of the notice of the draft Chai Wan Outline Zoning Plan No. S/H20/16.

COUNTRY PARK

Country Park means a country park or special area as designated under the Country Parks Ordinance (Cap. 208). All uses and developments require consent from the Country and Marine Parks Authority and approval from the Town Planning Board is not required.

HONG KONG PLANNING AREA NO. 20

~~APPROVED~~ *DRAFT* CHAI WAN OUTLINE ZONING PLAN NO. S/H20/21*A*

EXPLANATORY STATEMENT

HONG KONG PLANNING AREA NO. 20

~~APPROVED~~ *DRAFT* CHAI WAN OUTLINE ZONING PLAN NO. S/H20/21*A*

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<u>**HONG KONG PLANNING AREA NO. 20**</u>

<u>**~~APPROVED~~ *DRAFT* CHAI WAN OUTLINE ZONING PLAN NO. S/H20/21*A***</u>

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

<u>**EXPLANATORY STATEMENT**</u>

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*** Chai Wan Outline Zoning Plan (OZP) No. S/H20/21***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 August 1957, the draft Chai Wan Outline Development Plan No. LH20/1/2, being the first statutory plan covering the Chai Wan area, was gazetted under the Town Planning Ordinance (the Ordinance). Since then, the plan had been amended many times to reflect the changing circumstances and updated land use development.

2.2 On 6 September 1988, the Chai Wan OZP No. S/H20/4 was approved by the then Governor in Council under section 9(1)(a) of the Ordinance. On 6 November 1990, the then Governor in Council referred the approved OZP to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. Since then, the OZP had been amended ten times and exhibited for public inspection under section 5 or 7 of the Ordinance to reflect the changing circumstances.

2.3 On 26 November 2002, the Chief Executive in Council (CE in C), under section 9(1)(a) of the Ordinance, approved the draft Chai Wan OZP, which was subsequently renumbered as S/H20/15. On 8 July 2003, the CE in C referred the approved Chai Wan OZP No. S/H20/15 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. On 21 October 2004, the draft Chai Wan OZP No. S/H20/16 was exhibited for public inspection under section 5 of the Ordinance.

2.4 On 8 November 2005, the CE in C under section 9(1)(a) of the Ordinance, approved the draft Chai Wan OZP, which was subsequently renumbered as S/H20/17. On 20 June 2006, the CE in C referred the approved Chai Wan OZP No. S/H20/17 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. ***The OZP was amended three times and exhibited for public inspection under section 5 or 7 of the Ordinance.***

~~2.5~~ ~~On 30 June 2011, the draft Chai Wan OZP No. S/H20/18, incorporating amendments to the Notes of the "Industrial" zone, was exhibited for public inspection under section 5 of the Ordinance. During the exhibition period, a total of 5 representations were received. On 23 September 2011, the Board published the representations for 3 weeks for public comments and no comments were received. After giving consideration to the representations on 3 February 2012, the Board decided not to uphold the representations.~~

~~2.6~~ ~~On 11 November 2011, the draft Chai Wan OZP No. S/H20/19, incorporating amendments relating to the extension of the western boundary of the OZP, rezoning of a few sites and deletion of a previously proposed pier, was exhibited for public inspection under section 7 of the Ordinance. During the exhibition period, a total of 2 representations were received. On 3 February 2012, the Board published the representations for 3 weeks for public comments and no public comments were received. After giving consideration to the representations on 22 June 2012, the Board decided not to uphold the representations.~~

~~2.7~~ ~~On 20 January 2012, the draft Chai Wan OZP No. S/H20/20, incorporating amendments mainly relating to the imposition of building height restrictions for various zones and plot ratio restrictions for the "Industrial" and "Other Specified Uses" annotated "Business" zones, rezoning of "Commercial/Residential" ("C/R") sites to "Residential (Group A)" ("R(A)") and rezoning proposals to reflect their as-built situation, was exhibited for public inspection under section 7 of the Ordinance. During the exhibition period, a total of 284 representations were received. On 10 April 2012, the Board published the representations for 3 weeks for public comments and 1 comment was received. After giving consideration to the representations and comment on 27 July 2012, the Board decided not to uphold the representations.~~

2.~~8~~***5*** On 5 February 2013, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft Chai Wan OZP, which was subsequently renumbered as S/H20/21. ~~On 22 February 2013, the approved Chai Wan OZP No. S/H20/21 (the Plan) was exhibited for public inspection under section 9(5) of the Ordinance.~~ ***On 29 April 2014, the CE in C agreed to refer the approved Chai Wan OZP 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 16 May 2014 under section 12(2) of the Ordinance.***

2.6 ***On ____ September 2016, the draft Chai Wan OZP No. S/H20/21A (the Plan), incorporating amendments mainly to rezone a site at the junction of Chai Wan Road, Wing Ping Street and San Ha Street from "Open Space" to "Residential (Group A)", and to rezone a site at Cape Collinson Road from "Other Specified Uses" annotated "Funeral Parlour" to "Other Specified Uses" annotated "Columbarium", 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 networks so that development and redevelopment within the Planning Scheme Area can be put under statutory planning control.

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

3.3 Since the Plan is to show broad land use zoning, there would be cases that 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 and site coverage calculation. Development within residential zones should be restricted to building lots carrying development right in order to maintain the character and amenity of the Chai Wan 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 Planning Scheme 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 Planning Scheme Area (the Area) is located in the eastern part of Hong Kong Island. It is bounded by Heng Fa Chuen to the north, Tai Tam Country Park to the west, and Shek O Country Park to the south. To the east, it extends to the waterfront. The boundary of the Area is shown by a heavy broken line on the Plan. It covers an area of about 614 hectares of land. Developments in the Area are mainly on land reclaimed from the sea, with reclamation started in 1961.

5.2 Chai Wan has been predominantly a public housing area. There exist a number of public rental housing estates, Home Ownership Schemes (HOS) and Private Sector Participation Schemes (PSPS) developments. Nevertheless, there are also a number of private residential developments, such as Heng Fa Chuen on top of and adjacent to the Mass Transit Railway (MTR) depot and Island Resort in Siu Sai Wan.

5.3 Chai Wan is also one of the major industrial areas on Hong Kong Island. Industrial developments are located around Lee Chung Street near MTR Chai Wan Station and adjacent to the cargo handling basin.

5.4 Siu Sai Wan has been developed mainly for residential uses with some government, institution and community (GIC) uses. Public rental housing estates, HOS and PSPS developments have been developed along the foothills of Pottinger Peak. Adjoining it is the Siu Sai Wan reclamation area which has been developed for both public and private housing, sports ground, open space and GIC facilities.

5.5 The hillside to the south along Cape Collinson Road is dominated by cemeteries including crematorium and columbarium uses. The Area also covers parts of Shek O Country Park and Tai Tam Country Park.

6. POPULATION

According to the ~~2006~~ ***2011*** Population ~~By~~ Census, the population of the Area was about ~~182,800~~***179,050***. It is estimated that the planned population of the Area would be about ~~186,300~~***178,510***.

7. BUILDING HEIGHT RESTRICTIONS

7.1 In the absence of building height control, tall buildings may proliferate at random locations and the scale may be out-of-context in the locality, resulting in negative impacts on the visual quality of the Area and may sometimes obstructing air ventilation. In order to provide better planning control on the development intensity and building height upon development/redevelopment, to prevent excessively tall or out-of-context buildings and to meet public aspirations for greater certainty and transparency in the statutory planning system, a review of the Chai Wan OZP has been undertaken with a view to incorporating appropriate building height restrictions on the Plan for various development zones.

7.2 The review has taken into account urban design considerations and various factors including preservation of public view to the ridgelines, the stepped height concept in general as recommended in the Urban Design Guidelines, the local topography and characteristics, local wind environment, compatibility of building masses in the wider setting, as well as the need to strike a balance between public interest and private development rights.

7.3 Building height restrictions of 35 to 100 metres above Principal Datum (mPD) are generally adopted for the "Other Specified Uses" ("OU"), "Government, Institution or Community" ("G/IC") and "Industrial" ("I") sites located at the central waterfront around the Basin area. Specific "OU" and "G/IC" sites directly abutting the waterfront are restricted to more stringent height restrictions to maintain the low-rise character of waterfront developments. Further inland in the

Chai Wan Town Centre area, maximum height of 100 to 120mPD are adopted in order to achieve a stepped building height profile and to preserve the existing view to the ridgelines.

7.4 Following the topography of the area which rises further uphill in the northern, western and southern peripheries, and against the mountain backdrop, higher building height restrictions of 70 to 140mPD and 160 to 210mPD are adopted respectively for the Pamela Youde Nethersole Eastern Hospital under "G/IC" zoning at the northern periphery and the "R(A)" zones located in the southern periphery of the area in Siu Sai Wan/areas north of Cape Collinson Road as well as in the western periphery area near the foothills of Mount Parker.

7.5 Specific building height restrictions for the "G/IC" and "OU" zones in terms of number of storeys or mPD, which mainly reflect the building heights of existing and committed developments, have been incorporated into the Plan to provide visual and spatial relief to the high density environment of the Area.

7.6 An Expert Evaluation on Air Ventilation Assessment (AVA) has been undertaken to assess the existing wind environment and the likely impact of the proposed building heights of the development sites within the Area on the pedestrian wind environment. The building height and non-building area restrictions as well as the building gap requirements incorporated into the Plan have taken the findings of the AVA into consideration.

7.7 In general, the major prevailing annual wind comes from the north-east and east directions, and the prevailing summer wind mainly comes from the south-west, south, south-east to east directions. There are strong northeast-southwest and east-southwest channelling effects at or near the ground level due to the surrounding topography and the area's proximity to the waterfront.

7.8 To facilitate better air ventilation in the Area, the AVA has recommended that existing open space and low-rise GIC or OU sites and the major breezeways should be maintained to allow penetration of wind inland. Non-building areas (NBAs) and building gaps are stipulated on the Plan to facilitate the air ventilation at major ventilation corridors. Furthermore, future developments are encouraged to adopt suitable design measures to minimize any possible adverse air ventilation impacts. These include greater permeability of podiums, wider gap between buildings, building set-back to create air/wind path for better ventilation and minimizing the blocking of air/wind flow through positioning of building towers and podiums to align with the prevailing wind directions, as appropriate.

7.9 In general, a minor relaxation clause in respect of building height restrictions is incorporated into the Notes of the Plan in order to provide incentive for developments/redevelopments with planning and design merits and to cater for circumstances with specific site constraints. Each planning application for minor relaxation of building height restrictions under section 16 of the Ordinance will be considered on its own merits and the relevant criteria for consideration of such application 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 a public passage/street widening;

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

(d) providing separation between buildings to enhance air 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 need for tree preservation, innovative building design and planning merits that would bring about improvements to townscape and amenity of the locality and would not cause adverse landscape and visual impacts.

7.10 However, for any existing building with building height already exceeding the building height restrictions in terms of mPD and/or number of storeys as stated in the Notes of the Plan and/or stipulated on the Plan, there is a general presumption against such application for minor relaxation unless under exceptional circumstances.

NBAs

7.11 In order to facilitate ventilation along major corridors, 3 NBAs are designated in the area:

(a) a 30m wide NBA is designated to the south of Hing Man Estate to facilitate air ventilation along the southwest-northeast air corridor. It will facilitate the valley wind to flow over the 4-storeyed Chai Wan Health Centre across Chai Wan Road towards the proposed NBA along Hong Man Street;

(b) NBAs are designated along Hong Man Street to facilitate the flowing of valley winds from the southerly quarters. These comprise a 10m wide NBA from the lot boundary of Greenwood Terrace, 3m wide NBAs from the lot boundary of 45 Kut Shing Street and 10 Hong Man Street fronting Hong Man Street, 4m wide NBAs from the lot boundary of 44 Lee Chung Street and 40 Lee Chung Street fronting Hong Man Street with the 6m wide footpath between them; and

(c) a 20m wide NBA within Tsui Wan Estate (covering part of Tsui Wan Street) is designated to facilitate the air ventilation along the major southwest-northeast air path and the penetration of sea breeze between the waterfront and the inland.

Building Gaps

7.12 Gaps between buildings play a key role in creating air paths by appropriate design and disposition of building blocks.

(a) A 5m wide setback requirement within the "CDA" zone above 21mPD (about 15m above ground level) along the northwestern side of the existing Chai Wan Flatted Factory is imposed. With wind channeling through the existing 3-storeyed Telephone Exchange Building at Cheung Lee Street to Chui Hang Street, Lee Chung Street and the existing open-air bus terminus at Ning Foo Street, the proposed setback together with Chui Hang Street will create a 20m wide building gap to facilitate air ventilation along the major southwest-northeast air path; and

(b) A 15m wide building gap above 23mPD (about 15m above ground level) between two existing industrial buildings, namely Chai Wan Industrial Centre and Minico Building, is introduced taking account of the existing building gap above podium level for air/wind penetration as well as visual permeability, and to facilitate the air ventilation along the major southwest-northeast air path.

8. LAND USE ZONINGS

8.1 Comprehensive Development Area ("CDA") : Total Area 1.37 ha

8.1.1 This zone is intended for comprehensive development/redevelopment of the area for residential and/or commercial uses with the provision of open space and other supporting facilities. The zoning is to facilitate appropriate planning control over the development mix, scale, design and layout of development, taking account of various environmental, traffic, infrastructure and other constraints.

8.1.2 This zone covers two sites, one located to the immediate west of the MTR Chai Wan Station and the other one at Chai Wan Road near Siu Sai Wan Road. Pursuant to section 4A(1) of the Ordinance, any development within the "CDA" zone would require approval of the Board by way of a planning application under section 16 of the Ordinance. A Master Layout Plan (MLP) should be submitted in accordance with the requirements as specified in the Notes for the approval of the Board pursuant to section 4A(2) of the Ordinance. A copy of the approved MLP would be available for public inspection in the Land Registry pursuant to section 4A(3) of the Ordinance.

8.1.3 The "CDA" site to the immediate west of the MTR Chai Wan Station is for the ~~redevelopment~~***conservation and conversion*** of the Chai Wan Flatted Factory ***(CWFF) building for public rental housing use. The conservation and conversion project of the CWFF building is already completed***. ~~The site is subject to a maximum building height of 120mPD. Maximum building height of 21mPD (about 15m above ground level) is imposed for part of the site along Chui Hang Street to facilitate air ventilation. Since the site is subject to air and noise pollution generated by the nearby industrial uses and traffic on nearby roads, due regard should be given to these environmental problems in formulating a redevelopment scheme for the site. A planning brief~~

~~will be prepared to guide the future development of this "CDA" site.~~

8.1.4 The "CDA(1)" site at Chai Wan Road near Siu Sai Wan Road covers part of the bus depot, formerly occupied by the China Motor Bus (CMB), and the adjoining bus terminus. It is intended for comprehensive development/redevelopment for residential and/or commercial uses with the provision of supporting facilities. While a maximum building height restriction of 140mPD is imposed, a stepped height profile should be adopted for future development. To ensure that the development will be of compatible scale, a maximum total gross floor area of 86,268m^2 is specified in the Notes of the Plan.

8.1.5 Minor relaxation of the gross floor area and building height restrictions may be considered by the Board on application. Each application will be considered on its own merits.

8.2 Residential (Group A) ("R(A)") : Total Area ~~72.51~~***72.88*** ha

8.2.1 This zoning is intended primarily for high-density residential developments. Commercial uses such as shops, services and eating places 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 Public housing projects include public rental housing estates, HOS and PSPS and a few private residential developments are within this zone. Major community facilities and open space as well as commercial facilities are provided within these public housing developments to serve the needs of the residents.

8.2.3 Developments and redevelopments within the "R(A)" zone are subject to building height restrictions as stipulated on the Plan or the height of the existing building, whichever is the greater. Following the topography of the area and adopting the urban design principle of stepped heights, residential developments within the zone are restricted to the range of 100mPD to 120mPD at the town centre and the Siu Sai Wan waterfront area (with the exception of Island Resort); 100mPD to 140mPD at the inland area in Siu Sai Wan and along the foothills of Pottinger Peak in the south and Mount Parker in the west and 160 to 210mPD for the uphill location in the western periphery area near Mount Parker.

8.2.4 Island Resort on the waterfront of Siu Sai Wan is a private residential development with a public transport interchange and public car park and is zoned "R(A)1" on the Plan. The existing building height of the development at 193mPD is considered incompatible and incongruous with the surrounding developments and the waterfront setting. In order to respect the urban design principle for maintaining lower building heights on the waterfront to avoid out-of-context and incompatible developments, a maximum building height of 140mPD is imposed on this "R(A)1" site. Future redevelopment to the existing building height is not permitted.

8.2.5 A non-building area of 30m wide is designated to the south of Hing Man Estate to facilitate valley wind from the southwest to penetrate into the inland area. Two non-building areas of 10m and 20m wide are imposed within Greenwood Terrace and Tsui Wan Estate (covering part of Tsui Wan Street) respectively to facilitate valley wind from the southwest to the northeastern part of the area.

8.2.6 An AVA Expert Evaluation (AVA EE (2016)) has been carried out for the "R(A)" site at the junction of Chai Wan Road, Wing Ping Street and San Ha Street. The AVA EE (2016) indicates that tower setbacks and permeability design of domestic block on top of the podium should be incorporated in the proposed development to alleviate the potential ventilation impact to the surrounding area. A planning brief will be prepared to guide the development of the site.

8.2.~~6~~***7*** Minor relaxation of the building height restrictions and the non-building area requirements may be considered by the Board on application. Each application will be considered on its own merits.

8.3 Industrial ("I") : Total Area 6.19 ha

8.3.1 This zone is intended primarily for general industrial uses to ensure an adequate supply of industrial floor space to meet demand from production-oriented industries. Information technology and telecommunications industries and office related to industrial use are always permitted in this zone. However, general commercial and office uses, other than those permitted in the purpose-designed non-industrial portion on the lower floors of an existing building will require permission from the Board.

8.3.2 Industrial developments to the east and south of the Basin are subject to a maximum plot ratio of 12 having regard to the traffic condition in the area and a maximum building height of 100mPD. Established industrial developments are mainly located in the vicinity of Wing Tai Road, Ka Yip Street, Fung Yip Street and On Yip Street.

8.3.3 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.

8.3.4 Minor relaxation of the building height and plot ratio restrictions may be considered by the Board on application. Each application will be considered on its own merits.

8.4. Government, Institution or Community ("G/IC") : Total Area 70.58 ha

8.4.1 This zone is intended primarily for the provision of government, institution and community (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. Such developments, particularly for those which are low-rise, serve to provide visual and spatial relief to the densely built-up environment of the Area.

8.4.2 Existing facilities include the Siu Sai Wan Complex, Youth Square, a swimming pool complex, a health centre, a technical institute, a divisional police station, three post offices, two fire stations, some service reservoirs, a fresh water pumping station, a salt water pumping station, a switching cum pumping station, electricity sub-stations, a refuse collection point, a cooked food centre, a telephone exchange, churches and a number of primary and secondary schools. In addition, there are two existing correctional services institutions, i.e. Lai Chi Rehabilitation Centre and Cape Collinson Correctional Institution. The police rank-and-file quarters are located near Yue Wan Estate. The Fire Services Department Staff Quarters are located at Fei Tsui Road. A minimum 30m wide non-building area to the north of the Sai Wan Service Reservoir shall be provided to facilitate the flowing of valley wind.

8.4.3 A standard sports ground is provided in the Siu Sai Wan reclamation area primarily to meet the district demand and to serve as the main venue for school athletic events.

8.4.4 The "G/IC(1)" site covering a site at the junction of Siu Sai Wan Road and Sun Yip Street is reserved for an ambulance depot.

8.4.5 The "G/IC(3)" site at Heng Fa Chuen is subject to a maximum building height of 8 storeys, excluding the Mass Transit Railway depot, for the provision of land for the depot with GIC facilities above.

8.4.6 A site to the north of Lok Man Road is occupied by Pamela Youde Nethersole Eastern Hospital (the Eastern Hospital). Maximum building height restrictions of 120mPD and 140mPD have been imposed for the southern and northern parts of the site respectively to reflect their respective existing heights. The Chai Wan Laundry located at the western part of the Hospital, a building height of 120mPD has been imposed generalizing the building height of the adjacent Main Block/Pathology Block and having regard to the Hospital's expansion plan. For the eastern portion of the Hospital, which is under the Hospital's helicopter flight path, is zoned "G/IC(2)" and building height restrictions of 70mPD and 100mPD, including roof-top structures, are imposed.

8.4.7 For the Hong Kong Institute of Vocational Education north of Shun Tai Road, a building height restriction of 55mPD is imposed for the Institute portion. As for the staff quarters in the northern part of the site, which is zoned "G/IC(2)" on the Plan, a building height restriction of 70mPD, including roof-top structures, is imposed as the area is under the helicopter flight path of the Eastern Hospital.

8.4.8 Some sites to the north of the cargo handling area in Chai Wan East are reserved for future GIC developments including a site at the junction of Sheung Mau Street and Sheung On Street for a joint-user government building. Due consideration should be given to incorporating suitable landscaping treatment and innovative design elements in the future development of these sites to enhance the environment near the waterfront. This area is under the helicopter flight path of the Eastern Hospital and is zoned "G/IC(2)" with a maximum building height restriction of 70mPD, including roof-top structures, so as to safeguard the operation of helicopters and to facilitate the penetration of sea breeze into the inland area. The Government Flying Services should be consulted on any development on the sites under the flight path.

8.4.9 Law Uk near the junction of Chai Wan Road and Kut Shing Street has been developed into a folk museum.

8.4.10 Development and redevelopment within the "G/IC", "G/IC(1)", "G/IC(2)" and "G/IC(3)" zones are subject to maximum building height restrictions as stipulated on the Plan/in the Notes, or the height of the existing building, whichever is the greater. Minor relaxation of the building height restrictions and the non-building area requirement may be considered by the Board on application. The Government Flying Services should be consulted on any application for minor relaxation of building height restrictions for "G/IC(2)" sites. Each application will be considered on its own merits.

8.5 Open Space ("O") : Total Area ~~21.35~~***20.98*** ha

8.5.1 This zoning 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 Chai Wan Park which occupies a central location in Chai Wan has provided a wide range of recreational facilities to serve the population in the Area. As part of the Wan Tsui Estate redevelopment, a site to its south has been developed as a public park.

8.5.3 Within the Siu Sai Wan reclamation area, open spaces are planned near Harmony Garden as well as along the waterfront for the convenience of the public and for their enjoyment of sea view. Another site at Sheung On Street near the waterfront is also reserved for open space development.

8.5.4 Open spaces are also provided within public housing estates, and within private residential developments such as Heng Fa Chuen and Island Resort. These open spaces do not fall within areas zoned "O". Smaller pockets of open spaces are reserved and developed at suitable locations to provide as far as possible an even distribution of recreational facilities within the Area.

8.6 Other Specified Uses ("OU") : Total Area 88.15 ha

8.6.1 Heng Fa Chuen and the adjoining area are zoned "OU(Mass Transit Railway Comprehensive Development Area)". Heng Fa Chuen is a comprehensive commercial/residential development on top of and adjacent to the MTR depot. Adequate open space and community facilities have been provided within the development to serve the residents. Having regard to the existing building height and its waterfront location, a stepped height of 70mPD and 90mPD are imposed for the lower platform near the waterfront and for the upper platform above the MTR Heng Fa Chuen Station respectively. A maximum domestic and non-domestic GFA of 425,000m^2 and 26,750m^2 respectively for residential and commercial uses is also imposed.

8.6.2 The industrial sites to the west of MTR Chai Wan Station (except for the Chai Wan Flatted Factory site) and the sites at Sun Yip Street in Siu Sai Wan are designated for "Business" use (totaling 5.56 ha) to allow flexibility in the use of existing industrial and industrial-office (I-O) buildings as well as in the development of new buildings for both commercial and clean industrial uses. The planning intention of the "OU(B)" zone is 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 the existing industrial or I-O buildings within this zone.

8.6.3 As it is not possible to phase out existing polluting and hazardous industrial uses all at once, it is necessary to ensure compatibility of the uses within the same building and in existing industrial areas until the whole area is transformed to cater for the new non-polluting business uses. Development within this zone should make reference to the relevant Town Planning Board Guidelines.

8.6.4 Having regard to the traffic capacity in the two "OU(Business)" areas, a plot ratio restriction of 12 is imposed on the "OU(Business)" zones. A building height restriction of 120mPD for the "OU(Business)" zones to the west of MTR Chai Wan Station and those clustered around Sun Yip Street is imposed.

8.6.5 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.

8.6.6 Other specified uses in the Area include a public filling barging point, a cargo handling area, a refuse transfer station, liquefied petroleum gas cum petrol filling stations, oil depot~~, and~~ cemeteries ***and columbarium***. These facilities are subject to building height restrictions as stipulated on the Plan.~~ A site is also reserved for a funeral parlour but there is no development programme.~~

8.6.7 A 3m wide non-building area from the lot boundary of 45 Kut Shing Street and 10 Hong Man Street, and 4m wide non-building area from the lot boundary of 44 Lee Chung Street and 40 Lee Chung Street, all fronting Hong Man Street are imposed. In addition, a building gap of 15m wide above 23mPD (about 15m above ground level) is imposed between Chai Wan Industrial Centre and Minico Building.

8.6.8 Minor relaxation of the plot ratio and building height restrictions, and the non-building area requirements, may be considered by the Board on application. Each application will be considered on its own merits.

8.7 Green Belt (“GB”) : Total Area 181.32 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.

8.7.2 This zone covers the steep hillsides to the west and south-west where, because of difficult topography, urban type development as well as extensive recreational uses are not possible. However, the area contributes visually to the environment of the district. 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.

8.7.3 There is a large site to the north of the Area which was originally part of Lei Yue Mun Barracks. A portion of the site has been turned into Lei Yue Mun Park to serve as a natural break between the built-up areas of Chai Wan and Shau Kei Wan, apart from providing some recreational outlets for the residents.

8.8 Coastal Protection Area (“CPA”) : Total Area 5.88 ha

8.8.1 This zoning is intended to conserve, protect and retain the natural coastlines and the sensitive coastal natural environment, including attractive geological features, physical landform or area of high landscape, scenic or ecological value, with a minimum of built development. It may also cover areas which serve as natural protection areas sheltering nearby developments against the effects of coastal erosion.

8.8.2 There is a general presumption against development in this zone. In general, only developments that are needed to support the conservation of the existing natural landscape or scenic quality of the area or the development is an essential infrastructure project with overriding public interest may be permitted.

8.8.3 This zone comprises mainly areas of natural coastlines with attractive coastal features such as boulders and rocky shore. These areas of high scenic quality should be protected from development. Falling within this area are undeveloped coastal areas mainly below the 20 metre contour, including the coastal areas of Cape Collinson and Ngan Wan southwards towards Tso Tui Wan.

8.9 Country Park ("CP") : Total Area 115.43 ha

Country Park means a country park or special area as designated under the Country Parks Ordinance (Cap. 208). All uses and developments require consent from the Country and Marine Parks Authority and approval from the Town Planning Board is not required. This zone covers parts of Tai Tam Country Park and Shek O Country Park which fall within the planning scheme boundary of the Plan. The Country Parks contribute to the conservation of the natural environment. Both passive and active recreational outlets are available within the Country Parks.

9. COMMUNICATIONS

9.1 Roads

Chai Wan Road and Island Eastern Corridor are major roads connecting the Area to other parts of Hong Kong Island. It is also proposed to widen Cape Collinson Road.

9.2 Mass Transit Railway (MTR)

The Area is served by the MTR Island Line with Chai Wan Station and Heng Fa Chuen Station. The railway is elevated and traverses the Area in a north-south direction.

9.3 Public Transport Termini

There are several existing public transport termini within the Area, including the ones at MTR Chai Wan Station, Siu Sai Wan Estate, Heng Fa Chuen, Sheung On Street and within the Island Resort.

10. UTILITY SERVICES

10.1 Fresh water supply to the Area is served by five fresh water service reservoirs beside the Eastern Hospital, Heng Fa Chuen, Shan Tsui Court, Hing Wah Estate and Siu Sai Wan Estate respectively. Salt water supply to the Area is served by a salt water service reservoir to the east of Fung Wah Estate.

10.2 There is a sewage screening plant and a refuse transfer station at Sun Yip Street.

10.3 Three electricity substations are located respectively at Shing Tai Road, Chai Wan Road and Cheung Lee Street to serve the Area. There is a telephone exchange to the west of Lee Chung Street to provide telephone services to the community.

10.4 No great difficulty is envisaged in meeting the future requirements for services and public utilities.

11. CULTURAL HERITAGE

11.1 Law Uk is a declared monument. The Cape Collinson Muslim Cemetery, Mosque and the Cape Collinson Light house are Grade 3 historic buildings. The Antiquities Advisory Board (AAB) has released the list of historic buildings and details of these historic buildings have been uploaded onto the official website of the Antiquities and Monuments Office (AMO) of the Leisure and Cultural Services Department (LCSD) at http://www.amo.gov.hk for reference. Prior consultation with the AMO of the LCSD should be made if any development or rezoning proposals might affect the declared monument/graded historic buildings.

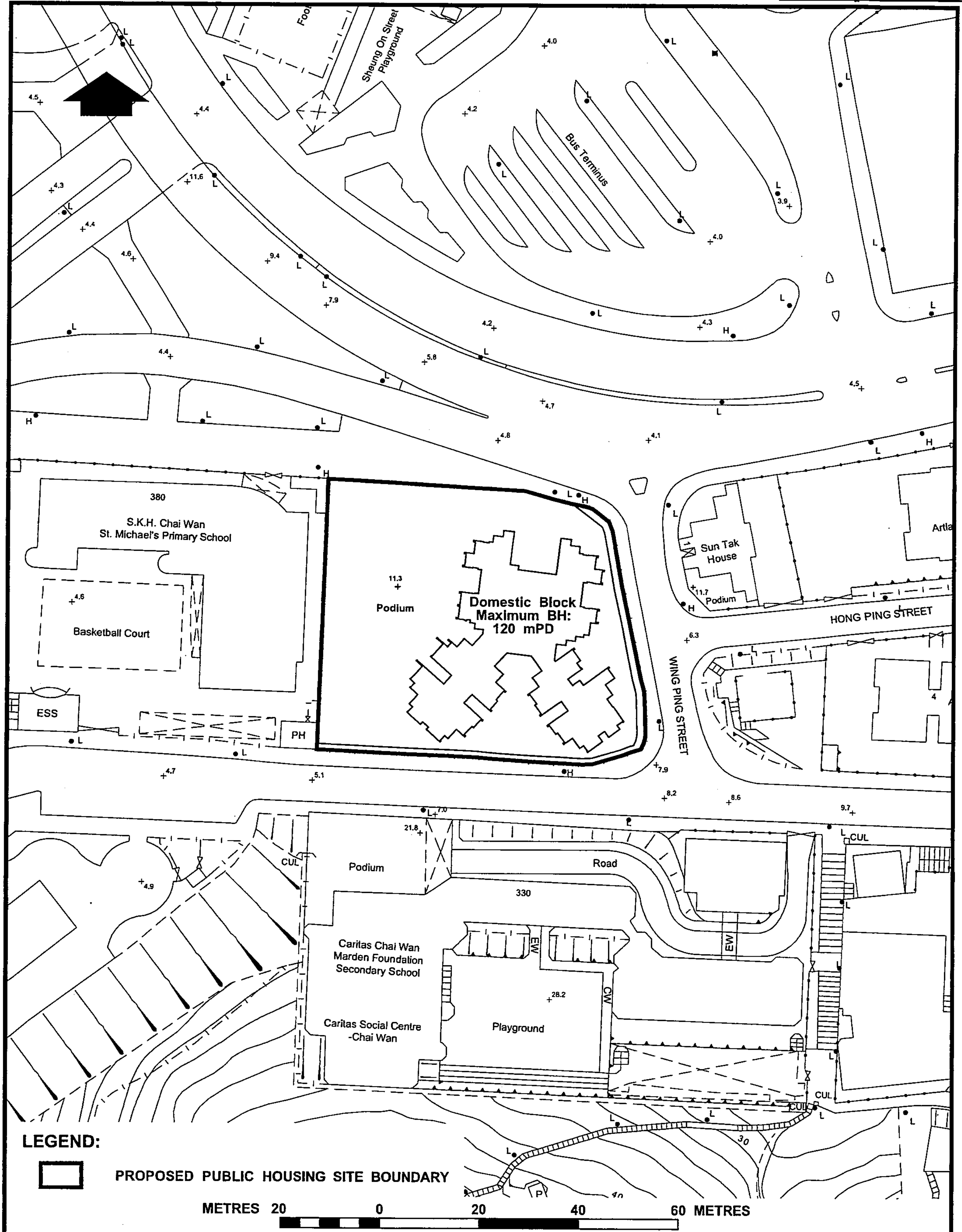
12. IMPLEMENTATION

12.1 Although existing uses non-conforming to the statutory zonings 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 Government departments. 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 Eastern District Council would be consulted as appropriate.

12.3 Planning applications to the Board will be assessed on individual merits. In general, the Board’s consideration of the planning applications will take into account all relevant planning considerations which may include the departmental outline development plans/layout plans and the Guidelines published by the Board. The outline development plans and layout 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 the 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
~~FEBRUARY 2013~~*AUGUST 2016*



J/O OF CHAI WAN ROAD, WING PING STREET AND SAN HA STREET - TENTATIVE LAYOUT

(SUBJECT TO CHANGES IN DETAIL DESIGN)

HOUSING DEPARTMENT
PLANNING SECTION

DRAWING B

DATE: 26. 2. 2016

BASE EXTRACTED FROM SHT. No. 11-SE-19B

16_0160HK_Layout

Visual Appraisal

Proposed Public Housing Development
at J/O of Chai Wan Road, Wing Ping Street, and San Ha Street, Chai Wan
(Site No. GLA 4)

1. Site Particulars and Proposed Development

1.1 The subject site (about 0.33 ha) is zoned "Open Space" on the approved Chai Wan Outline Zoning Plan (OZP) No. S/H20/21. It is currently occupied by LCSD's plant nursery on government land.

1.2 The subject site is located on the eastern fringe of Chai Wan. It is bounded by Chai Wan Road to the north, Wing Ping Street to the east, and San Ha Street to the south. SKH Chai Wan St. Michael's Primary School (about 29mPD) is located to the immediate west and high-rise residential clusters including Chai Wan Estate (about 118mPD) and Lok Hin Terrace (about 99mPD) located to the further west. Residential clusters (about 48 - 90mPD) can also be found to the immediate east with Chai Wan Swimming Pool and Siu Sai Wan Estate (about 113 - 118mPD) to the further east. To the immediate north is a bus terminus with an industrial area to the further north and the former China Motor Bus Depot to the northeast. A comprehensive development (about 134 - 140mPD) is planned at the bus terminus and the former China Motor Bus Depot. Caritas Chai Wan Marden Foundation Secondary School (about 41mPD) is found to the immediate south, with Cape Collinson Chinese Permanent Cemetery to the further south. Please refer to **Drawing A** for details**.**

1.3 The subject site is situated in a predominantly built-up area with high-rise residential development and industrial buildings mingled with low-rise Government, Institution, or Community uses. The mountain backdrop and Pottinger Peak are located to the further south of the subject site. As stipulated in the OZP, the building height restriction is imposed in the area in order to form a stepped building height profile from the waterfront towards the inland. Major visual detractors in the area include the Cape Collinson Chinese Permanent Cemetery in the south and the industrial uses in the area (including the cargo handling basin) in the north.

1.4 The site is proposed to be rezoned to "Residential (Group A)" ("R(A)") for public housing development, and subject to a building height restriction of 120mPD and total GFA of about 33,000 m^2 (equivalent to a plot ratio of about 10). The proposed public housing development will deliver about 800 flats to accommodate a design population of about 2,000 persons. The proposed development comprises a single building block on top of a podium not exceeding 7m high. Please refer to **Drawing B** for details**.**

2. Viewpoints (VPs)

2.1 Four VPs from different directions and distances are selected (**Drawing A** refers) for appraisal of the visual impact of the proposed development. These VPs are located at prominent and easily accessible pedestrian nodes in the area with direct sightline to the subject site. They include:

VP 1	Bus stop along Chai Wan Road (outside former China Motor Bus Depot)
VP 2	Outside Chai Wan Swimming Pool
VP 3	Bus stop along Chai Wan Road (outside Yue On House of Yue Wan Estate)
VP 4	Pedestrian footpath at Junction of Wing Tai Road and Sheung Ping Street

2.2 A vantage point from Sheung On Street Playground (the "O" zone between "GIC" and "CDA" zones at the junction of Wing Tai Road/ Ka Yip Street/ Sheung On Street) was initially selected as one of the vantage points but subsequently not adopted because it will be blocked by the planned CDA development and the peripheral trees at the Playground (**Figure 1** refers). Notwithstanding, VP4 approximates a similar view angle.

3. Visual Appraisal

VP1 - Bus stop along Chai Wan Road (outside former China Motor Bus Depot (**Plan 1** refers)

3.1 Frequently used by the bus commuters, this VP is situated at the eastbound bus stop on Chai Wan Road at about 170m from the proposed development. In addition to the commuters, this VP can approximate the views of the future users of the open space to the east of the planned CDA development, which is not available for public access at the moment. The existing view from this VP mainly consists of the former China Motor Bus Depot, high-rise residential buildings and school against the mountain and sky view. As demonstrated in the photomontage in **Plan 1**, the view from the bus stop towards the site is dominated by the neighbouring residential buildings, namely, Sun Tak House (about 90mPD) and Artland Court (49mPD). The proposed development will be partially blocked by Sun Tak House with parts of the podium and building block being visible. The visual impact of the proposed development as viewed from this VP is considered slight.

VP2 - Outside Chai Wan Swimming Pool (**Plan 2** refers)

3.2 Located 185m from the proposed development, this VP is situated at a key pedestrian node at San Ha Street, which is frequented by users of Chai Wan Swimming Pool, the students/staffs of Precious Blood Secondary School, and residents nearby. The existing view from this VP mainly consists of the existing residential buildings and Precious Blood Secondary School, with mountain and sky backdrop. From this VP, the proposed development including its podium will be partially obstructed by the residential building of Artview Court (about 49mPD) and the existing trees. As shown in the photomontage in **Plan 2**, the proposed development by virtue of its height would reduce the view of the sky. Viewers at this VP are mostly pedestrians passing this location and experiencing transient view of the proposed development. The visual impact of the proposed development is considered moderate.

VP3 - Bus stop along Chai Wan Road (outside Yue On House of Yue Wan Estate) (**Plan 3** refers)

3.3 This VP is located at a highly utilized eastbound bus stop on Chai Wan Road (outside Yue On House of Yue Wan Estate) at about 240m from the proposed development. The existing view from this VP mainly consists of high-rise residential developments, including Sun Tak House (about 90mPD) and Chai Wan Estate (about 118mPD), and schools set against the open sky backdrop. As demonstrated in the photomontage in **Plan 3**, the proposed development by virtue of its height will intrude into the view of the sky. The lower portion of the proposed development would be blocked by the existing school buildings and vegetation in front. Taking into account the nearby Chai Wan Estate, the proposed development is not incompatible in terms of scale and height with the residential developments in the neighbourhood including the planned comprehensive development (of about 140mPD) at the adjacent CDA site. The visual impact from this viewpoint is considered moderate.

VP4 - Pedestrian footpath at Junction of Wing Tai Road and Sheung Ping Street (**Plan 4** refers)

3.4 This VP is situated at the pedestrian footpath at Junction of Wing Tai Road and Sheung Ping Street at about 410m from the proposed development. The existing view from this VP consists of Chai Wan Industrial City Phase 1 and 2 (about 90 - 93mPD), Hang Tsui Court (about 99mPD) and its multi-storey car park with SKH Chai Wan St. Michael's Primary School and mountain/open sky view as the backdrop. As demonstrated in the photomontage in **Plan 4**, the proposed development is compatible in scale and height with the surrounding buildings. With the existing trees and the elevated road in the midground, the podium of the proposed development is not visible from this VP. However, the proposed development would intrude into the view of the sky and block the mountain backdrop. In view of the above factors, the visual impact of the proposed development as viewed from this VP is considered moderate.

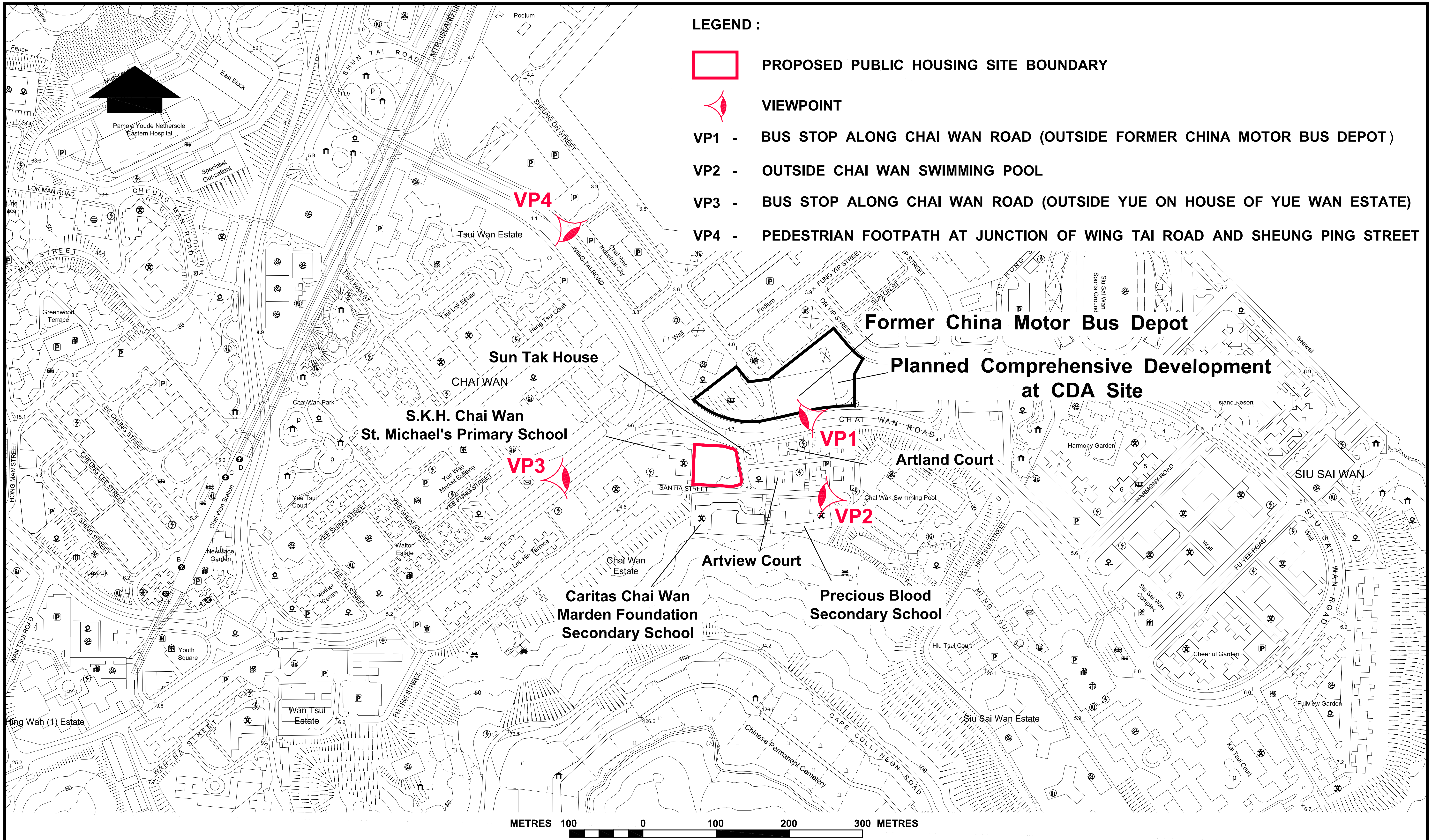
4. Conclusion

As discussed in Section 3 above, the visual impact of the proposed development will be slight as viewed from VP1 and moderate as viewed from VP2, VP3 and VP4. It would detract from the visual openness of the locality. Nevertheless, in terms of scale and height, it is not incompatible with the surrounding developments. Mitigation measures such as careful building disposition, maximization of at-grade greening, use of architectural articulations will be explored at detailed design stage for better integration of the proposed development with the neighbourhood. In overall terms, the visual impact of the proposed public housing development is considered moderate.

Attachments

Drawing A	Locations of Viewpoints for Visual Appraisal
Drawing B	Tentative layout
Figure 1	Vantage Point from Sheung On Street Playground
Plan 1	Photomontages at VP 1 (View from bus stop along Chai Wan Road (outside former China Motor Bus Depot))
Plan 2	Photomontages at VP 2 (View from outside Chai Wan Swimming Pool)
Plan 3	Photomontages at VP 3 (View from bus stop along Chai Wan Road (outside Yue On House of Yue Wan Estate))
Plan 4	Photomontages at VP 4 (View from pedestrian footpath at Junction of Wing Tai Road and Sheung Ping Street)

HOUSING DEPARTMENT
May 2016



PUBLIC HOUSING SITE AT J/O OF CHAI WAN ROAD, WING PING STREET AND SAN HA STREET - PROPOSED VIEWPOINTS FOR VISUAL APPRAISAL

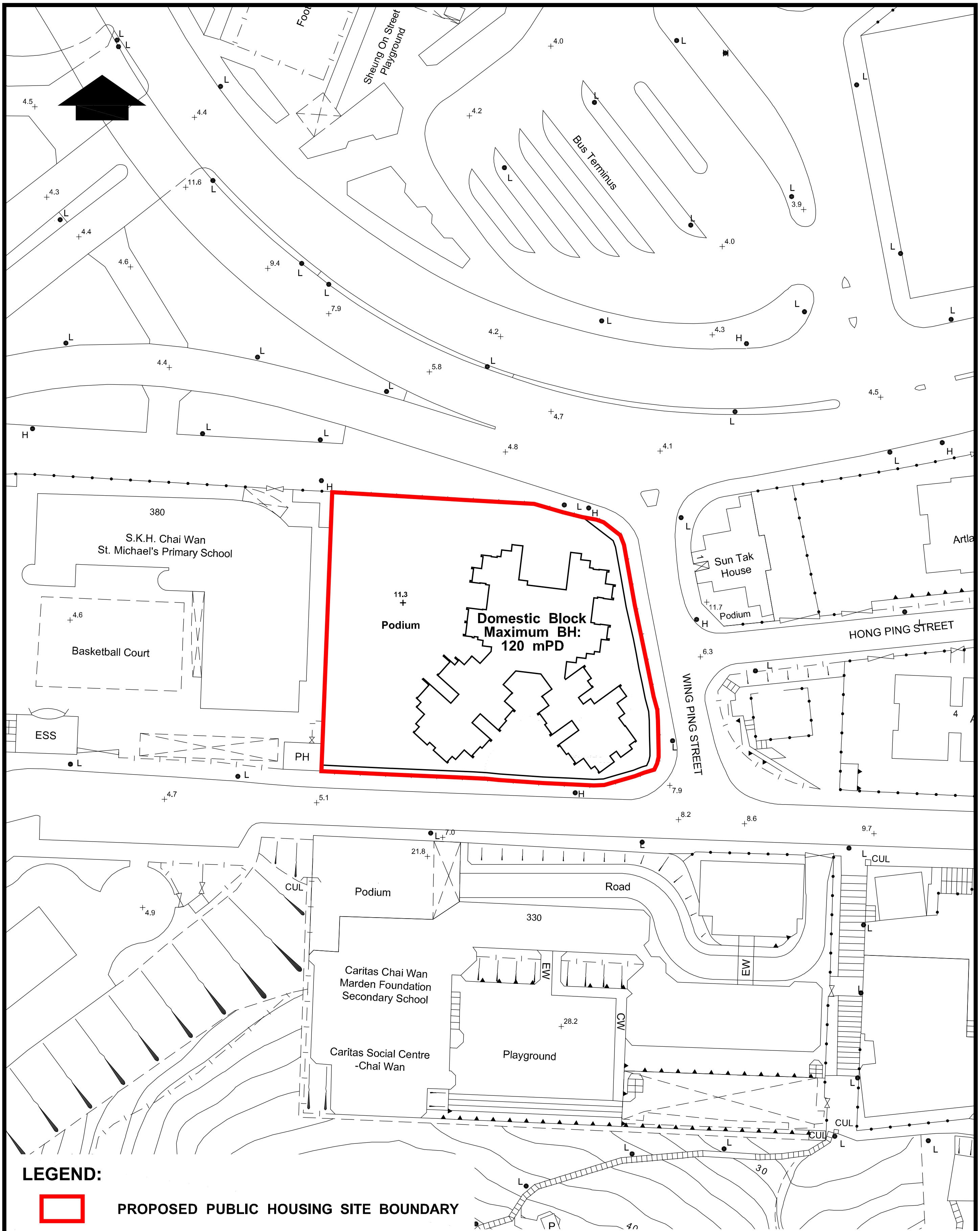
HOUSING DEPARTMENT
PLANNING SECTION

DRAWING A

DATE : 3. 5. 2016

BASE EXTRACTED FROM SHT. No. 11-SE-D

16_0160HK_VPs



LEGEND:

PROPOSED PUBLIC HOUSING SITE BOUNDARY

METRES 20 0 20 40 60 METRES

J/O OF CHAI WAN ROAD, WING PING STREET AND SAN HA STREET - TENTATIVE LAYOUT

(SUBJECT TO CHANGES IN DETAIL DESIGN)

HOUSING DEPARTMENT
PLANNING SECTION

DRAWING B

DATE :
26. 2. 2016

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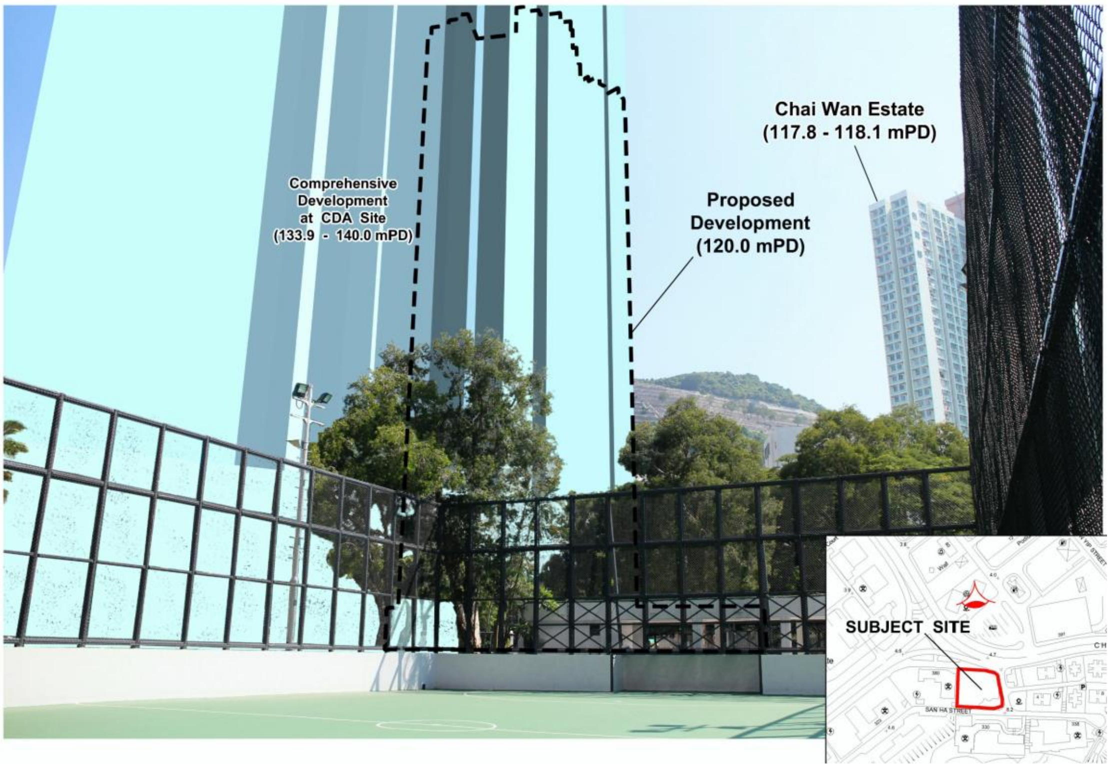
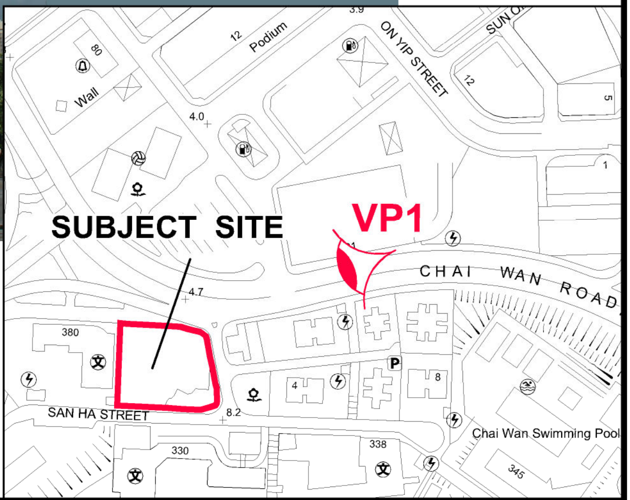


Figure 1 Vantage Point from Sheung On Street Playground

With Existing View

With Proposed Development



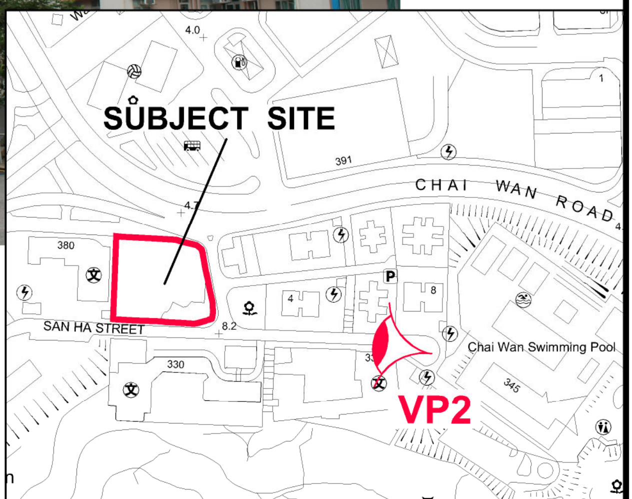
PHOTOMONTAGE AT VIEWPOINT (VP)1
(VIEW FROM BUS STOP ALONG CHAI WAN ROAD (OUTSIDE FORMER CHINA MOTOR BUS DEPOT))

HOUSING DEPARTMENT
PLANNING SECTION

PLAN 1

DATE : 29. 4. 2016

16_0160HK_vp1



PHOTOMONTAGE AT VIEWPOINT (VP)2
(VIEW FROM OUTSIDE CHAI WAN SWIMMING POOL)

HOUSING DEPARTMENT
PLANNING SECTION

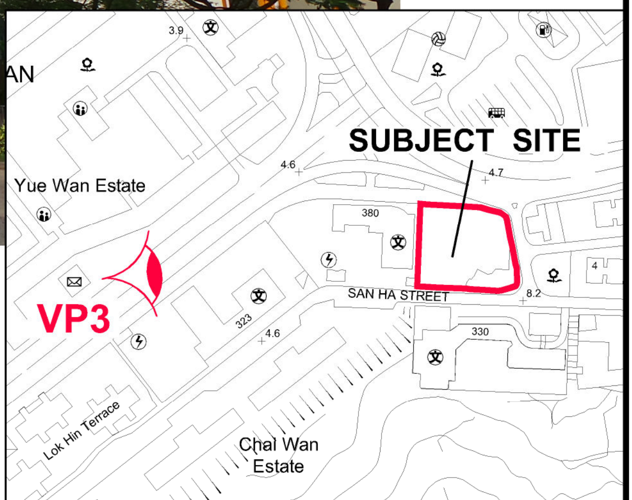
PLAN 2

DATE :
3. 5. 2016

16_0160HK_vp2

With Existing View

With Proposed Development



PHOTOMONTAGE AT VIEWPOINT (VP)3

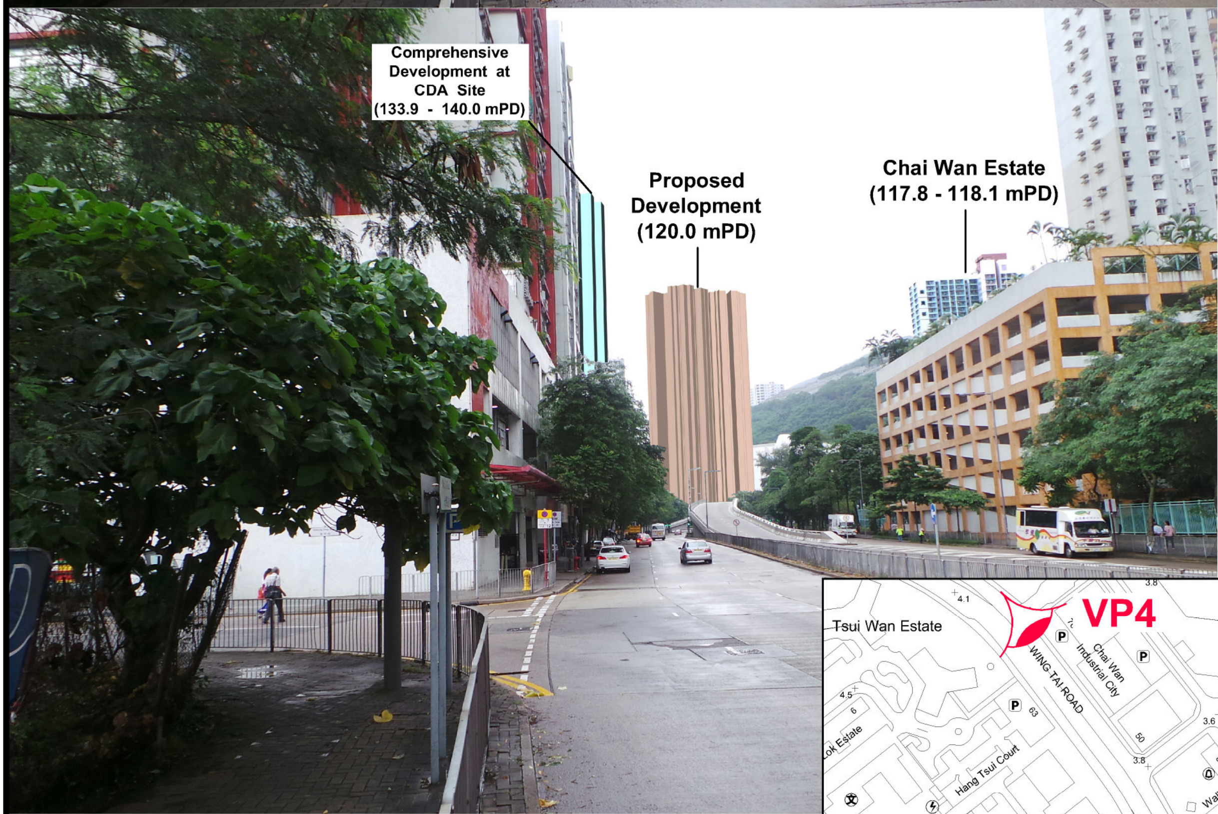
(VIEW FROM BUS STOP ALONG CHAI WAN ROAD (OUTSIDE YUE ON HOUSE OF YUE WAN ESTATE))

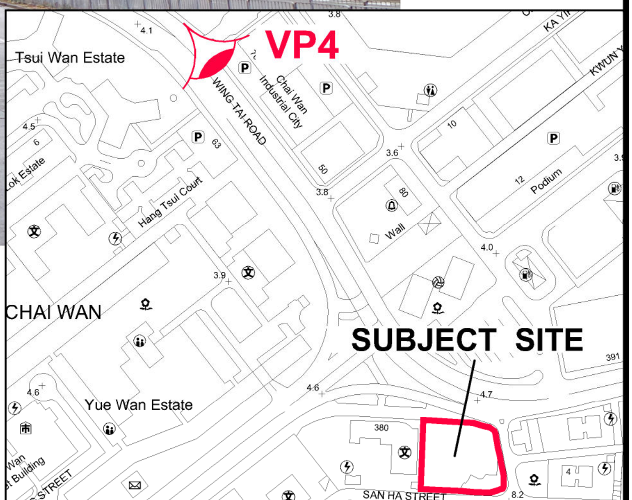
HOUSING DEPARTMENT
PLANNING SECTION

PLAN 3

DATE : 3. 5. 2016

16_0160HK_vp3





PHOTOMONTAGE AT VIEWPOINT (VP)4
(VIEW FROM PEDESTRIAN FOOTPATH AT JUNCTION OF WING TAI ROAD AND SHEUNG PING STREET)

HOUSING DEPARTMENT
PLANNING SECTION

PLAN 4

DATE :
29. 4. 2016

16_0160HK_vp4

Attachment VII of
MPC Paper No. 13/16

11/08/2016

Reference number: CHK50019644

TERM TRAFFIC AND ENVIRONMENTAL CONSULTANCY SERVICES 2014-2016
INSTRUCTION NO. M31
PROPOSED PUBLIC HOUSING DEVELOPMENT AT CHAI WAN ROAD
TRAFFIC IMPACT ASSESSMENT STUDY
DRAFT FINAL REPORT

Hong Kong Housing Authority
香港房屋委員會

In association with
Mott MacDonald Hong Kong Ltd.
ENVIRON Hong Kong Ltd.
Cinotech Consultants Ltd.
Maurice Lee & Associates Ltd.

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PROPOSED PUBLIC HOUSING DEVELOPMENT AT CHAI WAN ROAD

TRAFFIC IMPACT ASSESSMENT STUDY

IDENTIFICATION TABLE	
Client/Project owner	Hong Kong Housing Authority
Project	Proposed Public Housing Development at Chai Wan Road
Study	Traffic Impact Assessment Study
Type of document	Draft Final Report
Date	11/08/2016
File name	g:\mva\hk500196\chk50019644 (m31)\report\draft final rpt_20160811b.docx
Reference number	CHK50019644

APPROVAL

Version	Name		Position	Date	Modifications
2	Author	George Lee	Associate	11/08/2016	
	Checked by	Steven Ho	Divisional Director	11/08/2016	
	Approved by	Francis Sootoo	Director	11/08/2016	

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LIST OF TABLES

1. INTRODUCTION

1.1 Background

1.1.1 MVA Hong Kong Limited (MVA) was commissioned by the Hong Kong Housing Authority (HKHA) in 2015 to conduct a Traffic Impact Assessment (TIA) study for the proposed housing development at Chai Wan Road. **Drawing 1.1** shows the location of the development site.

1.1.2 This TIA study is to examine the impact of the traffic generated by the proposed development on the existing and planned road networks in the near vicinity. Any deficiency would be identified and improvement proposals would be recommended if necessary to resolve any foreseeable problem.

1.2 Study Objectives

1.2.1 The main objectives of the study are as follows:

- to assess the existing traffic conditions in the vicinity of the proposed development;
- to forecast traffic demands on the adjacent road network in the design year 2025;
- to estimate the likely traffic generated by the proposed development based on the updated planning parameters;
- to assess the impacts of traffic generated by the proposed development on the adjacent road network;
- to recommend improvement measures, if necessary, to alleviate any traffic problems on the road network; and
- to investigate the public transport and pedestrian needs in the near vicinity.

1.3 Structure of the Report

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

1.3.2 **Chapter 2** – **The Proposed Development**, which presents the planning parameters of the proposed development.

1.3.3 **Chapter 3 – Existing Traffic Conditions**, which describes the existing road network in the vicinity of the proposed development, presents the summary of traffic count survey and assesses the existing traffic conditions.

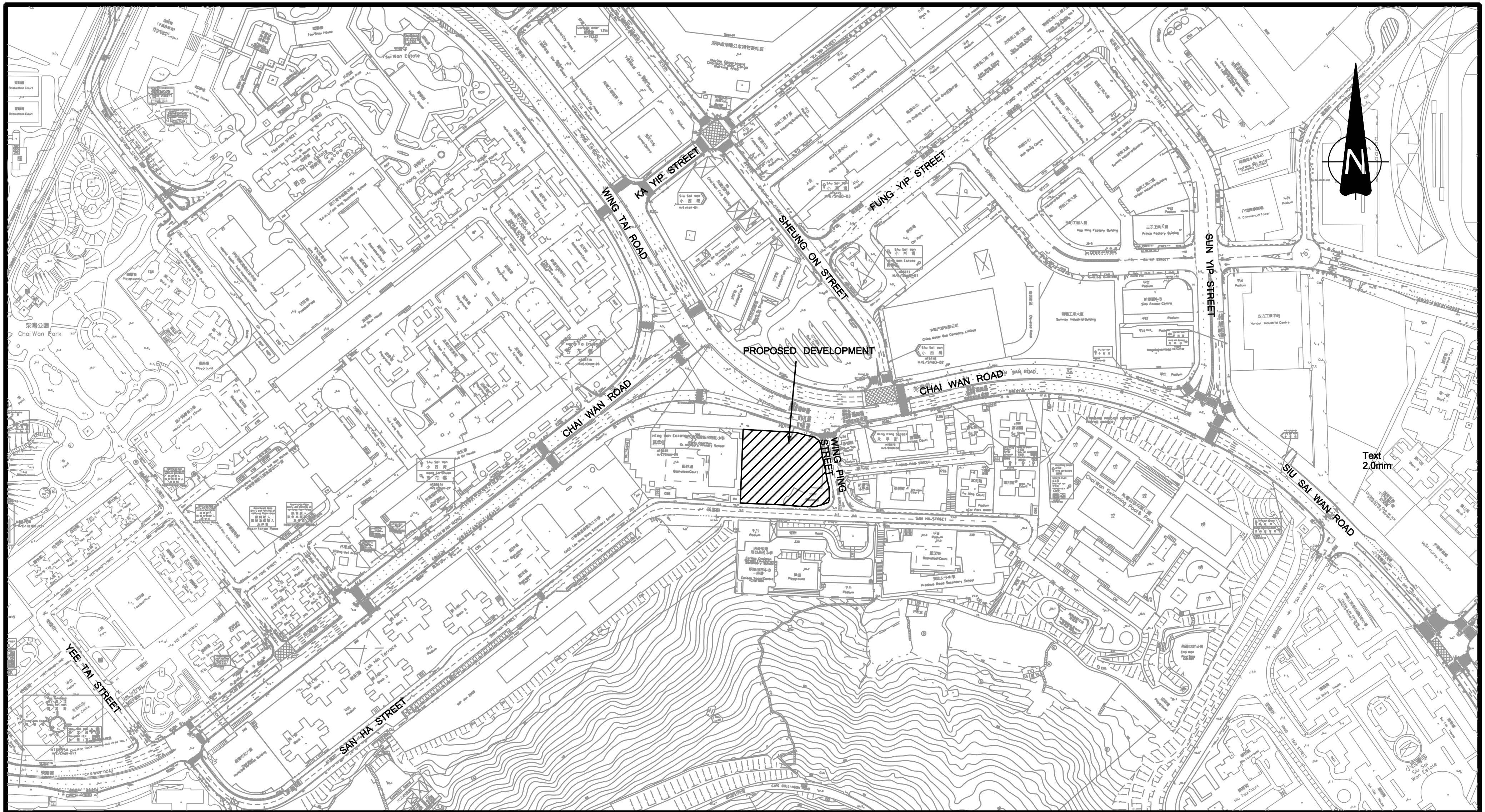
1.3.4 **Chapter 4 – Future Traffic Conditions**, which describes the future road network in the near vicinity and discusses the potential traffic generations and attractions of the proposed development under the updated development proposal. It also summarises the methodology for future traffic forecasts.

1.3.5 **Chapter 5 – Traffic Impact Assessment**, which presents the findings of the traffic impact assessment in the future design year and recommends improvement measures, if necessary.

1.3.6 **Chapter 6 – Public Transport Provisions Service**, which provides an examination of the provisions of public transport in the vicinity of the proposed development.

1.3.7 **Chapter 7 – Pedestrian Facilities and Assessment**, which provides an examination of the provision of existing pedestrian facilities in the vicinity of the proposed development.

1.3.8 **Chapter 8 – Summary and Conclusion**, which summarises the findings of the study and presents the conclusion regarding the traffic issues of the proposed development.



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Project Title

PROPOSED HOUSING DEVELOPMENT
AT CHAI WAN ROAD
TRAFFIC IMPACT ASSESSMENT

Drawing Title

SITE LOCATION

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2. THE PROPOSED DEVELOPMENT

2.1 Site Location

2.1.1 As shown in **Drawing 1.1**, the site subjected to this assessment is located at Chai Wan adjacent to the junction of Chai Wan Road, Wing Ping Street and San Ha Street.

2.2 Proposed Development

2.2.1 The proposed development is planned as Public Rental Housing (PRH), which falls within part of the subject site. **Table 2.1** summarises the development parameters.

Table 2.1 Development Parameters

Component	Development Parameter
Public Rental Housing (PRH)	800 flats (including 183 flats of 1/2P)
Retail	180 sq.m GFA

2.2.2 The proposed development is scheduled to be completed by end of 2022. The layout plan of the proposed development is shown in **Drawing 2.1**.

2.3 Vehicular Access of Proposed Development

2.3.1 As shown in **Drawing 2.1**, an all-movement vehicular access of the proposed development will be located at San Ha Street. At present, San Ha Street is a single two lanes carriageway running in east-west direction.

2.4 Parking and Servicing Facilities Provisions of Proposed Development

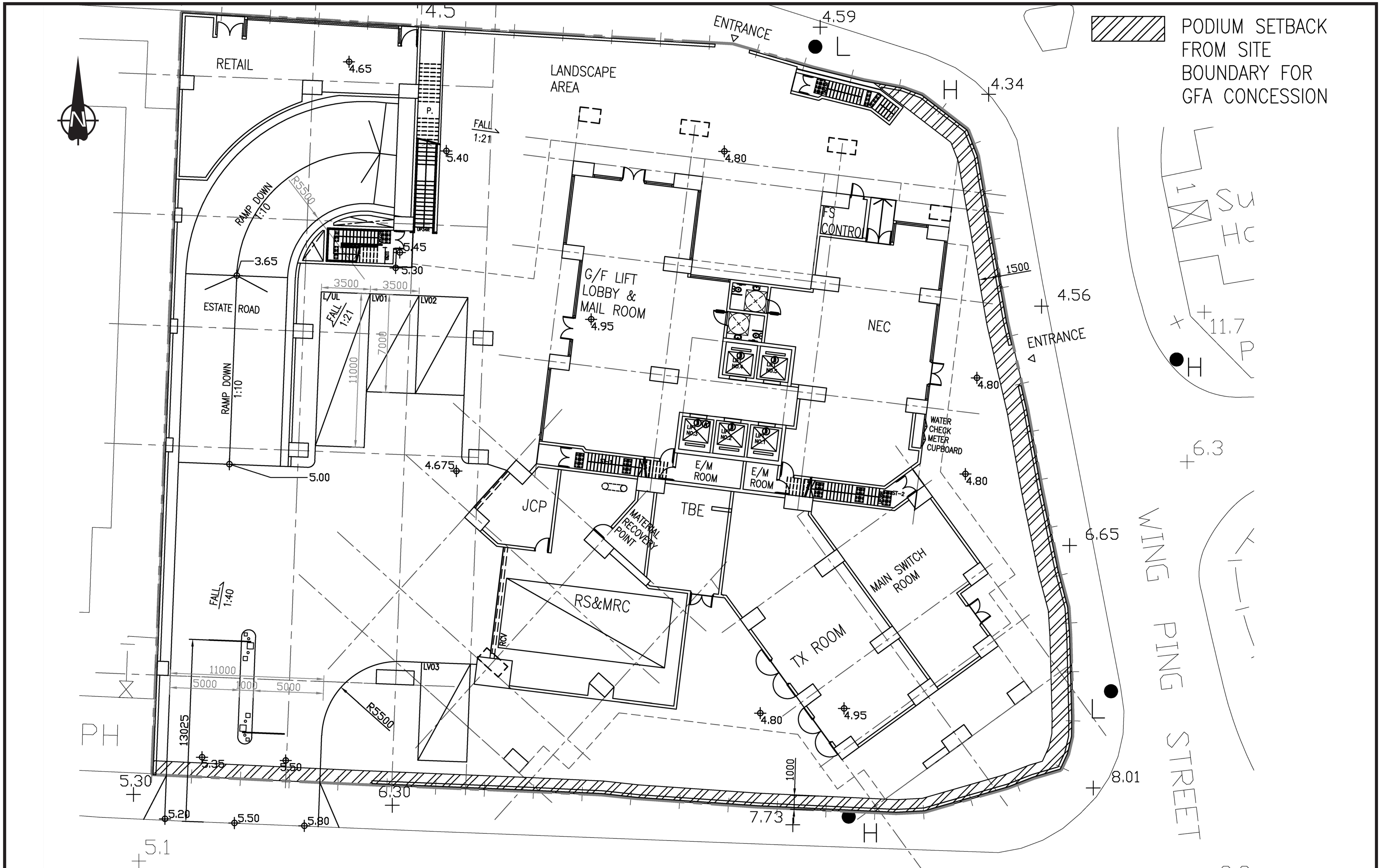
2.4.1 Private car, motor-cycle, light good vehicle parking spaces, loading/unloading bays will be provided inside the proposed development.

2.4.2 Based on the proposed development parameters as shown in **Table 2.1** and District-Based Parking Standards for Chai Wan, the proposed parking provisions for the proposed development are summarized in **Table 2.2** and **2.3**.

Table 2.2 Proposed Parking and Loading/Unloading Bays Requirements for Proposed Development

Parking Facilities	Chai Wan District-based Parking Standards outside 500m of Rail Station(1)	HKPSG Requirements	Proposed Provision
Car Parking Spaces (domestic)	1 per 26-40 flats (Outside 500m radius of a rail station)	15-23	23(3)
Car Parking Spaces (Retail)	-	-	1
Motor-cycle Parking	1 per 110-210 flats	3-6	6
Light Goods Vehicle	1 per 200-600 flats	1-3	2
Loading/Unloading	-	-	1

Notes: (1) 1p/2p flats are excluded from parking provision.
(2) Based on HKPSG requirement of 1 bay per block



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Project Title

PROPOSED HOUSING DEVELOPMENT AT WANG CHIU ROAD - TRAFFIC IMPACT ASSESSMENT

Drawing Title

LAYOUT PLAN OF PROPOSED DEVELOPMENT

Designed	Checked	Scale	Date	Drawing No.	Rev.
SFL	GPH	NTS	JUN 2016	2.1	A

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3. EXISTING TRAFFIC CONDITIONS

3.1 Existing Road Network

3.1.1 **Drawing 3.1** shows the existing road network that serves the proposed development. The proposed development is mainly served by Wing Tai Road, Chai Wan Road, Ka Yip Street, Sheung On Street, Wing Ping Street and San Ha Street. These existing major corridors are listed below:

- Wing Tai Road is a mainly a dual-three lanes district distributor in north-south direction connecting Island Eastern Corridor and Chai Wan Road. The north direction also consists of a flyover between Sheung Ping Street and Wing Ping Street.
- Chai Wan Road is a dual-three lanes primary distributor in east-west direction. It connects with Siu Sai Wan Road to the east and extends into the interland of Shau Kei Wan area which connects with Shau Kei Wan Road to the west.
- Ka Yip Street is a single two lanes local distributor which connects with Sheung On Street to southwest and terminates at a cul-de-sac to the northeast. A section of Ka Yip Street between Wing Tai Road and Sheung On Street is operating in one-way eastbound direction with two traffic lanes.
- Sheung On Street is a single two lanes local distributor in north-south direction. It connects with Chong Fu Road to the north and Chai Wan Road to the south. The section of Sheung On Street between Sheung Ping Street and Ka Yip Street is operating in a one-way northbound direction.
- Wing Ping Street is a single two lanes carriageway in north-south direction connecting Chai Wan Road and San Ha Street.
- San Ha Street is a single two lanes carriageway in east-west direction which connects with Chai Wan Road to the east and terminates at a cul-de-sac to the west. It provides direct access to the proposed development.

3.2 Critical Junctions

3.2.1 Six junctions were identified to be critical for assessment of traffic impact due to the proposed development. They are listed in **Table 3.1** below.

Table 3.1 Critical Junctions for Assessment

Ref.	Junction	Type	Drawing No.
A	Chai Wan Road/Sheung On Street/Wing Ping Street	Signal	3.2
B	Wing Tai Road/Chai Wan Road	Signal	3.3
C	Wing Tai Road/Ka Yip Street	Signal	3.4
D	Ka Yip Street/Sheung On Street	Signal	3.5
E	Chai Wan Road / Sun Yip Street	Signal	3.6
F	Chai Wan Road / San Ha Street	Signal	3.7

3.2.2 The locations of the above six junctions are illustrated in **Drawing 3.1**. The existing junction layout arrangements and method of control for critical junctions are shown in **Drawings 3.2** to **3.7** respectively.

3.2.3 In order to appraise the existing traffic conditions of these junctions, a traffic survey in the form of manual classified count was conducted at a typical weekday in June 2015. Analysis of the observed traffic data indicates that the AM and PM peak hour flows occurred from 7:30 to 8:30 and from 17:00 to 18:00 respectively. The results are shown in **Drawing 3.8**.

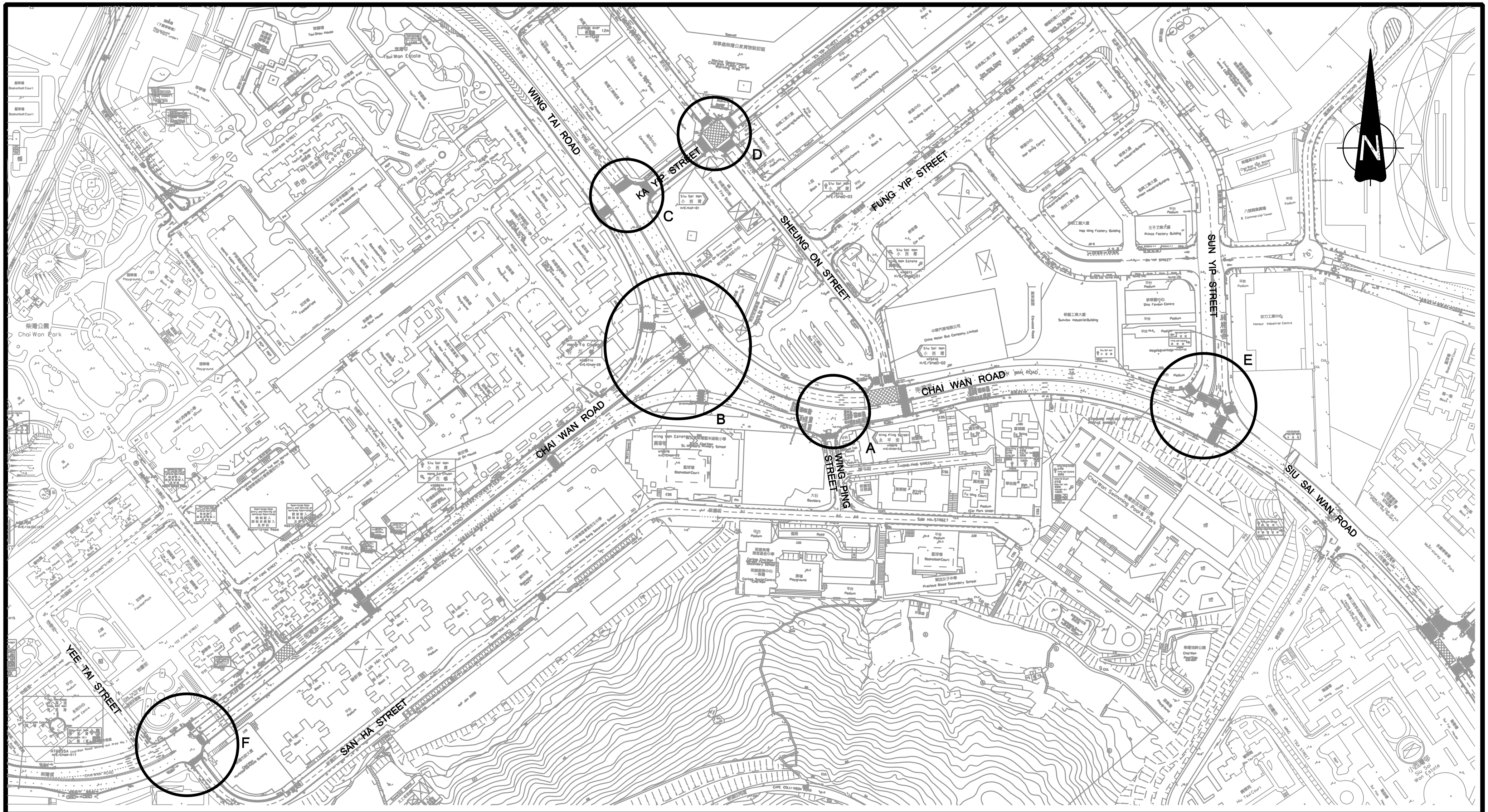
3.2.4 Existing operational performance of the critical junctions and the results are listed in **Table 3.2** below.

Table 3.2 Operational Performance of Critical Junctions in 2015

Ref.	Junction	Type	2015 RC (1)	
			AM Peak	PM Peak
A	Chai Wan Road/Sheung On Street/Wing Ping Street	Signal	25%	25%
B	Wing Tai Road/Chai Wan Road	Signal	>100%	>100%
C	Wing Tai Road/Ka Yip Street	Signal	>100%	>100%
D	Ka Yip Street/Sheung On Street	Signal	62%	54%
E	Chai Wan Road / Sun Yip Street	Signal	34%	70%
F	Chai Wan Road / San Ha Street	Signal	97%	>100%

Notes: (1) RC represents the reserve capacity for signal junction. A positive RC value indicates the junction is within capacity and a negative RC value indicates the junction is at/over capacity.

3.2.5 The assessment results in **Table 3.2** indicate that all critical junctions are at present operating within capacities.



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Project Title

PROPOSED HOUSING DEVELOPMENT
AT CHAI WAN ROAD
TRAFFIC IMPACT ASSESSMENT

Drawing Title

EXISTING ROAD NETWORK AND CRITICAL JUNCTIONS

Designed	Checked	Scale	Date	Drawing No.	Rev.
SFL	GPH	1:4000(A4)	JUN 2016	3.1	A

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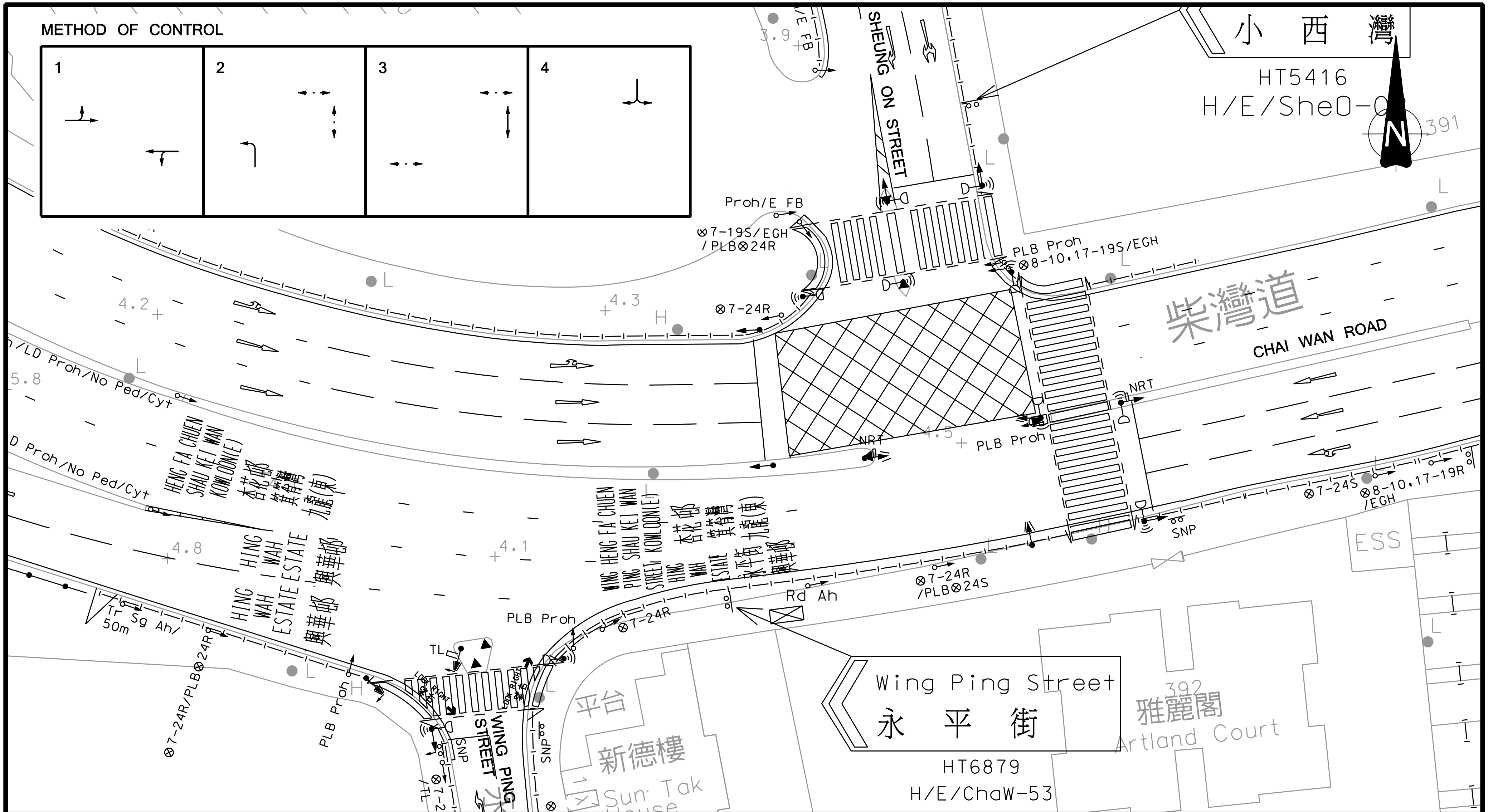

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Project Title

PROPOSED HOUSING DEVELOPMENT
AT CHAI WAN ROAD
TRAFFIC IMPACT ASSESSMENT

Drawing Title

EXISTING JUNCTION LAYOUT OF CHAI WAN ROAD / SHEUNG ON STREET / WING PING STREET (A)

Designed	Checked	Scale	Date	Drawing No.	Rev.
TYC	GPH	1:500(A4)	JAN 2016	**3.2**	-

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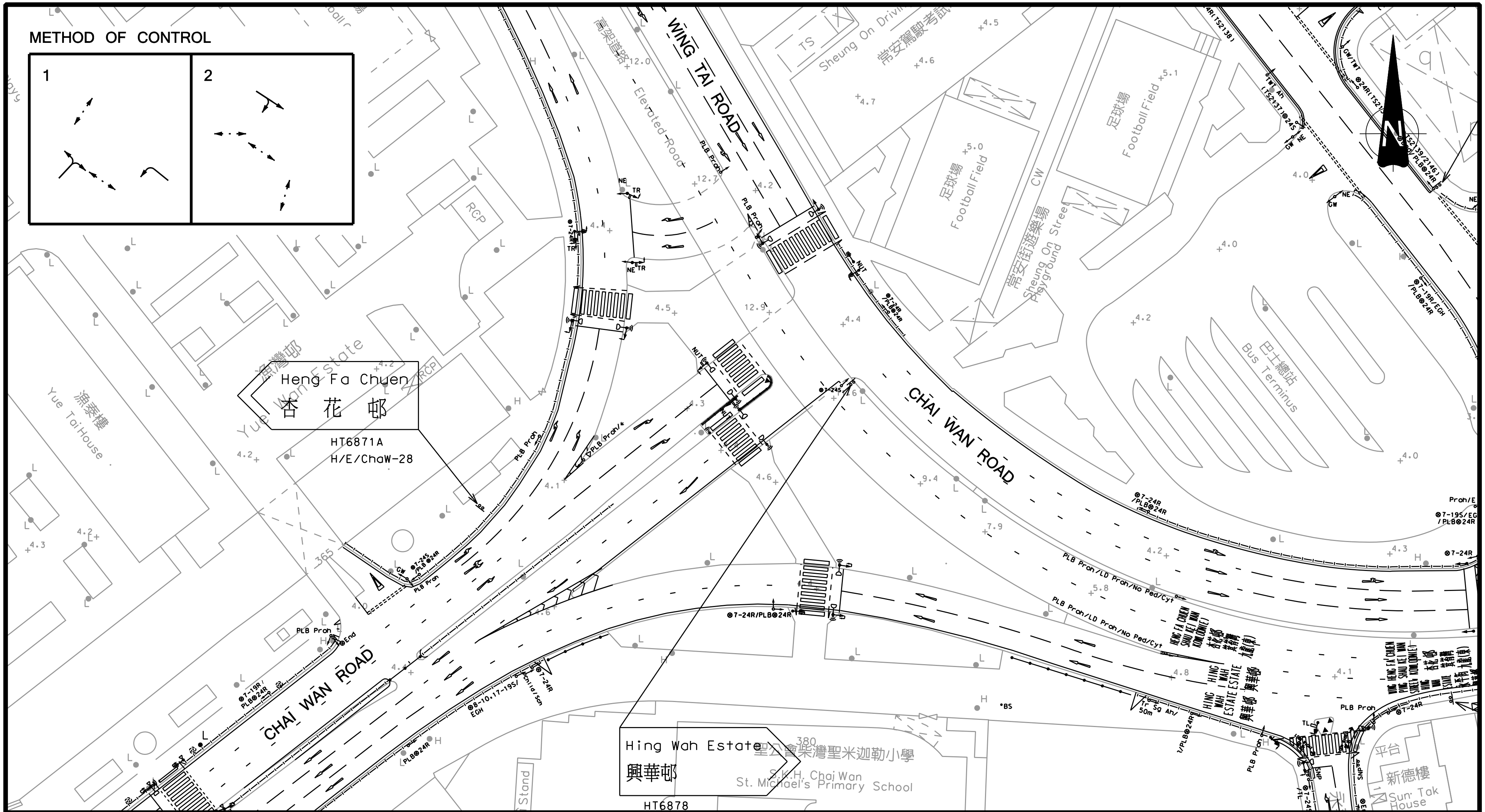

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Project Title

PROPOSED HOUSING DEVELOPMENT
AT CHAI WAN ROAD
TRAFFIC IMPACT ASSESSMENT

Drawing Title

EXISTING JUNCTION LAYOUT OF WING TAI ROAD / CHAI WAN ROAD (B)

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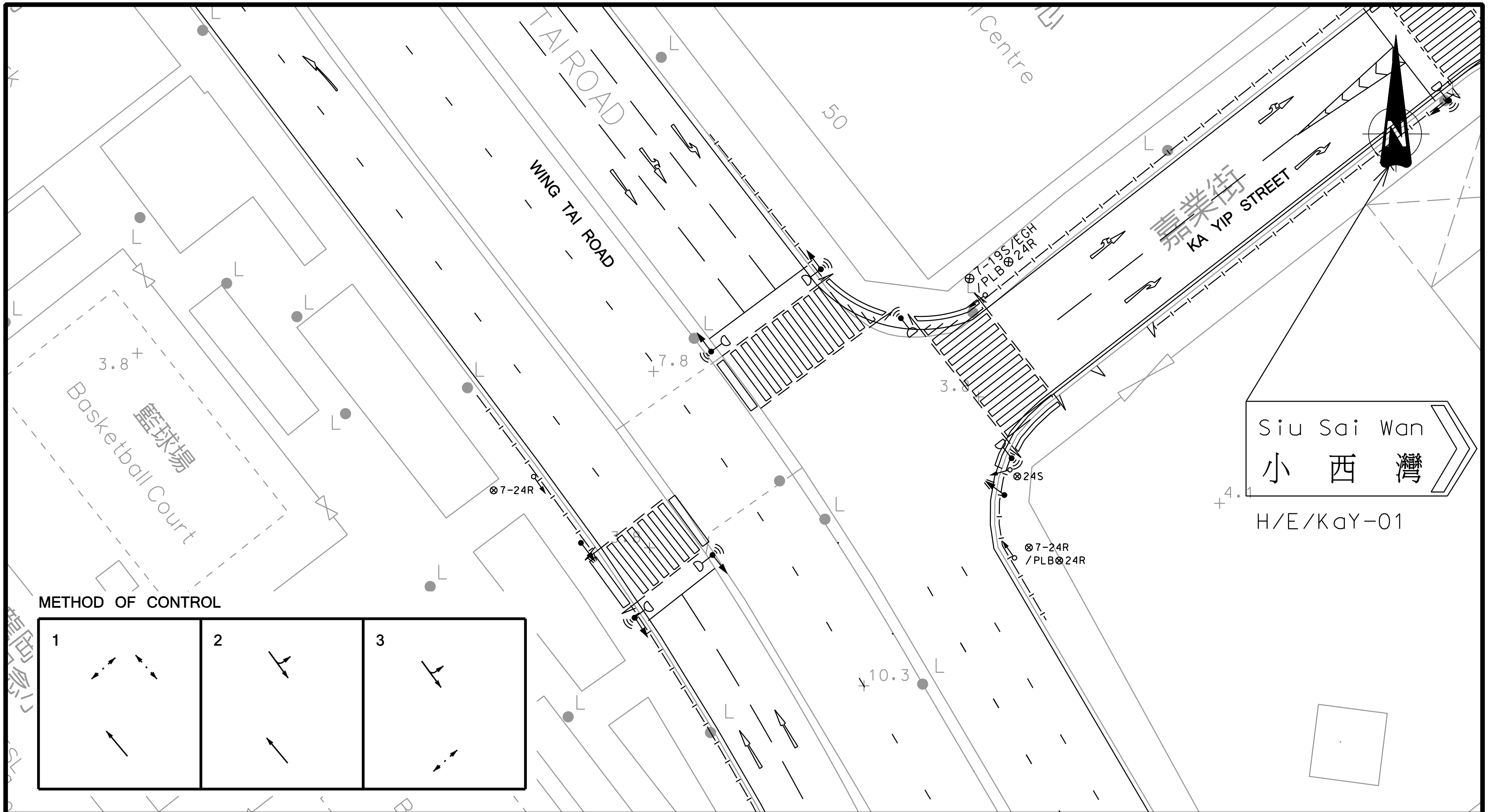

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Project Title

PROPOSED HOUSING DEVELOPMENT
AT CHAI WAN ROAD
TRAFFIC IMPACT ASSESSMENT

Drawing Title

EXISTING JUNCTION LAYOUT OF WING TAI ROAD / KA YIP STREET (C)

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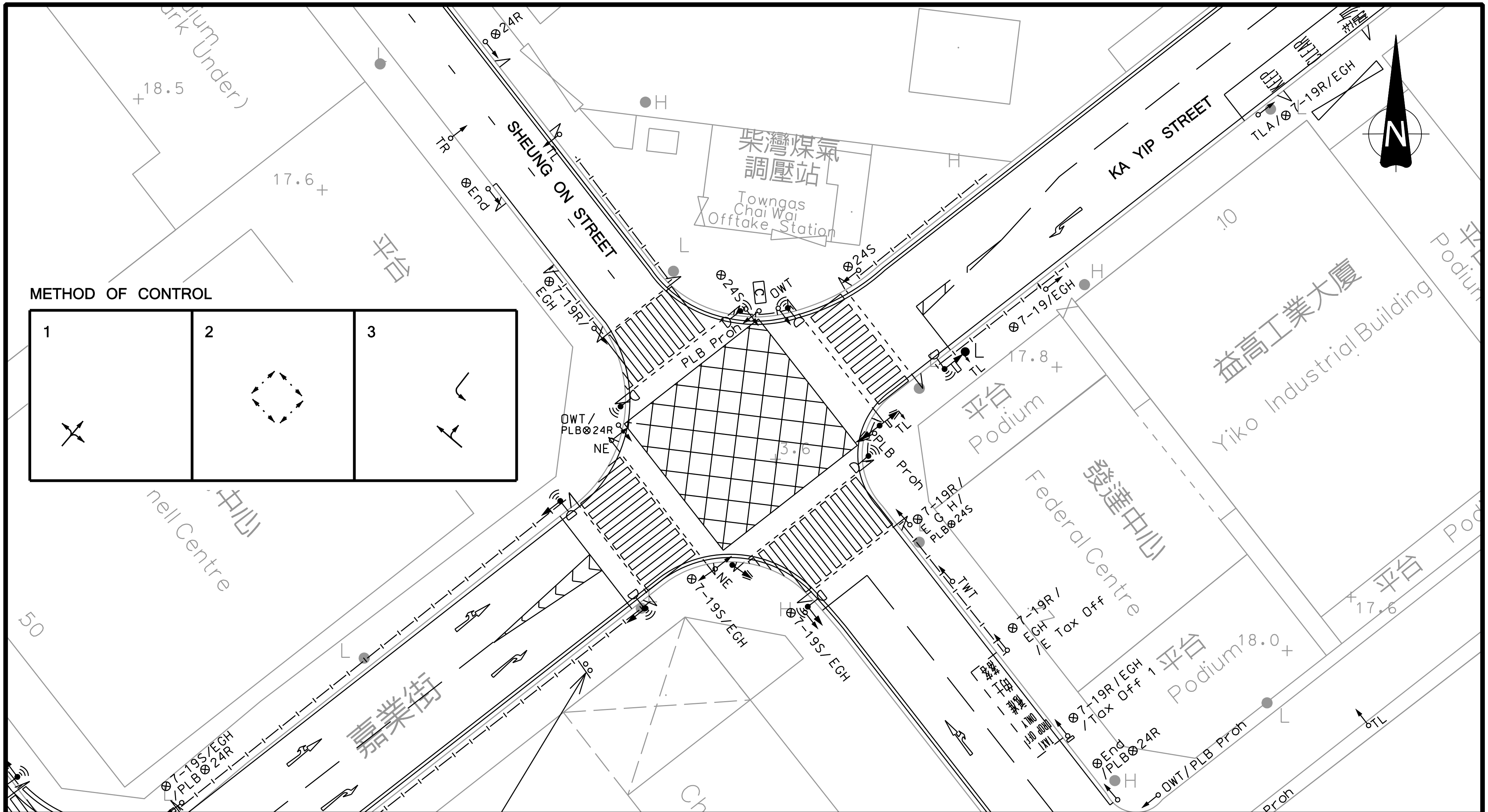

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Project Title

PROPOSED HOUSING DEVELOPMENT
AT CHAI WAN ROAD
TRAFFIC IMPACT ASSESSMENT

Drawing Title

EXISTING JUNCTION LAYOUT OF KA YIP STREET / SHEUNG ON STREET (D)

Designed	Checked	Scale	Date	Drawing No.	Rev.
TYC	GPH	1:500(A4)	JAN 2016	3.5	-

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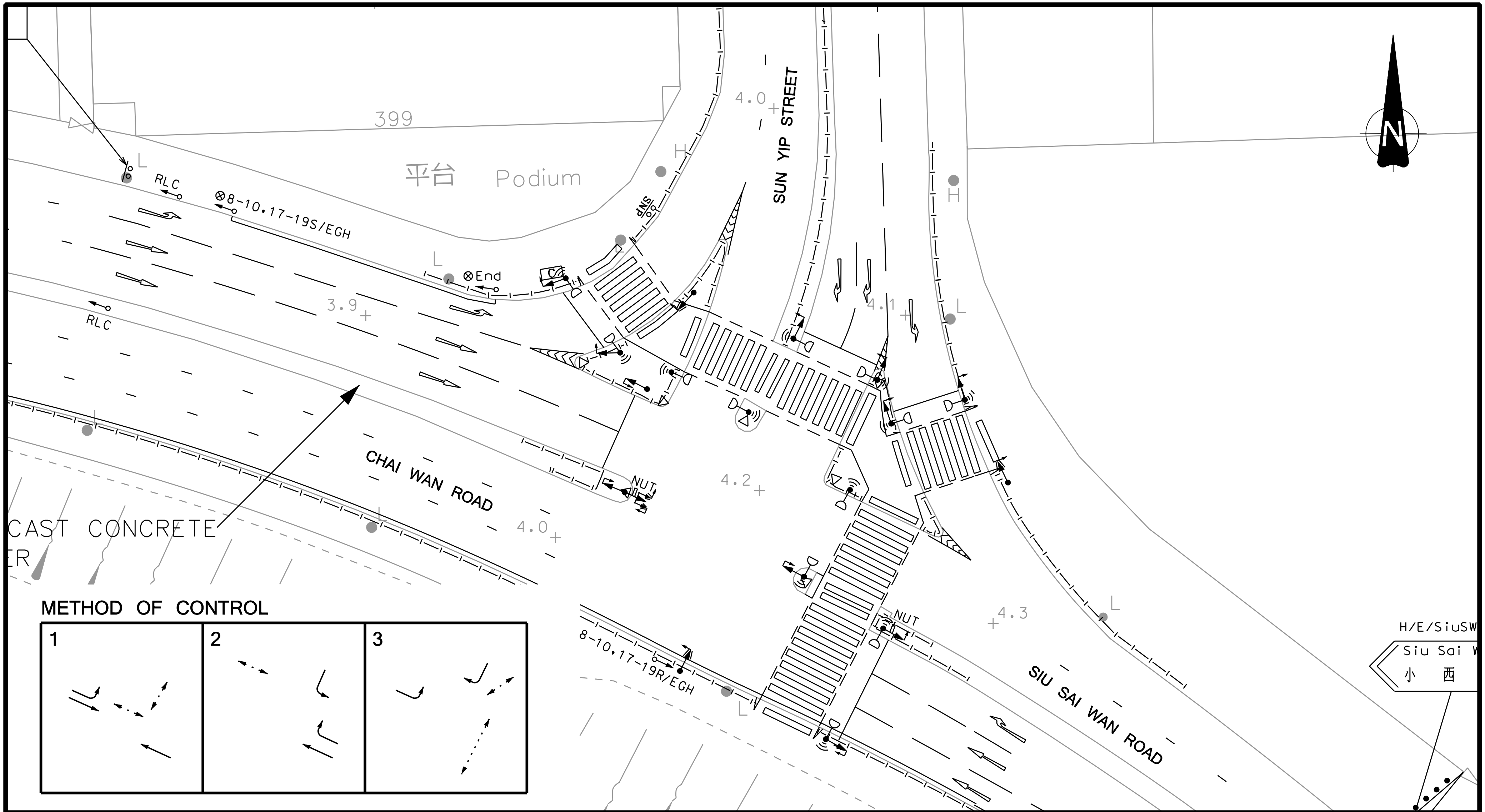

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Project Title

PROPOSED HOUSING DEVELOPMENT
AT CHAI WAN ROAD
TRAFFIC IMPACT ASSESSMENT

Drawing Title

EXISTING JUNCTION LAYOUT OF CHAI WAN ROAD / SUN YIP STREET (E)

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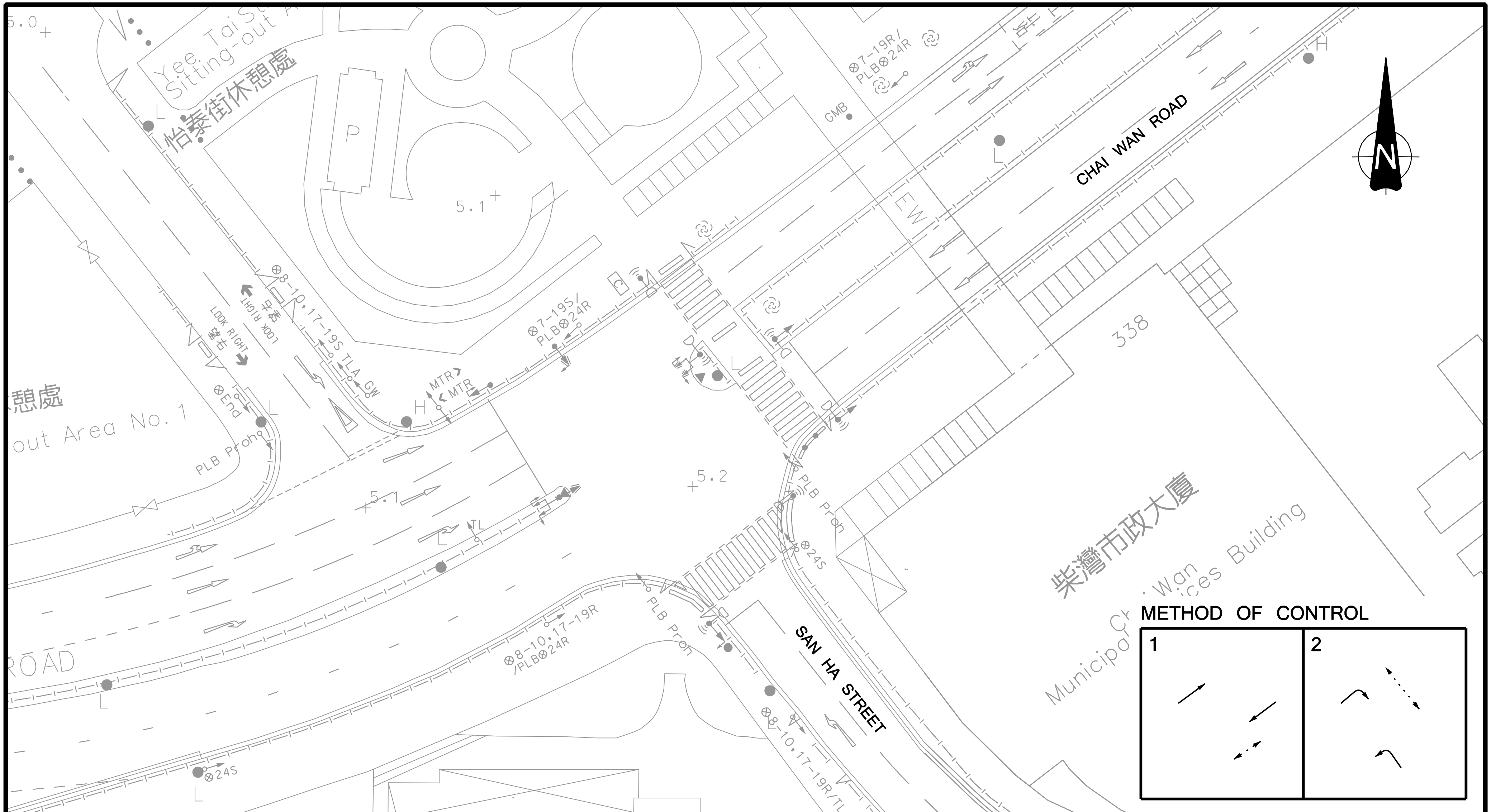

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Project Title	Drawing Title	
PROPOSED HOUSING DEVELOPMENT AT CHAI WAN ROAD TRAFFIC IMPACT ASSESSMENT	**EXISTING JUNCTION LAYOUT OF CHAI WAN ROAD / SAN HA STREET (F)**	MVA SYSTRA GROUP

Designed	Checked	Scale	Date	Drawing No.	Rev.
SFL	GPH	1:500(A4)	JUN 2016	**3.7**	A

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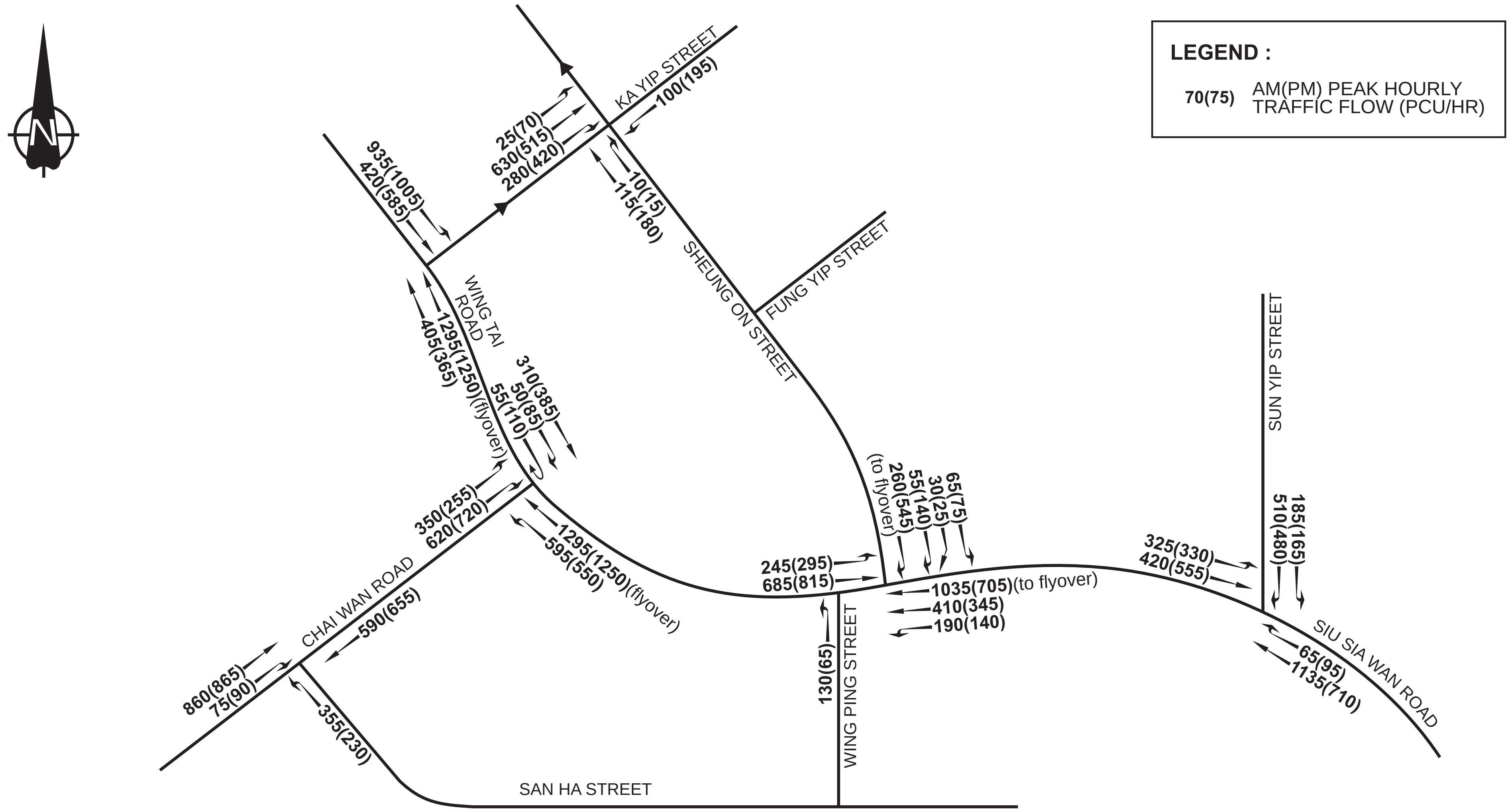

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A	MINOR AMENDMENT	GPH	3JUN16	-	-	-	-	-	-	-	-

Project Title

PROPOSED HOUSING DEVELOPMENT AT CHAI WAN ROAD - TRAFFIC IMPACT ASSESSMENT

Drawing Title

2015 OBSERVED TRAFFIC FLOWS

Designed	Checked	Scale	Date	Drawing No.	Rev.
SFL	GPH	NTS	FEB 2016	3.8	A

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4. FUTURE TRAFFIC CONDITIONS

4.1 Design Year

4.1.1 It is anticipated that the proposed development will be completed by end of 2022. In order to assess the impact of the development related traffic on the local road network, it is necessary to forecast the traffic flows for year 2025, the adopted design year, which is 3 years upon completion.

4.2 Future Road Network

4.2.1 The future road network in the vicinity of the proposed development is anticipated to remain essentially the same as the existing network. No major planned highway infrastructures are anticipated.

4.3 Reference Traffic Flows

4.3.1 Since there is no major change in road network in the vicinity of the proposed development, the traffic forecast has been derived based on the review of the following information:

- Historical traffic data of the Annual Traffic Census (ATC) reports published annually by transport Department;
- 2011-Based TPEDM land use/planning data published by Planning Department;
- Planned/committed developments in the vicinity of the proposed development; and
- The traffic flow of Chai Wan Public Fill Barging Point ("CWPFBP") with reference to the previously approved TIA.

Historical Growth Trend

4.3.2 The Transport Department has traffic count stations in the vicinity of the proposed development. The traffic count at the concerned stations over a period of 5 years between 2010 and 2014 are summarised in **Table 4.1**.

Table 4.1 ATC Counting Station Records

Station No.	Road Name	Annual Average Daily Traffic (AADT)				
		2010	2011	2012	2013	2014
1254	Chai Wan Rd (From Wing Tai Rd to Sun Yip St)	23,570*	23,140*	23,080*	23,150	23,700
1420	Chai Wan Rd (From Wan Tsui Rd to Wing Tai Rd)	18,570	18,910*	19,200*	19,200*	17,220
1857	Wing Tai Rd (From Chai Wan Rd to Shun Tai Rd)	22,750*	24,560	24,350	24,030*	23,860*
2614	Fung Yip St (From Sheung On St to Sun Yip St)	6,220	5,360	5,780	5,680	5,510
2620	Ka Yip St (From Wing Tai Rd to End)	11,610	10,810	12,210	11,040	9,970

Station No.	Road Name	Annual Average Daily Traffic (AADT)				
		2010	2011	2012	2013	2014
2650	Sheung On St (From Chai Wan Rd to Chong Fu Rd)	11,780	10,600	10,530	11,300	10,820
Total		**94,500**	**93,380**	**95,150**	**94,400**	**91,080**
Average Annual Growth Rate (%)		**-0.9%**				

Notes: (1) Number marked with "*" are estimated by growth rate.

4.3.3 From the above **Table 4.1**, it can be noted that over the past 5 years, 2010-2014, the average annual traffic growth pattern in the area shows a negative growth trend with rate of -0.9% per annum.

Planning Data

4.3.4 Reference has also been made to the latest 2011-Based Territorial Population and Employment Data Matrices (TPEDM) planning data published by the Planning Departments for years 2011 and 2025 in Chai Wan Area. The average annual growth rate in terms of population and employment from year 2011 to year 2025 are illustrated in **Tables 4.2** and **4.3**, respectively.

Table 4.2 2011 to 2025 Population Growth in Chai Wan Area

TPEDM Zone(1)	Population	
	2011	2025
33	57,550	58,000
34	70,450	69,800
Total	**128,000**	**127,800**
Average Annual Growth Rate between Years 2011 and 2025 = 0%		

Notes: (1) Refer to Drawing 4.1 for TPEDM Zone 33 and 34

Table 4.3 2011 to 2025 Employment Growth in Chai Wan Area

TPEDM Zone(1)	Employment	
	2011	2025
33	25,900	26,850
34	32,300	36,800
Total	**58,200**	**63,650**
Average Annual Growth Rate between Years 2011 and 2025 = 0.6%		

Notes: (1) Refer to Drawing 4.1 for TPEDM Zone 33 and 34

4.3.5 From **Table 4.2 and Table 4.3**, the population and employment growth rate in the vicinity of the area from 2011 to 2025 is 0.6% per annum respectively.

Adopted Growth Rate

4.3.6 The growth rate derived from employment growth is the highest (+0.6% p.a.). Therefore, an annual growth rate of 0.6% p.a. was adopted to project the 2015 observed flows to 2025 traffic flows.

Planned/Committed Development Traffic

4.3.7 In addition to the consideration of annual traffic growth rate of TPEDM and planning data, the reference traffic forecast had also taken into consideration of the planned and committed developments in the vicinity of the subject site as summarised in **Table 4.4** and **Drawing 4.2**.

Table 4.4 Planned/Committed Development

Site No.	Sites	Development Parameters	Designated Land Uses	Current Status
A	Sheung On Street, Sheung Ping Street, Wing Tai Road	39,730 sq.m (1)	Government, Institution or Community / Open Space	Construction Site of THEi New Campus Development / Short term tenancy carpark (4)/(5)
B	Sheung On Street, Sheung Mau Street	84,000 sq.m (2)	Development of Chai Wan Government Complex and Vehicle Depot	Construction Site of Chai Wan Government Complex and Vehicle Deport (4)/(5)
C	Chong Fu Road, Shing Tai Road	115,000 sq.m (2)	Development of WSD and CSD Headquarters	Short term tenancy carpark (4) (reserved for Development of WSD and CSD Headquarters (5))
D	Chong Fu Road site next to Government Logistic Centre	57,000 sq.m (2)	Industrial Use	Site for scrap metal recycle (4)
E	Sheung On Street, Shing Tai Road, Shing Mau Street	3,986 sq.m (2) (Land Area)	Other Specified Uses (Petrol Filling Station)	Petrol filling station & LPG station (4)
F	Fung Yip Street	1,743 sq.m (2) (Land Area)	Other Specified Uses (Petrol Filling Station)	Petrol filling station & LPG station (4)
G	Shing Tai Road	5,053 sq.m (2) (Land Area)	Open Space	Temporary land allocations (reserved for the development of a local open space to serve the working population nearby)
H	Fung Yip Street	N/A (3)	Open Space	Vacant Site (4)
I	Wing Tai Road	860 flats	Public Housing Development	Construction Site of Public Housing Development (4)/(5)
J	Chai Wan Road	64,500 sq.m	PTI & Residential Use	Existing PTI & Depot

Notes: (1) GFA data extracted from GBP of THEi new campus approved in Apr 2014
(2) GFA data extracted from previous approved TIA approved in 2013
(3) Data not available from Planning Department
(4) Information obtained by on-site observation on 23 Feb 2016
(5) Information obtained by Transportation Department

4.3.8 In order to estimate the traffic generation and attraction of the planned/committed development in the vicinity, reference has been made to the trip generation rates as stipulated in Volume 1 Chapter 3 Appendix D Table 1 of the latest T.P.D.M.. The adopted trip rates are summarized in **Table 4.5**.

Table 4.5 Adopted Trip Rates for Planned/Committed Development

Site No.	Land Use		AM Peak		PM Peak	
			Generation	Attraction	Generation	Attraction
D	Industrial	pcu/hr/100 sq.m GFA	0.0926	0.1386	0.135	0.1049
I	Subsidised Housing: Public Rental (Average flat size:30sq.m)	pcu/hr/flat	0.0242	0.0226	0.0177	0.0201

4.3.9 Based on the planned/committed development parameters and the adopted trip rates shown in **Table 4.4** and **Table 4.5**, **Table 4.6** summarises the volume of traffic generated by the planned/committed Development.

Table 4.6 Traffic Generations of Planned/Committed Development (pcu/hr)

Site No.	Sites	Designated Land Uses	AM Peak		PM Peak	
			Generation	Attraction	Generation	Attraction
A	Sheung On Street, Sheung Ping Street, Wing Tai Road	THEi New Campus	16(1)	23(1)	45(1)	29(1)
B	Sheung On Street, Sheung Mau Street	Development of Chai Wan Government Complex and Vehicle Depot	47(1)	20(1)	15(1)	12(1)
C	Chong Fu Road, Shing Tai Road	Development of WSD and CSD Headquarters	237(1)	206(1)	117(1)	149(1)
D	Chong Fu Road site next to Government Logistic Centre	Industrial	53	79	77	60
E	Sheung On Street, Shing Tai Road, Shing Mau Street	Other Specified Uses	-	-	-	-
F	Fung Yip Street	Other Specified Uses	-	-	-	-
G	Shing Tai Road	Open Space	-	-	-	-
H	Fung Yip Street	Open Space	-	-	-	-
I	Wing Tai Road	Public Rental Housing	21	19	15	17
J	Proposed residential development at 391 Chai Wan Road	PTI & Private Housing	100(2)	57(2)	54(2)	45(2)

Notes: (1) Trip generation obtained from "Water Supplies Department Headquarters with Hong Kong and Islands Regional Office and Correctional Services Department Headquarters at Junction of Shing Tai Road, Chong Fu Road and Sheung Tat Street" TIA report

(2) Trip generation obtained from "Proposed Residential Development at 391 Chai Wan Road, Hong Kong" TIA report

Traffic Flow of the Chai Wan Public Fill Barging Point

4.3.10 A manual classified traffic count survey had been conducted during the morning (0730-0930) and evening (1700-1900) peak hours on a typical weekday in June 2015 for the purpose of identifying the existing traffic generation and pattern of the CWPFBP site. The CWPFBP site was closed on the surveyed date. For conservative purpose, the traffic flow generated and attracted by the CWPFBP site has been taken into consideration in the reference traffic forecast and the design traffic forecast in Year 2026, based on previous studies.

4.3.11 Two-way traffic of some 160 veh/hr and 135 veh/hr were recorded during the morning and evening peak respectively.

4.3.12 Taking into consideration of the possible increase of utilisation for disposal of construction waste due to the construction of new MTR lines, it is assumed that an increase of two-way traffic of some 50 construction vehicles per hour during the morning and evening peak periods. This assumption translates to a total of some 210 veh/hr and 185 veh/hr during the morning and evening peak period, which is about 35% increase from the existing traffic generation of the CWPFBP.

4.3.13 Based on the previously approved TIA in 2013, the maximum daily incoming truck is about 1100 vehicles per day (i.e. 138 vehicles per hour based on 8 working hours per day), therefore the aforesaid assumption should be reasonably conservative for traffic assessment purpose.

4.3.14 Based on site observation, the ingress and egress routings of CWPFBP are illustrated in Figure 4.2 and its estimated future traffic generation is then assigned to the road network accordingly in developing the reference traffic forecast.

2025 Reference Traffic Flows

4.3.15 Based on an annual growth rate of 0.6% p.a., the traffic generation of planned/committed development shown in **Table 4.5** and the additional construction traffic from CWPFBP, 2025 reference traffic flows have been projected from 2015 observed flows and shown in **Drawing No. 4.3**.

4.3.16 2025 Reference Flows = 2015 Observed Flows x Growth Factor (0.6% p.a. for 10 years) + Planned/Committed Development Traffic + Additional Chai Wan Public Fill Barging Point Traffic

4.4 Development Traffic Generation

4.4.1 In order to estimate the traffic generation and attraction of the proposed development, reference has been made to the trip generation rates as stipulated in Volume 1 Chapter 3 Appendix D Table 1 of the latest T.P.D.M. and the adopted trip rates are summarised in **Table 4.7**.

Table 4.7 Adopted Trip Rates

	AM Peak		PM Peak	
	Generation	Attraction	Generation	Attraction
Public Rental (PRH) (pcu/hr/flat)	0.0432	0.0326	0.0237	0.0301
Retail (pcu/hr/100 sqm GFA)	0.2296	0.2434	0.3100	0.3563

4.4.2 As a conservative approach, an additional 10% allowance had been allowed for the proposed development for future design variation. The traffic impact assessment has been based on 880 PRH flats and 198 sq.m GFA of retail.

4.4.3 Based on adopted trip rates given in **Table 4.7**, the total trips generated by the proposed development are computed and shown in **Table 4.8**.

Table 4.8 Traffic Generations of Proposed Development (pcu/hr)

Development Parameters	AM Peak		PM Peak	
	Generation	Attraction	Generation	Attraction
880 PRH Flats	38	29	21	26
Retail (198 sqm GFA)	1	1	1	1
Total	39	30	22	27

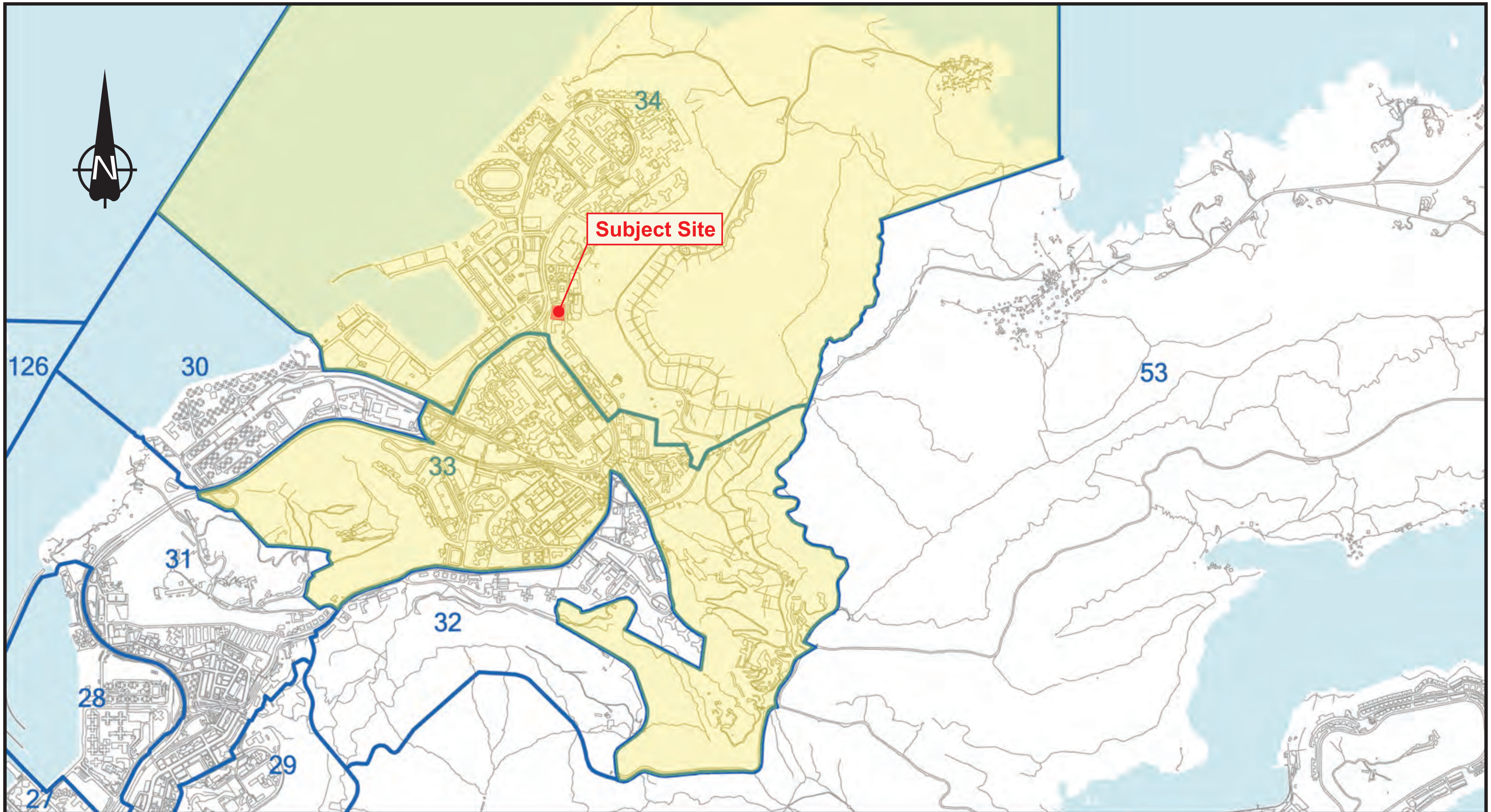
4.4.4 It is estimated that the proposed development will generate and attract about 39 pcu/hr and 30 pcu/hr in the AM peak hour, and generate and attract about 22 pcu/hr and 27 pcu/hr in the PM peak hour respectively.

4.5 Design Traffic Forecasts

4.5.1 The development traffic flows were then superimposed onto the 2025 reference traffic flows (without development) as shown in **Drawing 4.3** to derive the 2025 design traffic forecasts (with development).

4.5.2 2025 Design Flows = 2025 Reference Flows + Proposed Development Traffic

4.5.3 The 2025 AM and PM peak hour design traffic forecasts (with development) are shown in **Drawing 4.4**.



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

Project Title

PROPOSED HOUSING DEVELOPMENT
AT CHAI WAN ROAD -
TRAFFIC IMPACT ASSESSMENT

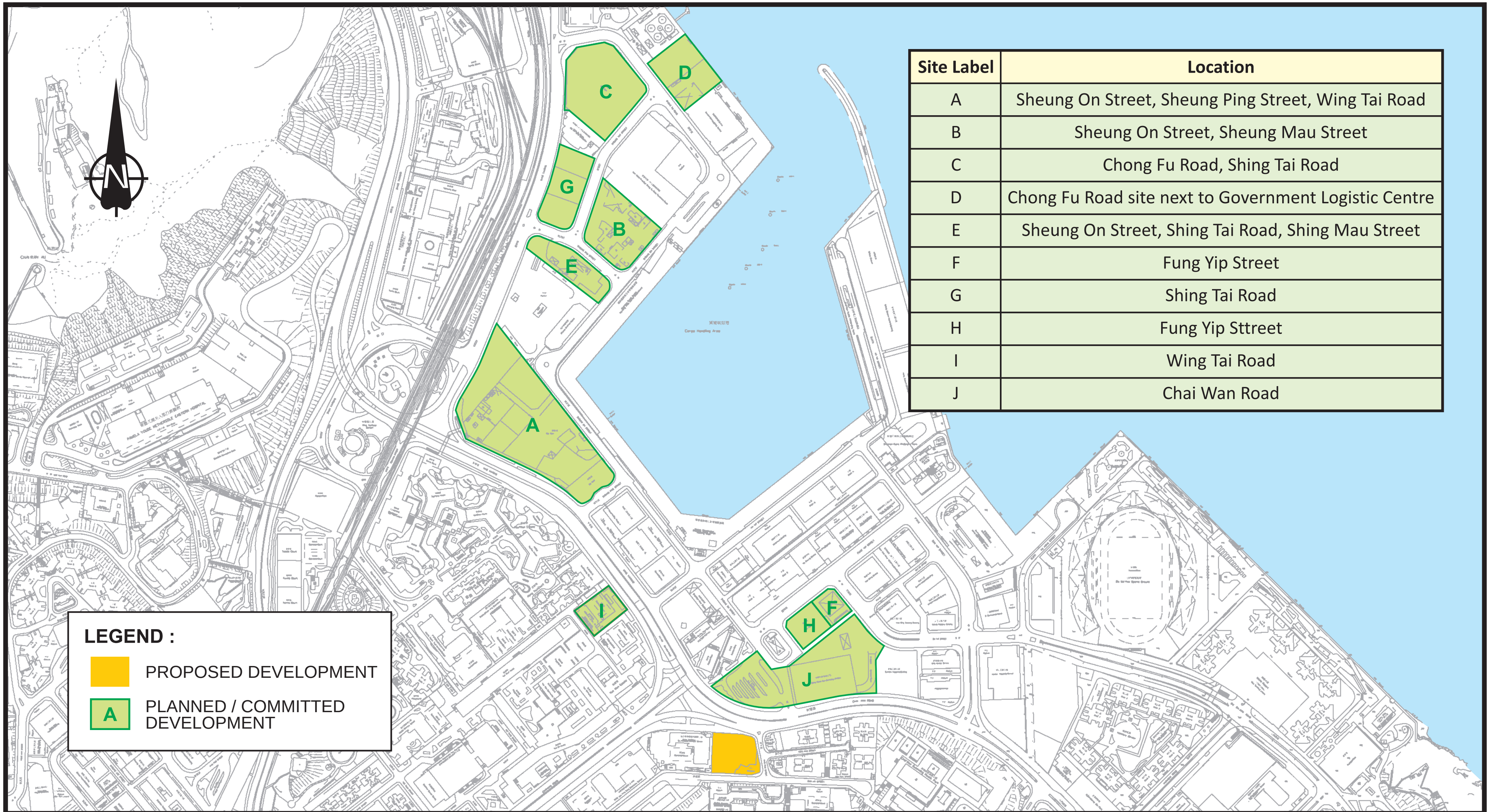
Drawing Title

2011-BASED TPEDM ZONE PLAN

Designed	Checked	Scale	Date	Drawing No.	Rev.
TYC	GPH	NTS	FEB 2016	4.1	-

MVA SYSTRA GROUP

CHK50019644/TIA/F41.CDR/CKM/12FEB16



Site Label	Location
A	Sheung On Street, Sheung Ping Street, Wing Tai Road
B	Sheung On Street, Sheung Mau Street
C	Chong Fu Road, Shing Tai Road
D	Chong Fu Road site next to Government Logistic Centre
E	Sheung On Street, Shing Tai Road, Shing Mau Street
F	Fung Yip Street
G	Shing Tai Road
H	Fung Yip Sttreet
I	Wing Tai Road
J	Chai Wan Road

Rev.	Description	Checked	Date	Rev.	Description	Checked	Date	Rev.	Description	Checked	Date
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Project Title

PROPOSED HOUSING DEVELOPMENT
AT CHAI WAN ROAD -
TRAFFIC IMPACT ASSESSMENT

Drawing Title

PLANNED AND COMMITTED DEVELOPMENTS

Designed	Checked	Scale	Date	Drawing No.	Rev.
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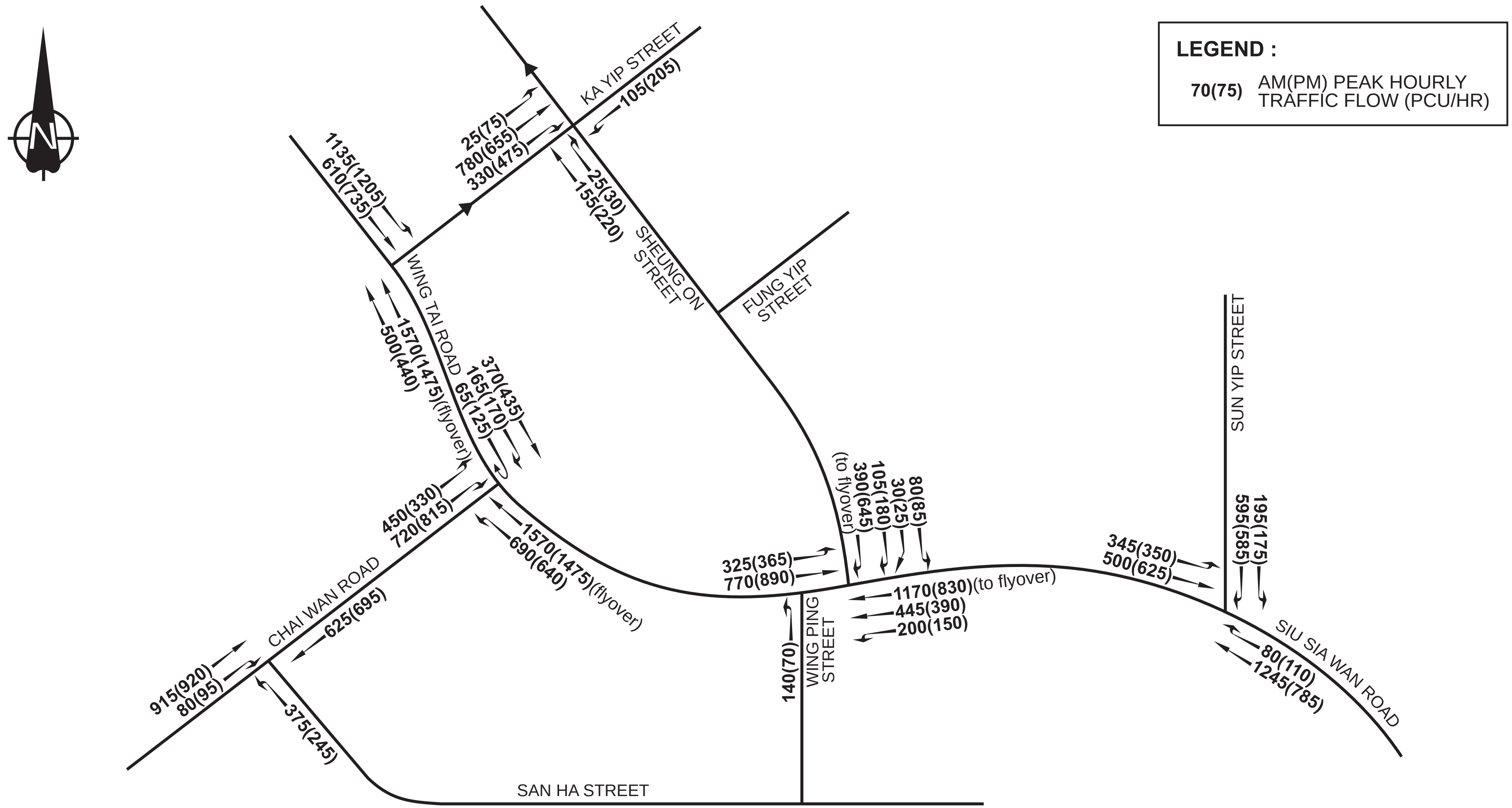
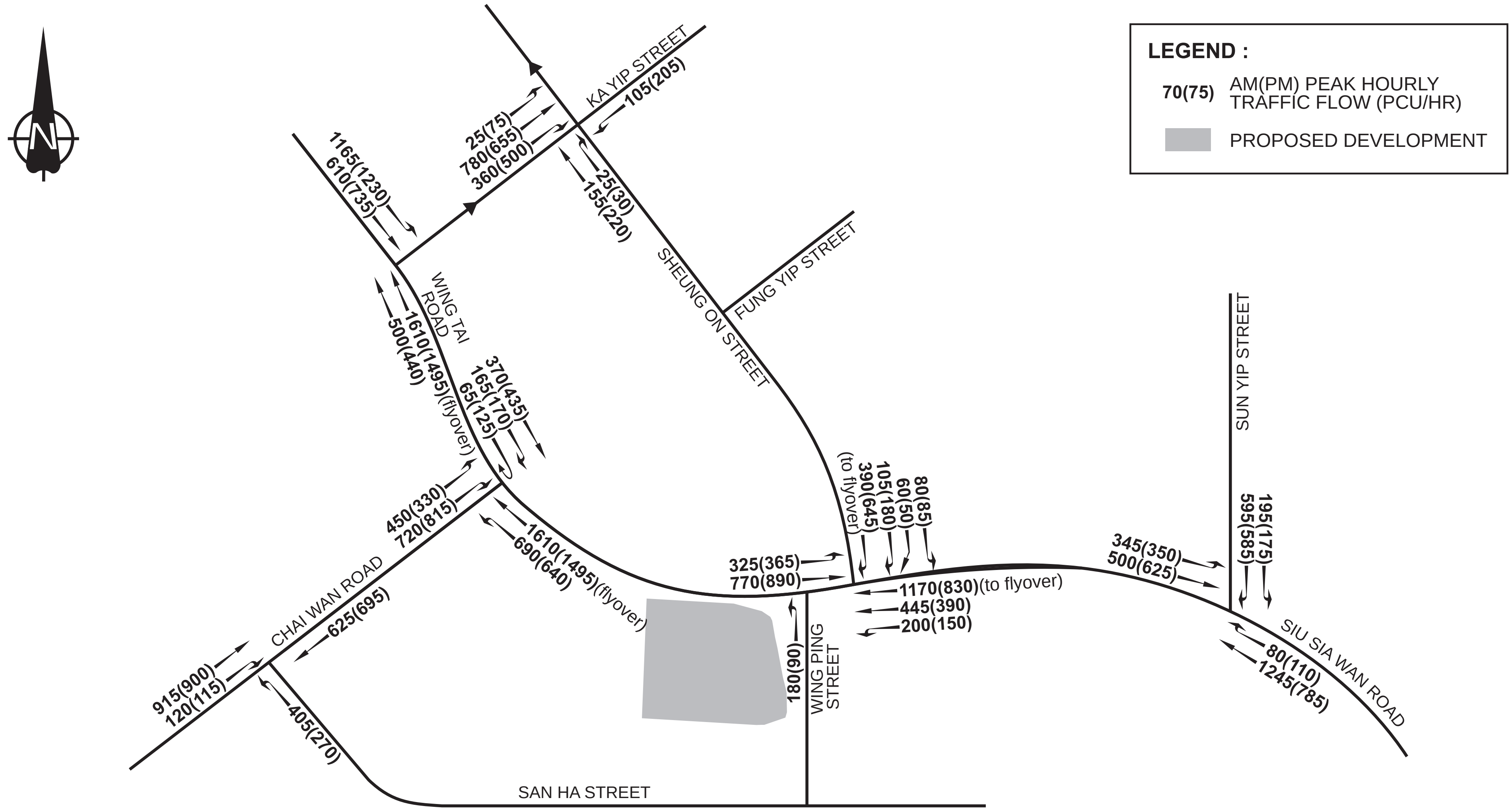


Rev.	Description	Checked	Date	Rev.	Description	Checked	Date	Rev.	Description	Checked	Date
A	MINOR AMENDMENT	GPH	3JUN16	-	-	-	-	-	-	-	-

Project Title	Drawing Title	
PROPOSED HOUSING DEVELOPMENT AT CHAI WAN ROAD - TRAFFIC IMPACT ASSESSMENT	**2025 REFERENCE TRAFFIC FLOWS (WITHOUT DEVELOPMENT)**	MVA SYSTRA GROUP

Designed	Checked	Scale	Date	Drawing No.	Rev.
SFL	GPH	NTS	FEB 2016	**4.3**	A

CHK50019644/TIA/F43-A.CDR/CKM/6JUN16



Rev.	Description	Checked	Date	Rev.	Description	Checked	Date	Rev.	Description	Checked	Date
A	MINOR AMENDMENT	GPH	3JUN16	-	-	-	-	-	-	-	-

Project Title

PROPOSED HOUSING DEVELOPMENT AT CHAI WAN ROAD - TRAFFIC IMPACT ASSESSMENT

Drawing Title

2025 DESIGN TRAFFIC FLOWS (WITH DEVELOPMENT)

MVA SYSTRA GROUP

Designed	Checked	Scale	Date	Drawing No.	Rev.
SFL	GPH	NTS	FEB 2016	4.4	A

CHK50019644/TIA/F44-A.CDR/CKM/6JUN16

5. TRAFFIC IMPACT ASSESSMENT

5.1 Operational Assessment

5.1.1 To assess the traffic impact due to the proposed development, capacity analysis of the identified critical junctions in the study area for both reference and design scenarios in year 2025 has been carried out.

5.1.2 As identified in the redevelopment of former China Motor Bus Depot study, junction improvement schemes have been proposed at Junction A as illustrated in **Drawing 5.1**. The proposed improvement scheme will be carried out by the applicant of the redevelopment of former China Motor Bus Depot study.

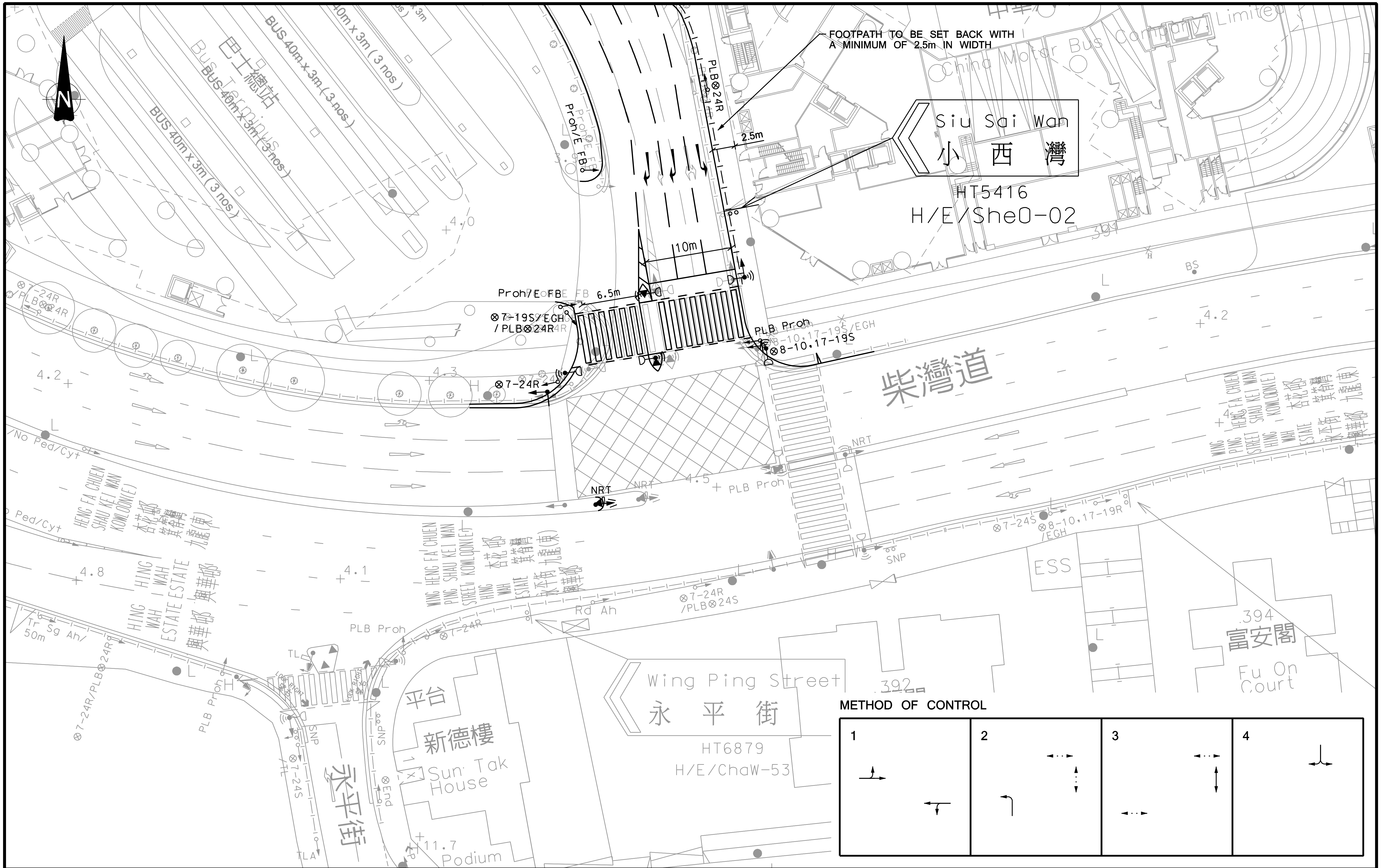
5.1.3 The results are summarised and presented in **Table 5.1**.

Table 5.1 Operational Performance of Critical Junctions in 2025

Ref.	Junction	Type	2025 RC (1)			
			Reference Scenario (Without Development)		Design Scenario (With Development)	
			AM Peak	PM Peak	AM Peak	PM Peak
A	Chai Wan Road/Sheung On Street/Wing Ping Street (2)	Signal	19%	24%	12%	19%
B	Wing Tai Road/Chai Wan Road	Signal	>100%	>100%	>100%	>100%
C	Wing Tai Road/Ka Yip Street	Signal	91%	87%	88%	85%
D	Ka Yip Street/Sheung On Street	Signal	29%	29%	29%	29%
E	Chai Wan Road / Sun Yip Street	Signal	19%	47%	19%	47%
F	Chai Wan Road / San Ha Street	Signal	85%	>100%	79%	>100%

Notes: (1) RC represents the reserve capacity for signal junction. A positive RC value indicates the junction is within capacity and a negative RC value indicates the junction is at/over capacity.
(2) Based on redevelopment of former China Motor Bus study's proposed junction improvement scheme.

5.1.4 The assessment results in **Table 5.1** indicates that all critical junctions will still operate within their capacities in design year 2025.



				Project Title	Drawing Title					
-	-	-	-	PROPOSED HOUSING DEVELOPMENT AT CHAI WAN ROAD TRAFFIC IMPACT ASSESSMENT	PLANNED JUNCTION IMPROVEMENT SCHEME AT CHAI WAN ROAD /SHEUNG ON STREET / WING PING STREET (A) (UNDER THE REDEVELOPMENT OF FORMER CHINA MOTOR BUS DEPOT AT CHAI WAN ROAD)					MVA SYSTRA GROUP
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A	MINOR AMENDMENT	GPH	09AUG16		Designed SFL	Checked GPH	Scale 1:400(A3)	Date JUN 2016	Drawing No. 5.1	Rev. A
Rev.	Description	Checked	Date							

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6. PUBLIC TRANSPORT PROVISIONS

6.1 Existing Public Transport Services

6.1.1 At present, there are currently 33 bus routes and 9 GMB routes operating in the near vicinity to the proposed development site as illustrated in **Drawing 6.1**. Details of the existing public transport services available are summarized in **Table 6.1** to **Table 6.3**. In addition, there is an existing bus terminus, the Chai Wan (East) Bus Terminus located at north of Chai Wan Road, which is located in close proximity to the proposed development.

Table 6.1 Existing Public Transport Services at Public Transport Terminus at Sheung On Street

Rout	Service	Destinations	Service Hour	Peak Hour Frequency (minutes)	Non-Peak Hour Frequency (minutes)
Day Time Routes					
82	NWFB	Siu Sai Wan (Island Resort) <-> North Point Ferry Pier	05:20-00:40	6-9	10
682	NWFB	Chai Wan (East) <-> Ma On Shan (Wu Kai Sha Station)	08:05-23:50	8-12	12-20
780	CTB	Chai Wan (East) <-> Central (Ferry Piers)	05:35-00:30	8-11	15
Peaks Only Routes/ Special Departures Routes					
682	NWFB	Chai Wan (East) <-> Ma On Shan (Lee On Estate)	05:40-09:18	5-11	-
682A	NWFB	Ma On Shan Town Centre -> Chai Wan (East)	07:20-07:40	20	-
		Chai Wan (East) -> Ma On Shan (Wu Kai Sha Station)	18:00-18:20	20	-
682B	NWFB	Shui Chuen O Estate -> Chai Wan (East)	07:20-07:35	15	-
		Chai Wan (East) -> Shui Chuen O Estate	18:05-18:25	20	-
682P	NWFB	Ma On Shan (Lee On Estate) -> Chai Wan (East)	07:30-07:55	-	-
		Ma On Shan (Wu Kai Sha Station) -> Chai Wan (East)	07:20	-	-

Table 6.2 Existing Bus Services in the near vicinity

Route	Service	Destinations	Service Hour	Peak Hour Frequency (minutes)	Non-Peak Hour Frequency (minutes)
Day Time Routes					
8	NWFB	Heng Fa Chuen <-> Wan Chai North	05:30-00:45	11-15	12-15
8P	NWFB	Siu Sai Wan (Island Resort) <-> Wan Chai North	05:30-00:55	4-9	5-10
8X	CTB	Siu Sai Wan (Island Resort) <-> Happy Valley (Lower)	05:26-00:45	5-18	10-25
19	CTB	Siu Sai Wan (Island Resort) <-> Happy Valley (Upper)	05:40-23:30	8-20	20-30

Route	Service	Destinations	Service Hour	Peak Hour Frequency (minutes)	Non-Peak Hour Frequency (minutes)
82M	NWFB	Chai Wan Station <-> Siu Sai Wan (Island Resort) (Circular)	07:20-16:20	20	40
82X	NWFB	Siu Sai Wan (Island Resort) <-> Quarry Bay	06:40-20:28	9	15
85	CTB	Siu Sai Wan (Island Resort) <-> Braemar Hill (Circular)	06:00-22:10	10-12	15-20
106	KMB / NWFB	Siu Sai Wan (Island Resort) <-> Wong Tai Sin	05:35-00:00	4-10	5-10
118	KMB / CTB	Siu Sai Wan (Island Resort) <-> Sham Shui Po (Tonkin Street)	06:02-00:00	3-6	5-10
606	KMB / CTB	Siu Sai Wan (Island Resort) <-> Choi Wan (Fung Shing Street)	09:30-20:00	15	20-25-
694	NWFB	Siu Sai Wan Estate **<->** Tiu Keng Leng Station	06:00-00:30	15-20	25
788	CTB	Siu Sai Wan (Island Resort) **<->** Central (Macau Ferry)	05:30-00:30	3-8	10-15
789	CTB	Siu Sai Wan (Island Resort) **<->** Admiralty (Rodney Street)	06:25-00:30	4-9	10-15
A12	CTB	Siu Sai Wan (Island Resort) <-> Airport (Ground Transportation Centre)	05:30-00:10	20	20-30
Peaks Only Routes/ Special Departures Routes					
81S	NWFB	Siu Sai Wan (Harmony Garden) -> Braemar Hill	06:50-07:10	10	-
82M	NWFB	Siu Sai Wan (Harmony Garden) -> Chai Wan Station	07:00-08:40	25	-
82S	NWFB	Siu Sai Wan (Island Resort) <-> Yiu Tung (Wai Hang Street)	06:45-07:40	20-30	-
85	CTB	Siu Sai Wan (Island Resort) <-> North Point Ferry Pier	22:30-00:00	20	-
85P	CTB	Siu Sai Wan (Island Resort) -> Braemar Hill	06:55-07:15	10	-
		Braemar Hill -> Siu Sai Wan (Island Resort)	16:10-16:30	20	-
106P	KMB / NWFB	Siu Sai Wan (Island Resort) -> Wong Tai Sin	06:45-07:55 18:00-18:15	12-15	-
		Wong Tai Sin -> Siu Sai Wan (Island Resort)	17:15-17:35	20	-
118P	KMB / CTB	Siu Sai Wan (Island Resort) -> Sham Shui Po (Tonkin Street)	07:18-08:24	5-7	-
		Sham Shui Po (Tonkin Street) -> Siu Sai Wan (Island Resort)	16:55-18:55	12-14	-
606	KMB / CTB	Choi Wan (Fung Shing Street) -> Siu Sai Wan (Island Resort) (via Choi Ha Road)	06:30-08:54	17-22	-
606X	KMB / CTB	Siu Sai Wan (Island Resort) **<->** Kowloon Bay	06:10-09:10	10-20	-
802	KMB / NWFB	Shatin Racecourse -> Siu Sai Wan (Island Resort)	-	-	-

Route	Service	Destinations	Service Hour	Peak Hour Frequency (minutes)	Non-Peak Hour Frequency (minutes)
A12	CTB	Siu Sai Wan (Island Resort) -> Airport (via Cathay City / CAD Headquarters)	06:50-07:30	20	-
		Airport (via Cathay City / CAD Headquarters) -> Siu Sai Wan (Island Resort)	17:30-18:10	20	-
Recreation Routes					
8S	CTB	Happy Valley Racecourse -> Siu Sai Wan (Island Resort)	-	-	-
314	CTB	Siu Sai Wan (Island Resort) **<->** Stanley (Beach / Market)	07:08-19:43	30	30
Overnight Routes					
N8	NWFB	Heng Fa Chuen <-> Wan Chai North	00:15-06:10	15	30
N8P	NWFB	Siu Sai Wan (Island Resort) <-> Wan Chai (Harbour Road)	00:35-05:40	15	15
N8X	CTB	Siu Sai Wan (Island Resort) <-> Central (Macau Ferry)	00:15-05:45	30	30
N118	KMB / CTB	Siu Sai Wan (Island Resort) <-> Sham Shui Po (Tonkin Street)	00:10-05:55	15	20

Table 6.3 Existing GMB Services in the near vicinity

Route	Service	Destinations	Service Hour	Peak Hour Frequency (minutes)	Non-Peak Hour Frequency (minutes)
Day Time Routes					
20	GMB	Sai Wan Ho (Grand Promenade) Public Transport Terminus <-> Chai Wan (Fung Yip Street)/ Chai Wan Industrial City	06:00-23:40	6	6-12
20M	GMB	Hing Man Estate <-> Chai Wan Industrial City	06:15-00:45	4-15	4-15
47E	GMB	Siu Sai Wan Phase III <-> Pamela Youde Nethersole Eastern Hospital (Circular)	10:00-17:00	20	20
47M	GMB	Chai Wan Station <-> Siu Sai Wan Phase III	06:00-01:15	3-10	3-10
47S	GMB	Chai Wan Station <-> Harmony Garden (Circular)	06:00-00:00	10-20	10-20
62	GMB	Heng Fa Chuen Public Transport Interchange -> Siu Sai Wan (Cheerful Garden)	06:15-01:20	5-8	5-8
62A	GMB	Siu Sai Wan (Island Resort) Public Transport Interchange <-> Heng Fa Chuen Public Transport Interchange	06:15-23:36	4-9	4-9

Route	Service	Destinations	Service Hour	Peak Hour Frequency (minutes)	Non-Peak Hour Frequency (minutes)
Peaks Only Routes/ Special Departures Routes					
47M	GMB	Hiu Tsui Street <-> Chai Wan Station	07:30-09:00	10-15	-
		Wing Ping Street <-> Chai Wan Station	07:30-08:15	15	-
62	GMB	Siu Sai Wan (Cheerful Garden) -> Heng Fa Chuen Public Transport Interchange	06:15-09:00	5	-
62A	GMB	Siu Sai Wan (Island Resort) Public Transport Interchange <-> Heng Fa Chuen (Circular route)	06:15-09:00	5-6	-
Overnight Routes					
44M	GMB	Chai Wan Station > Siu Sai Wan Estate (Circular)	00:00-06:00	15	-
61	GMB	Siu Sai Wan (Island Resort) <-> Mong Kok East Station	23:00-05:30	30	30

6.1.2 The nearest railway station would be Chai Wan Station. The walking distance would be about 1km and the walking time is about 15mins as illustrated in **Drawing 6.2**.

6.1.3 The local taxi stands are provided at Chai Wan Road, Sheung Ping Street, while the cross harbour taxi stand is provided at Island Resort as illustrated on **Drawing 6.3**. The walking distance (time) to the local stand at Chai Wan Road and Sheung Ping Street are about 300m (5 min.) and 460m (7 min.) respectively. The walking distance (time) to the cross harbour taxi stand at Island Resort is about 1km (15 min.)

6.2 Public Transport Demand of the Proposed Development

6.2.1 Based on our in-house MVCTS Public Transport Model, **Table 6.4** summarizes the 2025 Peak outbound direction Public Transport (PT) Demand (rail and non-rail) due to the proposed PRH development. According to the model, a factor for PT of 0.18 was adopted and the modal split for rail (including feeder services of bus/GMB) and non-rail (bus/GMB) is about 32% and 68%. It is anticipated the modal for The anticipated outbound direction PT demands are summarized in **Table 6.4**.

Table 6.4 Year 2027 Anticipated Outbound Direction PT Demand

Site	Population	2025 AM Peak Outbound Direction Public Transport Demand (patronage/hr)
Proposed Development	2,200 (1)	Rail (including feeder services) : 127 Bus/GMB : 269

Notes: (1) A total of 800 PRH would be provided on the proposed development. To allow for 10% additional buffer and assume 2.5 persons per flat, a total population of 2,200 is assumed for the proposed development.

6.3 Feeder Services to Railway Station

6.3.1 The additional demand due to the proposed development on the Bus/GMB could be easily accommodated taken into consideration of the comprehensive of the public transport services in the near vicinity. The additional demand on rail (including feeder services) is considered to be minimal in view of the scale of the proposed development.

6.3.2 In view of the long walking distance to Chai Wan MTR Station (about 1km), the public housing residents would take the feeder routes GMB 47M and its short working trips departed at Wing Ping Street to travel to/from Chai Wan Station. The stop for GMB 47M is located at Wing Ping Street adjacent to our proposed development and is considered to be very convenient for the proposed housing development.

6.3.3 In order to determine the adequacy of the existing feeder services, a traffic survey was conducted on 9 August 2016 and is non-school day and HD agreed to conduct a new survey upon commencement of the new school term to assess the sufficiency of services and work out improvement measures with student demand taken into account. The occupancy of the feeder route GMB 47M were observed upon the arrival of each GMB.

6.3.4 It is considered that the impact to the feeder service during the AM Peak (outbound direction – to Chai Wan Station) and PM Peak (inbound direction – from Chai Wan Station) would be most critical. Therefore, the GMB occupancy were determined at Wing Ping Street GMB stop and San Ha Street GMB stop at the AM Peak and at Chai Wan MTR Station at the PM Peak. The results are summarized in **Table 6.5**.

Table 6.5 Occupancy of Existing Feeder Services (AM Peak Outbound Direction)

GMB/ Stop Location	Destination	Observed No. of GMB	Observed Capacity (Patronage/hr)	Existing Occupancy	Additional PassegnerTrips due to Proposed Development (Patronage/hr)	Anticipated Occupancy (with Proposed Development) (%)
GMB						
Route 47M (Wing Ping Street)	Chai Wan Station	79	1264 (16 passenger / GMB)	1,228 (97%)	-	1,228 (97%)
Route 47S (Wing Ping Street)		7	112 (16 passenger /GMB)	109 (97%)	-	109 (97%)
BUS Route 82M						
Chai Wan Road (near Wing Ping Street)	Chai Wan Station	3	393 (131 passenger /Bus)	187 (48%)	127	314 (80%)

Table 6.6 Occupancy of Existing Feeder Services (PM Peak Inbound Direction)

GMB Stop Location	Destination	Observed No. of GMB	Observed Capacity (Patronage/hr)	Existing Occupancy (%)	Additional PassegnerTrips due to Proposed Development (Patronage/hr)	Anticipated Occupancy (with Proposed Development) (%)
GMB						
Route 47M (Chai Wan MTR Station)	Siu Sai Wan Phase III	72	1152 (16 passenger / GMB)	1,106 (96%)	127 (equivalent to additional 8 GMB trip/hr)	1,233 (107%)
Route 47S (Chai Wan MTR Station)	Harmony Garden	5	80 (16 passenger / GMB)	76 (95%)	-	76 (95%)

6.3.5 The GMB occupancy results in **Table 6.5** revealed that GMB 47M is already operating near its capacity in the AM peak, therefore, it is anticipated that the future residents of the proposed development will take Bus Route 82M to Chai Wan Station during the AM Peak. Also, it is proposed provide additional special services of the GMB 47M shorting working trips at Wing Ping Street to strengthen the service.

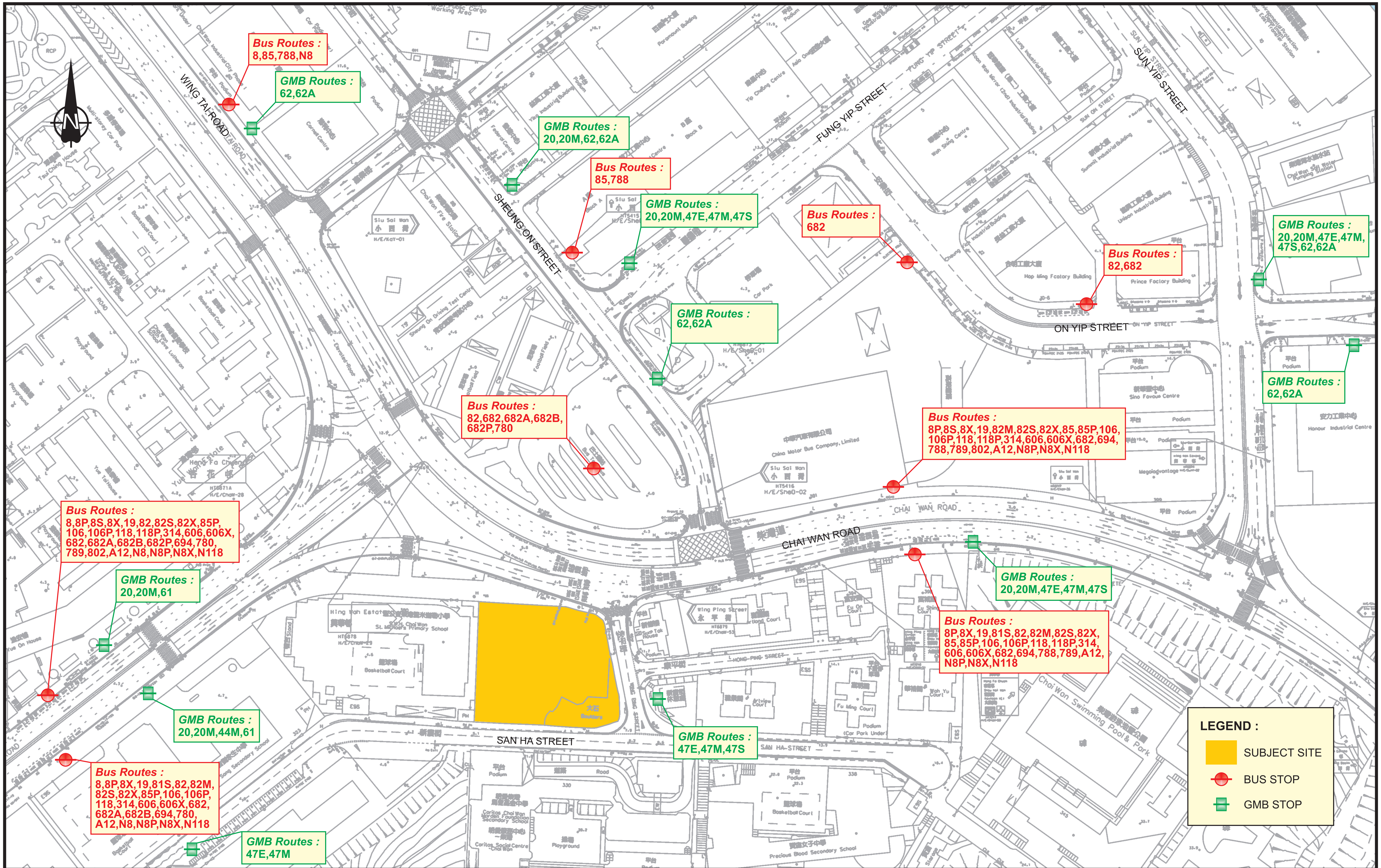
6.3.6 The GMB occupancy results in **Table 6.6** revealed that GMB 47M is already operating near its capacity and over capacity after in-take of the proposed development in the PM Peak. It is proposed to increase the peak hour frequency of the GMB 47M to strengthen the service. An alternative feeder service between Chai Wan Station and proposed development would be bus route NWFB 82M. The existing stop for NWFB 82M is located at Chai Wan Road near its junction with Wing Ping Street. It is considered this is also a convenient bus stop for the future residents to use. The existing NWFB 82M is a circular route travel between Chai Wan Station and Siu Sai Wan, which operates from 7:20 to 16:20. It is proposed to extend the services to until 20:00 at the evening peak to cover the additional passenger trip demand. The exact time could be further reviewed subject to overall planning of the public transport services in the future. The capacity of 82M is 131 passengers/bus. To extend the service under the existing frequency (3 veh/hr), the total capacity is 393 passengers/hr which should be enough to cater the additional passenger demand (i.e. 127 passenger trips). Subject to the future planning of public transport services in the district, it is considered that the extension of the operation hours of this bus route to the evening peak would also be beneficial to the proposed development.

6.3.7 Taking into consideration, the necessary of additional stacking to accommodate the additional GMB, it is proposed to extend the existing GMB stand for Route 47M at Chai Wan Station as illustrated in **Drawing 6.4**. The existing traffic arrangement could only accommodate 5no. GMB at the maximum. With the proposed arrangement, about 7 nos. of GMB could be accommodated. The proposed improvement would only require minor modification of traffic aids. Taken into consideration of the nature of the required site works, the improvement proposal could be further reviewed and ascertained upon the intake of the proposed development.

6.3.8 The existing footpath (near the GMB stop) is about 2.5m wide at Wing Ping Street. For the Wing Ping Street en-route GMB stop, the existing footpath extends from Wing Ping Street to San Ha Street (i.e. over 50m), which should be sufficient for passenger queuing. HD undertake to conduct further assessment on sufficiency of both GMB loading/unloading spaces and passenger queuing spaces at Chai Wan Station PTI and Wing Ping Street en-route stop (Chai Wan Station bound) and work out viable solutions cum improvement proposals to cater for the new population intake's public transport demand for TD's consideration.

6.3.9 The analysis results suggested improvement to public transport services based on the current survey results in August, which is not a typical school day. Nevertheless, it is expected the proposed improvement would also applicable, which should still improve the situation during school day. Also, it is anticipated that recommended improvement could accommodate the additional public transport demand due to proposed housing development during school day. Nevertheless, HD agreed to conduct a new survey upon commencement of the new school term to assess the sufficiency of services and work out improvement measures with student demand taken into account.

6.3.10 In view of the comprehensive coverage of the public transport services and the available different choices on transport modes together with the recommended measures, the proposed development is considered to have very good accessibility via the public transport.



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A	MINOR AMENDMENT	GPH	10AUG16

Project Title

PROPOSED HOUSING DEVELOPMENT AT CHAI WAN ROAD - TRAFFIC IMPACT ASSESSMENT

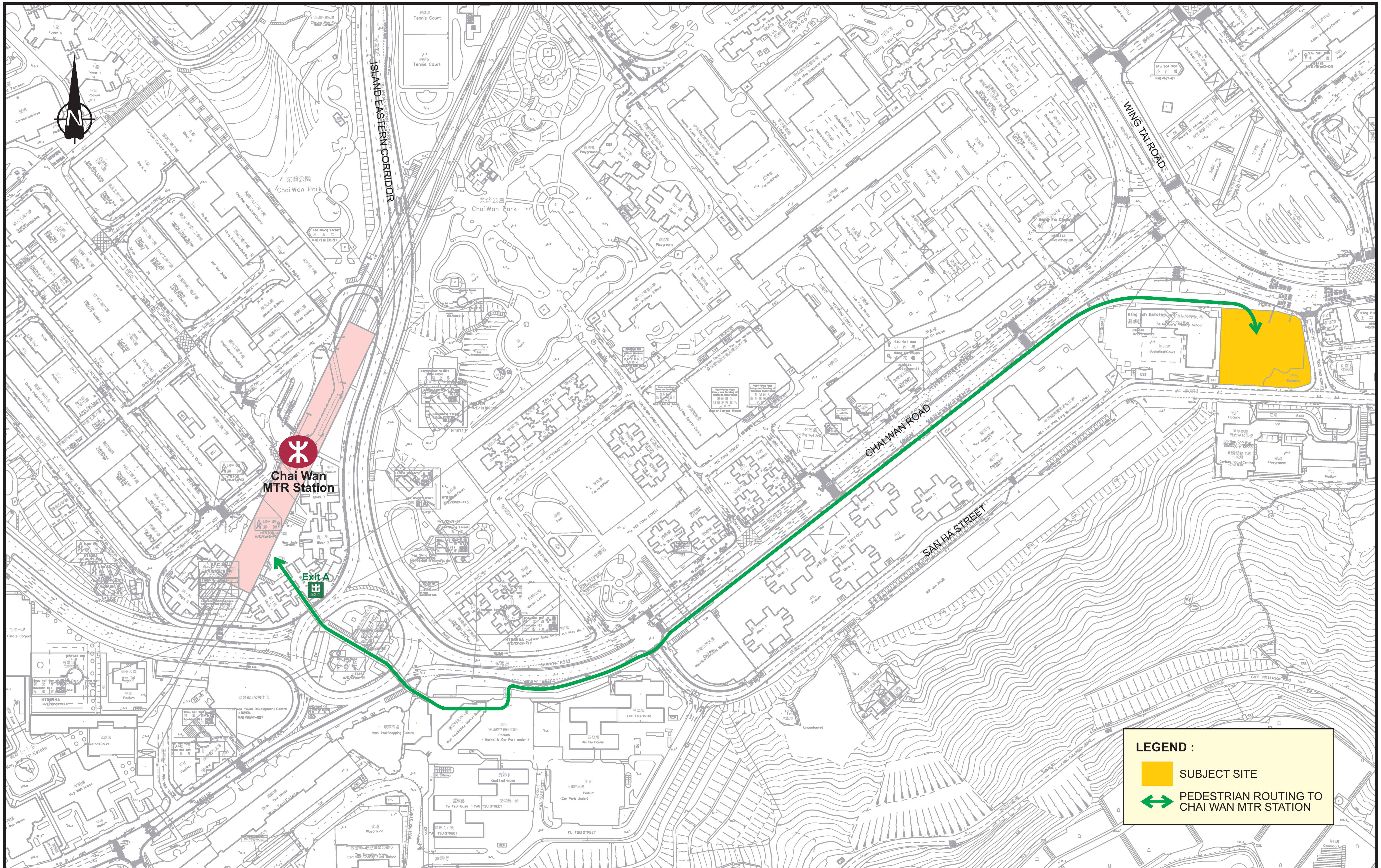
Drawing Title

EXISTING BUS AND GMB FACILITIES

Designed	Checked	Scale	Date	Drawing No.	Rev.
SFL	GPH	NTS	FEB 2016	6.1	A

MVA SYSTRA GROUP

CHK50019644/TIA/F61-A.CDR/LLH/10AUG16



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Project Title

PROPOSED HOUSING DEVELOPMENT
AT CHAI WAN ROAD -
TRAFFIC IMPACT ASSESSMENT

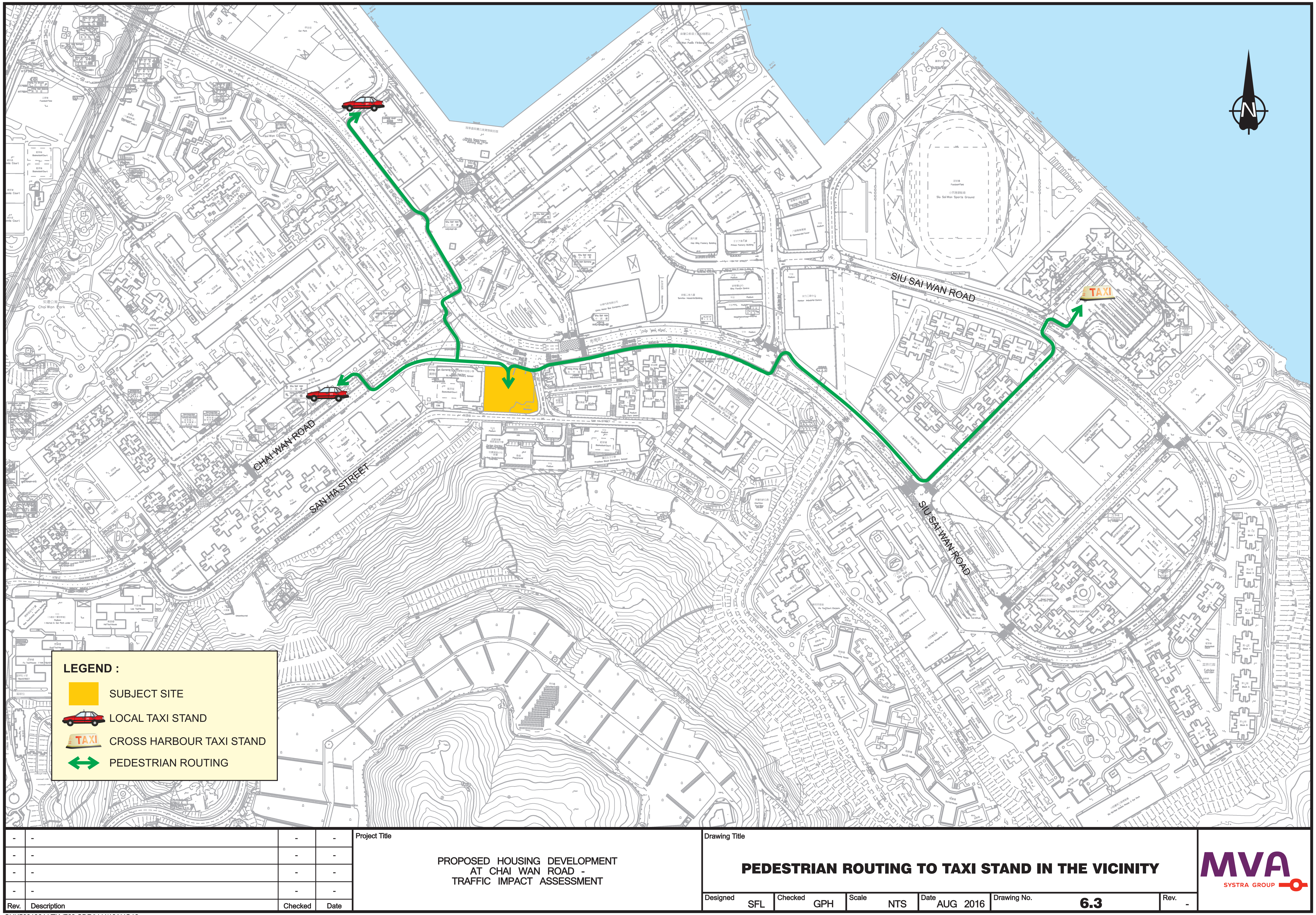
Drawing Title

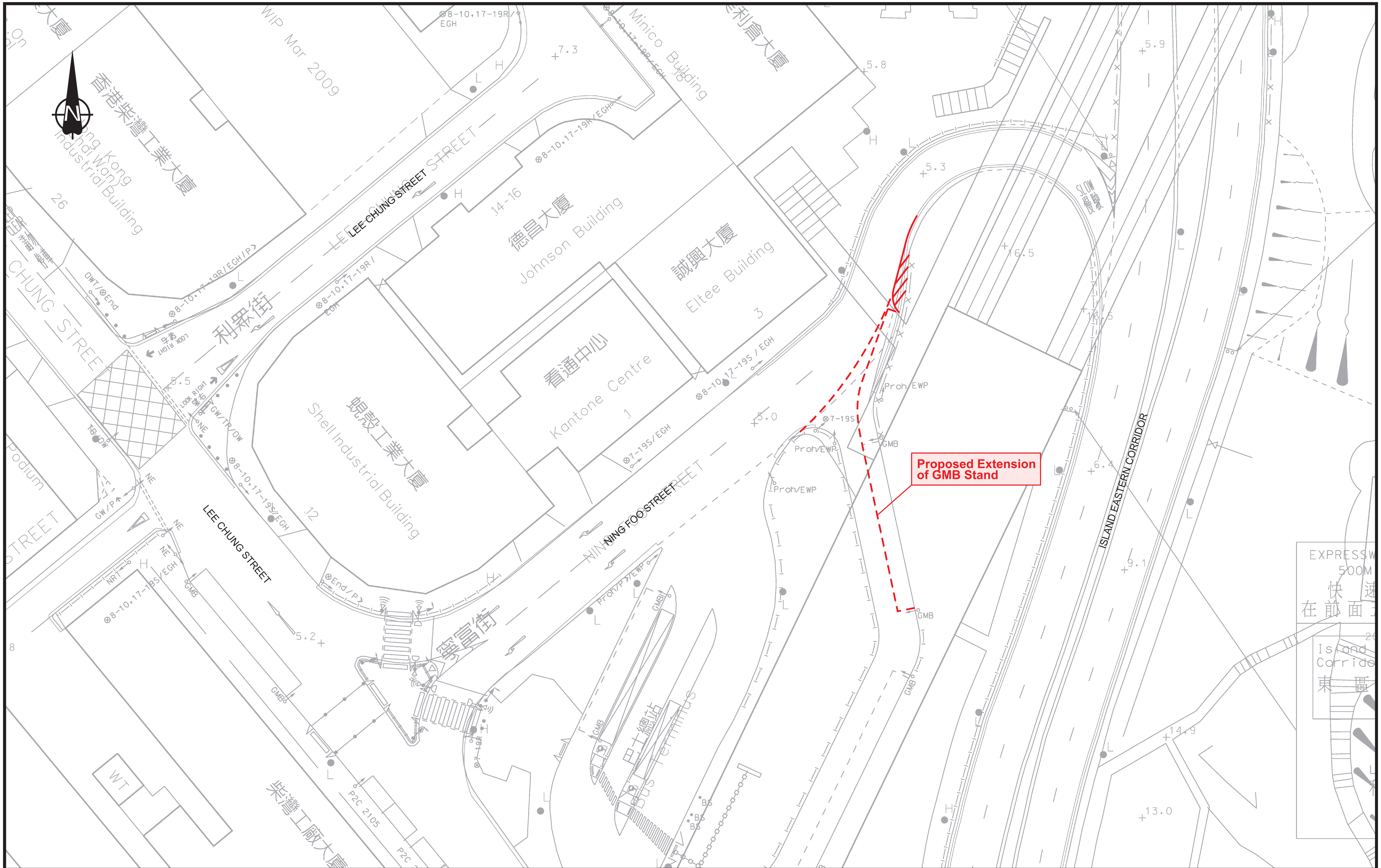
PEDESTRIAN ROUTING TO CHAI WAN MTR STATION

Designed	Checked	Scale	Date	Drawing No.	Rev.
SFL	GPH	NTS	AUG 2016	6.2	-

MVA
SYSTRA GROUP

CHK50019644/TIA/F62.CDR/LLH/10AUG16


SIU SAI WAN ROAD
CHAI WAN ROAD
SAN HA STREET
SIU SAI WAN ROAD
TAXI
LEGEND :
SUBJECT SITE
LOCAL TAXI STAND
CROSS HARBOUR TAXI STAND
PEDESTRIAN ROUTING
Rev.
Description
Checked
Date
Project Title
PROPOSED HOUSING DEVELOPMENT
AT CHAI WAN ROAD -
TRAFFIC IMPACT ASSESSMENT
Drawing Title
PEDESTRIAN ROUTING TO TAXI STAND IN THE VICINITY
Designed SFL
Checked GPH
Scale NTS
Date AUG 2016
Drawing No. 6.3
Rev. -
MVA
SYSTRA GROUP



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Project Title

PROPOSED HOUSING DEVELOPMENT
AT CHAI WAN ROAD -
TRAFFIC IMPACT ASSESSMENT

Drawing Title

PROPOSED EXTENSION OF GMB STAND AT CHAI WAN STATION

Designed	Checked	Scale	Date	Drawing No.	Rev.
SFL	GPH	NTS	AUG 2016	6.4	-

MVA SYSTRA GROUP

CHK50019644/TIA/F64.CDR/LLH/12AUG16

7. PEDESTRIAN FACILITIES

7.1 Existing Pedestrian Conditions

Existing Pedestrian Facilities

7.1.1 At present, numerous pedestrian crossings and footbridges are provided in the vicinity and at the nearby junctions to link up the proposed development and the surrounding housing developments and shopping centre. The locations of the pedestrian crossings and footbridges in the vicinity of the proposed development are shown in **Drawing 7.1**.

Observed Pedestrian Demand

7.1.2 In order to determine the existing pedestrian condition, pedestrian surveys in form of manual head count survey was conducted on a typical weekday in December 2015 at the footpaths in the vicinity of the proposed development.

7.1.3 The observed pedestrian count data indicates that the highest peak 15-mins pedestrian demands occur at 7:35 to 7:50 and 17:45 to 18:00 in the AM and PM peaks respectively. The observed peak 15-mins pedestrian flows are shown in **Drawing 7.2**.

7.1.4 To investigate the serviceability level of the footpath near the proposed development, the concept of Level-of-Service (LOS) as stipulated in T.P.D.M. Volume 6 Chapter 10 Section 10.4.2 have been applied. The concept of Level-of-Service (LOS) defines the serviceability level of walkway in terms of several parameters such as flow rate, pedestrian space, walking speed, etc. Operational assessment on the existing footpaths under LOS concept has been assessed and the results are summarized in **Table 7.1** and shown in **Drawing 7.2**.

Table 7.1 Operational Assessment for Existing Footpaths near the Proposed Development

Footpath Section	Total Width (Approx. In metres)	Effective Width(1) (Approx. in meters)(1)	Two-way 15-mins Pedestrian Flows (ped/15 mins)		Two-way Pedestrian Flow Rate (ped/min/m) (2)		Level of Service (LOS)(3)	
			AM	PM	AM	PM	AM	PM
P1	2.6	1.1	50	25	3	2	A	A
P2	2.5	1.0	35	25	2	2	A	A
P3	4.7	3.2	330	155	7	3	A	A

Note: (1) Effective width of footpath is defined as the actual width of footpath by excluding the dead widths on both sides (0.5m on both sides) and 0.5m for kerbside railings.
(2) Two–way pedestrian flow rate = Two-way 15-mins pedestrian flows / 15 min / Effective width of footpath
(3) Details of Pedestrian Walkway LOS refer to T.P.D.M. Volume 6 Chapter 10 Section 10.4.2.

7.1.5 As indicated in **Tables 7.1**, the existing footpaths near the proposed development are now operating with adequate level of services to cater for the existing pedestrian demand.

7.2 Future Pedestrian Conditions

Pedestrian Forecast

7.2.1 It is anticipated that the proposed development will be completed and occupied by year 2023 under the latest programme. For the purpose of this pedestrian study, year 2025 will be adopted as the design year, which is 3 years upon completion.

7.2.2 There are two main factors being considered to derive the pedestrian demand forecasting including:

- General growth of pedestrian in the area; and
- Pedestrian trip generations of the proposed development.

Pedestrian Generation

7.2.3 In order to estimate the potential pedestrian trip generations of the proposed development, trip generation rates of similar characteristics have been adopted for the different proposed development components. The reference surveyed trip rates are summarised in **Table 7.2**.

Table 7.2 Reference Trip Rates

	Pedestrian Trip Rates			
	AM Peak		PM Peak	
	Generation	Attraction	Generation	Attraction
PRH flats (ped/flat/hr)(1)	0.47	0.10	0.19	0.33
Retail/Commercial (ped/hr/100sqm GFA)(2)	4.82	7.37	3.69	2.08

Note: (1) Trip rate obtained from survey at Tung Wui Estate – Wui Sum House.
(2) Trip rate obtained from survey at Po Tat Shopping Center.

7.2.4 Based on the 880 PRH flats, 198 sq.m GFA of retail and the surveyed trip rates given in **Table 7.2**, the total pedestrian trips generated by the proposed development under the updated development proposals are computed and shown in **Table 7.3**.

Table 7.3 Pedestrian Generations of Proposed Development

	Pedestrian Trip Rates (pedestrians/flat/hr)			
	AM Peak		PM Peak	
	Generation	Attraction	Generation	Attraction
880 PRH Flats	414	88	167	290
Retail (198 sqm GFA)	10	15	7	4
Total	424	103	174	294

7.2.5 With reference to the latest 2011-Based Territorial Population and Employment Data Matrices (TPEDM) planning data, the anticipated 2025 peak hour pedestrian flows along the footpaths are derived by applying the adopted +0.6% annual growth rate onto the observed pedestrian flows. The likely pedestrian generations of the proposed development have been added and assigned onto the footpaths/crossings. The anticipated 2025 pedestrian flows are produced and shown in **Drawing 7.3**.

Operational Assessment

7.2.6 Under the proposed development, footpath sections P1, P2 and P3 will be widened to 3.6m, 4.0m and 3.0m respectively. Operational assessment for footpaths based on LOS concept has been assessed and the results are summarized in **Table 7.4** and shown in **Drawing 7.3**. Operational assessment for crossing at Junction A based on proposed improvement scheme under the redevelopment of former China Motor Bus has also been assessed and the results are summarized in **Table 7.5**.

Table 7.4 2025 Operational Assessment for Footpaths near the Proposed Development

Footpath Section	Total Width (Approx. In metres)	Effective Width(1) (Approx. in meters)(1)	Two-way 15-mins Pedestrian Flows (ped/15 mins)		Two-way Pedestrian Flow Rate (ped/min/m) (2)		Level of Service (LOS)(3)	
			AM	PM	AM	PM	AM	PM
P1	3.6	2.1	185	145	6	5	A	A
P2	4.0	2.5	170	145	5	4	A	A
P3	3.0	1.5	480	280	21	12	B	A

Note: (1) Effective width of footpath is defined as the actual width of footpath by excluding the dead widths on both sides (0.5m on both sides) and 0.5m for kerbside railings.
(2) Two–way pedestrian flow rate = Two-way 15-mins pedestrian flows / 15 min / Effective width of footpath
(3) Details of Pedestrian Walkway LOS refer to T.P.D.M. Volume 6 Chapter 10 Section 10.4.2.

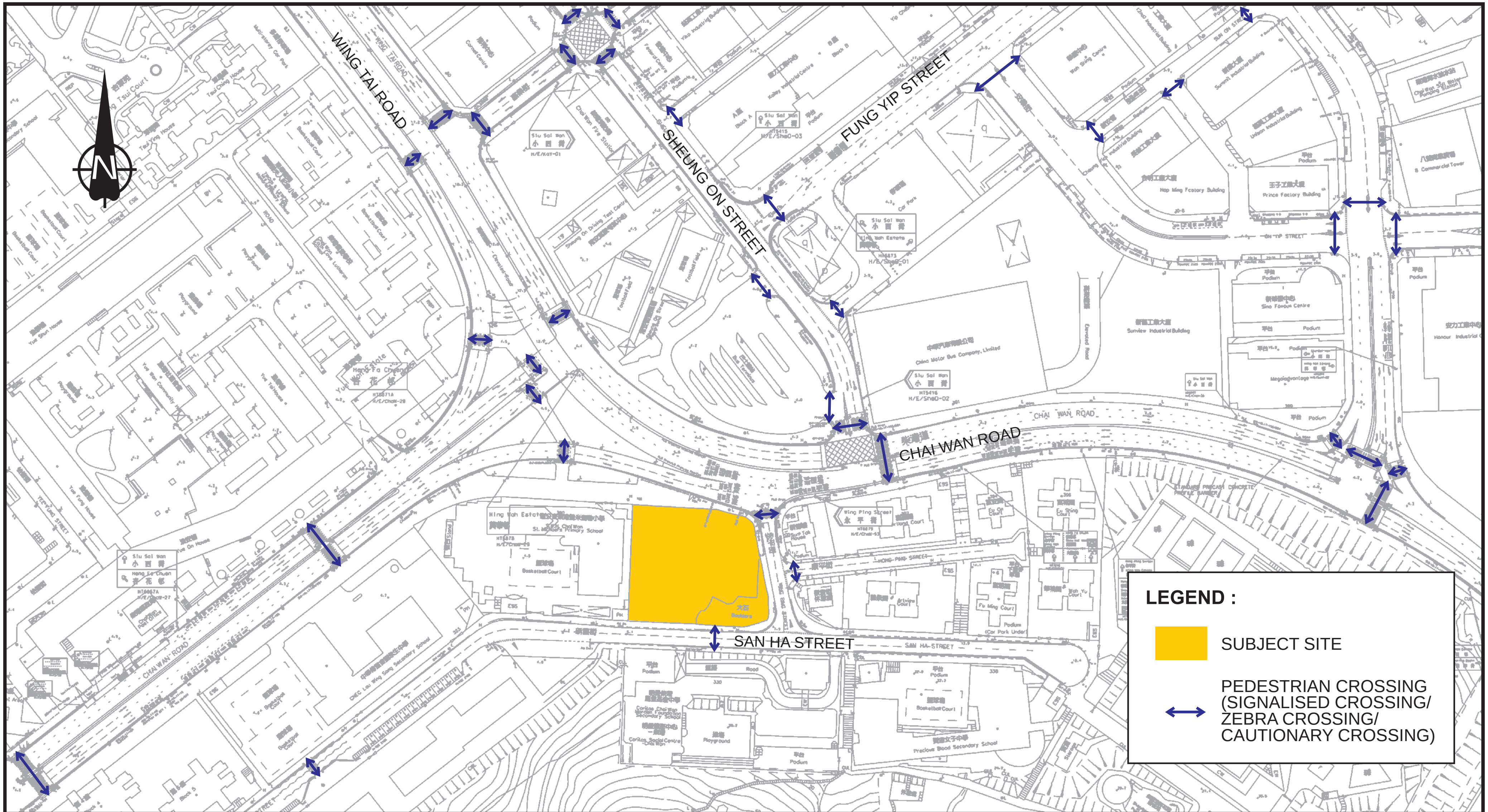
Table 7.5 2025 Operational Performance for Crossings at Junction A

Index	Location of Pedestrian Crossing	Cycle Time (Sec)	Pedestrian Green Time (Sec)	Green Time Proportion	Lateral Width (m)	Pedestrian Capacity (Ped/hr) (1)	2-way Flow (Ped/hr)	V/C Ratio
Chai Wan Road/Sheung On Street/Wing Ping Street								
AM Peak								
1	North of Junction	120	37	0.31	6	3,534	1,055	0.30
2	East of Junction	120	37	0.31	6	3,534	1,005	0.28
3	South of Junction	120	18	0.15	4	1,140	1,065	0.93
PM Peak								
1	North of Junction	120	31	0.26	6	2,964	725	0.24
2	East of Junction	120	31	0.26	6	2,964	1,325	0.45
3	South of Junction	120	18	0.15	4	1,140	780	0.68

Note: (1) PC = K x GTP x W (Refer to TPDM Volume 4, 3.2.5.6)
where PC = Pedestrian crossing capacity in pedestrians per hour
GTP = Green time proportion i.e. (Pedestrian green + flashing green time) / Cycle time
W = Lateral width of pedestrian crossing
K = A constant equivalent to saturation flow for pedestrians, may be taken as 1900 ped/metre/hours.

7.2.7 As indicated in **Tables 7.4**, the footpaths in the vicinity of the proposed development will still operate satisfactorily in year 2025 after the population intake of the proposed development. The results shown in **Table 7.5** indicate that all crossings at Junction A will still operate within their capacities in year 2025 after the population intake of the proposed development.

7.2.8 In view of the level of services of footpath in vicinity of the proposed development, it is expected that the pedestrian facilities will operate within acceptable serviceability. In view of the pedestrian facilities provision and the scale of the proposed development, it is not expected that there will be significant impact on the existing pedestrian facilities.



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Project Title

PROPOSED HOUSING DEVELOPMENT AT CHAI WAN ROAD - TRAFFIC IMPACT ASSESSMENT

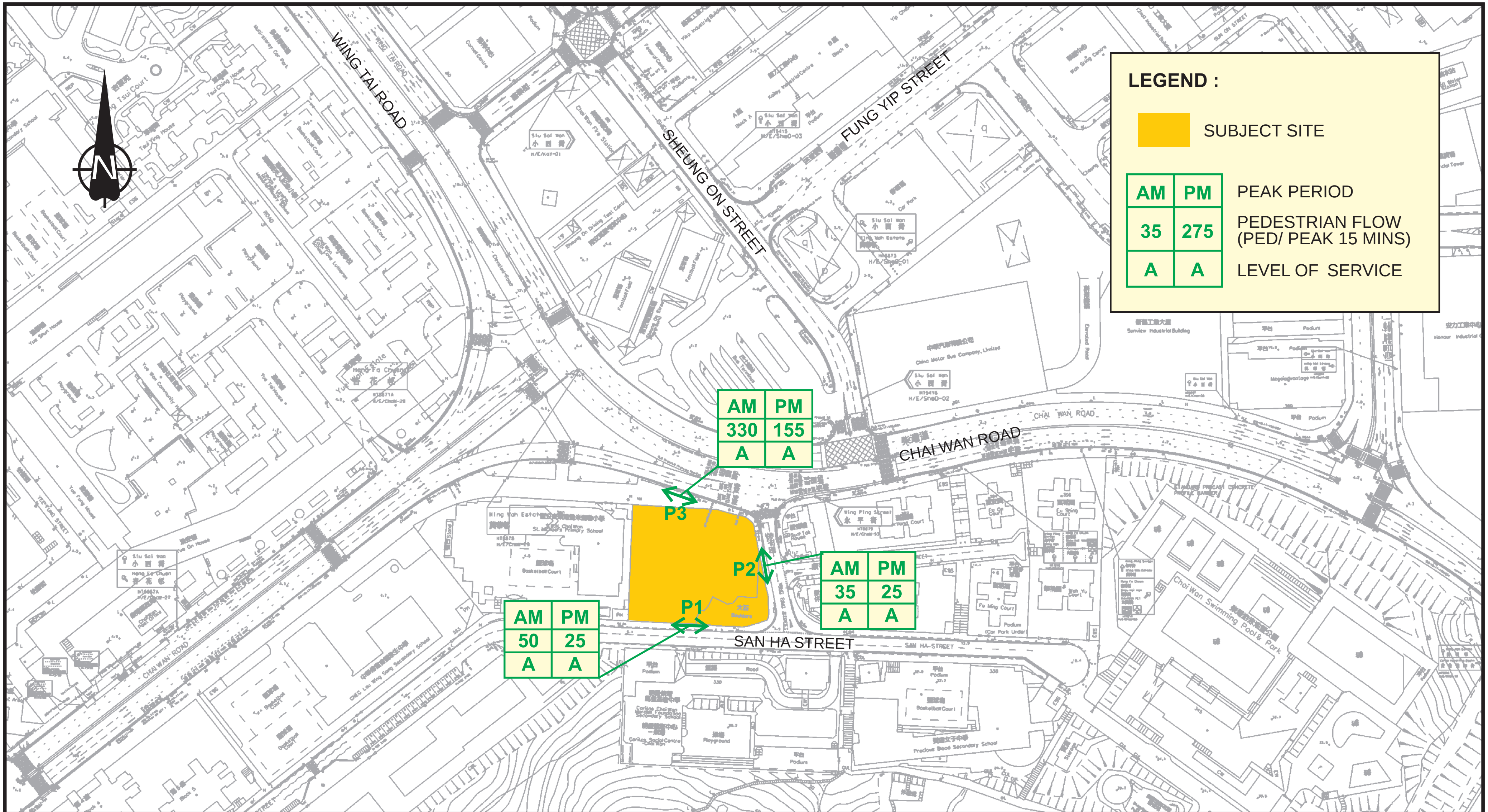
Drawing Title

EXISTING PEDESTRIAN CROSSING FACILITIES

Designed	Checked	Scale	Date	Drawing No.	Rev.
TYC	GPH	NTS	FEB 2016	7.1	-

MVA SYSTRA GROUP

CHK50019644/TIA/F71.CDR/CKM/11FEB16



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Project Title

PROPOSED HOUSING DEVELOPMENT AT CHAI WAN ROAD - TRAFFIC IMPACT ASSESSMENT

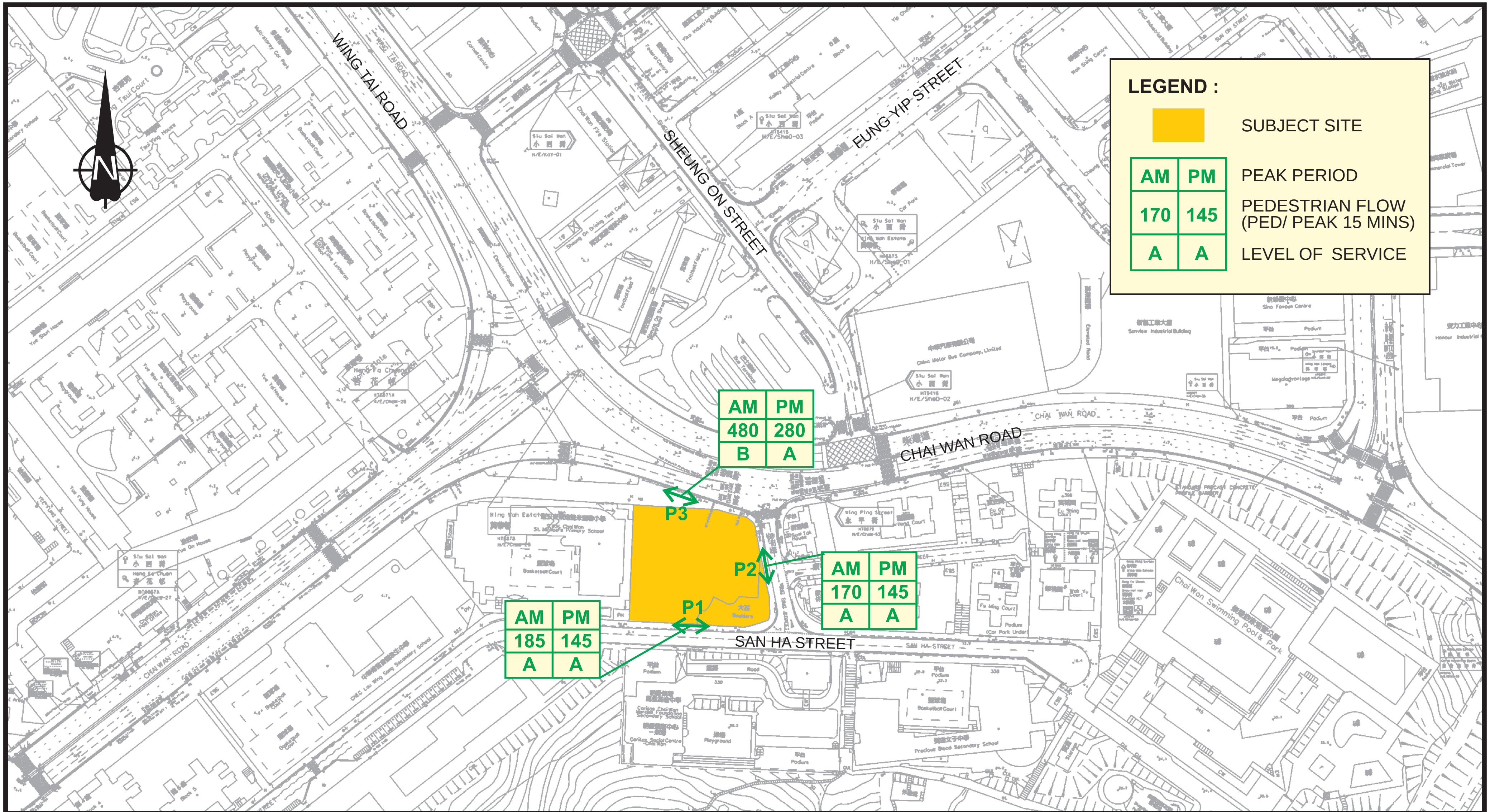
Drawing Title

EXISTING PEDESTRIAN FLOW AND PERFORMANCE

Designed	Checked	Scale	Date	Drawing No.	Rev.
TYC	GPH	NTS	FEB 2016	7.2	-

MVA SYSTRA GROUP

CHK50019644/TIA/F72.CDR/CKM/11FEB16



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A	MINOR AMENDMENT	GPH	6JUN16	-	-	-	-	-	-	-	-

Project Title

PROPOSED HOUSING DEVELOPMENT AT CHAI WAN ROAD - TRAFFIC IMPACT ASSESSMENT

Drawing Title

ANTICIPATED PEDESTRIAN FLOW AND PERFORMANCE (WITH DEVELOPMENT)

MVA SYSTRA GROUP

Designed	Checked	Scale	Date	Drawing No.	Rev.
SFL	GPH	NTS	FEB 2016	7.3	A

CHK50019644/TIA/F73.CDR/LLH/26FEB16

8. SUMMARY AND CONCLUSION

8.1 Summary

8.1.1 MVA Hong Kong Limited (MVA) was commissioned by the Hong Kong Housing Authority (HKHA) to carry out a traffic impact assessment study for the proposed housing development at Chai Wan Road.

8.1.2 The proposed PRH development will comprise about 800 public rental flats. The proposed development is scheduled to be completed by end of 2022. As a conservative approach, an additional 10% allowance had been allowed for the proposed development to cater for future design variation. The traffic impact assessment has been based on 880 public rental flats.

8.1.3 To appraise the existing traffic condition, traffic count surveys were conducted in the surrounding road network of the proposed development. Moreover, current operational performance of the critical junctions was assessed with the observed traffic flows. The operational assessment results revealed that all critical junctions are at present operating within capacities.

8.1.4 In order to assess the impact of the development related traffic on the local road network, it is necessary to forecast the traffic flows for 2025, which is 3 years upon completion.

8.1.5 The planned/committed development traffic from the planned/committed developments in the vicinity of the subject site are also included in the assessment.

8.1.6 Traffic generation and attraction from the proposed development has been assessed. It is estimated that the proposed development will generate and attract about 39pcu/hr and 30pcu/hr in the AM peak hour, and generate and attract about 22pcu/hr and 27pcu/hr in the PM peak hour respectively.

8.1.7 Assessment of operational performance of the critical junctions revealed that all critical junctions will still operate within their capacities in design year 2025.

8.1.8 The assessment results indicated that the GMB 47M is already operating near its capacity in the AM peak, therefore, it is anticipated that the future residents of the proposed development will take Bus Route 82M to Chai Wan Station during the AM Peak. Also, it is proposed to increase the peak hour frequency of the GMB 47M shorting working trips at Wing Ping Street to strengthen the service.

8.1.9 The assessment results indicated that the GMB 47M is already operating near its capacity and over capacity after in-take of the proposed development in the PM Peak. It is proposed to increase the peak hour frequency of the GMB 47M to strengthen the service. An alternative feeder service between Chai Wan Station and proposed development would be bus route NWFB 82M. The existing stop for NWFB 82M is located at Chai Wan Road near its junction with Wing Ping Street. It is considered this is also a convenient bus stop for the future residents to use. The existing NWFB 82M is a circular route travel between Chai Wan Station and Siu Sai Wan, which operates from 7:20 to 16:20. Subject to the future planning of public transport services in the district, it is considered that the extension of the operation hours of this bus route to the evening peak would also be beneficial to the proposed development.

8.1.10 Taking into consideration, the necessary of additional stacking to accommodate the additional GMB, it is proposed to extend the existing GMB stand for Route 47M at Chai Wan Station. The existing traffic arrangement could only accommodate 5no. GMB at the maximum. With the proposed arrangement, about 7 nos. of GMB could be accommodated. The proposed improvement would only require minor modification of traffic aids. Taken into consideration of the nature of the required site works, the improvement proposal could be further reviewed and ascertained upon the intake of the proposed development.

8.1.11 In view of the comprehensive coverage of the public transport services and the available different choices on transport modes together with the recommended measures, the proposed development is considered to have very good accessibility via the public transport.

8.1.12 Future pedestrian demand has been assessed, the result indicates that the additional pedestrian demands generated to/from the proposed development are not significant and the existing pedestrian facilities in the vicinity will be able to cater for the anticipated pedestrian demands.

8.2 Conclusion

8.2.1 In conclusion, the traffic impact assessment has demonstrated that the traffic generated by the proposed development can be absorbed by the nearby road network and would not cause any adverse traffic impact. Hence it can be concluded that the proposed development is acceptable in traffic terms.

Appendix A – Junction Calculation Sheets

2015 Observed Flows

TRAFFIC SIGNALS CALCULATION

Job No.: CHK50019644 **MVA ASIA LIMITED**

Junction: Chai Wan Road/Sheung On Street/Wing Ping Street Design Year: 2015

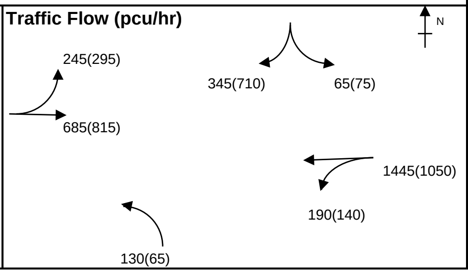
Description: Observed Traffic Flows Designed By: TYC Checked By: GPH

Approach	Movement notation	Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	Uphill gradient (%)	Pro. Turning (%) A.M.	Pro. Turning (%) P.M.	Revised Saturation Flow (pcu/hr) A.M.	Revised Saturation Flow (pcu/hr) P.M.	A.M. Peak Flow (pcu/hr)	A.M. Peak y Value	A.M. Peak Critical y	P.M. Peak Flow (pcu/hr)	P.M. Peak y Value	P.M. Peak Critical y
Chai Wan Road EB		A	1	4.000	12			91%	92%	1720	1715	268	0.156		320	0.187	
		A	1	3.600						2115	2115	330	0.156		394	0.186	
		A	1	3.700						2125	2125	332	0.156		396	0.186	
Sheung On Street SB		C	4	4.000	10	15		32% / 68%	19% / 81%	1805	1815	202	0.112	0.112	387	0.213	
		C	4	3.900		10				1865	1865	208	0.112		398	0.213	0.213
Chai Wan Road WB		A	1	3.800	15			37%	37%	1925	1925	518	0.269		377	0.196	
		A	1	3.200						2075	2075	559	0.269	0.269	407	0.196	0.196
		A	1	3.200						2075	2075	558	0.269		406	0.196	
Wing Ping Street NB		B	2	3.900	15					1825	1825	130	0.071	0.071	65	0.036	
Pedestrian Crossing		Dp	2,3	MIN GREEN + FLASH			10	+	18	=	28						
		Ep	2,3	MIN GREEN + FLASH			11	+	14	=	25						
		Fp	3	MIN GREEN + FLASH			6	+	12	=	18			*			*

Notes:

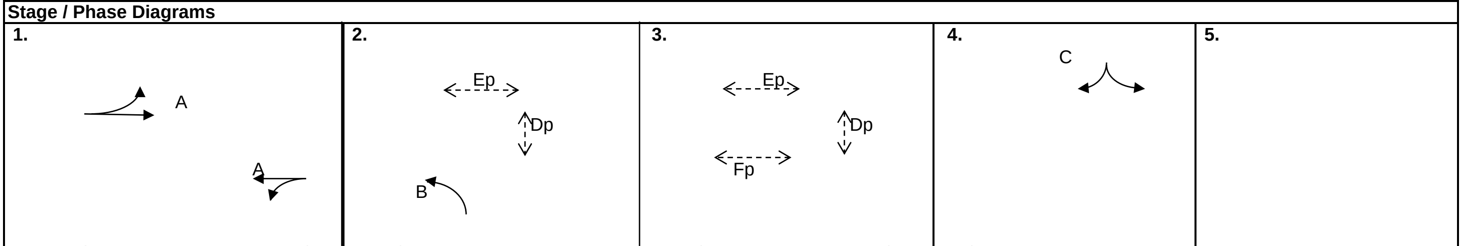
1 Site factor of 0.95 has been applied to the nearside lane of
Chai Wan Road EB for the GMB stop located right after the junction outside the bus terminus.

Traffic Flow (pcu/hr)



Group		A,B,Fp,C	Group		A,B,Fp,C,
y		0.453	y		0.410
L (sec)		37	L (sec)		43
C (sec)		100	C (sec)		100
y pract.		0.567	y pract.		0.513
R.C. (%)		25%	R.C. (%)		25%

Stage / Phase Diagrams



I/G= 5		I/G= 11		I/G= 4	18	I/G= 2		I/G=	
I/G= 5		I/G= 11	5	I/G= 4	18	I/G= 2		I/G=	

Date:	Junction: A
Aug-16	Chai Wan Road/Sheung On Street/Wing Ping Stre

TRAFFIC SIGNALS CALCULATION

Job No.: CHK50019644 **MVA ASIA LIMITED**

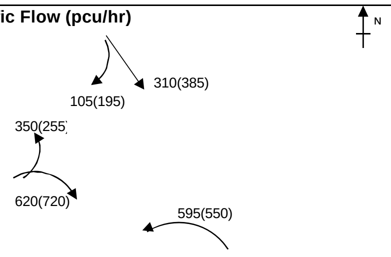
Junction: Wing Tai Road/Chai Wan Road Design Year: 2015

Description: Observed Traffic Flows Designed By: TYC Checked By: GPH

Approach	Movement notation	Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	Uphill gradient (%)	Pro. Turning (%) A.M.	Pro. Turning (%) P.M.	Revised Saturation Flow (pcu/hr) A.M.	Revised Saturation Flow (pcu/hr) P.M.	A.M. Peak Flow (pcu/hr)	A.M. Peak y Value	A.M. Peak Critical y	P.M. Peak Flow (pcu/hr)	P.M. Peak y Value	P.M. Peak Critical y
Chai Wan Road		B	1	2.900	70					1865	1865	306	0.164		255	0.137	
EB		B	1	3.800	70	25		13% / 87%	0% / 100%	2025	2015	333	0.164	0.164	360	0.179	0.179
		B	1	4.100		20				2015	2015	331	0.164		360	0.179	
Wing Tai Road		C	2	3.700						1985	1985	135	0.068	0.068	186	0.094	
SB		C	2	3.700						2125	2125	144	0.068		199	0.094	
		C	2	4.000		15		77%	100%	2000	1960	136	0.068		195	0.099	0.099
Chai Wan Road		A	1	4.000	100					1985	1985	287	0.145		265	0.134	
WB		A	1	4.100	100					2135	2135	308	0.144		285	0.133	
Pedestrian Crossing		Dp	1	MIN GREEN + FLASH			8	+	10	=	18						
		Ep	1	MIN GREEN + FLASH			6	+	7	=	13						
		Fp	2	MIN GREEN + FLASH			6	+	7	=	13						

Notes:

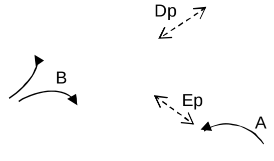
Traffic Flow (pcu/hr)



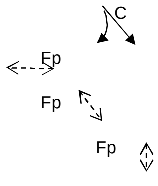
Group	A,C	B,C	Group	A,C,,,	B,C,,,
y	0.213	0.232	**y**	0.233	0.278
L (sec)	10	10	**L (sec)**	10	10
C (sec)	100	100	**C (sec)**	100	100
y pract.	0.810	0.810	**y pract.**	0.810	0.810
R.C. (%)	281%	248%	**R.C. (%)**	248%	191%

Stage / Phase Diagrams

1.



2.



3.

4.

5.

I/G= 5		I/G= 7		I/G=		I/G=		I/G=	
I/G= 5		I/G= 7		I/G=		I/G=		I/G=	

Date: Jun-16 **Junction:** Wing Tai Road/Chai Wan Road B

TRAFFIC SIGNALS CALCULATION

Job No.: CHK50019644 **MVA ASIA LIMITED**

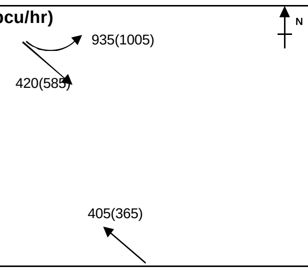
Junction: Wing Tai Road/Ka Yip Street Design Year: 2015

Description: Observed Traffic Flows Designed By: TYC Checked By: GPH

Approach	Movement notation	Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	Uphill gradient (%)	Pro. Turning (%) A.M.	Pro. Turning (%) P.M.	Revised Saturation Flow (pcu/hr) A.M.	Revised Saturation Flow (pcu/hr) P.M.	A.M. Peak Flow (pcu/hr)	A.M. Peak y Value	A.M. Peak Critical y	P.M. Peak Flow (pcu/hr)	P.M. Peak y Value	P.M. Peak Critical y
Wing Tai Road		B	2,3	3.830	13					1790	1790	447	0.250		482	0.269	
SB		B	2,3	3.580	18			100%	99%	1950	1950	488	0.250	0.250	526	0.270	0.270
		B	2,3	4.040						2160	2160	420	0.194		582	0.269	
Wing Tai Road		A	1,2	4.240						2040	2040	197	0.097		178	0.087	0.087
NB		A	1,2	3.910						2145	2145	208	0.097	0.097	187	0.087	
Pedestrian Crossing		Cp	3	MIN GREEN + FLASH			10	+	7	=	17						
		Dp	1	MIN GREEN + FLASH			7	+	13	=	20						
		Ep	1	MIN GREEN + FLASH			6	+	12	=	18						

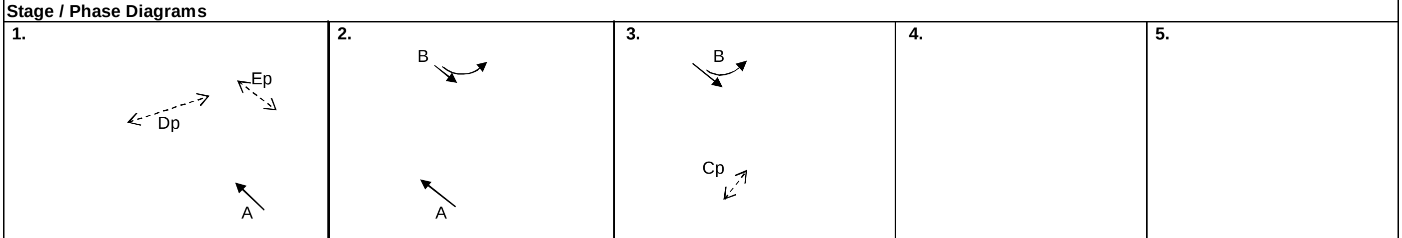
Notes:

Traffic Flow (pcu/hr)



Group	Ep,B	A,B	Group	Ep,B,,,	A,B,,,
y	0.250	0.347	y	0.270	0.357
L (sec)	30	10	L (sec)	30	10
C (sec)	100	100	C (sec)	100	100
y pract.	0.630	0.810	y pract.	0.630	0.810
R.C. (%)	152%	133%	R.C. (%)	134%	127%

Stage / Phase Diagrams



I/G=		I/G= 7		I/G= 5		I/G=		I/G=	
I/G=		I/G= 7		I/G= 5		I/G=		I/G=	

Date:	Junction:	
Jun-16	Wing Tai Road/Ka Yip Street	C

TRAFFIC SIGNALS CALCULATION

Job No.: CHK50019644 **MVA ASIA LIMITED**

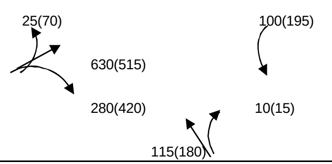
Junction: Ka Yip Street/Sheung On Street Design Year: 2015

Description: Observed Traffic Flows Designed By: TYC Checked By: GPH

Approach	Movement notation	Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	Uphill gradient (%)	Pro. Turning (%) A.M.	Pro. Turning (%) P.M.	Revised Saturation Flow (pcu/hr) A.M.	Revised Saturation Flow (pcu/hr) P.M.	A.M. Peak Flow (pcu/hr)	A.M. Peak y Value	A.M. Peak Critical y	P.M. Peak Flow (pcu/hr)	P.M. Peak y Value	P.M. Peak Critical y
Ka Yip Street WB		B	3	4.070	10					1760	1760	100	0.057		195	0.111	0.111
Sheung On Street NB		B	3	5.240		15		8%	8%	2120	2125	125	0.059	0.059	195	0.092	
Ka Yip Street EB		A	1	4.490	15			4%	12%	2055	2040	655	0.319	0.319	585	0.287	0.287
		A	1	4.450		15				2000	2000	280	0.140		420	0.210	
Pedestrian Crossing		Cp	2,3	MIN GREEN + FLASH			10	+	10	=	20						
		Dp	2	MIN GREEN + FLASH			7	+	10	=	17			*			*

Notes:

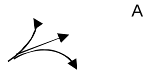
Traffic Flow (pcu/hr)



Group		A,Dp,B	Group		A,Dp,B,,
y		0.378	y		0.398
L (sec)		32	L (sec)		32
C (sec)		100	C (sec)		100
y pract.		0.612	y pract.		0.612
R.C. (%)		62%	R.C. (%)		54%

Stage / Phase Diagrams

1.



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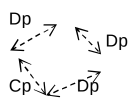

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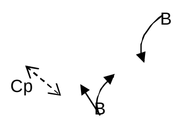


4.

5.

I/G= 6		I/G= 8	17	I/G= 3		I/G=		I/G=	
I/G= 6		I/G= 8	17	I/G= 3		I/G=		I/G=	

Date:	Junction: D
Jun-16	Ka Yip Street/Sheung On Street

TRAFFIC SIGNALS CALCULATION

Job No.: CHK50019644 **MVA HONG KONG LIMITED**

Junction: Chai Wan Road / Siu Sai Wan Road / Sun Yip Street Design Year: 2015

Description: Observed Traffic Flows Designed By: LTH Checked By: EDC

Approach	Movements	Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	Gradient (%)	Pro. Turning (%) AM	Pro. Turning (%) PM	Revised Saturation Flow (pcu/hr) AM	Revised Saturation Flow (pcu/hr) PM	AM Peak Flow (pcu/hr)	AM Peak y Value	AM Peak Critical y	PM Peak Flow (pcu/hr)	PM Peak y Value	PM Peak Critical y
Chai Wan Road		F	1,3	3.100	10					1675	1675	325	0.194		330	0.197	
EB		A	1	3.100						1925	1925	199	0.103		263	0.137	0.137
		A	1	3.900						2145	2145	221	0.103		292	0.136	
Sun Yip Street		D	3	4.260	45					1975	1975	185	0.094		165	0.084	0.084
SB	1	E	3	4.300		15				2050	2050	510	0.249	0.249	480	0.234	0.234
Siu Sai Wan Road		B	1,2	3.100						1925	1925	685	0.356	0.356	428	0.222	
WB	2	B	1,2	3.500						1265	1265	450	0.356		282	0.223	
	2	C	2	3.500		20				1175	1175	65	0.055		95	0.081	

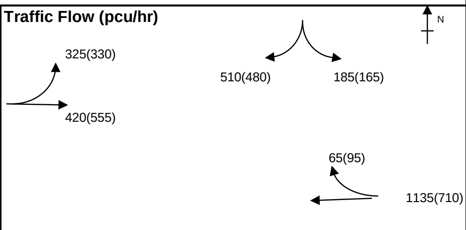
Pedestrian Crossing	Gp	1,2	MIN GREEN + FLASH =	10	+	6	=	16
	Hp	1	MIN GREEN + FLASH =	7	+	7	=	14
	Ip	2	MIN GREEN + FLASH =	7	+	6	=	13
	Jp	3	MIN GREEN + FLASH =	9	+	16	=	25

Notes:

1. 72pcu/hr is added for the flare lane of Sun Yip Street SB right turn lane.

2. Site factor of 0.6 are added for flare lane of offside lane.

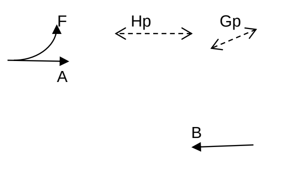
Traffic Flow (pcu/hr)



Group	A,D,E	B,E	Group	A,C,E	A,D,E
y	0.446	0.605	y	0.452	0.454
L (sec)	14	10	L (sec)	12	14
C (sec)	100	100	C (sec)	100	100
y pract.	0.774	0.810	y pract.	0.792	0.774
R.C. (%)	74%	34%	R.C. (%)	75%	70%

Stage / Phase Diagrams

1.



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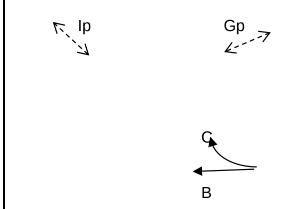

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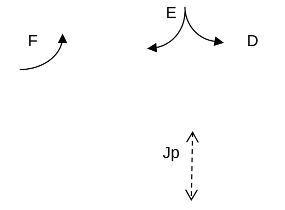


4.

5.

I/G= 7		I/G=		I/G= 5		I/G=		I/G=	
I/G= 5		I/G= 7		I/G= 5		I/G=		I/G=	

Date: Nov, 2015 **Junction:** Chai Wan Road / Siu Sai Wan Road / S E

TRAFFIC SIGNALS CALCULATION

Job No.: CHK50019644 **MVA ASIA LIMITED**

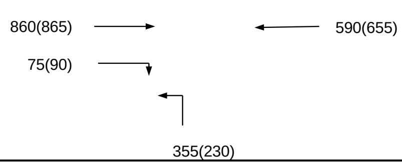
Junction: Chai Wan Road/ San Ha Street Design Year: 2015

Description: Observe Flows Designed By: HKH Checked By: GPH

Approach	Movement notation	Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	(%) uphill Gradient	Pro. Turning (%) A.M.	Pro. Turning (%) P.M.	Revised Saturation Flow (pcu/hr) A.M.	Revised Saturation Flow (pcu/hr) P.M.	A.M. Peak Flow (pcu/hr)	A.M. Peak y Value	A.M. Peak Critical y	P.M. Peak Flow (pcu/hr)	P.M. Peak y Value	P.M. Peak Critical y
Chai Wan Road		A	1	3.300						1945	1945	415	0.213		417	0.214	
EB		A	1	3.300						2085	2085	445	0.213	0.213	448	0.215	0.215
		B	2	3.300		15				1895	1895	75	0.040		90	0.047	
Chai Wan Road		A	1	3.500						1965	1965	285	0.145		316	0.161	
WB		A	1	3.500						2105	2105	305	0.145		339	0.161	
San Ha Street		C	2	4.000	10					1750	1750	355	0.203	0.203	230	0.131	0.131
NB																	
LRT/Pedestrian		Dp	1	Min	6	+	11			=	17						
		Ep	2	Min	12	+	8			=	20						

Notes:

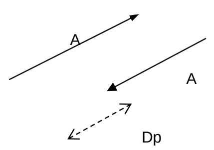
Traffic Flow (pcu/hr)



Group	AEp	AC	Group	AEp	AC
y	0.213	0.416	y	0.215	0.346
L (sec)	28	9	L (sec)	28	9
C (sec)	100	100	C (sec)	100	100
y pract.	0.648	0.819	y pract.	0.648	0.819
R.C. (%)	204%	97%	R.C. (%)	202%	137%

Stage / Phase Diagrams

1.



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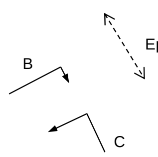


3. **4.** **5.**

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

Date: Aug-16 **Junction:** F

2025 Reference Flows

TRAFFIC SIGNALS CALCULATION **Job No.: CHK50019644** **MVA ASIA LIMITED**

Junction: Chai Wan Road/Sheung On Street/Wing Ping Street Design Year: 2025

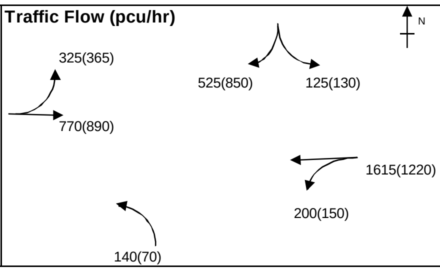
Description: Reference Traffic Flows Designed By: TYC Checked By: GPH

Approach	Movement notation	Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	Uphill gradient (%)	Pro. Turning (%) A.M.	Pro. Turning (%) P.M.	Revised Saturation Flow (pcu/hr) A.M.	Revised Saturation Flow (pcu/hr) P.M.	A.M. Peak Flow (pcu/hr)	A.M. Peak y Value	A.M. Peak Critical y	P.M. Peak Flow (pcu/hr)	P.M. Peak y Value	P.M. Peak Critical y
Chai Wan Road EB		A	1	4.000	12			100%	100%	1700	1700	325	0.191		365	0.215	
		A	1	3.600						2115	2115	384	0.182		444	0.210	
		A	1	3.700						2125	2125	386	0.182		446	0.210	
Sheung On Street SB		C	4	3.333	10					1695	1695	125	0.074		130	0.077	
		C	4	3.333		12				1730	1730	256	0.148		415	0.240	0.240
		C	4	3.333		10				1815	1815	269	0.148	0.148	435	0.240	
Chai Wan Road WB		A	1	3.800	15			35%	34%	1930	1930	576	0.298		435	0.225	
		A	1	3.200						2075	2075	620	0.299	0.299	468	0.226	0.226
		A	1	3.200						2075	2075	619	0.298		467	0.225	
Wing Ping Street NB		B	2	3.900	15					1825	1825	140	0.077	0.077	70	0.038	0.038
Pedestrian Crossing		Dp	2,3	MIN GREEN + FLASH			10	+	18	=	28						
		Ep	2,3	MIN GREEN + FLASH			11	+	14	=	25						
		Fp	3	MIN GREEN + FLASH			6	+	12	=	18			*			*

Notes:

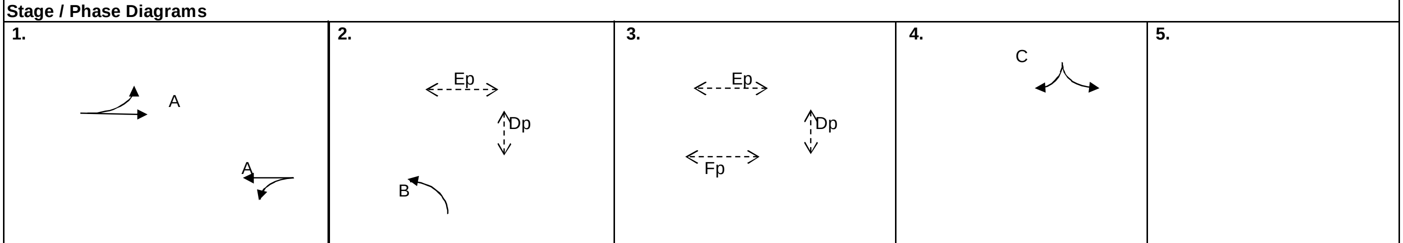
1 Site factor of 0.95 has been applied to the nearside lane of
Chai Wan Road EB for the GMB stop located right after the junction outside the bus terminus.

Traffic Flow (pcu/hr)



Group		A,B,Fp,C	Group		A,B,Fp,C,
y		0.524	y		0.504
L (sec)		37	L (sec)		37
C (sec)		120	C (sec)		120
y pract.		0.623	y pract.		0.623
R.C. (%)		19%	R.C. (%)		24%

Stage / Phase Diagrams



I/G= 5		I/G= 11		I/G= 4	18	I/G= 2		I/G=	
I/G= 5		I/G= 11		I/G= 4	18	I/G= 2		I/G=	

Date:	Junction: A
Aug-16	Chai Wan Road/Sheung On Street/Wing Ping Stre

TRAFFIC SIGNALS CALCULATION

Job No.: CHK50019644 **MVA ASIA LIMITED**

Junction: Wing Tai Road/Chai Wan Road Design Year: 2025

Description: Reference Traffic Flows Designed By: TYC Checked By: GPH

Approach	Movement notation	Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	Uphill gradient (%)	Pro. Turning (%) A.M.	Pro. Turning (%) P.M.	Revised Saturation Flow (pcu/hr) A.M.	Revised Saturation Flow (pcu/hr) P.M.	A.M. Peak Flow (pcu/hr)	A.M. Peak y Value	A.M. Peak Critical y	P.M. Peak Flow (pcu/hr)	P.M. Peak y Value	P.M. Peak Critical y
Chai Wan Road		B	1	2.900	70					1865	1865	369	0.198		330	0.177	
EB		B	1	3.800	70	25		20% / 80%	0% / 100%	2030	2015	402	0.198	0.198	407	0.202	
		B	1	4.100		20				2015	2015	399	0.198		408	0.202	0.202
Wing Tai Road		C	2	3.700						1985	1985	179	0.090		210	0.106	
SB		C	2	3.700						2125	2125	191	0.090		225	0.106	
		C	2	4.000		15		100%	100%	1960	1960	230	0.117	0.117	295	0.151	0.151
Chai Wan Road		A	1	4.000	100					1985	1985	332	0.167		308	0.155	
WB		A	1	4.100	100					2135	2135	358	0.168		332	0.156	
Pedestrian Crossing		Dp	1	MIN GREEN + FLASH			8	+	10	=	18						
		Ep	1	MIN GREEN + FLASH			6	+	7	=	13						
		Fp	2	MIN GREEN + FLASH			6	+	7	=	13						

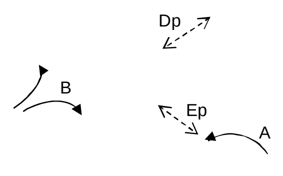
Notes:

Traffic Flow (pcu/hr)

Group	A,C	B,C	Group	A,C,,,	B,C,,,
y	0.285	0.315	y	0.306	0.353
L (sec)	10	10	L (sec)	10	10
C (sec)	100	100	C (sec)	100	100
y pract.	0.810	0.810	y pract.	0.810	0.810
R.C. (%)	184%	157%	R.C. (%)	165%	129%

Stage / Phase Diagrams

1.



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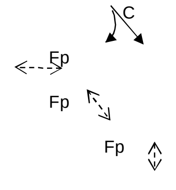


3. **4.** **5.**

I/G= 5		I/G= 7		I/G=		I/G=		I/G=	
I/G= 5		I/G= 7		I/G=		I/G=		I/G=	

Date:	Junction: B
Jun-16	Wing Tai Road/Chai Wan Road

TRAFFIC SIGNALS CALCULATION

Job No.: CHK50019644 **MVA ASIA LIMITED**

Junction: Wing Tai Road/Ka Yip Street — Design Year: 2025

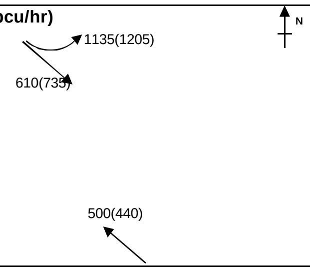
Description: Reference Traffic Flows — Designed By: TYC — Checked By: GPH

Approach	Movement notation	Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	Uphill gradient (%)	Pro. Turning (%) A.M.	Pro. Turning (%) P.M.	Revised Saturation Flow (pcu/hr) A.M.	Revised Saturation Flow (pcu/hr) P.M.	A.M. Peak Flow (pcu/hr)	A.M. Peak y Value	A.M. Peak Critical y	P.M. Peak Flow (pcu/hr)	P.M. Peak y Value	P.M. Peak Critical y
Wing Tai Road	↳	B	2,3	3.830	13					1790	1790	543	0.303		588	0.328	
SB	↓↱	B	2,3	3.580	18			100%	96%	1950	1955	592	0.304	0.304	643	0.329	0.329
	↓	B	2,3	4.040						2160	2160	610	0.282		709	0.328	
Wing Tai Road	↑	A	1,2	4.240						2040	2040	244	0.120	0.120	214	0.105	
NB	↑	A	1,2	3.910						2145	2145	256	0.119		226	0.105	0.105

	Phase	Stage						
Pedestrian Crossing	Cp	3	MIN GREEN + FLASH	10	+	7	=	17
	Dp	1	MIN GREEN + FLASH	7	+	13	=	20
	Ep	1	MIN GREEN + FLASH	6	+	12	=	18

Notes:

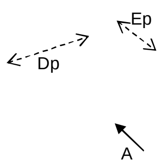
Traffic Flow (pcu/hr)



Group	Ep,B	A,B	Group	Ep,B,,,	A,B,,,
y	0.304	0.423	**y**	0.329	0.434
L (sec)	30	10	**L (sec)**	30	10
C (sec)	100	100	**C (sec)**	100	100
y pract.	0.630	0.810	**y pract.**	0.630	0.810
R.C. (%)	108%	91%	**R.C. (%)**	92%	87%

Stage / Phase Diagrams

1.



2.

3.

4.

5.

I/G=		I/G= 7		I/G= 5		I/G=		I/G=	
I/G=		I/G= 7		I/G= 5		I/G=		I/G=	

Date: Jun-16 — **Junction:** Wing Tai Road/Ka Yip Street — C

TRAFFIC SIGNALS CALCULATION

Job No.: CHK50019644 **MVA ASIA LIMITED**

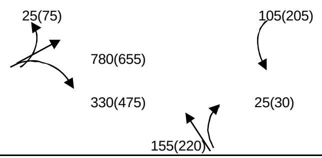
Junction: Ka Yip Street/Sheung On Street Design Year: 2025

Description: Reference Traffic Flows Designed By: TYC Checked By: GPH

Approach	Movement notation	Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	Uphill gradient (%)	Pro. Turning (%) A.M.	Pro. Turning (%) P.M.	Revised Saturation Flow (pcu/hr) A.M.	Revised Saturation Flow (pcu/hr) P.M.	A.M. Peak Flow (pcu/hr)	A.M. Peak y Value	A.M. Peak Critical y	P.M. Peak Flow (pcu/hr)	P.M. Peak y Value	P.M. Peak Critical y
Ka Yip Street WB		B	3	4.070	10					1760	1760	105	0.060		205	0.116	
Sheung On Street NB		B	3	5.240		15		14%	12%	2110	2115	180	0.085	0.085	250	0.118	0.118
Ka Yip Street EB		A	1	4.490	15			3%	10%	2060	2045	805	0.391	0.391	730	0.357	0.357
		A	1	4.450		15				2000	2000	330	0.165		475	0.238	
Pedestrian Crossing		Cp	2,3	MIN GREEN + FLASH			10	+	10	=	20						
		Dp	2	MIN GREEN + FLASH			7	+	10	=	17			*			*

Notes:

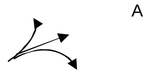
Traffic Flow (pcu/hr)



Group		A,Dp,B	Group		A,Dp,B,,
y		0.476	**y**		0.475
L (sec)		32	**L (sec)**		32
C (sec)		100	**C (sec)**		100
y pract.		0.612	**y pract.**		0.612
R.C. (%)		29%	**R.C. (%)**		29%

Stage / Phase Diagrams

1.



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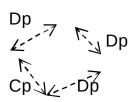
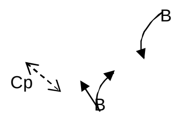


3.



4.

5.

I/G= 6		I/G= 8	17	I/G= 3		I/G=		I/G=	
I/G= 6		I/G= 8	17	I/G= 3		I/G=		I/G=	

Date:	**Junction:** (D)
Jun-16	Ka Yip Street/Sheung On Street

TRAFFIC SIGNALS CALCULATION

Job No.: CHK50019644 **MVA HONG KONG LIMITED**

Junction: Chai Wan Road / Siu Sai Wan Road / Sun Yip Street | Design Year: 2025

Description: Reference Traffic Flow | Designed By: LTH | Checked By: EDC

Approach	Movements	Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	Gradient (%)	Pro. Turning (%) AM	Pro. Turning (%) PM	Revised Saturation Flow (pcu/hr) AM	Revised Saturation Flow (pcu/hr) PM	AM Peak Flow (pcu/hr)	AM Peak y Value	AM Peak Critical y	PM Peak Flow (pcu/hr)	PM Peak y Value	PM Peak Critical y
Chai Wan Road EB		F	1,3	3.100	10					1675	1675	345	0.206		350	0.209	
		A	1	3.100						1925	1925	236	0.123		296	0.154	0.154
		A	1	3.900						2145	2145	264	0.123		329	0.153	
Sun Yip Street SB		D	3	4.260	45					1975	1975	195	0.099		175	0.089	0.089
	1	E	3	4.300		15				2050	2050	595	0.290	0.290	585	0.285	0.285
Siu Sai Wan Road WB		B	1,2	3.100						1925	1925	751	0.390		474	0.246	
	2	B	1,2	3.500						1265	1265	494	0.391	0.391	311	0.246	
	2	C	2	3.500		20				1175	1175	80	0.068		110	0.094	

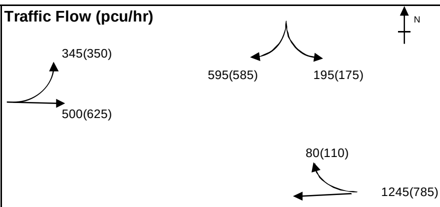
Pedestrian Crossing	Phase	Stage						
	Gp	1,2	MIN GREEN + FLASH =	10	+	6	=	16
	Hp	1	MIN GREEN + FLASH =	7	+	7	=	14
	Ip	2	MIN GREEN + FLASH =	7	+	6	=	13
	Jp	3	MIN GREEN + FLASH =	9	+	16	=	25

Notes:

1. 72pcu/hr is added for the flare lane of Sun Yip Street SB right turn lane.

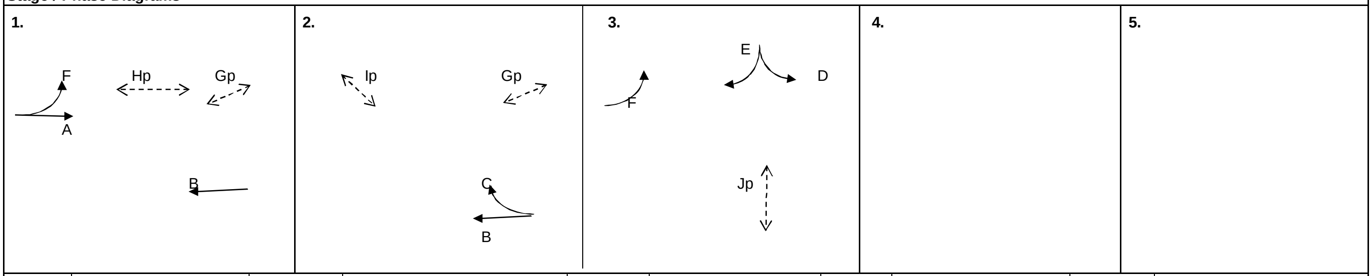
2. Site factor of 0.6 are added for flare lane of offside lane.

Traffic Flow (pcu/hr)



Group	A,D,E	B,E	Group	A,C,E	A,D,E
y	0.512	0.681	y	0.533	0.528
L (sec)	14	10	L (sec)	12	14
C (sec)	100	100	C (sec)	100	100
y pract.	0.774	0.810	y pract.	0.792	0.774
R.C. (%)	51%	19%	R.C. (%)	49%	47%

Stage / Phase Diagrams



I/G= 7		I/G=		I/G= 5		I/G=		I/G=	
I/G= 5		I/G= 7		I/G= 5		I/G=		I/G=	

Date: Nov, 2015 | **Junction:** Chai Wan Road / Siu Sai Wan Road / S E

TRAFFIC SIGNALS CALCULATION

Job No.: CHK50019644 **MVA ASIA LIMITED**

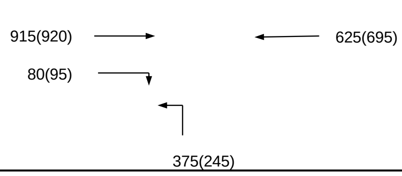
Junction: Chai Wan Road/ San Ha Street Design Year: 2025

Description: Reference Flow Designed By: HKH Checked By: GPH

Approach	Movement notation	Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	(%) uphill Gradient	Pro. Turning (%) A.M.	Pro. Turning (%) P.M.	Revised Saturation Flow (pcu/hr) A.M.	Revised Saturation Flow (pcu/hr) P.M.	A.M. Peak Flow (pcu/hr)	A.M. Peak y Value	A.M. Peak Critical y	P.M. Peak Flow (pcu/hr)	P.M. Peak y Value	P.M. Peak Critical y
Chai Wan Road		A	1	3.300						1945	1945	442	0.227	0.227	444	0.228	
EB		A	1	3.300						2085	2085	473	0.227		476	0.228	0.228
		B	2	3.300		15				1895	1895	80	0.042		95	0.050	
Chai Wan Road		A	1	3.500						1965	1965	302	0.154		336	0.171	
WB		A	1	3.500						2105	2105	323	0.153		359	0.171	
San Ha Street		C	2	4.000	10					1750	1750	375	0.214	0.214	245	0.140	0.140
NB																	
LRT/Pedestrian		Dp	1	Min	6	+	11			=	17						
		Ep	2	Min	12	+	8			=	20						

Notes:

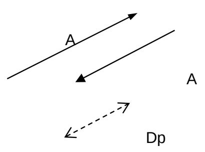
Traffic Flow (pcu/hr)



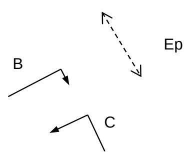
Group	AEp	AC	Group	AEp	AC
y	0.227	0.442	y	0.228	0.368
L (sec)	28	9	L (sec)	28	9
C (sec)	100	100	C (sec)	100	100
y pract.	0.648	0.819	y pract.	0.648	0.819
R.C. (%)	185%	85%	R.C. (%)	184%	122%

Stage / Phase Diagrams

1.



2.



3.

4.

5.

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

Date: Aug-16 **Junction:** F

2025 Design Flows

TRAFFIC SIGNALS CALCULATION

Job No.: CHK50019644 **MVA ASIA LIMITED**

Junction: Chai Wan Road/Sheung On Street/Wing Ping Street   Design Year: 2025

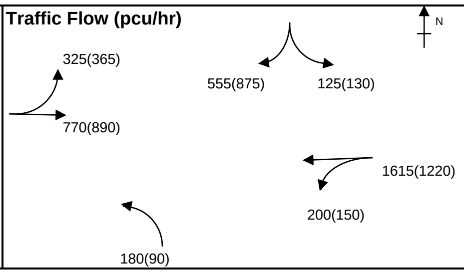
Description: Design Traffic Flows   Designed By: TYC   Checked By: GPH

Approach	Movement notation	Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	Uphill gradient (%)	Pro. Turning (%) A.M.	Pro. Turning (%) P.M.	Revised Saturation Flow (pcu/hr) A.M.	Revised Saturation Flow (pcu/hr) P.M.	A.M. Peak Flow (pcu/hr)	A.M. Peak y Value	A.M. Peak Critical y	P.M. Peak Flow (pcu/hr)	P.M. Peak y Value	P.M. Peak Critical y
Chai Wan Road EB		A	1	4.000	12			100%	100%	1700	1700	325	0.191		365	0.215	
		A	1	3.600						2115	2115	384	0.182		444	0.210	
		A	1	3.700						2125	2125	386	0.182		446	0.210	
Sheung On Street SB		C	4	3.333	10					1695	1695	125	0.074		130	0.077	
		C	4	3.333		12				1730	1730	271	0.157	0.157	427	0.247	
		C	4	3.333		10				1815	1815	284	0.156		448	0.247	0.247
Chai Wan Road WB		A	1	3.800	15			35%	34%	1930	1930	576	0.298		435	0.225	
		A	1	3.200						2075	2075	620	0.299	0.299	468	0.226	0.226
		A	1	3.200						2075	2075	619	0.298		467	0.225	
Wing Ping Street NB		B	2	3.900	15					1825	1825	180	0.099	0.099	90	0.049	0.049
Pedestrian Crossing		Dp	2,3	MIN GREEN + FLASH			10	+	18	=	28						
		Ep	2,3	MIN GREEN + FLASH			11	+	14	=	25						
		Fp	3	MIN GREEN + FLASH			6	+	12	=	18			*			*

Notes:

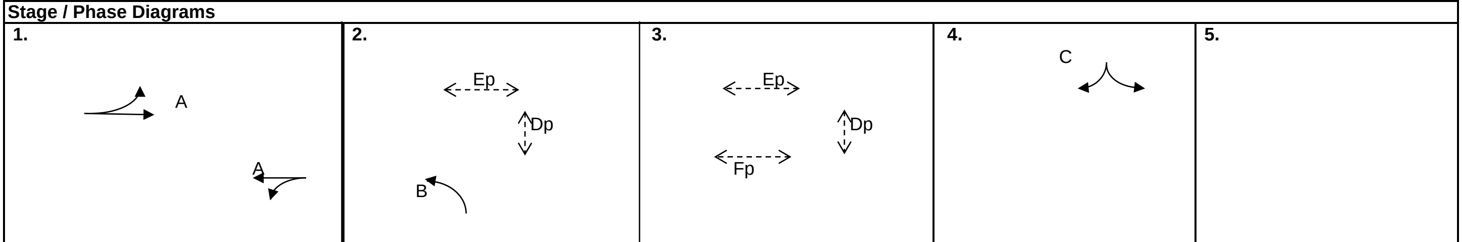
1 Site factor of 0.95 has been applied to the nearside lane of
Chai Wan Road EB for the GMB stop located right after the junction outside the bus terminus.

Traffic Flow (pcu/hr)



Group		A,B,Fp,C	Group		A,B,Fp,C,
y		0.554	y		0.522
L (sec)		37	L (sec)		37
C (sec)		120	C (sec)		120
y pract.		0.623	y pract.		0.623
R.C. (%)		12%	R.C. (%)		19%

Stage / Phase Diagrams



I/G= 5		I/G= 11		I/G= 4	18	I/G= 2		I/G=	
I/G= 5		I/G= 11		I/G= 4	18	I/G= 2		I/G=	

Date:	Junction: A
Aug-16	Chai Wan Road/Sheung On Street/Wing Ping Stre

TRAFFIC SIGNALS CALCULATION **Job No.: CHK50019644** **MVA ASIA LIMITED**

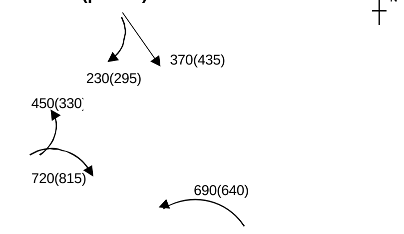
Junction: Wing Tai Road/Chai Wan Road Design Year: 2025

Description: Design Traffic Flows Designed By: TYC Checked By: GPH

Approach	Movement notation	Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	Uphill gradient (%)	Pro. Turning (%) A.M.	Pro. Turning (%) P.M.	Revised Saturation Flow (pcu/hr) A.M.	Revised Saturation Flow (pcu/hr) P.M.	A.M. Peak Flow (pcu/hr)	A.M. Peak y Value	A.M. Peak Critical y	P.M. Peak Flow (pcu/hr)	P.M. Peak y Value	P.M. Peak Critical y
Chai Wan Road		B	1	2.900	70					1865	1865	369	0.198		330	0.177	
EB		B	1	3.800	70	25		20% / 80%	0% / 100%	2030	2015	402	0.198	0.198	407	0.202	
		B	1	4.100		20				2015	2015	399	0.198		408	0.202	0.202
Wing Tai Road		C	2	3.700						1985	1985	179	0.090		210	0.106	
SB		C	2	3.700						2125	2125	191	0.090		225	0.106	
		C	2	4.000		15		100%	100%	1960	1960	230	0.117	0.117	295	0.151	0.151
Chai Wan Road		A	1	4.000	100					1985	1985	332	0.167		308	0.155	
WB		A	1	4.100	100					2135	2135	358	0.168		332	0.156	
Pedestrian Crossing		Dp	1	MIN GREEN + FLASH			8	+	10	=	18						
		Ep	1	MIN GREEN + FLASH			6	+	7	=	13						
		Fp	2	MIN GREEN + FLASH			6	+	7	=	13						

Notes:

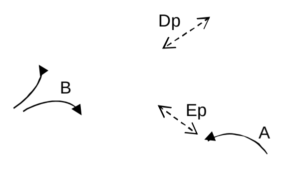
Traffic Flow (pcu/hr)



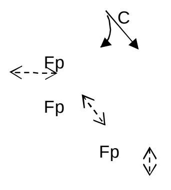
Group	A,C	B,C	Group	A,C,,,	B,C,,,
y	0.285	0.315	**y**	0.306	0.353
L (sec)	10	10	**L (sec)**	10	10
C (sec)	100	100	**C (sec)**	100	100
y pract.	0.810	0.810	**y pract.**	0.810	0.810
R.C. (%)	184%	157%	**R.C. (%)**	165%	129%

Stage / Phase Diagrams

1.



2.



3. **4.** **5.**

I/G= 5		I/G= 7		I/G=		I/G=		I/G=	
I/G= 5		I/G= 7		I/G=		I/G=		I/G=	

Date:	**Junction:** B
Jun-16	Wing Tai Road/Chai Wan Road

TRAFFIC SIGNALS CALCULATION

Job No.: CHK50019644 **MVA ASIA LIMITED**

Junction: Wing Tai Road/Ka Yip Street Design Year: 2025

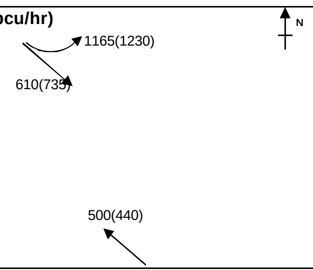
Description: Design Traffic Flows Designed By: TYC Checked By: GPH

Approach	Movement notation	Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	Uphill gradient (%)	Pro. Turning (%) A.M.	Pro. Turning (%) P.M.	Revised Saturation Flow (pcu/hr) A.M.	Revised Saturation Flow (pcu/hr) P.M.	A.M. Peak Flow (pcu/hr)	A.M. Peak y Value	A.M. Peak Critical y	P.M. Peak Flow (pcu/hr)	P.M. Peak y Value	P.M. Peak Critical y
Wing Tai Road		B	2,3	3.830	13					1790	1790	558	0.312	0.312	596	0.333	0.333
SB		B	2,3	3.580	18			100%	98%	1950	1955	607	0.311		650	0.332	
		B	2,3	4.040						2160	2160	610	0.282		719	0.333	
Wing Tai Road		A	1,2	4.240						2040	2040	244	0.120	0.120	214	0.105	
NB		A	1,2	3.910						2145	2145	256	0.119		226	0.105	0.105

Pedestrian Crossing	Phase	Stage						
Pedestrian Crossing	Cp	3	MIN GREEN + FLASH	10	+	7	=	17
	Dp	1	MIN GREEN + FLASH	7	+	13	=	20
	Ep	1	MIN GREEN + FLASH	6	+	12	=	18

Notes:

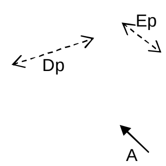
Traffic Flow (pcu/hr)



Group	Ep,B	A,B	Group	Ep,B,,,	A,B,,,
y	0.312	0.431	**y**	0.333	0.438
L (sec)	30	10	**L (sec)**	30	10
C (sec)	100	100	**C (sec)**	100	100
y pract.	0.630	0.810	**y pract.**	0.630	0.810
R.C. (%)	102%	88%	**R.C. (%)**	89%	85%

Stage / Phase Diagrams

1.



2.

3.

4.

5.

1.		2.		3.		4.		5.	
I/G=		I/G= 7		I/G= 5		I/G=		I/G=	
I/G=		I/G= 7		I/G= 5		I/G=		I/G=	

Date:	**Junction:** C
Jun-16	Wing Tai Road/Ka Yip Street

TRAFFIC SIGNALS CALCULATION

Job No.: CHK50019644 **MVA ASIA LIMITED**

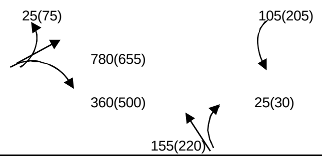
Junction: Ka Yip Street/Sheung On Street — Design Year: 2025

Description: Design Traffic Flows — Designed By: TYC — Checked By: GPH

Approach	Movement notation	Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	Uphill gradient (%)	Pro. Turning (%) A.M.	Pro. Turning (%) P.M.	Revised Saturation Flow (pcu/hr) A.M.	Revised Saturation Flow (pcu/hr) P.M.	A.M. Peak Flow (pcu/hr)	A.M. Peak y Value	A.M. Peak Critical y	P.M. Peak Flow (pcu/hr)	P.M. Peak y Value	P.M. Peak Critical y
Ka Yip Street WB		B	3	4.070	10					1760	1760	105	0.060		205	0.116	
Sheung On Street NB		B	3	5.240		15		14%	12%	2110	2115	180	0.085	0.085	250	0.118	0.118
Ka Yip Street EB		A	1	4.490	15			3%	10%	2060	2045	805	0.391	0.391	730	0.357	0.357
		A	1	4.450		15				2000	2000	360	0.180		500	0.250	
Pedestrian Crossing		Cp	2,3	MIN GREEN + FLASH			10	+	10	=	20						
		Dp	2	MIN GREEN + FLASH			7	+	10	=	17			*			*

Notes:

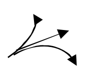
Traffic Flow (pcu/hr)



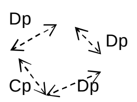
Group		A,Dp,B	Group		A,Dp,B,,
y		0.476	**y**		0.475
L (sec)		32	**L (sec)**		32
C (sec)		100	**C (sec)**		100
y pract.		0.612	**y pract.**		0.612
R.C. (%)		29%	**R.C. (%)**		29%

Stage / Phase Diagrams

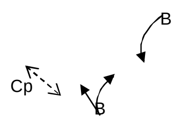
1.



2.



3.



4.

5.

I/G= 6		I/G= 8	17	I/G= 3		I/G=		I/G=	
I/G= 6		I/G= 8	17	I/G= 3		I/G=		I/G=	

Date: Jun-16 **Junction:** Ka Yip Street/Sheung On Street (D)

TRAFFIC SIGNALS CALCULATION

Job No.: CHK50019644 **MVA HONG KONG LIMITED**

Junction: Chai Wan Road / Siu Sai Wan Road / Sun Yip Street — Design Year: 2025

Description: Design Traffic Flow — Designed By: LTH — Checked By: EDC

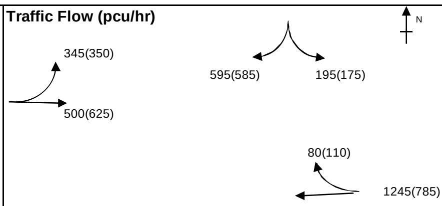
Approach	Movements	Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	Gradient (%)	Pro. Turning (%) AM	Pro. Turning (%) PM	Revised Saturation Flow (pcu/hr) AM	Revised Saturation Flow (pcu/hr) PM	AM Peak Flow (pcu/hr)	AM Peak y Value	AM Peak Critical y	PM Peak Flow (pcu/hr)	PM Peak y Value	PM Peak Critical y
Chai Wan Road EB		F	1,3	3.100	10					1675	1675	345	0.206		350	0.209	
		A	1	3.100						1925	1925	236	0.123		296	0.154	0.154
		A	1	3.900						2145	2145	264	0.123		329	0.153	
Sun Yip Street SB		D	3	4.260	45					1975	1975	195	0.099		175	0.089	0.089
	1	E	3	4.300		15				2050	2050	595	0.290	0.290	585	0.285	0.285
Siu Sai Wan Road WB		B	1,2	3.100						1925	1925	751	0.390		474	0.246	
	2	B	1,2	3.500						1265	1265	494	0.391	0.391	311	0.246	
	2	C	2	3.500		20				1175	1175	80	0.068		110	0.094	
Pedestrian Crossing		Gp	1,2	MIN GREEN + FLASH =			10	+	6	=	16						
		Hp	1	MIN GREEN + FLASH =			7	+	7	=	14						
		Ip	2	MIN GREEN + FLASH =			7	+	6	=	13						
		Jp	3	MIN GREEN + FLASH =			9	+	16	=	25						

Notes:

1. 72pcu/hr is added for the flare lane of Sun Yip Street SB right turn lane.

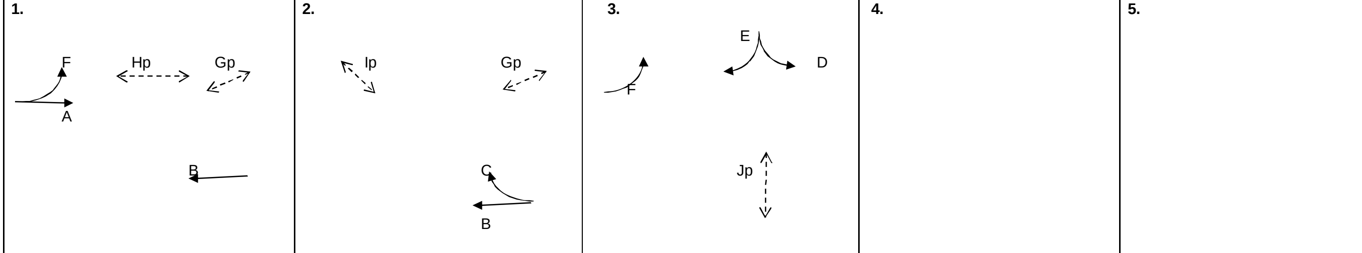
2. Site factor of 0.6 are added for flare lane of offside lane.

Traffic Flow (pcu/hr)



Group	A,D,E	B,E	Group	A,C,E	A,D,E
y	0.512	0.681	y	0.533	0.528
L (sec)	14	10	L (sec)	12	14
C (sec)	100	100	C (sec)	100	100
y pract.	0.774	0.810	y pract.	0.792	0.774
R.C. (%)	51%	19%	R.C. (%)	49%	47%

Stage / Phase Diagrams



I/G= 7		I/G=		I/G= 5		I/G=		I/G=	
I/G= 5		I/G= 7		I/G= 5		I/G=		I/G=	

Date: Nov, 2015

Junction: Chai Wan Road / Siu Sai Wan Road / S E

TRAFFIC SIGNALS CALCULATION

Job No.: CHK50019644

MVA ASIA LIMITED

Junction: Chai Wan Road/ San Ha Street

Design Year: 2025

Description: Design Flow

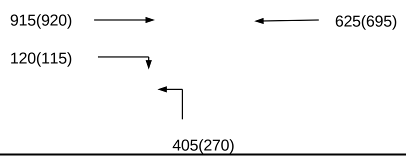
Designed By: HKH

Checked By: GPH

Approach	Movement notation	Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	(%) uphill Gradient	Pro. Turning (%) A.M.	Pro. Turning (%) P.M.	Revised Saturation Flow (pcu/hr) A.M.	Revised Saturation Flow (pcu/hr) P.M.	A.M. Peak Flow (pcu/hr)	A.M. Peak y Value	A.M. Peak Critical y	P.M. Peak Flow (pcu/hr)	P.M. Peak y Value	P.M. Peak Critical y
Chai Wan Road	→	A	1	3.300						1945	1945	442	0.227	0.227	444	0.228	
EB	→	A	1	3.300						2085	2085	473	0.227		476	0.228	0.228
	↴	B	2	3.300		15				1895	1895	120	0.063		115	0.061	
Chai Wan Road	←	A	1	3.500						1965	1965	302	0.154		336	0.171	
WB	←	A	1	3.500						2105	2105	323	0.153		359	0.171	
San Ha Street	↰	C	2	4.000	10					1750	1750	405	0.231	0.231	270	0.154	0.154
NB																	
LRT/Pedestrian		Dp	1	Min	6	+	11			=	17						
		Ep	2	Min	12	+	8			=	20						

Notes:

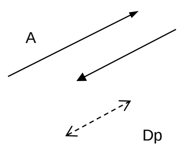
Traffic Flow (pcu/hr)



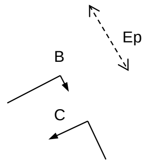
Group	AEp	AC	Group	AEp	AC
y	0.227	0.459	y	0.228	0.383
L (sec)	28	9	L (sec)	28	9
C (sec)	100	100	C (sec)	100	100
y pract.	0.648	0.819	y pract.	0.648	0.819
R.C. (%)	185%	79%	R.C. (%)	184%	114%

Stage / Phase Diagrams

1.



2.



3.

4.

5.

1.		2.		3.		4.		5.	
I/G= 5		I/G= 6		I/G=		I/G=		I/G=	
I/G= 5		I/G= 6		I/G=		I/G=		I/G=	

Date: Aug-16

Junction: F

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MVA
SYSTRA GROUP

Hong Kong Housing Authority

Air Ventilation Assessment of Proposed Public Housing Development at J/O of Chai Wan Road, Wing Ping Street, and San Ha Street

Expert Evaluation Report

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Issue 4 Rev 3 | 18 August 2016

Job number --

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Document Verification

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Job title		Air Ventilation Assessment of Proposed Public Housing Development at J/O of Chai Wan Road, Wing Ping Street, and San Ha Street			**Job number** --
Document title		Expert Evaluation Report			**File reference**
Document ref		--			
Revision	**Date**	**Filename**	20151230_ChaiWanRoad_EE_Issue1.docx		
Issue 1	30 Dec 2015	**Description**	Issue 1		
			Prepared by	Checked by	Approved by
		Name	Wincy Wan	Hannah Wong	Sui-Hang Yan
		Signature			
Issue 2	9 May 2016	**Filename**	20160509_ChaiWanRoad_EE_Issue2v6.docx		
		Description	Issue 2		
			Prepared by	Checked by	Approved by
		Name	Wincy Wan	Hannah Wong	Sui-Hang Yan
		Signature			
Issue 3	23 Jun 2016	**Filename**	20160622_ChaiWanRoad_EE_Issue2v7.docx		
		Description	Issue 3		
			Prepared by	Checked by	Approved by
		Name	Wincy Wan	Hannah Wong	Tony Lam
		Signature			
Issue 4	3 Aug 2016	**Filename**	20160803_ChaiWanRoad_EE_Issue4.docx		
		Description	Issue 4		
			Prepared by	Checked by	Approved by
		Name	Wincy Wan	Hannah Wong	Tony Lam
		Signature			

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Job title		Air Ventilation Assessment of Proposed Public Housing Development at J/O of Chai Wan Road, Wing Ping Street, and San Ha Street			**Job number** --
Document title		Expert Evaluation Report			**File reference**
Document ref		--			
Revision	**Date**	**Filename**	20160810_ChaiWanRoad_EE_Issue4_rev1.docx		
Issue 4 Rev 1	10 Aug 2016	**Description**	Issue 4 Rev 1		
			Prepared by	Checked by	Approved by
		Name	Wincy Wan	Hannah Wong	Tony Lam
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Issue 4 Rev 2	12 Aug 2016	**Filename**	20160812_ChaiWanRoad_EE_Issue4_rev2.docx		
		Description	Issue 4 Rev 2		
			Prepared by	Checked by	Approved by
		Name	Wincy Wan	Hannah Wong	Tony Lam
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Issue 4 Rev 3	18 Aug 2016	**Filename**	20160818_ChaiWanRoad_EE_Issue4_rev3.docx		
		Description	Issue 4 Rev 3		
			Prepared by	Checked by	Approved by
		Name	Wincy Wan	Hannah Wong	Tony Lam
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		Filename			
		Description			
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		Name			
		Signature			

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Contents

1 Introduction

1.1 Project Background

Ove Arup & Partners Hong Kong Ltd (Arup) was commissioned by the Hong Kong Housing Authority (HKHA) to carry out an Air Ventilation Assessment (AVA) – Expert Evaluation for the development at J/O of Chai Wan Road, Wing Ping Street, and San Ha Street (the Development).

1.2 Objective

The objective of this study is to evaluate the wind performance of the Development using the methodology of Air Ventilation Assessment, based on the "*Housing Planning and Lands Bureau – Technical Circular No. 1/06, Environment, Transport and Works Bureau – Technical Circular No. 1/06*" issued on 19th July 2006 (the Technical Circular) and "*Technical Guide for Air Ventilation Assessment for Development in Hong Kong – Annex A*" (the Technical Guide). This report presents the findings for the Expert Evaluation, which is to advise the implication of the proposed development on the pedestrian wind environment in a qualitative manner.

An Initial Study will be conducted in the next stage at detailed building design to help optimize the wind pertinence through the use of computation fluid dynamic (CFD) techniques.

1.3 Study Tasks

The major task of this study is to carry out an expert evaluation on the characteristics of the site wind availability data of the development area and assessment of the wind performance under existing development situation and the proposed building design option in a qualitative way. The expert evaluation will cover the following tasks:

- Identify the wind condition
- Identify problem areas
- Identify good design features

2 Site Characteristics

The proposed Development is located within Chai Wan district, on a flat reclamation land. The Chai Wan Area is, exposed to the sea to the northeast and surrounded by Mount Collinson (≈ 348mPD) to the south, Mount Parker (≈ 507mPD) to the west and also Pottinger Peak (≈312 mPD) to the southeast as shown in Figure 1.

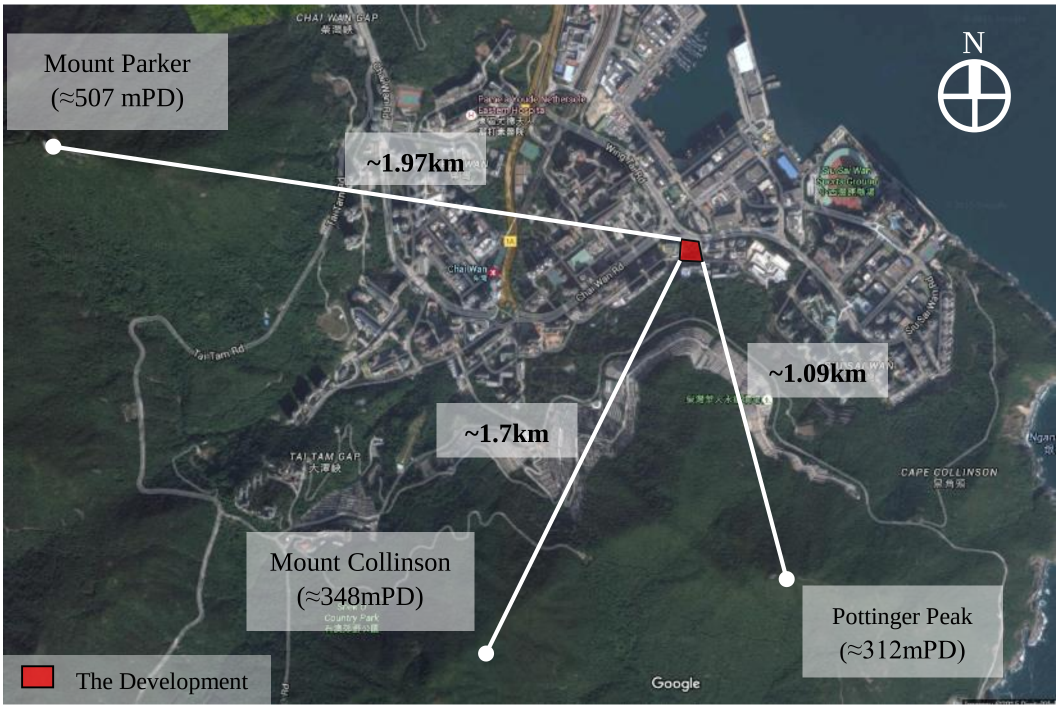


Figure 1 Topography of Chai Wan District (source: google map)

The Proposed Development is located adjacent to Chai Wan Road (Green line), Wing Ping Street (Black line) and San Ha Street (Orange Line). The location of the Development site is shown in Figure 2.

It is in close proximity to low rise school area (SKH Chai Wan St. Michael's Primary School and Caritas Chai Wan Marden Foundation Secondary School etc.) at its west and south. There are high rise residential estate (Chai Wan Estate and Lok Hin Terrace) at the southwest side. At its east side, there are mid to high rise residential buildings at Hong Ping Street. The industrial buildings cluster (Ex-bus depot of the China Motor Bus Company and Sunview Industrial building etc.) are located at the northeast side of the site.

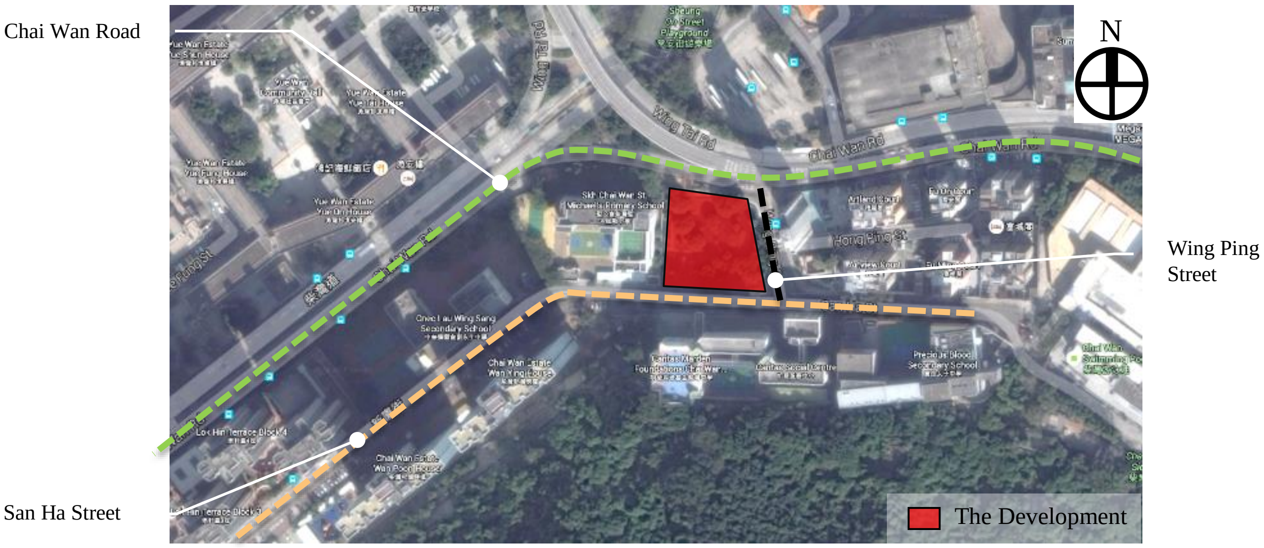


Figure 2 Location of surrounding major roads (source: google map)

Figure 3 Location of the Development and its surrounding developments (source: google map)

There will be a planned development at Wing Tai Road located northwest to the - Development and a planned development in a site zoned Comprehensive Development Area (CDA) on the ex-bus depot site situated to the north of the Development as shown in Figure 4. The development parameters of these planned developments are tabulated in Table 1.

Figure 4 Location of future developments (source: google map)

Table 1 Development parameters of planned developments

	Wing Tai Road	CDA site
Source	In-fill block at Yue Wan Estate	Approved planning application (no. A/H20/177) approved by the Town Planning Board on 23 August 2013
Number of blocks	1	3
Building height	Max. 110mPD	133.9 - 140mPD
Plot ratio	3.4 (Overall Yue Wan Estate)	5.98 (Domestic) 0.017 (Non-domestic)
Podium height	--	2-3 storeys
Podium coverage	Podium Free Design	Development above podium

3 Site Wind Availability

To investigate the wind performance of the Development site, the characteristic of the natural wind availability of the site is essential. Site wind availability data presented in the wind rose could be used to assess the wind characteristics in terms of the magnitude and frequency of approaching wind from different wind directions. There are three sources of site wind data for this Development, including simulated RAMS, simulated MM5 data and the nearby Hong Kong Observatory (HKO) Station – North Point weather station.

3.1 RAMS Wind Data

As stipulated in the Technical Guide, the site wind availability would be presented by using appropriate mathematical models (e.g. RAMS simulation). Planning Department (PlanD) has set up a set of wind availability data of the Territory for AVA study, which could be downloaded at Planning Department Website[1].

The wind availability data at 200mPD of location grid (y:94, x:30) obtained from the RAMS simulation is utilised for the Expert Evaluation, as shown in Figure 5a and Figure 5b below.

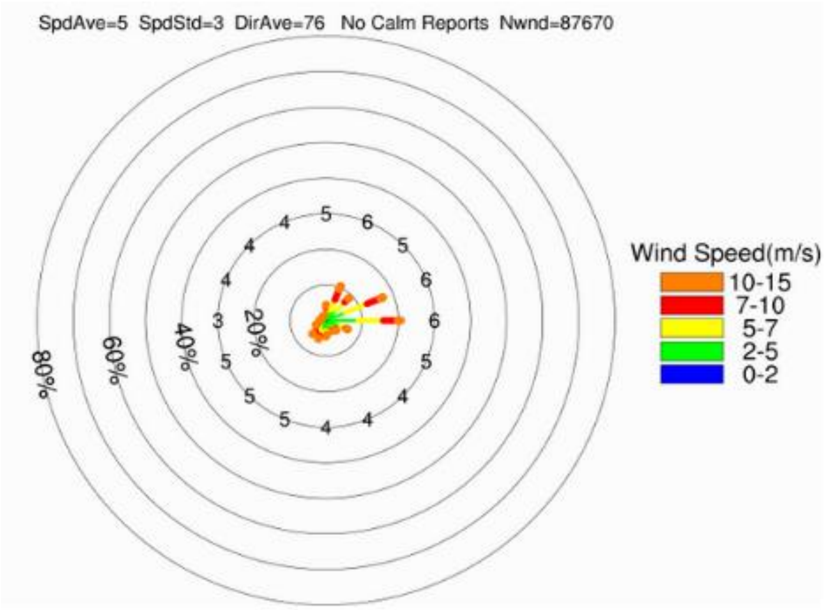


Figure 5a Annual Wind Rose at 200 mPD from RAMS data

[1] http://www.pland.gov.hk/pland_en/info_serv/site_wind/site_wind/index.html

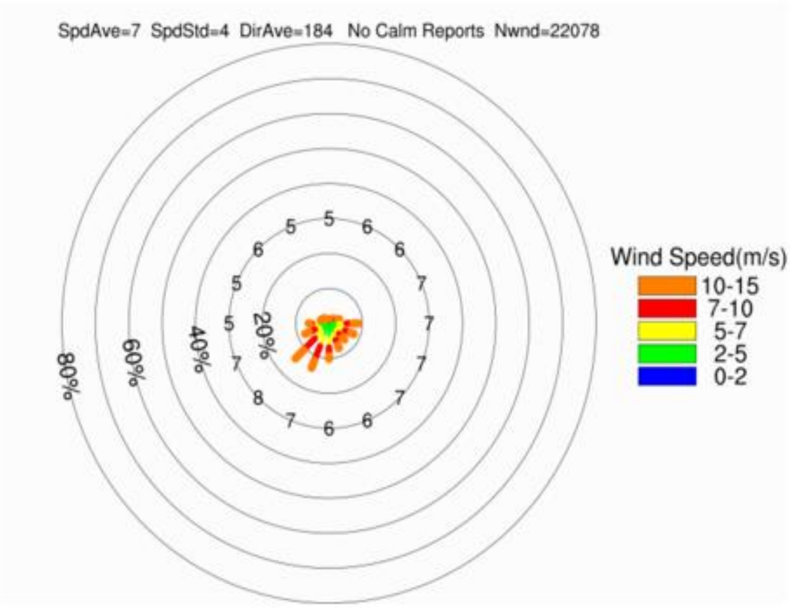


Figure 5b Summer Wind Rose at 200 mPD from RAMS data

Table 2 Prevailing wind frequency

Prevailing Wind	Annual			Summer		
Wind Direction	**NNE**	**ENE**	**E**	**SSW**	**SW**	**S**
Wind Frequency	10.5%	17.0%	20.7%	13.2%	14.9%	11.4%

According to the RAMS wind data, NNE, ENE and E winds contribute to 10.5%, 17.0% and 20.7% of the annual wind frequency respectively while the SSW, SW and S winds contribute to 13.2%, 14.9% and 11.4% of the summer wind frequency respectively. Hence, NNE, ENE and E winds are identified as the annual prevailing wind direction and SSW, SW and S winds are identified as the summer prevailing wind direction.

3.2 MM5 Wind Data

The MM5 data quoted in the Term Consultancy for Air Ventilation Assessment Services report for the Chai Wan Area[2] is used as the second reference. With consideration of flow characteristics, MM5 data extraction location A (Red spot) would have closer flow pattern to the Development then location C (Green spot). Location A and the Development are located close to the same major breezeway. Wind Data from location A is selected for the study. The wind roses of the location A (shown in Figure 6) at 120m and 450m are extracted and illustrated in Figure 7.

With reference to the Expert Evaluation for the Chai Wan Area, the annual prevailing winds are NE, ENE and E, while the summer prevailing wind are E, SE and SW winds.

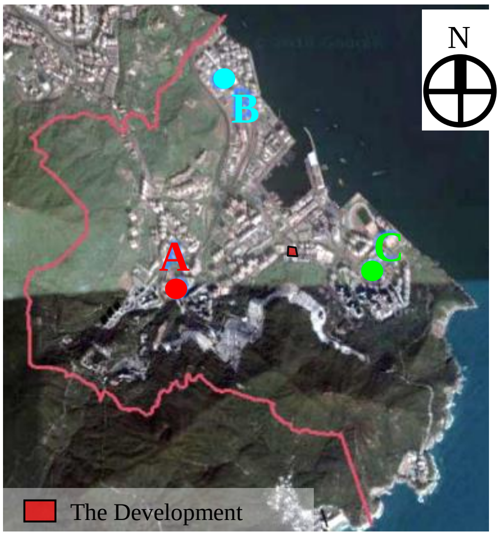


Figure 6 The three locations of MM5 extracted data

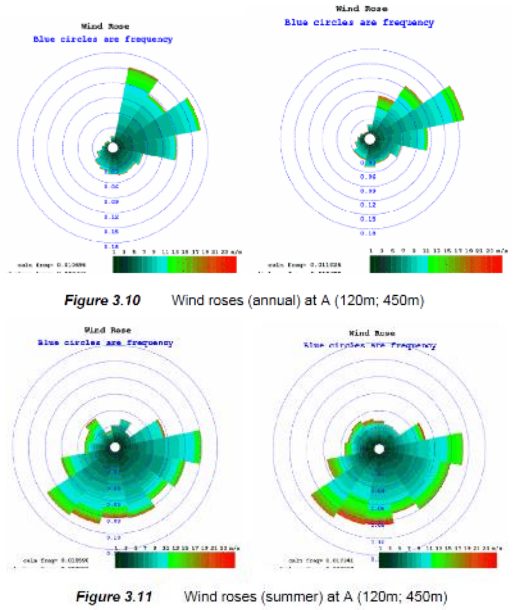


Figure 7 Annual and summer wind roses for Chai Wan Area

[2] Term Consultancy for Expert Evaluation and Advisory Services on Air Ventilation Assessment (PLNQ 35/2009)

3.3 Hong Kong Observatory

On the other hand, the prevailing wind direction measured at the closest weather station - North Point Weather Station from the Hong Kong Observatory[3] is tabulated in Table 3 for each month. It can be seen from Table 3 that the E wind is the annual prevailing wind direction while the SW and E winds are the summer prevailing wind directions.

Table 3 Monthly Wind Direction Recorded at North Point Station (Source: HKO)

Month		Prevailing Wind Direction (°)
January		90
February		90
March		90
April		90
May		260
June		**260**
July	**(Summer)**	**80**
August		**260**
September		80
October		90
November		90
December		90
Annual		**90**

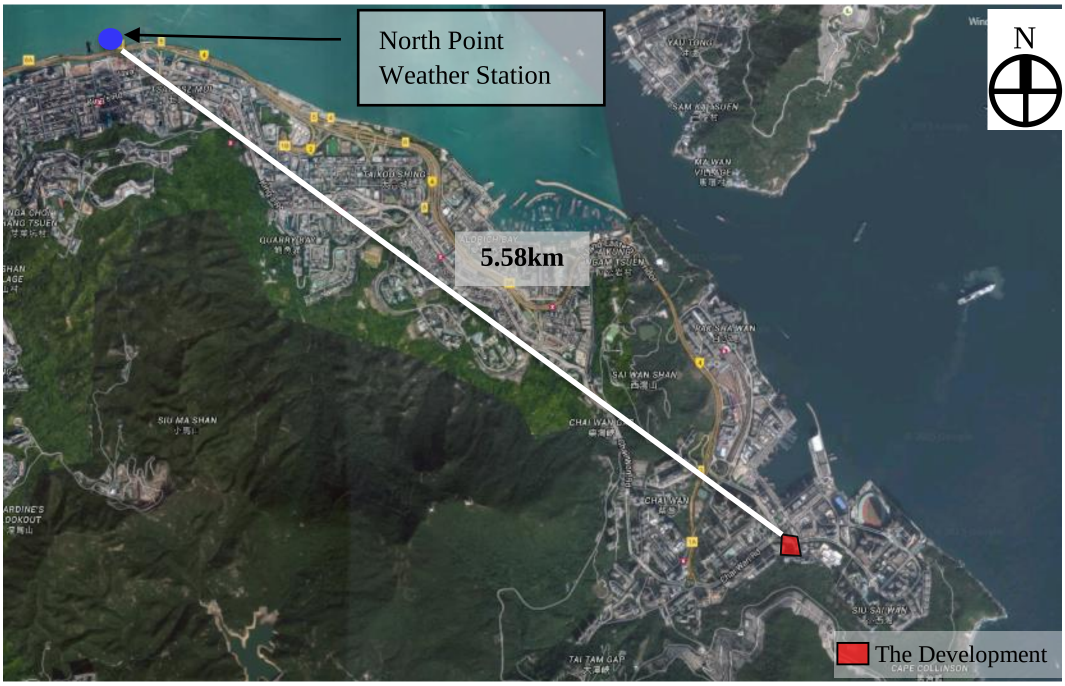


Figure 8 Location of North Point Weather Station

[3] Summary of Meteorological and Tidal Observations in Hong Kong

3.4 Summary of the Site Wind Availability

These three sets of wind data have been studied. The wind data from North Point weather station is considered distant from the Development and this is not used in estimating the wind condition for this study. The RAMS and MM5 data indicated prevailing winds directions are tabulated in Table 4.

The tabulated data reflects similar annual prevailing wind directions which are NNE, NE, ENE and E, whereas the summer prevailing wind directions varies from E, SE, S, SSW and SW. The evaluation of site wind performance would consider both site wind availability data and site characteristics.

Table 4 Prevailing wind directions for the Study Area

Prevailing Wind Direction	RAMS	MM5 (Chai Wan Area)
Annual	NNE/ENE/E	NE/ENE/E
Summer	S/SSW/SW	E/SE/SW

4 Qualitative Assessment of the Existing Condition with Committed Development

4.1 Preliminary Assessment on Site Wind Performance

The Development is located in flat reclaimed area which expose to the sea in the northeast and surrounded by mountains in the west, south and southeast. There is a strong northeast-southwest and east-southwest channelling effect near the ground level due to the surrounding topography and the area proximity to the waterfront.

As discussed in Section 3, the annual prevailing wind is from NNE, ENE, NE and E directions while the summer prevailing wind is from E, SE, S, SSW and SW directions. The ventilation performance of the development site at pedestrian level is evaluated based on these prevailing wind directions and channelling wind effect.

It is expected that the planned developments at adjacent CDA site, may impose some impact on the air path around the Development, the layout of the planned CDA development as shown in Figure 9 is also taken into consideration in the following analysis.

The planned public housing development at Wing Tai Road is considered distant from the Development and it is not located in the upwind nor the downwind directions of the prevailing winds, thus the planned development at Wing Tai Road not taken account in the following study.

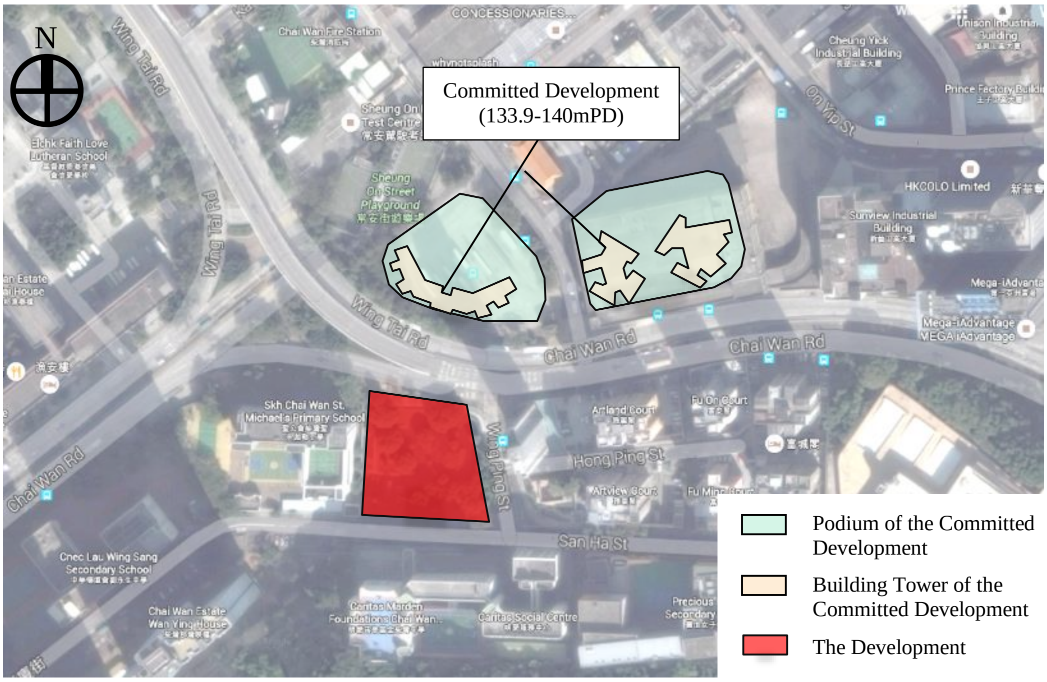


Figure 9 Layout of the Committed Development at the Comprehensive Development Area (CDA) Site

4.1.1 Annual prevailing wind condition

North-Northeast (NNE), Northeast (NE), East-north-east (ENE) and East (E) directions are the annual prevailing wind directions.

In the topography characteristics described above, the NNE, NE and ENE prevailing winds from the sea and travel along the Fung Yip Street and then Chai Wan Road; and also Sun On Street and penetrate through the building separation between the planned CDA site and reach the Development and San Ha Street (the blue arrows in Figure 10).

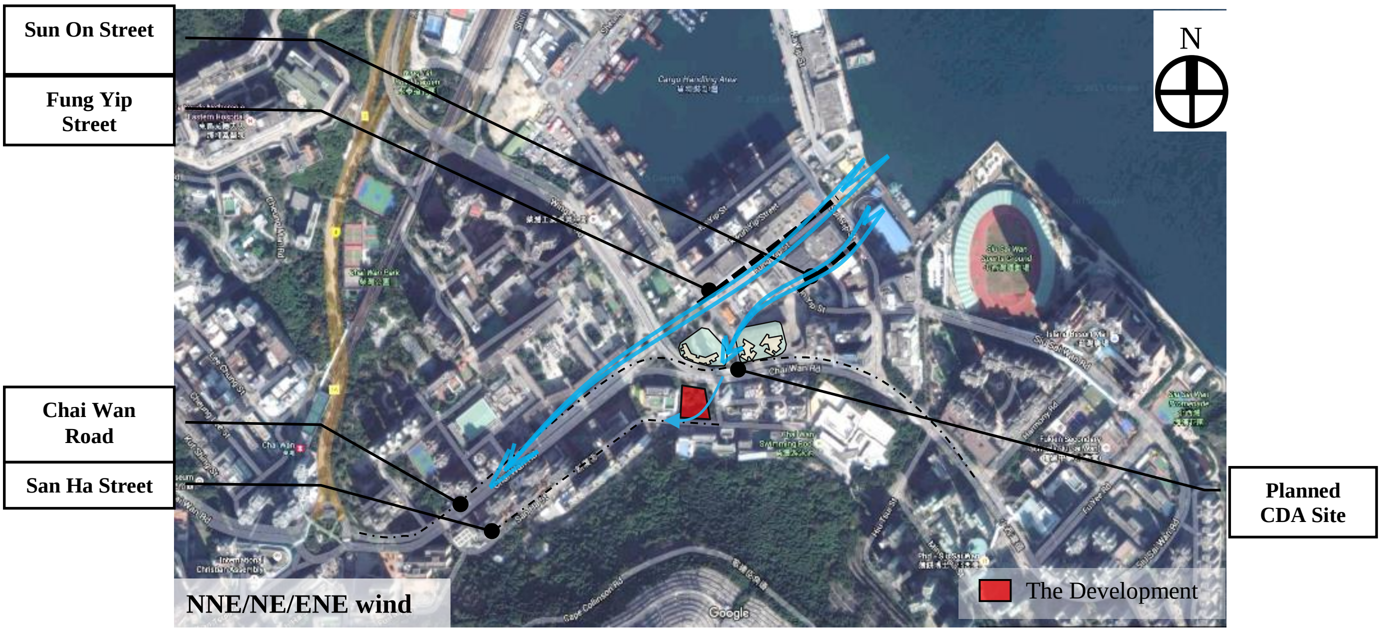


Figure 10 Wind environment of Chai Wan Area under annual condition (NNE, NE and ENE winds)

Under E wind direction, high-rise buildings situated at the upwind direction at the east, such as the Island Resort, Harmony Garden and residential building at Hong Ping Street may likely shield the approaching wind and deflect to Siu Sai Wan Road and Chai Wan Road via Siu Sai Wan Road Garden (the blue arrows in Figure 11). In addition, approaching wind would also penetrate over atop of the school districts and Chai Wan Swimming Pool and flow along San Ha Street and Chai Wan Road (the dark blue arrows in Figure 11).

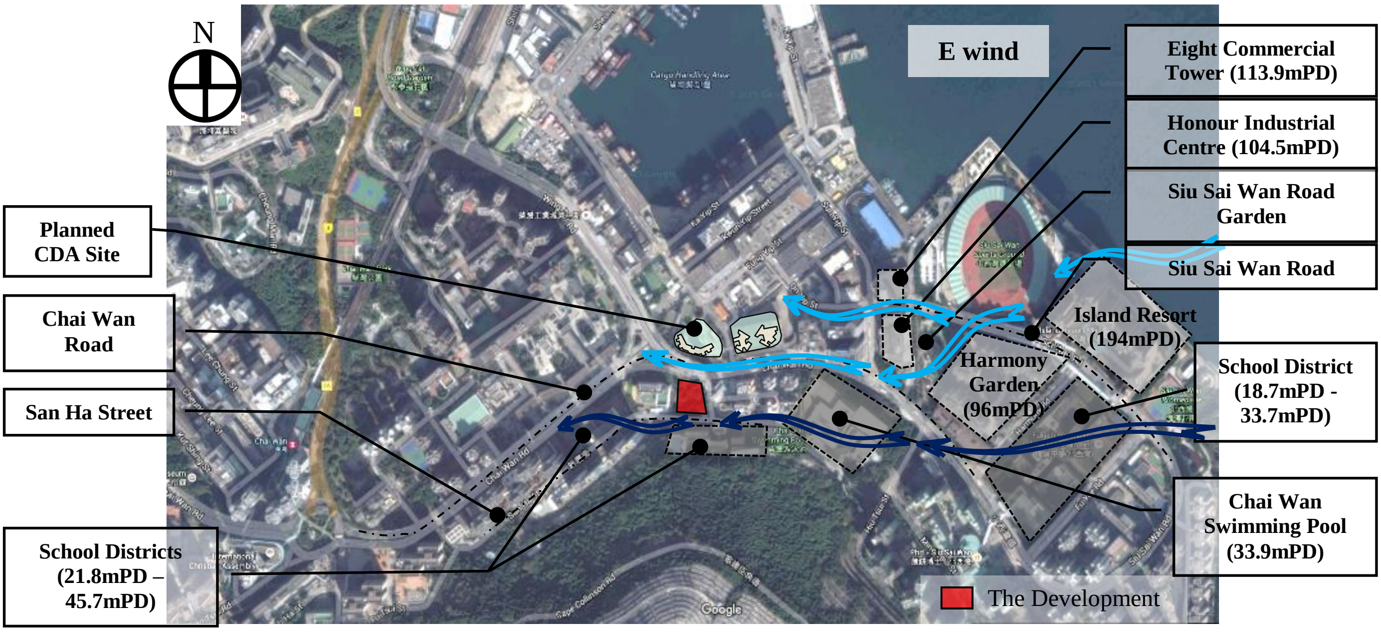


Figure 11 Wind environment of Chai Wan Area under annual condition (E wind)

4.1.2 Summer prevailing wind condition

East (E), Southeast (SE), South (S), South-Southwest (SSW) and Southwest (SW) directions are the summer prevailing wind directions. Under SSW and SW summer prevailing wind condition, Chai Wan Road serve as the major breezeway for inducing the SSW and SW prevailing wind passing through the Sheung On Playground and continue to travel along Fung Yip Street to allow wind penetration to the northeast of the Chai Wan Area. San Ha Street is the secondary breezeway to facilitate the penetration of the SSW and SW wind through Chai Wan Area. As the existing condition of the project site is open space, the summer prevailing wind along San Ha Street could further penetrate across the site and atop of the school sites to Chai Wan Road and Hong Ping Street. The E prevailing wind condition is as described in 4.1.1.

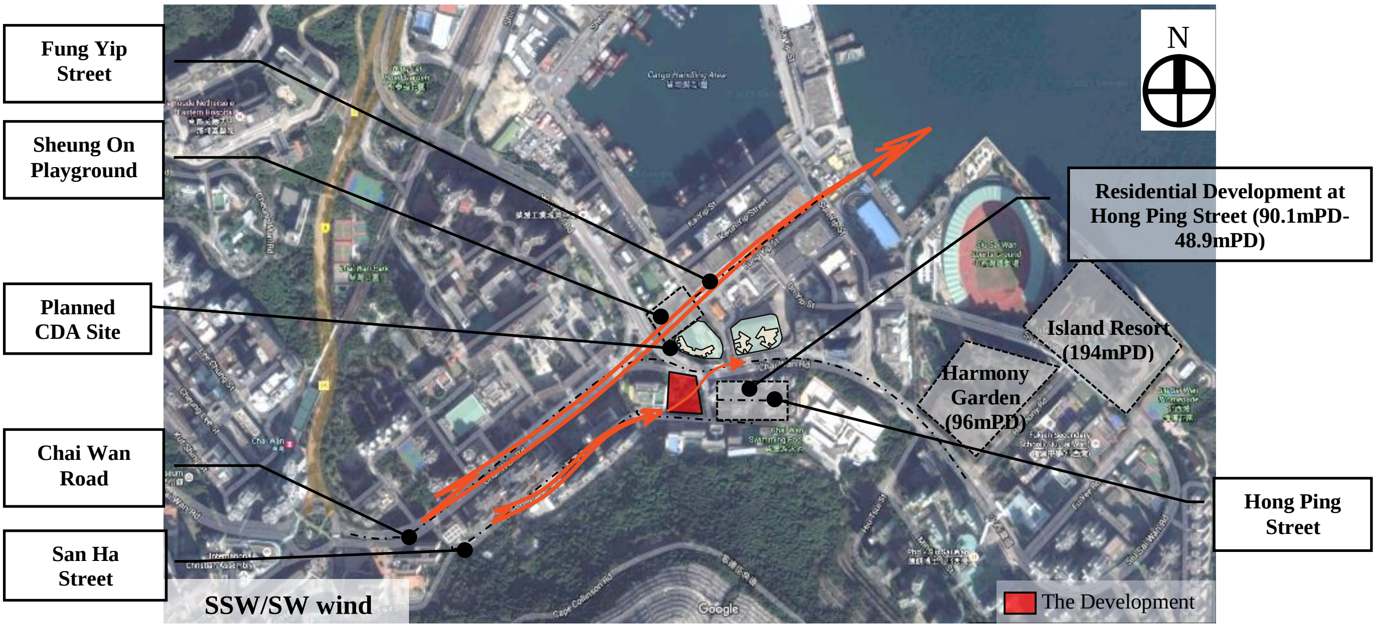


Figure 12 Wind environment of Chai Wan Area under summer condition (SSW and SW winds)

Under S wind condition, the Pottinger Peak (312mPD) is situated at the upwind direction that would alter the S approaching wind that majority of the incoming wind would likely penetrate into Chai Wan Area from southeast and southwest direction. Although minor south prevailing wind may skim over the Pottinger Peak and penetrate towards the Project Site, Caritas Chai Wan Marden Foundation Secondary School, Caritas Social Centre and Precious Blood Secondary School located at the downhill area of the Pottinger Peak would likely shield the approaching wind from Pottinger Peak. The wind being diverted by the high-rise residential cluster Lok Hin Terrace that travels along San Ha Street would become the dominant approaching wind towards the Project Site.

As the existing condition of the project site is open space, the summer prevailing wind along San Ha Street could further penetrate across the site to Chai Wan Road and Hong Ping Street.

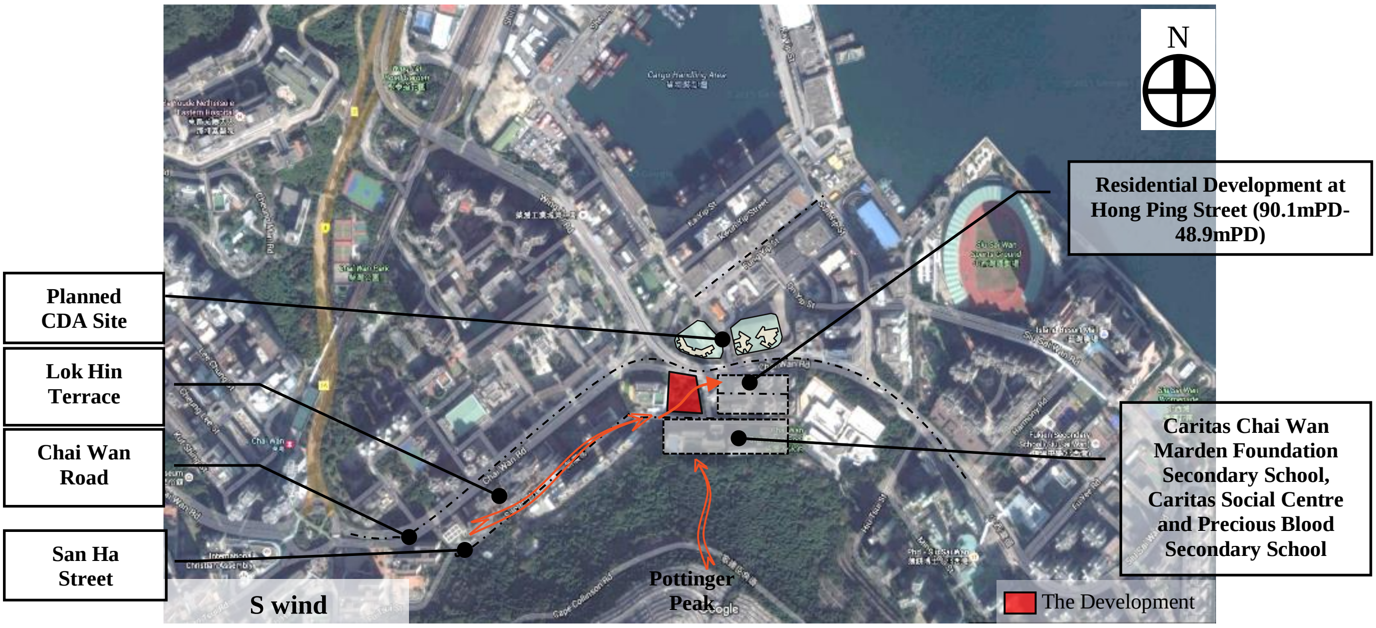


Figure 13 Wind environment of Chai Wan Area under summer condition (S wind)

Under SE wind direction, the relative openness to the south of Siu Sai Wan Estate allows the SE wind reaches Siu Sai Wan Estate through the building gaps (the purple arrow) and along Ming Tsui Street (the blue arrow). The approaching wind may likely penetrate into San Ha Street via the building separation between Chai Wan Swimming Pool and Schools and reach to the Development.

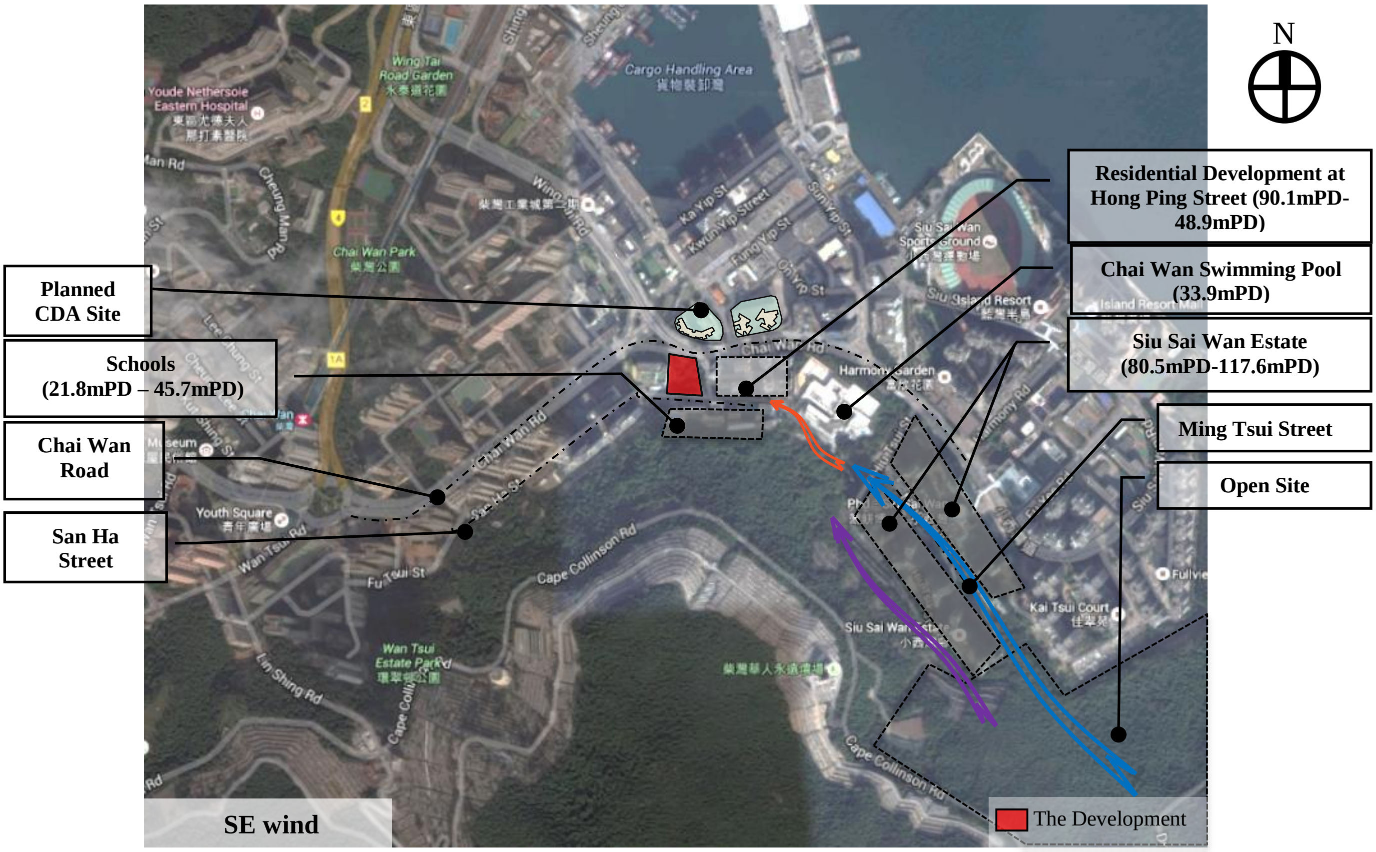


Figure 14 Wind environment of Chai Wan Area under summer condition (SE wind)

5 Preliminary Plan

The Development consists of a single residential block with 38 domestic storeys on a podium. The podium garden is provided at 11.3mPD with about 91% site boundary coverage. The tower block (from transfer plate or above) has a setback of about 7m from Site Boundary along Chai Wan Road and about 18m from the adjacent school block to its west. (Subject to future design)

Figure 15 and Figure 16 show the site layout plan and elevation of the Development.

Table 5 Indicative parameters of the Development

Gross Site Area	0.33 ha
Plot Ratio	10
Maximum Building Height	120mPD

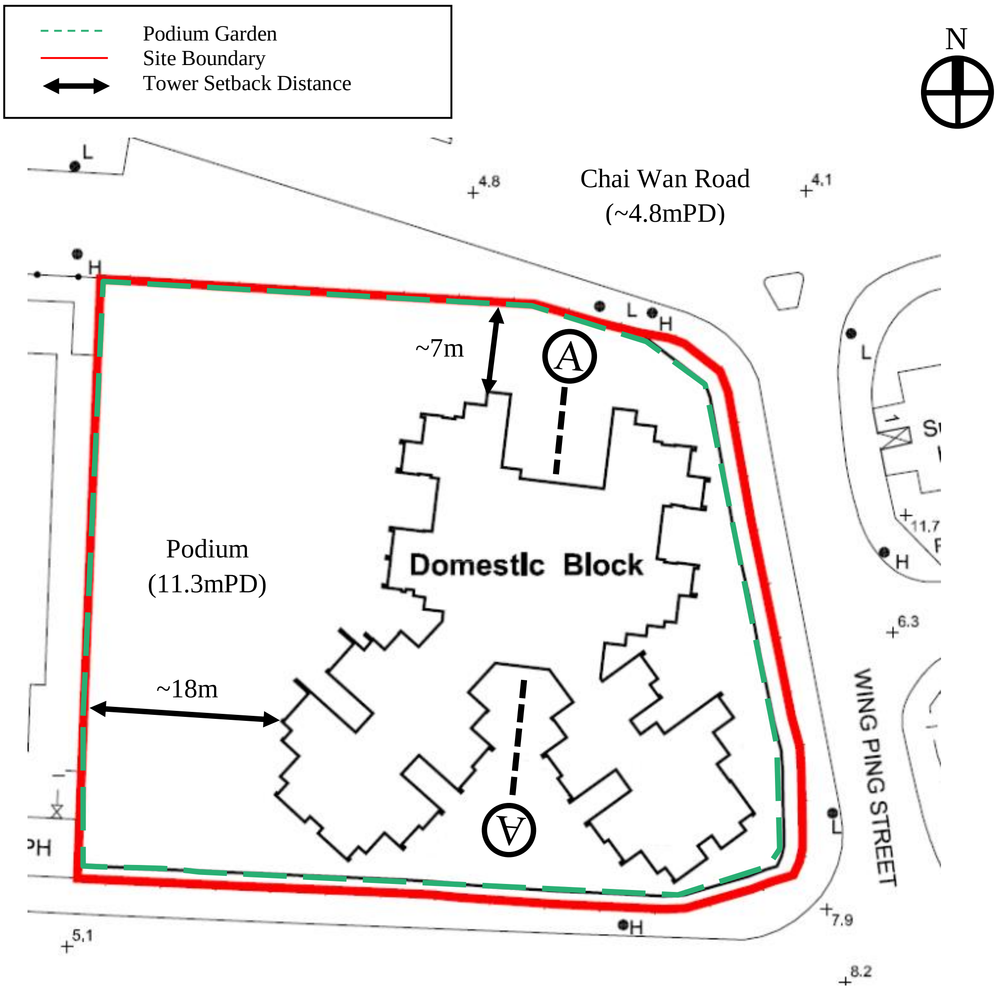


Figure 15 Site Layout Plan of the Development (Subject to future design)

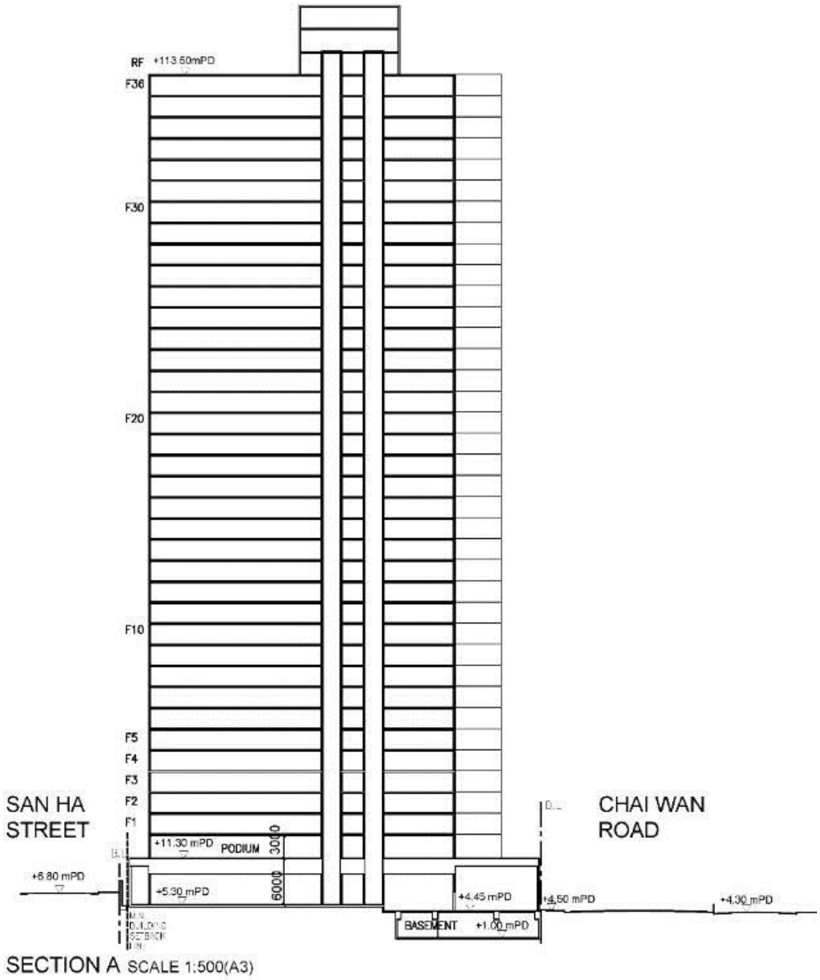


Figure 16 Elevation Plan of the Development

6 Ventilation Performance of the Proposed Development

This section explains how the annual and summer prevailing wing access to the Development and the ventilation impact to the surroundings by the Development.

6.1 Ventilation Performance under Annual Condition

Under E Wind

As the high rise and high density residential developments at Hong Ping Street is located at the east side of the development, the E prevailing wind flow mainly along Chai Wan Road and San Ha Street to reach the Development (the blue arrows in Figure 17). As the disposition of the tower block and podium of the Development is generally aligned with the adjacent buildings such as the residential development at Hong Ping Street and SKH Chai Wan St. Michael's Primary School, thus it is expected that the Proposed Development would not induce significant interruption to the major breezeway along Chai Wan Road. Hence, it is expected that the Development would not induce significant adverse impacts to the ventilation performance of major breezeway.

The Proposed Development is expected to induce wind shadow to the adjacent SKH Chai Wan St. Michael's Primary School, however, with provision of the tower setback of about 18m from the school site, the potential ventilation impact on the downstream school site could be reduced. The 18m separation between the school site and the tower of the proposed development would reduce the potential wake area on the school site. This would allow some incoming E wind to enter the school site at the downstream more easily.

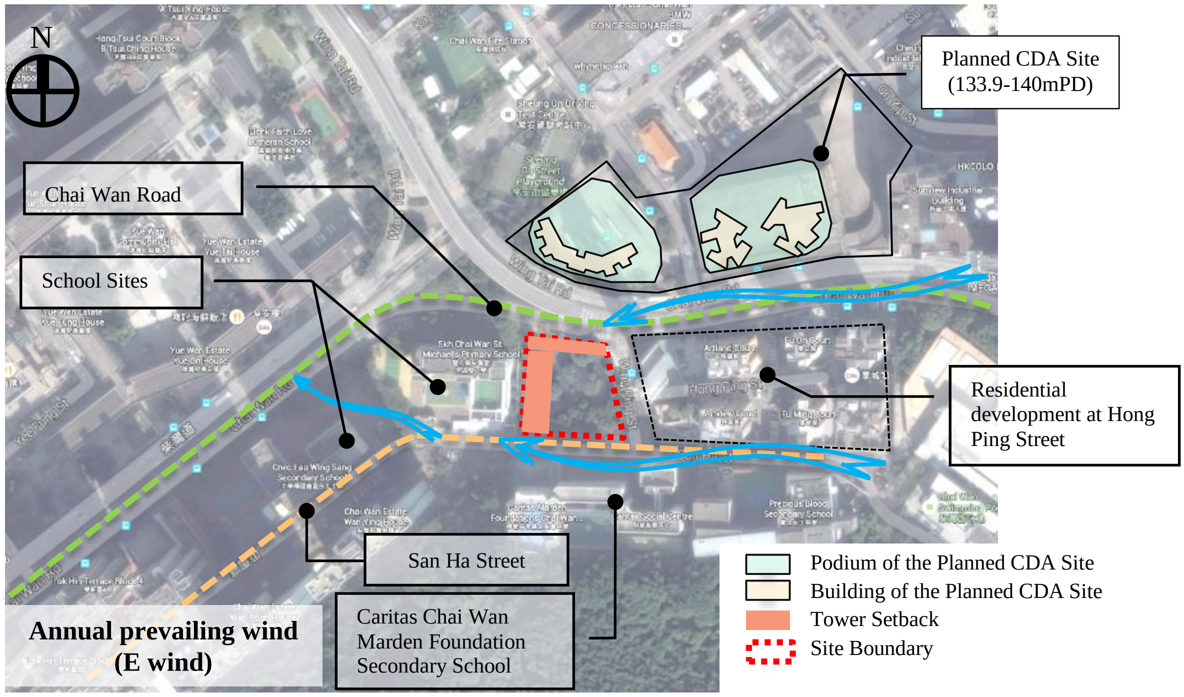


Figure 17 Wind environment under annual wind condition (E wind)

Under NNE, NE and ENE Wind

NNE, NE and ENE annual prevailing winds would likely flow through Sun On Street and Fung Yip Street from the waterfront. The air stream from Fung Yip Street would connect with Chai Wan Road for wind penetration (the purple arrows in Figure 18) while the air stream along Sun On Street would skim over the podium of the Planned CDA Site and reach to the Development. Hence, the approaching wind is diverted to reach the Development by NE direction.

With located at the immediate windward side of the Caritas Chai Wan Marden Foundation Secondary School, the high-rise domestic tower of the Development would potentially shield the approaching wind. The 18m separation between the school site and the tower of the proposed development allow some incoming NNE/NE/ENE winds to enter the school site at the downstream more easily and slightly alleviate the impact on the wind environment.

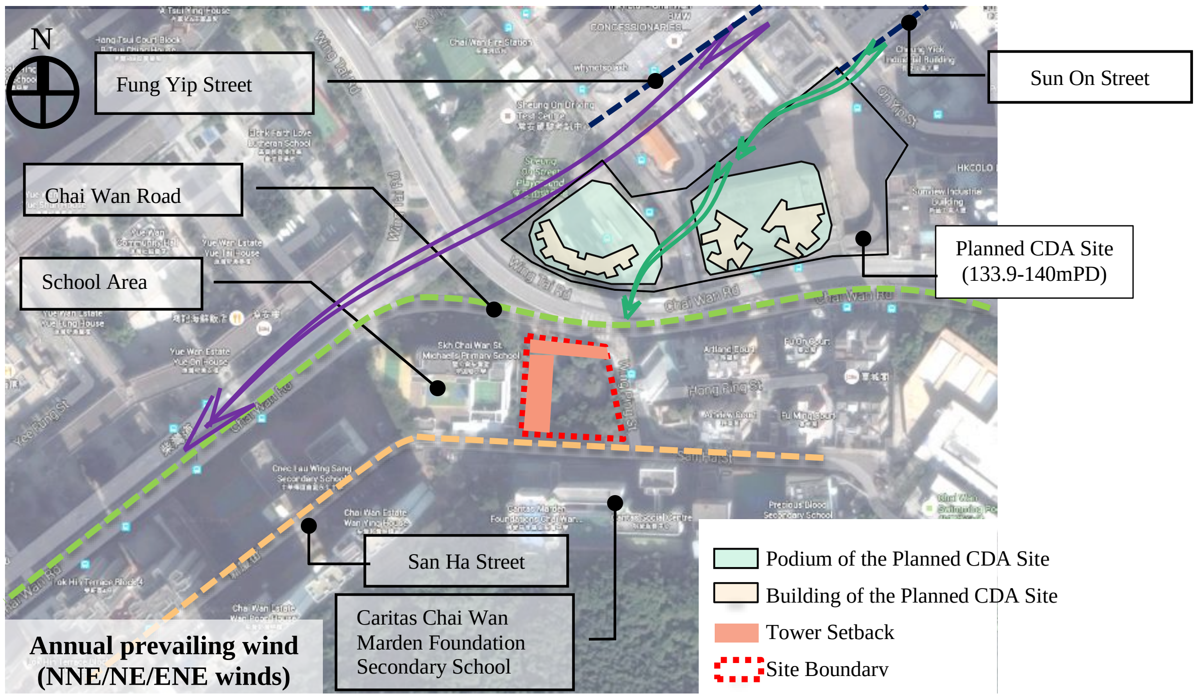


Figure 18 Wind environment under annual wind condition (NNE/NE/ENE winds)

6.2 Ventilation Performance under Summer Condition

Under summer condition, the prevailing winds are mainly coming from E, SE, S, SSW and SW wind directions, in which the E prevailing wind condition is descibed in Section 6.1.

Under S, SSW and SW winds

Under the S, SSW and SW winds, the prevailing wind would ventilate along Chai Wan Road. Since the Development is located away from of Chai Wan Road, the ventilation performance of the major breezeway would unlikely be interrupted by the Development.

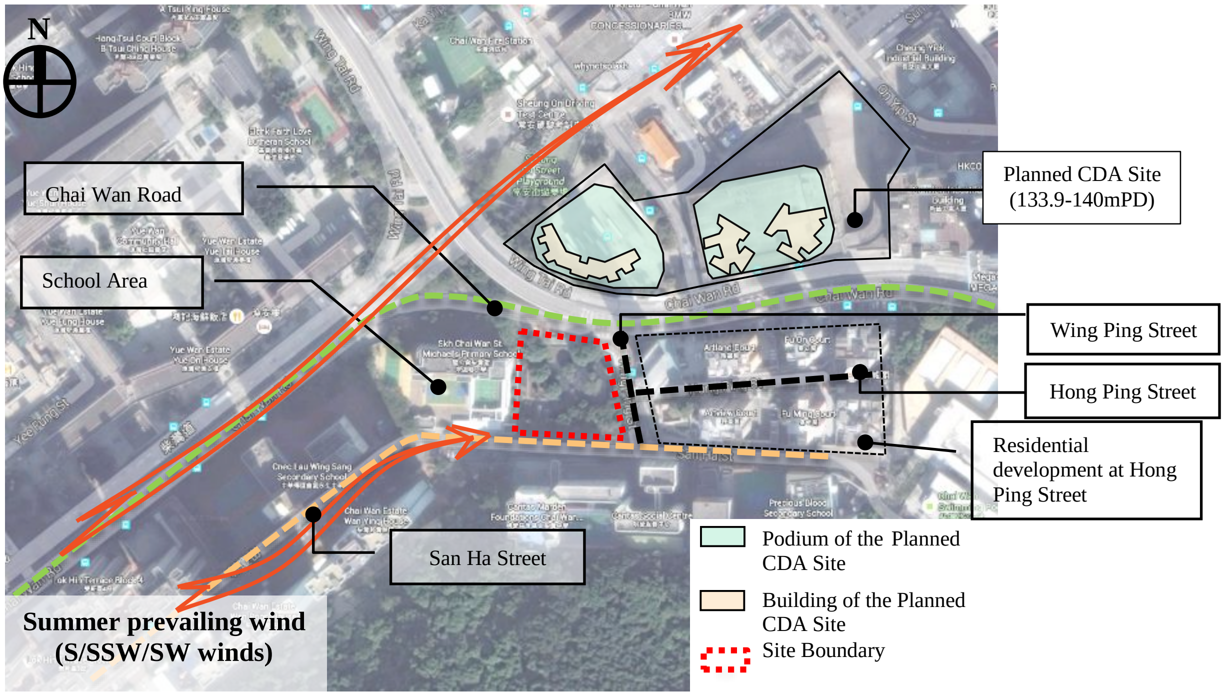


Figure 19 Wind environment under summer wind condition (SW/SSW Winds)

Besides, SW and SSW prevailing winds would reach the Development via the secondary wind path along San Ha Street. With the presence of the building block of the Development, it would be likely to cause localised ventilation impact on the leeward side, such as Wing Ping Street, Hong Ping Street, Chai Wan Road and Planned CDA Site in comparison to the existing situation.

The presence of the tower setback on podium top from the adjacent SKH Chai Wan St. Michael's Primary School, may allow the prevailing wind ventilate through the Development as shown in Figure 20. Hence, the potential ventilation impact at the Chai Wan Road and Planned CDA Site is reduced under summer wind condition.

Figure 20 Summer wind condition (S/SSW/SW winds) of the Development

Under SE wind

Under the SE wind, the prevailing wind would ventilate along San Ha Street and reach to the Development. With the presence of domestic tower at the junction of Wing Ping Street and San Ha Street, the approaching wind would be diverted into two air streams, one ventilates along San Ha Street and the other one flow through Wing Ping Street as indicated in Figure 22. Hence, the high-rise domestic tower would potentially cast wind shadow towards the northwest part of its own site and the adjacent SKH Chai Wan St. Michael's Primary School and a portion of Chai Wan Road. Since the school site is relatively low-rise, the SE incoming wind from San Ha Street would skim over the school area and carry on travelling along Chai Wan Road, minor ventilation impacts on the adjcent school site and Chai Wan Road are expected.

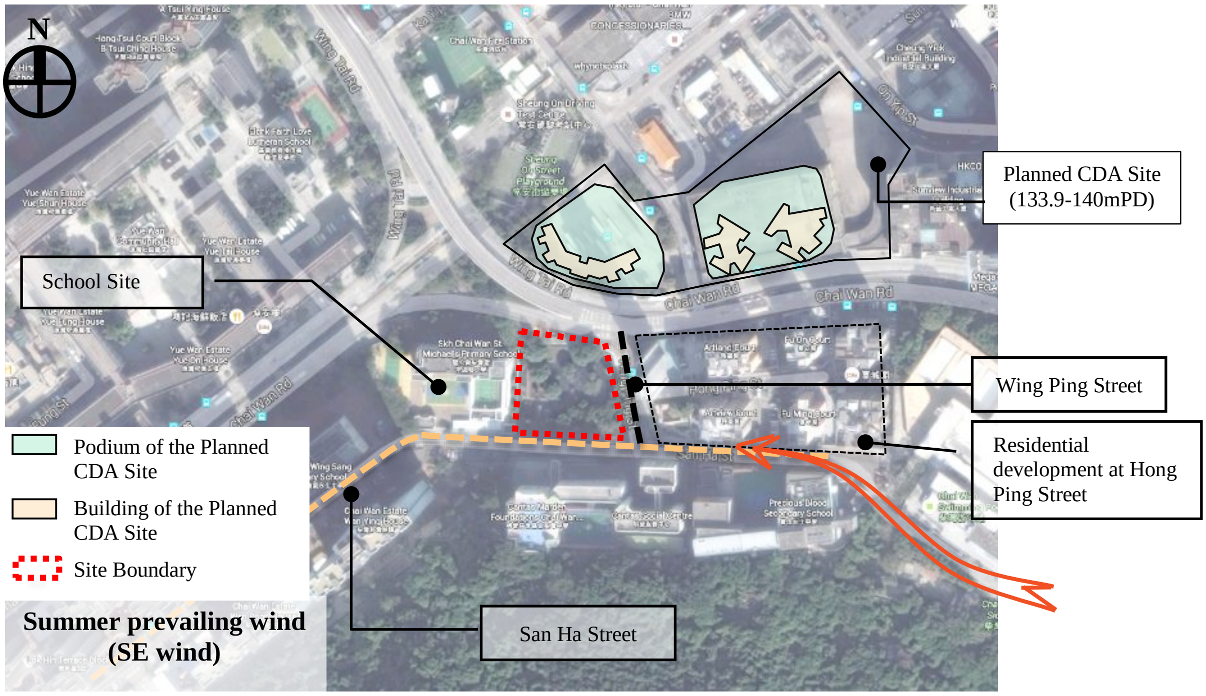


Figure 21 Wind environment under summer wind condition (SE Wind)

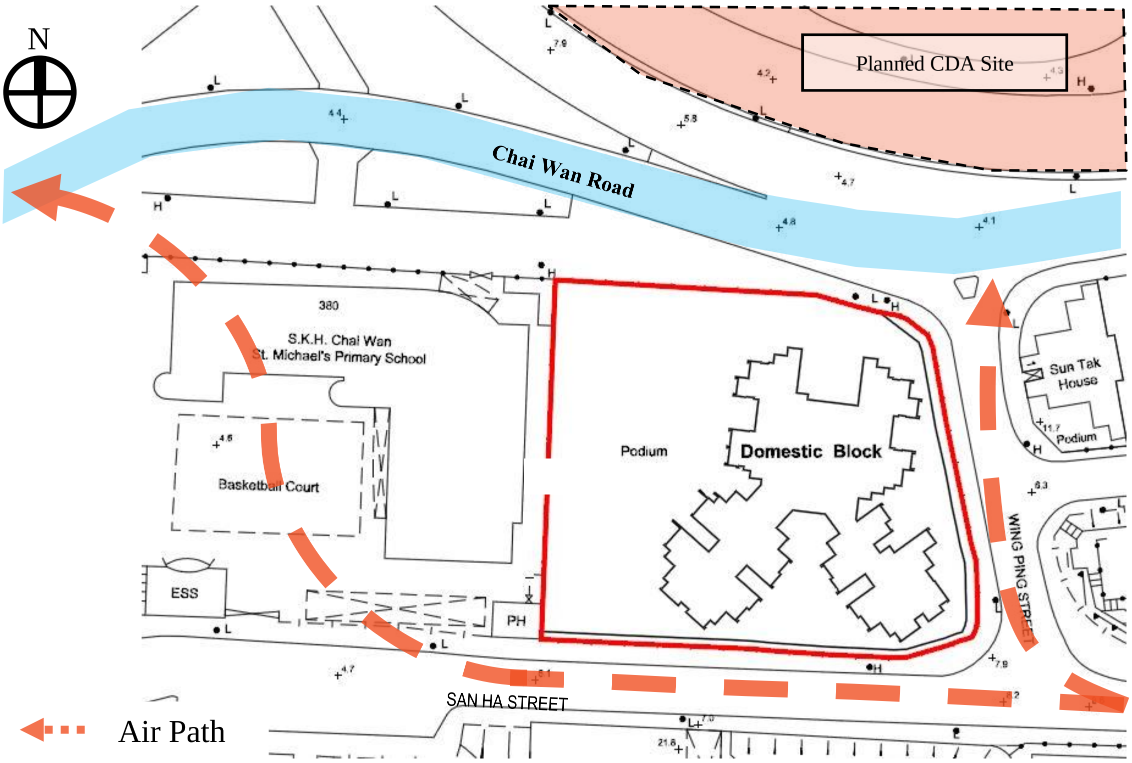


Figure 22 Summer wind condition (SE wind) of the Development

7 Recommendation

To further alleviate the wind performance of the Development and its surrounding areas and mitigate the localized ventilation impact on its downstream area, the following recommendation is suggested.

7.1 Empty bay at podium level

As discussed at Section 6.2, the presence of the Development would be likely to cause localised ventilation impact on Wing Ping Street and Hong Ping Street in comparison to the existing situation. Podium level empty bay (1 storey) of 10m in width could be considered at the southeast wing of the building block (Subject to detail design) to enhance summer wind permeability towards Wing Ping Street and Hong Ping Street at the leeward side.

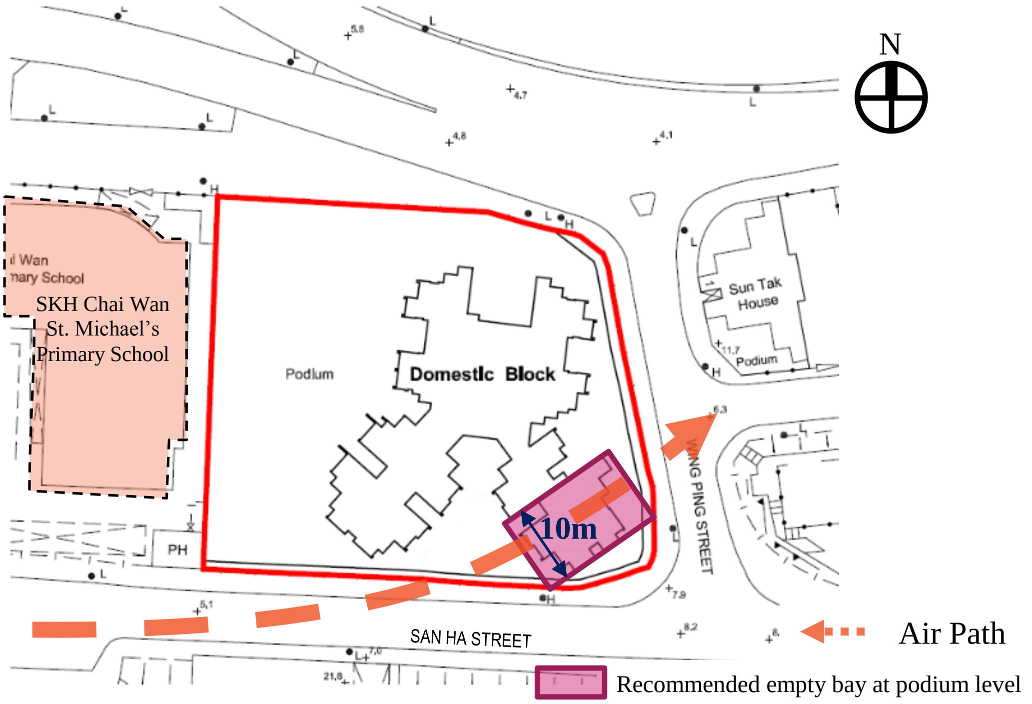


Figure 23 Recommended podium level empty bay for summer wind condition (Subject to future design)

8 Further Quantitative Study

In general, the Development may not significantly affect the ventilation performance of the major breezeway of Chai Wan Road under annual wind condition due to the tower setback from Chai Wan Road. However, localized ventilation impact would be induced at the school sites under annual condition and at Chai Wan Road and planned CDA site under summer condition. With provision of the below adopted and recommended mitigation measures listed below (Subject to detail design), the wind environment of leeward side is expected to be alleviated.

- 7m tower setback from Chai Wan Road
- 18m tower setback from adjacent school site
- Suggested 10m wide podium level empty bay

Since the ventilation impact of the Development would subject to the detailed building design of the Development, it is recommended to proceed with the AVA Initial study to optimise the wind performance at the building design stage in accordance with the guideline given in "*HOUSING, PLANNING AND LANDS BUREAU TECHNICAL CIRCULAR NO. 1/06 ENVIRONMENT, TRANSPORT AND WORKS BUREAU TECHNICAL CIRCULAR NO. 1/06, Technical Guide for Air Ventilation Assessment for Developments in Hong Kong*". The above recommended mitigation measures would be taken into account and assessed in the Initial Study.

9 Conclusion

Qualitative assessment of the wind environment of the Development at Chai Wan Road was conducted. The air ventilation impacts of the building design was studied.

According to the analysis, the annual prevailing wind comes from NNE, NE, ENE and E directions while the summer prevailing wind is from E, SE, S, SSW, and SW directions.

The Development consists of single building block that it is slightly setbacked from major breezeway of Chai Wan Road, so that the Development would not significantly affect the ventilation performance of the major breezeway of Chai Wan Road under the annual wind condition.

Besides, although localized ventilation impact would be induced at leeward side under summer and annual condition, tower setback is maintained with adjacent SKH Chai Wan St. Michael’s Primary School to the west would allow wind penetration and reduce the ventilation impacts at the leeward side under summer and annual wind condition.

In addition, the Development could consider to further provide a 1 storey empty bay at podium level to improve the ventilation. It is also important to maintain the tower setback between building block and school building to facilitate wind penetration across the Development and hence minimize the localized ventilation impact.

While this Expert Evaluation provides qualitative analysis of wind performance of the Development, AVA Initial study is recommended to further optimize the wind performance at the building design stage.

Preliminary Landscape Proposal

Proposed Public Housing Development
at J/O of Chai Wan Road, Wing Ping Street, and San Ha Street, Chai Wan
(Site No. GLA 4)

Content

1.0 Introduction

1.1 This Preliminary Landscape Proposal is to support the rezoning by the Planning Department (PlanD) from "Open Space" ("O") zone to "Residential (Group A)" ("R(A)") zone at J/O of Chai Wan Road, Wing Ping Street, and San Ha Street, Chai Wan (the Subject Site).

1.2 A public housing development is proposed at the Subject Site with basement car park and retail along Chai Wan Road.

2.0 Existing Site Conditions (Plan 1 refers)

2.1 The Subject Site, with an area of about 0.33 ha, is zoned "Open Space" ("O") on the Approved Chai Wan Outline Zoning Plan No. S/H20/21.

2.2 At present, it is bounded by Chai Wan Road to the north; and San Ha Street to the south and Wing Ping Street to the east.

2.3 The Subject Site is currently allocated to Leisure and Cultural Services Department (LCSD) for plant nursery.

3.0 Assessment of Existing Trees

3.1 Initial tree survey was carried out in October 2014. Approximately 102 nos. of existing trees have been identified within and adjoining the Subject Site.

3.2 Tree inventory survey was carried out in December 2015.

3.3 No Champion trees, registered Old and Valuable Trees (OVTs), or potentially registration is recorded.

3.4 Dominated species include-
Hisbiscus tiliaceus (黃槿)
Erythrina variegata (刺桐)
Cinnamomum burmannii (陰香)
*Koelreuteria bipinnata (*複羽葉欒樹)
Ficus benjamina (垂葉榕)

They are species commonly found in Hong Kong.

3.5 Health and structural condition of existing trees are generally from fair to poor.

3.6 Impact on existing trees has been carefully studied. Tree preservation proposal and comprehensive compensatory planting proposal will be prepared and submitted to relevant government authority(s) for comments and approval in later stage.

3.7 Within the Subject site, 1 no. of tree, which is of higher landscape / amenity value, is recommended to be transplanted and 88 nos. are recommended to be felled.

3.8 Estimated loss of 88 nos. of trees within the Subject Site with 17,485 mm DBH will be compensated with heavy standard trees according to DEVB TC(W) No. 7/2015 as far as possible and subject to the approval of Tree Preservation Committee (TPC) of Housing Department (HD).

3.9 Blanket approval has been given by District Lands Office (DLO) of Lands Department (LandsD) to TPC of HD as per DEVB TC(W) No. 7/2015 to consider tree removal application for trees affected by public housing development.

3.10 There are 15 nos. roadside trees along Chai Wan Road, Wing Ping Street, and San Ha Street. These trees will be retained as far as practicable except those affected by the run-in/run-out of the Proposed Development, which is yet to be confirmed at this stage.

3.11 Future approval of tree removal application(s) will be circulated to PlanD and LandsD for formal record.

3.12 Upon possession of site, tree inventory survey will be carried out again by the HD to update and verify the accuracy of the initial tree survey.

4.0 Proposed Landscaping

4.1 HD aims to achieve 20% site coverage of greenery for public housing development with site area of less than 2 ha.

4.2 Calculation of site coverage of greenery shall comply with the requirement as stipulated in PNAP APP-152.

4.3 The Site area as stated in para. 2.1 above is subject to detailed survey and layout finalization.

4.4 All of the proposed greenery shall be uncovered.

4.5 All of the proposed greenery areas at 15m pedestrian zone are designed as development common areas, which will be accessible by all occupants of the proposed development except for the vertical greening.

5.0 Barrier Free Access Design

5.1 Design Manual – Barrier Free Access issued by Building Authority will be followed in the provision of access to cater for disabled persons to landscape areas.

6.0 Soil Depth, Drainage & Irrigation

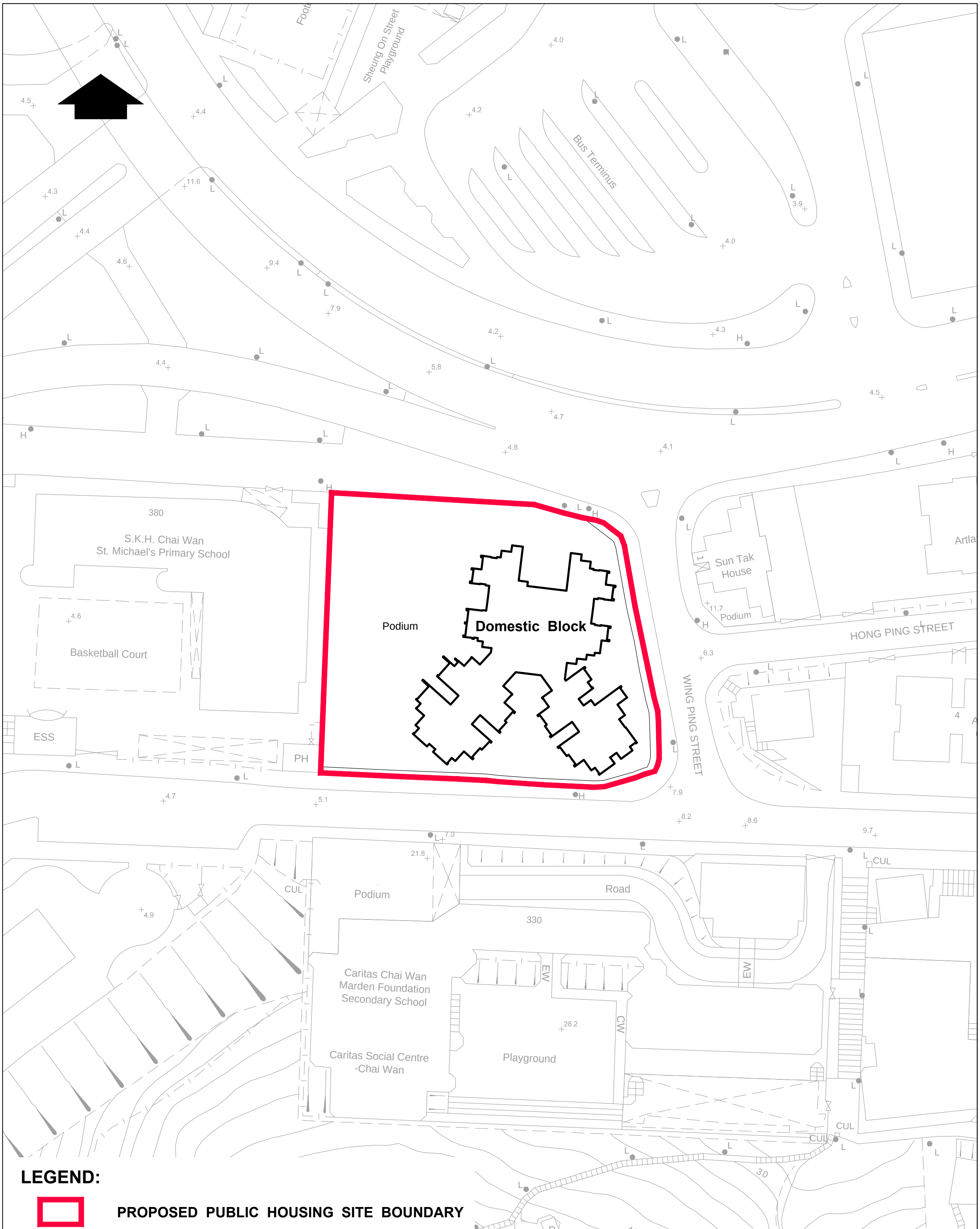
6.1 The landscaped area will be designed with adequate soil depth
(i.e. a minimum 1.2m soil depth excluding drainage layers for tree planting).

6.2 Structural capacity for tree/ palm planting will be carefully calculated and allowed.

6.3 Drainage for all planted areas will be provided with the provision of water supply at 20m hose radius.

7.0 Landscape Management & Maintenance

7.1 Management and maintenance of all landscape areas will be undertaken by respective facilities management office in a sustainable manner.



LEGEND:

PROPOSED PUBLIC HOUSING SITE BOUNDARY

METRES 20 0 20 40 60 METRES

J/O OF CHAI WAN ROAD, WING PING STREET AND SAN HA STREET - TENTATIVE LAYOUT

(MAY BE CHANGED SUBJECT TO DETAIL DESIGN)

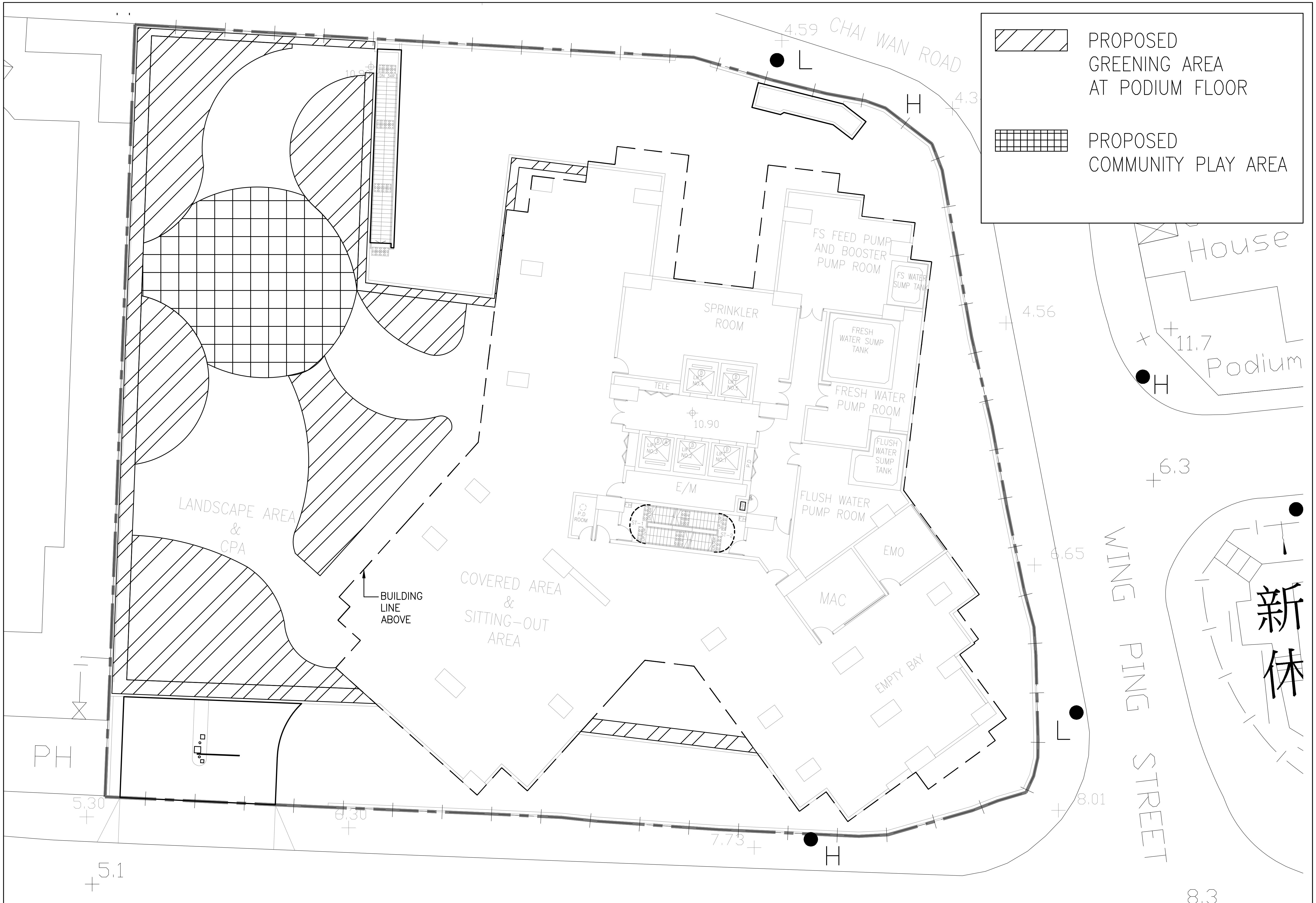
HOUSING DEPARTMENT LANDSCAPE GROUP

PLAN 1

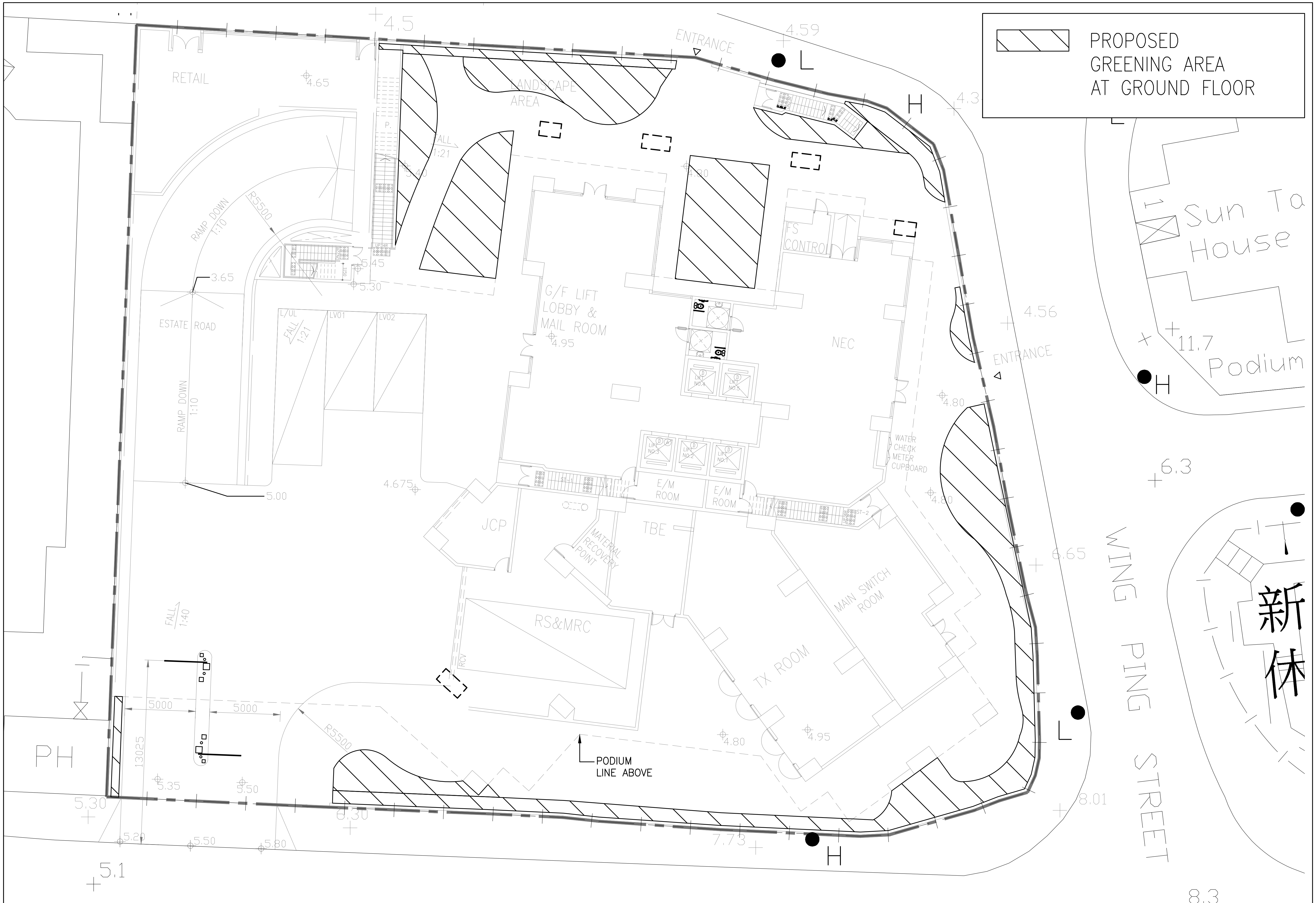
DATE : 29. 12. 2015

BASE EXTRACTED FROM SHT. No. 11-SE-19B

15_1254HK_Layout (Plan 1)



ET05 – PROPOSED DEVELOPMENT AT CHAI WAN ROAD, CHAI WAN	SKETCH – SCHEME 8D DRAFT GREENING AREA – PODIUM FLOOR
13-07-2016	1:250



ET05 – PROPOSED DEVELOPMENT AT CHAI WAN ROAD,
CHAI WAN

SKETCH – SCHEME 8D
DRAFT GREENING AREA – GROUND FLOOR

13-07-2016
1:250

Attachment X of
<u>MPC Paper No. 13/16</u>

AECOM

Hong Kong Housing Authority

Quantitative Risk Assessment for A Proposed Public Housing Development near Chai Wan Road

Final QRA Report

May 2016

	Name	Signature
Prepared & Checked:	Connie Tsai	
Reviewed & Approved:	Benita Kung	

Version: 2 Date: 23 May 2016

Disclaimer

The information contained in this report is, to the best of our knowledge, correct at the time of printing. The interpretation and recommendations in the report are based on our experience, using reasonable professional skill and judgment, and based upon the information that was available to us. These interpretations and recommendations are not necessarily relevant to any aspect outside the restricted requirements of our brief. This report has been prepared for the sole and specific use of our client and AECOM Asia Co. Ltd. accepts no responsibility for its use by others.

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Appendices

1 INTRODUCTION

1.1 Background

1.1.1 AECOM Asia Company Limited (AECOM) has been commissioned by the Hong Kong Housing Authority (HKHA) (the Client) to carry out a quantitative risk assessment (QRA) for a proposed public housing development near Chai Wan Road (the Project).

1.1.2 This assessment investigates the feasibility of locating the proposed development on a plot of land which is zoned as “Open Space" (O) near Chai Wan Road at Chai Wan.

1.1.3 The project site is adjacent to a Petrol-cum-LPG Filling Station at 23 Fung Yip Street, Chai Wan (the LPG Filling Station). This QRA study is to ascertain the risk level, posed by the LPG Filling Station with the proposed development, fulfils the Hong Kong Risk Guidelines’ requirement.

1.1.4 The assessment is carried out in accordance with the Hong Kong Planning Standards and Guidelines (HKPSG).

1.2 Scope of Work

1.2.1 The scope of the study is paraphrased as follows:

(a) Identify potential hazards and estimate associated frequencies by reviewing of the LPG system design and historical data;

(b) Carry out QRA to determine the risk levels impacted by the LPG Filling Station;

(c) Present the QRA results in the form of iso-risk contours and “fN” curve for individual and societal risks respectively; and

(d) Compare the results of QRA, both existing land use (Existing Scenario) and the future operation of the LPG Filling Station (Future Scenario) scenarios, with Government’s Risk Guidelines; propose risk mitigation measures if necessary.

1.2.2 In undertaking this study, it is necessary to set the following boundaries:

(a) The risks associated with the transport of LPG by road tankers have been restricted to the consideration of their final approach to the LPG Filling Station.

(b) The risk assessment has been limited to those events which have the potential for off-site fatalities.

1.3 Hong Kong Risk Guidelines

1.3.1 The LPG Filling Station stores LPG in bulk quantities less than 25 tonnes and thus is classified as a Notifiable Gas Installation (NGI) under the Gas Safety Ordinance Cap. 51, but not a Potential Hazardous Installation according to the *Miscellaneous Planning Standards and Guidelines* of *Hong Kong Planning Standards and Guidelines*.

1.3.2 An NGI is subjected to criteria for individual and societal risks in accordance with the Hong Kong Risk Guidelines. The criterion for individual risk is that no person off-site shall be subject to an additional risk of 1×10^{-5} / year due to the operation of the LPG Filling Station. The Societal Risk Guidelines specify ranges of risk values which define the limits of “acceptable” and “unacceptable” risks. For societal risk which exceeds the “acceptable” risk limits but not the “unacceptable” risk limits, cost-effective measures should be taken to reduce the risk “as low as reasonably practicable” (ALARP). The societal risk guidelines are shown in **Figure 1**.

1.4 Structure of the Report

1.4.1 The report has been written in 8 sections with this section providing a broad introduction.

Section 2 Describes the characteristics of the LPG Filling Station, its surrounding environment, background information and the proposed development;

Section 3 Identifies all potential failure cases of the operation of the LPG facilities and their frequencies of occurrence;

Section 4 Estimates the frequencies of hazard events which could lead to a gas release;

Section 5 Presents the method for analyzing the consequences of the outcomes, given a release;

Section 6 Presents the results of the associated risk computations and examines whether they are likely to be regarded as acceptable in relation to the Risk Guidelines;

Section 7 Summarizes the overall findings and conclusions; and

Section 8 References

2 SITE DESCRIPTION

2.1 Study Area

2.1.1 The subject site near Chai Wan Road falls within an area zoned as “Open Space (O)” on the Chai Wan Outline Zoning Plan (OZP) No. S/H20/21. The study area of 200m radius from the LPG Filling Station is adopted in the study and shown in **Figure 2**.

2.1.2 The LPG Filling Station is located to the north of the proposed development, surrounded by Fung Yip Street and Sheung On Street to the north-west, an open space to the east and a CDA site to the south.

2.1.3 There is a proposed comprehensive residential development at 391 Chai Wan Road and adjoining government land. Although the programme of this development is not yet known, its population will be included in the risk assessment for the Future scenario of this QRA.

2.2 The Proposed Development

2.2.1 The project site is currently a vacant land. The proposed public housing development will have 1 residential building. The proposed development will produce about 800 flats. It is scheduled to be completed in Q4 of 2022, and the tentative intake year is assumed to be 2023 in this assessment. Layout plan of the proposed development is shown in **Appendix A**.

2.3 The Existing LPG Filling Station

2.3.1 The LPG Filling Station is operated by Feoso. Written requests were made to the operators for operational details of the LPG Filling Station and the reply from Feoso is attached in **Appendix I**.

2.3.2 According to the information provided by Feoso, the LPG Filling Station consists of one 21kL (water capacity) underground storage vessel, and the storage vessel is filled to a maximum permissible level (85% of the maximum capacity). There are 2 dispensers and 4 nozzles for vehicle refuelling in the LPG Filling Station.

2.3.3 The storage vessel is manufactured and tested in accordance with the requirements of GSO, and it is covered with corrosion protection coating, stress relieved and 100% radiographed.

2.4 LPG Delivery and Transfer

2.4.1 LPG is delivered to the LPG Filling Station by road tankers. The maximum capacity of the road tanker is about 9 tonnes. Based on information provided by Feoso, there is around 300 vehicles refilling LPG and 350 vehicles refilling gasoline / diesel.

2.4.2 According to the collected information, there is around 700 annual LPG deliveries or 1 to 2 daily deliveries of LPG. The exact number of deliveries depends on seasonal demand. Adopting a conservative approach, 2 deliveries per day or 730 deliveries per year is assumed for risk modelling purpose. According to the information provided by Feoso, LPG deliveries will be made between 8:00am to 6:00pm.

2.4.3 Based on the LPG pumping rate of 200 litre / minute, the duration of replenishment of storage vessel would take approximately 60 minutes for 9t delivery. In addition, the road tanker is expected to spend about 15 minutes on site for setting up and preparation. Therefore, the road tanker’s residence time on the LPG Filling Station is around 1.25 hours for a 9-tonne load.

2.4.4 Road tankers are operated in accordance with the standard requirements of the LPG Filling Station operator. The standard procedures for the LPG delivery are summarized as follows:

(a) Two people are present during delivery operation (the driver and assistant)
(b) Dedicated unloading area is available for unloading operation. There is a possibility of road tankers reversing in the unloading area. Road tankers will face towards run-out so that it may leave rapidly should it need to do so

(c) The condition of all connections and hoses is checked by the driver
(d) The vessels are filled to a maximum of 85% of the liquid level capacity
(e) During delivery, the driver waits in close proximity to the "emergency-cut-off switch" while the assistant takes care the delivery process

2.5 Population

2.5.1 Societal risk is a measure of the consequence magnitude and the frequency of the hazardous events. In order to establish the impact of any release (the number of people likely to be affected) in the future, it is necessary to have a good knowledge of the future surrounding population levels. It includes residential population, government and institutional population and transport population. **Figure 3** shows locations of population groups and roads which are included in the assessment.

Proposed Public Housing Development

2.5.2 According to the information from the HKHA, the total designed population for the residential building is about 2,000. A 10% margin for the residential population is included in the risk assessment to allow flexibility of building design, and thus the population in the proposed development is modelled as 2,200. The tentative intake year for the proposed development is assumed to be 2023, and year 2023 is taken as the assessment year for Future scenario.

Surrounding Population

2.5.3 Residential and employment population are estimated based on the observation through site surveys and data from the enhanced 2011-based Territorial Population and Employment Data Matrix (TPEDM) provided by the Planning Department (PlanD), which estimates the population in various areas of Hong Kong in Year 2011 and Year 2026. PlanD has been consulted for the latest land use and population assumption in the vicinity on 1 March 2016 and its reply is attached in **Appendix J**. The population assumption used in this report have incorporated all comments from PlanD.

2.5.4 The population in each area are listed in **Table 2.1**. Details of population at different time modes and information sources are given in **Appendix B**. It is estimated with the following assumptions:

(a) 50% and 70% of night-time population is assumed for day-time population on weekdays and weekends for residential buildings respectively;
(b) Occupancies of the LPG Filling Station are assumed to be 100% at any time;
(c) According to enhanced 2011-based TPEDM, there were 3.19 residents in a household in the PDZ#34 in 2011, and it was found to have a negative growth rate of the household size of this residential area between the period of 2011 and 2026. Considering the worst case scenario, a household size of 3.19 is assumed for both existing and future scenarios;
(d) An average of 5% residential and office populations is taken to be out of doors;
(e) Population in the proposed development is provided by Client; and
(f) Population in the proposed comprehensive residential development is estimated based on the information provided in the Planning Application No. A/H20/177.

Table 2.1 Population around 200 metre from the LPG Filling Station

Location	Description	Existing Land Use	Maximum Population [Note 2]	
			2016	2023
1	Project Site	O	0	2200 [Note 1]
2	S.K.H. Chai Wan Saint Michael's Primary School	G/IC	1050	1050
3	San Ha Street Sitting-out Area	O	5	5
4	Sun Tak House	R(A)	345	345
5	Artland Court	R(A)	510	510
6	Artview Court	R(A)	479	479
7	Fu On Court	R(A)	268	268
8	Fu Ming Court	R(A)	230	230
9	Fu Shing Court	R(A)	357	357
10	Wah Yu Court	R(A)	383	383
11	Bus Terminus	CDA(1)	20	0
12	China Motor Bus Company Limited	CDA(1)	43	0
11+12	Proposed Comprehensive Residential Development	CDA(1)	0	4060
	- Residential Blocks		0	4000
	- Public Transport Terminus		0	20
	- Open Space		0	40
13	Sunview Industrial Building	OU	1317	1317
14	Cheung Yick Industrial Building & Hop Ming Factory Building	I	985	985
15	Vacant Land	O	0	20
16	ECO dedicated LPG Filling Station	OU	15	15
17	Wah Shing Centre	I	861	861
18	Reality Tower	I	422	422
19	Kailey Industrial Centre	I	1586	1586
20	Yip Cheung Centre	I	572	572
21	Asia One Tower	I	367	367
22	Gee Wing Chang Industrial Building & Gee Tung Chang Industrial Building	I	1055	1055
23	Federal Centre	I	422	422
24	Yiko Industrial Building	I	548	548
25	Paramount Building	I	1472	1472
26	Ming Pao Industrial Centre Block B	I	1133	1133
27	Sheung On Street Playground	O	50	50
28	Sheung On Driving Test Centre	G/IC	20	20
29	RCP	G/IC	2	2
30	Chai Wan Fire Station [Note 3]	G/IC	43	43
31	Cornell Centre	I	1149	1149
32	Feoso Petrol cum LPG Filling Station	O	5	5
33	Chai Wan Public Cargo Working Area	OU	50	50
34	Yue On House	R(A)	761	761
35	The Evangelical Lutheran Church of Hong Kong Faith Love Lutheran School	R(A)	390	390
36	Caritas Chai Wan Marden Foundation Secondary School	G/IC	673	673
37	Precious Blood Secondary School	G/IC	899	899
38	Summit Industrial Building	I	1593	1593
R1	Wing Tai Road	Road	21	23
R2	Chai Wan Road	Road	58	63
R3	Ka Yip Street	Road	17	18
R4	Sheung On Street	Road	30	32
R5	Fung Yip Street	Road	12	13

R6	Kwun Yip Street	Road	0	0
R7	On Yip Street	Road	5	5

Notes:
[1] Population in the proposed development is provided by Client.
[2] According to data for Years 2011 and 2026 of enhanced 2011-based TPEDM data, annual growth rate of average household size for PDZ#33 and #34 obtained from TPEDM is -0.39% (from 3.02 person per flat in 2011 to 2.85 person per flat in 2026) and -0.36% (from 3.19 person per flat in 2011 to 3.02 person per flat in 2026) respectively. To be conservative, the average household size of residential areas in Years 2016 and 2023 is assumed to be equivalent to that in Year 2011.
[3] Population in the Chai Wan Fire Station is estimated based on 9,500 uniformed personnel and 720 civilian member in 79 fire stations in Hong Kong, and all the personnel are working at 8-hour shift.

Road Population

2.5.5 Traffic data is obtained from the Transport Department, "Annual Traffic Census 2014" [2] for the estimation of traffic population and reference data source is attached in **Appendix C**. Speed limit on all the assed road is assumed to be 50km/hr. The road population is predicted based on the following equation:

*Population = No. of person/vehicle * No. of vehicles/hr * Road Length / Speed*

The estimated population on road is presented in **Table 2.2** with the following assumptions:

(a) "The Annual Traffic Census 2014" for Chai Wan Road (from Island Eastern Corridor approach to Tai Tam Road) is adopted for estimation of vehicle type distribution and corresponding occupancy;
(b) Traffic density for day-time (07:00 – 19:00) is assumed the same as the peak hour traffic density.
(c) According to information provided in "The Annual Traffic Census 2014" for Chai Wan Road (from Island Eastern Corridor approach to Tai Tam Road), the percentage of daytime (12-hour basis) and night-time traffic are 70.8% and 29.2% respectively. Therefore, night-time road population assumed is 41% of the daytime population; and
(d) Traffic speed limit is applied to traffic speed for each road
(e) Road population in the existing scenario (Year 2016) and future scenario (Year 2023) is projected from the Year 2014 data with 1% annual growth rate.

Table 2.2 Road Population within the Study Area

Road	Length of Road Segment (km)	Existing (2016)			Future (2023)		
		Peak Hour Traffic Density (vehicle per hour)	Estimated Population		Peak Hour Traffic Density (vehicle per hour)	Estimated Population	
			Day	Night		Day	Night
Wing Tai Road	0.15	900	14	11	965	15	12
Chai Wan Road	0.42	1850	81	66	2023	89	72
Ka Yip Street	0.25	600	16	13	643	17	14
Sheung On Street	0.28	1080	32	26	1158	34	27
Fung Yip Street	0.22	540	12	10	579	13	11
Kwun Yip Street	0.20	8	0	0	9	0	0
On Yip Street	0.16	270	5	4	289	5	4

2.6 Meteorology

2.6.1 Meteorological data is required for consequence modelling and risk calculation. Consequence modelling (dispersion modelling) requires wind speed and stability class to determine the degree of turbulent mixing potential whereas risk calculation requires wind-rose frequencies for each combination of wind speed and stability class.

2.6.2 Since there is no weather station with wind measurement in Chai Wan, the nearest weather station with similar topographic features is used to represent the meteorological condition in the project area. Meteorological data is obtained from North Point Weather Station (2014) where wind speed, stability class, weather class and wind direction are available. This data represents the weather conditions for the whole year in 2014 and has already taken into account of seasonal variations, and is therefore considered applicable for this assessment. **Table 2.3** shows the wind speed-stability frequencies.

Table 2.3 Stability Category-Wind Speed Frequencies at North Point Station

Daytime							
Wind Speed (m/s)	**A**	**B**	**C**	**D**	**E**	**F**	**Total (%)**
0.0-1.9	6.63	3.1	0	4.27	0	6.15	20.15
2.0-3.9	2.69	13.42	7.05	10.08	3.72	0.99	37.95
4.0-5.9	0	10.05	9.52	11.93	0.62	0	32.12
6.0-7.9	0	0	1.79	6.5	0	0	8.29
Over 8.0	0	0	0.09	1.4	0	0	1.49
All (%)	9.32	26.57	18.45	34.18	4.34	7.14	100

Night-time							
Wind Speed (m/s)	**A**	**B**	**C**	**D**	**E**	**F**	**Total (%)**
0.0-1.9	0	0	0	0.53	0	35.4	35.93
2.0-3.9	0	0	0	12.98	17.78	4.93	35.69
4.0-5.9	0	0	0	17.02	2.73	0	19.75
6.0-7.9	0	0	0	6.31	0	0	6.31
Over 8.0	0	0	0	2.32	0	0	2.32
All (%)	0	0	0	39.16	20.51	40.33	100

2.6.3 According to **Table 2.3**, 6 combinations (3B, 1D, 4D, 7D, 3E and 1F) and 5 combinations (1D, 4D, 7D, 2E and 1F) of wind speed and stability class are chosen for day-time and night-time meteorological conditions respectively. These combinations of wind speed and stability class are referred as weather classes. These combinations are considered adequate to reflect the full range of observed variations in these quantities. It is not necessary and efficient to consider every combination observed. The principle is to group these combinations into representative weather classes which together cover all conditions observed.

2.6.4 Once the weather classes have been selected, frequencies for each wind direction for each weather class can then be determined. These frequency distributions are given in **Table 2.4** for the day-time and night-time meteorological conditions respectively.

Table 2.4 Weather Class-Wind Direction Frequencies at North Point Station

Daytime							
Direction	**3B**	**1D**	**4D**	**7D**	**3E**	**1F**	**Total**
0 – 30	4.07	1.46	2.73	0.05	0.96	2.11	11.38
30 – 60	1.17	0.07	0.81	0.07	0.48	0.10	2.70
60 – 90	2.47	0.17	3.14	0.48	0.69	0.14	7.09
90 – 120	16.44	0.36	21.36	13.75	2.73	0.41	55.05
120 – 150	0.46	0.10	0.67	0.00	0.69	0.31	2.23
150 – 180	0.02	0.00	0.00	0.00	0.02	0.00	0.04
180 – 210	0.14	0.00	0.02	0.00	0.00	0.02	0.18
210 – 240	0.36	0.00	0.14	0.00	0.07	0.02	0.59
240 – 270	4.07	0.17	2.32	0.53	0.50	0.22	7.81
270 – 300	5.39	0.14	3.50	1.20	0.69	0.24	11.16
300 – 330	0.22	0.02	0.24	0.02	0.12	0.10	0.72
330 – 360	0.19	0.00	0.55	0.00	0.26	0.05	1.05
All	35.00	2.49	35.48	16.10	7.21	3.72	100.00

Night-time						
Direction	**1D**	**4D**	**7D**	**2E**	**1F**	**Total**
0 – 30	0.27	2.37	0.05	3.18	11.49	17.36
30 – 60	0.00	0.66	0.15	1.78	0.24	2.83
60 – 90	0.00	2.52	0.39	3.69	1.08	7.68
90 – 120	0.00	17.63	11.49	15.99	3.45	48.56
120 – 150	0.00	0.24	0.02	2.79	1.86	4.91
150 – 180	0.00	0.00	0.00	0.00	0.10	0.10
180 – 210	0.00	0.02	0.00	0.07	0.17	0.26
210 – 240	0.00	0.00	0.00	0.34	0.22	0.56
240 – 270	0.07	1.74	0.20	3.81	0.86	6.68
270 – 300	0.00	3.20	0.12	4.64	1.37	9.33
300 – 330	0.00	0.02	0.02	0.10	0.20	0.34
330 – 360	0.02	0.42	0.02	0.61	0.32	1.39
All	0.36	28.82	12.46	37.00	21.36	100.00

3 HAZARD IDENTIFICATION AND ANALYSIS

3.1 Introduction

3.1.1 A hazard is described as the property of a material or activity with the potential to do harm. A release of flammable gas such as LPG has the potential to cause fire or explosion if ignited. Without ignition, the gas vapours will disperse harmlessly. Under normal conditions, the LPG at the existing LPG Filling Station will be stored and handled under contained and controlled manners. For LPG to pose a hazard to people in the surrounding area, a release must occur as a result of a failure of that containment or as a result of faulty transfer procedures.

3.1.2 This section of the report summarises all possible failure cases and associated failure rates which could lead to a release of LPG. The failure rates adopted throughout this report are quoted in the paper on "Quantitative Risk Assessment for LPG Installations (Reeves, Minah and Chow, 1997)" [1]. Furthermore, some frequencies are referenced from approved EIA Reports [3][12] and QRA studies [7][9] where it is necessary. In addition, possible initiating events are identified.

3.2 Behaviour of LPG Releases

3.2.1 LPG is a mixture of butane and propane. The gas is twice as heavier than that of air. For a release of LPG, the nature of the combustion will depend on the timing of ignition and the size of the release.

3.2.2 Release of several tonnes of LPG, if ignited immediately, will produce a fireball. Initially the gas concentration in the mixture will be above the Upper Flammability Limit (UFL). As burning occurs around the edges of the release, this will entrain more air into the mixture and more combustion will take place. The process accelerates until the mixture rising above the ground as a ball of fire. A fireball may also result from a boiling liquid expanding vapour explosion (BLEVE). This results from the bursting of a vessel (due to a high internal pressure and a weakening of the vessel material, due to a fire for example). The vessel contents rapidly vaporise and are ignited.

3.2.3 If not ignited immediately, the gas will disperse and dilute. If ignition occurs when the gas concentration is between lower Flammability Limit (LFL) and Upper Flammability Limit (UFL), a flame front will propagate to produce a flash fire.

3.2.4 For small releases, immediate ignition will produce a long vigorous jet flame from the point of release. As for large releases, delayed ignition will generally produce a flash fire.

3.2.5 For all sizes of release the LPG will disperse harmlessly if there is no source of ignition.

3.3 Hazard Analysis

<u>Spontaneous Failures</u>

Failure of Storage Vessel

3.3.1 Failure of vessel can be resulted from (i) cold catastrophic failure leading to instantaneous release of full inventory and (ii) partial failure leading to continuous release of full inventory via 25mm hole. The causes of failure are summarised as follows:

(a) Spontaneous failure due to corrosion, fatigue, etc
(b) Overfilling
(c) Earthquake

Failure of Road Tanker

3.3.2 Causes of failure of a road tanker are similar to that of a storage vessel. Furthermore, road tankers are vulnerable to collision with other road vehicles during delivery.

Guillotine Failure of Liquid Filling Line to Storage Vessel

3.3.3 Failure of liquid line is possible due to corrosion or fatigue, vehicle impact and external events. Only guillotine failure of LPG pipework is considered in this study as partial failure of the pipeworks is insignificant contributors towards the overall risk levels. The failure would result in LPG leaking from full bore of the pipe. Moreover, part of the pipeworks is installed aboveground. Failure of the aboveground portion of liquid filling line can be resulted from vehicle impact while failure of the underground portion of the liquid filling line can be resulted from earthquake.

Guillotine Failure of Liquid Line to Dispenser

3.3.4 Cause of failure of this line is similar to liquid filling line to storage vessel, mainly due to corrosion or fatigue. Moreover, the failure of the underground portion of the pipework can be resulted from external events while the aboveground portion of the pipework can be resulted from vehicle impact. Releases would result in leak from full bore of the pipe.

Guillotine Failure of Liquid Line from Tanker Pipe to Loading Hose

3.3.5 Cause of failure of this line is similar to liquid filling line to storage vessel, mainly due to corrosion or fatigue. Moreover, the failure can be due to vehicle impact and other external events.

Failure of Dispenser

3.3.6 The cause of failure of dispenser could be corrosion, fatigue, vehicle impact (vehicle visiting the LPG Filling Station) and other external events, which would result in a release of the dispenser pipework.

Failure of Flexible Hose

3.3.7 The loading hose could fail due to the following causes:

(a) Fatigue
(b) Hose misconnection
(c) Hose disconnection during loading or unloading process
(d) Vehicle impact
(e) Operator / driver error.

Failure of Vapour Return Line

3.3.8 Similar to the liquid line, failure of the vapour return line is credible which would result in vapour leak equivalent to the diameter of the line. Moreover, the failure of vapour return line can be resulted from external events.

Release from Storage Vessel Pump Flange

3.3.9 Release from the submersible pump on the storage vessel is not credible as the LPG release would flow back into the storage vessel, however, the release would take place from the flanges associated with the pump fitting.

Release from Storage Tank Drain Valve

3.3.10 The storage tank drain valve is open to drain out accumulated water several times per year. Release from drain valve is possible due to human error. The operator fails to close it by accident.

Leak from Vehicle Vessel

3.3.11 Similar to the failure of LPG storage vessel and road tanker, a leak from vehicle vessel could be spontaneous caused by other vehicles impact or refuelling error. However, the LPG inventory of vehicle vessel is small as compared to storage vessel and road tanker. The effect is insignificant.

<u>Delivery Failures</u>

3.3.12 When LPG releases occur as a direct result of the road tanker unloading operation, the failure events can be regarded as loading failures.

3.3.13 The failure events could be categorised as loading failures were listed as follows:

(a) Hose misconnection and disconnection error
(b) Tanker drive away error
(c) Road tanker collision
(d) Vehicle impact with tanker during unloading
(e) Storage vessel overfilling
(f) Over-pressurization of pipework.

Hose Misconnection and Disconnection Error

3.3.14 A significant release of LPG during transfer from road tanker to storage vessel could occur as a result of failure of the transfer hoses and coupling, human error, or vehicle impact.

Tanker Drive away Error

3.3.15 This error could be resulted from: (i) repositioning of truck during delivery; and/or (ii) driver drives the tanker away before the delivery is completed.

Road Tanker Collision

3.3.16 Road tanker collision refers to the striking facilities of the LPG Filling Station by the LPG road tanker and damages are resulted. Dedicated road tanker parking area and unloading area, speed control, controlling the use of dispenser system and well-adopted training system are safety measures commonly adopted to avoid serious collision incidents. Road tanker collision leading to failure of the road tanker itself is considered to be insignificant. Underground facilities such as LPG storage vessel and pipework would not be affected by this event since they are installed underground. Collision of an LPG road tanker with other road tankers is considered not possible as concurrent unloading of liquid fuels and LPG at the station is not allowed in Hong Kong.

Vehicle Impact with Road Tanker during Unloading

3.3.17 There is a possibility that a vehicle collides with the road tanker during unloading operation. When this happens, a release of LPG could occur.

Storage Vessel Overfilling

3.3.18 Failure of LPG storage vessel could occur as a result of overfilling of LPG from road tanker to vessel.

Over-pressurization of Pipework

3.3.19 Over-pressurization could be caused by continuing unloading operation when a storage vessel is overfilled or isolation valves at the receiving storage vessel are closed. It is considered that the probability of the pipework over-pressurization is negligible with all the safety system provided at the LPG Filling Station, and therefore not considered in this study.

External Events

3.3.20 A LPG release event could occur due to external events and the consequences could be catastrophic. The related external events are listed as follows:

(a) Earthquake
(b) Aircraft crash
(c) Landslide
(d) Severe environmental event such as typhoon or tsunami
(e) Subsidence
(f) External Fire.

3.3.21 According to BDEIA [3], earthquake of Modified Mercali Intensity (MMI) VII could provide enough intensity to result in damage to storage vessel or pipework. Therefore, earthquake is considered in this study.

3.3.22 Aircrafts crashing into the LPG Filling Station due to take-off and landing as well as arrival/departure flight paths are taken into account in this study. Method given in HSE (1997) [6] for calculation of aircraft crash frequency is adopted.

3.3.23 The LPG Filling Station is bounded by roads and buildings with no slope in vicinity of it. Therefore, the probability of landslide is negligible and this external event is not further considered in this study.

3.3.24 According to BDEIA [3], loss of LPG content due to severe environmental event such as typhoon or tsunami (i.e. a tidal wave following an earthquake) is considered to be insignificant as the installation of LPG vessel is situated underground and away from seashore. Subsidence is usually slow in movement and such movement can be observed and remedial action can be taken in time. Therefore, the probabilities of severe environmental events and subsidence are very small or negligible so these external events are not further considered in this study.

3.3.25 External fire means the occurrence of fire event which leads to the failure of tanker / vessel or other facilities. The key concern is the LPG road tanker being affected by external fires. In Hong Kong, LPG delivery trucks are of Chartek coating. Chartek coating could ensure that tanker wall temperatures are kept sufficiently low. Fire extinguishers are also provided in the LPG Filling Station. The LPG system will be shut down as a closed system once there is external fire threatening the station. Escalation due to fire outside of the LPG Filling Station is therefore considered not credible. Fire events, such as vehicle fire, within the LPG Filling Station may cause damage to LPG facilities and are further elaborated in the “Escalation” sections in this assessment.

Safety Features

3.3.26 Safety features installed in the facilities can act in different combination to mitigate LPG releases. Such features are highlighted in the following sections.

Pressure Relief Valve

3.3.27 Relief valve is employed to ensure the vessel is not subjected to an excessive internal pressure which may cause failure due to overfilling. Also it offers protection against excessive pressure build up within the vessel in case of fire situation.

Non-return Valve

3.3.28 Non-return valve on the liquid filling line can isolate release immediately. If it functions properly, there will be no significant consequence.

Excess Flow Valve

3.3.29 Excess flow valve installed at the road tanker and the storage vessel is expected to mitigate release from guillotine failure of pipework or flexible filling hose.

Emergency Shutdown System

3.3.30 An Emergency Shutdown (ESD) system is installed on both road tankers and vessel. For release from road tankers, emergency isolation system and engine emergency stop system can be activated to isolate release due to equipment failure and human error. For release from vessel, emergency isolation system can be triggered to enable quick remote closure of all actuated valves at the station mitigating the release at the road tanker unloading / filling point, the liquid supply line and vapour return line of each dispenser, the liquid outlet / inlet and vapour return line on the vessel.

Double-check Filler Valve

3.3.31 Double-check filler valve is provided at the hose connection point on the liquid filling line to prevent release to be fed back from the vessel. The design of this valve is essentially 2 non-return valves in series.

Breakaway Coupling

3.3.32 One problem identified with road tankers and refilling vehicles is the possibility of road tankers and vehicles being driven away whilst the hose is still connected causing damage to facilities and resulting in release of LPG. The breakaway coupling is installed to prevent undue spillage of LPG due to movement of road tankers and vehicles.

Manual Isolation System

3.3.33 Manual valve is installed for the operators/ drivers to close the manual valve in case of failure.

Human Error

3.3.34 When failure of equipment or loading process occurs, it is possible for staff to rectify the problem before hazard event occurs. Human error is considered as a failure case if staff fails to rectify the problem.

<u>Fire Protection / Fighting System</u>

Water Spray System

3.3.35 The LPG Filling Station possesses with its own storage of 30 minutes of water supply to the entire water spray system. When a water spray system is activated, the fire associated with equipment in the LPG Filling Station such as pipeworks, dispensers and LPG vehicles can be extinguished or prevented from spreading towards a parked road tanker.

Fire Service

3.3.36 Fire service will be available within a few minutes in case of fire. The extinguishments of fire by fire fighters prevent BLEVE from occurring. Besides, a street fire hydrant is available nearby and fire service water inlet is installed at the perimeter of the LPG Filling Station to provide additional fire water supply.

Chartek Coating

3.3.37 Chartek coating is a safety feature coated on road tankers. It was reported that the coating could give a protection for at least 30 minutes in case of jet fire. The coating could prevent a hot spot on the road tanker due to jet fire attack, which can cause thermal weakening of the road tanker wall leading to BLEVE.

<u>Escalation</u>

3.3.38 BLEVE of a LPG road tanker can happen if the road tanker is impinged by jetfire from aboveground LPG facilities listed below:

(a) Dispenser
(b) In-let filling pipework
(c) Liquid supply line to dispenser
(d) Flexible hose during loading to underground vessel
(e) Liquid line from tanker to loading hose
(f) Flexible hose during loading to vehicle is not considered as the jet flame produced will not impinge on the road tanker; and
(g) While Chartek coating can provide 30 minutes protection to the storage tank, the release and jetfire duration is less than 10 min in leak failure of a LPG vehicle. Therefore, jetfire in leak failure of LPG vehicle does not lead to BLEVE of a LPG road tanker

<u>Summary</u>

3.3.39 Possible hazard events for day-to-day operation of LPG filling station have been identified and reviewed in previous section. Only those possible failure cases considered to have the potential to cause off-site fatality are summarized in **Table 3.1**.

3.3.40 The significance of each failure case and adoption of generic frequency are discussed in the next section.

Table 3.1 Identified Failure Case of the LPG Filling Station

FAILURE TYPES	FAILURE CASES
Spontaneous Failure of Pressurised LPG Equipment	• Storage Vessel Failure • Road Tanker Failure • Pipework Failure • Dispenser Failure • Hose Failure • Vapour Return Line Failure • Release from Storage Vessel Pump Flange • Release from Storage Vessel Drain Valve
Delivery Failure	• Hose Misconnection Error • Hose Disconnection Error • Tanker Drive-away Error • Road Tanker Collision during Unloading • Vehicle Impact with Tanker during Unloading • Storage Vessel Overfilling
External Event	• Earthquake MMI VIII • Aircraft Crash
Safety System Failure	• Pressure Relief Valve Failure • Non-return Valve Failure • Excess Flow Valve Failure • Emergency Shutdown System Failure • Double-check Filler Valve Failure • Breakaway Coupling Failure • Manual Isolation Valve Failure • Human Error
Fire Fighting System Failure	• Water Spray System Failure • Fire Services Failure • Chartek Coating Failure
Escalation	• LPG Road Tanker BLEVE Due to Fire in the Filling Facilities • LPG Road Tanker BLEVE Due to Jetfire from Aboveground LPG Facilities

<u>Spontaneous Failure of Pressurised LPG Equipment</u>

Storage Vessel Failure

3.3.41 A release of LPG could occur as a result of catastrophic failure or partial failure of the storage vessel and such a failure would lead to either a loss of entire contents of the vessel or a continuous release of LPG to atmosphere. A generic failure rate of 1.8 x 10^{-7} per vessel year [1] is adopted for cold catastrophic failure. Due to the variation of contents of the vessel with time, it is assumed that the vessel is being nominally full for 30% of the time and 60% of maximum for the other 70% of time. The variation of content of the storage vessel is estimated from operation parameters as shown in **Section 2.4**.

3.3.42 For partial failure, a generic failure rate of 5 x 10^{-6} per vessel year [1] is applied.

Road Tanker Failure

3.3.43 As discussed in Section 3.3.2, the definitions of catastrophic and partial failures of road tanker are similar to that of vessel. It is generally considered that catastrophic failure rate for LPG road tankers could be higher than for a fixed storage vessel because of a) stresses experienced by the road tanker due to vibration during transportation, and b) cyclic loading associated with filling/unloading the road tanker. A rate of 2.0 x 10^{-6} per tanker year [1] is adopted for catastrophic tanker failure. Similar to storage vessel, the tanker is modelled at maximum content for 30% of the time and 50% maximum for 70% of the time.

3.3.44 A failure rate of 5.0 x 10^{-6} per tanker year [1] is applied for partial failure of road tanker.

Pipework Failure

3.3.45 According to the study conducted by Reeves et al. (1997) [1], it is assumed that releases from pipework partial failures are insignificant contributors towards the overall risk levels. Therefore, in this study, only guillotine failure of LPG pipework is considered as the release from partial failure of pipework is insignificant towards the overall risk levels. A generic guillotine failure of pipework is taken as 1.0 x 10^{-6} per meter per year.

Dispenser Failure

3.3.46 The dispenser is a metering device, a hose with a self-sealing connector, 4 ball valves (with 2 flanges for each valve) and a certain length of rigid pipework. The only way to estimate the failure frequency would be to account for each of these components and add together. Assuming the dispenser is equivalent to 1m of small bore piping (<100mm) with 2 flanges joints and 4 ball valves with 8 flange joints, failure rate of a LPG disperser 5x10^{-5} per hour is obtained with following estimates:

(a) 1m piping * 1x10^{-10} per meter per hour [10]
(b) 10 flanges (8 from 4 ball valves, 2 from meter joints) * 3x10^{-7} per flange per hour [11]
(c) 4 ball valves * 0.5x10^{-6} per valve per hour [11]

3.3.47 Therefore, the dispenser failure rate per year is estimated as 5x10^{-6} x 8,760 (1 year = 8760 hours) = 4.38 x 10^{-2}.

Hose Failure

3.3.48 Again, the effect of partial failure of the hose is neglected. A generic guillotine failure rate of flexible hose of 1.8 x 10^{-7} per transfer, for 2 hours transfer, is assumed thus giving a guillotine failure rate of flexible hose of 9.0 x 10^{-8} per hour [1].

3.3.49 Each unloading process for 9t deliveries takes 105 minutes (from road tanker to vessel). Therefore, guillotine failure rate of flexible hose for 9t LPG unloading is 1.58 x 10^{-7} per transfer. In addition, vehicle loading process takes about 5 minutes (from dispenser to vehicle). Therefore, guillotine failure rate of flexible hose for LPG loading to a vehicle is 7.5 x 10^{-9} per transfer.

Vapour Return Line Failure

3.3.50 A generic failure rate of 1 x 10^{-6} per meter per year is adopted [1].

Release from Storage Vessel Pump Flange

3.3.51 A generic failure rate of 1.09 x 10^{-4} per flange per year[1] is adopted [8].

Release from Storage Vessel Drain Valve

3.3.52 For the operator failed to close the drain valve by accident, a failure rate of 2.0 x 10^{-5} per operation [4] is adopted.

[1] Referencing the SPC/TECH/OSD/24 - accident/incident data from Health and Safety Executive (HSE) reviewed in March 2007, it stated the failure rate of pump flange is between 4.11 x 10^{-5} and 1.09 x 10^{-4} /flange year. Thus, a conservative value of 1.09 x 10-4 /flange year was assumed in this study as this is an updated value in March 2007 to reflect the failure frequency of a pump flange.

Loading / Unloading Failures

Hose Misconnection Error

3.3.53 A significant release of LPG during transfer from road tanker to storage vessel could occur as a result of failure of the transfer hoses and coupling, human error, or vehicle impact. The likelihood of such an event is taken as 3×10^{-5} per operation [1].

Hose Disconnection Error

3.3.54 A rate of 2×10^{-6} per operation [1] is adopted in this failure case.

Tanker Drive-away Error

3.3.55 Tanker drive-away error refers tanker moves away with the hose still connected. It could be resulted from inadvertent drive away before delivery is completed. It is considered that drive-away is unlikely. Even such error do occur, it is highly likely that the failure can be immediately rectified since delivery process would not go unattended. A failure rate of 4×10^{-6} per operation [1] is adopted.

Tanker Collision during Unloading

3.3.56 A release of LPG cloud occurs as a result of an incident involving an LPG tanker during delivery and LPG equipment. It is assumed that the failure rate of tanker impact during unloading is 1.5×10^{-4} per delivery [1].

Vehicle Impact with Road Tanker during Unloading

3.3.57 A rate of 1×10^{-8} per operation [1] is adopted for the case that a vehicle impact into road tanker during unloading.

Storage Vessel Overfilling

3.3.58 The practice on-site in unloading LPG to the underground storage vessel is that the vessel will be only filled to 85% of the maximum capacity. It is considered that the probability of the driver overfilling a storage vessel is low. The rate 2×10^{-2} per operation [1] is adopted for this failure case.

External Events

Earthquake MMI VIII

3.3.59 The probability 1.0×10^{-5} per year of earthquake MMI VIII occurrence is adopted. The failure rate of pipework and partial failure of underground vessel due to earthquake is assumed to be 0.01 [3], whereas the other failure rate of road tanker and the underground vessel is considered to be zero.

Aircraft Crash

3.3.60 The distance between the nearest arrival flight path and the LPG Filling Station is approximately 4.5 km. The distance between the LPG Filling Station and Chek Lap Kok International Airport is about 33 km and over 5 miles which is the criteria for the consideration of airfield accident. At such distances, the LPG Filling Station is not covered by critical takeoff and landing phases, therefore, background crash rate and airway crash rate are taken into account. The frequency of aircraft crash was estimated using the methodology of the HSE (1997) [6]. The model takes into account specific factors such as the target area of the LPG Filling Station and distance between the LPG Filling Station and the runway threshold. The aircraft crash frequency per year is calculated as:

Frequency (per year) = Background Crash Rate + Airway Crash Rate

Frequency (per year) = $(A \times B_i) + (A \times N_i \times R_i \times afac/\ alt)$

where A is the area of the LPG Station, N is the number of runway movements per year and Ri is the aircraft in-flight reliability per year per km per aircraft movement. According to the statistic of Civil International Air Transport Movements of Aircraft, there are 406,034 movements per year which represents the largest number of movements per year from January 2015 to December 2015. The detailed calculation of aircraft crash is shown in **Appendix D**.

3.3.61 The frequency of the event aircraft due to background and airway crash in the LPG Station is estimated at 2.10×10^{-9} per year.

Safety System Failure

3.3.62 If the safety system operates as designed then releases will not present an off-site hazard. There is, however, potential for failure of the safety system. A typical safety system involves pressure relief valve, non-return valve, excess flow valve, emergency shutdown system, breakaway coupling and double-check filler valve.

Pressure Relief Valve Failure

3.3.63 Pressure relief valve avoids the LPG pipework or underground storage vessel from getting overpressure. A generic failure of pressure relief valve on demand of 1×10^{-4} [1] is adopted.

Non-return Valve Failure

3.3.64 Non-return valve is intended to avoid the back flow of LPG. A generic failure rate of 0.013 per demand [1] is adopted.

Excess Flow Valve Failure

3.3.65 The excess flow valve installed at road tanker and storage vessel is expected to be functional when guillotine failure of pipework or flexible hose occurs. Considering different testing interval for road tankers and storage vessels, generic failure rates of 0.013 and 0.13 per demand [1] are adopted for road tanker and vessel respectively.

Emergency Shutdown System Failure

3.3.66 A generic failure rate of 1×10^{-4} per demand [1] is assumed.

Breakaway Coupling Failure

3.3.67 Generic failure rate of 0.013 and 0.13 per demand [1] is adopted for road tanker and dispenser, respectively.

Double-check Filler Valve Failure

3.3.68 Double-check filler valve prevents the LPG release to be fed back from the storage vessel. The design is 2 non-return valves in series. A generic failure rate of 2.6×10^{-3} per demand [1], common mode failure, is adopted.

Manual Isolation Valve Failure

3.3.69 A generic failure rate of 0.5 per demand [1] is assumed.

Human Error

3.3.70 According to Appendix III of Reactor Safety Study prepared by US Nuclear Regulatory Commission in 1975, an estimation of average error rate of 0.2 to 0.3 was assumed for nuclear power plant personnel in a high-stress situation [4]. In that study, it also stated that the range of 0.2 to 0.3 was to be considered conservative. In this study, a probability of 0.2 per demand[2] [3] is assumed to account for human error in which operators fail to rectify the problem before any hazard event occurs.

Fire Fighting System Failure

Water Spray System Failure

3.3.71 A generic failure rate of 1.5 x 10^{-2} per demand [1] is adopted to account for the common problems of the water spray system: blocked nozzles and malfunction of the fire detectors.

Failure of Fire Services

3.3.72 It is assumed that the Fire Services are always operational and zero probability is therefore applied for the failure of "Fire Services arrive late". A generic failure rate of 0.5 per demand [1] is assumed for the Fire Services to be ineffective against a fire attack.

Gas Detection System

3.3.73 The system is identified as an additional safety device for the operator to take emergency actions when LPG release occurs. Since the system would not induce additional likelihood of failure events, the system would not be included into the fault tree analysis.

Chartek Coating Failure

3.3.74 A generic failure rate of 0.1 per demand [1] is applied for Chartek coating fails to prevent hot spot on road tanker in a jet fire attack due to poor maintenance.

3.3.75 The above initialising events could result in LPG release scenarios. **Table 3.2** summarises the identified LPG release scenarios.

Table 3.2 Summary of Identified Failure Cases and Their Associated Failure Rates for the LPG Filling Station

Failure Cases	Failure Rates	Reference Source
Spontaneous Failure of Pressurized LPG Equipment		
Catastrophic Failure of Storage Vessel	1.8×10^{-7} per vessel year	Reference [1]
Partial Failure of Storage Vessel	5.0×10^{-6} per vessel year	Reference [1]
Catastrophic Failure of Road Tanker	2.0×10^{-6} per tanker year	Reference [1]
Partial Failure of Road Tanker	5.0×10^{-6} per tanker year	Reference [1]
Guillotine Failure of Pipework	1.0×10^{-6} per meter per year	Reference [1]
Hose Failure	9.0×10^{-8} per hour	Reference [1]
Dispenser Failure	4.38×10^{-2} per year	Sections 3.3.46 – 3.3.47
Vapour Return Line Failure	1.0×10^{-6} per meter per year	Reference [1]
Release from Storage Vessel Pump Flange	1.09×10^{-4} per year	Reference [8]
Release from Storage Vessel Drain	2.0×10^{-5} per operation	Reference [4]

[2] According to the EIA study "Proposed Headquarters and Bus Maintenance Depot in Chai Wan" (BDEIA), by Ling Chan + Partners Limited. (2001)", a probability of 0.2 is assumed for human error. Moreover, from Appendix III of Reactor Safety Study prepared by US Nuclear Regulatory Commission in 1975, an estimation of average error rate of 0.2 to 0.3 was assumed for nuclear power plant personnel in a high-stress situation. In that study, it also stated that the range of 0.2 to 0.3 was to be considered conservative. In this study, a probability of 0.2 (per demand) was assumed to account for human error which operators fail to rectify the problem before any hazard event occurs.

Failure Cases	Failure Rates	Reference Source
Valve		
External Event		
Earthquake (MMI VIII)	1.0×10^{-5} per year	Reference [3]
Aircraft Crash	2.10×10^{-9} per year	Appendix D
LPG Loading Failure		
Hose Misconnection Failure	3.0×10^{-5} per operation	Reference [1]
Hose Disconnection Failure	2.0×10^{-6} per operation	Reference [1]
Tanker Drive-away Error	4.0×10^{-6} per operation	Reference [1]
Road Tanker Collision	1.5×10^{-4} per operation	Reference [1]
Vehicle Impact into Tanker During Unloading	1.0×10^{-8} per operation	Reference [1]
Storage Vessel Overfilling	2.0×10^{-2} per operation	Reference [1]
Safety Features Failure		
Pressure Relief Valve Failure	1×10^{-4} per demand	Reference [1] based on ESD system
Non-return Valve Failure	0.013 per demand	Reference [1]
Excess Flow Valve Failure	0.013 per demand for tanker 0.13 per demand for vessel	Reference [1]
Emergency Shutdown System Failure	1.0×10^{-4} per demand	Reference [1]
Breakaway Coupling Failure	0.013 per demand for tanker, 0.13 per demand for dispenser	Reference [1]
Double-check Filler Valve Failure	2.6×10^{-3} per demand	Reference [1]
Human Error	0.2 per demand	Reference [4]
Fire Protection / Fighting System Failure		
Water Spray System Failure	1.5×10^{-2} per demand	Reference [1]
Failure of Fire Services	0.5 per demand	Reference [1]
Chartek Coating Failure	0.1	Reference [1]

Escalation

3.3.76 Escalation refers to a relatively insignificant accident causes an event with much more significance to occur. As the LPG filling facilities is located beside petrol/diesel filling facilities within the station, hazards in the petrol filling facilities that may lead to escalation are considered in this study.

3.3.77 Typical hazards that could lead to escalation are:

(a) Shrapnels from LPG storage vessel impacting on an LPG road tanker;
(b) Fire at the filling facilities, such as leakage of petrol through pipelines and dispensers as well as vehicle fire, engulfing an LPG road tanker and causing BLEVE; and
(c) Ignited leak from above ground LPG facilities (jetfire) impinging an LPG road tanker and causing BLEVE.

3.3.78 As storage vessel is installed underground, the knock-on failures on this equipment from an accident are unlikely to occur. Therefore, knock-on failures on storage are not further considered.

3.3.79 When a LPG road tanker is impacted by the shrapnels from LPG storage vessels (i.e. catastrophic rupture of vessels occurs), this is already a severe event and no knock-on events significantly worse have been identified.

BLEVE of LPG Road Tanker Caused by Liquid Fuel Pool Fire

3.3.80 For a pool fire leading to BLEVE of LPG road tanker, the factors needed to be considered are as follows:

(a) Frequency of fire incidents occurring in petrol / LPG Filling Station
(b) The proportion of fire incidents severe enough to endanger the road tanker
(c) The portion of time for tanker present in the LPG Filling Station
(d) Failure to prevent BLEVE from occurring

3.3.81 The calculation of probability of road tanker BLEVE is shown in **Appendix E**. The frequency/proportion used in the first two factors is described below.

Frequency of Fire Incidents Occurring in Petrol / LPG Filling Stations

3.3.82 The frequency is estimated by the equation:

Number of fire incidents occurred / number of petrol filling station-year

3.3.83 Information on the number of fire incidents occurred is provided by Hong Kong Fire Services Department (**Appendix G**). According to the record, there were 23 fire incidents occurred in petrol filling stations from year 1995 to 2011. Until year 2007, there were 189 commercial petrol filling stations in Hong Kong; at year 2011, there were 187 commercial petrol filling stations. By assuming the number of petrol filling stations remaining stable from 1995 to 2007 and from 2007 to 2011, it is estimated that the frequency of fire incidents = 23 fire incidents / (189 x 13 + 187 x 4 petrol filling station-year) = 7.18 x 10^{-3} fire incident per petrol filling station-year.

3.3.84 It should be noted that it is a conservative estimate because non-commercial petrol filing stations are not considered.

The Proportion of Fire Incidents Severe Enough to Endanger the Road Tanker

3.3.85 Not all the fire incidents recorded/occurred in petrol filling stations will endanger the road tanker. There is a portion of recorded fire incidents could be false alarm which leads to overestimate of the fire incident frequency. Moreover, a fire leading to BLEVE of road tanker needs to be sufficiently long period (i.e. 30 minutes). A prolonged pool fire engulfing the road tanker can only sustain with enough flammable source. However, most of the fire incidents occurred is small in scale such as fire caused by smoking, small fire in the office of petrol filling station, fire due to small leakage of liquid fuel etc. Therefore, a proportion of 1 in 100 is assumed for severe fire incidents.

3.3.86 By considering the 4 factors mentioned above, the calculated frequency of a fire incident in petrol filling station causing BLEVE of LPG road tanker is 5.61 x 10^{-9} per year for 9-tonne LPG delivery.

BLEVE of LPG Road Tanker Caused by Jetfire from Above Ground LPG Facilities

3.3.87 For a jetfire leading to BLEVE of LPG road tanker, a number of factors are needed to be considered, as follows:

(a) Frequency of LPG leak from above ground LPG facilities last for at least 30 minutes
(b) Immediate ignition probability of LPG leak from above ground LPG facilities which causes a jetfire
(c) The portion of jetfire impinging at road tanker
(d) The portion of time for road tanker present in the LPG filling station
(e) Failure to prevent BLEVE from occurring

3.3.88 The calculation of probability of road tanker BLEVE is shown in **Appendix E**. The elaboration of the first three factors is provided below.

Frequency of LPG Leak from Aboveground LPG Facilities Lasting for at Least 30 Minutes

3.3.89 It is conservatively assumed that the inventory in the storage vessel at maximum inventory or 60% of maximum inventory is enough to support a 30-minute leakage. Therefore, the frequencies of aboveground LPG facilities failure shown in **Appendix E** are applied to the frequencies of LPG leak lasting for at least 30 minutes.

Immediate Ignition Probability of LPG Leak from Aboveground LPG Facilities

3.3.90 Immediate ignition of LPG release from aboveground LPG facilities will cause a jetfire. A probability of 0.05 is adopted in **Appendix F** for immediate ignition of LPG leak from aboveground LPG facilities.

The Portion of Jetfire Impinging at Road Tanker On Site

3.3.91 Not all the ignited jetfire from aboveground LPG facilities will impinge into the LPG road tanker. Jetfire due to LPG release from aboveground LPG facilities may impinge into other objects or burn as a free jet. A probability of 0.1 is assumed for the jetfire from most of the aboveground LPG facilities impinge into LPG road tanker on site by considering the relative angular position of the LPG road tanker to LPG facilities such as dispensers. For jetfire caused by liquid supply line between from road tanker and loading hose, probability of 0.5 is assumed.

3.3.92 By considering the 5 factors mentioned above, the calculated frequency of a jetfire from aboveground LPG facilities causing BLEVE of LPG road tanker is 1.27×10^{-9} per year for 9-tonne LPG delivery.

4 HAZARD OCCURRENCE

4.1 Introduction

4.1.1 Subsequent to the Hazard Identification and Analysis in previous section, the next step will be to estimate the likelihoods of various release scenarios. There are combinations of hazard initiating events, as identified in previous section, which would lead to release scenarios.

4.1.2 Fault Tree Analysis (FTA) permits the hazardous incident ("Significant Failure Events") frequency to be estimated from a logical model of the failure mechanisms of a system. The model is based on the combinations of failures of more basic components, safety systems and human errors. Station-specific circumstances (e.g. number of LPG tanker visit) are taken into account in the FTA.

4.1.3 FTA is the use of a combination of simple logic gates, "AND" and "OR" gates, to synthesize a failure model of the hazardous installation. The "Significant Failure Events" frequency is calculated from failure data of more simple events.

4.1.4 A basic assumption in FTA is that all failures in a system are binary in nature, a component or operator either performs successfully or fails completely. In addition, the system is assumed to be functioning if all sub-components are operating properly.

4.1.5 The stepwise procedure for undertaking FTA is presented below:

(a) Hazard identification and selection of the "Significant Failure Events", where the "Significant Failure Events" are considered as significant LPG release cases.
(b) Construction of fault tree
(c) Quantitative evaluation of the fault tree

4.1.6 The inventory in LPG storage vessel and road tanker during unloading varies with time. It is assumed that the inventories are full (100% maximum capacity of vessel) in the risk model at 30% of time and there are nominal 70% inventory in vessel at 80% of time; while the inventory in road tanker is full (100% maximum capacity of tanker) in the risk model at 30% of time and there are nominal 50% inventory in road tanker at 70% of time.

4.2 Frequency of Occurrence

4.2.1 Sets of fault tree diagrams are attached in **Appendix E**. The estimated likelihoods of various releases of LPG at the existing LPG Filling Station are summarized in **Table 4.1**.

Table 4.1 Estimated Occurrence Frequency of Significant LPG Releases

Release Case	Frequency of Occurrence/ Year
Catastrophic Failure of a Storage Vessel (Full Inventory)	7.34E-08
Catastrophic Failure of a Storage Vessel (60% Inventory)	1.71E-07
Catastrophic Failure of Road Tanker (Full Inventory)	6.28E-08
Catastrophic Failure of Road Tanker (50% Inventory)	1.46E-07
Partial Failure of a Storage Vessel (Full Inventory)	1.52E-06
Partial Failure of a Storage Vessel (60% Inventory)	3.55E-06
Partial Failure of Road Tanker (Full Inventory)	1.58E-07
Partial Failure of Road Tanker (50% Inventory)	3.69E-07

Guillotine Failure of Liquid Filling Line to Storage Vessel – release from vessel (Full Inventory in Storage Vessel)	1.83E-11
Guillotine Failure of Liquid Filling Line to Storage Vessel – release from vessel (60% Inventory in Storage Vessel)	4.28E-11
Guillotine Failure of Liquid Filling Line to Storage Vessel – release from road tanker (Full Inventory in Road Tanker)	1.91E-12
Guillotine Failure of Liquid Filling Line to Storage Vessel – release from road tanker (50% Inventory in Road Tanker)	4.46E-12
Guillotine Failure of Liquid Filling Line to Dispenser (Full Inventory in Storage Vessel)	1.39E-07
Guillotine Failure of Liquid Filling Line to Dispenser (60% Inventory in Storage Vessel)	3.24E-07
Failure of Dispenser (Full Inventory in Storage Vessel)	3.71E-04
Failure of Dispenser (60% Inventory in Storage Vessel)	8.65E-04
Guillotine Failure of Hose during Unloading from Road Tanker to Storage Vessel, LPG Released from Tanker (Full Inventory in tanker)	9.32E-07
Guillotine Failure of Hose during Unloading from Road Tanker to Storage Vessel, LPG Released from Tanker (50% Inventory in tanker)	2.18E-06
Guillotine Failure of Hose during Unloading from Road Tanker to Storage Vessel, LPG Released from Vessel (Full Inventory in vessel)	2.42E-09
Guillotine Failure of Hose during Unloading from Road Tanker to Storage Vessel, LPG Released from Vessel (60% Inventory in vessel)	5.66E-09
Failure of Flexible Hose during Loading to LPG vehicles, LPG Released from Dispenser (Full Inventory in Storage Vessel)	7.38E-02
Failure of Flexible Hose during Loading to LPG vehicles, LPG Released from Dispenser (60% Inventory in Storage Vessel)	1.72E-01
Failure of Flexible Hose during Loading to LPG vehicles, LPG Released from vehicle (Full Inventory in Vehicle)	4.92E-01
Release from Storage Vessel Pump Flange (Full Inventory in Storage Vessel)	1.31E-04
Release from Storage Vessel Pump Flange (60% Inventory in Storage Vessel)	3.05E-04
Release from Storage Vessel Drain Valve (Full Inventory in Storage Vessel)	7.20E-05
Release from Storage Vessel Drain Valve (60% Inventory in Storage Vessel)	1.68E-04
Failure of Vapour Return Line (Full Inventory in Storage Vessel)	1.79E-07
Failure of Vapour Return Line (60% Inventory in Storage Vessel)	4.17E-07
Guillotine Failure of Liquid Line from Tanker to Flexible Hose (full inventory in Road Tanker)	2.41E-09

Guillotine Failure of Liquid Line from Tanker to Flexible Hose (50% inventory in Road Tanker)	5.63E-09
BLEVE of Road Tanker (Full Inventory in Road Tanker)	2.06E-09
BLEVE of Road Tanker (50% Inventory in Road Tanker)	4.81E-09

5 CONSEQUENCES AND IMPACT ANALYSIS

5.1 Introduction

5.1.1 Consequence and impact analysis is conducted to provide a quantitative estimate of the likelihood and number of deaths associated with the range of possible outcomes (i.e. fireball, jet fire, flash fire etc) which are resulted from failure cases identified in previous sections for the LPG Filling Station. In this study, PhastRisk 6.7, upgraded version of DNV SAFETI, is used.

5.2 Modelling Input

5.2.1 The LPG Station failure events identified in previous sections have been considered and evaluated through consequence analysis. Taking into account the safeguard measures, layout plan of the LPG Filling Station and effect distances of failure events, some failure events would have insignificant off-site impact. Those failure events having potential off-site impact are listed as follows:

(a) Rupture of storage vessel
(b) Rupture of road tanker
(c) Partial failure of storage vessel
(d) Partial failure of road tanker
(e) Guillotine failure of liquid filling line to storage vessel
(f) Pump flange leak
(g) BLEVE of road tanker

5.2.2 There is one underground vessel with water capacity of 21kL at the LPG Filling Station. Therefore, maximum inventory for the LPG storage vessel is assumed 10 tonnes in this study. Replenishment of LPG is assumed to be 2 deliveries per day, and the replenishment is assumed to be arranged at day-time for risk modelling purpose according to the information provided by Feoso.

5.3 Ignition Source

5.3.1 In order to calculate the risk from flammable materials, information on ignition sources present in the study area needs to be identified. Such data is included in the risk model for each type of ignition source (i.e. point sources, line sources and area sources). The risk calculation program (MPACT) will then predict the probability of a flammable cloud being ignited (delayed ignition) as the cloud moves downwind over ignition sources.

Point Sources

5.3.2 According to HSE (1997) [5], compressors could be categorised as a strong ignition source with ignition probability greater than 0.5 but smaller than 1. Although a vehicle using the LPG Station is close to a release source, it is classified as a weak ignition source with ignition probability between 0.05 and 0.5. Therefore, the following assumptions are applied to estimate the presence factor of the point source and the ignition probability.

(a) Probability of ignition for a compressor is taken as 0.75 in 60 seconds
(b) Presence factor of the ignition source is assumed to be 1.

Line Sources

5.3.3 Roads are defined as line sources in PhastRisk. The following assumptions are applied to estimate the presence factor of the line source and the ignition probability:

(a) Probability of ignition for a vehicle is taken as 0.4 in 60 seconds
(b) Traffic density is based on the projected traffic flow as shown **Table 2.2**.

5.3.4 Ignition line sources are summarized in **Table 5.1** to **Table 5.2**.

Table 5.1 Summary of Line Ignition Source for Current Scenario (Year 2016)

Line Source	Daytime Traffic Density (veh/ hr)	Night-time Traffic Density (veh/ hr)	Average Traffic Speed (km / hr)
Wing Tai Road	900	302	50
Chai Wan Road	1850	620	50
Ka Yip Street	600	201	50
Sheung On Street	1080	362	50
Fung Yip Street	540	181	50
Kwun Yip Street	8	3	50
On Yip Street	270	90	50

Table 5.2 Summary of Line Ignition Source for Future Scenario (Year 2023)

Line Source	Daytime Traffic Density (veh/ hr)	Night-time Traffic Density (veh/ hr)	Average Traffic Speed (km / hr)
Wing Tai Road	965	323	50
Chai Wan Road	2023	678	50
Ka Yip Street	643	216	50
Sheung On Street	1158	388	50
Fung Yip Street	579	194	50
Kwun Yip Street	9	3	50
On Yip Street	289	97	50

Area Source

5.3.5 PhastRisk considers residential population as an ignition source (such as cooking, smoking, heating appliances etc.). The ignition probability is derived from population densities in the concerned area by the software.

5.4 Ignition Probability

5.4.1 Immediate ignition probabilities of 0.9 and 0.05 [1] are adopted for instantaneous release and continuous release of LPG respectively. These ignition probabilities are applied to event trees which are adopted in PhastRisk as shown in **Appendix F**. Input parameters of PhastRisk are shown in **Appendix H**.

5.5 Population Input

5.5.1 With reference to previous practice with SAFETI in Hong Kong, population at locations listed in **Table 2.1** are applied to the risk model and described in the following.

5.5.2 Cloud height decreases further away from the source. Most dispersed clouds for LPG will have a cloud height lower than 10m [1]. As a result, only the population of the lowest 2 storeys (including ground level) are being affected. The actual population affected by release events is dependent on gas dispersion results in PhastRisk. Therefore, consequence modelling results for the worst instantaneous and continuous releases are examined to determine the height protection factors.

5.5.3 Shielding protection factors for fireball events are applied to the population surrounding the LPG Filling Station [1]. For building wholly within the fireball diameter, population at the back of the building are considered protected. For building wholly outside the fireball diameter, population without direct line of sight of the LPG facilities are considered protected. The actual population affected by fireball events are also detailed in **Appendix B**.

5.5.4 To allow flexible of building design of the proposed development, no height protection factor and shielding factor are applied for the proposed residential building as a conservative approach.

6 RISK EVALUATION

6.1 Introduction

6.1.1 In this section, the risks arising from the LPG Filling Station are evaluated in terms of both individual and societal risks.

6.1.2 Individual risk is a measure of the risk to a chosen individual at a particular location. As such, this is evaluated by summing the contributions to that risk across a spectrum of incidents which could occur at a particular location.

6.1.3 Societal risk is a measure of the overall impact of an activity upon the surrounding community. As such, the likelihoods and consequences of the range of incidents postulated for that particular activity are combined to create a cumulative picture of the spectrum of the possible consequences and their frequencies. This is usually presented as an fN curve and the acceptability of the results can be judged against the societal risk criterion under the risk guidelines.

6.2 Individual Risk

6.2.1 The associated individual risk levels are shown in **Figure 4**. Five levels of risk area shown are 1×10^{-5}, 1×10^{-6}, 1×10^{-7}, 1×10^{-8} and 1×10^{-9} per year. The risk level is based on 100% occupancy with no allowance made for shelter or escape, which can be referred from the user manual of PhastRisk.

6.2.2 The 1×10^{-5}, 1×10^{-6}, 1×10^{-7}, 1×10^{-8} and 1×10^{-9} per year contours extend 9m, 24m, 43m, 71m and 125m from the LPG Filling Station, respectively. The 1×10^{-5} per year risk contour lies within the boundary of the LPG Filling Station. Therefore, no individual would be exposed under risk level greater than 1×10^{-5} per year offsite of the LPG Filling Station.

Acceptability

6.2.3 On this basis, it would appear that the level of individual risk associated with the LPG Filling Station and individual risk imposed to the proposed development should be acceptable since it meets the Government Risk Guidelines.

6.3 Societal Risk

6.3.1 The societal risks are evaluated for the range of incidents with the potential for fatalities in the vicinity of the LPG Filling Station and are shown in **Figure 5** (Existing Scenario) and **Figure 6** (Future Scenario). The societal risk is more complex than that for individual risk but, in essence, comprises three regions:

(a) Unacceptable - a region within which the risks may be regarded as unacceptable
(b) Acceptable – a region within which the risks may be regarded as acceptable
(c) ALARP – a region between the two in which measures should be taken to demonstrate the risks as “as low as reasonably practicable” (ALARP). In other words, consideration is given not only to the level of risk but also the cost and practicality of reducing it

6.3.2 Numerically, the upper bound of the ALARP region (and hence the borderline of “unacceptability”) can be summarised as:

(a) 1 chance in 1,000 per year of an incident resulting in 1 or more fatalities;
(b) 1 chance in 10,000 per year of an incident resulting in 10 or more fatalities;
(c) 1 chance in 100,000 per year of an incident resulting in 100 or more fatalities; and
(d) not more than 1,000 fatalities at a frequency of greater than 1 chance in a billion (1,000,000,000) per year.

Acceptability

6.3.3 As shown in **Figure 5** and **Figure 6**, the societal risk associated with the operation of the LPG Filling Station falls in the "Acceptable" region in both Existing Scenario and Future Scenario. Therefore, the associated societal risk is considered acceptable. Data points for the Future Scenario are tabulated in **Table 6.1**.

Table 6.1 Societal Risk Data of the LPG Filling Station (Future Scenario)

No. Fatalities	Frequency (/year)	No. Fatalities	Frequency (/year)	No. Fatalities	Frequency (/year)
1	1.94E-06	15	2.10E-07	120	6.90E-09
2	3.32E-07	20	2.05E-07	150	6.87E-09
3	2.54E-07	25	2.03E-07	200	6.87E-09
4	2.45E-07	30	2.01E-07	250	6.49E-09
5	2.37E-07	40	6.78E-08	300	2.06E-09
6	2.32E-07	50	6.64E-08	400	2.06E-09
8	2.25E-07	60	6.53E-08	500	2.06E-09
10	2.18E-07	80	7.59E-09	600	2.06E-09
12	2.14E-07	100	6.98E-09	800	2.06E-09

6.4 Potential Loss of Life (PLL)

6.4.1 The total PLL and top 5 most significant contributing events for the modelled case at Year 2023 for the LPG Filling Station are tabulated in **Table 6.2**. Based on the modelling results, LPG road tanker rupture is the main contributor to the overall risk.

Table 6.2 Breakdown of PLL for the LPG Filling Station (Future Scenario)

Event Description	Potential Loss of Life (PLL) / per year	% of Total PLL
Road Tanker Rupture - 9t delivery (50% of inventory)	4.40E-06	31.5
Road Tanker Rupture - 9t delivery (100% of inventory)	4.25E-06	30.5
BLEVE of Road Tanker (100% of inventory)	1.73E-06	12.4
BLEVE of Road Tanker (500% of inventory)	1.21E-06	8.6
Pump Flange Leak (60% of inventory)	9.70E-07	7.0
Others	1.39E-06	10.0
Total	**1.39E-05**	**100**

7 CONCLUSIONS

7.1 General

7.1.1 A full quantitative risk assessment has been carried out for the proposed development near the LPG Filling Station at Fung Yip Street, Chai Wan. The assessment is based on information collected from Hong Kong Observatory, Planning Department, Transport Department and site visits made by the Consultant.

7.1.2 The predicted individual risks for the LPG Filling Station comply with the Hong Kong Risk Guidelines as stipulated in HKPSG. The predicted societal risks for the LPG Filling Station, taking into account the proposed development, are considered acceptable by satisfying the following criteria,

(a) The 1 x 10^{-5} per year contour for individual risk is confined within the boundary of the LPG Filling Station. Therefore, no offsite population is subject to the individual risk exceeding 1 x 10^{-5} per year;

(b) Societal risk for the LPG Filling Station falls into the "Acceptable" region.

7.1.3 Therefore, results of this assessment support that the proposed development would not result in unacceptable risks to the overall population around the LPG Filling Station.

7.2 Recommendations

7.2.1 As shown in previous sections, the level of individual and societal risks for the LPG Filling Station is acceptable on risk grounds based on the information and data available at the time of preparing this report. The future land uses, particularly with significant population increase comparing with those assumed in this assessment, in the vicinity of the LPG Filling Station should be carefully assessed to ensure the risk levels to any new population are acceptable. QRA is recommended for developments in the Study Area with significant change in population or significant increase in LPG throughput at the LPG Filling Station.

8 REFERENCES

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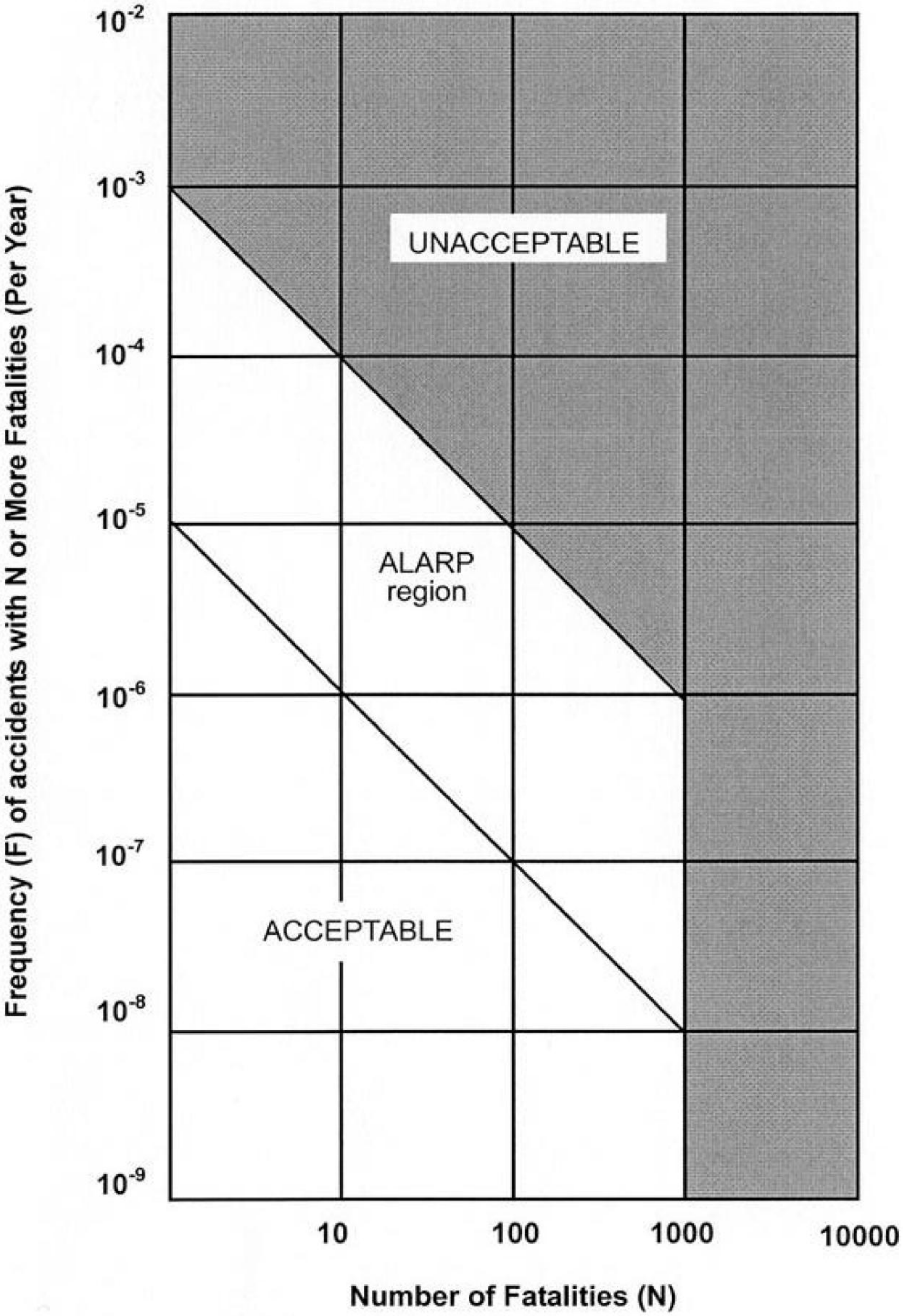
FIGURES



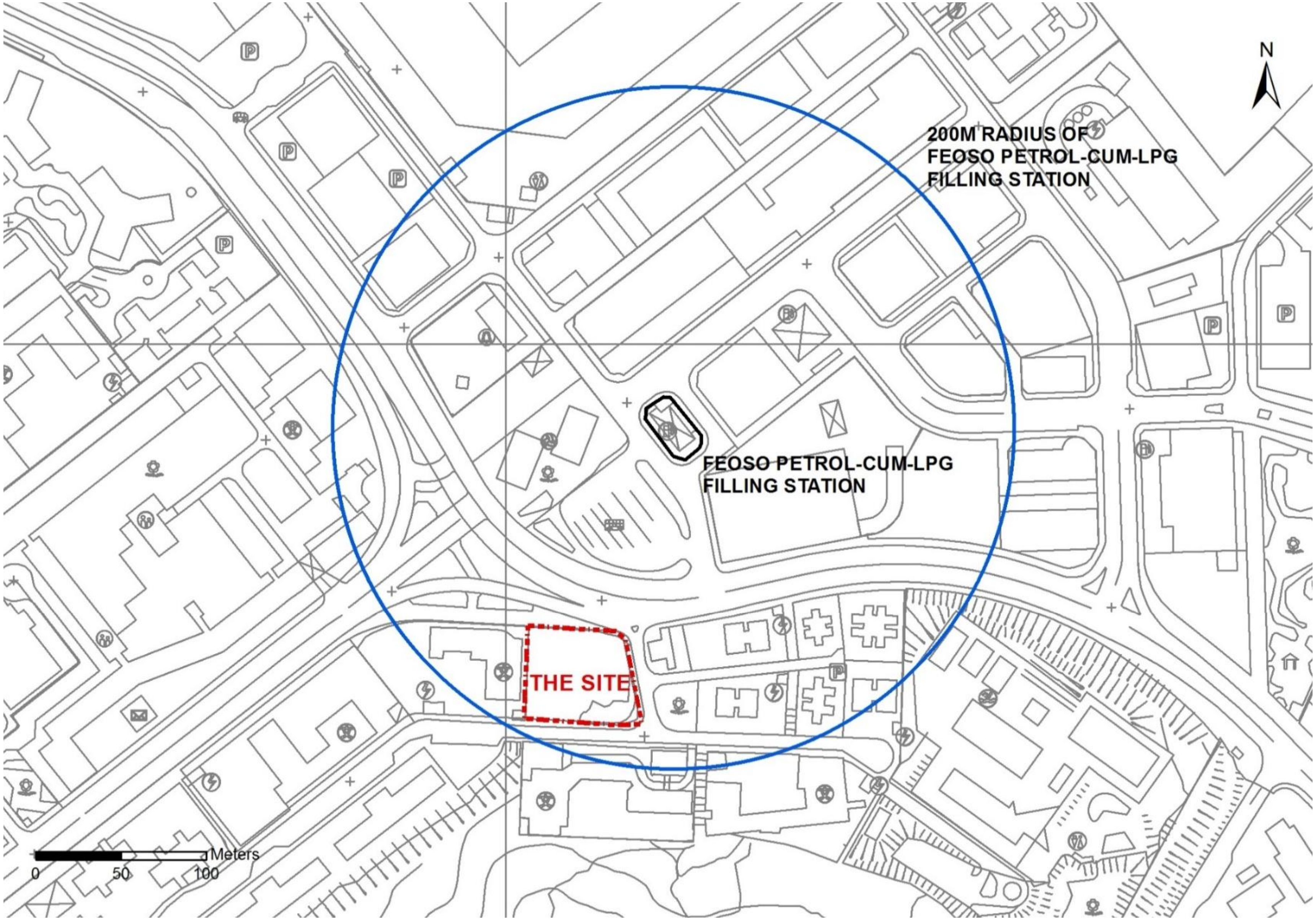
QUANTITATIVE RISK ASSESSMENT FOR A PROPOSED PUBLIC HOUSING DEVELOPMENT NEAR CHAI WAN ROAD

SOCIETAL RISK GUIDELINES

AECOM

Figure 1

Project No.: 60488705 Date: MAR 2016



QUANTITATIVE RISK ASSESSMENT
FOR A PROPOSED PUBLIC HOUSING
DEVELOPMENT NEAR CHAI WAN ROAD

SITE LOCATION PLAN

AECOM

Project No.: 60488705 Date: MAR 2016

Figure 2

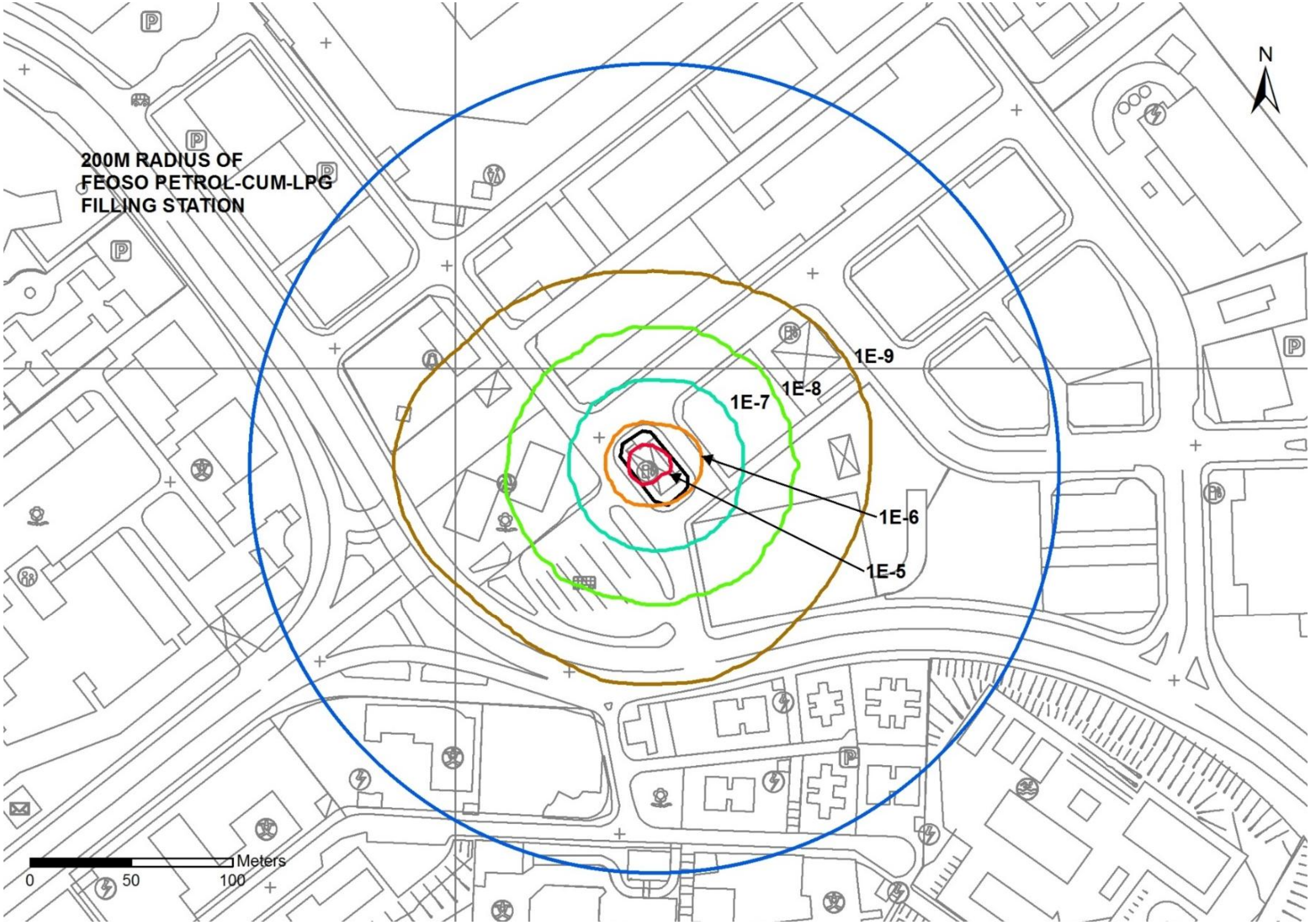
QUANTITATIVE RISK ASSESSMENT
FOR A PROPOSED PUBLIC HOUSING
DEVELOPMENT NEAR CHAI WAN ROAD

SURROUNDING POPULATION GROUPS

AECOM

Project No.: 60488705 Date: MAR 2016

Figure 3



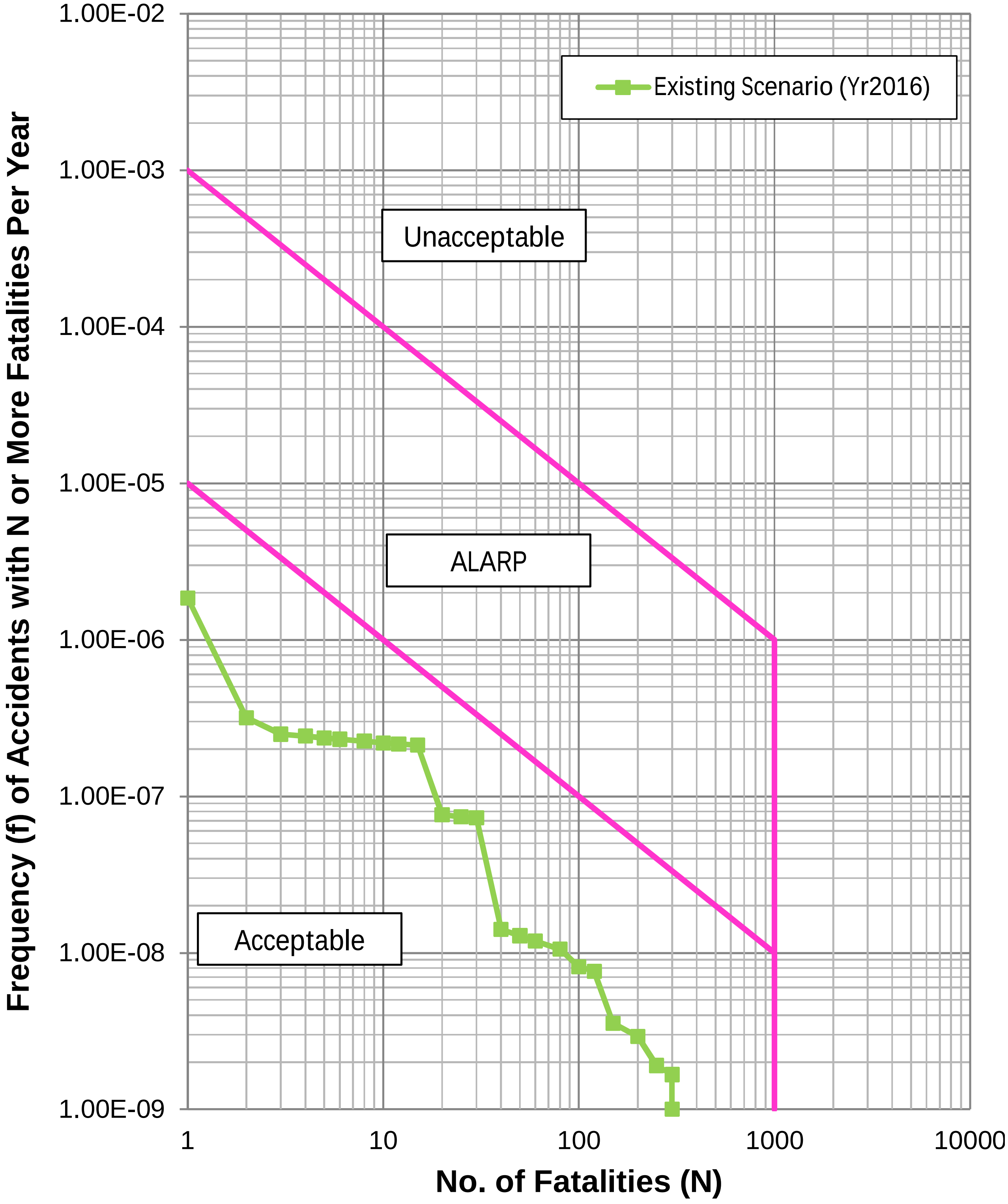
QUANTITATIVE RISK ASSESSMENT
FOR A PROPOSED PUBLIC HOUSING
DEVELOPMENT NEAR CHAI WAN ROAD

INDIVIDUAL RISK CONTOURS FOR LPG FILLING STATION

AECOM

Project No.: 60488705 Date: MAR 2016

Figure 4



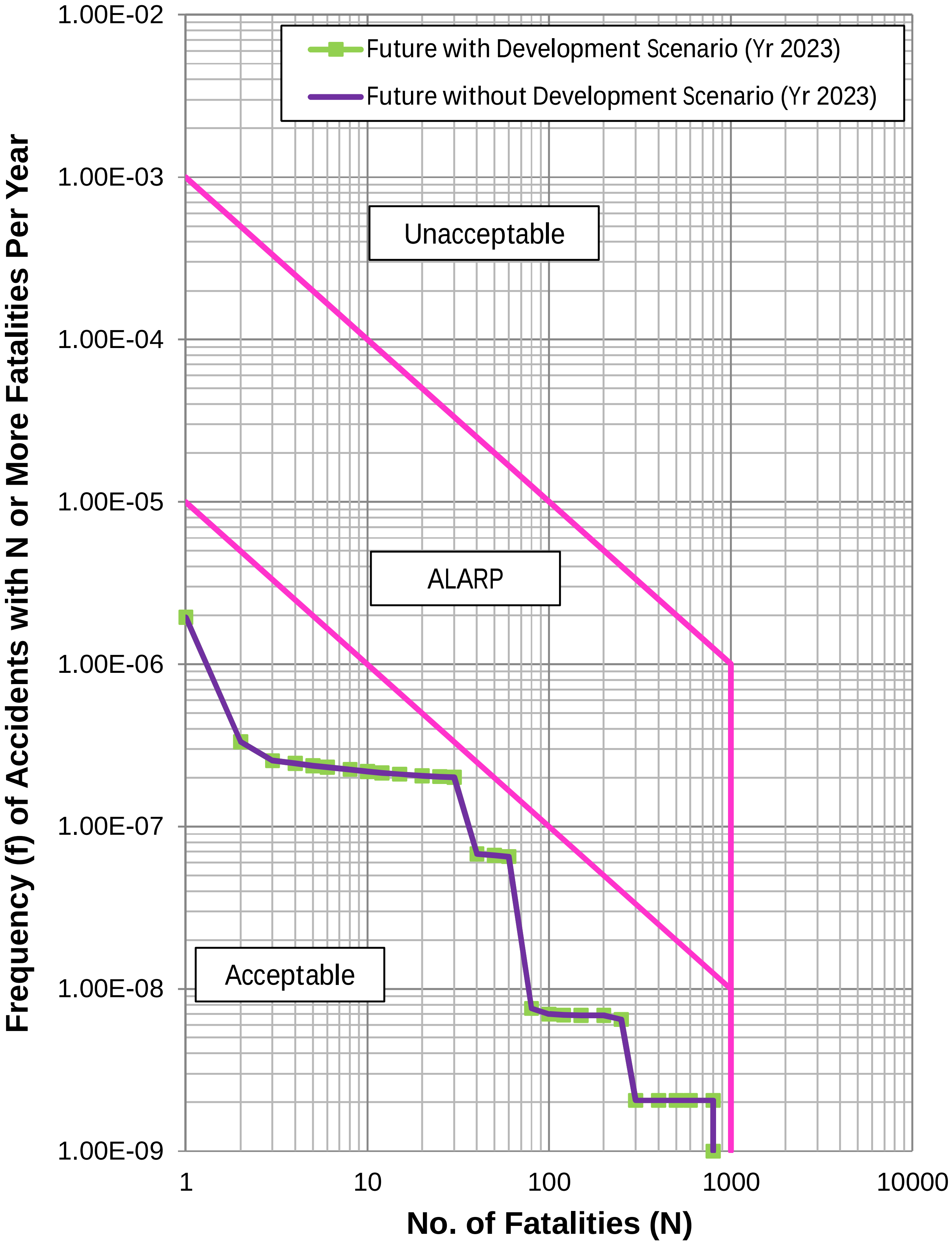
QUANTITATIVE RISK ASSESSMENT
FOR A PROPOSED PUBLIC HOUSING
DEVELOPMENT NEAR CHAI WAN ROAD

Project No.: 60488705 Date: MAR 2016

FN CURVE FOR
LPG FILLING STATION
(EXISTING SCENARIO)

AECOM

Figure 5



QUANTITATIVE RISK ASSESSMENT
FOR A PROPOSED PUBLIC HOUSING
DEVELOPMENT NEAR CHAI WAN ROAD

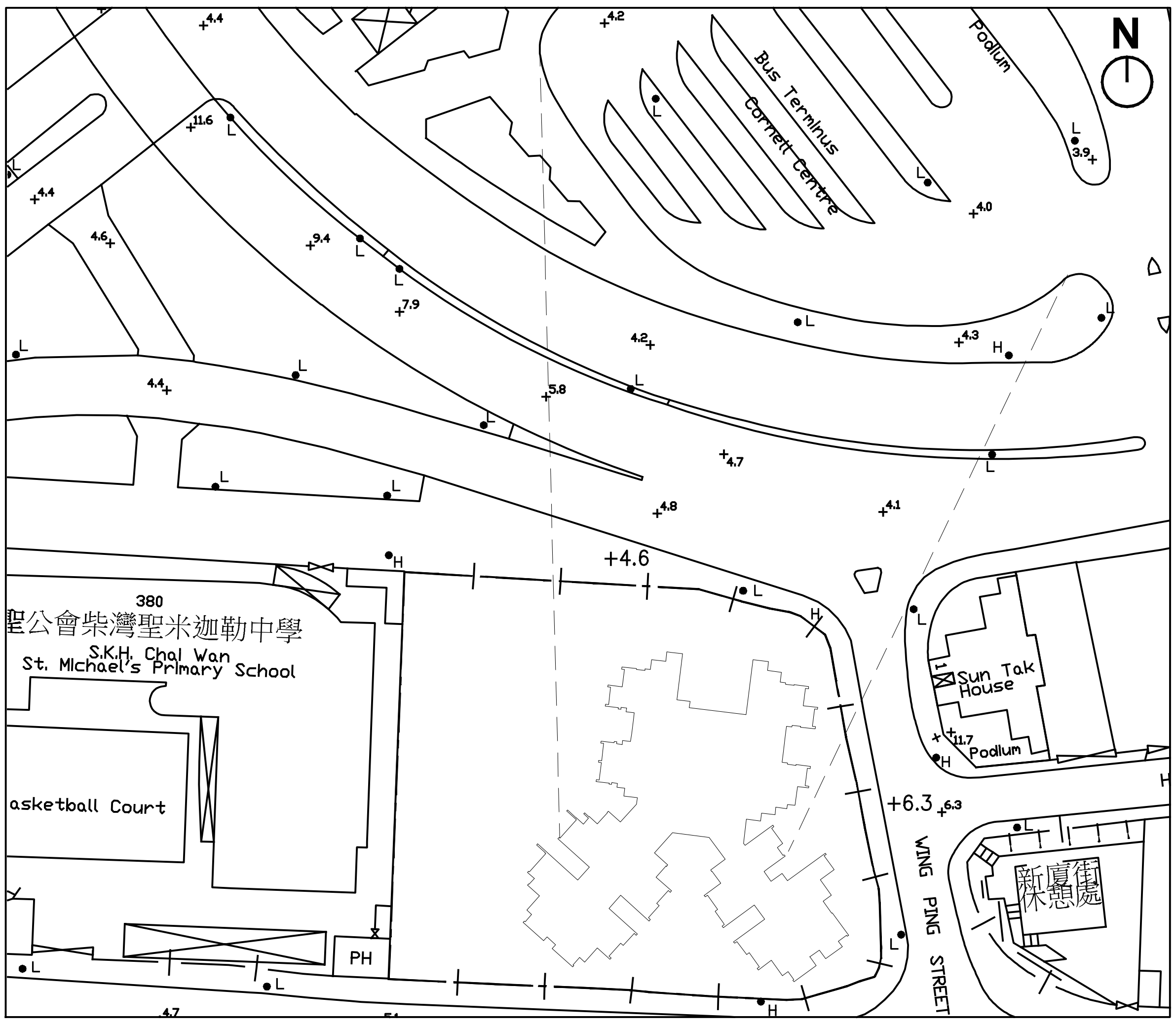
Project No.: 60488705 Date: MAY 2016

FN CURVE FOR
LPG FILLING STATION
(FUTURE STAGE)

Figure 6

APPENDIX A

Layout Plan of the Proposed Development



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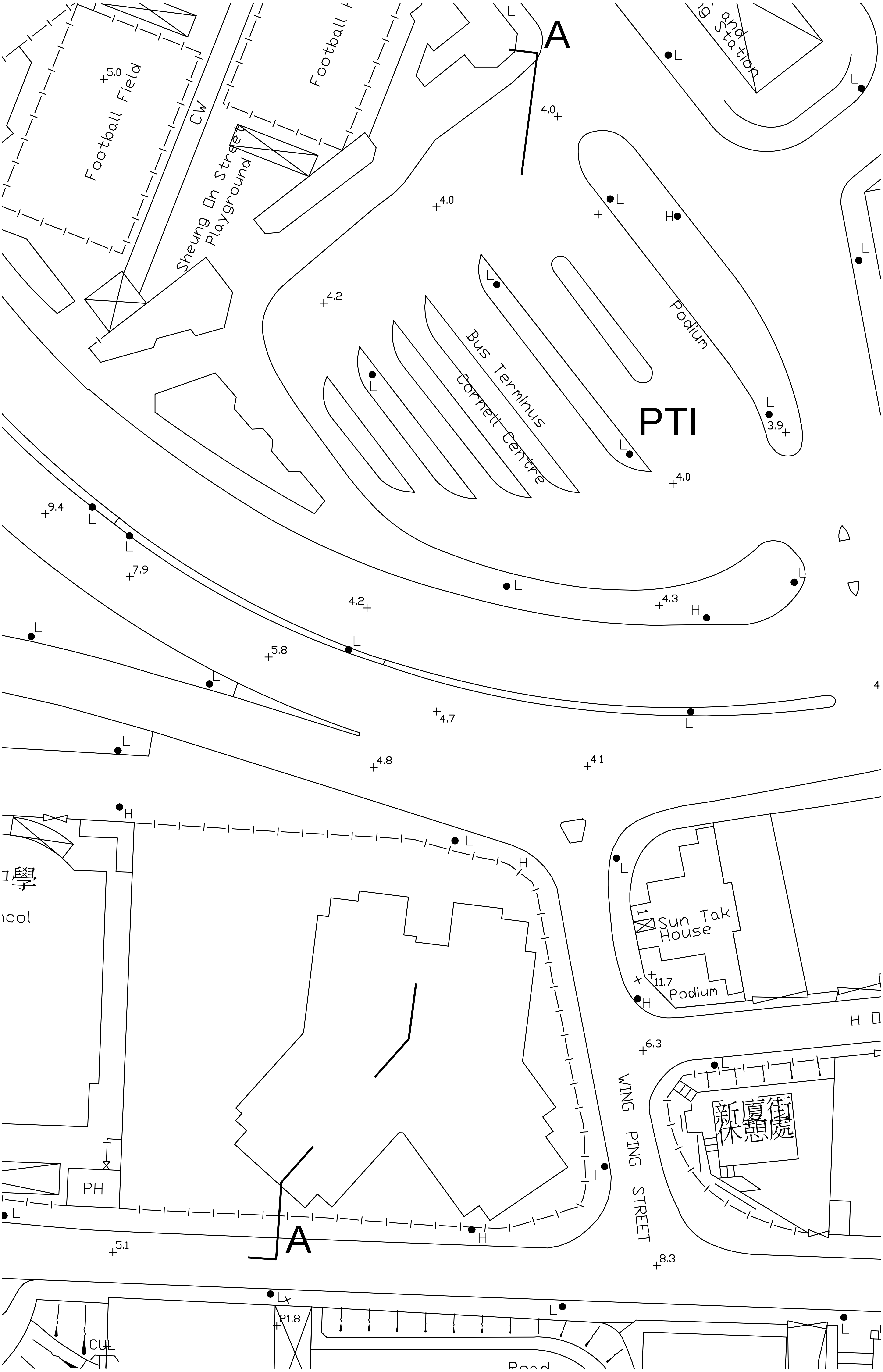
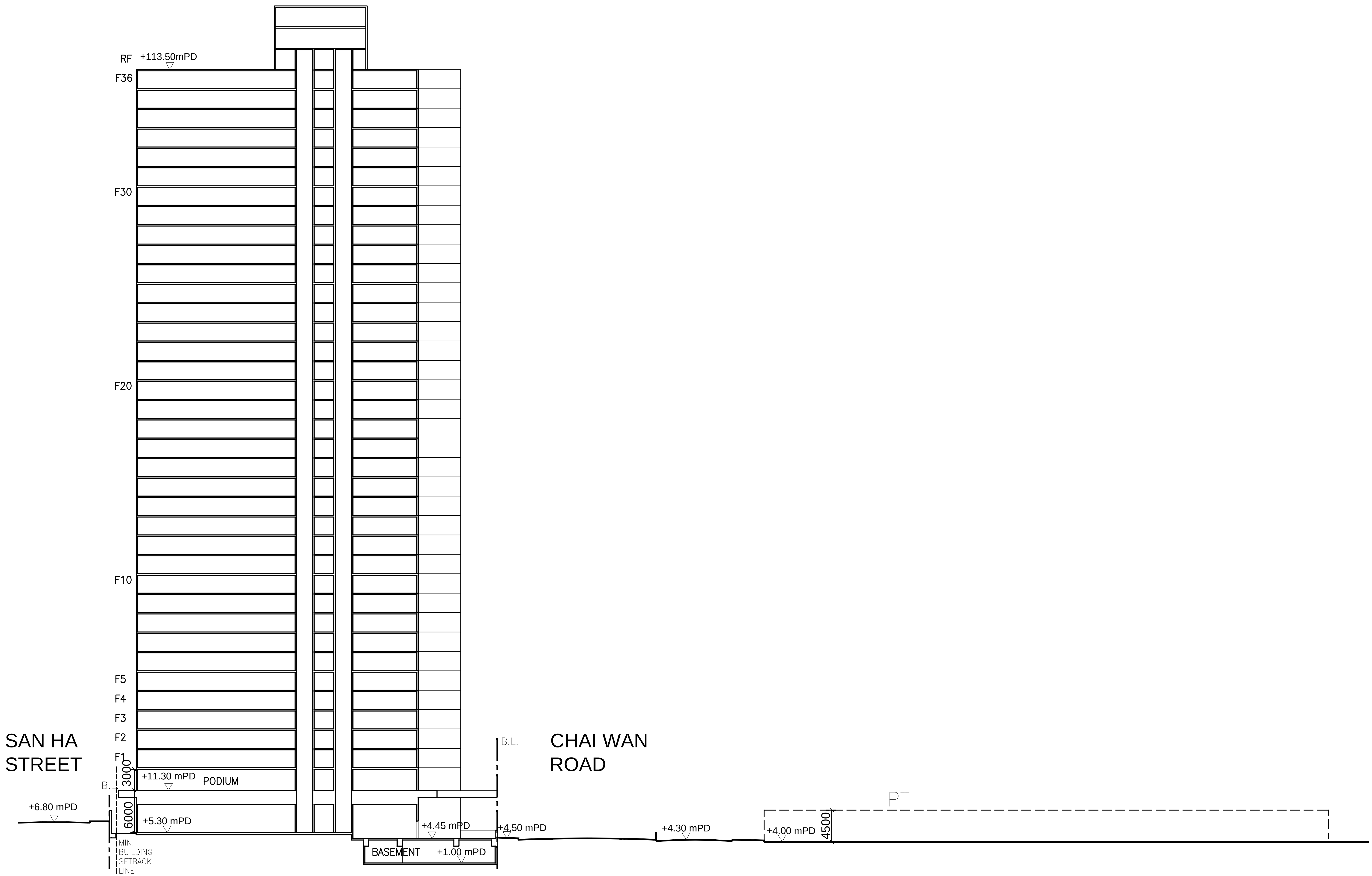


KEY PLAN SCALE 1:2000(A3)



SECTION A SCALE 1:500(A3)

APPENDIX B

Population Data

ID	Description	No. of Storeys	Population		Indoor ratio	% occupancy				Exisiting (Year 2016)				Future (Year 2023)			
			Maximum Population	Maximum Population						Population				Population			
						Weekday		Weekend		Weekday		Weekend		Weekday		Weekend	
			Existing - Yr 2016	Future - Yr 2023		Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
1	Project Site	1	0	2200	0.95	50%	100%	70%	100%	0	0	0	0	1100	2200	1540	2200
2	S.K.H. Chai Wan Saint Michael's Primary School	6	1050	1050	0.95	100%	0%	55%	0%	1050	0	578	0	1050	0	578	0
3	San Ha Street Sitting-out Area	1	5	5	0	100%	10%	100%	10%	5	1	5	1	5	1	5	1
4	Sun Tak House	27	345	345	0.95	50%	100%	70%	100%	172	345	241	345	172	345	241	345
5	Artland Court	16	510	510	0.95	50%	100%	70%	100%	255	510	357	510	255	510	357	510
6	Artview Court	15	479	479	0.95	50%	100%	70%	100%	240	479	335	479	240	479	335	479
7	Fu On Court	14	268	268	0.95	50%	100%	70%	100%	134	268	188	268	134	268	188	268
8	Fu Ming Court	12	230	230	0.95	50%	100%	70%	100%	115	230	161	230	115	230	161	230
9	Fu Shing Court	14	357	357	0.95	50%	100%	70%	100%	179	357	250	357	179	357	250	357
10	Wah Yu Court	12	383	383	0.95	50%	100%	70%	100%	191	383	268	383	191	383	268	383
11	Bus Terminus	1	20	0	0	100%	20%	100%	20%	20	4	20	4	0	0	0	0
12	China Motor Bus Company Limited	4	43	0	0.95	100%	0%	50%	0%	43	0	22	0	0	0	0	0
11+12	Proposed Comprehensive Residential Development		0	4060													
	- Residential Blocks	Note 1	0	4000	0.95	50%	100%	70%	100%	0	0	0	0	2000	4000	2800	4000
	- Public Transport Terminus	1	0	20	0.95	100%	20%	100%	20%	0	0	0	0	20	4	20	4
	- Open Space	1	0	40	0	100%	10%	100%	10%	0	0	0	0	40	4	40	4
13	Sunview Industrial Building	15	1317	1317	0.95	100%	0%	50%	0%	1317	0	659	0	1317	0	659	0
14	Cheung Yick Industrial Building & Hop Ming Factory Building	15	985	985	0.95	100%	0%	50%	0%	985	0	493	0	985	0	493	0
15	Vacant Land	1	0	20	0.5	100%	0%	50%	0%	0	0	0	0	20	0	10	0
16	ECO dedicated LPG Filling Station	1	15	15	0	100%	100%	100%	100%	15	15	15	15	15	15	15	15
17	Wah Shing Centre	14	861	861	0.95	100%	0%	50%	0%	861	0	431	0	861	0	431	0
18	Reality Tower	15	422	422	0.95	100%	0%	50%	0%	422	0	211	0	422	0	211	0
19	Kailey Industrial Centre	18	1586	1586	0.95	100%	0%	50%	0%	1586	0	793	0	1586	0	793	0
20	Yip Cheung Centre	15	572	572	0.95	100%	0%	50%	0%	572	0	286	0	572	0	286	0
21	Asia One Tower	15	367	367	0.95	100%	0%	50%	0%	367	0	184	0	367	0	184	0
22	Gee Wing Chang Industrial Building & Gee Tung Chang Industrial Building	15	1055	1055	0.95	100%	0%	50%	0%	1055	0	528	0	1055	0	528	0
23	Federal Centre	15	422	422	0.95	100%	0%	50%	0%	422	0	211	0	422	0	211	0
24	Yiko Industrial Building	15	548	548	0.95	100%	0%	50%	0%	548	0	274	0	548	0	274	0
25	Paramount Building	15	1472	1472	0.95	100%	0%	50%	0%	1472	0	736	0	1472	0	736	0
26	Ming Pao Industrial Centre Block B	15	1133	1133	0.95	100%	0%	50%	0%	1133	0	567	0	1133	0	567	0
27	Sheung On Street Playground	1	50	50	0	100%	10%	100%	10%	50	5	50	5	50	5	50	5
28	Sheung On Driving Test Centre	1	20	20	0	100%	50%	100%	50%	20	10	20	10	20	10	20	10
29	RCP	1	2	2	0	100%	100%	100%	100%	2	2	2	2	2	2	2	2
30	Chai Wan Fire Station	3	43	43	0.95	100%	50%	100%	50%	43	22	43	22	43	22	43	22
31	Cornell Centre	20	1149	1149	0.95	100%	0%	50%	0%	1149	0	575	0	1149	0	575	0
32	Feoso Petrol cum LPG Filling Station	1	5	5	0	100%	100%	100%	100%	5	5	5	5	5	5	5	5
33	Chai Wan Public Cargo Working Area	1	50	50	0	100%	10%	100%	10%	50	5	50	5	50	5	50	5
34	Yue On House	6	761	761	0.95	50%	100%	70%	100%	381	761	533	761	381	761	533	761
35	The Evangelical Lutheran Church of Hong Kong Faith Love Lutheran School	6	390	390	0.95	100%	0%	55%	0%	390	0	215	0	390	0	215	0
36	Caritas Chai Wan Marden Foundation Secondary School		673	673	0.95	100%	0%	55%	0%	673	0	370	0	673	0	370	0
37	Precious Blood Secondary School	6	899	899	0.95	100%	0%	55%	0%	899	0	494	0	899	0	494	0
38	Summit Industrial Building	15	1593	1593	0.95	100%	0%	50%	0%	1593	0	797	0	1593	0	797	0
R1	Wing Tai Road	1	14	15	0	-	-	-	-	14	5	14	5	15	5	15	5
R2	Chai Wan Road	1	81	89	0	-	-	-	-	81	27	81	27	89	30	89	30
R3	Ka Yip Street	1	16	17	0	-	-	-	-	16	5	16	5	17	6	17	6
R4	Sheung On Street	1	32	34	0	-	-	-	-	32	11	32	11	34	11	34	11
R5	Fung Yip Street	1	12	13	0	-	-	-	-	12	4	12	4	13	4	13	4
R6	Kwun Yip Street	1	0	0	0	-	-	-	-	0	0	0	0	0	0	0	0
R7	On Yip Street	1	5	5	0	-	-	-	-	5	2	5	2	5	2	5	2

Note 1: The residential blocks will be located above a podium which is over 10m, hence population in the residential blocks will be protected from flash fire and jet fire.

ID	Description	Shielding Factor	Year 2016_FB				Protection Factor	Year 2016_FF,JF			
			Weekday		Weekend			Weekday		Weekend	
			Day	Night	Day	Night		Day	Night	Day	Night
1	Project Site	0.00	0	0	0	0	0.00	0	0	0	0
2	S.K.H. Chai Wan Saint Michael's Primary School	0.50	525	0	289	0	0.50	525	0	289	0
3	San Ha Street Sitting-out Area	0.00	5	1	5	1	0.00	5	1	5	1
4	Sun Tak House	0.50	86	172	121	172	0.89	19	38	27	38
5	Artland Court	0.50	128	255	179	255	0.81	48	96	67	96
6	Artview Court	0.50	120	240	168	240	0.80	48	96	67	96
7	Fu On Court	0.50	67	134	94	134	0.79	29	57	40	57
8	Fu Ming Court	0.50	58	115	81	115	0.75	29	58	40	58
9	Fu Shing Court	0.50	89	179	125	179	0.79	38	77	54	77
10	Wah Yu Court	0.50	96	191	134	191	0.75	48	96	67	96
11	Bus Terminus	0.00	20	4	20	4	0.00	20	4	20	4
12	China Motor Bus Company Limited	0.00	43	0	22	0	0.25	32	0	16	0
11+12	Proposed Comprehensive Residential Development										
	- Residential Blocks	0.50	0	0	0	0	1.00	0	0	0	0
	- Public Transport Terminus	0.00	0	0	0	0	0.00	0	0	0	0
	- Open Space	0.00	0	0	0	0	0.00	0	0	0	0
13	Sunview Industrial Building	0.50	659	0	329	0	0.80	263	0	132	0
14	Cheung Yick Industrial Building & Hop Ming Factory Building	0.50	493	0	246	0	0.80	197	0	99	0
15	Vacant Land	0.00	0	0	0	0	0.00	0	0	0	0
16	ECO dedicated LPG Filling Station	0.00	15	15	15	15	0.00	15	15	15	15
17	Wah Shing Centre	0.50	431	0	215	0	0.79	185	0	92	0
18	Reality Tower	1.00	0	0	0	0	0.80	84	0	42	0
19	Kailey Industrial Centre	0.50	793	0	397	0	0.83	264	0	132	0
20	Yip Cheung Centre	0.50	286	0	143	0	0.80	114	0	57	0
21	Asia One Tower	0.50	184	0	92	0	0.80	73	0	37	0
22	Gee Wing Chang Industrial Building & Gee Tung Chang Industrial Building	0.50	528	0	264	0	0.80	211	0	106	0
23	Federal Centre	1.00	0	0	0	0	0.80	84	0	42	0
24	Yiko Industrial Building	1.00	0	0	0	0	0.80	110	0	55	0
25	Paramount Building	1.00	0	0	0	0	0.80	294	0	147	0
26	Ming Pao Industrial Centre Block B	1.00	0	0	0	0	0.80	227	0	113	0
27	Sheung On Street Playground	0.00	50	5	50	5	0.00	50	5	50	5
28	Sheung On Driving Test Centre	0.00	20	10	20	10	0.00	20	10	20	10
29	RCP	0.00	2	2	2	2	0.00	2	2	2	2
30	Chai Wan Fire Station	0.50	22	11	22	11	0.00	43	22	43	22
31	Cornell Centre	0.50	575	0	287	0	0.85	172	0	86	0
32	Feoso Petrol cum LPG Filling Station	0.00	5	5	5	5	0.00	5	5	5	5
33	Chai Wan Public Cargo Working Area	0.00	50	5	50	5	0.00	50	5	50	5
34	Yue On House	0.50	190	381	266	381	0.67	127	254	178	254
35	The Evangelical Lutheran Church of Hong Kong Faith Love Lutheran School	0.50	195	0	107	0	0.50	195	0	107	0
36	Caritas Chai Wan Marden Foundation Secondary School	0.50	337	0	185	0	0.50	337	0	185	0
37	Precious Blood Secondary School	0.50	450	0	247	0	0.50	450	0	247	0
38	Summit Industrial Building	0.50	797	0	398	0	0.80	319	0	159	0
R1	Wing Tai Road	0.00	14	5	14	5	0.00	14	5	14	5
R2	Chai Wan Road	0.00	81	27	81	27	0.00	81	27	81	27
R3	Ka Yip Street	0.00	16	5	16	5	0.00	16	5	16	5
R4	Sheung On Street	0.00	32	11	32	11	0.00	32	11	32	11
R5	Fung Yip Street	0.00	12	4	12	4	0.00	12	4	12	4
R6	Kwun Yip Street	0.00	0	0	0	0	0.00	0	0	0	0
R7	On Yip Street	0.00	5	2	5	2	0.00	5	2	5	2

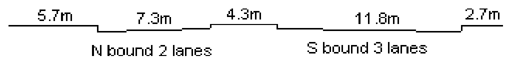
ID	Description	Shielding Factor	Year 2023_FB				Protection Factor	Year 2023_FF,JF			
			Weekday		Weekend			Weekday		Weekend	
			Day	Night	Day	Night		Day	Night	Day	Night
1	Project Site	0.00	1100	2200	1540	2200	0.00	1100	2200	1540	2200
2	S.K.H. Chai Wan Saint Michael's Primary School	0.50	525	0	289	0	0.50	525	0	289	0
3	San Ha Street Sitting-out Area	0.00	5	1	5	1	0.00	5	1	5	1
4	Sun Tak House	0.50	86	172	121	172	0.89	19	38	27	38
5	Artland Court	0.50	128	255	179	255	0.81	48	96	67	96
6	Artview Court	0.50	120	240	168	240	0.80	48	96	67	96
7	Fu On Court	0.50	67	134	94	134	0.79	29	57	40	57
8	Fu Ming Court	0.50	58	115	81	115	0.75	29	58	40	58
9	Fu Shing Court	0.50	89	179	125	179	0.79	38	77	54	77
10	Wah Yu Court	0.50	96	191	134	191	0.75	48	96	67	96
11	Bus Terminus	0.00	0	0	0	0	0.00	0	0	0	0
12	China Motor Bus Company Limited	0.00	0	0	0	0	0.25	0	0	0	0
11+12	Proposed Comprehensive Residential Development										
	- Residential Blocks	0.50	1000	2000	1400	2000	1.00	0	0	0	0
	- Public Transport Terminus	0.00	20	4	20	4	0.00	20	4	20	4
	- Open Space	0.00	40	4	40	4	0.00	40	4	40	4
13	Sunview Industrial Building	0.50	659	0	329	0	0.80	263	0	132	0
14	Cheung Yick Industrial Building & Hop Ming Factory Building	0.50	493	0	246	0	0.80	197	0	99	0
15	Vacant Land	0.00	20	0	10	0	0.00	20	0	10	0
16	ECO dedicated LPG Filling Station	0.00	15	15	15	15	0.00	15	15	15	15
17	Wah Shing Centre	0.50	431	0	215	0	0.79	185	0	92	0
18	Reality Tower	1.00	0	0	0	0	0.80	84	0	42	0
19	Kailey Industrial Centre	0.50	793	0	397	0	0.83	264	0	132	0
20	Yip Cheung Centre	0.50	286	0	143	0	0.80	114	0	57	0
21	Asia One Tower	0.50	184	0	92	0	0.80	73	0	37	0
22	Gee Wing Chang Industrial Building & Gee Tung Chang Industrial Building	0.50	528	0	264	0	0.80	211	0	106	0
23	Federal Centre	1.00	0	0	0	0	0.80	84	0	42	0
24	Yiko Industrial Building	1.00	0	0	0	0	0.80	110	0	55	0
25	Paramount Building	1.00	0	0	0	0	0.80	294	0	147	0
26	Ming Pao Industrial Centre Block B	1.00	0	0	0	0	0.80	227	0	113	0
27	Sheung On Street Playground	0.00	50	5	50	5	0.00	50	5	50	5
28	Sheung On Driving Test Centre	0.00	20	10	20	10	0.00	20	10	20	10
29	RCP	0.00	2	2	2	2	0.00	2	2	2	2
30	Chai Wan Fire Station	0.50	22	11	22	11	0.00	43	22	43	22
31	Cornell Centre	0.50	575	0	287	0	0.85	172	0	86	0
32	Feoso Petrol cum LPG Filling Station	0.00	5	5	5	5	0.00	5	5	5	5
33	Chai Wan Public Cargo Working Area	0.00	50	5	50	5	0.00	50	5	50	5
34	Yue On House	0.50	190	381	266	381	0.67	127	254	178	254
35	The Evangelical Lutheran Church of Hong Kong Faith Love Lutheran School	0.50	195	0	107	0	0.50	195	0	107	0
36	Caritas Chai Wan Marden Foundation Secondary School	0.50	337	0	185	0	0.50	337	0	185	0
37	Precious Blood Secondary School	0.50	450	0	247	0	0.50	450	0	247	0
38	Summit Industrial Building	0.50	797	0	398	0	0.80	319	0	159	0
R1	Wing Tai Road	0.00	15	5	15	5	0.00	15	5	15	5
R2	Chai Wan Road	0.00	89	30	89	30	0.00	89	30	89	30
R3	Ka Yip Street	0.00	17	6	17	6	0.00	17	6	17	6
R4	Sheung On Street	0.00	34	11	34	11	0.00	34	11	34	11
R5	Fung Yip Street	0.00	13	4	13	4	0.00	13	4	13	4
R6	Kwun Yip Street	0.00	0	0	0	0	0.00	0	0	0	0
R7	On Yip Street	0.00	5	2	5	2	0.00	5	2	5	2

APPENDIX C

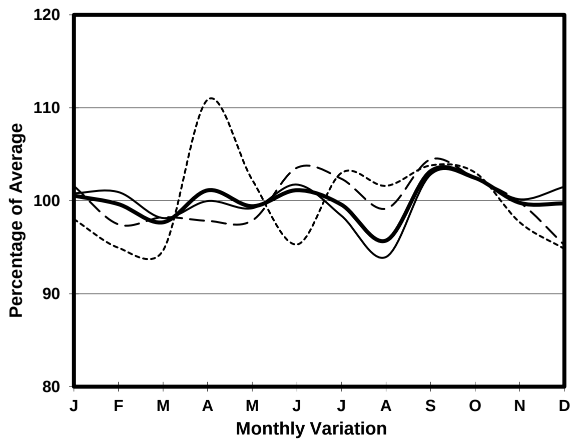
Traffic Data

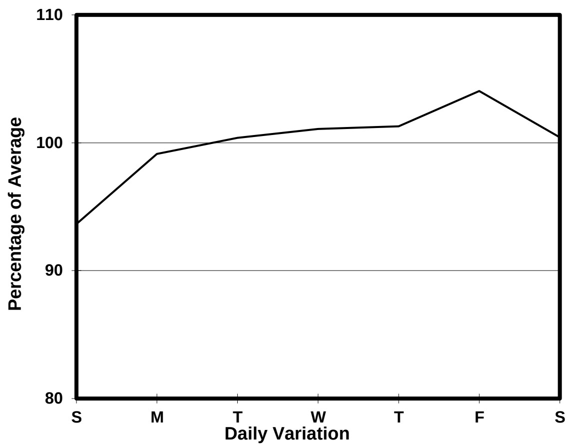
YEAR 2014 **LINK** CHAI WAN RD (from ISLAND EASTERN CORRIDOR APPROACH to TAI TAM RD)

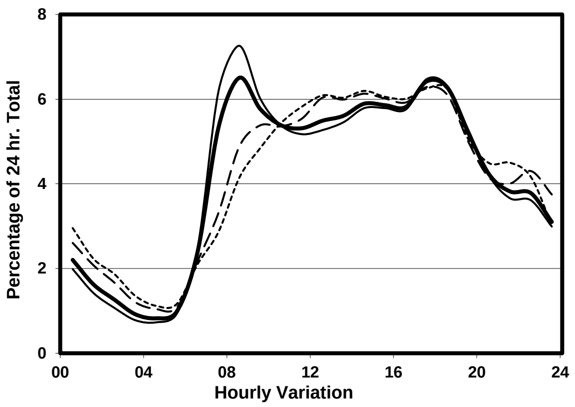
CORE STATION 1009
ROAD NETWORK MAJOR
ROAD TYPE PRIMARY DISTRIBUTOR

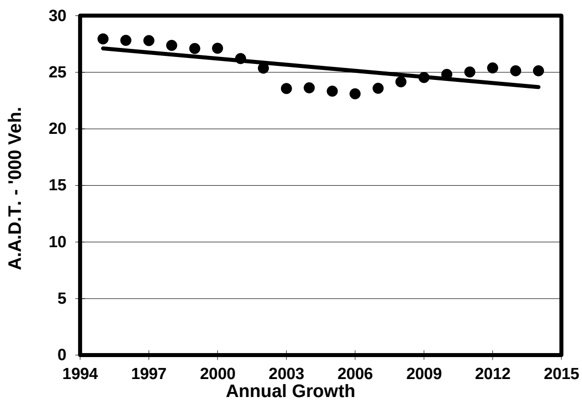


1. TRAFFIC FLOW VARIATION AND GROWTH









All day Mon.- Fri. Sat. Sun.

2. TRAFFIC CHARACTERISTICS (BY DIRECTION)

Parameter	All - Day	Mon. - Fri.	Sat.	Sun.
SOUTH BOUND				
A.A.D.T.	12690	12860	12840	11930
R 12 / 24 - %	67.3	68.3	65	64.2
R 16 / 24 - %	85.5	86.5	83	82.7
AM Peak Hour	0800-0900	0800-0900	0900-1000	0900-1000
One-way flow at AM peak hour	830	930	700	570
T - % (AM)	-	8.7	-	-
PM Peak Hour	1800-1900	1800-1900	1700-1800	1600-1700
One-way flow at PM peak hour	730	740	740	690
T - % (PM)	-	9.9	-	-
Prop.of commercial vehicles - 16 hr.	-	12.6	-	-

Parameter	All - Day	Mon. - Fri.	Sat.	Sun.
NORTH BOUND				
A.A.D.T.	12420	12610	12460	11730
R 12 / 24 - %	72.1	73.4	68.9	67.8
R 16 / 24 - %	87.9	88.6	85.8	85.7
AM Peak Hour	0800-0900	0800-0900	0900-1000	0900-1000
One-way flow at AM peak hour	810	920	660	580
T - % (AM)	-	10.4	-	-
PM Peak Hour	1700-1800	1700-1800	1700-1800	1700-1800
One-way flow at PM peak hour	930	980	850	810
T - % (PM)	-	10.1	-	-
Prop.of commercial vehicles - 16 hr.	-	11.7	-	-

3. OTHER INFORMATION AND COMMENT

4. Vehicle classification and occupancy - Monday to Friday

Time		Motor Cycle	Private Car	Taxi	Private LB	PLB	Goods veh. Light	Goods veh. M & H	Non Fr. Bus	Fr. Bus SD	Fr. Bus DD
0700-0800	Pro	3.1	27.6	27.9	2.4	11.9	7.8	0.0	8.2	0.5	10.7
	Ocp	1.2	1.4	2.0	5.4	10.3	1.2	0.0	18.3	14.0	49.1
0800-0900	Pro	1.6	52.1	21.1	2.0	7.3	6.3	0.8	2.0	0.4	6.4
Peak hour	Ocp	1.0	1.2	2.0	3.1	12.9	1.4	2.3	8.8	29.9	42.9
0900-1000	Pro	3.4	39.1	22.6	1.8	8.6	12.5	0.6	2.1	0.4	8.9
	Ocp	1.0	1.3	2.1	2.2	9.6	1.5	1.0	17.9	17.8	28.9
1000-1100	Pro	1.8	32.4	27.5	2.4	9.8	13.1	0.3	3.4	0.1	9.2
	Ocp	1.0	1.3	2.1	1.8	8.0	1.4	4.0	8.5	18.0	22.4
1100-1200	Pro	2.7	37.8	23.5	1.7	8.5	15.7	0.3	0.3	0.3	9.1
	Ocp	1.0	1.4	2.2	1.6	8.7	1.7	1.0	1.0	12.3	25.6
1200-1300	Pro	2.1	36.7	27.9	4.7	7.0	12.4	0.0	1.3	0.3	7.7
	Ocp	1.1	1.5	1.9	3.7	10.0	1.5	0.0	11.4	21.0	23.7
1300-1400	Pro	1.3	29.0	27.5	2.2	13.7	13.7	1.6	2.2	0.3	8.5
	Ocp	1.0	1.2	1.9	3.0	7.6	1.3	1.4	7.0	9.5	24.6
1400-1500	Pro	1.9	40.8	21.0	1.9	10.2	12.7	0.6	1.9	0.3	8.6
	Ocp	1.2	1.4	2.2	2.7	8.0	1.5	1.5	1.0	16.3	29.7
1500-1600	Pro	2.1	33.9	22.5	2.8	9.7	12.5	1.0	4.8	0.3	10.3
	Ocp	1.0	1.5	2.5	5.8	9.3	1.6	1.7	13.1	16.5	30.0
1600-1700	Pro	3.6	39.1	17.9	2.2	9.2	13.4	0.3	6.4	0.2	7.6
	Ocp	1.0	1.4	2.1	5.3	9.6	1.6	1.0	26.2	14.7	38.9
1700-1800	Pro	3.9	35.9	23.1	2.4	10.4	12.4	0.3	3.0	0.0	8.7
	Ocp	1.1	1.5	2.0	4.8	11.0	1.5	2.0	7.1	0.0	45.1
1800-1900	Pro	4.0	45.6	24.6	0.5	9.0	7.5	0.0	0.8	0.2	7.8
	Ocp	1.1	1.6	2.5	2.5	11.6	1.4	0.0	19.0	37.3	48.4
1900-2000	Pro	4.7	49.6	22.8	0.3	10.4	2.8	0.0	0.3	0.1	8.9
	Ocp	1.1	1.5	2.1	3.0	10.4	1.1	0.0	16.0	24.0	35.6
2000-2100	Pro	3.4	37.3	33.1	0.0	9.9	2.7	0.4	0.0	0.2	13.0
	Ocp	1.0	1.6	1.9	0.0	9.0	2.0	1.0	0.0	7.0	24.4
2100-2200	Pro	1.4	31.6	38.1	0.5	10.2	4.2	0.0	0.5	0.1	13.6
	Ocp	1.0	1.9	2.4	4.0	7.2	1.6	0.0	1.0	5.0	28.9
2200-2300	Pro	4.1	37.7	34.5	0.9	6.9	2.3	0.5	0.0	0.0	13.1
	Ocp	1.1	1.9	2.0	3.0	7.1	1.4	2.0	0.0	0.0	27.6
16 hours	Pro	2.8	38.7	25.3	1.9	9.5	9.7	0.4	2.4	0.2	9.1
	Ocp	1.1	1.4	2.1	3.6	9.5	1.5	1.7	14.5	18.5	33.0

Legend

Pro. Proportion of vehicles in % (Sum may not add up to 100% due to figure rounding)
Ocp. Average occupancy of vehicles
M&H Medium and Heavy

APPENDIX D

Aircraft Crash Frequency Calculation

APPENDIX D AIRCRAFT CRASH FREQUENCY CALCULATION

Introduction

The distance between the nearest arrival/departure flight path and the LPG Filling Station at Fung Yip Street is about 4.5 km. The distance between the LPG Filling Station and Chek Lap Kok International Airport is 33 km (distance between the LPG Filling Station and runway is approximately 33.5 km) and over 8 km, which fulfills the criteria for the consideration of airfield accident. At such distances, the LPG Filling Station is not covered by critical takeoff and landing phases. The frequency of aircraft crash is estimated using the methodology of the HSE (1997). Civil aircraft is the main type using the airport. According to the statistic of Civil International Air Transport Movements of Aircraft, there are 406,034 movements between January 2015 and December 2015 inclusively.

Frequency Calculation

The frequency of aircraft crash of a particular aircraft type is calculated with reference to *Health and Safety Executives - The Calculation of Aircraft Crash Risk in the UK* prepared by J P Byrue in 1997, given by the following equation:

Frequency (per year) = Background Crash Rate + Airway Crash Rate

Frequency (per year) = (A x B_i) + (A x N_i x R_i x afac/ alt), where

- A = area of the LPG Filling Station (in km^2)
- N_i = number of aircraft movement (for aircraft type i)
- B_i = background crash rate for aircraft (for aircraft type i, in per year per km^2)
- R_i = aircraft in-flight reliability (for aircraft type i, crashes per year per km per aircraft movement)
- alt = altitudes of airways (in km)
- afac = area factor used in airway calculation

The parameters of the above equation are listed as follows:

- Area of the LPG Filling Station (A): 6.96×10^{-4} km^2 = $696m^2$
- Number of aircraft movement (N):
  - There is 406,034 aircraft movement annually.
- Background aircraft crash rate (B_i):
  - The background crash rate for airliners is 2×10^{-6} per year per km^2
- Aircraft in-flight crash rate (R_i):
  - It is taken as 4.7×10^{-11} per year per km per movement
- Altitudes of airways (alt):
  - altitudes of airways is taken as 5 km
- Area factor (afac):
  - area factor (afac) is taken as 0.265 from Table 9 of Byrne (1997) with corresponding x1 = 0.9
    (x1 = x/alt where x = the minimum horizontal distance from airway/ flight path to the site which is taken as 4.5 km)

By substituting the parameters into the equation listed above, the annual aircraft crash rate can be estimated and listed as follows:

- Crash rate for airliners = 2.10×10^{-9} per year

Therefore, the frequency of aircraft crash at the LPG Filling Station
= 2.10×10^{-9} per year.

Probability of LPG equipment failure due to aircraft crash

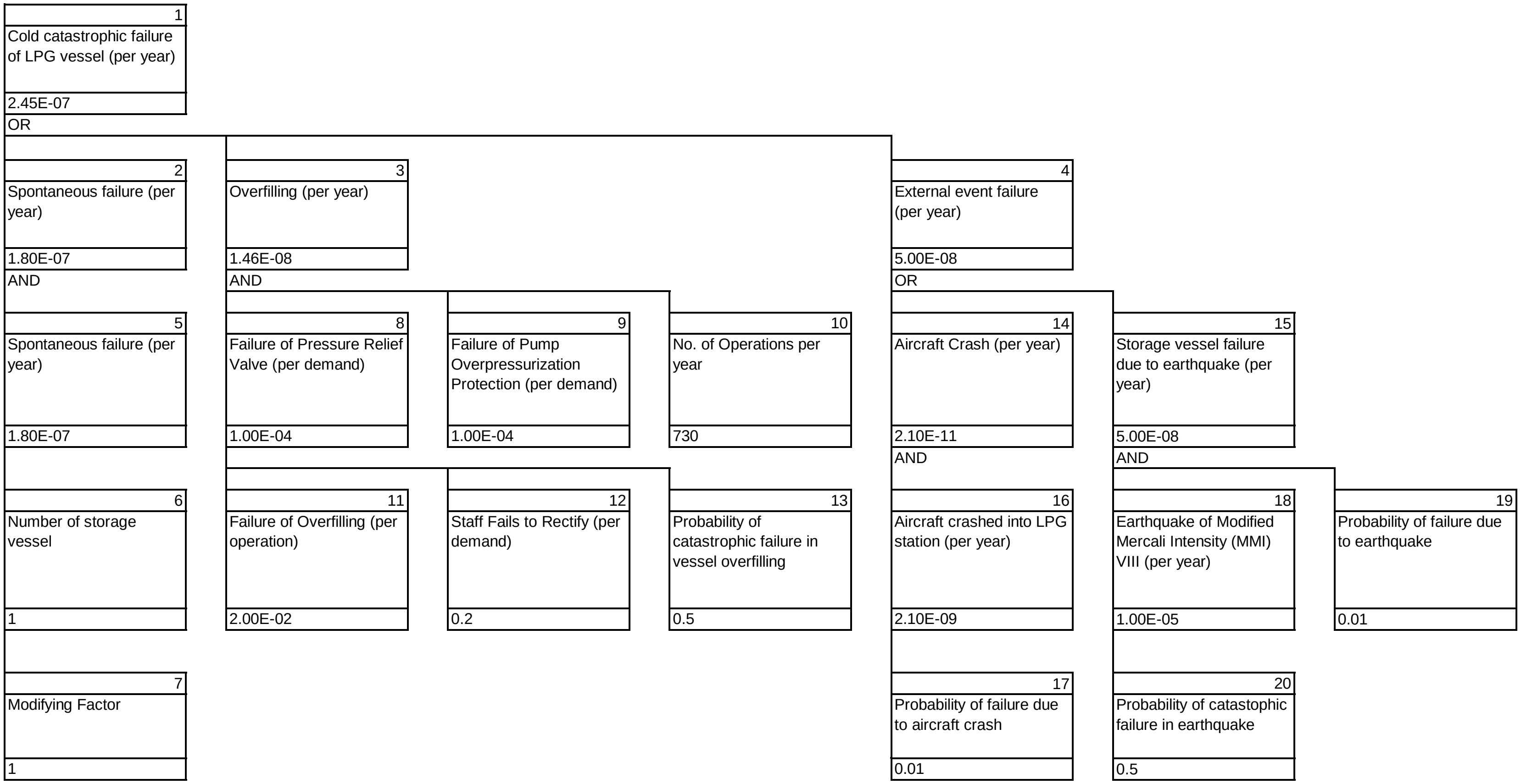
It is assumed that when there is an aircraft crash, the LPG liquid-line pipework (i.e. ‘liquid inlet pipeline to storage vessel’ and ‘liquid line to dispenser’) and dispenser will definitely fail (i.e. probability = 1). For ‘vapour return line’, it is assumed that the probability is 10 times lower than that of liquid-line pipework because the vapour return line is installed underground. The ‘liquid line from tanker to flexible hose’ is not considered because aircraft crash to tanker will lead to ‘road tanker failure’, which has a greater consequence.

For failure of road tanker, it is assumed that the probability of ‘road tanker rupture’ and ‘road tanker partial failure’ given that there is an aircraft crash are 0.1 and 0.9 respectively. For failure of storage vessel, it is assumed that the probability of failure is 10 times lower than that of road tanker because the LPG storage vessel is installed underground. Therefore, it is assumed that the probability of ‘storage vessel rupture’ and ‘storage vessel partial failure’ given that there is an aircraft crash are 0.01 and 0.09 respectively.

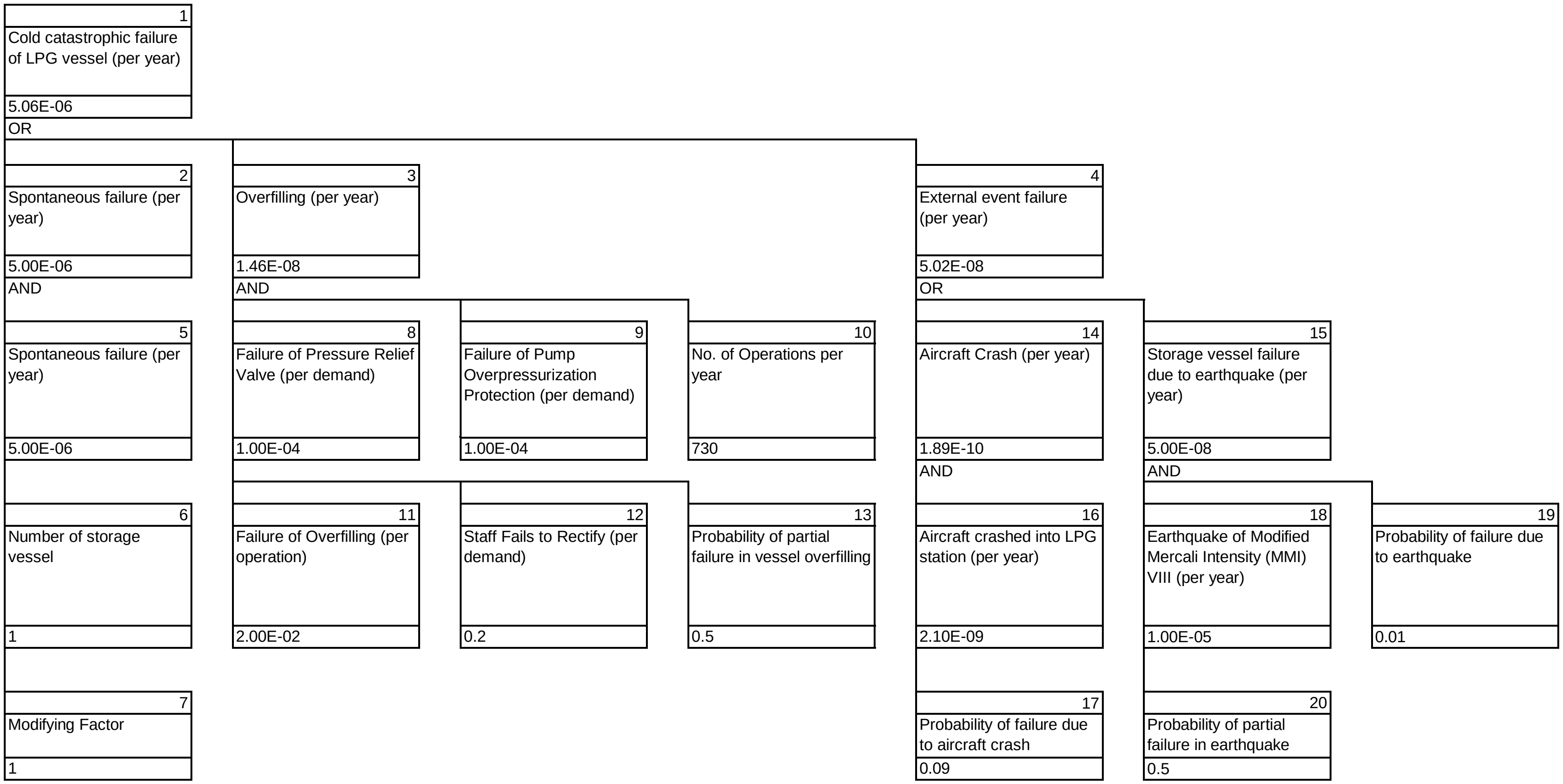
APPENDIX E

Fault Tree Analysis

A-1 ***Cold Catastrophic Failure of an LPG Vessel***



A-2 ***Cold Partial Failure of an LPG Vessel***



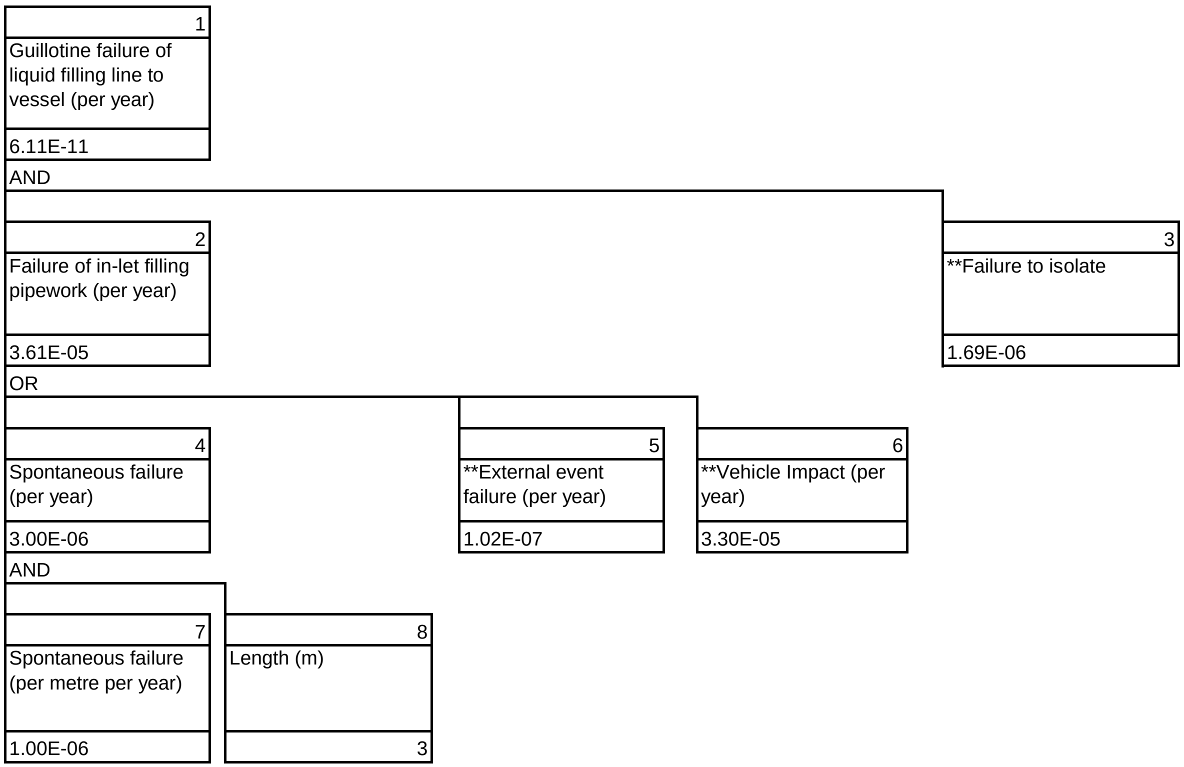
A-3 ***Cold Catastrophic Failure of Road Tanker***

- **1** Cold catastrophic failure of LPG road tanker (per year) — 2.09E-07 — OR
  - **2** Spontaneous failure (per year) — 2.08E-07 — AND
    - **6** Spontaneous failure (per year) — 2.00E-06
    - **7** Portion of time on site — 0.104
  - **3** Vehicle Impact (per year) — 7.30E-10 — AND
    - **8** Vehicle impact into tanker during unloading (per operation) — 1.00E-08
      - **10** Probability to cause rupture — 0.10
      - **11** portion of impact with sufficient energy to cause damage — 0.001
    - **9** No. of operation per year — 730
  - **4** Tanker Collision (per year) — 0.00E+00 — AND
    - **12** Tanker collision during unloading (per operation) — 1.50E-04
      - **14** Probability of concurrent road tanker unloading — 0
      - **16** Portion of impact with sufficient energy to cause damage — 0.01
    - **13** No. of operation per year — 730
      - **15** Probability to cause rupture — 0.1
  - **5** External Events Failure (per year) — 2.18E-10 — OR
    - **17** Aircraft Crash (per year) — 2.18E-10 — AND
      - **20** Aircraft crashed into LPG station (per year) — 2.10E-09
      - **21** Probability of failure due to aircraft crash — 1
      - **22** Portion of time for tanker on site — 0.104
    - **18** Failure due to earthquake (per year) — 0.00E+00 — AND
      - **23** Earthquake of Modified Mercali Intensity (MMI) VIII (per year) — 1.00E-05
      - **24** Probability of failure due to earthquake — 0.0
      - **25** Portion of time for tanker on site — 0.104
    - **19** Failure due to landslide (per year) — 0.00E+00 — AND
      - **26** Landslide (per year) — 0.00E+00
      - **27** Probability of failure due to landslide — 0.005
      - **28** Portion of time for tanker on site — 0.104

A-4 ***Cold Partial Failure of Road Tanker***

- 1 — Cold partial failure of LPG road tanker (per year) — 5.27E-07 — OR
  - 2 — Spontaneous failure (per year) — 5.21E-07 — AND
    - 6 — Spontaneous failure (per year) — 5.00E-06
    - 7 — Portion of time on site — 0.104
  - 3 — Vehicle Impact (per year) — 6.57E-09 — AND
    - 8 — Vehicle impact into tanker during unloading (per operation) — 1.00E-08
      - 10 — Probability to cause partial failure — 0.90
      - 11 — portion of impact with sufficient energy to cause damage — 0.001
    - 9 — No. of operation per year — 730
  - 4 — Tanker Collision (per year) — 0.00E+00 — AND
    - 12 — Tanker collision during unloading (per operation) — 1.50E-04
      - 14 — Probability of concurrent road tanker unloading — 0
      - 16 — Portion of impact with sufficient energy to cause damage — 0.01
    - 13 — No. of operation per year — 730
      - 15 — Probability to cause partial failure — 0.9
  - 5 — External Events Failure (per year) — 0.00E+00 — OR
    - 17 — Aircraft Crash (per year) — 0.00E+00 — AND
      - 20 — Aircraft crashed into LPG station (per year) — 2.10E-09
      - 21 — Probability of failure due to aircraft crash — 0
      - 22 — Portion of time for tanker on site — 0.104
    - 18 — Failure due to earthquake (per year) — 0.00E+00 — AND
      - 23 — Earthquake of Modified Mercali Intensity (MMI) VIII (per year) — 1.00E-05
      - 24 — Probability of failure due to earthquake — 0.0
      - 25 — Portion of time for tanker on site — 0.104
    - 19 — Failure due to landslide (per year) — 0.00E+00 — AND
      - 26 — Landslide (per year) — 0.00E+00
      - 27 — Probability of failure due to landslide — 0.010
      - 28 — Portion of time for tanker on site — 0.104

A-5a ***Guillotine Failure of In-let Filling Pipework (release from the vessel)***



A-5a ***Guillotine Failure of In-let Filling Pipework (release from the vessel) (Con't)***

3
**Failure to isolate
1.69E-06

AND

9	10	11	12
Emergency Isolation System (EIS) is not effective	Non-return valve failure (per demand)	Manual Valve Failure (per demand)	Double-check valve Failure (per demand)
1.00E-01	0.013	0.50	2.60E-03

OR (under 9)

13	14
fail to activate EIS (per demand)	failure of EIS (per demand)
0.1	1.00E-04

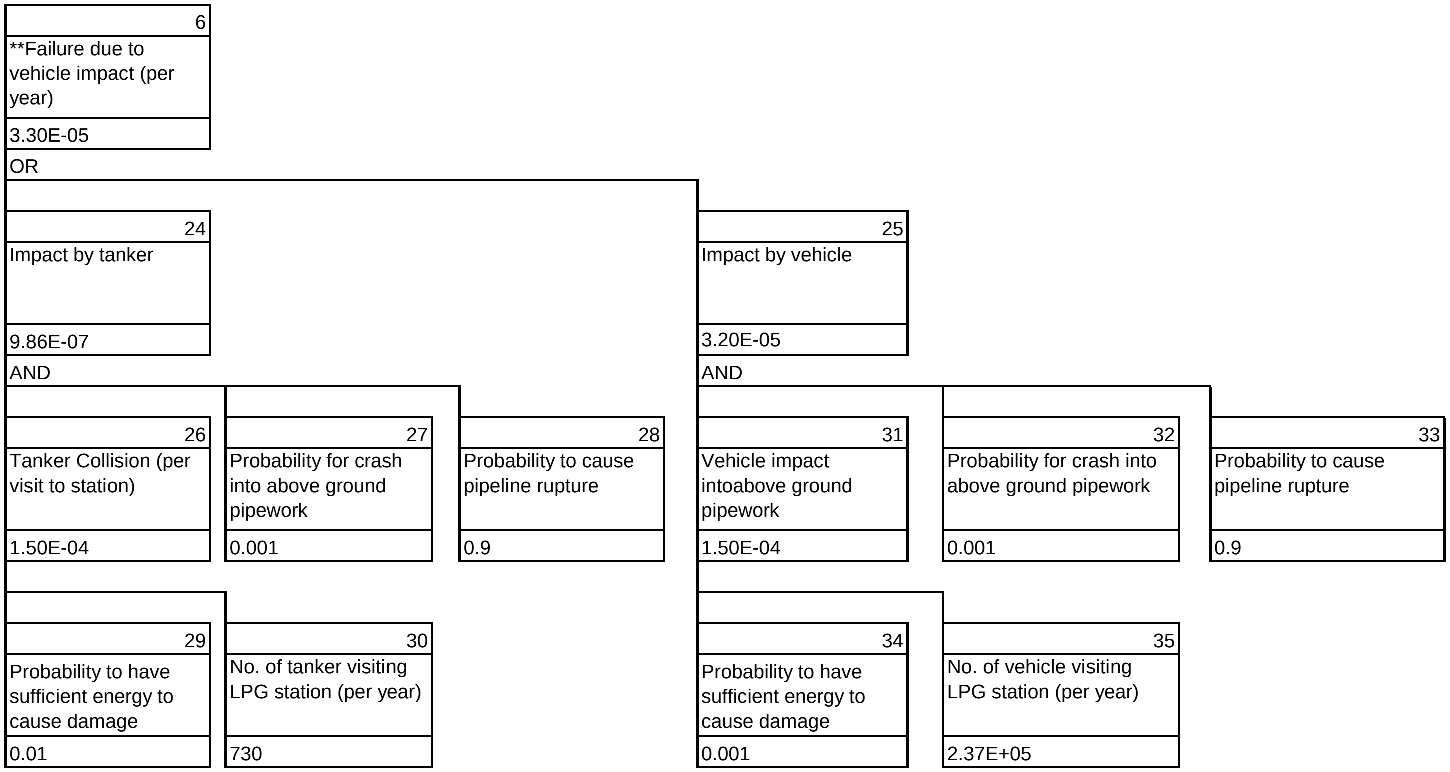
5
**External event failure (per year)
1.02E-07

OR

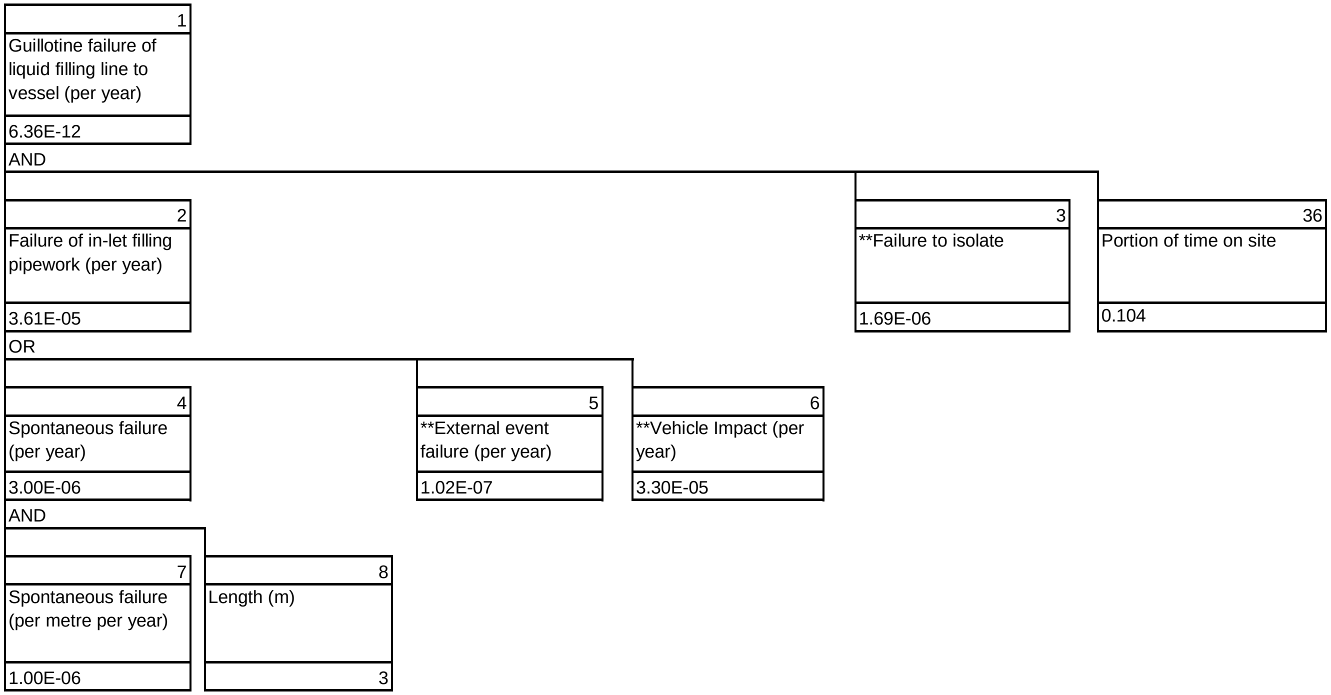
15	18	21
Failure due to earthquake (per year)	Aircraft Crash (per year)	Failure due to landslide (per year)
1.00E-07	2.10E-09	0.00E+00
AND	AND	AND

16	17	19	20	22	23
Earthquake of Modified Mercali Intensity (MMI) VIII (per year)	Probability of failure due to earthquake	Aircraft crashed into LPG station (per year)	Probability of failure due to aircraft crash	Landslide (per year)	Probability of failure due to landslide
1.00E-05	0.01	2.10E-09	1	0.00E+00	0.01

A-5a ***Guillotine Failure of In-let Filling Pipework (release from the vessel) (Con't)***



A-5b ***Guillotine Failure of In-let Filling Pipework (release from road tanker)***

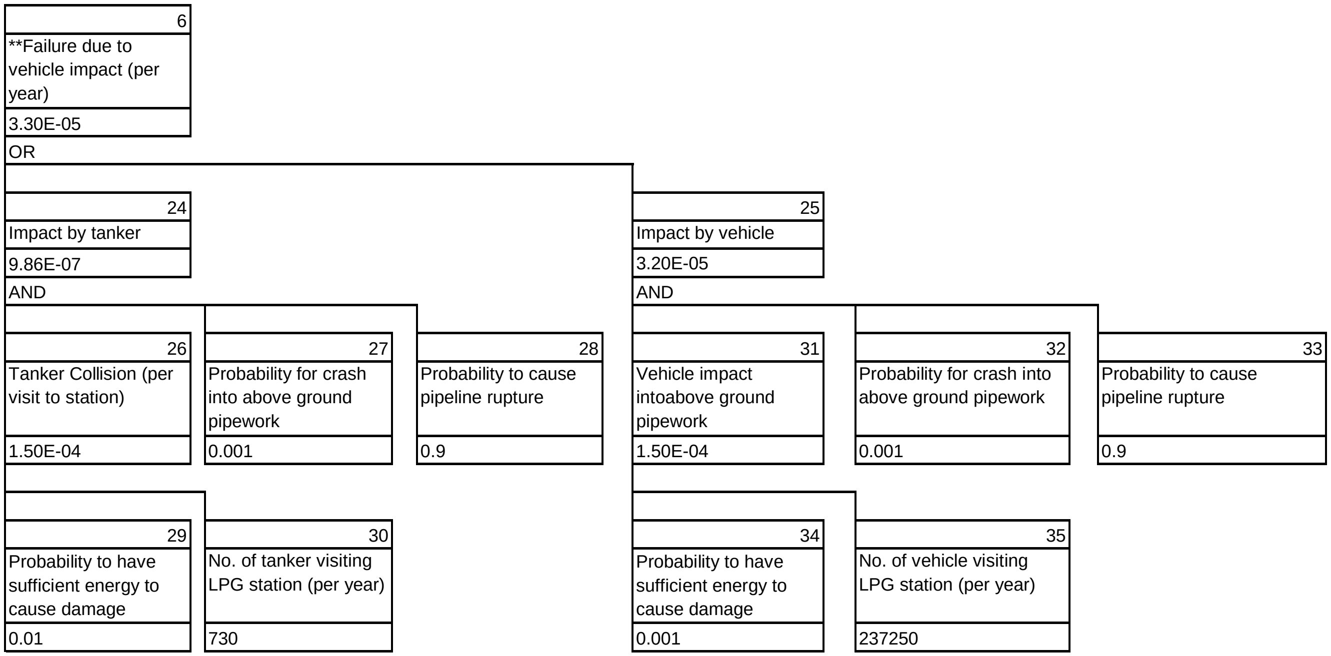


A-5b ***Guillotine Failure of In-let Filling Pipework (release from road tanker) (Con't)***

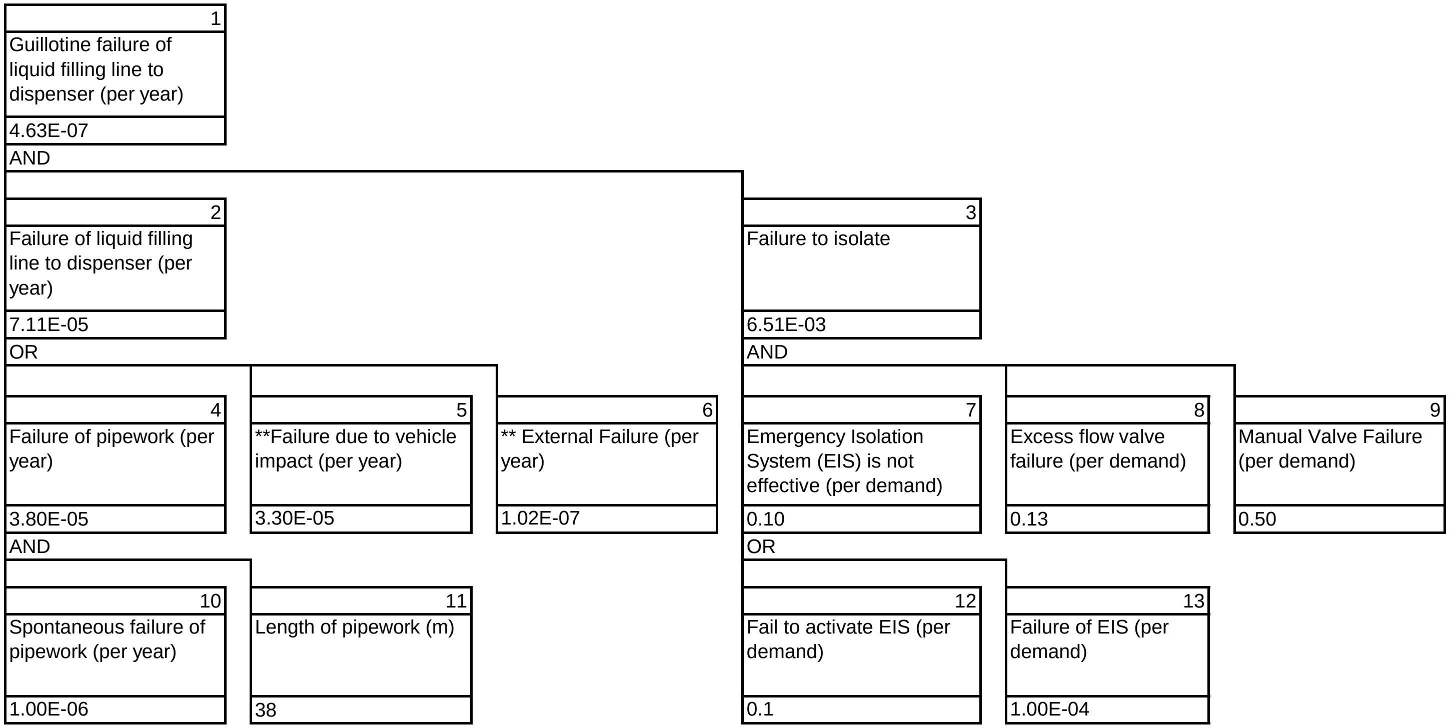
- **3** — **Failure to isolate — 1.69E-06 — AND
  - **9** — Emergency Isolation System (EIS) is not effective — 1.00E-01 — OR
    - **13** — fail to activate EIS (per demand) — 0.1
    - **14** — failure of EIS (per demand) — 1.00E-04
  - **10** — Non-return valve failure (per demand) — 0.013
  - **11** — Manual Valve Failure (per demand) — 0.50
  - **12** — Double-check valve Failure (per demand) — 2.60E-03

- **5** — **External event failure (per year) — 1.02E-07 — OR
  - **15** — Failure due to earthquake (per year) — 1.00E-07 — AND
    - **16** — Earthquake of Modified Mercali Intensity (MMI) VIII (per year) — 1.00E-05
    - **17** — Probability of failure due to earthquake — 0.01
  - **18** — Aircraft Crash (per year) — 2.10E-09 — AND
    - **19** — Aircraft crashed into LPG station (per year) — 2.10E-09
    - **20** — Probability of failure due to aircraft crash — 1
  - **21** — Failure due to landslide (per year) — 0.00E+00 — AND
    - **22** — Landslide (per year) — 0.00E+00
    - **23** — Probability of failure due to landslide — 0.01

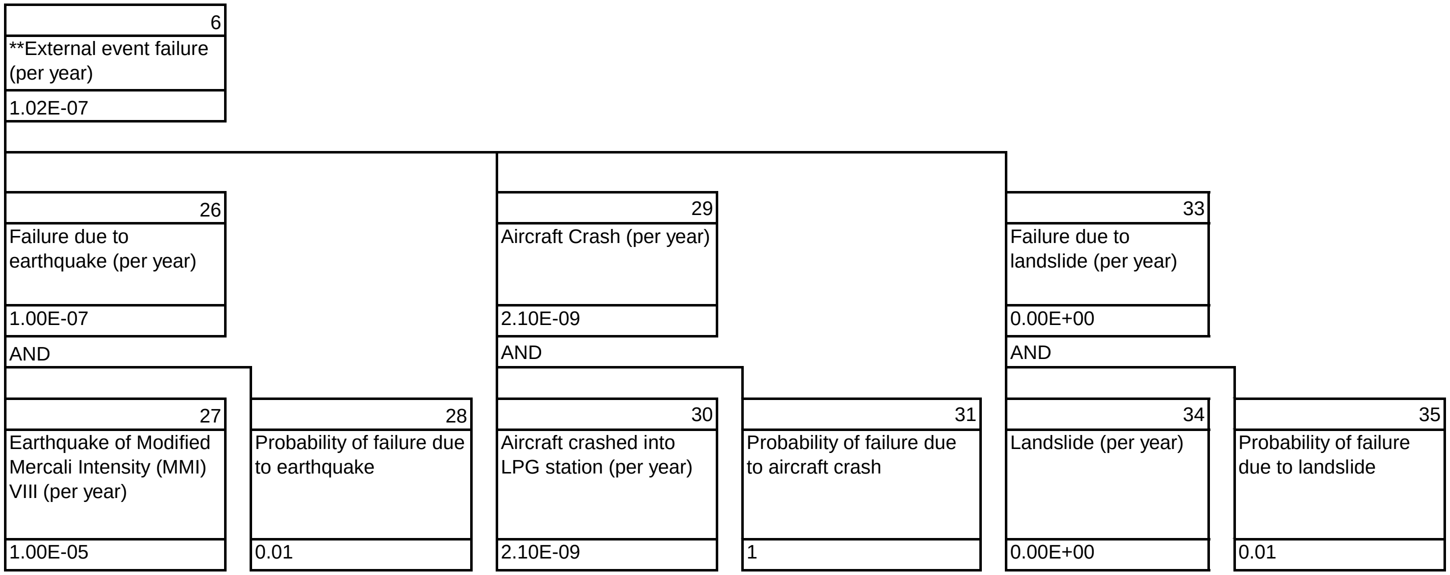
A-5b ***Guillotine Failure of In-let Filling Pipework (release from road tanker) (Con't)***



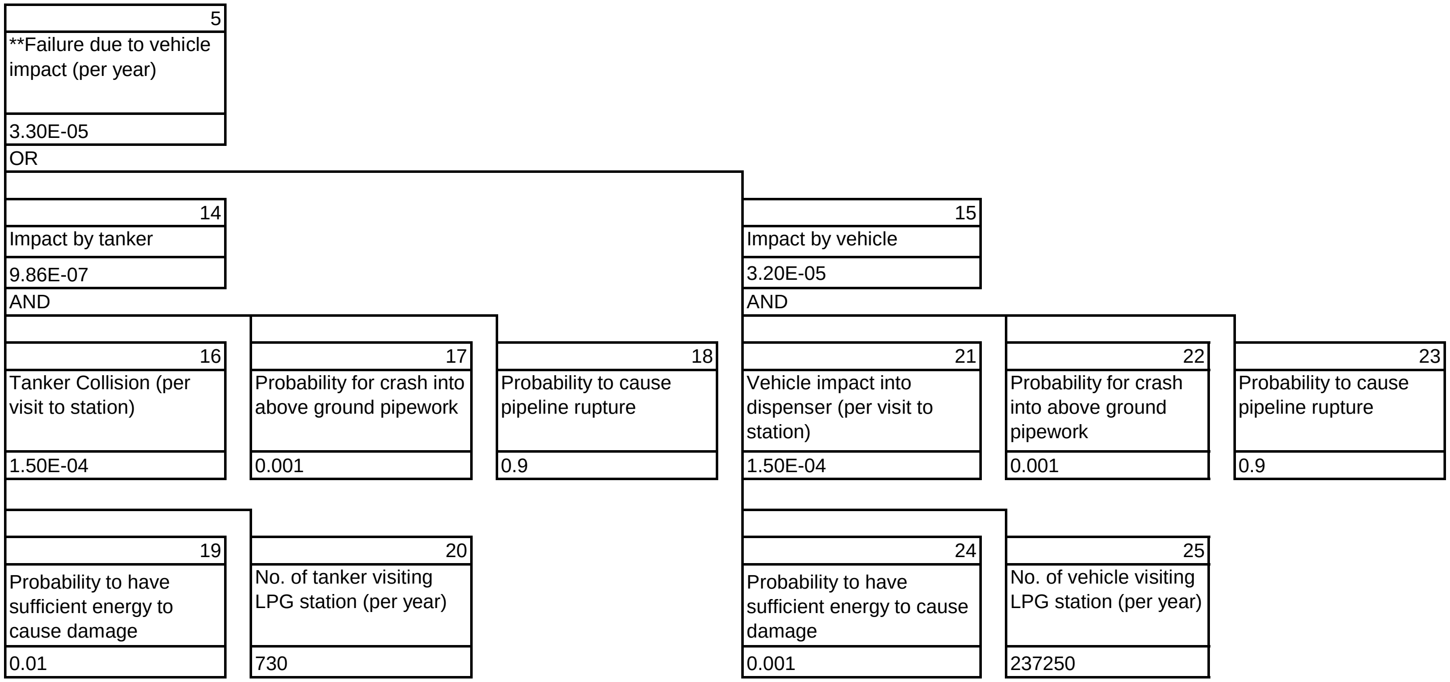
A-6 ***Guillotine Failure of Liquid Supply Line to Dispenser***



A-6 ***Guillotine Failure of Liquid Supply Line to Dispenser (Con't)***



A-6 ***Guillotine Failure of Liquid Supply Line to Dispenser (Con't)***



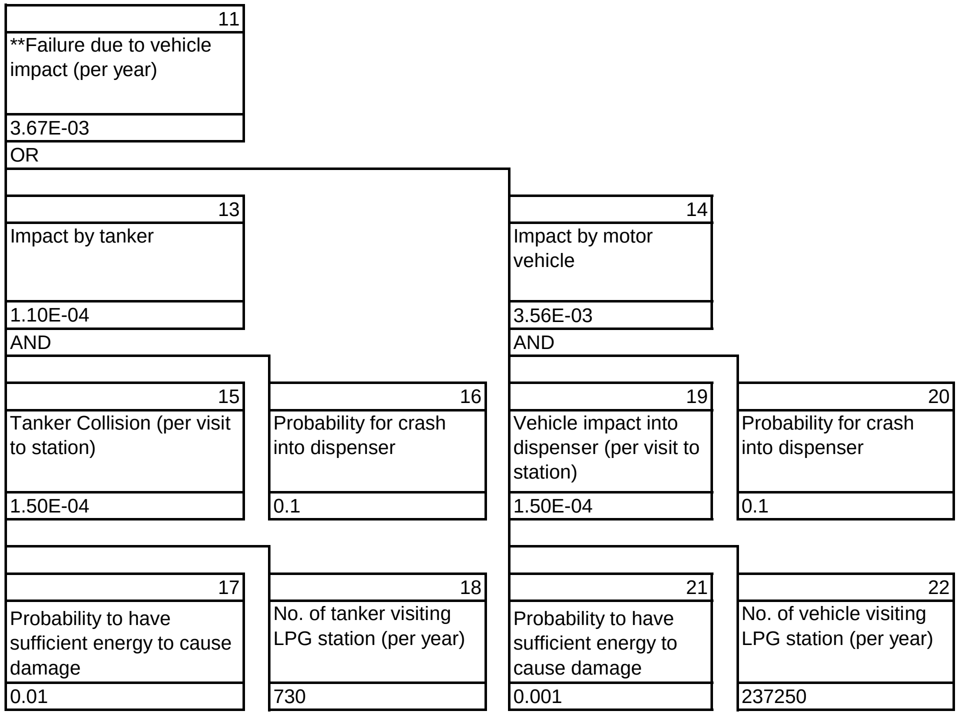
A-7 ***Failure of Dispenser***

- **1** Dispenser failure (per year) — 1.24E-03
  - AND
    - **2** Failure of dispenser (per year) — 9.49E-02
      - AND
        - **4** Failure of dispenser (per year) — 4.75E-02
          - OR
            - **10** Spontaneous failure of dispenser (per year) — 4.38E-02
            - **11** **Failure due to vehicle impact (per year) — 3.67E-03
            - **12** **External Failure (per year) — 1.02E-07
        - **5** No. of dispenser — 2
    - **3** Failure to isolate — 1.30E-02
      - AND
        - **6** Emergency Isolation System (EIS) is not effective (per demand) — 0.10
          - OR
            - **8** Fail to activate EIS (per demand) — 0.1
            - **9** Failure of EIS (per demand) — 1.00E-04
        - **7** Excess flow valve failure (per demand) — 0.13

A-7 ***Failure of Dispenser (con't)***

12	**External event failure (per year)	1.02E-07	OR
23	Failure due to earthquake (per year)	1.00E-07	AND
26	Earthquake of Modified Mercali Intensity (MMI) VIII (per year)	1.00E-05	
27	Probability of failure due to earthquake	0.01	
24	Aircraft Crash (per year)	2.10E-09	AND
28	Aircraft crashed into LPG station (per year)	2.10E-09	
29	Probability of failure due to aircraft crash	1	
25	Failure due to landslide (per year)	0.00E+00	AND
30	Landslide (per year)	0.00E+00	
31	Probability of failure due to landslide	0.01	

A-7 ***Failure of Dispenser (con't)***

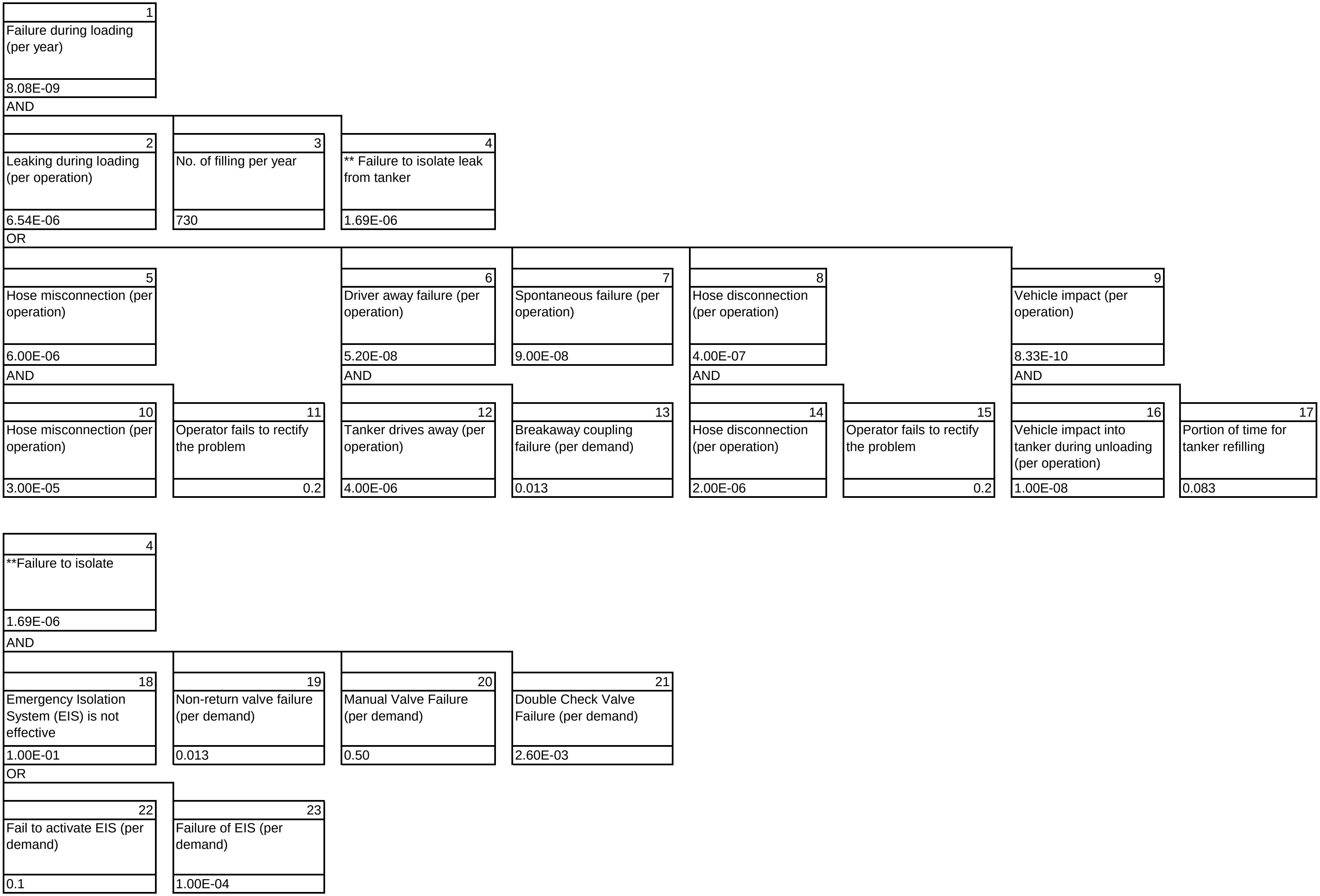


A-8a ***Failure of Flexible Hose during Loading to Storage Vessel (LPG released from the Hose Connecting to Road Tanker)***

1	Failure during loading (per year)	3.11E-06	AND
2	Leaking during loading (per operation)	6.54E-06	OR
3	No. of filling per year	730	
4	** Failure to isolate leak from tanker	6.51E-04	
5	Hose misconnection (per operation)	6.00E-06	AND
6	Driver away failure (per operation)	5.20E-08	AND
7	Spontaneous failure (per operation)	9.00E-08	
8	Hose disconnection (per operation)	4.00E-07	AND
9	Vehicle impact (per operation)	8.33E-10	AND
10	Hose misconnection (per operation)	3.00E-05	
11	Operator fails to rectify the problem	0.2	
12	Tanker drives away (per operation)	4.00E-06	
13	Breakaway coupling failure (per demand)	0.013	
14	Hose disconnection (per operation)	2.00E-06	
15	Operator fails to rectify the problem	2.00E-01	
16	Vehicle impact into tanker during unloading (per	1.00E-08	
17	Portion of time for tanker refilling	0.083	

4	**Failure to isolate	6.51E-04	AND
18	Emergency Isolation System (EIS) is not effective	1.00E-01	OR
19	Excess flow valve failure (per demand)	0.013	
20	Manual Valve Failure (per demand)	0.50	
21	fail to activate EIS (per demand)	0.1	
22	failure of EIS (per demand)	1.00E-04	

A-8b ***Failure of Flexible Hose during Loading to Storage Vessel (LPG released from the Hose Connecting to vessel)***



A-9a ***Failure of Flexible Hose during Loading to Vehicle (LPG released from the Hose Connecting to Dispenser)***

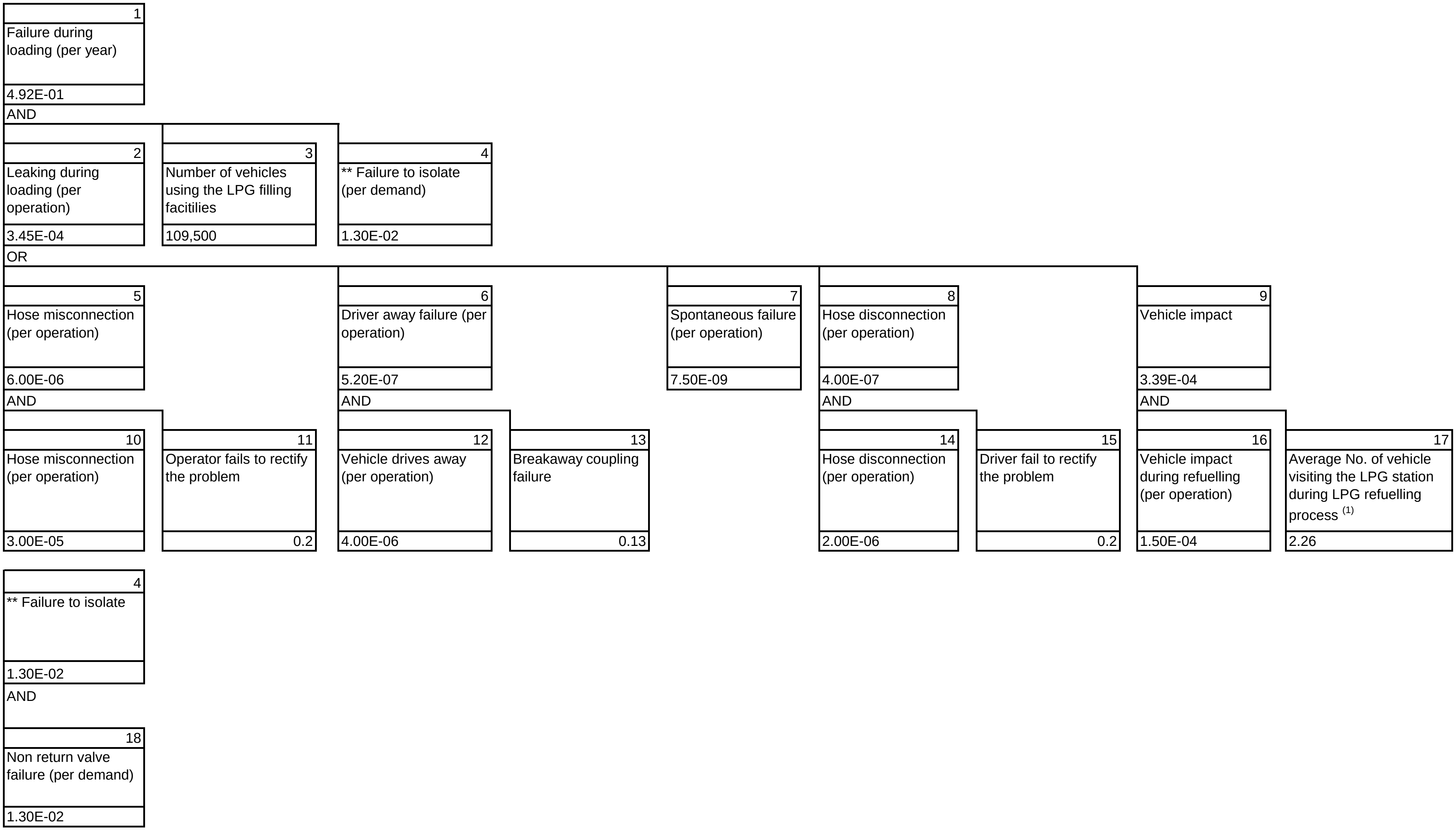
- 1 Failure during loading (per year) — 2.46E-01
  - AND
    - 2 Leaking during loading (per operation) — 3.45E-04
      - OR
        - 5 Hose misconnection (per operation) — 6.00E-06
          - AND
            - 10 Hose misconnection (per operation) — 3.00E-05
            - 11 Operator fails to rectify the problem — 0.2
        - 6 Driver away failure (per operation) — 5.20E-07
          - AND
            - 12 Vehicle drives away (per operation) — 4.00E-06
            - 13 Breakaway coupling failure — 0.13
        - 7 Spontaneous failure (per operation) — 7.50E-09
        - 8 Hose disconnection (per operation) — 4.00E-07
          - AND
            - 14 Hose disconnection (per operation) — 2.00E-06
            - 15 Driver fail to rectify the problem — 0.2
        - 9 Vehicle impact — 3.39E-04
          - AND
            - 16 Vehicle impact during refuelling (per operation) — 1.50E-04
            - 17 Average No. of vehicle visiting the LPG station during LPG refuelling process (1) — 2.26
    - 3 Number of vehicles using the LPG filling facitilies — 109,500
    - 4 ** Failure to isolate (per demand) — 6.51E-03

- 4 ** Failure to isolate — 6.51E-03
  - AND
    - 18 Emergency Isolation System (EIS) is not effective — 1.00E-01
      - OR
        - 21 Fail to activate EIS (per demand) — 0.1
        - 22 Failure of EIS (per demand) — 1.00E-04
    - 19 Manual Valve Failure (per demand) — 0.50
    - 20 Excess flow valve failure (per demand) — 0.13

Remarks:

(1) = (daily no. of vehicle visit/24 hours)/(60 mins) * average time of filling

A-9b ***Failure of Flexible Hose during Loading to Vehicle (LPG released from the Hose Connecting to Vehicle)***



Remarks:

(1) = (daily no. of vehicle visit/24 hours)/(60 mins) * average time of refilling

A-10 ***Failure to Prevent BLEVE***

1		
Failure to prevent BLEVE		
7.50E-04		
AND		
2	3	4
Water spray system failure	Fire Service fail to prevent BLEVE	Chartek Coating fail under jet fire
1.50E-02	0.5	0.1

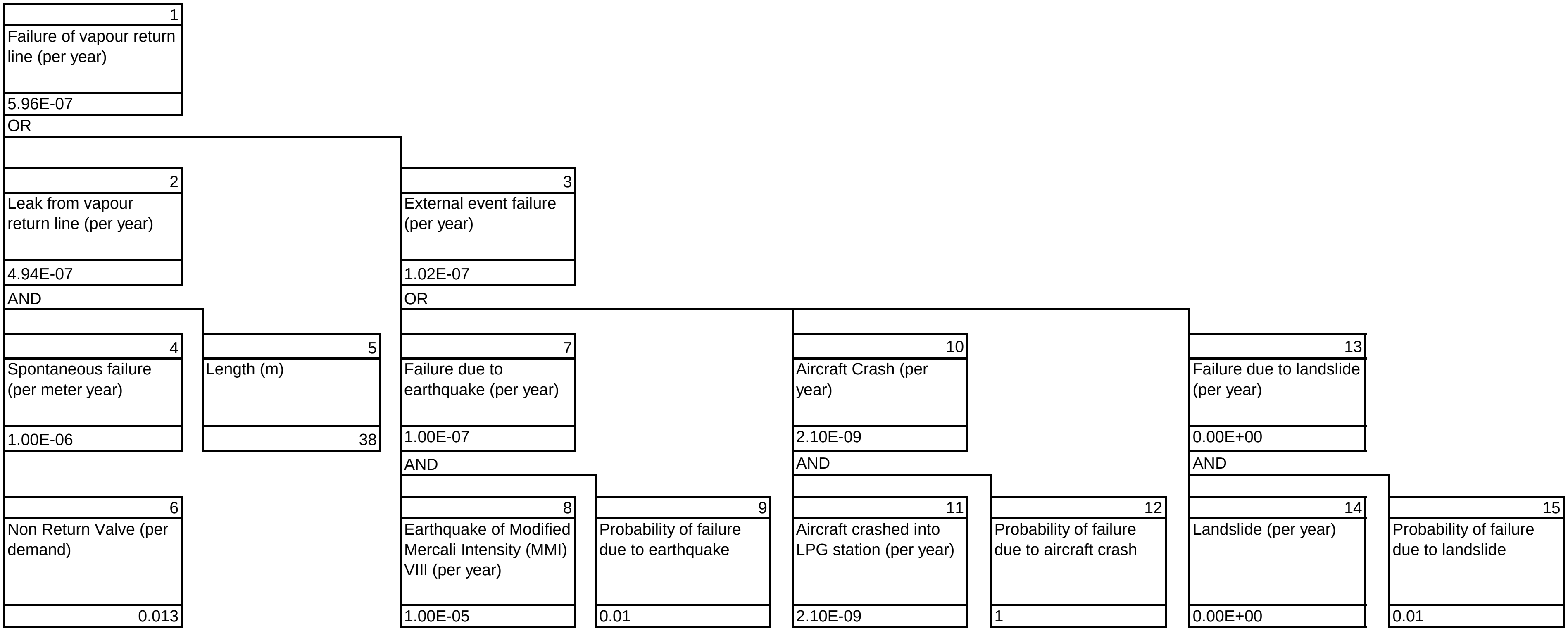
A-11 ***Leak From Pump Flange***

1	
Leak from Pump Flange (per year)	
4.36E-04	
AND	
2	3
Flange Faliure (per year)	No. of Flange
1.09E-04	4

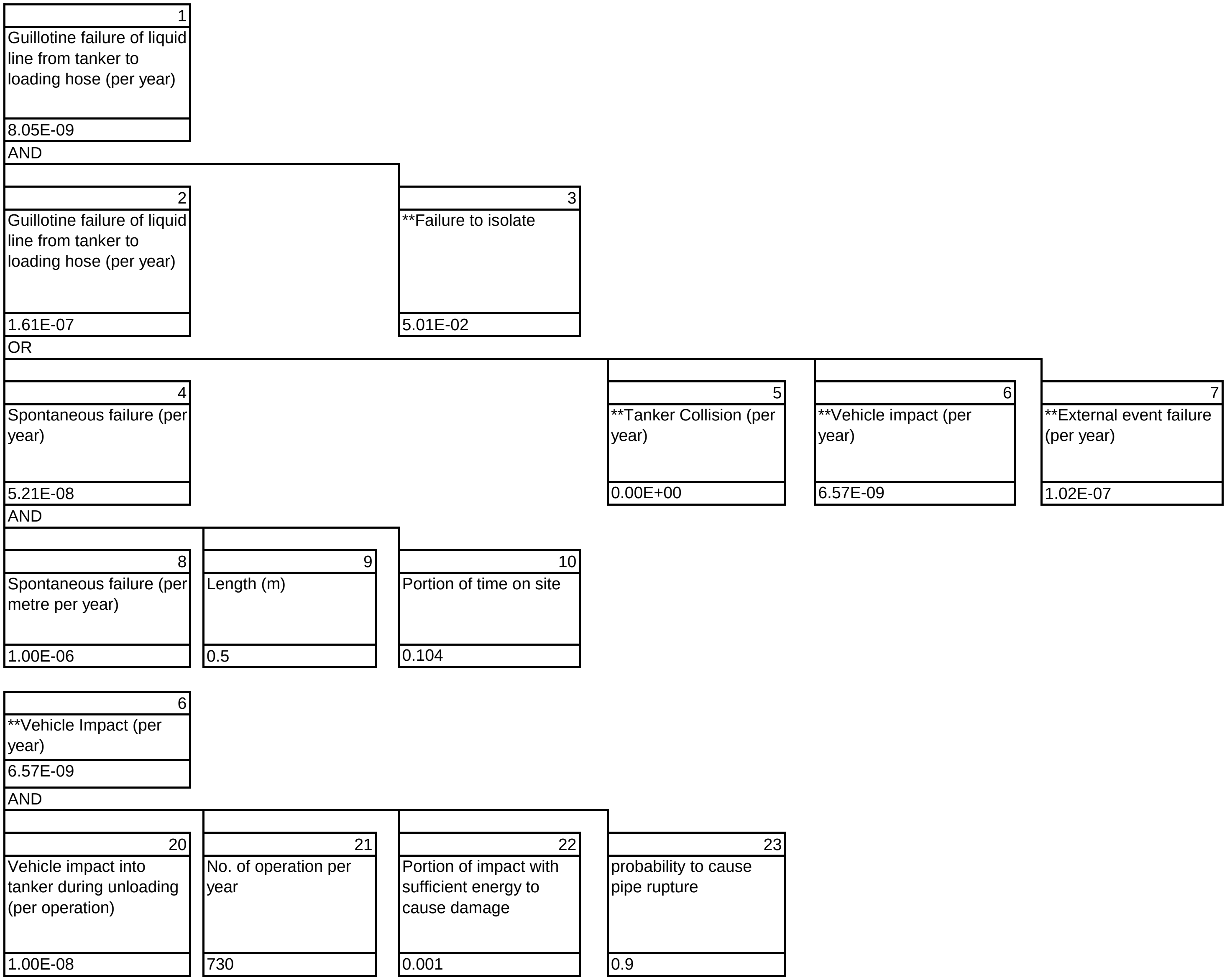
A-12 ***Leak From Drain Valve***

1	
Leak from drain valve (per year)	
2.40E-04	
AND	
2	3
Valve fails to close (per operation)	No. of operation per year
2.00E-05	12

A-13 ***Failure of Vapour Return Line***



A-14 ***Guillotine Failure of liquid line from Road Tanker to loading hose***



Guillotine Failure of liquid line from Road Tanker to loading hose (Con't)

3
**Failure to isolate
5.01E-02

AND

11	12
Emergency Isolation System (EIS) is not effective	Manual Valve Failure (per demand)
1.00E-01	0.50

OR

13	14
Fail to activate EIS (per demand)	Failure of EIS (per demand)
0.1	1.00E-04

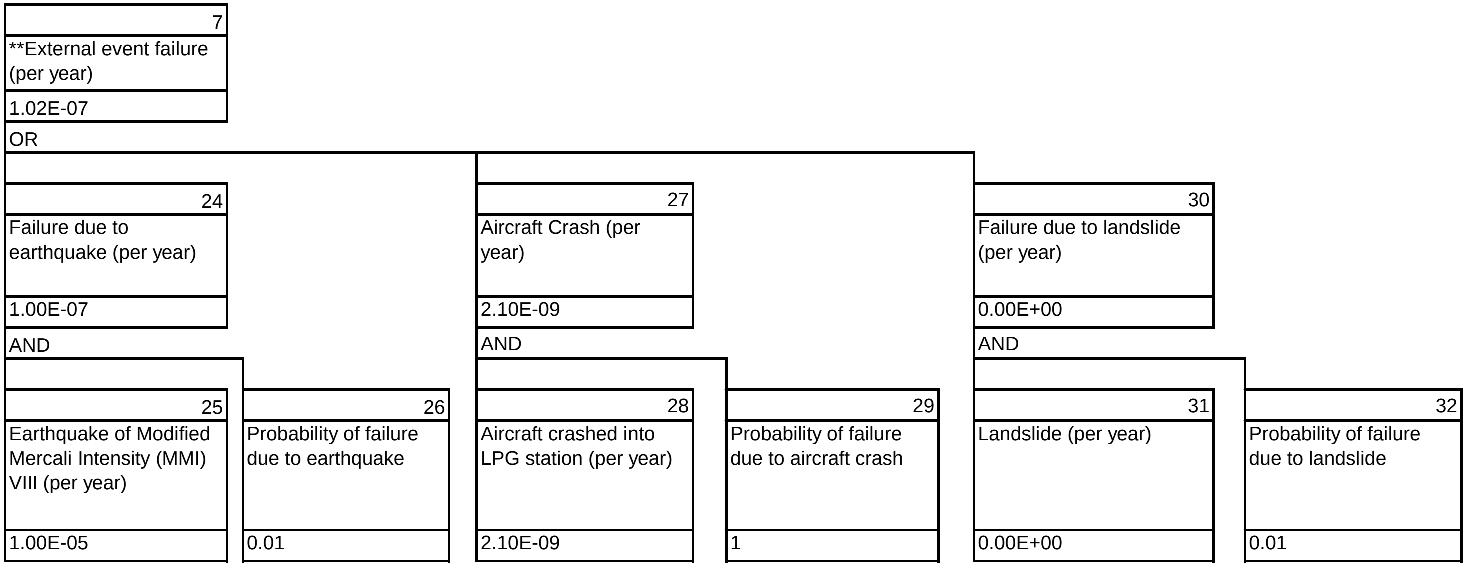
5
**Tanker Collision (per year)
0.00E+00

AND

15	16	17	19
Tanker collision during unloading (per operation)	No. of operation per year	Portion of impact with sufficient energy to cause damage	Probability of concurrent road tanker unloading
1.50E-04	730	0.01	0

18
Probability to cause pipe rupture
0.90

A-14 ***Guillotine Failure of liquid line from Road Tanker to loading hose (Con't)***



A-15a **BLEVE of LPG road tanker due to fire from petrol filling facilities**

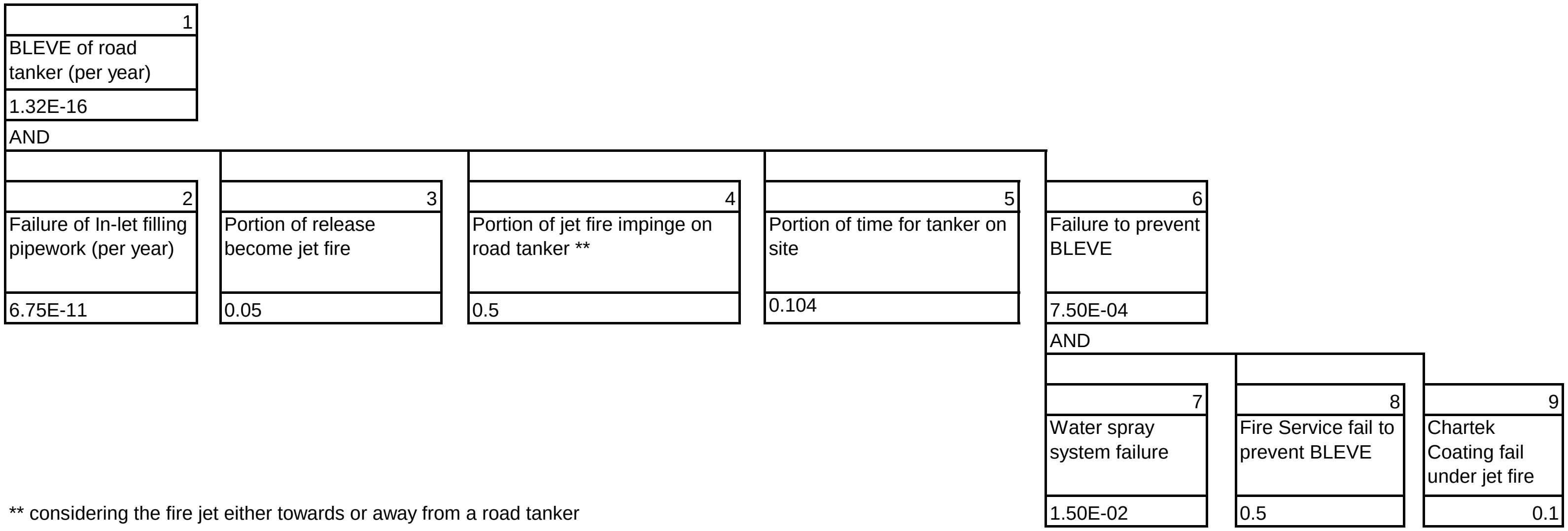
- 1 BLEVE of road tanker (per year) — 5.61E-09
  - AND
    - 2 Fire incident from petrol filling facilities (per year) — 7.18E-03
    - 3 Portion of fire incident which is serious enough to endanager road tanker — 0.01
    - 4 Portion of time for tanker on site — 0.104
    - 5 Failure to prevent BLEVE — 7.50E-04
      - AND
        - 6 Water spray system failure — 1.50E-02
        - 7 Fire Service fail to prevent BLEVE — 0.5
        - 8 Chartek Coating fail under jet fire — 0.1

A-15b **BLEVE of LPG road tanker due to fire from LPG dispenser**

- 1 BLEVE of road tanker (per year) — 1.21E-09
  - AND
    - 2 LPG dispenser failure (per year) — 1.24E-03
    - 3 Portion of release become jet fire — 0.05
    - 4 Portion of jet fire impinge on road tanker * — 0.25
    - 5 Portion of time for tanker on site — 0.104
    - 6 Failure to prevent BLEVE — 7.50E-04
      - AND
        - 7 Water spray system failure — 1.50E-02
        - 8 Fire Service fail to prevent BLEVE — 0.5
        - 9 Chartek Coating fail under jet fire — 0.1

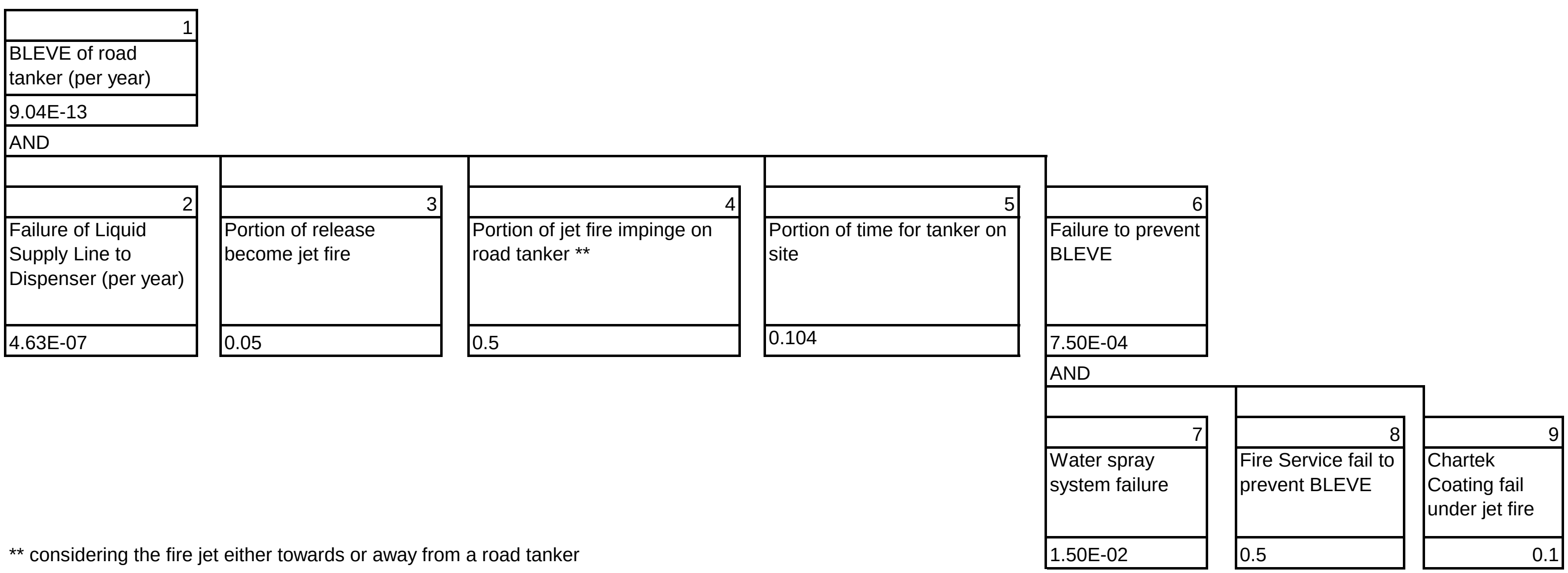
* considering the road tanker unloading bay is within a quadant of a dispenser

A-15c **BLEVE of LPG road tanker due to fire from In-let Filling Pipework**



** considering the fire jet either towards or away from a road tanker

A-15d **BLEVE of LPG road tanker due to fire from Liquid Supply Line to Dispenser**



** considering the fire jet either towards or away from a road tanker

A-15e **BLEVE of LPG road tanker due to fire from Flexible Hose during loading to underground vessel**

1	BLEVE of road tanker (per year)	5.84E-11	AND
2	Failure of Flexible Hose during loading to vessel (per year)	3.12E-06	
3	Portion of release become jet fire	0.05	
4	Portion of jet fire impinge on road tanker **	0.5	
5	Failure to prevent BLEVE	7.50E-04	AND
6	Water spray system failure	1.50E-02	
7	Fire Service fail to prevent BLEVE	0.5	
8	Chartek Coating fail under jet fire	0.1	

** considering the fire jet either towards or away from a road tanker

A-15f **BLEVE of LPG road tanker due to fire from Liquid Line (from tanker to loading hose)**

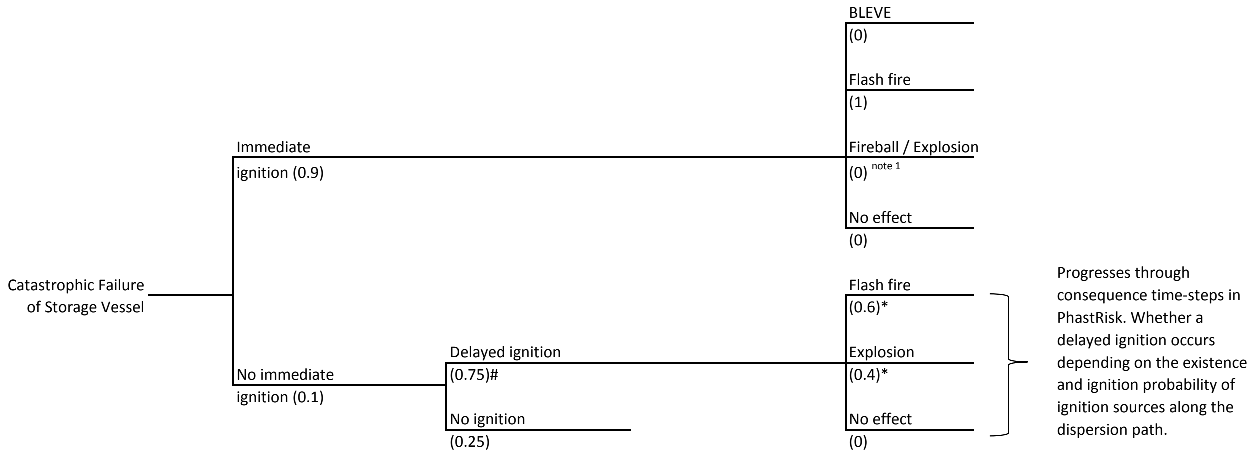
1	BLEVE of road tanker (per year)	1.51E-13	AND
2	Failure of Liquid Line from tanker to loading hose (per year)	8.05E-09	
3	Portion of release become jet fire	0.05	
4	Portion of jet fire impinge on road tanker **	0.5	
5	Failure to prevent BLEVE	7.50E-04	AND
6	Water spray system failure	1.50E-02	
7	Fire Service fail to prevent BLEVE	0.5	
8	Chartek Coating fail under jet fire	0.1	

** considering the fire jet either towards or away from a road tanker

APPENDIX F

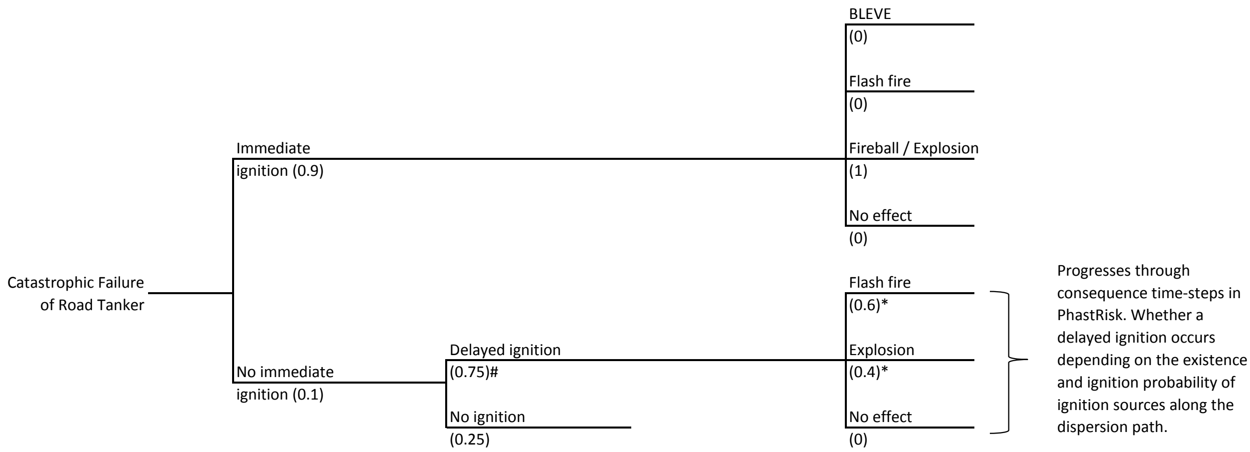
Event Tree Analysis

Catastrophic Failure of Storage Vessel (Instantaneous release without rainout)



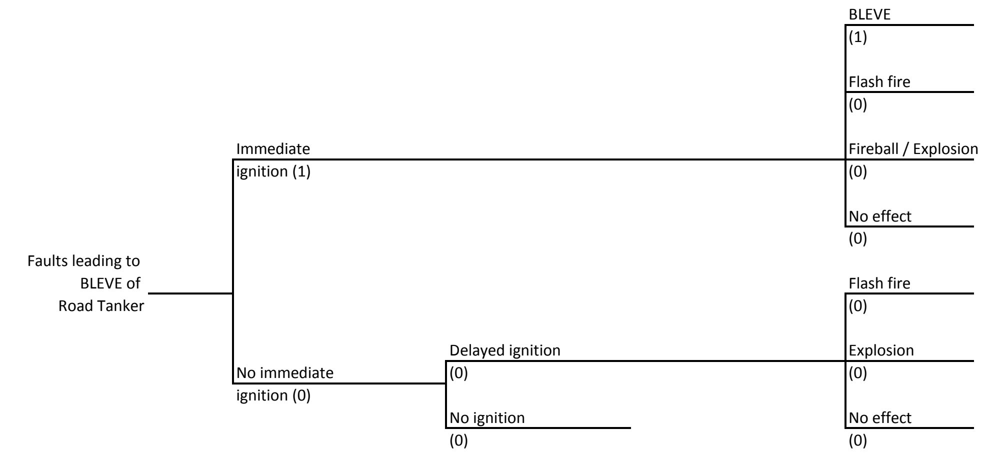
Note 1: applicable to mounded or underground tank only
* default in PhastRisk - based on TNO Purple Bool
delayed ignition probability varies from 0.4 to 0.75 for specified ignition sources and together with ignition due to population

Catastrophic Failure of Road Tanker (Instantaneous release without rainout)

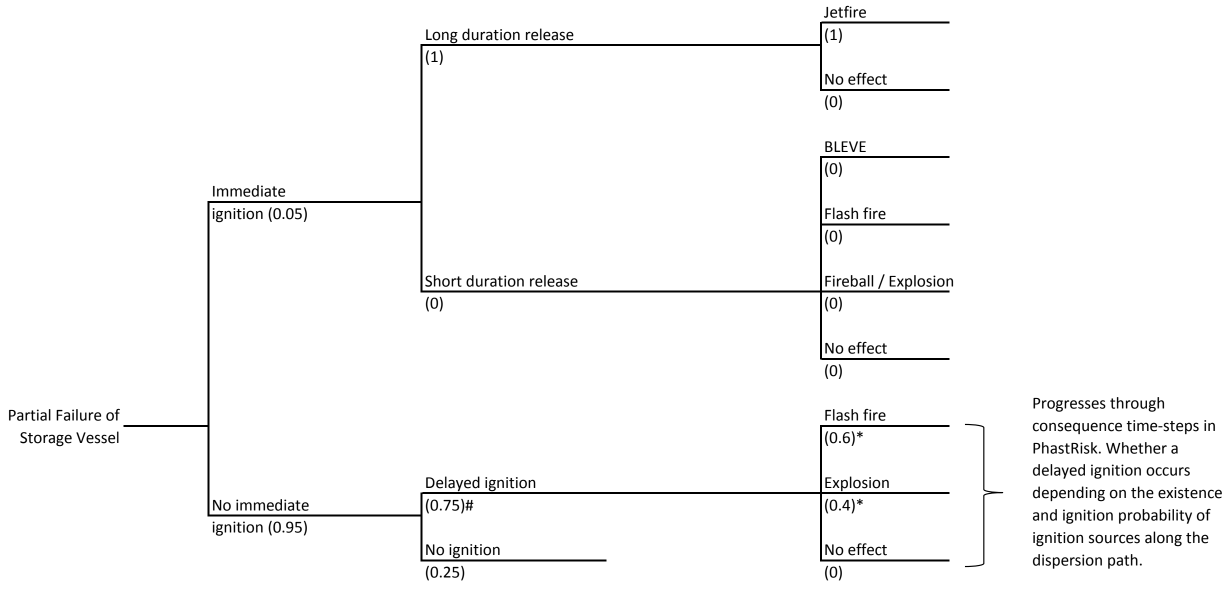


* default in PhastRisk - based on TNO Purple Bool
delayed ignition probability varies from 0.4 to 0.75 for specified ignition sources and together with ignition due to population

Fault leading to BLEVE of Road Tanker (Instantaneous release without rainout)

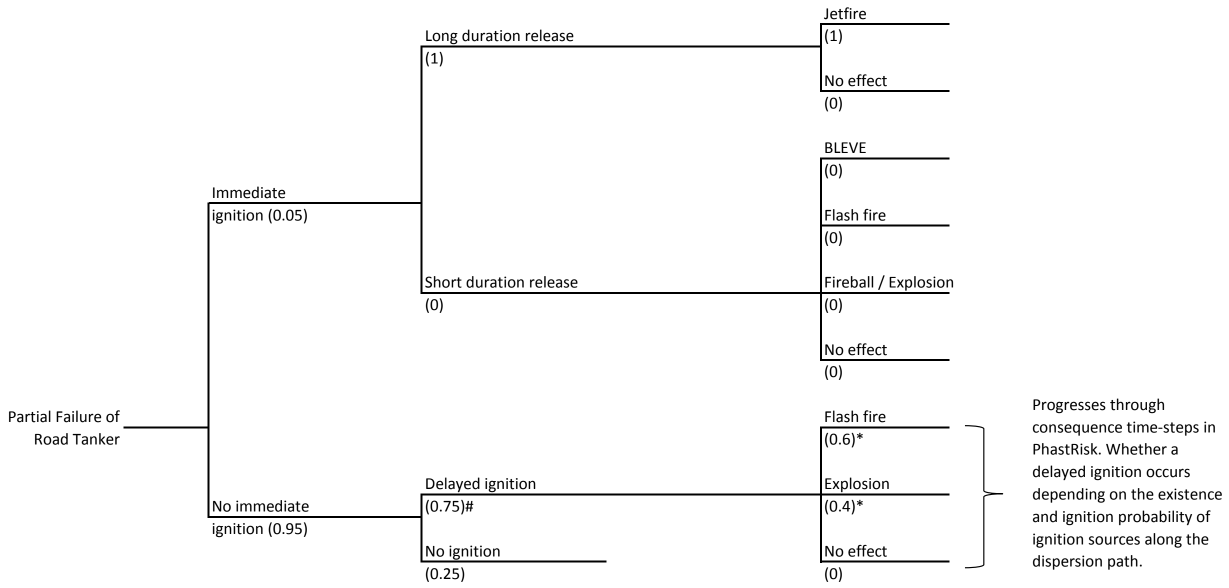


Partial Failure of Storage Vessel (Continuous release without rainout)



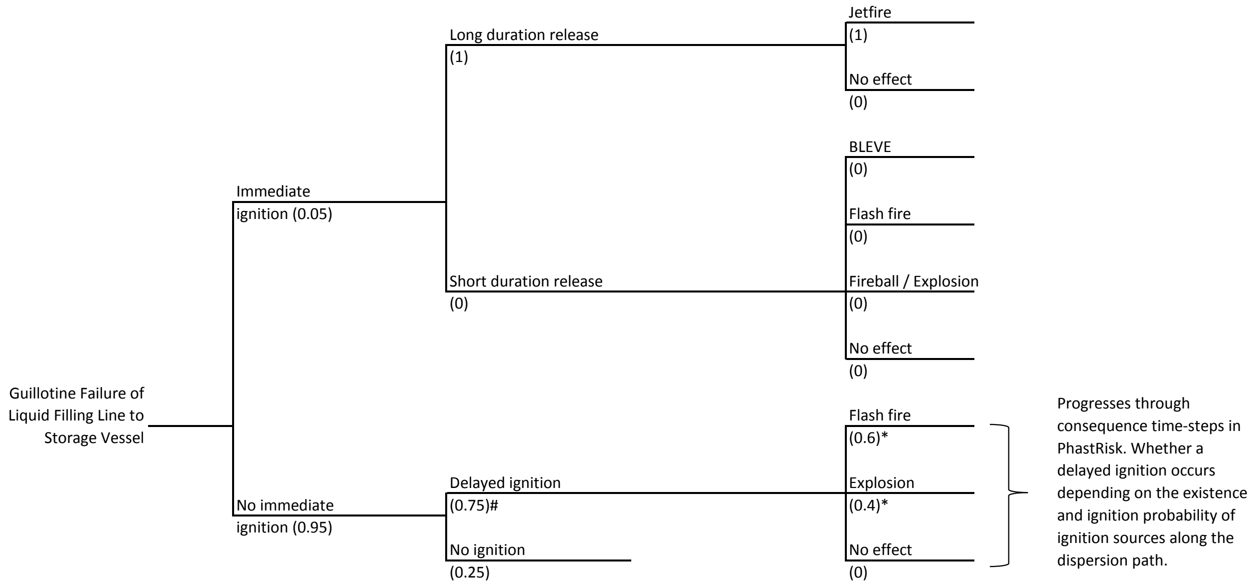
* default in PhastRisk - based on TNO Purple Bool
delayed ignition probability varies from 0.4 to 0.75 for specified ignition sources and together with ignition due to population

Partial Failure of Road Tanker (Continuous release without rainout)



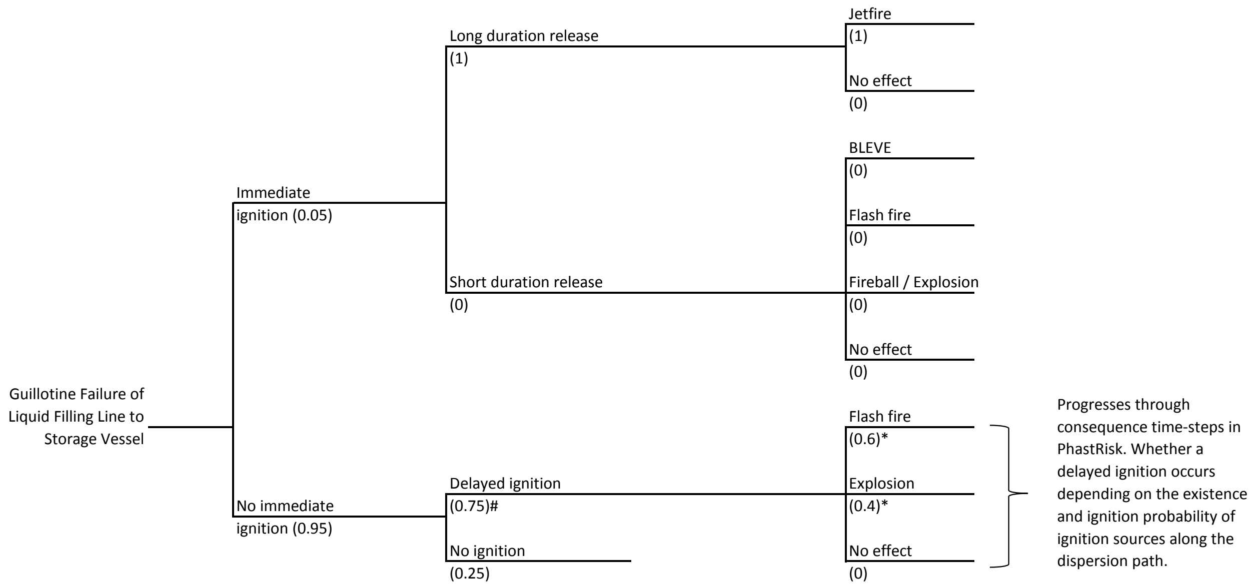
* default in PhastRisk - based on TNO Purple Bool
delayed ignition probability varies from 0.4 to 0.75 for specified ignition sources and together with ignition due to population

Guillotine Failure of Liquid Filling Line to Storage Vessel (Continuous release without rainout)



* default in PhastRisk - based on TNO Purple Bool
delayed ignition probability varies from 0.4 to 0.75 for specified ignition sources and together with ignition due to population

Pump Flange Leak (Continuous release without rainout)



* default in PhastRisk - based on TNO Purple Bool
delayed ignition probability varies from 0.4 to 0.75 for specified ignition sources and together with ignition due to population

APPENDIX G

Information from Fire Services Department

消防處
香港九龍尖沙咀東部康莊道1號
消防總部大廈

FIRE SERVICES DEPARTMENT
FIRE SERVICES HEADQUARTERS BUILDING,
No.1 Hong Chong Road,
Tsim Sha Tsui, Kowloon,
Hong Kong.

本處檔號 OUR REF. : (2) in FSD/GR AI 22/03
來函檔號 YOUR REF. : R01501/c/wwck/3
電訊掛號 Telex : 39607 HKFSD HX (24 小時 Hours FAX)
圖文傳真 FAX: : 852-2739 5879
電 話 TEL NO. : 852-2733 7818

6 June 2003

Maunsell Environment Management Consultants Ltd.
Room 1213-1219, Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Road,
Shatin, New Territories,
Hong Kong.
(Attn.: Mr. Arthur Lee)

By fax only : 2891 0305

Dear Mr. Lee,

Quantitative Risk Assessment (QRA) of a LPG Compound at Repulse Bay

I refer to your letter of 28 May 2003.

I wish to inform you that we do not have any record of fire incidents under petrol filling station category before 1995, as such, I can only provide you below with the number of incidents in Petrol Filling Stations after 1995:-

Year	Number of Incidents in Petrol Filling Station
1995	4
1996	2
1997	2
1998	4
1999	1
2000	2
2001	0
2002	1
2003 (Up to March)	0

Yours faithfully,

(TSANG Wan-hing)
for Director of Fire Services

Ref. Number and date should be quoted in reference to this letter
凡提及本信時請引述編號及日期

TOTAL P.01

消 防 處
香港九龍尖沙咀東康莊道1號
消防總部大廈

FIRE SERVICES DEPARTMENT
FIRE SERVICES HEADQUARTERS BUILDING
No.1 Hong Chong Road
Tsim Sha Tsui East Kowloon
Hong Kong

本處檔號	Our Ref.:	(2) in FSD/GR AI 9/08
來函檔號	Your Ref.:	
電子郵件	E-mail:	hkfsdenq@hkfsd.gov.hk
圖文傳真	Fax:	852-2739 5879
電 話	Tel No.:	852-2733 7818

26 June 2008

ENSR Asia(HK) Ltd
11/F Grand Central Plaza, Tower 2,
138 Shatin Rural Committee, Shatin,
Hong Kong

By fax only : 2891 0305

Dear Mr. Hung,

Code on Access to Information
Fire Incidents Records under
Fuel Filling Station
<u>From 2003 to present</u>

I refer to your email dated 20 June 2008.

2. Please be advised that the number of incidents in Fuel Filling Station as follows:-

Year	Number of Incidents in Fuel (Petrol/LPG/Petrol cum LPG) Filling Station
2003	1
2004	0
2005	2
2006	0
2007	0
2008 (up to Feb)	0

Yours faithfully,

(CHUI Man-leung)
for Director of Fire Services

REF. NUMBER AND DATE SHOULD BE QUOTED IN REFERENCE TO THIS LETTER
凡 提 及 本 信 時 請 引 述 編 號 及 日 期

消　防　處

香港九龍尖沙咀東康莊道 1 號

消防總部大廈

FIRE SERVICES DEPARTMENT

FIRE SERVICES HEADQUARTERS BUILDING
No.1 Hong Chong Road
Tsim Sha Tsui East Kowloon
Hong Kong

本處檔號 Our Ref. : (139) in FSD GR 6-5/5 R
來函檔號 Your Ref. : 60268214/C/atym12100812
電子郵件 E-mail : hkfsdenq@hkfsd.gov.hk
圖文傳真 Fax : 852-2739 5879
電　話 Tel No. : 852-2733 7818

AECOM RECEIVED ON
2012 OCT 22 A 11:34

18 October 2012

AECOM
8/F, Grand Central Plaza, Tower 2,
138 Shatin Rurai Committee Road, Shatin,
Hong Kong
(Attn: Ms. Angie TAI, Assistant Environmental Consultant)

Dear Ms. TAI,

Request for Fire Incidents Records under Fuel Filling Station Category from Year 2008 to Present

Reference is made to your letter dated 8 October 2012.

Please be advised that the statistical information pertaining to the captioned subject is as follows:-

Year	Number of Incidents in Fuel (Petrol/LPG/Petrol cum LPG) Filling Station
2008	0
2009	3
2010	1
2011	0
2012 (Jan to Jun)	0

Should you have any queries, please feel free to contact Miss CHAN at 2733 7532.

Yours sincerely,

(YEUNG Ping-kwai)
for Director of Fire Services

REF. NUMBER AND DATE SHOULD BE QUOTED IN REFERENCE TO THIS LETTER

凡提及本信時請引述編號及日期

FS 107A (Rev.10/95)

APPENDIX H

Input Parameters

HA Chai Wan Road (RunRow 2023WDD_fbx)

ParametersFB

Discharge Parameters

Continuous Critical Weber number	12.5	
Instantaneous Critical Weber number	12.5	
Venting equation constant	24.82	
Relief valve safety factor	1.2	
Minimum RV diameter ratio	1	
Critical pressure greater than flow phase	0.3447	bar
Maximum release velocity	500	m/s
Minimum drop diameter allowed	0.01	um
Maximum drop diameter allowed	1E4	um
Default Liquid Fraction	1	fraction
Continuous Drop Slip factor	1	
Instantaneous Drop Slip factor	1	
Number of Time Steps	100.00	
Maximum Number of Data Points	1,000.00	
Tolerance	0.0001	
Thermal coupling to the wall	No modelling of heat transfer	
Use Bernoulli for forced -phase liq-liq discharge	Use compressible flow eqn	
Capping of pipe flow rates	Use leak scenario cap, disallow flashing	
Velocity capping method	FixedVelocity	
Droplet Method - continuous only	Modified CCPS	
Thermodynamic Option for Gas Pipellines	Non-ideal Gas	
Excess Flow Valve velocity head losses	0	
Non-Return Valve velocity head losses	0	
Shut-Off Valve velocity head losses	0	
Frequency of bends in long pipes	0	/m
Frequency of couplings in long pipes	0	/m
Frequency of junctions in long pipes	0	/m
Line length	10	m
Pipe roughness	0.0457	mm
Air changes	3	/hr
Elevation	1	m
Atmospheric Expansion Method	Closest to Initial Conditions	
Tank Roof Failure Model Effects	Instantaneous effects	
Frequency of Excess Flow Valves	0	/m
Frequency of Non-Return Valves	0	/m
Frequency of Shut-Off Valves	0	/m
Mechanism for forcing droplet breakup - Inst.	Use flashing correlation	
Mechanism for forcing droplet breakup - Cont	Do not force correlation	
Flashing in the orifice	No flashing in the orifice	
Handling of droplets	Not Trapped	
Indoor mass modification factor	3	
Vacuum Relief Valve	Operating	
Vacuum Relief Valve Set Point	0	bar

Dispersion Parameters

Expansion zone length/source diameter ratio	0.01	
Near Field Passive Entrainment Parameter	1	
Jet Model	Morton et.al.	
Jet entrainment coefficient alpha1	0.17	
Jet entrainment coefficient alpha2	0.35	

Drag coefficient between plume and air	0	
Dense cloud parameter gamma - continuous	0	
Dense cloud parameter gamma - instant	0.3	
Dense cloud parameter K - continuous	1.15	
Dense cloud parameter K - instantaneous	1.15	
Modeling of instantaneous expansion	Standard Method	
Maximum Cloud/Ambient Velocity Difference	0.1	
Maximum Cloud/Ambient Density Difference	0.015	
Maximum Non-passive entrainment fraction	0.3	
Maximum Richardson number	15	
Distance multiple for full passive entrainment	2	
Core Averaging Time	18.75	s
Ratio instantaneous/continuous sigma-y	1	
Ratio instantaneous/continuous sigma-z	1	
Droplet evaporation thermodynamics model	No Rainout, Equilibrium	
Ratio Droplet/ expansion velocity for inst. release	0.8	
Expansion energy cutoff for droplet angle	0.69	kJ/kg
Coefficient of Initial Rainout	0	
Flag to reset rainout position	Do not reset rainout position	
Richardson Number for passive transition above pool	0.015	
Pool Vaporization entrainment parameter	1.5	
Richardson number criterion for cloud lift-off	-20	
Flag for Heat/Water vapor transfer	Heat and Water	
Surface over which the dispersion occurs	Land	
Minimum temperature allowed	-262.1	degC
Maximum temperature allowed	626.9	degC
Minimum release velocity for cont. release	0.1	m/s
Minimum Continuous Release Height	0	m
Maximum distance for dispersion	5E4	m
Maximum height for dispersion	1000	m
Minimum cloud depth	0.02	m
Treatment of top mixing layer	Constrained	
Model In Use	Best Estimate	
Lee Length	Calculate	
Lee Half-Width	Calculate	
Lee Height	Calculate	
K-Factor	Calculate	
Switch Distance	Calculate	
Maximum Initial Step Size	10	m
Minimum Number of Steps per Zone	5.00	
Factor for Step Increase	1.2	
Maximum Number of Output Steps	1,000.00	
Flag for finite duration correction	QI without Duration Adjustment	
Quasi-instantaneous transition parameter	0.8	
Relative tolerance for dispersion calculations	0.001	
Relative tolerance for droplet calculations	0.001	
Initial integration step size - Instantaneous	0.01	s
Initial integration step size - Continuous	0.01	m
Maximum integration step size - Instantaneous	100	s
Maximum integration step size - Continuous	100	m
Criterion for halting dispersion model	Risk based	
Impingement Option	Use Velocity Modification Factor	
Impinged velocity limit	500	m/s
Impinged Velocity Factor	0.25	
Dispersion Model to use	Version 2 model	

Fixed step size - Instantaneous	0.01	s
Fixed step size - Continuous	0.1	m
Number of fixed size output steps	20.00	
Multiplier for output step sizes	1.2	

Event Tree Probabilities

Probability of a BLEVE	1	fraction
Probability of a Pool Fire	1	fraction
Toxic Probability	1	fraction
Continuous no Rainout Immediate Ignition	0.05	fraction
Continuous no Rainout Long Duration Horizontal Fraction	0	fraction
Continuous no Rainout Long Duration Horizontal Jet Fire	0	fraction
Continuous no Rainout Long Duration Vertical Jet Fire	0	fraction
Continuous no Rainout Short Duration Fraction	1	fraction
Continuous no Rainout Short Duration BLEVE	1	fraction
Continuous no Rainout Short Duration Flash Fire	0	fraction
Continuous no Rainout Short Duration Explosion	0	fraction
Continuous no Rainout Delayed Ignition Flash Fire	0	fraction
Continuous no Rainout Delayed Ignition Explosion	0	fraction
Continuous with Rainout Immediate Ignition	0.05	fraction
Continuous with Rainout Long Duration Horizontal Fraction	0.6	fraction
Continuous with Rainout Long Duration Horizontal Jet Fire	0	fraction
Continuous with Rainout Long Duration Horizontal Pool Fire	0	fraction
Continuous with Rainout Long Duration Horizontal Jet Fire with Pool Fire	1	fraction
Continuous with Rainout Long Duration Vertical Pool Fire	0	fraction
Continuous with Rainout Long Duration Vertical Jet Fire	0	fraction
Continuous with Rainout Short Duration Fraction	1	fraction
Continuous with Rainout Long Duration Vertical Jet Fire with Pool Fire	1	fraction
Continuous with Rainout Short Duration BLEVE with Pool Fire	1	fraction
Continuous with Rainout Short Duration BLEVE alone	0	fraction
Continuous with Rainout Short Duration Flash Fire with Pool Fire	0	fraction
Continuous with Rainout Short Duration Flash Fire Alone	0	fraction
Continuous with Rainout Short Duration Explosion with Pool Fire	0	fraction
Continuous with Rainout Short Duration Explosion Alone	0	fraction
Continuous with Rainout Short Duration Pool Fire	0	fraction
Continuous with Rainout Residual Pool Fire	0.15	fraction
Continuous with Rainout Delayed Ignition Flash Fire	0	fraction
Continuous with Rainout Delayed Ignition Explosion	0.4	fraction
Instantaneous no Rainout Immediate Ignition	0.9	fraction
Instantaneous no Rainout BLEVE	1	fraction
Instantaneous no Rainout Immediate Flash Fire	0	fraction
Instantaneous no Rainout Immediate Explosion	0	fraction
Instantaneous no Rainout Delayed Ignition Flash Fire	0	fraction
Instantaneous no Rainout Delayed Ignition Explosion	0	fraction
Instantaneous with Rainout Immediate Ignition	0.9	fraction
Instantaneous with Rainout BLEVE with Pool Fire	1	fraction
Instantaneous with Rainout BLEVE Alone	0	fraction
Instantaneous with Rainout Immediate Flash Fire with Pool Fire	0	fraction
Instantaneous with Rainout Immediate Flash Fire Alone	0	fraction
Instantaneous with Rainout Immediate Explosion with Pool Fire	0	fraction
Instantaneous with Rainout Immediate Explosion Alone	0	fraction
Instantaneous with Rainout Immediate Pool Fire Alone	0	fraction
Instantaneous with Rainout Residual Pool Fire	0.15	fraction
Instantaneous with Rainout Delayed Ignition Flash Fire	0	fraction
Instantaneous with Rainout Delayed Ignition Explosion	0.4	fraction

Immediate Ignition	0.1	fraction
Explosion Given Ignition	0.5	fraction
Long Duration Jet Fire	0.5	fraction
Short Duration Any Ignition of Cloud	0.5	fraction
Short Duration Ignition of Cloud with Pool Fire	0	fraction
Long Duration Horizontal Jet Fire with Pool	0	fraction
Long Duration Vertical Jet Fire with Pool	0	fraction
Short Duration Fraction for Effects	0	fraction
Short Duration BLEVE not Flash Fire	0.5	fraction
Volume based explosion probabilities	No	
FlamespeedLowMedium	0.45	m/s
FlamespeedMediumHigh	0.75	m/s
Obstructed Cloud Volume (1)	200	m3
Obstructed Cloud Volume (2)	3000	m3
Obstructed Cloud Volume (3)	6000	m3
Low Flame Speed Probability (1)	0	fraction
Low Flame Speed Probability (2)	0.3	fraction
Low Flame Speed Probability (3)	0.6	fraction
Medium Flame Speed Probability (1)	0.3	fraction
Medium Flame Speed Probability (2)	0.6	fraction
Medium Flame Speed Probability (3)	0.9	fraction
High Flame Speed Probability (1)	0.6	fraction
High Flame Speed Probability (2)	0.9	fraction
High Flame Speed Probability (3)	1	fraction

Explosion Parameters

Over Pressure Level 1	0.02068	bar
Over Pressure Level 2	0.1379	bar
Over Pressure Level 3	0.2068	bar
Explosion Location Criterion	Cloud Front (LFL Fraction)	
Minimum explosive mass	0	kg
Minimum Explosion Energy	5E6	kJ
Explosion Efficiency	0.1	fraction
Coefficient for zone of heavy damage	0.03	
Coefficient for zone of light damage	0.06	
Explosion efficiency	10	%
Air or Ground burst	Air burst	
Explosion Mass Modification Factor	3	
Use of mass modification factor	Early and late explosions	

Fireball and BLEVE Blast Parameters

Maximum surface emissive power	400	kW/m2
Radiation Dose for Fireball risk calculations	5.784E6	
Calculate Dose	Unselected	
Calculate Probit	Unselected	
Calculate Lethality	Unselected	
TNO model flame temperature	1727	degC
Mass Modification Factor	3	
Calculation method for fireball	DNV Recommended	
Fireball Maximum Exposure Duration	20	s
Intensity Levels (1)	4	kW/m2
Intensity Levels (2)	12.5	kW/m2
Intensity Levels (3)	37.5	kW/m2
Probit Levels (1)	2.73	
Probit Levels (2)	3.72	

Probit Levels (3)	7.5	
Dose Levels (1)	1.27E6	
Dose Levels (2)	5.8E6	
Dose Levels (3)	2.51E7	
Lethality Levels (1)	0.01	
Lethality Levels (2)	0.1	
Lethality Levels (3)	1	
Ground Reflection	Ground Burst	
Ideal Gas Modeling	Model as real gas	
Minimum Distance	0	m
Number of Distance Points	100.00	
Ground Reflection	Ground Burst	
Ideal Gas Modeling	Model as real gas	
Minimum Distance	0	m
Number of Distance Points	100.00	
Ground Reflection	Ground Burst	
Ideal Gas Modeling	Model as real gas	
Minimum Distance	0	m
Number of Distance Points	100.00	

Flammable Parameters

Height for calculation of flammable effects	0	m
Flammable result grid step in X-direction	10	m
LFL fraction to finish	0.85	
Angle of inclination	0	deg
Observer direction	Variable	
Flammable mass calculation method	Mass between LFL and UFL	
Flammable Base averaging time	18.75	s
Radiation level for Jet/Pool Fire Risk	35	kW/m2
Cut Off fraction for cloud volume	0.001	fraction
UFL Multiple for immediate ignition	1	
Cut Off Time for Short Continuous Releases	20	s
Observer type radiation modelling flag	Planar	
Probit A Value	-36.38	
Probit B Value	2.56	
Probit N Value	1.333	
Height for reports	Centreline Height	
Angle of orientation	0	deg
Relative tolerance for radiation calculations	0.01	fraction
Number of Lethality Ellipses	5.00	
Ellipse linear spacing variable	Probit	
Minimum Probability Of Death	0.01	fraction
Number of radiation/distance points in linked radiation calculations	50.00	
Method for fitting ellipse to flash fire shape	ChiSq method	
Absolute tolerance for linked radiation calcs	1e-010	
Solar radiation	Exclude from calculations	
For time-varying releases	Don't Model Short Duration Effects	
Match fireball duration and mass released	No	

General Parameters

Maximum release duration	3600	s
Height for concentration output	0	m
Rotation	0	deg
Lower Elevation	0	m
Multicomponent aerosol behaviour	Single aerosol modelling	

General Risk Parameters

Use Free Field Modelling	No Free Field	
Distance to Site Boundary	0	m
Late Pool Fire	Exclude Effects	
Minimum Case Frequency	1e-012	/AvgeYear
Minimum Event Probability	1e-012	
Population Omega Factor	0.000168	
Maximum Number of Subsquares across Ellipse	10.00	
Maximum Number of Subdivisions per Square	5.00	
Factor for Toxic F-N Spread	2	
Grid Sizing	Calculated	
Grid Bounds Minimum X	-1000	m
Grid Bounds Maximum X	1000	m
Grid Bounds Minimum Y	-1000	m
Grid Bounds Maximum Y	1000	m
Grid Calculation Method	Number of cells	
Grid cell size	10	m
Maximum number of cells	40,000.00	
Aversion Index	1.2	
Indoor Population Omega Factor	0	
Number of wind subdivisions per sector	1.00	
Method for handling Indoor/Outdoor risk	Indoor and outdoor risk calculations	
Inter-ellipse interpolation method	Weighted	
Method option	Normal dispersion	
Cylinder height over radius ratio	3	
Building damage method	Worst point	
Reflection method	Calculated Angle	
Number of X steps per view	11.00	
Minimum X step	0.1	m
Number of time steps - continuous clouds	5.00	
Between Cloud Views	Minimise Gaps	
Pressure exceedance curves	Calculate	
Elevation of Floor or Ceiling	0	m
Concentration method for filling	Stoichiometric	
Minimum probability of death for explosions	0.001	
Minimum Pressure Filter	0.01	bar
Separation specification	Use Ratio	
Critical Separation Ratio	0.5	
Cloud Shape of Area Integration	Elliptical	
Explosion efficiency method	100% efficiency	
Explosion Type Calculation Method	Polynomial Curve-Fit Equations	
Number of Blast Curve Discretization Points	30,000.00	
Maximum No. effect points along transect	2.00	
Low to medium criterion	0.006	
Medium to high criterion	0.08	
Options available	Volume Averaged	
Method option:	Ground reflection	
Reflection factor	1	
Unconfined Explosion Strength	2	
Explosion Efficiency	1	fraction
Flammable Mass Calculation Type	Area Weighted Mass Integral	
Minimum Explosion Energy	0	kJ
Maximum number of time steps	100.00	
Number of timesteps - time varying clouds	10.00	
Active Shut Down	No Shut Down	

Fraction of Population Indoors for Societal Risk	0.9	fraction
Fraction of Population Indoors for Individual Risk	0	fraction

Indoor Vulnerability

Vulnerability Model	Discrete Overpressure	
Pressure Method - Building calculation	Reflected	
Pressure Method - Individual Risk	Side on	
Pressure Method - Grid population	Side on	
Overpressure for Lethality (1)	0.1	bar
Overpressure for Lethality (2)	0.3	bar
Lethality (1)	0.025	fraction
Lethality (2)	1	fraction
Lethality (1)	1	fraction
Equation Constant (1)	0.3	bar
Equation Exponent (1)	1	
Overpressure Offset (1)	0.3	bar
Impulse Offset (1)	0	N.s/m2
ProbitA	-10.46	
ProbitB	1.35	
ProbitN	1	
Number of overpressures	2.00	
Number of impulses	1.00	
Fireball (Societal Radiation Criteria Zone)	0.5	fraction
Fireball (Individual Radiation Criteria Zone)	1	fraction
Fireball (Societal Flammable Probit Zone)	0	fraction
Fireball (Individual Flammable Probit Zone)	0	fraction
Jet Fire (Societal Radiation Criteria Zone)	1	fraction
Jet Fire (Individual Radiation Criteria Zone)	1	fraction
Jet Fire (Societal Flammable Probit Zone)	0	fraction
Jet Fire (Individual Flammable Probit Zone)	0	fraction
Pool Fire (Societal Radiation Criteria Zone)	1	fraction
Pool Fire (Individual Radiation Criteria Zone)	1	fraction
Pool Fire (Societal Flammable Probit Zone)	0	fraction
Pool Fire (Individual Flammable Probit Zone)	0	fraction
Light Explosion Damage vulnerability	0.025	fraction
Heavy explosion damage vulnerability	1	fraction
Method for Radiation Vulnerability	Use Probit method	
Flash Fire Vulnerability	0.1	
Toxic Vulnerability	1	
Pool Fire Radiation Intensity Level (1)	4	kW/m2
Pool Fire Radiation Intensity Level (2)	12.5	kW/m2
Pool Fire Radiation Intensity Level (3)	37.5	kW/m2
Jet Fire Radiation Intensity Level (1)	4	kW/m2
Jet Fire Radiation Intensity Level (2)	12.5	kW/m2
Jet Fire Radiation Intensity Level (3)	37.5	kW/m2
Fire Ball Radiation Intensity Level (1)	4	kW/m2
Fire Ball Radiation Intensity Level (2)	12.5	kW/m2
Fire Ball Radiation Intensity Level (3)	37.5	kW/m2

Jet Fire Parameters

Maximum SEP for a Jet Fire	400	kW/m2
Jet Fire Averaging Time	20	s
Calculate Dose	Unselected	
Calculate Probit	Unselected	
Calculate Lethality	Unselected	

Crosswind Angle	0	deg
Correlation	DNV Recommended	
Horizontal Options	Use standard method	
Rate Modification Factor	3	
Jet Fire Maximum Exposure Duration	20	s
Emissivity Method	E and F calculated	
Intensity Levels (1)	4	kW/m2
Intensity Levels (2)	12.5	kW/m2
Intensity Levels (3)	37.5	kW/m2
Probit Levels (1)	2.73	
Probit Levels (2)	3.72	
Probit Levels (3)	7.5	
Dose Levels (1)	1.27E6	
Dose Levels (2)	5.8E6	
Dose Levels (3)	2.51E7	
Lethality Levels (1)	0.01	
Lethality Levels (2)	0.1	
Lethality Levels (3)	1	

Outdoor Vulnerability

Vulnerability Model	Discrete Overpressure	
Pressure Method - Building calculation	Reflected	
Pressure Method - Individual Risk	Side on	
Pressure Method - Grid population	Side on	
Overpressure for Lethality (1)	0.3	bar
Lethality (1)	1	fraction
Lethality (1)	1	fraction
Equation Constant (1)	0.3	bar
Equation Exponent (1)	1	
Overpressure Offset (1)	0.3	bar
Impulse Offset (1)	0	N.s/m2
ProbitA	-10.46	
ProbitB	1.35	
ProbitN	1	
Number of overpressures	1.00	
Number of impulses	1.00	
Fireball (Societal Radiation Criteria Zone)	1	fraction
Fireball (Individual Radiation Criteria Zone)	1	fraction
Fireball (Societal Flammable Probit Zone)	0.14	fraction
Fireball (Individual Flammable Probit Zone)	1	fraction
Jet Fire (Societal Radiation Criteria Zone)	1	fraction
Jet Fire (Individual Radiation Criteria Zone)	1	fraction
Jet Fire (Societal Flammable Probit Zone)	0.14	fraction
Jet Fire (Individual Flammable Probit Zone)	1	fraction
Pool Fire (Societal Radiation Criteria Zone)	1	fraction
Pool Fire (Individual Radiation Criteria Zone)	1	fraction
Pool Fire (Societal Flammable Probit Zone)	0.14	fraction
Pool Fire (Individual Flammable Probit Zone)	1	fraction
Light Explosion Damage vulnerability	0	fraction
Heavy explosion damage vulnerability	1	fraction
Method for Radiation Vulnerability	Use Probit method	
Flash Fire Vulnerability	1	
Toxic Vulnerability	1	
Pool Fire Radiation Intensity Level (1)	4	kW/m2
Pool Fire Radiation Intensity Level (2)	12.5	kW/m2

Pool Fire Radiation Intensity Level (3)	37.5	kW/m2
Jet Fire Radiation Intensity Level (1)	4	kW/m2
Jet Fire Radiation Intensity Level (2)	12.5	kW/m2
Jet Fire Radiation Intensity Level (3)	37.5	kW/m2
Fire Ball Radiation Intensity Level (1)	4	kW/m2
Fire Ball Radiation Intensity Level (2)	12.5	kW/m2
Fire Ball Radiation Intensity Level (3)	37.5	kW/m2

Pool Fire Parameters

Instantaneous releases	10	s
Continuous releases	10	s
Calculate Dose	Not selected	
Calculate Probit	Not selected	
Calculate Lethality	Not selected	
MaxExposureDuration	20	s
Radiative fraction for general fires	0.4	fraction
Intensity Levels (1)	4	kW/m2
Intensity Levels (2)	12.5	kW/m2
Intensity Levels (3)	37.5	kW/m2
Dose Levels (1)	1.27E6	
Dose Levels (2)	5.8E6	
Dose Levels (3)	2.51E7	
Probit Levels (1)	2.73	
Probit Levels (2)	3.72	
Probit Levels (3)	7.5	
Lethality Levels (1)	0.01	
Lethality Levels (2)	0.1	
Lethality Levels (3)	1	

Pool Vaporization Parameters

Toxics cut-off rate for pool evaporation	0.001	kg/s
Flammable cut-off rate for pool evaporation	0.1	kg/s
Concentration power to use in pool rate load calculation	1	
Maximum number of pool evaporation rates	10.00	
Pool minimum thickness	5	mm
Surface thermal conductivity	0.00221	kJ/m.s.degK
Surface roughness factor	2.634	
Surface thermal diffusivity	9.48E-7	m2/s
Type of Bund Surface	Concrete	
Bund Height	0	m
Bund Failure Modeling	Bund cannot fail	

Toxic Parameters

Toxics: minimum probability of death	0.001	
Toxics: height for calculation of effects	0	m
Toxics: results grid step in Y-direction	2.5	m
Toxics: results grid step in X-direction	25	m
Multi-comp. toxic calc. method	Mixture Probit	
Toxic Averaging Time - New Parameter	600	s
Probit Calculation Method	Use Probit	
Building Exchange Rate	4	/hr
Tail Time	1800	s
Indoor Calculations	Unselected	
Wind Dependent Exchange Rate	Case Specified	
Set averaging time equal to exposure time	Use a fixed averaging time	
Cut-off fraction of toxic load for exposure time calculation	0.05	fraction

Cut-off concentration for exposure time calculations	0	fraction

Weather Parameters

Atmospheric pressure	1.013	bar
Atmospheric molecular weight	28.97	
Atmospheric specific heat at constant pressure	1.004	kJ/kg.degK
Wind speed reference height	10	m
Temperature reference height	0	m
Cut-off height for wind speed profile	1	m
Wind speed profile	Power Law	
Atmospheric T and P Profile	Temp.Logarithmic; Pres.Linear	
Atmospheric Temperature	25	degC
Relative Humidity	0.75	fraction
Parameter	0.1	
Length	183.2	mm
Surface Roughness	Use Parameter	
Surface Temperature for Dispersion Calculations	25	degC
Surface Temperature for Pool Calculations	25	degC
Solar Radiation Flux	0.5	kW/m2
Building Exchange Rate	4	/hr
Tail Time	1800	s
Surface Type	3m - City centre with high and low rise buildings	
Mixing Layer Height for Pasquil Stability A	1300	m
Mixing Layer Height for Pasquil Stability A/B	1080	m
Mixing Layer Height for Pasquil Stability B	920	m
Mixing Layer Height for Pasquil Stability B/C	880	m
Mixing Layer Height for Pasquil Stability C	840	m
Mixing Layer Height for Pasquil Stability C/D	820	m
Mixing Layer Height for Pasquil Stability D	800	m
Mixing Layer Height for Pasquil Stability E	400	m
Mixing Layer Height for Pasquil Stability F	100	m
Mixing Layer Height for Pasquil Stability G	100	m

HA Chai Wan Road (RunRow 2023WDN_ffx)

ParametersFF

Discharge Parameters

Continuous Critical Weber number	12.5	
Instantaneous Critical Weber number	12.5	
Venting equation constant	24.82	
Relief valve safety factor	1.2	
Minimum RV diameter ratio	1	
Critical pressure greater than flow phase	0.3447	bar
Maximum release velocity	500	m/s
Minimum drop diameter allowed	0.01	um
Maximum drop diameter allowed	1E4	um
Default Liquid Fraction	1	fraction
Continuous Drop Slip factor	1	
Instantaneous Drop Slip factor	1	
Number of Time Steps	100.00	
Maximum Number of Data Points	1,000.00	
Tolerance	0.0001	
Thermal coupling to the wall	No modelling of heat transfer	
Use Bernoulli for forced -phase liq-liq discharge	Use compressible flow eqn	
Capping of pipe flow rates	Use leak scenario cap, disallow flashing	
Velocity capping method	FixedVelocity	
Droplet Method - continuous only	Modified CCPS	
Thermodynamic Option for Gas Pipellines	Non-ideal Gas	
Excess Flow Valve velocity head losses	0	
Non-Return Valve velocity head losses	0	
Shut-Off Valve velocity head losses	0	
Frequency of bends in long pipes	0	/m
Frequency of couplings in long pipes	0	/m
Frequency of junctions in long pipes	0	/m
Line length	10	m
Pipe roughness	0.0457	mm
Air changes	3	/hr
Elevation	1	m
Atmospheric Expansion Method	Closest to Initial Conditions	
Tank Roof Failure Model Effects	Instantaneous effects	
Frequency of Excess Flow Valves	0	/m
Frequency of Non-Return Valves	0	/m
Frequency of Shut-Off Valves	0	/m
Mechanism for forcing droplet breakup - Inst.	Use flashing correlation	
Mechanism for forcing droplet breakup - Cont	Do not force correlation	
Flashing in the orifice	No flashing in the orifice	
Handling of droplets	Not Trapped	
Indoor mass modification factor	3	
Vacuum Relief Valve	Operating	
Vacuum Relief Valve Set Point	0	bar

Dispersion Parameters

Expansion zone length/source diameter ratio	0.01	
Near Field Passive Entrainment Parameter	1	
Jet Model	Morton et.al.	
Jet entrainment coefficient alpha1	0.17	
Jet entrainment coefficient alpha2	0.35	

Drag coefficient between plume and air	0	
Dense cloud parameter gamma - continuous	0	
Dense cloud parameter gamma - instant	0.3	
Dense cloud parameter K - continuous	1.15	
Dense cloud parameter K - instantaneous	1.15	
Modeling of instantaneous expansion	Standard Method	
Maximum Cloud/Ambient Velocity Difference	0.1	
Maximum Cloud/Ambient Density Difference	0.015	
Maximum Non-passive entrainment fraction	0.3	
Maximum Richardson number	15	
Distance multiple for full passive entrainment	2	
Core Averaging Time	18.75	s
Ratio instantaneous/continuous sigma-y	1	
Ratio instantaneous/continuous sigma-z	1	
Droplet evaporation thermodynamics model	No Rainout, Equilibrium	
Ratio Droplet/ expansion velocity for inst. release	0.8	
Expansion energy cutoff for droplet angle	0.69	kJ/kg
Coefficient of Initial Rainout	0	
Flag to reset rainout position	Do not reset rainout position	
Richardson Number for passive transition above pool	0.015	
Pool Vaporization entrainment parameter	1.5	
Richardson number criterion for cloud lift-off	-20	
Flag for Heat/Water vapor transfer	Heat and Water	
Surface over which the dispersion occurs	Land	
Minimum temperature allowed	-262.1	degC
Maximum temperature allowed	626.9	degC
Minimum release velocity for cont. release	0.1	m/s
Minimum Continuous Release Height	0	m
Maximum distance for dispersion	5E4	m
Maximum height for dispersion	1000	m
Minimum cloud depth	0.02	m
Treatment of top mixing layer	Constrained	
Model In Use	Best Estimate	
Lee Length	Calculate	
Lee Half-Width	Calculate	
Lee Height	Calculate	
K-Factor	Calculate	
Switch Distance	Calculate	
Maximum Initial Step Size	10	m
Minimum Number of Steps per Zone	5.00	
Factor for Step Increase	1.2	
Maximum Number of Output Steps	1,000.00	
Flag for finite duration correction	QI without Duration Adjustment	
Quasi-instantaneous transition parameter	0.8	
Relative tolerance for dispersion calculations	0.001	
Relative tolerance for droplet calculations	0.001	
Initial integration step size - Instantaneous	0.01	s
Initial integration step size - Continuous	0.01	m
Maximum integration step size - Instantaneous	100	s
Maximum integration step size - Continuous	100	m
Criterion for halting dispersion model	Risk based	
Impingement Option	Use Velocity Modification Factor	
Impinged velocity limit	500	m/s
Impinged Velocity Factor	0.25	
Dispersion Model to use	Version 2 model	

Fixed step size - Instantaneous	0.01	s
Fixed step size - Continuous	0.1	m
Number of fixed size output steps	20.00	
Multiplier for output step sizes	1.2	

Event Tree Probabilities

Probability of a BLEVE	0	fraction
Probability of a Pool Fire	0	fraction
Toxic Probability	0	fraction
Continuous no Rainout Immediate Ignition	0.05	fraction
Continuous no Rainout Long Duration Horizontal Fraction	0	fraction
Continuous no Rainout Long Duration Horizontal Jet Fire	0	fraction
Continuous no Rainout Long Duration Vertical Jet Fire	0	fraction
Continuous no Rainout Short Duration Fraction	0	fraction
Continuous no Rainout Short Duration BLEVE	0	fraction
Continuous no Rainout Short Duration Flash Fire	0	fraction
Continuous no Rainout Short Duration Explosion	0	fraction
Continuous no Rainout Delayed Ignition Flash Fire	0.6	fraction
Continuous no Rainout Delayed Ignition Explosion	0.4	fraction
Continuous with Rainout Immediate Ignition	0.05	fraction
Continuous with Rainout Long Duration Horizontal Fraction	0	fraction
Continuous with Rainout Long Duration Horizontal Jet Fire	0	fraction
Continuous with Rainout Long Duration Horizontal Pool Fire	0	fraction
Continuous with Rainout Long Duration Horizontal Jet Fire with Pool Fire	0	fraction
Continuous with Rainout Long Duration Vertical Pool Fire	0	fraction
Continuous with Rainout Long Duration Vertical Jet Fire	0	fraction
Continuous with Rainout Short Duration Fraction	0	fraction
Continuous with Rainout Long Duration Vertical Jet Fire with Pool Fire	0	fraction
Continuous with Rainout Short Duration BLEVE with Pool Fire	0	fraction
Continuous with Rainout Short Duration BLEVE alone	0	fraction
Continuous with Rainout Short Duration Flash Fire with Pool Fire	0	fraction
Continuous with Rainout Short Duration Flash Fire Alone	0	fraction
Continuous with Rainout Short Duration Explosion with Pool Fire	0	fraction
Continuous with Rainout Short Duration Explosion Alone	0	fraction
Continuous with Rainout Short Duration Pool Fire	0	fraction
Continuous with Rainout Residual Pool Fire	0.15	fraction
Continuous with Rainout Delayed Ignition Flash Fire	0.6	fraction
Continuous with Rainout Delayed Ignition Explosion	0.4	fraction
Instantaneous no Rainout Immediate Ignition	0.9	fraction
Instantaneous no Rainout BLEVE	0	fraction
Instantaneous no Rainout Immediate Flash Fire	0	fraction
Instantaneous no Rainout Immediate Explosion	0	fraction
Instantaneous no Rainout Delayed Ignition Flash Fire	0.6	fraction
Instantaneous no Rainout Delayed Ignition Explosion	0.4	fraction
Instantaneous with Rainout Immediate Ignition	0.9	fraction
Instantaneous with Rainout BLEVE with Pool Fire	0	fraction
Instantaneous with Rainout BLEVE Alone	0	fraction
Instantaneous with Rainout Immediate Flash Fire with Pool Fire	0	fraction
Instantaneous with Rainout Immediate Flash Fire Alone	0	fraction
Instantaneous with Rainout Immediate Explosion with Pool Fire	0	fraction
Instantaneous with Rainout Immediate Explosion Alone	0	fraction
Instantaneous with Rainout Immediate Pool Fire Alone	0	fraction
Instantaneous with Rainout Residual Pool Fire	0.15	fraction
Instantaneous with Rainout Delayed Ignition Flash Fire	0.6	fraction
Instantaneous with Rainout Delayed Ignition Explosion	0.4	fraction

Immediate Ignition	0.1	fraction
Explosion Given Ignition	0.5	fraction
Long Duration Jet Fire	0.5	fraction
Short Duration Any Ignition of Cloud	0.5	fraction
Short Duration Ignition of Cloud with Pool Fire	0	fraction
Long Duration Horizontal Jet Fire with Pool	0	fraction
Long Duration Vertical Jet Fire with Pool	0	fraction
Short Duration Fraction for Effects	0	fraction
Short Duration BLEVE not Flash Fire	0.5	fraction
Volume based explosion probabilities	No	
FlamespeedLowMedium	0.45	m/s
FlamespeedMediumHigh	0.75	m/s
Obstructed Cloud Volume (1)	200	m3
Obstructed Cloud Volume (2)	3000	m3
Obstructed Cloud Volume (3)	6000	m3
Low Flame Speed Probability (1)	0	fraction
Low Flame Speed Probability (2)	0.3	fraction
Low Flame Speed Probability (3)	0.6	fraction
Medium Flame Speed Probability (1)	0.3	fraction
Medium Flame Speed Probability (2)	0.6	fraction
Medium Flame Speed Probability (3)	0.9	fraction
High Flame Speed Probability (1)	0.6	fraction
High Flame Speed Probability (2)	0.9	fraction
High Flame Speed Probability (3)	1	fraction

Explosion Parameters

Over Pressure Level 1	0.02068	bar
Over Pressure Level 2	0.1379	bar
Over Pressure Level 3	0.2068	bar
Explosion Location Criterion	Cloud Front (LFL Fraction)	
Minimum explosive mass	0	kg
Minimum Explosion Energy	5E6	kJ
Explosion Efficiency	0.1	fraction
Coefficient for zone of heavy damage	0.03	
Coefficient for zone of light damage	0.06	
Explosion efficiency	10	%
Air or Ground burst	Air burst	
Explosion Mass Modification Factor	3	
Use of mass modification factor	Early and late explosions	

Fireball and BLEVE Blast Parameters

Maximum surface emissive power	400	kW/m2
Radiation Dose for Fireball risk calculations	5.784E6	
Calculate Dose	Unselected	
Calculate Probit	Unselected	
Calculate Lethality	Unselected	
TNO model flame temperature	1727	degC
Mass Modification Factor	3	
Calculation method for fireball	DNV Recommended	
Fireball Maximum Exposure Duration	20	s
Intensity Levels (1)	4	kW/m2
Intensity Levels (2)	12.5	kW/m2
Intensity Levels (3)	37.5	kW/m2
Probit Levels (1)	2.73	
Probit Levels (2)	3.72	

Probit Levels (3)	7.5	
Dose Levels (1)	1.27E6	
Dose Levels (2)	5.8E6	
Dose Levels (3)	2.51E7	
Lethality Levels (1)	0.01	
Lethality Levels (2)	0.1	
Lethality Levels (3)	1	
Ground Reflection	Ground Burst	
Ideal Gas Modeling	Model as real gas	
Minimum Distance	0	m
Number of Distance Points	100.00	
Ground Reflection	Ground Burst	
Ideal Gas Modeling	Model as real gas	
Minimum Distance	0	m
Number of Distance Points	100.00	
Ground Reflection	Ground Burst	
Ideal Gas Modeling	Model as real gas	
Minimum Distance	0	m
Number of Distance Points	100.00	

Flammable Parameters

Height for calculation of flammable effects	0	m
Flammable result grid step in X-direction	10	m
LFL fraction to finish	0.85	
Angle of inclination	0	deg
Observer direction	Variable	
Flammable mass calculation method	Mass between LFL and UFL	
Flammable Base averaging time	18.75	s
Radiation level for Jet/Pool Fire Risk	35	kW/m2
Cut Off fraction for cloud volume	0.001	fraction
UFL Multiple for immediate ignition	1	
Cut Off Time for Short Continuous Releases	20	s
Observer type radiation modelling flag	Planar	
Probit A Value	-36.38	
Probit B Value	2.56	
Probit N Value	1.333	
Height for reports	Centreline Height	
Angle of orientation	0	deg
Relative tolerance for radiation calculations	0.01	fraction
Number of Lethality Ellipses	5.00	
Ellipse linear spacing variable	Probit	
Minimum Probability Of Death	0.01	fraction
Number of radiation/distance points in linked radiation calculations	50.00	
Method for fitting ellipse to flash fire shape	ChiSq method	
Absolute tolerance for linked radiation calcs	1e-010	
Solar radiation	Exclude from calculations	
For time-varying releases	Don't Model Short Duration Effects	
Match fireball duration and mass released	No	

General Parameters

Maximum release duration	3600	s
Height for concentration output	0	m
Rotation	0	deg
Lower Elevation	0	m
Multicomponent aerosol behaviour	Single aerosol modelling	

General Risk Parameters

Use Free Field Modelling	No Free Field	
Distance to Site Boundary	0	m
Late Pool Fire	Exclude Effects	
Minimum Case Frequency	1e-012	/AvgeYear
Minimum Event Probability	1e-012	
Population Omega Factor	0.000168	
Maximum Number of Subsquares across Ellipse	10.00	
Maximum Number of Subdivisions per Square	5.00	
Factor for Toxic F-N Spread	2	
Grid Sizing	Calculated	
Grid Bounds Minimum X	-1000	m
Grid Bounds Maximum X	1000	m
Grid Bounds Minimum Y	-1000	m
Grid Bounds Maximum Y	1000	m
Grid Calculation Method	Number of cells	
Grid cell size	10	m
Maximum number of cells	40,000.00	
Aversion Index	1.2	
Indoor Population Omega Factor	0	
Number of wind subdivisions per sector	1.00	
Method for handling Indoor/Outdoor risk	Indoor and outdoor risk calculations	
Inter-ellipse interpolation method	Weighted	
Method option	Normal dispersion	
Cylinder height over radius ratio	3	
Building damage method	Worst point	
Reflection method	Calculated Angle	
Number of X steps per view	11.00	
Minimum X step	0.1	m
Number of time steps - continuous clouds	5.00	
Between Cloud Views	Minimise Gaps	
Pressure exceedance curves	Calculate	
Elevation of Floor or Ceiling	0	m
Concentration method for filling	Stoichiometric	
Minimum probability of death for explosions	0.001	
Minimum Pressure Filter	0.01	bar
Separation specification	Use Ratio	
Critical Separation Ratio	0.5	
Cloud Shape of Area Integration	Elliptical	
Explosion efficiency method	100% efficiency	
Explosion Type Calculation Method	Polynomial Curve-Fit Equations	
Number of Blast Curve Discretization Points	30,000.00	
Maximum No. effect points along transect	2.00	
Low to medium criterion	0.006	
Medium to high criterion	0.08	
Options available	Volume Averaged	
Method option:	Ground reflection	
Reflection factor	1	
Unconfined Explosion Strength	2	
Explosion Efficiency	1	fraction
Flammable Mass Calculation Type	Area Weighted Mass Integral	
Minimum Explosion Energy	0	kJ
Maximum number of time steps	100.00	
Number of timesteps - time varying clouds	10.00	
Active Shut Down	No Shut Down	

Fraction of Population Indoors for Societal Risk	0.9	fraction
Fraction of Population Indoors for Individual Risk	0	fraction

Indoor Vulnerability

Vulnerability Model	Discrete Overpressure	
Pressure Method - Building calculation	Reflected	
Pressure Method - Individual Risk	Side on	
Pressure Method - Grid population	Side on	
Overpressure for Lethality (1)	0.1	bar
Overpressure for Lethality (2)	0.3	bar
Lethality (1)	0.025	fraction
Lethality (2)	1	fraction
Lethality (1)	1	fraction
Equation Constant (1)	0.3	bar
Equation Exponent (1)	1	
Overpressure Offset (1)	0.3	bar
Impulse Offset (1)	0	N.s/m2
ProbitA	-10.46	
ProbitB	1.35	
ProbitN	1	
Number of overpressures	2.00	
Number of impulses	1.00	
Fireball (Societal Radiation Criteria Zone)	0.5	fraction
Fireball (Individual Radiation Criteria Zone)	1	fraction
Fireball (Societal Flammable Probit Zone)	0	fraction
Fireball (Individual Flammable Probit Zone)	0	fraction
Jet Fire (Societal Radiation Criteria Zone)	1	fraction
Jet Fire (Individual Radiation Criteria Zone)	1	fraction
Jet Fire (Societal Flammable Probit Zone)	0	fraction
Jet Fire (Individual Flammable Probit Zone)	0	fraction
Pool Fire (Societal Radiation Criteria Zone)	1	fraction
Pool Fire (Individual Radiation Criteria Zone)	1	fraction
Pool Fire (Societal Flammable Probit Zone)	0	fraction
Pool Fire (Individual Flammable Probit Zone)	0	fraction
Light Explosion Damage vulnerability	0.025	fraction
Heavy explosion damage vulnerability	1	fraction
Method for Radiation Vulnerability	Use Probit method	
Flash Fire Vulnerability	0.1	
Toxic Vulnerability	1	
Pool Fire Radiation Intensity Level (1)	4	kW/m2
Pool Fire Radiation Intensity Level (2)	12.5	kW/m2
Pool Fire Radiation Intensity Level (3)	37.5	kW/m2
Jet Fire Radiation Intensity Level (1)	4	kW/m2
Jet Fire Radiation Intensity Level (2)	12.5	kW/m2
Jet Fire Radiation Intensity Level (3)	37.5	kW/m2
Fire Ball Radiation Intensity Level (1)	4	kW/m2
Fire Ball Radiation Intensity Level (2)	12.5	kW/m2
Fire Ball Radiation Intensity Level (3)	37.5	kW/m2

Jet Fire Parameters

Maximum SEP for a Jet Fire	400	kW/m2
Jet Fire Averaging Time	20	s
Calculate Dose	Unselected	
Calculate Probit	Unselected	
Calculate Lethality	Unselected	

Crosswind Angle	0	deg
Correlation	DNV Recommended	
Horizontal Options	Use standard method	
Rate Modification Factor	3	
Jet Fire Maximum Exposure Duration	20	s
Emissivity Method	E and F calculated	
Intensity Levels (1)	4	kW/m2
Intensity Levels (2)	12.5	kW/m2
Intensity Levels (3)	37.5	kW/m2
Probit Levels (1)	2.73	
Probit Levels (2)	3.72	
Probit Levels (3)	7.5	
Dose Levels (1)	1.27E6	
Dose Levels (2)	5.8E6	
Dose Levels (3)	2.51E7	
Lethality Levels (1)	0.01	
Lethality Levels (2)	0.1	
Lethality Levels (3)	1	

Outdoor Vulnerability

Vulnerability Model	Discrete Overpressure	
Pressure Method - Building calculation	Reflected	
Pressure Method - Individual Risk	Side on	
Pressure Method - Grid population	Side on	
Overpressure for Lethality (1)	0.3	bar
Lethality (1)	1	fraction
Lethality (1)	1	fraction
Equation Constant (1)	0.3	bar
Equation Exponent (1)	1	
Overpressure Offset (1)	0.3	bar
Impulse Offset (1)	0	N.s/m2
ProbitA	-10.46	
ProbitB	1.35	
ProbitN	1	
Number of overpressures	1.00	
Number of impulses	1.00	
Fireball (Societal Radiation Criteria Zone)	1	fraction
Fireball (Individual Radiation Criteria Zone)	1	fraction
Fireball (Societal Flammable Probit Zone)	0.14	fraction
Fireball (Individual Flammable Probit Zone)	1	fraction
Jet Fire (Societal Radiation Criteria Zone)	1	fraction
Jet Fire (Individual Radiation Criteria Zone)	1	fraction
Jet Fire (Societal Flammable Probit Zone)	0.14	fraction
Jet Fire (Individual Flammable Probit Zone)	1	fraction
Pool Fire (Societal Radiation Criteria Zone)	1	fraction
Pool Fire (Individual Radiation Criteria Zone)	1	fraction
Pool Fire (Societal Flammable Probit Zone)	0.14	fraction
Pool Fire (Individual Flammable Probit Zone)	1	fraction
Light Explosion Damage vulnerability	0	fraction
Heavy explosion damage vulnerability	1	fraction
Method for Radiation Vulnerability	Use Probit method	
Flash Fire Vulnerability	1	
Toxic Vulnerability	1	
Pool Fire Radiation Intensity Level (1)	4	kW/m2
Pool Fire Radiation Intensity Level (2)	12.5	kW/m2

Pool Fire Radiation Intensity Level (3)	37.5	kW/m2
Jet Fire Radiation Intensity Level (1)	4	kW/m2
Jet Fire Radiation Intensity Level (2)	12.5	kW/m2
Jet Fire Radiation Intensity Level (3)	37.5	kW/m2
Fire Ball Radiation Intensity Level (1)	4	kW/m2
Fire Ball Radiation Intensity Level (2)	12.5	kW/m2
Fire Ball Radiation Intensity Level (3)	37.5	kW/m2

Pool Fire Parameters

Instantaneous releases	10	s
Continuous releases	10	s
Calculate Dose	Not selected	
Calculate Probit	Not selected	
Calculate Lethality	Not selected	
MaxExposureDuration	20	s
Radiative fraction for general fires	0.4	fraction
Intensity Levels (1)	4	kW/m2
Intensity Levels (2)	12.5	kW/m2
Intensity Levels (3)	37.5	kW/m2
Dose Levels (1)	1.27E6	
Dose Levels (2)	5.8E6	
Dose Levels (3)	2.51E7	
Probit Levels (1)	2.73	
Probit Levels (2)	3.72	
Probit Levels (3)	7.5	
Lethality Levels (1)	0.01	
Lethality Levels (2)	0.1	
Lethality Levels (3)	1	

Pool Vaporization Parameters

Toxics cut-off rate for pool evaporation	0.001	kg/s
Flammable cut-off rate for pool evaporation	0.1	kg/s
Concentration power to use in pool rate load calculation	1	
Maximum number of pool evaporation rates	10.00	
Pool minimum thickness	5	mm
Surface thermal conductivity	0.00221	kJ/m.s.degK
Surface roughness factor	2.634	
Surface thermal diffusivity	9.48E-7	m2/s
Type of Bund Surface	Concrete	
Bund Height	0	m
Bund Failure Modeling	Bund cannot fail	

Toxic Parameters

Toxics: minimum probability of death	0.001	
Toxics: height for calculation of effects	0	m
Toxics: results grid step in Y-direction	2.5	m
Toxics: results grid step in X-direction	25	m
Multi-comp. toxic calc. method	Mixture Probit	
Toxic Averaging Time - New Parameter	600	s
Probit Calculation Method	Use Probit	
Building Exchange Rate	4	/hr
Tail Time	1800	s
Indoor Calculations	Unselected	
Wind Dependent Exchange Rate	Case Specified	
Set averaging time equal to exposure time	Use a fixed averaging time	
Cut-off fraction of toxic load for exposure time calculation	0.05	fraction

Cut-off concentration for exposure time calculations	0	fraction

Weather Parameters

Atmospheric pressure	1.013	bar
Atmospheric molecular weight	28.97	
Atmospheric specific heat at constant pressure	1.004	kJ/kg.degK
Wind speed reference height	10	m
Temperature reference height	0	m
Cut-off height for wind speed profile	1	m
Wind speed profile	Power Law	
Atmospheric T and P Profile	Temp.Logarithmic; Pres.Linear	
Atmospheric Temperature	25	degC
Relative Humidity	0.75	fraction
Parameter	0.1	
Length	183.2	mm
Surface Roughness	Use Parameter	
Surface Temperature for Dispersion Calculations	25	degC
Surface Temperature for Pool Calculations	25	degC
Solar Radiation Flux	0.5	kW/m2
Building Exchange Rate	4	/hr
Tail Time	1800	s
Surface Type	3m - City centre with high and low rise buildings	
Mixing Layer Height for Pasquil Stability A	1300	m
Mixing Layer Height for Pasquil Stability A/B	1080	m
Mixing Layer Height for Pasquil Stability B	920	m
Mixing Layer Height for Pasquil Stability B/C	880	m
Mixing Layer Height for Pasquil Stability C	840	m
Mixing Layer Height for Pasquil Stability C/D	820	m
Mixing Layer Height for Pasquil Stability D	800	m
Mixing Layer Height for Pasquil Stability E	400	m
Mixing Layer Height for Pasquil Stability F	100	m
Mixing Layer Height for Pasquil Stability G	100	m

APPENDIX I

Record of Requesting Information from LPG Filling Station

香港房屋委員會
Hong Kong Housing Authority

Our Ref. : HD(BS2) GAS/1059

Tel No. : 2761 7346

Fax No. : 2715 8247

Date: 25 February 2016

Feoso Oil Limited
10/F, Feoso Building,
877 Lai Chi Kok Road,
Kowloon, Hong Kong

Dear Sirs,

Quantitative Risk Assessment (QRA) on the Existing Petrol cum LPG Filling Station at 23 Fung Yip Street, Chai Wan

Request of Operation Information from Feoso

A public housing development will be developed near the Junction of Chai Wan Road and Wing Ping Street. As the proposed development is closed to the existing petrol cum LPG filling station at 23 Fung Yip Street in Chai Wan operating by Feoso, HKHA had appointed an environmental consultant, Messrs. AECOM Asia Co. Ltd., to carry out a Quantitative Risk Assessment (QRA) to the satisfactory of EMSD. In order to undertake the assessment by our consultant, I am writing to request the operation information for the captioned Petrol cum LPG filling station.

Attached please find an information request form for your completion. Please understand that this is a standard procedure for project data verification suggested by Gas Standards Office, EMSD. It would be highly appreciated if you could let us have the requested information by 4 March 2016.

Should you have any queries, please do not hesitate to contact the undersigned or our consultant representative Ms Connie Tsai at 3922 9419.

Yours faithfully,

(Jonathan C.Y. NG)
BSE/C35
for Director of Housing

Encl.

c.c. A/25
PO/33
AECOM (Att.: Ms Benita Kung)

File via SBSE/C12

Quantitative Risk Assessment on the Existing Petrol cum LPG Filling Station at 23 Fung Yip Street, Chai Wan

Information Request Form

Item #	Requested Information	Information Provided by Operator
	Petrol cum LPG Filling Station at 23 Fung Yip Street, Chai Wan	**Feoso**
	LPG facilities	
1	Layout plan showing location of equipment and pipeline associated with LPG	
	- LPG storage vessel	
	- pipeline from filling point to dispensers	
	- valves	
	- filling point (connecting to LPG road tanker)	
	- LPG road tanker unloading bay	
2	LPG Storage Vessel	
	Schematic diagram for LPG Storage Vessel	
	number of submersible pump per storage vessel	
	Number of LPG Storage Vessel	
	Max. capacity of LPG Storage Vessel	
	Max. inventory level (% of max. capacity of LPG vessel)	
	Undergound/ Aboveground?	
3	Operating conditions and physical parameters of LPG vessel / pipeline	
	- liquid filling line from filling point to vessel (length & diameter of pipeline)	
	- storage vessel (length & diameter)	
	- liquid supply line from vessel to dispenser (length & diameter of pipeline)	
	- vapour return line (length & diameter of pipeline)	
4	LPG dispensers	
	- total number	
	- number of nozzles	
	- number of flange joints/ (ball) valves	
	- pumping rate	
5	Please indicate % time for LPG inventory in a storage vessel:	
	- above 60% of the vessel capacity	
	- below 60% of the vessel capacity	
	Safety devices	
6	Whether the storage vessels have the following protection measures	
	- corrosion protection coating / system	
	- stress relieved	
	- 100% radiographed	
7	Please indicate the availability of the following FS protection system,	
	- water spray system	
	- gas detection system	
	- others (please specify)	
8	Any overfilling protection (for refilling of the LPG vessel)	
9	Any lightning protection system	

	LPG replenishment	
10	Number of LPG road tanker deliveries in a year	
11	Road Tanker deliveries time (such as day-time / night-time, period of time 09:00 - 12:00), if any specific time period	
12	Maximum capacity of LPG road tanker	
13	Nominal loading of LPG road tanker (% of max. capacity)	
14	LPG pumping rate for unloading from LPG road tanker to LPG storage vessel	
15	Time (no. of minutes) for a road tanker staying at the LPG Station for unloading operation	
16	Please comment on the appropriateness for the following LPG road tanker unloading operation procedure,	
	- number of persons present during unloading operation (including the driver and his assistant)	
	- no road tankers reversing into the unloading area is needed	
	- road tankers face towards the exit so that it may leave rapidly should it need to do so	
	- dedicated unloading area is available for unloading operation	
	- the condition of all connections and hoses is checked by the driver before unloading	
	- during delivery, the driver waits in close proximity to the "emergency-cut-off switch " while the assistant takes care the delivery process.	
	Utilisation of the Petrol/Diesel Filling Facilities	
17	Number of diesel / gasoline road tanker deliveries in a year	
18	Number of vehicles using Petrol/Diesel filing services (daily/annual)	
19	Would it be possible for both LPG road tanker and diesel/gasoline road tanker staying in the station at the same time? If possible, please specify how frequency it would happen (e.g. 1 in 2 LPG unloading operations)	
	Utilisation of the LPG Filling Facilities	
20	Daily / annual LPG consumption rate	
21	Number of vehicles using the LPG filling service (daily/annual)	
22	Peak hours of the LPG filling Station (e.g. 15:00 - 17:00)	
23	Number of vehicles using LPG filling service during peak hours	
24	Operating time-mode and number of staff in the station	

東方石油有限公司
Feoso Oil Limited

1st March, 2016
Our Ref. No. FEOLT0178/16

PREVIEW	ACTION OFFICER	FILE & RETURN
SPSE/G2	BSE/C	F/R
BUILDING SERVICES SECTION		

File = GAS/1059

Housing Authority Headquarters,
33 Fat Kwong Street, Ho Man Tin,
Kowloon, Hong Kong.
Kind Attention: Mr. Jonathan C.Y. Ng

Dear Mr. Ng,

Re Quantitative Risk Assessment (QRA) on the Existing Petrol cum LPG Filling Station at 23 Fung Yip Street, Chai Wan

---

We acknowledge receipt with thanks of your captioned letter dated 25th February, 2016.

As requested, we enclose herewith copy of your "information Request Form" with part of the column has been completed for your reference as other information will not release to public.

Thanking in advance for your kind attention.

Yours faithfully,

Mr. K. K. Ko - Manager

Building Services Section
RECEIVED
- 3 MAR 2016
Development & Construction Division
Housing Department

Encl:

HONG KONG OFFICE: 9-11 FLS., FEOSO BLDG., 877 LAI CHI KOK RD., KOWLOON, HONG KONG. FAX: 3162 3658 TEL: 3162 3888
SINGAPORE OFFICE: 400 ORCHARD ROAD, #13-06 ORCHARD TOWERS, SINGAPORE 238875. FAX: 6732 2055 TEL: 6732 1732
香港公司：香港九龍荔枝角道877號東方石油大廈9-11樓・新加坡公司：烏節路400號・豪傑大廈13-06室・新加坡・郵區238875

Quantitative Risk Assessment on the Existing Petrol cum LPG Filling Station at 23 Fung Yip Street, Chai Wan

Information Request Form

Item #	Requested Information	Information Provided by Operator
	Petrol cum LPG Filling Station at 23 Fung Yip Street, Chai Wan	Feoso
	LPG facilities	
1	Layout plan showing location of equipment and pipeline associated with LPG	
	- LPG storage vessel	
	- pipeline from filling point to dispensers	
	- valves	
	- filling point (connecting to LPG road tanker)	
	- LPG road tanker unloading bay	
2	LPG Storage Vessel	
	Schematic diagram for LPG Storage Vessel	
	number of submersible pump per storage vessel	2
	Number of LPG Storage Vessel	1
	Max. capacity of LPG Storage Vessel	21 KL
	Max. inventory level (% of max. capacity of LPG vessel)	85%
	Undergound/ Aboveground?	Undergound
3	Operating conditions and physical parameters of LPG vessel / pipeline	
	- liquid filling line from filling point to vessel (length & diameter of pipeline)	
	- storage vessel (length & diameter)	
	- liquid supply line from vessel to dispenser (length & diameter of pipeline)	
	- vapour return line (length & diameter of pipeline)	
4	LPG dispensers	
	- total number	2
	- number of nozzles	4
	- number of flange joints/ (ball) valves	
	- pumping rate	
5	Please indicate % time for LPG inventory in a storage vessel:	
	- above 60% of the vessel capacity	
	- below 60% of the vessel capacity	
	Safety devices	
6	Whether the storage vessels have the following protection measures	
	- corrosion protection coating / system	Y
	- stress relieved	Y
	- 100% radiographed	Y
7	Please indicate the availability of the following FS protection system,	
	- water spray system	Y
	- gas detection system	Y
	- others (please specify)	
8	Any overfilling protection (for refilling of the LPG vessel)	
9	Any lightning protection system	Y

	LPG replenishment	
10	Number of LPG road tanker deliveries in a year	700
11	Road Tanker deliveries time (such as day-time / night-time, period of time 09:00 - 12:00), if any specific time period	8:00 - 18:00
12	Maximum capacity of LPG road tanker	15000 LT
13	Nominal loading of LPG road tanker (% of max. capacity)	
14	LPG pumping rate for unloading from LPG road tanker to LPG storage vessel	
15	Time (no. of minutes) for a road tanker staying at the LPG Station for unloading operation	30 m
16	Please comment on the appropriateness for the following LPG road tanker unloading operation procedure,	
	- number of persons present during unloading operation (including the driver and his assistant)	2
	- no road tankers reversing into the unloading area is needed	No
	- road tankers face towards the exit so that it may leave rapidly should it need to do so	yes
	- dedicated unloading area is available for unloading operation	yes
	- the condition of all connections and hoses is checked by the driver before unloading	yes
	- during delivery, the driver waits in close proximity to the "emergency-cut-off switch " while the assistant takes care the delivery process.	yes
	Utilisation of the Petrol/Diesel Filling Facilities	
17	Number of diesel / gasoline road tanker deliveries in a year	160
18	Number of vehicles using Petrol/Diesel filing services (daily/annual)	350/d
19	Would it be possible for both LPG road tanker and diesel/gasoline road tanker staying in the station at the same time? If possible, please specify how frequency it would happen (e.g. 1 in 2 LPG unloading operations)	No
	Utilisation of the LPG Filling Facilities	
20	Daily / annual LPG consumption rate	
21	Number of vehicles using the LPG filling service (daily/annual)	300/d
22	Peak hours of the LPG filling Station (e.g. 15:00 - 17:00)	
23	Number of vehicles using LPG filling service during peak hours	
24	Operating time-mode and number of staff in the station	4-5

APPENDIX J

Reply from PlanD

Tsai, Wai Yan Connie

From:	hli@pland.gov.hk
Sent:	Wednesday, March 09, 2016 3:23 PM
To:	Tsai, Wai Yan Connie
Cc:	jjaustin@pland.gov.hk; jonathan.ng@housingauthority.gov.hk; edith.fung@housingauthority.gov.hk; cynthia.chu@housingauthority.gov.hk
Subject:	Re: Proposed Public Housing Development at Junction of Chai Wan Road, Wing Ping Street and San Ha Street, Chai Wan (Site no.: GLA 4) - QRA

Dear Ms. Tsai,

I refer to the captioned email dated 1.3.2016 seeking comments on population assumptions for the captioned project. Further to the e-mail from our SP Section dated 2.3.2016, please note the following additional comments on the estimated population data.

General
A small part of Yue Wan Estate, Caritas Chai Wan Marden Foundation Secondary School, Precious Blood Secondary School, Summit Industrial Building and The Evangelical Lutheran Church of Hong Kong Faith Love Lutheran School also fall into the 200 m radius of Feoso petrol-cum-LPG filling station. Please be advised that a certain percentage of the population of these buildings should also be covered in the assessment in order to arrive at the most conservative population figure.

Specific
ID 15 - It is suggested that the population should be estimated according to the planned use (zoned "O") instead of its temporary use.

ID 23 - Federal Centre is a commercial/office building, the worker density according to HKPSG should be 20-25m^2/worker. It is suggested 20m^2/worker should be used as the basis of population assumption.

ID 30 - It is doubtful that there are only 20 persons in a fire station. The consultant should be reminded that a more conservative population estimation for QRA should be adopted.

Regards,
Haniel LI
for District Planning Officer/Hong Kong
Planning Department
Tel: 2231 4938

----- Forwarded by Christopher Yiu Fai PANG/PLAND/HKSARG on 01/03/2016 10:59 -----

From:	"Tsai, Wai Yan Connie" <connie.tsai@aecom.com>
To:	"cyfpang@pland.gov.hk" <cyfpang@pland.gov.hk>,
Cc:	"jonathan.ng@housingauthority.gov.hk" <jonathan.ng@housingauthority.gov.hk>, Edith KW FUNG <edith.fung@housingauthority.gov.hk>, "cynthia.chu@housingauthority.gov.hk" <cynthia.chu@housingauthority.gov.hk>
Date:	01/03/2016 10:10
Subject:	Proposed Public Housing Development at Junction of Chai Wan Road, Wing Ping Street and San Ha Street, Chai Wan (Site no.: GLA 4) - QRA

Dear Mr. Pang,

We are the Consultant commissioned by the Housing Authority to undertake a Quantitative Risk Assessment (QRA) for the captioned project. Based on site survey, request to corresponding population groups and the TPEDM data, we estimate the existing (year 2016) and future population(intake year at year 2023) within the study area. The estimated population data is adopted in the QRA study. The population data together with a map showing location of population groups is enclosed for your comments/advice.

We would be most grateful to receive your feedback by 7 Mar 2016 so that we can incorporate your comment into the QRA report for onward submission to EMSD.
Should you have further queries, please do not hesitate to contact me at 3922 9419.

Regards,

Connie WY Tsai, BEng(Hons) PhD MAWMA
SENIOR ENVIRONMENTAL CONSULTANT
D +852 3922 9419
connie.tsai@aecom.com

AECOM
15/F, Tower 1, Grand Central Plaza, 138 Shatin Rural Committee Road, Shatin, New Territories, Hong Kong
T: +852 3922 9000 F +852 3922 9797
www.aecom.com

[attachment "Population Assumption.pdf" deleted by Haniel LI/PLAND/HKSARG]

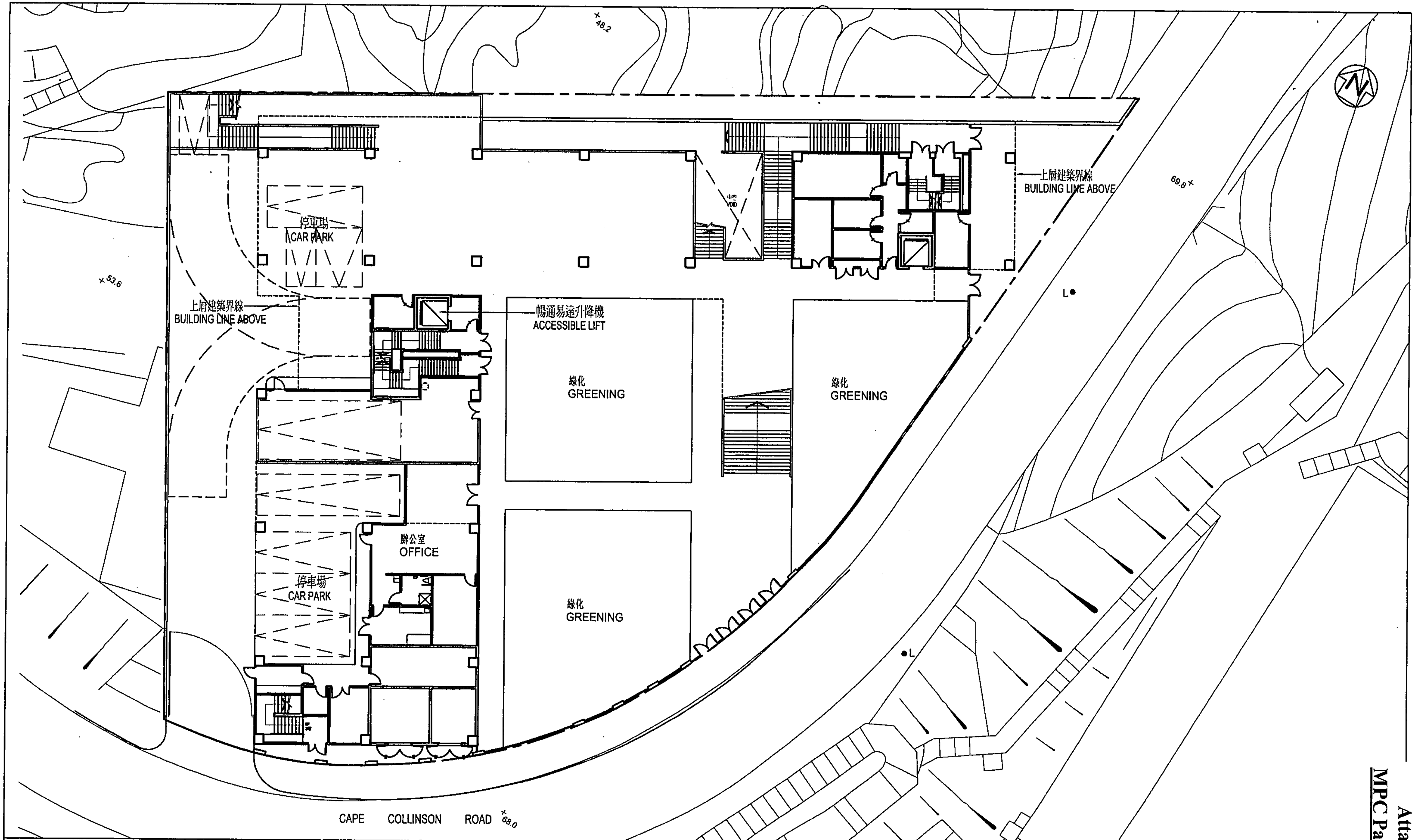
Table 1 Population Assumption

ID	Description	Maximum Population at Year 2016	Maximum Population at Year 2023	Remarks
1	Project Site	0	2,200	Information provided by HA
2	S.K.H Chai Wan St. Michael's Primary School	1050	1050	Estimated based on 24 classes, 30 students per class & 50 staffs
3	San Ha Street Sitting-out Area	5	5	Site Survey
4	Sun Tak House	345	345	Enhanced TPEDM PDZ#34, estimated based on the people per household (=3.19ppl/hsehld)
5	Artland Court	510	510	Enhanced TPEDM PDZ#34, estimated based on the people per household (=3.19ppl/hsehld)
6	Artview Court	479	479	Enhanced TPEDM PDZ#34, estimated based on the people per household (=3.19ppl/hsehld)
7	Fu On Court	268	268	Enhanced TPEDM PDZ#34, estimated based on the people per household (=3.19ppl/hsehld)
8	Fu Ming Court	230	230	Enhanced TPEDM PDZ#34, estimated based on the people per household (=3.19ppl/hsehld)
9	Fu Shing Court	357	357	Enhanced TPEDM PDZ#34, estimated based on the people per household (=3.19ppl/hsehld)
10	Wah Yu Court	383	383	Enhanced TPEDM PDZ#34, estimated based on the people per household (=3.19ppl/hsehld)
11	Bus Terminus	20		Site Survey
12	China Motor Bus Company Limited	43		HKPSG, 700m^2/worker
11+12	Proposed Comprehensive Residential Development		2548	Planning Application No. A/H20/177
	Residential Blocks		2488	780 units, 3.19ppl per household
	Public Transport Terminus		20	Assume to be the same as current situation
	Open Space		40	0.01ppl per m^2
13	Sunview Industrial Building	1317	1317	HKPSG, 25m^2/worker
14	Cheung Yick Industrial Building & Hop Ming Factory Building	985	985	HKPSG, 25m^2/worker
15	Vacant Land	0	20	The site was the temporary site office and storage area for

				WSD, due to lack of development information of this site, similar use is assumed for future scenario.
16	ECO dedicated LPG filling station	15	15	Site Survey
17	Wah Shing Centre	861	861	HKPSG, 25m^2/worker
18	Reality Tower	422	422	HKPSG, 25m^2/worker
19	Kailey Industrial Centre	1586	1586	HKPSG, 25m^2/worker
20	Yip Cheung Centre	572	572	HKPSG, 25m^2/worker
21	Asia One Tower	367	367	HKPSG, 25m^2/worker
22	Gee Wing Chang Industrial Building & Gee Tung Chang Industrial Building	1055	1055	HKPSG, 25m^2/worker
23	Federal Centre	338	338	HKPSG, 25m^2/worker
24	Yiko Industrial Building	548	548	HKPSG, 25m^2/worker
25	Paramount Building	1472	1472	HKPSG, 25m^2/worker
26	Ming Pao Industrial Centre Block B	1133	1133	HKPSG, 25m^2/worker
27	Sheung On Street Playground	50	50	Site Survey
28	Sheung On Driving Test Centre	20	20	Site Survey
29	RCP	2	2	Site Survey
30	Chai Wan Fire Station	20	20	Estimated based on previous project
31	Cornell Centre	1149	1149	HKPSG, 25m^2/worker
32	Feoso Petrol cum LPG filling station	10	10	Site Survey
33	Chai Wan Public Cargo Working Area	50	50	Site Survey

Notes: According to data for Years 2011 and Year 2026 of enhanced 2011-based TPEDM data, annual growth rate of average household size obtained from the TPEDM is -0.36%. The household size of Year 2016 and Year 2023 is assumed to be equivalent to that of 2011, taking into account the worst case scenario.

Figure 1 Population within Study Area



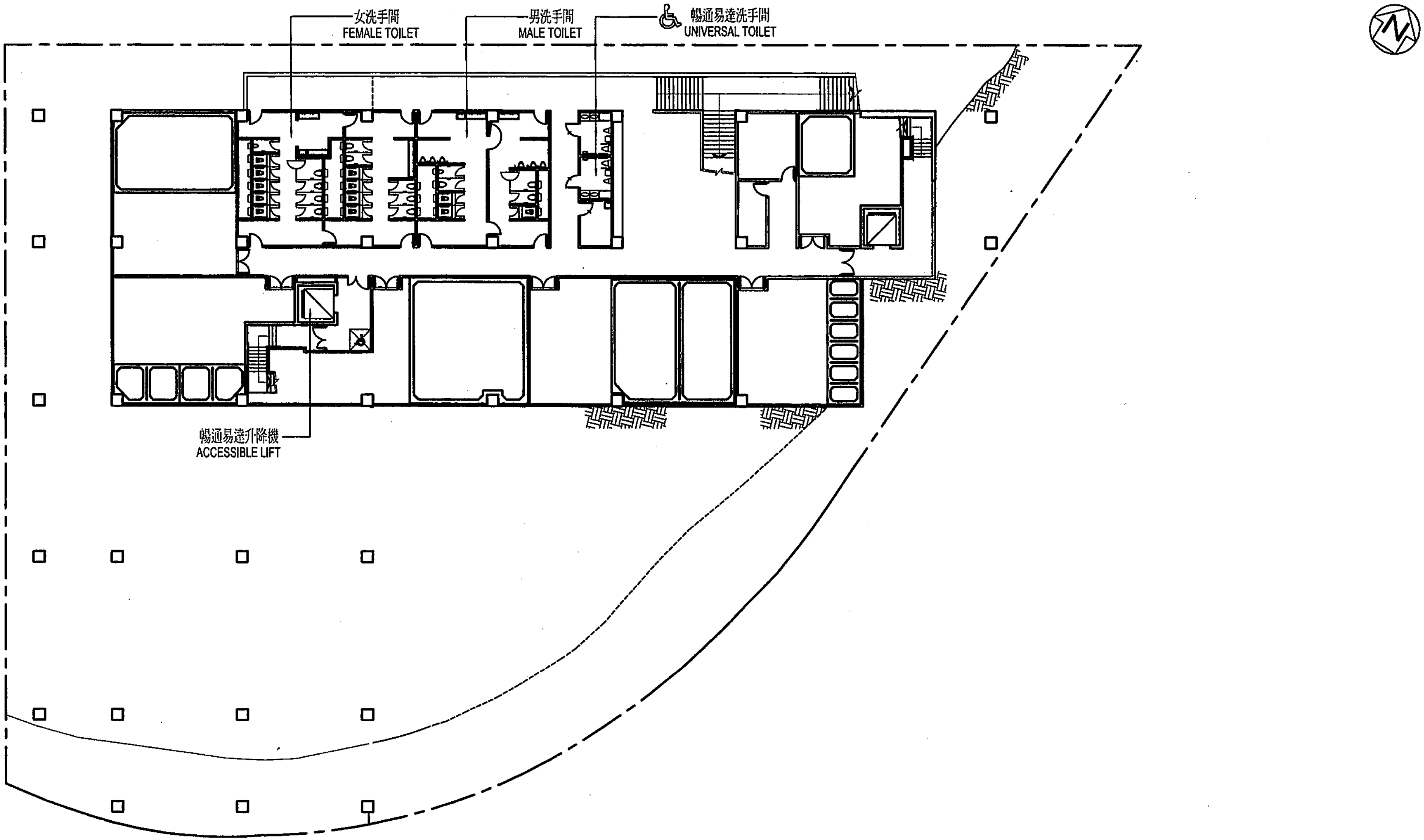
NOTIONAL GROUND FLOOR PLAN
(SUBJECT TO DETAIL DESIGN)

Project Title

PROVISION OF COLUMBARIUM AT CAPE COLLINSON ROAD IN CHAI WAN

5M 0 5M 10M

Attachment XI of MPC Paper No. 13/16

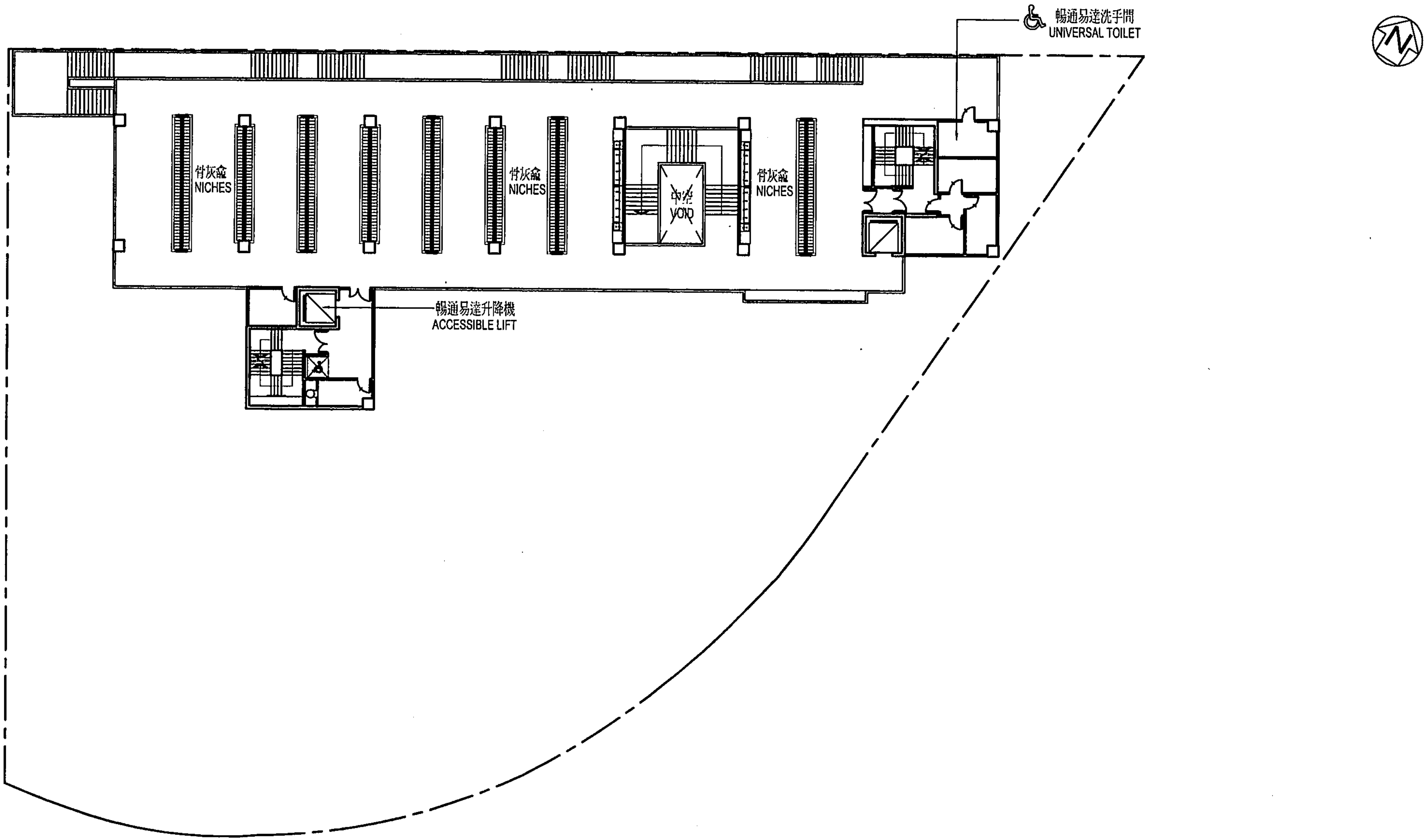


NOTIONAL LOWER GROUND FLOOR PLAN
(SUBJECT TO DETAIL DESIGN)

Project Title

PROVISION OF COLUMBARIUM AT CAPE COLLINSON ROAD IN CHAI WAN

5M 0 5M 10M

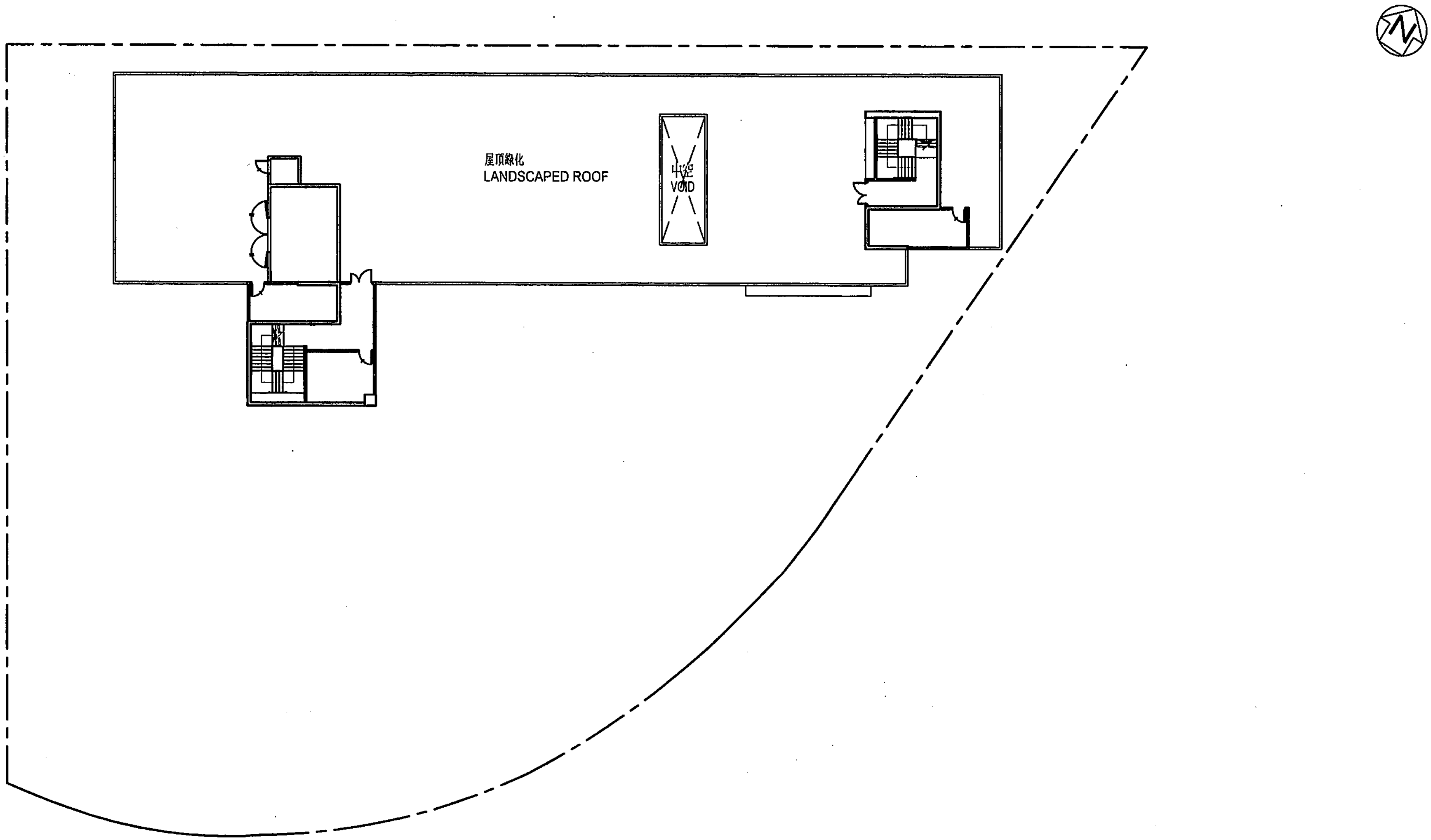


NOTIONAL TYPICAL FLOOR PLAN
(1/F - 4/F)
(SUBJECT TO DETAIL DESIGN)

Project Title

PROVISION OF COLUMBARIUM AT CAPE COLLINSON ROAD IN CHAI WAN

5M 0 5M 10M



NOTIONAL ROOF FLOOR PLAN (SUBJECT TO DETAIL DESIGN)	Project Title PROVISION OF COLUMBARIUM AT CAPE COLLINSON ROAD IN CHAI WAN 5M 0 5M 10M

Halcrow China Ltd

Traffic Impact Assessment Study for
Columbarium Development
at Cape Collinson Road, Chai Wan
Final Traffic Review Study Report

February 2014

Architectural Services Department

Halcrow China Ltd

Traffic Impact Assessment Study for
Columbarium Development
at Cape Collinson Road, Chai Wan
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February 2014

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Architectural Services Department

Traffic Impact Assessment Study for Columbarium Development at Cape Collinson Road, Chai Wan

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February 2014

DOC No.

Serial No.

Contents Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description	Date	Signed
1	0	Draft	Sept 2013	OC/PS
1	0	Final	19/9/2013	OC/PS
1	1	Final	19/11/2013	OC/PS
1	2	Final	14/2/2014	OC/PS

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1 Introduction

1.1 *General*

Halcrow China Limited (HCL) has been commissioned by Architectural Services Department (ArchSD) of the Government of the Hong Kong Special Administrative Region to undertake a Traffic Review Study (hereafter called "the Study") for the proposed revised provision of new niches at the Columbarium Development at Cape Collinson Road, Chai Wan.

1.2 *Background*

In order to meet the public demand for niches, the Government has been exploring various potential sites in the territory for columbarium development. Amongst the potential sites, two sites (Site I and Site II) on Cape Collinson Road have been identified for development of multi-storey columbarium blocks, as shown in Figure 1.1. Site I is planned for the construction of a multi-storey columbarium building, providing about 15,000 niches with ancillary facilities while Site II will provide 8,000 niches. As only one of the 2 sites would be developed, Site I was selected having regard to its potential of providing a larger number of niches. The proposed development at Site I is tentatively scheduled to commence construction in 2015 for completion in 2018.

A Traffic Impact Assessment (TIA) Study was conducted and completed in May 2012 (2012 Study) with the findings and recommended traffic and transport improvements endorsed by HKPF and TD, relating to the provision of 15,000 niches at Site I. The 2012 Study had already taken reference to the planned niche development in the vicinity in the forthcoming years in the analyses. For better utilisation of the site, a preliminary study was conducted to increase the niches by 10,000, making the total provision to 25,000 niches. In this connection, it was considered appropriate to conduct a review on the 2012 Study Report to assess the likely impact on the traffic and transport arrangements arising from the revised provision of 25,000 niches at Site I.

1.3 *Objectives of the Review Study*

The main objectives of this Review Study are to:

(i) Carry out a TIA review study for the revised provision of 25,000 niches based on the findings and recommendations in the 2012 Study Report .

(ii) Identify traffic impacts within the study area for the assessment years 2011, 2016, 2021 and 2026 with updated information.

(iii) Propose solutions to the traffic impact and problems identified in the review study.

1.4 *Scope of the Study*

The main scope of the Assignment is to conduct a review study to assess the adequacy of the recommendations put forward in the 2012 Study in coping with the demand induced by the revised development proposal of 25,000 niches at Site I.

Specific scope of work includes:

(i) To review the traffic demand by taking into account the historic data of grave sweepers visiting cemeteries in the Chai Wan area (Chai Wan Cemeteries) and to forecast the traffic flow in the study area under different traffic conditions during Ching Ming festive period in order to assess the traffic requirements of the project.

(ii) To conduct a review on the special traffic arrangement and public transport service arrangement (including bus, taxi, pick-up/ drop-off operation) proposed in the 2012 Study Report and recommend further improvements as appropriate.

(iii) To review the public transport arrangement for Ching Ming festive period, such as the stacking of buses, passenger queuing arrangement, pick up and set down of passengers for services operating between the MTR stations and San Ha Street.

(iv) To undertake sensitivity tests for Ching Ming Festival and at immediate Saturdays and Sundays prior to and after Ching Ming in 2021 and recommend contingency traffic management measures.

(a) the trip generation and attraction rate assumed for Site I is underestimated by 20% during the critical days;

(b) the proposed number of niches at Site I is increased by 20%; and

(c) the background traffic at the road network within the study area is underestimated by 20%.

1.5 *Structure of the Report*

This Review Study Report contains the following chapters:

Chapter 2 - Existing Conditions of the Site;

Chapter 3 - Forecast Development Traffic;

Chapter 4 - Review of Proposed Improvement Schemes;

Chapter 5 - Traffic Assessment;

Chapter 6 - Sensitivity Tests; and

Chapter 7 - Conclusion.

2 Existing Conditions of the Site

2.1 *Site Location*

Figure 1.1 shows the proposed development site (Site I), which is located within the cluster of cemeteries in the Chai Wan area , and the road network in the Chai Wan district and the Study Area of the 2012 Study. Details of existing transport network and transport facilities in the study area are given in Chapter 2 of the 2012 Study Report. Table 2-1 and Figure 2.1 show the public transport services serving the Chai Wan area.

Table 2-1 Franchised Bus and GMB Services Serving Chai Wan District

Service	Route No.	Terminating Points		Remarks
Franchised Bus	8	Heng Fa Chuen	Wan Chai Ferry Pier	Daily services every 10-15 minutes
	8S	Siu Sai Wan (Island Resort)	Happy Valley Race Course	Services on horse racing day only
	8X	Siu Sai Wan (Island Resort)	Happy Valley (Lower)	Daily services every 7-25 minutes
	8P	Siu Sai Wan (Island Resort)	Wan Chai Ferry	Daily express services every 3-7 minutes
	19	Siu Sai Wan (Island Resort)	Happy Valley (Upper)	Daily services every 10-30 minutes
	81	Chai Wan (Hing Wah Estate)	Lai Tak Tsuen	Daily services every 15-20 minutes
	81A	Hing Wah Estate	Lai Tak Tsuen	Services on school days morning & evening peaks only
	81S	Siu Sai Wan (Harmony Garden)	Braemar Hill	Services on school days mornings only
	82	North Point Ferry Pier	Siu Sai Wan (Island Resort)	Daily services every 5-15 minutes
	82M	Chai Wan Station	Siu Sai Wan (Island Resort) (Circular)	Services on weekday every 20-40 minutes; special departure during morning peak between 07:00 - 08:40 every 25 minutes on Mondays to Fridays
	82S	Yiu Tung (Wai Hang Street)	Siu Sai Wan (Island Resort)	Services on school day mornings only
	82X	Siu Sai Wan (Island Resort)	Quarry Bay	Daily express services every 10-20 minutes. Special departure during morning peak at 07:12 on School days.
	85	Siu Sai Wan (Island Reort)	Braemar Hill (Circular)/ North Point Ferry Pier	Daily services every 10-20 minutes, Departures from Siu Sai Wan after 21:50 daily will be terminated at North Point Ferry Pier every 20 minutes
	85P	Siu Sai Wan (Island Resort)	Braemar Hill	Services on school days morning & evening peaks only
	106	Wong Tai Sin	Siu Sai Wan (Island Resort)	Daily services every 4-10 minutes
	106P	Siu Sai Wan (Island Resort)	Wong Tai Sin	Services on Monday to Friday at 06:45, 07:00, 07:12, 07:25, 07:40, 07:55 and 18:00, 18:15.

Service	Route No.	Terminating Points		Remarks
Franchised Bus	314	Siu Sai Wan (Island Resort)	Stanley (Beach / Market) (Circular)	Services on Sunday and Public Holidays during Swimming Season from June to September every 30 minutes only.
	388	Chai Wan MTR Station	Chai Wan Cemeteries / Cape Collinson(Circular)	Services on specified day, circular.
	389	Shau Kei Wan MTR Station	Chai Wan Cemeteries / Cape Collinson	Services on specified day, circular.
	118	Siu Sai Wan (Island Resort)	Sham Shui Po (Tonkin Street)	Daily services every 4-10 minutes; Special departures on Monday to Saturday morning peak services.
	118P	Siu Sai Wan (Island Resort)	Sham Shui Po (Tonkin Street)/ Mong Kok (Bute Street)	Monday to Saturday express morning and evening peak services
	606	Choi Wan (Fung Shing Street)	Siu Sai Wan (Island Resort)	Daily services every 11-22 minutes
	606A	Choi Wan	Yiu Tung Estate	Daily morning services every 15-22 minutes except Sundays and public holidays
	698R	Siu Sai Wan (Island Resort)	Sai Kung (Wong Shek Pier)	Sunday and public holidays morning and evening limited services
	682	Lee On	Chai Wan (East)	Daily services every 8-20 minutes
	682P	Lee On Wu Kai Sha Station	Chai Wan (East) Chai Wan (East)	Monday to Saturday morning peak only Monday to Friday morning peak only
	682A	Ma On Shan Town Centre	Siu Sai Wan	Monday to Friday morning peak express services at 07:20 and 07:40
	682B	Shui Chuen O -	Siu Sai Wan	Monday to Friday Morning peak only
	694	Tiu Keng Leng PTI	Siu Sai Wan	Daily express services every 15-25 minutes
	780	Chai Wan (East)	Central(Central Ferry Piers)	Daily express services every 12-17minutes
	780P	Hing Wah (via Causeway Bay)	Central (Ferry Piers)	Services on Monday to Saturday morning every 20 minutes.
	788	Central (Macau Ferry)	Siu Sai Wan (Island Resort)	Daily express services every 4-15 minutes
	789	Admiralty (Rodney Street)	Siu Sai Wan (Island Resort)	Daily express services every 4-15 minutes
	802	Shatin Racecourse	Siu Sai Wan (Island Resort)	Service on specified day, horse racing.
	9	Shau Kei Wan	Shek O	Daily services every 6-30 minutes.
	14	Grand Promenade	Stanley Fort(Gate) (Circular)/ Stanley Plaza (Ma Hang) / Stanley Fort (Gate) (omit Ma Hang)	Daily services every 10-20 minutes.
	A12	Siu Sai Wan (Island Resort)	Airport (Ground Transportation Centre)	Cityflyer services daily every 20-25 minutes; Special departure during morning and evening peaks.
Franchised Bus	N8	Wan Chai Ferry Pier	Heng Fa Chuen	Daily over-night services every 30 minutes.

Service	Route No.	Terminating Points		Remarks
	N8X	Siu Sai Wan (Island Resort)	Central (Macau Ferry)	Daily over-night services every 30 minutes.
	N8P	Siu Sai Wan (Island Resort)	Wan Chai (Harbour Road)	Daily over-night services every 15 minutes.
	N118	Siu Sai Wan (Island Resort)	Sham Shui Po (Tonkin Street)	Daily over-night services every 15-20 minutes.
GMB	16A(1)	Chai Wan Station	Chung Hom Kok (Circular)	Daily services from Chai Wan Station at 10:05, 12:05, 12:40, 17:15 and 19:35; from Chung Hom Kok at 10:35, 12:35, 13:05, 17:45 and 20:05
	16M(1)	Chai Wan Station	Chung Hom Kok	Daily services every 5-15 minutes
	16X(1)	Chai Wan Station	Stanley Beach Road	Daily services every 5-15 minutes
	18M(1)	Chai Wan Station	Cape Collinson (Correctional Institution)	Monday to Sunday(except Wednesday and public holidays) from 08:00 to 18:30, every 90-120 minutes
	20	Grand Promenade	Chai Wan Ind City	Daily services every 7 minutes
	20M	Hing Man Estate	Chai Wan Ind City	Daily services every 6-9 minutes
	43M(1)	Chai Wan Station	Fung Wah Estate (Circular)	Daily service every 5-15 minutes
	44M	Chai Wan Station	Siu San Wan Estate (Circular)	Daily over-night services every 15 minutes.
	47E	Siu Sai Wan Estate	Eastern Hospital(Circular)	Services on Monday to Saturday every 20 minutes
	47M	Chai Wan Station	Siu Sai Wan Estate (Circular)/Hiu Tsui Court/ Chai Wan (Wing Ping St)	Daily services every 3-10 minutes; Short Working services on Monday to Saturday morning every 10-15 minutes. Special services on Monday to Saturday every 20 minutes.
	47S	Chai Wan Station	Harmony Garden(Circular)/ Chai Wan (Wing Ping St)	Daily services every 10-20 minutes. Special services on Monday to Saturday morning every 10 minutes.
	48M	Chai Wan Station (Lee Chung Street)	Pamela Youde Nethersole Eastern Hospital	Daily services every 3-10 minutes
	61	Siu Sai Wan(Island Resort)	Mong Kok(Fife St)	Daily over-night services every 30 minutes.
	62	Heng Fa Chuen	Cheerful Garden(Circular)	Daily services every 6-8 minutes
	62A	Heng Fa Chuen	Island Resort	Daily services every 8-10 minutes
	65	Eastern Hospital	North Point (Fort St)	Daily services every 5-6 minutes
	65A	Chai Wan(Hong Man St)	Quarry Bay(Circular)	Services on Monday to Saturday every 10-15 minutes
	66(1)	Chai Wan (Wan Tsui Road)	Aldrich Bay (Circular)	Daily service every 8-10 minutes
	66A	Eastern Hospital	Aldrich Bay(Circular)	Daily service every 8 minutes

Note: (1) Refer to Figure 2.1 for locations of GMB terminus, T2 – Terminus of Route 66 and T1 – Terminus for all other routes

2.2 *Observed Traffic and Pedestrian Data*

2.2.1 *2011 Ching Ming Festive Period Traffic and Pedestrian Survey*

Figure 2.2 shows the locations of the traffic and pedestrian traffic surveys undertaken in the area during the Ching Ming festive period in 2011 and details of the surveys are given in the 2012 Study Report. Table 2-2 summarises the survey periods and the identified peak hour on each survey day.

Table 2-2 Traffic and Pedestrian Peak Hours During Ching Ming Period

Survey Date	HKPF Traffic Plan	Traffic Survey		Pedestrian Survey	
		Survey Period	Peak Hour	Survey Period	Peak Hour
2 April 2011, Saturday	Level 2	0700-1800	1045 – 1145	0700-1800	1050 -1150
3 April 2011, Sunday	Level 3	0700-1800	1015 – 1115	0700-1800	1045 – 1145
5 April 2011, Tuesday (Ching Ming Day)	Level 3	0700-1800	1015 – 1115	0700-1800	1045 – 1145
9 April 2011, Saturday	Level 2	0700-1800	1115 – 1215	0700-1800	1110 – 1210
10 April 2011, Sunday	Level 2	0700-1800	1030 – 1130	0700-1800	1205 – 1305

It is noted that the peak hour for the vehicular traffic on the road network in the study area and the peak hour for grave sweeper person trips differed slightly. For conservative estimates, respective peak hour figures are adopted to derive the peak hour person trip rates and vehicle trip rates in the subsequent assessment.

Table 2-2 also shows the associated traffic plans (Level 1, 2 or 3) implemented by the Police on each survey day. In general, Level 1 is implemented when inflow of visitors starting to build up until around 3000-4000 visitors per hour, and change to Level 2 when visitor inflow continues to build up and Level 3 will be adopted with the highest level of visitor inflow such as the situation on Ching Ming Day.

During Level 2 (i.e. on 2, 9 and 10 April 2011), vehicular traffic on Cape Collinson Road east of Lin Shing Road are re-routed for one-way clockwise traffic for cars and taxis. General traffic are also allowed to travel along Cape Collinson Road west of Lin Shing Road leading to Shek O Road. Special franchised buses (Nos. 388, 389) and authorised GMB routes (Routes 16A, 16M, 16X, 18M) travelled on Lin Shing Road to Cape Collinson Road to Shek O Road, which was running one way in westbound direction.

Implementation of Level 3 on 3 April and 5 April (i.e. Ching Ming Day) involved the following traffic diversion and road closures due to heavy pedestrian flows.

(a) Cape Collinson Road east of Lin Shing Road;
(b) the slip road leading from Cape Collinson Road to Garden of Remembrance and Crematorium, except hearses and vehicle carrying passengers to service at the Crematorium (crematorium was closed on Ching Ming Day);
(c) the slip road leading to Chai Wan Chinese Permanent Cemetery;
(d) Wan Tsui Lane
(e) Cape Collinson Road west of Lin Shing Road and Lin Shing Road were closed to all vehicular traffic except franchised buses, GMB routes 16A, 16M, 16X, 18M and hearses.

2.2.2 *Daily and Peak Hour Grave Sweepers Inflows*

Table 2-3 shows the daily grave sweeper inflows by different modes observed by the TIA Consultant during the Ching Ming festive period in 2011. The total no. of visitors is calculated based on the followings:

- Accessing pedestrians on Lin Shing Road Footpath (Location P1 of Figure 2.2)
  - When Level 2 was implemented on 2, 9 and 10 April, pedestrians on Lin Shing Road included those from MTR Chai Wan station, bus passengers from Chai Wan Road and other walk modes.
  - When Level 3 was implemented on 3 and 5 April, pedestrians on Lin Shing Road also included visitors by car/taxi from Wan Tsui Road pick up/drop off areas as Lin Shing Road was closed for general traffic.
- Incoming bus traffic for Special Route 388 and 389 and occupancy rates observed at Location J2 and also visitors by Route No. 9 on Shek O Road at Location J3 of Figure 2.2.
- Incoming GMB vehicle traffic and occupancy rates observed at Location J2 of Figure 2.2.
- Incoming car and taxi vehicle traffic and an assumed occupancy rate of 2.5 persons per vehicle.

Table 2-3 2011 Daily Grave Sweeper Flows by Modes during Ching Ming Festive Period

Date	Traffic Plan Level	Lin Shing Road Footpath	Bus (Routes 388/389/9)			GMB			Car/Taxi			Total Visitors
		No. of visitors	No. of vehicles	Ave Occ*	No. of visitors	No. of vehicles	Ave Occ*	No. of visitors	No. of vehicles	Ave Occ*	No. of visitors	
2/4/2011, Saturday	2	3,805	216	61	13176	325	9	2925	3042	2.5	7605	27511
3/4/2011, Sunday	3	15,682	301	78	23478	397	12	4764	-	-	**	43924
5/4/2011, Ching Ming Day	3	37,907	507	83	42081	375	13	4875	-	-	**	84863
9/4/2011, Saturday	2	2,740	184	38	6992	307	6	1842	2992	2.5	7480	19054
10/4/2011, Sunday	2	7,719	292	57	16644	345	9	3105	4235	2.5	10588	38056

Notes: * Ave Occ = Average Occupancy (persons per vehicle) observed on-site
** Visitors by car/taxi are included in Lin Shing Road footpath when Level 3 is implemented.

Table 2-4 shows the daily grave sweepers provided by the Hong Kong Police Force between 2009 and 2013 and with details given in Appendix A. The table also includes the 2011 daily grave sweeper flows collected by the TIA Consultant as detailed in Table 2-3.

Table 2-4 Comparisons of Daily Grave Sweeper Inflows

Day	2009	2010	2011	2012	2013	2011 Traffic and Pedestrian Surveys
Preceding Saturday	3940	5900	16635	8920	14380	27511
Preceding Sunday	14930	8035	43565	43050	18260	43924
Ching Ming Day	102800	40070	70920	45400	93600	84863
Following Saturday	6590	5120	13875	6600	7720	19054
Following Sunday	3060	22135	28990	9800	32240	38056

Table 2-5 shows the peak hour visitor flows by modes collected by the TIA Consultant on Ching Ming Day and the preceding and following Saturday and Sunday in 2011 and Table 2-6 compares the corresponding figures in 2012 and 2013 provided by the Police. The tables also show the associated traffic plans implemented by the Police during the respective peak hours.

Table 2-5 2011 Peak Hour Grave Sweeper Flows by Modes

Date	Level	No. of Visitors				
		Lin Shing Road Footpath	Bus	GMB	Car/ Taxi	Total
Preceding Saturday (2/4/2011)	2	744	3426	492	1101	5763
Preceding Sunday (3/4/2011)	3	2544	6507	400	*	9451
Ching Ming Day (5/4/2011)	3	8879	9882	504	*	19265
Following Saturday (9/4/2011)	2	431	2553	396	957	4337
Following Sunday (10/4/2011)	2	1178	4377	672	1354	7581

Notes: * Visitors by car/taxi are included in Lin Shing Road footpath when Level 3 is implemented.

Table 2-6 Comparison of Peak Hour Grave Sweeper Inflows

Day	2011 Traffic and Pedestrian Surveys		2012		2013	
	Level	No. of Visitors	Level	No. of Visitors	Level	No. of Visitors
Preceding Saturday	2	5763	2	2250	2	3800
Preceding Sunday	3	9451	2	9600	2	3710
Ching Ming Day	3	19265	3	8100	3	24000
Following Saturday	2	4337	2	1250	2	1650
Following Sunday	2	7581	2	2110	2	7500

It is noted in Table 2-4 and Table 2-6 that the daily and peak hour visitor flows recorded in the 2011 traffic and pedestrian count survey fall in the upper range of the historic data provided by the Police. As the survey data provide detailed information on modal splits, hence, the 2011 survey data are adopted in the subsequent analysis. In addition, a sensitivity test with an increase of the trip rates by 20% is included in Section 6.

To assess the traffic impact under different levels of traffic conditions, the peak hour flows on 9/4/2011, 10/4/2011 and 5/4/2011 are adopted for the assessment of Level 1, Level 2 and Level 3 traffic conditions respectively. As no data for the Level 1 traffic condition is available, despite Level 2 was implemented on 9/4/2011, the peak hour traffic on 9/4/2011 which is less busy and condition of traffic is close to Level 1 situation is adopted to represent Level 1.

2.2.3 *Existing Peak Hour Trip Generations by Vehicular Modes*

Based on the observed vehicle flows collected on different days during the 2011 Ching Ming festive period, Table 4-2 in the 2012 Study Report which shows the peak hour vehicle flows (in pcu's) and associated trip generation rates induced by the existing facilities in Chai Wan Cemeteries on Ching Ming Day (i.e. Level 3) is updated to include the peak hour traffic conditions at Level 1 (9/4/2011) and Level 2 (10/4/2011). The results are shown in Table 2-7. All vehicle flows in the subsequent analysis are converted to passenger car unit (PCU) based on the PCU factors indicated below.

Vehicle Type	**PCU Factor**
Private Car/Taxi/Passenger Van	1.0
Public Light Bus including GMB and RMB	1.5
Medium Good Vehicle	1.75
Heavy Goods Vehicle	2.0
Bus and Coach	3.0

The existing vehicle trip generation rates will be used to estimate the additional vehicular traffic to be generated by the committed and proposed future developments in Chai Wan Cemeteries for assessment of the potential traffic impact to the road network in the study area.

Table 2-7 2011 Peak Hour Generation Rates by Vehicular Modes

	Peak Hour Traffic Flow (PCU)								
	Level 1 (9/4/2011)			Level 2 (10/4/2011)			Level 3 (Ching Ming,5/4/2011)		
	In	Out	Total	In	Out	Total	In	Out	Total
Car/Taxi	338	329	667	610	428	1038	552	557	1109
Bus	75	57	132	123	78	201	198	162	360
GMB	68	68	136	65	66	131	92	98	190
Others	18	5	23	9	2	11	25	29	54
Total	499	459	958	807	574	1381	867	846	1713
	Peak Hour Trip Rate (PCU per 100 graves/ urn graves/ niches)								
Car/Taxi	0.165	0.161	0.326	0.298	0.209	0.508	0.270	0.272	0.542
Bus	0.037	0.028	0.065	0.060	0.038	0.098	0.097	0.079	0.176
GMB	0.033	0.033	0.067	0.032	0.032	0.064	0.045	0.048	0.093
Others	0.009	0.003	0.011	0.006	0.001	0.005	0.012	0.014	0.026
Total	0.244	0.224	0.469	0.395	0.281	0.675	0.424	0.413	0.837

Note: 2011 total number of graves/ urn graves/ niches = 204,437

2.2.4 *Peak Hour Traffic Conditions*

Table 2-8 shows the existing peak hour junction performance at the key junctions in the study area. Detailed calculation sheets are given in Appendix B.

The calculation of the reserve capacities (RC) of signal controlled junctions and design flow/capacity ratio (DFC) of priority junctions and roundabout are carried out in accordance with the Transport Planning and Design Manual (TPDM) Volumes 2 and 4. A RC value of 10% or >10% for signal controlled junctions is considered within acceptable level without causing undue delay to motorists passing through the concerned junction. Likewise, a DFC value of 0.85 or <0.85 for priority and roundabout junction is considered satisfactory.

Table 2-8 2011 Peak Hour Junction Performance during Different Traffic Plan Levels

Jn No.	Location	Junction Type	Level 1 (9/4/2011)	Level 2 (10/4/2011)	Level 3 (Ching Ming, 5/4/2011)
J1	J/O Cape Collinson Road and Lin Shing Road	Priority	0.50	0.77	0.32
J2	J/O Lin Shing Road and Wan Tsui Road	Signal	36.6%	6.4%	37.7%
J3	J/O Cape Collinson Road and Shek O Road	Priority	0.61	1.47	0.52
J4	J/O Chai Wan Road Roundabout	Roundabout	0.66	0.55	0.60
J5	J/O Chai Wan Road and Wing Tai Road and Siu Sai Wan Road	Signal	187.5%	315.2%	282.8%
J6	J/O Siu Sai Wan Road and Harmony Road (SW)	Signal	91.6%	95.7%	144.9%
J7	J/O Siu Sai Wan Road and Harmony Road (NE)	Signal	103.8%	108.8%	184.1%
J8	J/O Chai Wan Road and Tai Tam Road	Signal	46.8%	18.5%	**7.7%**
J9	J/O Chai Wan Road and Wan Tsui Road	Priority	0.35	0.24	0.43

*Notes: Reserve Capacity (RC) for signal controlled junction;
Design Flow /Capacity Ratio (DFC) for priority junction and roundabout
J1/J2/J3 are for information only (on-site manual traffic control implemented by the HKPF)

During the Ching Ming Period, special traffic arrangements had been implemented as described in Section 2.2.1 and traffic control was carried out by the HKPF at the junctions along Cape Collinson Road and Lin Shing Road, i.e. J1, J2 and J3. Hence, calculation of RC and DFC at these junctions as shown in Table 2-7 is for reference only and does not truly reflect the actual traffic condition as extensive traffic control and management measures were implemented by HKPF aimed to balance the demand of vehicular and pedestrian traffic and ensure road safety.

With the exception of J8 (J/O Chai Wan Road and Tai Tam Road), all other key junctions in the area performed satisfactorily during the peak hours at Level 1, 2 and 3. For J8, heavy right turn movements from Chai Wan Road (N) to Tai Tam Road were recorded and the junction was found to approach capacity during the peak hour under Level 3, i.e. on Ching Ming Day.

2.2.5 *Traffic Analysis of Key Pedestrian Routes*

Table 2-9 presents the peak hour pedestrian flows at the critical links recorded at Level 1, 2 and 3 during Ching Ming festive period. Figure 2.3 shows the locations of the critical footpath links and these are:

- P1: the footpaths on Cape Collinson Road east of Lin Shing Road
- P2: the footpaths on Lin Shing Road
- P3: the footpaths on Cape Collinson Road east of Shek O Road junction
- P4: the footpaths on Cape Collinson Road near the Second Columbarium.

Table 2-9 2011 Peak Hour Pedestrian Flows at Critical Lnks during Ching Ming Festive Period

Route	**P1**		**P2**			**P3**		**P4**		**Total**
Link	A	B	C	D	E	F	G	H	I	
Level 1 (9/4/2011 11:10-12:10)	437	507	273	431	675	562	1495	197	99	4676
Level 2 (10/4/2011 12:05-13:05)	1884	2258	1079	1178	2122	1913	2909	938	946	15227
Level 3 (5/4/2011 10:45-11:45)	7584	6029	5709	8879	3634	3673	6113	4082	2110	47813

Note: Refer to Figure 2.3 for locations of footpaths and direction of movements

2.2.6 *Traffic Analysis of Key Pedestrian Routes*

In order to assess the performance of these critical pedestrian links, the level of service (LOS) of the links is calculated. The definitions of different levels of LOS in accordance with the Highway Capacity Manual (HCM) 2000 are given in Appendix C for easy reference. In general, LOS D is considered the minimum threshold from a comfort and safety point of view.

The LOS at the critical links is calculated using the observed peak-5 minute pedestrian flows along the links. It is noted that the actual widths along the critical links such as D and E along Lin Shing Road are widened by the special traffic management implemented on-site. For all footpath widths, 0.5m "shy zone" is deducted from the actual width to derive the effective width for the calculation. The calculations of the pedestrian LOS for Ching Ming Day at critical links for the peak 5-mins flows are shown in Table 2-10.

Table 2-10 2011 LOS of Critical Links in Level 1, 2 and 3 during Ching Ming Festive Period

Level 1						
Route	Critical Link	Actual Width	Effective Width(1)	Peak 5-min flows	Ped/min/m	LOS
P1	A+B	3.0	2.5	113	9	A
	C(3)	3.0	2.5	49	4	A
	D	3.0	2.5	72	6	A
P2	E	2.3	1.8	108	12	A
P3	F+G(5)	2.8	2.3	205	18	B
P4	H+I(2)	2.5	2.0	50	5	A
Level 2						
Route	Critical Link	Actual Width	Effective Width(1)	Peak 5-min flows	Ped/min/m	LOS
P1	A+B	3.0	2.5	455	36	D
	C(3)	3.0	2.5	218	-	-
	D	3.0	2.5	325	26	C
P2	E	2.3	1.8	329	37	D
P3	F+G(5)	2.8	2.3	785	68	**E**
P4	H+I(2)	2.5	2.0	213	21	B
Level 3						
Route	Critical Link	Actual Width	Effective Width(1)	Peak 5-min flows	Ped/min/m	LOS
P1	A+B(2)	10.9	9.9	1620	33	C
	C(3)	3.0	2.5	354	-	-
	D(4)	4.5	4.0	1026	51	**E**
P2	E(4)	3.3	2.8	719	52	**E**
P3	F+G(5)	2.8	2.3	1322	115	**F**
P4	H+I(2)	5.9	4.9	1063	44	D

Notes: (1) Effective width = Actual width – 0.5m (one side or both sides)
(2) Carriageway without traffic being used as footway
(3) Management and crowd control by the HKPF at pedestrian crossings to control flows
(4) Footway width includes 1.0m temporary footway widening
(5) Footway at Link G only, no footway at Link F

As indicated in Table 2-10, the walking conditions at the critical links at Level 1 are generally within acceptable level as the pedestrian flows are relatively lighter than Level 2 and much less than Level 3. The condition at Level 3, i.e. on Ching Ming Day, is most critical as pedestrian demand is very high. An undesirable LOS value of E is calculated on the footpaths on both sides of Lin Shing Road, i.e. Link D and Link E at P2, which is the main pedestrian route to/from Chai Wan Cemeteries.

The other main entrance to Chai Wan Cemeteries is situated at the western end of Cape Collinson Road, i.e. Links F and G at P3. A high volume of bus passengers accessed the cemeteries after alighting at the bus stops on Shek O Road. Likewise, a large amount of leaving grave sweepers either taking Routes 388 or 389 on Cape Collinson Road, or other bus services on Shek O Road. It is concerned that there is actually no footpath at Link F, instead, bus passengers were queuing along the edge of carriageway and high level of vehicular/pedestrian conflicts were observed during the peak period. Due to the narrow width of the available footpath and the high intensity of conflicting vehicular and pedestrian activities in the area, observations revealed that in reality, pedestrian were found to spill over and walked along the trafficked carriageway and required high demand of management and control by the HKPF.

3 Forecast Development Traffic

3.1 Columbarium and Graves Facilities

The existing and planned columbarium and graves facilities in Chai Wan Cemeteries are summarized in Table 3-1.

Table 3-1 Existing and Planned Columbarium and Graves Facilities

Completion	**Management**	**Type**	**No.**	**Total**
Existing (as at 2011)	Cape Collinson Columbarium	Niches	61,615	
	Chinese Permanent Cemeteries	Coffin Graves	22,715	
		Urns	1409	
		Niches	66,229	
		Ossuaries	8849	
	Roman Catholic Cemetery; Muslim Cemetery; Buddhist Cemetery	Coffin Graves	10,506	
		Urns	710	
		Niches	31,090	
		Ossuaries	1314	204,437
2011-12	Chinese Permanent Cemeteries	Niches	8205	
2014		Niches	17,129	
2013	Buddhist Cemetery	Niches	3220	28,554
2018	Site I	Niches	25,000	25,000
Total				257,991

At present, Chai Wan Cemeteries provide a total of 204,437 niches/ urn/ graves/ ossuaries. BMCPC plans to provide additional 8,205 niches in 2011-12 and 17.129 niches in 2014 and the Buddhist Cemetery also plans to provide additional 3,220 niches in 2013, giving a total of 28,554 new niches by 2014. Together with the currently proposed 25,000 at Site 1, there would be a total of 257,991 columbarium and graves facilities in Chan Wan Cemeteries.

3.2 Vehicular Traffic Generations from Committed and Proposed Developments

Based on the existing trip rates described in Table 2-7 and the committed and proposed provisions detailed in Table 3-1, Table 3-2 summarises the peak hour vehicular trips to be induced by the committed development and Site I development for Level 1, 2 and 3.

Table 3-2 Forecast Peak Hour Development Vehicular Traffic

		Peak Hour Traffic Flow (PCU)								
		Level 1			Level 2			Level 3		
		In	Out	Total	In	Out	Total	In	Out	Total
Committed Development (28,554 niches)	Car/Taxi	47	46	93	85	60	145	77	78	155
	Bus	10	8	18	17	11	28	28	23	51
	GMB	9	9	18	9	9	18	13	14	27
	Others	2	1	3	1	0	1	4	4	8
	Total	68	64	132	112	80	192	122	119	241
Site I (25,000 niches)	Car/Taxi	41	40	81	75	52	127	68	68	136
	Bus	9	7	16	15	10	25	24	20	44
	GMB	8	8	16	8	8	16	11	12	23
	Others	2	1	3	1	0	1	3	4	7
	Total	60	56	116	99	70	169	106	104	210

The committed developments (28,554 niches) are expected to induce two-way traffic flows of 132, 192 and 241 pcu's during the peak hour in Level 1, 2 and 3 respectively. The corresponding figures for Site 1 (25,000 niches) are 116, 169 and 210 respectively.

The additional development will be added to the background traffic, taking into account the proposed improvement and special traffic arrangements, to assess the traffic impact to the road network in the Study Area.

3.3 Person Trip Generations from Committed and Proposed Developments

Based on the observed peak hour trips described in Table 2-5 and the committed and proposed provisions detailed in Table 3-1, Table 3-3 summarises the peak hour person trips to be induced by the committed development and Site I development for Level 1, 2 and 3.

Table 3-3 Forecast Peak Hour Arriving Grave Sweeper Flows by Modes

	Committed Provisions (28,554 nos)			**Site I (25,000 nos.)**		
	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3
MTR/Walk	60	165	1240	53	144	1086
Other Bus	58	171	272	50	149	238
388, 389	299	441	1109	262	386	971
GMB	55	94	70	48	82	62
Taxi/ Car	134	189	*	117	166	*
TOTAL	606	1060	2691	530	927	2357

* Visitors by car/taxi are included in Lin Shing Road footpath when Level 3 is implemented.

For the most critical peak hour in Level 3, i.e. on Ching Ming Day, the committed development would attract 2,691 visitors and Site I would attract another 2,357 visitors, giving a total increase 5,048 visitors.

3.4 Review of Forecast Bus Passenger Demand

Based on the daily patronage figures provided by Transport Department, on 2013 Ching Ming Day, there were 29,044 and 25,550 passengers on board of Route No. 388 and No. 389 respectively, giving a daily patronage of 54,594 passengers. However, as there is no data regarding the peak hour patronage, the 2013 grave sweeper data provided by the Police are adopted to derive the peak hour patronage as detailed below:

2013 Routes 388 & 389 bus patronage = 29044 + 25550 = 54594 ……………..(a)

Refer to Table 2-4: 2013 Daily Grave Sweeper Flows = 93,600 and

Table 2-6: 2013 Peak Hour Grave Sweeper Flows = 24,000

⇨ Peak Hour Factor = 24,000 / 93,600 = 0.256……………………….. .(b)

Hence, the 2013 peak hour trip generation rate by bus is:

⇨ 54594 (a) x 0.256 (b) / 204437 = 0.0684 trip per grave/urn…..………. (c)

The peak hour bus demand for Site I development is:

⇨ 0.0684 (c) x 25,000 = 1,709 bus passengers per hour………………….(d)

Refer to Table 2-7, according to the 2011 observed Ching Ming Day peak hour data, the ratio between arriving bus trips (198 pcus) and departing bus trips (162 pcus) was 55:45. To provide conservative estimates, a ratio of 60:40 split between arriving and departing bus trips are assumed. Hence, the derived 2013 peak hour bus passenger demand for Site I development is:

⇨ 1,709 (d) x 60% = 1025 arriving bus passengers

⇨ 1,709 (d) x 40% (e) = 684 departing bus passenger

Based on the above, the forecast bus passenger demand by Route 388 and 389 during the peak hour on Ching Ming Day (Level 3) in Table 3-3 is adjusted to 1025 accordingly as indicated in Table 3-4. Similarly, the peak hour bus demand for the committed provisions is increased to 1172.

Table 3-4 Adjusted Peak Hour Arriving Grave Sweeper Flows by Modes

	Committed Provisions (28,554 nos)			**Site I (25,000 nos.)**		
	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3
MTR/Walk	60	165	1240	53	144	1086
Other Bus	58	171	272	50	149	238
388, 389	299	441	1172	262	386	1025
GMB	55	94	70	48	82	62
Taxi/ Car	134	189	*	117	166	*
TOTAL	606	1060	2754	530	927	2411

* Visitors by car/taxi are included in Lin Shing Road footpath when Level 3 is implemented.

4 Proposed Improvements

4.1 *Review of Proposed Improvement Schemes*

4.1.1 The following improvement schemes are recommended in the 2012 Report:

1. Provision of new pedestrian Access Route with escalators and stairways linking Cape Collinson Road and San Ha Street, with associated footpath and carriageway widening on Cape Collinson Road and special traffic plan.
2. Junction improvement at J/O Cape Collinson Road and Lin Shing Road.

4.1.2 To facilitate visitors to access the new pedestrian access route, new special bus services from MTR Shau Kei Wan Station and from MTR Heng Fa Chuen Station to San Ha Street and strengthening of existing bus services running along Chai Wan Road are proposed to cope with the anticipated demand.

4.1.3 The following special traffic arrangements are also proposed to facilitate the operation of the hillside escalators.

- Conversion of San Ha Street to one-way westbound direction in order to free up space for visitors.
- Closure of existing metered car parking spaces on the southern carriageway for temporary bus stand and/or pick up/drop off layby for car/taxi.
- Temporary bus stand for special bus services from MTR Heng Fa Chuen Station to San Ha Street and MTR Shau Kei Wan Station to San Ha Street and some existing bus services diverted from Chai Wan Road to San Ha Street.
- Temporarily closing the nearside lane of Chai Wan Road to accommodate left turning buses diverted from Chai Wan Road to San Ha Street via Wing Ping Street.
- The existing GMB service on San Ha Street westbound is to be maintained.
- The existing PLB prohibited zones on Chai Wan Road eastbound near San Ha Street, and San Ha Street are to be maintained.

- The arrangement for guiding pedestrians for access from MTR Chai Wan Station to escalators on San Ha Street via Chai Wan Park and Yee Shun Street and pedestrian egress route from San Ha Street to MTR Chai Wan Station via Chai Wan Road southern footpaths and the footbridges across Chai Wan Road Roundabout may be considered.

4.2 Proposed Changes to Original Improvement Schemes

4.2.1 The proposed improvement schemes as described in Section 4.1 above are reviewed by taking into account the forecast additional traffic flows detailed in Table 3-2 and additional grave sweeper flows given in Table 3-4. Table 4-1 discusses the proposed changes to the original improvement proposal.

Table 4-1 Summary of Proposed Changes to Original Improvement Proposal

Original Proposals in TIA Report	Proposed Changes	Reasons for Proposed Change
Provision of new pedestrian Access Route with escalators and stairways linking Cape Collinson Road and San Ha Street, with associated footpath and carriageway widening on Cape Collinson Road and improvement plan.	No change	(Figure 5.2a of the 2012 Study Report is attached in Appendix D for reference)
Junction improvement at J/O Cape Collinson Road and Lin Shing Road.	No change	(Figure 5.3a and Figure 5.3b of the 2012 Study Report are attached in Appendix D for reference)
New special bus services from MTR Shau Kei Wan Station and from MTR Heng Fa Chuen Station to San Ha Street	New special bus service from Heng Fa Chuen to San Ha Street only. (Figures 4.1 to 4.4)	- With clearer information to bus passengers - All bus bays and passenger queuing platforms are fully occupied at Shau Kei Wan bus terminus, with a new bus route NWFB18X started providing service to passengers between Shau Kei Wan Bus Terminus and Kennedy Town in July 2013.
Strengthening of existing bus services running along Chai Wan Road are proposed to cope with the anticipated demand	Minor changes of bus frequency to suit forecast demand.	
Divert some existing bus services on Chai Wan Road to San Ha Street	Maintain all existing franchised bus services on Chai Wan Road, the major corridor in Chai Wan, without diversion of bus routes onto San Ha Street.	
Conversion of San Ha Street to one-way westbound direction in order to free up space for visitors.	No change	
Closure of existing metered car parking spaces on the southern carriageway for temporary bus stand and/or pick up/drop off layby for car/taxi.	8 nos. of metered car parking spaces, 2 nos. of disabled parking spaces and 16 nos. of motorcycle parking spaces will need to be closed temporarily. (Fig 4.1)	To allow special bus services only at San Ha Street and visitors by car/taxi will use the pick up/drop off facilities on Wan Tsui Road same as the existing situation to minimize traffic flows and simplify crowd management and traffic control on San Ha Street.
Temporary bus stand for special bus services from MTR Heng Fa Chuen Station to san Ha Street and some existing bus services diverted from Chai Wan Road to San Ha Street.	All existing bus services on Chai Wan Road will be maintained without any diversion.	To minimize traffic flows on San Ha Street.
Temporarily closing the nearside lane of Chai Wan Road to accommodate left turning buses diverted from Chai Wan Road to San Ha Street via Wing Ping Street.	In addition, minor modification of the traffic island at Wing Ping Street approach is required (Figure 4.6)	To allow sufficient space for left turning bus.
The existing GMB service on San Ha Street westbound is to be maintained.	No change	
The existing PLB prohibited zones on Chai Wan Road eastbound near San Ha Street, and San Ha Street are to be maintained.	No change	
The arrangement for guiding pedestrians for	No change	

Original Proposals in TIA Report	Proposed Changes	Reasons for Proposed Change
access from MTR Chai Wan Station to escalators on San Ha Street via Chai Wan Park and Yee Shun Street and pedestrian egress route from San Ha Street to MTR Chai Wan Station via Chai Wan Road southern footpaths and the footbridges across Chai Wan Road Roundabout.		

4.2.2 Taking into account that the amount of visitors to Site I by car/taxi is relatively small, and also to minimize the amount of traffic flows on San Ha Street for more efficient crowd management, it is proposed that pick up/ drop off facilities for special bus service only be provided on San Ha Street. Visitors to Site I by car/taxi can use the pick up / drop off facilities on Wan Tsui Road same as the existing condition.

4.2.3 It is also proposed to provide only the special bus service between San Ha Street and Heng Fa Chuen as there is very limited scope for providing additional queuing area for the new special bus services in Shau Kei Wan bus terminus. The journey time for the proposed special bus route to travel between Heng Fa Chuen and San Ha Street, around 30 minutes (round trip time) is less that that of the journey time for another proposed special bus route to travel between Shau Kei Wan and San Ha Street of around 40 minutes (round trip time). Given the shorter turnaround time, the special bus route between Heng Fa Chuen and San Ha Street can provide a more frequent service to the passengers with a higher hourly carrying capacity.

4.2.4 The feasibility of providing additional bus services at the bus terminus at MTR Chai Wan Station is considered not viable due to lack of available vacant spaces for loading/unloading activities of buses and passenger queues. Also, the distance between MTR Chai Wan Station and Site I is not significant, visitors taking MTR to Chai Wan Station would likely to continue their journey by foot to the western part of Chai Wan Cemeteries similar to majority of the existing visitors.

4.2.5 The proposed special traffic arrangement on San Ha Street are shown in Figure 4.1 and detailed below:

- 4 no. of bus stacking spaces are provided (2 boarding bay + 1 layover bay + 1 alighting bay) and flexibility is available if additional bay is required by suspended a few more metered parking spaces.
- Since only one-way westbound traffic is allowed, westbound traffic will be diverted onto the eastbound carriageway while a short section of the westbound carriageway will be converted as bus bays for the special bus services.

- 8 nos. of existing metered car parking spaces, 2 nos. of disable parking and 16 motor-cycle parking spaces will need to be suspended temporarily and converted to become footpath and queuing area.
- A minimum length of 100m will be reserved for passenger queuing sufficient for 200 waiting passengers with an average waiting space of $0.5m^2$ per passenger to a maximum of 300 waiting passengers with an average space of $0.3m^2$ per passenger. Based on a peak hour demand of around 2400 bus passengers and a service headway of 3 minute, a maximum queue of 120 passengers per 3 minutes (which equivalent to the bus service headway) is expected. The queuing area is sufficient to accommodate the passenger queue with flexibility to hold a longer queue.
- For grave sweepers to and from Chai Wan Road, a one-way circulation system is proposed to minimize conflicting movements. The resulting Level of Services along the footpaths on San Ha Street are presented in Figure 4.2.

4.2.6 Figure 4.3 and Figure 4.4 shows two options for the provision of the temporary bus stand for the special bus service at Heng Fa Chuen. The proposed special traffic arrangements for Option 1 (Figure 4.3) are detailed below:

- The temporary bus stand will be provided at the layby next to the Heng Fa Chuen bus terminus. The lay-by, around 40m in length, can allow a stacking of 3 buses for 2 loading bays and 1 unloading bay.
- The pedestrian routes for arriving and departing bus passengers are segregated to minimize conflicting movements.
- A queuing area with the flexibility to arrange one queue or two different queues with a total length of around 120m would be sufficient to accommodate around 240 waiting passengers with an average waiting space of $0.5m^2$ per passenger to a maximum of 360 waiting passengers with an average space of $0.3m^2$ per passenger. Based on a peak hour demand of 2400 passengers and a service headway of 3 minute, a maximum queue of 120 passengers is expected and hence the queuing area would be sufficient to accommodate the expected queue.
- A temporary pedestrian crossing will be provided for the departing passengers after alighting from the bus. As the amount of vehicles entering the bus terminus is not high (less than 30 vehicles per hour), there would be sufficient crossing time available for the departing passengers.

4.2.7 The proposed special traffic arrangements for Option 2 (Figure 4.4) are detailed below:

- It is proposed to re-locate the existing GMB stand to the lay-by adjacent to the bus terminus and convert the GMB stand for the special bus service to

San Ha Street. The existing GMB stand can allow a stacking of 2 buses and 2 unloading bays will be provided within the bus terminus.

- A queuing area with a total length of around 83m would be sufficient to accommodate around 166 waiting passengers with an average waiting space of $0.5m^2$ per passenger to a maximum of 250 waiting passengers with an average space of $0.3m^2$ per passenger. The arriving and departing passengers do not need to walk across the crossing points.
- The existing lay-by can accommodate 5 no. of GMB. While GMB passengers are required to walk across the crossing points, the amount of passengers is much less than the special bus service. The footway adjacent to the lay-by which is about 50m in length would allow for a queuing area for at least 100 GMB passengers.

4.2.8 The requirement for bus stacking area in Heng Fa Chuen bus terminus and San Ha Street to accommodate a peak hour demand of 20 bus trips (refer to Table 5-3) is detailed below:

Peak Bus Allocation	= 12
Peak Frequency	= 3 mins
Journey Time	= 15 mins
Peak Bus Allocation x peak frequency	= 12 x 3 = 36
Total round trip (journey time x 2)	= 15 x 2 = 30 mins
Total excess time (layover)	= (36-30) mins
	= 6 mins (3 mins at each end)

Since the layover time is equal to the frequency, this should mean only one bus is on the stand at any one time. In Heng Fa Chuen bus terminus, 3 nos. stacking bays are provided for boarding, alighting and layover. At San Ha Street, 4 nos. of stacking bays are provided to allow for greater flexibility.

4.2.9 The routing of the special bus service between Heng Fa Chuen and San Ha Street is shown in Figure 4.5.

4.2.10 To allow for the special bus from Heng Fa Chuen to San Ha Street, it is required to temporarily closing the nearside lane of the Chai Wan Road approach at J11 (the junction of Chai Wan Road and Wing Ping Street) to allow buses left turn from Chai Wan Road to Wing Ping Street. In addition, minor modification of the traffic island which places the traffic lights at the approach of Wing Ping Street is required. The size of the traffic island needs to be reduced slightly as shown in Figure 4.6.

5 Traffic Assessment

5.1 Traffic and Transport Requirements to Complement the Proposed Escalators

5.1.1 Peak Hour Grave Sweeper Flows using Escalators

Table 5-1 shows the estimated amount of pedestrians who would use the proposed escalators during the peak hour in Level 1, 2 and 3.

Table 5-1 Assumed Peak Hour Usage of the Proposed Escalators

	Access Mode	**Level 1**	**Level 2**	**Level 3**
Site I Visitors	New Special Bus	530	927	2,411
	Car/Taxi	-	-	-
Other visitors	Diverted from No. 388/389 to existing bus services to access escalators	100	200	800
	Diverted from MTR to existing bus services to access escalators	100	200	800
	Continue to use existing bus services to access escalators	100	200	800
TOTAL		**830**	**1,527**	**4,811**

The following assumptions are adopted in deriving the usage of the proposed escalators:

- In reality, some of the Site I visitors will use other public transport modes such as MTR to access Chai Wan and then walk to Site I via Lin Shing Road, or taking other bus services on Chai Wan Road. Since, the basic principle of the usage assumptions is that the proposed escalator will serve not only the Site I visitors, but also to be shared use by all other visitors to the cemeteries. Hence, if some of the Site I visitors use other modes instead of using the new special bus and escalator to access Site I, the spare capacity will be filled by other visitors until the capacity of the escalator is reached.

  To take a conservative approach, therefore, it is assumed that all Site I visitors as shown in Table 3-4 would use the new special bus from Heng Fa Chuen to San Ha Street for accessing the proposed escalator. For Level 3, for example, around 2,411 Site I visitors are expected to use the new special bus service.

- Site I visitors by car/taxi will use the pick up /drop off facilities on Wan Tsui Road and then walk to Site I via Lin Shing Road same as the existing visitors.

- It is assumed around 800 of the existing Routes 388 and 389 bus passengers currently boarding and/or alighting at the bus stop near the junction of Cape Collinson Road and Lin Shing Road would be attracted by the proposed escalators, and hence will be diverted to use the existing bus service passing through Chai Wan Road for accessing the escalators on San Ha Street.

- It is assumed that a similar amount of the existing MTR passengers (800) would be attracted by the escalators. As the access route from MTR Chai Wan Station to San Ha Street via Chai Wan Park and Yee Shun Street is detour and indirect, majority of the accessing MTR visitors attracted by the escalators are expected to be diverted to use the existing bus services on Chai Wan Road for accessing the escalators instead of walking directly from MTR Chai Wan Station to San Ha Street. Hence, for the sake of simplicity, it is assumed no accessing visitors diverted directly from MTR to the escalators.

- Another 800 existing bus passengers currently using the various bus services on Chai Wan Road would be attracted to use the escalators instead of walking to Lin Shing Road. In this case, they would continue to use the existing bus services.

As a result, Table 5-1 shows that around 4,811 pedestrians are estimated to use the escalator in peak direction which is about 80-90% of the capacity of the escalator of around 5,000 – 5,500 pedestrians/hour. Among these pedestrians, around 50% (2,411 pedestrians) are visitors to Site I and about 50% (2,400 pedestrians) are “other visitors” to the nearby cemeteries.

Based on the above assumptions, Table 5-2 compares the existing peak hour flows and the future Reference, i.e. with committed developments but no improvement schemes, and the Design flows, i.e. with Site I and the proposed new special bus services and escalator provisions.

Table 5-2 Comparisons of Peak Hour Visitors by Modes With and Without Site I and Escalators

	Existing Provisions (204,437 nos.)			Reference Scenario (232,991nos)			Design Scenario (257,991 nos)		
	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3
MTR/Walk	431	1178	8879	491	1343	10119	391	1143	9319
9	412	1221	1944	469	1392	2216	469	1392	2216
388, 389	2141	3155	7938	2440	3596	9110	2340	3396	8310
GMB	396	672	504	451	766	574	451	766	574
Taxi/ Car	957	1355	0	1091	1544	*	1208	1709	*
Special Bus	-	-	-	-	-	-	530	927	2411
Additional Existing Bus	-	-	-	-	-	-	200	400	1600
TOTAL	4337	7581	19265	4943	8640	22019	5589	9733	24430

* Visitors by car/taxi are included in Lin Shing Road footpath when Level 3 is implemented.

Comparing the Reference and Design Scenarios in Level 3, around 2,411 Site 1 visitors would use the new special bus services and 1600 visitors will be diverted from other modes to use the existing bus services on Chai Wan Road to access the escalator. On the other hand, the amount of incoming visitors by MTR and Routes 388 and 389 would be reduced.

5.1.2 *Peak Hour Bus Passenger Demand and Bus Fleet Requirements*

(a) Special Bus Services

Based on Table 5-2 above, the estimated demand for the new special bus service is around 2,411. The additional bus trips and fleet requirement is shown in Table 5-3 for Level 3 (Ching Ming Day) which is the most critical stage. The recorded daily no. of bus trips and recorded patronage for Route 388 and 389 are 190 and 186, and 29,044 and 25,550 respectively on the Ching Ming Day in 2013. To provide conservative estimates, an average occupancy of 135 passengers is assumed in estimating the bus trips and fleet requirement as indicated in Table 5.3.

Table 5-3 Special Bus Services Requirements for Ching Ming Peak Hour (Level 3)

Bus Route	Journey* Time	Peak Hour Passengers			Peak Hour Bus Trips			No. of Bus		
		Existing	Reference	Design	Existing	Reference	Design	Existing	Reference	Design
No. 388	50-60 min	4366	5010	4570	33	37	34	33	37	34
No. 389	60-70 min	3572	4100	3740	27	31	28	32	36	33
Special Bus Service: Heng Fa Chuen MTR Station - San Ha Street	30-35 Min	-	-	2,411	-	-	18	-	-	12
TOTAL		7938	9110	10,721	60	68	80	65	73	79

Note: * Journey time = circular trip travelling time plus loading and unloading time
** Full bus occupancy = 135 passengers per bus

In summary, comparing the Reference (i.e. without Site I and escalators) and Design (with Site I and escalators) scenarios:

- An increase of 18 nos. of bus trips during the peak hour for the new bus services between Heng Fa Chuen and San Ha Street and a reduction of 6 bus trips for Nos. 388 and 389, giving a net increase of 12 bus trips in the peak hour.

- An increase of 12 nos. of bus is required during the peak hour for the new bus services and a reduction of 6 nos. of bus for Nos. 388 and 389, giving a net increase of 6 nos. of bus.

(b) Strengthening of Existing Bus Services

From Table 5-2, the additional bus passengers on other bus services from Design scenario to Reference scenario is 1,600 (diverted from 388, 389 and MTR).

To accommodate this increase in demand, it is proposed to strengthen some of existing bus routes on Chai Wan Road to accommodate the increased demand due to passengers attracted from other modes to access the escalators. An addition of 6 bus trips is required for the Reference scenario and about 13 nos. of bus trips for the Design Scenario. Table 5-4 shows the proposed strengthening of bus services.

Table 5-4 Strengthening of Existing Bus Services on Chai Wan Road

Bus Route	Terminating Points	Published Frequency	Existing	Reference	Design
8P	Siu Sai Wan - Wan Chai Ferry	3 – 7 min	10	11	11
8X	Siu Sai Wan - Happy Valley	7 – 25 min	10	10	11
82	North Point Ferry Pier - Siu Sai Wan	5 – 15 min	10	11	12
82X	North Point - Siu Sai Wan	10 - 20 min	4	4	5
106	Wong Tai Sin - Siu Sai Wan	4 - 10 min	10	11	12
118	Sham Shui Po - Siu Sai Wan	4 – 10 min	10	11	11
606	Siu Sai Wan - Choi Hung	11 - 22 min	6	7	7
682	Lee On - Chai Wan (East)	8 - 20 min	6	6	7
694	Siu Sai Wan - Tiu Keng Leng PTI	15 - 25 min	4	4	5
780	Chai Wan (East) - Central	12 - 17 min	9	10	11
TOTAL			**79**	**85**	**92**

5.2 *Traffic Impact Assessment with the proposed Special Traffic Plan*

Tables 5-5, 5-6 and 5-7 compare the junction capacity assessment results for 2016, 2021 and 2026 respectively for the following scenarios:

- Reference – no Site I and Escalators
- Design - Site I with Escalators and Revised Special Traffic Plan (car/taxi pick up / drop off remains on Wan Tsui Street).

In addition to the data collected during the Ching Ming festive period in 2011, additional traffic surveys at the Junction of Chai Wan Road and San Ha Street (J10), and the Junction of Chai Wan Road, Sheung On Street and Wing Ping Street (J11) have also been conducted during weekday morning and afternoon peak hours, and derived for the Ching Ming peak hour based on the travel pattern observed on the Ching Ming festive period in 2011. This additional data are collected in response to the recommendations and proposed improvement schemes. The peak hour junction performances for Reference and Design scenarios described above for all the design years of 2016, 2021 and 2026 are presented in Table 5-5 to 5-7 respectively and detailed junction calculation sheets are given in Appendix B.

Table 5-5 Comparisons of 2016 Peak Hour Junction Performance

Jn No.	Location	Junction Type	Year 2016 Level 1	Year 2016 Level 2	Year 2016 Level 3
Reference Scenario					
J1	J/O Cape Collinson Road and Lin Shing Road	Priority	0.62	0.87	0.41
J2	J/O Lin Shing Road and Wan Tsui Road	Signal	37.2%	17.3%	13.6%
J3	J/O Cape Collinson Road and Shek O Road	Priority	0.75	1.75	0.66
J4	J/O Chai Wan Road Roundabout	Roundabout	0.73	0.61	0.67
J5	J/O Chai Wan Road and Wing Tai Road and Siu Sai Wan Road	Signal	178.6%	300.4%	269.3%
J6	J/O Siu Sai Wan Road and Harmony Road (SW)	Signal	86.2%	90.2%	138.0%
J7	J/O Siu Sai Wan Road and Harmony Road (NE)	Signal	97.6%	102.3%	118.4%
J8	J/O Chai Wan Road and Tai Tam Road	Signal	37.5%	**9.6%**	**3.1%**
J9	J/O Chai Wan Road and Wan Tsui Road	Priority	0.36	0.25	0.48
J10	J/O Chai Wan Road and San Ha Street	Signal	74.6%	169.6%	142.5%
J11	J/O Chai Wan Road and Sheung On Street and Wing Ping Street	Signal	120.0%	128.5%	142.5%
Design Scenario					
J1	J/O Cape Collinson Road and Lin Shing Road	Priority	0.65	0.94	0.36
J2	J/O Lin Shing Road and Wan Tsui Road	Signal	32.4%	11.2%	58.1%
J3	J/O Cape Collinson Road and Shek O Road	Priority	0.78	1.85	0.58
J4	J/O Chai Wan Road Roundabout	Roundabout	0.75	0.63	0.72
J5	J/O Chai Wan Road and Wing Tai Road and Siu Sai Wan Road	Signal	177.4%	293.9%	260.1%
J6	J/O Siu Sai Wan Road and Harmony Road (SW)	Signal	86.0%	89.4%	135.2%
J7	J/O Siu Sai Wan Road and Harmony Road (NE)	Signal	97.6%	102.3%	118.4%
J8	J/O Chai Wan Road and Tai Tam Road	Signal	35.5%	**6.8%**	**1.9%**
J9	J/O Chai Wan Road and Wan Tsui Road	Priority	0.36	0.26	0.53
J10	J/O Chai Wan Road and San Ha Street	Signal	72.4%	154.6%	62.9%
J11	J/O Chai Wan Road and Sheung On Street and Wing Ping Street	Signal	120.0%	127.9%	141.1%

*Notes: Reserve Capacity (RC) for signal controlled junction
Design Flow /Capacity Ratio (DFC) for priority junction and roundabout.
J1/J2/J3 are for information only, on-site crowd management and traffic control is required

Table 5-6 Comparisons of 2021 Peak Hour Junction Performance

Jn No.	Location	Junction Type	Year 2021 Level 1	Level 2	Level 3
Reference Scenario					
J1	J/O Cape Collinson Road and Lin Shing Road	Priority	0.64	0.89	0.42
J2	J/O Lin Shing Road and Wan Tsui Road	Signal	33.7%	14.4%	58.7%
J3	J/O Cape Collinson Road and Shek O Road	Priority	0.77	1.81	0.68
J4	J/O Chai Wan Road Roundabout	Roundabout	0.76	0.63	0.70
J5	J/O Chai Wan Road and Wing Tai Road and Siu Sai Wan Road	Signal	171.1%	289.6%	259.0%
J6	J/O Siu Sai Wan Road and Harmony Road (SW)	Signal	81.2%	85.1%	131.5%
J7	J/O Siu Sai Wan Road and Harmony Road (NE)	Signal	99.1%	130.6%	112.4%
J8	J/O Chai Wan Road and Tai Tam Road	Signal	33.8%	**6.7%**	**-0.3%**
J9	J/O Chai Wan Road and Wan Tsui Road	Priority	0.37	0.26	0.50
J10	J/O Chai Wan Road and San Ha Street	Signal	69.9%	162.3%	132.8%
J11	J/O Chai Wan Road and Sheung On Street and Wing Ping Street	Signal	126.4%	122.3%	132.8%
Design Scenario					
J1	J/O Cape Collinson Road and Lin Shing Road	Priority	0.67	0.97	0.37
J2	J/O Lin Shing Road and Wan Tsui Road	Signal	29.1%	8.6%	54.6%
J3	J/O Cape Collinson Road and Shek O Road	Priority	0.80	1.91	0.60
J4	J/O Chai Wan Road Roundabout	Roundabout	0.78	0.65	0.74
J5	J/O Chai Wan Road and Wing Tai Road and Siu Sai Wan Road	Signal	169.9%	283.4%	250.6%
J6	J/O Siu Sai Wan Road and Harmony Road (SW)	Signal	81.0%	84.3%	128.9%
J7	J/O Siu Sai Wan Road and Harmony Road (NE)	Signal	99.1%	130.6%	112.4%
J8	J/O Chai Wan Road and Tai Tam Road	Signal	38.9%	**8.7%**	**-0.8%**
J9	J/O Chai Wan Road and Wan Tsui Road	Priority	0.37	0.26	0.54
J10	J/O Chai Wan Road and San Ha Street	Signal	67.8%	148.1%	59.2%
J11	J/O Chai Wan Road and Sheung On Street and Wing Ping Street	Signal	126.4%	122.3%	135.9%

*Notes: Reserve Capacity (RC) for signal controlled junction
Design Flow /Capacity Ratio (DFC) for priority junction and roundabout.
J1/J2/J3 are for information only, on-site crowd management and traffic control is required

Table 5-7 Comparisons of 2026 Peak Hour Junction Performance

Jn No.	Location	Junction Type	Year 2026		
			Level 1	Level 2	Level 3
Reference Scenario					
J1	J/O Cape Collinson Road and Lin Shing Road	Priority	0.66	0.92	0.43
J2	J/O Lin Shing Road and Wan Tsui Road	Signal	30.4%	11.6%	58.4%
J3	J/O Cape Collinson Road and Shek O Road	Priority	0.79	1.87	0.70
J4	J/O Chai Wan Road Roundabout	Roundabout	0.79	0.65	0.72
J5	J/O Chai Wan Road and Wing Tai Road and Siu Sai Wan Road	Signal	163.7%	279.0%	249.7%
J6	J/O Siu Sai Wan Road and Harmony Road (SW)	Signal	76.2%	80.0%	125.2%
J7	J/O Siu Sai Wan Road and Harmony Road (NE)	Signal	93.8%	91.6%	106.8%
J8	J/O Chai Wan Road and Tai Tam Road	Signal	30.3%	**3.9%**	**-2.3%**
J9	J/O Chai Wan Road and Wan Tsui Road	Priority	0.38	0.27	0.52
J10	J/O Chai Wan Road and San Ha Street	Signal	0.65	155.1%	129.5%
J11	J/O Chai Wan Road and Sheung On Street and Wing Ping Street	Signal	120.2%	116.2%	129.5%
Design Scenario					
J1	J/O Cape Collinson Road and Lin Shing Road	Priority	0.69	0.99	0.38
J2	J/O Lin Shing Road and Wan Tsui Road	Signal	26.0%	6.1%	51.2%
J3	J/O Cape Collinson Road and Shek O Road	Priority	0.83	1.97	0.62
J4	J/O Chai Wan Road Roundabout	Roundabout	0.81	0.67	0.77
J5	J/O Chai Wan Road and Wing Tai Road and Siu Sai Wan Road	Signal	162.6%	273.2%	241.4%
J6	J/O Siu Sai Wan Road and Harmony Road (SW)	Signal	76.0%	79.3%	122.8%
J7	J/O Siu Sai Wan Road and Harmony Road (NE)	Signal	87.1%	91.6%	106.8%
J8	J/O Chai Wan Road and Tai Tam Road	Signal	28.0%	**1.3%**	**-2.2%**
J9	J/O Chai Wan Road and Wan Tsui Road	Priority	0.38	0.27	0.56
J10	J/O Chai Wan Road and San Ha Street	Signal	63.3%	141.7%	55.5%
J11	J/O Chai Wan Road and Sheung On Street and Wing Ping Street	Signal	108.2%	116.2%	129.5%

*Notes: Reserve Capacity (RC) for signal controlled junction
Design Flow /Capacity Ratio (DFC) for priority junction and roundabout.
J1/J2/J3 are for information only, on-site crowd management and traffic control is required

As indicated in the above tables, it should be noted that the calculation of junction capacity for J1, J2 and J3 is for information only as extensive crowd management and control are required at these locations due to heavy pedestrian flow particularly during Level 2 and Level 3.

In general, the traffic impact to be induced by the proposed Site I development is within acceptable level. With the exception of J8 (J/O Chai Wan Road and Tai Tam Road), the reserve capacity of all other key junctions would be sufficient to cope with the anticipated increase. Similar to the existing situation, J8 would be overloaded slightly under Level 3 i.e. on Ching Ming Day even without the Site I development. It can be seen that the proposed Site I development will only induce limited negative impact to J8.

5.3 Peak Hour Main Pedestrian Route Assessments

Figure 5.1 shows the amount of pedestrians along the major pedestrian routes for the Reference Case (i.e. no escalator) and Design Case (i.e. with Site I and escalators) during the most critical hour in Level 3, i.e.Ching Ming Day. As shown in the figure, the amount of pedestrians on Lin Shing Road would be reduced in the Design scenario due to diversion of MTR and 388/389 visitors to other bus services on Chai Wan Road for access of the escalators.

Table 5-8 shows the LOS assessment results on the critical pedestrian links on Cape Collinson Road (P1) and Lin Shing Road (P2). The LOS on Lin Shing Road would be improved slightly due to the diversion of pedestrian flows to the escalators.

Table 5-8 Peak Hour LOS of Critical Links

Route(1)	**Critical Links**	**Effective Width(3)**	**Reference**		**Site I**	
			PMM(2)	LOS	PMM(2)	LOS
Proposed Improvement			No improvement		With Escalators	
P1	A+B(5)	9.9	37.4	D	34.9	D
P2	C	2.5	Flow management and control by HKPF			
	D(4)	4.0	59.8	**E**	42.2	D
	E(5)	2.8	54.5	**E**	47.3	D

Notes:
(1) Refer to Figure 2.3 for locations of Routes and Links
(2) PMM = Pedestrian/ min/ meter
(3) Assume effective width same as existing
(4) Based on uphill direction busiest hour flow
(5) Based on downhill direction busiest hour flow

6 Sensitivity Tests

6.1 Test Scenarios

Sensitivity tests have been conducted to assess the traffic impact in 2021 due to:

Test 1 - The trip generation and attraction rates are underestimated by 20% OR
The proposed no. of niches is increased by 20%

Test 2 - The background traffic is underestimated by 20%.

6.2 Test 1

Table 6-1 shows the junction performances in 2021 for Site I development for Level 1, 2 and 3. The results indicate that all key junctions in the study area would perform satisfactorily during the peak hour even with the 20% increase of development flows. It is noted that Junction of Chai Wan Road and Tai Tam Road (J8) would be overloaded slightly in Level 3.

Table 6-1 Test 1 - Comparisons of 2021 Peak Hour Junction Performance

Jn No.	Location	Junction Type	Year 2021 Level 1	Level 2	Level 3
Reference Scenario					
J1	J/O Cape Collinson Road and Lin Shing Road	Priority	0.66	0.91	0.43
J2	J/O Lin Shing Road and Wan Tsui Road	Signal	31.8%	12.1%	57.5%
J3	J/O Cape Collinson Road and Shek O Road	Priority	0.79	1.85	0.70
J4	J/O Chai Wan Road Roundabout	Roundabout	0.76	0.63	0.71
J5	J/O Chai Wan Road and Wing Tai Road and Siu Sai Wan Road	Signal	170.9%	289.0%	258.8%
J6	J/O Siu Sai Wan Road and Harmony Road (SW)	Signal	81.2%	85.1%	131.5%
J7	J/O Siu Sai Wan Road and Harmony Road (NE)	Signal	99.1%	96.8%	112.4%
J8	J/O Chai Wan Road and Tai Tam Road	Signal	33.0%	5.8%	0.1%
J9	J/O Chai Wan Road and Wan Tsui Road	Priority	0.37	0.26	0.51
J10	J/O Chai Wan Road and San Ha Street	Signal	69.8%	162.3%	79.5%
J11	J/O Chai Wan Road and Sheung On Street and Wing Ping Street	Signal	126.4%	122.3%	135.9%
Design Scenario					
J1	J/O Cape Collinson Road and Lin Shing Road	Priority	0.70	1.00	0.37
J2	J/O Lin Shing Road and Wan Tsui Road	Signal	26.5%	5.4%	49.0%
J3	J/O Cape Collinson Road and Shek O Road	Priority	0.83	1.97	0.61
J4	J/O Chai Wan Road Roundabout	Roundabout	0.79	0.66	0.77
J5	J/O Chai Wan Road and Wing Tai Road and Siu Sai Wan Road	Signal	169.5%	281.7%	248.5%
J6	J/O Siu Sai Wan Road and Harmony Road (SW)	Signal	80.9%	84.1%	128.4%
J7	J/O Siu Sai Wan Road and Harmony Road (NE)	Signal	92.1%	96.8%	112.4%
J8	J/O Chai Wan Road and Tai Tam Road	Signal	27.7%	0.4%	-1.4%
J9	J/O Chai Wan Road and Wan Tsui Road	Priority	0.37	0.26	0.56
J10	J/O Chai Wan Road and San Ha Street	Signal	67.3%	145.4%	54.3%
J11	J/O Chai Wan Road and Sheung On Street and Wing Ping Street	Signal	114.0%	122.3%	135.9%

*Notes: Reserve Capacity (RC) for signal controlled junction
Design Flow /Capacity Ratio (DFC) for priority junction and roundabout.
J1/J2/J3 are for information only, on-site crowd management and traffic control is required

6.3 Test 2

6.3.1 Traffic Assessment

For this sensitivity test, the 2021 background traffic is underestimated by 20% before adding the new development traffic (committed developments and Site I development). Table 6-2 shows the junction performance results and detailed calculation sheets are given in Appendix B.

Table 6-2 Test 2 - Comparisons of 2021 Peak Hour Junction Performance

Jn No.	Location	Junction Type	Year 2021 Level 1	Level 2	Level 3
Reference Scenario					
J1	J/O Cape Collinson Road and Lin Shing Road	Priority	0.77	1.05	0.49
J2	J/O Lin Shing Road and Wan Tsui Road	Signal	12.8%	-3.0%	38.5%
J3	J/O Cape Collinson Road and Shek O Road	Priority	0.93	2.28	0.84
J4	J/O Chai Wan Road Roundabout	Roundabout	1.01	0.77	0.87
J5	J/O Chai Wan Road and Wing Tai Road and Siu Sai Wan Road	Signal	126.0%	225.0%	199.8%
J6	J/O Siu Sai Wan Road and Harmony Road (SW)	Signal	51.0%	54.2%	93.0%
J7	J/O Siu Sai Wan Road and Harmony Road (NE)	Signal	57.5%	88.4%	73.8%
J8	J/O Chai Wan Road and Tai Tam Road	Signal	9.2%	-12.3%	-19.2%
J9	J/O Chai Wan Road and Wan Tsui Road	Priority	0.45	0.32	0.62
J10	J/O Chai Wan Road and San Ha Street	Signal	41.6%	118.6%	51.9%
J11	J/O Chai Wan Road and Sheung On Street and Wing Ping Street	Signal	78.3%	85.2%	96.6%
Design Scenario					
J1	J/O Cape Collinson Road and Lin Shing Road	Priority	0.80	1.00	0.43
J2	J/O Lin Shing Road and Wan Tsui Road	Signal	9.6%	-7.2%	33.0%
J3	J/O Cape Collinson Road and Shek O Road	Priority	0.96	1.97	0.76
J4	J/O Chai Wan Road Roundabout	Roundabout	1.04	0.80	0.93
J5	J/O Chai Wan Road and Wing Tai Road and Siu Sai Wan Road	Signal	125.2%	220.8%	193.7%
J6	J/O Siu Sai Wan Road and Harmony Road (SW)	Signal	50.8%	53.7%	91.1%
J7	J/O Siu Sai Wan Road and Harmony Road (NE)	Signal	57.5%	88.4%	73.8%
J8	J/O Chai Wan Road and Tai Tam Road	Signal	5.6%	-7.6%	-15.6%
J9	J/O Chai Wan Road and Wan Tsui Road	Priority	0.45	0.26	0.67
J10	J/O Chai Wan Road and San Ha Street	Signal	40.2%	108.6%	36.2%
J11	J/O Chai Wan Road and Sheung On Street and Wing Ping Street	Signal	78.3%	85.2%	96.6%

*Notes: Reserve Capacity (RC) for signal controlled junction
Design Flow /Capacity Ratio (DFC) for priority junction and roundabout.
J1/J2/J3 are for information only, on-site crowd management and traffic control is required

The results indicate that J4 and J8 would be overloaded under the Reference Case, i.e. even without the proposed Site I development due to a significant increase of background traffic in the future.

6.3.2 *Pedestrian Assessment*

Similarly, the change in pedestrian traffic under Test 1 and 2 above will provide the same amount of future pedestrian flows to be generated by the proposed Site I development. Based on the increased pedestrian demand, the LOS of the critical pedestrian routes P1 and P2 are assessed for both the Reference and Design scenarios, i.e. "without" and "with improvement schemes" respectively. The results are shown in Table 6-3.

Table 6-3 Sensitivity Test - Peak Hour LOS of Critical Links

Route[1]	**Critical Links**	**Effective Width**[3]	**Reference**		**Site I**	
			PMM[2]	LOS	PMM[2]	LOS
Proposed Improvement			No improvement		With Escalators	
P1	A+B[5]	9.9	44.9	D	41.9	D
P2	C	2.5	Flow management and control by HKPF			
	D[4]	4.0	71.7	**E**	50.6	E
	E[5]	2.8	65.4	**E**	56.8	E

Notes:
(1) Refer to Figure 2.3 for locations of Routes and Links
(2) PMM = Pedestrian/ min/ meter
(3) Assume effective width same as existing
(4) Based on uphill direction busiest hour flow
(5) Based on downhill direction busiest hour flow

7 Conclusion

7.1 Summary of Findings

7.1.1 Halcrow are commissioned by Architectural Services Department to undertake a traffic review for the proposed revision of development intensity at Site I from 15,000 niches to 25,000 niches.

7.1.2 Estimation of trip generations are reviewed by taking into account the observed data collected during the Ching Ming period in 2011 and on-site historical data provided by the Hong Kong Police Force. The observed pedestrian data obtained from the surveys in 2011 fall in the upper range of the historical data and hence are considered appropriate for the assessment study.

7.1.3 Peak hour junction capacity assessments are carried out for all the key junctions within the Study Area for the different traffic plans being implemented by the Police - Level 1, Level 2 and Level 3.

7.1.4 Based on the updated traffic forecasts, the proposed improvement schemes proposed in the TIA report are reviewed. The proposed improvement schemes are:

- Provision of new pedestrian route with escalators and stairways linking Cape Collinson Road and San Ha Street, with associated footpath and carriageway widening on Cape Collinson Road and special traffic plan.
- Junction improvement at J/O Cape Collinson Road and Lin Shing Road.

7.1.5 The results of the Review Study indicate that the proposed development at Site I with 25,000 niches would not create adverse vehicular traffic impact to the road network in Chai Wan area. Additional pedestrian facilities and associated bus services proposed in the 2012 Study report should be maintained in order to minimise the pedestrian impact induced by the proposed Site I development.

7.1.6 Sensitivity tests have been carried out and it is identified that most of the roads and pedestrian networks (with improvement schemes) in the area would be able to cope with a further increase of development traffic by 20% and the background traffic underestimated by 20%.

7.2 Conclusion

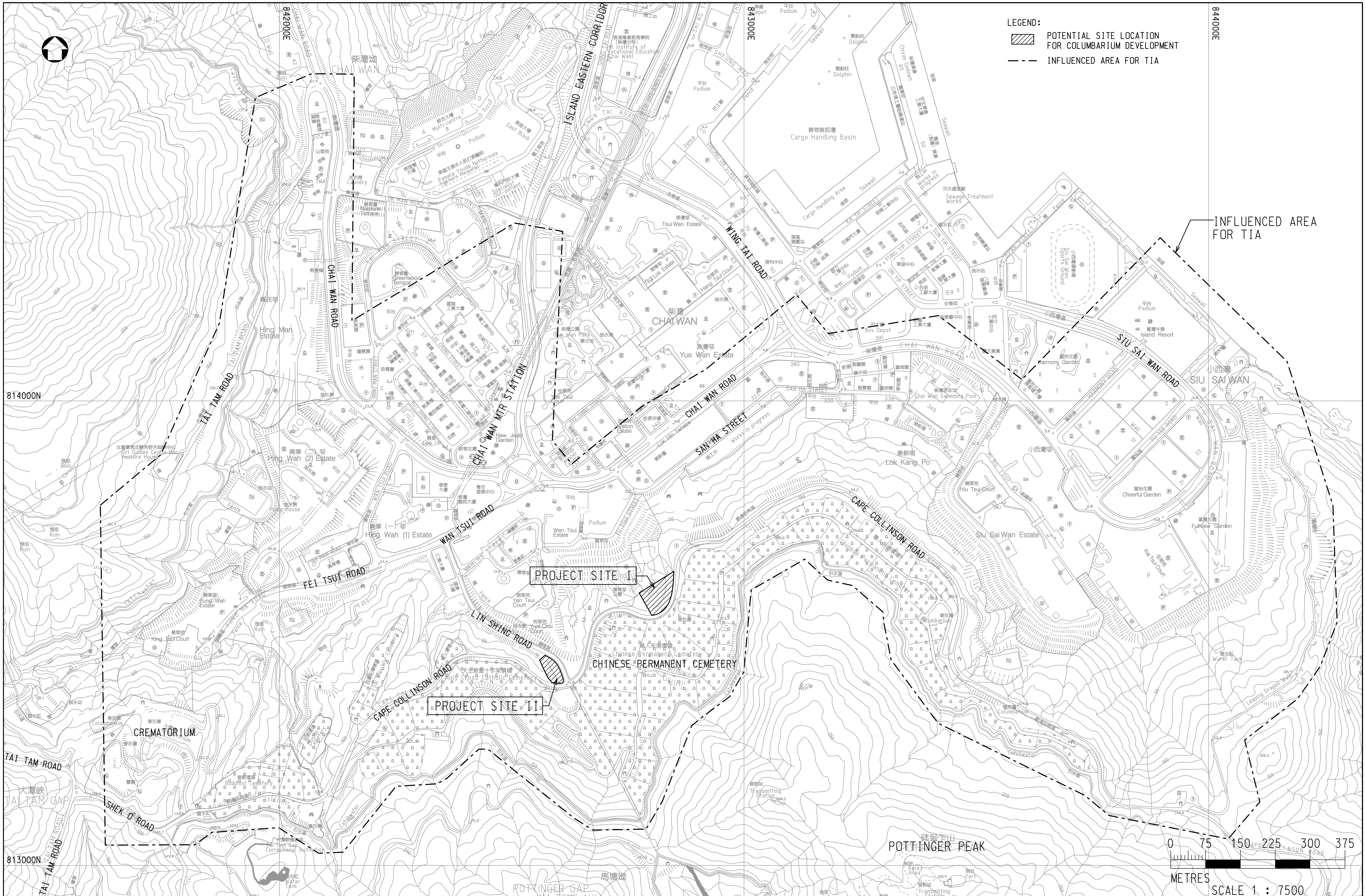
7.2.1 To complement the proposed pedestrian link at San Ha Street, the following Special Traffic Plan and special bus services are proposed:

- To maintain one way westbound only on San Ha Street.
- Temporary closure of about 8 nos. of existing metered car parking spaces, 2 nos. of disabled car parking spaces and 16 nos. of motorcycle parking spaces on the southern carriageway in order to provide temporary footway and queuing area for bus passengers.
- Convert a section of the westbound carriageway as bus bays for the special bus services from Heng Fa Chuen to San Ha Street.
- Temporarily closing the nearside lane of Chai Wan Road and minor modification of the junction layout at the junction of Chai Wan Road and Wing Ping Street is required to accommodate left turning buses diverted from Chai Wan Road to San Ha Street via Wing Ping Street.
- The existing GMB service on San Ha Street westbound is to be maintained.
- The existing PLB prohibited zones on Chai Wan Road eastbound near San Ha Street, and San Ha Street are to be maintained.
- The arrangement for guiding pedestrians for access from MTR Chai Wan Station to the escalators on San Ha Street via Chai Wan Park and Yee Shun Street and pedestrian egress route from San Ha Street to MTR Chai Wan Station via Chai Wan Road southern footpaths and the footbridges across Chai Wan Road Roundabout may be considered.

7.2.2 New bus service from MTR Heng Fa Chuen Station to San Ha Street is proposed with a service headway of 3 minutes during peak hours. Strengthening of existing bus services running along Chai Wan Road are also required to cope with the anticipated demand.

7.2.3 Bus stacking and passenger queuing arrangements at both San Ha Street and Heng Fa Chuen bus terminus are proposed.

Figures



Client: ARCHITECTURAL SERVICES DEPARTMENT

Consulting Engineer: Halcrow China Ltd.

Contract No.: CPM301_15/10

TRAFFIC IMPACT ASSESSMENT REPORT

FIGURE 1.1

Project Title: TRAFFIC IMPACT ASSESSMENT STUDY FOR COLUMBARIUM DEVELOPMENT AT CAPE COLLINSON ROAD, CHAI WAN

Drawing Title: SITE LOCATION PLAN AND INFLUENCED AREA FOR TIA

Checked	Scale	Rev.
OC	1:7500 @ A3	0
Designed	Drawn	Date
YC	PF	27/04/2011

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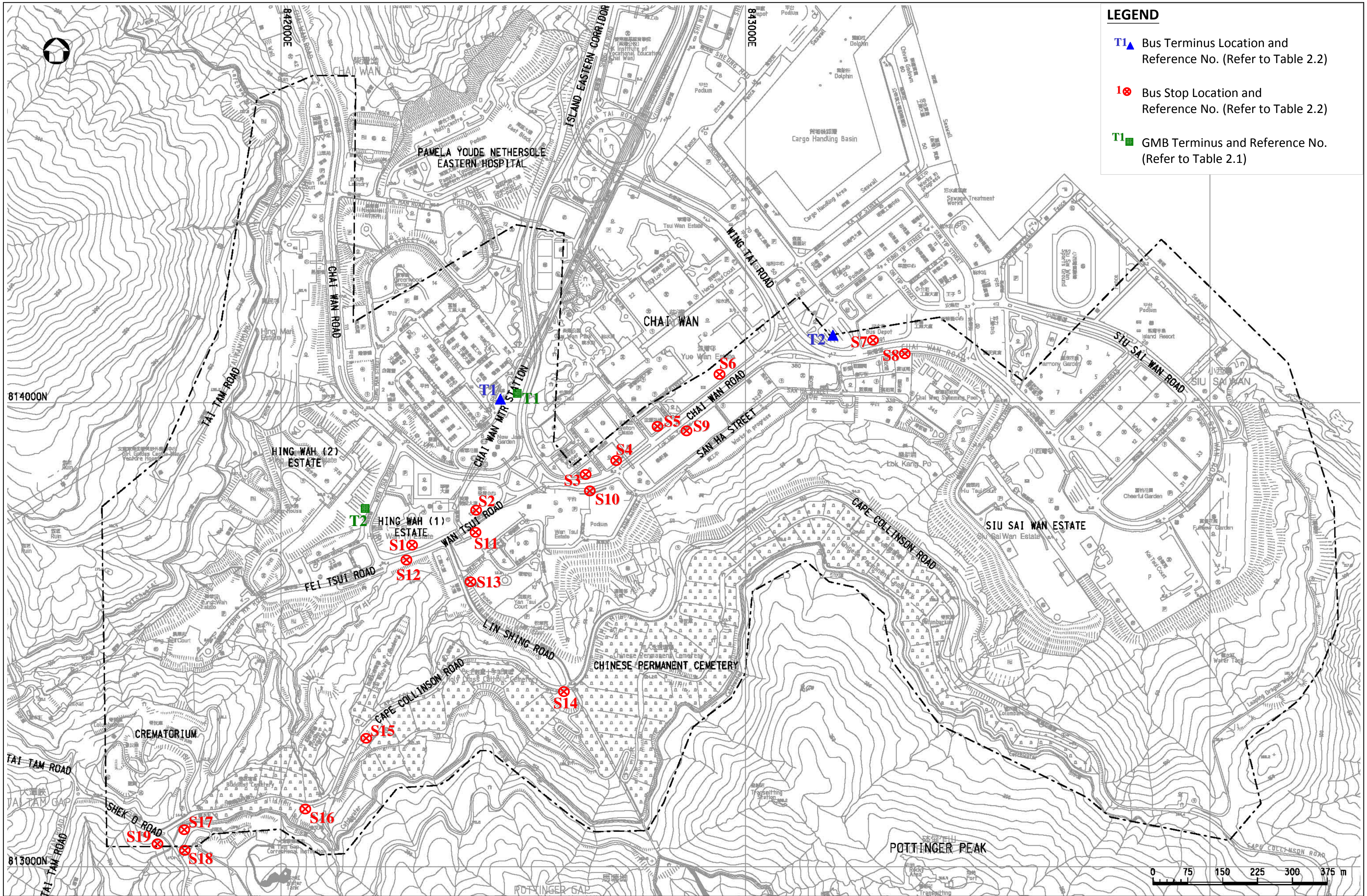
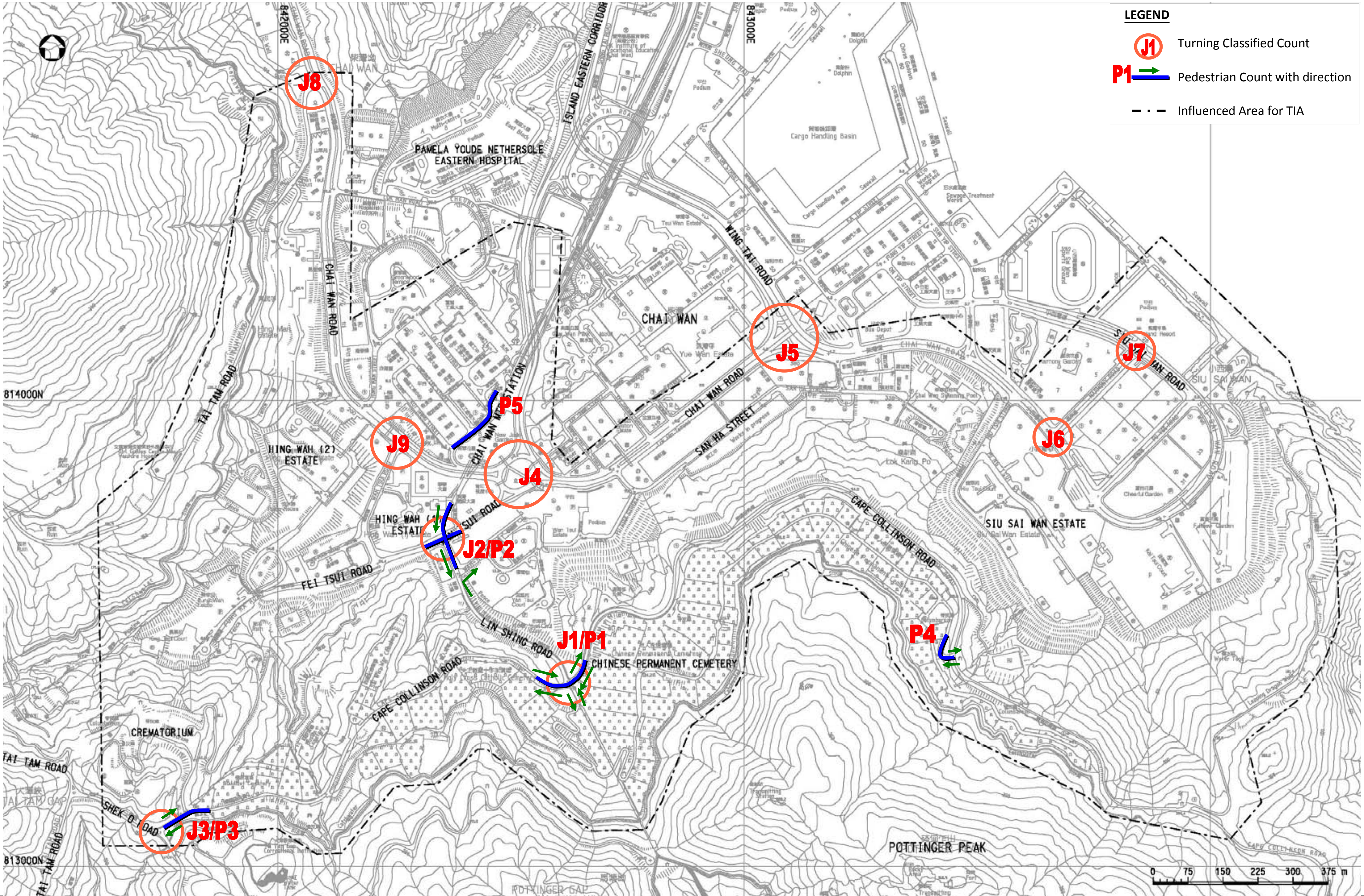
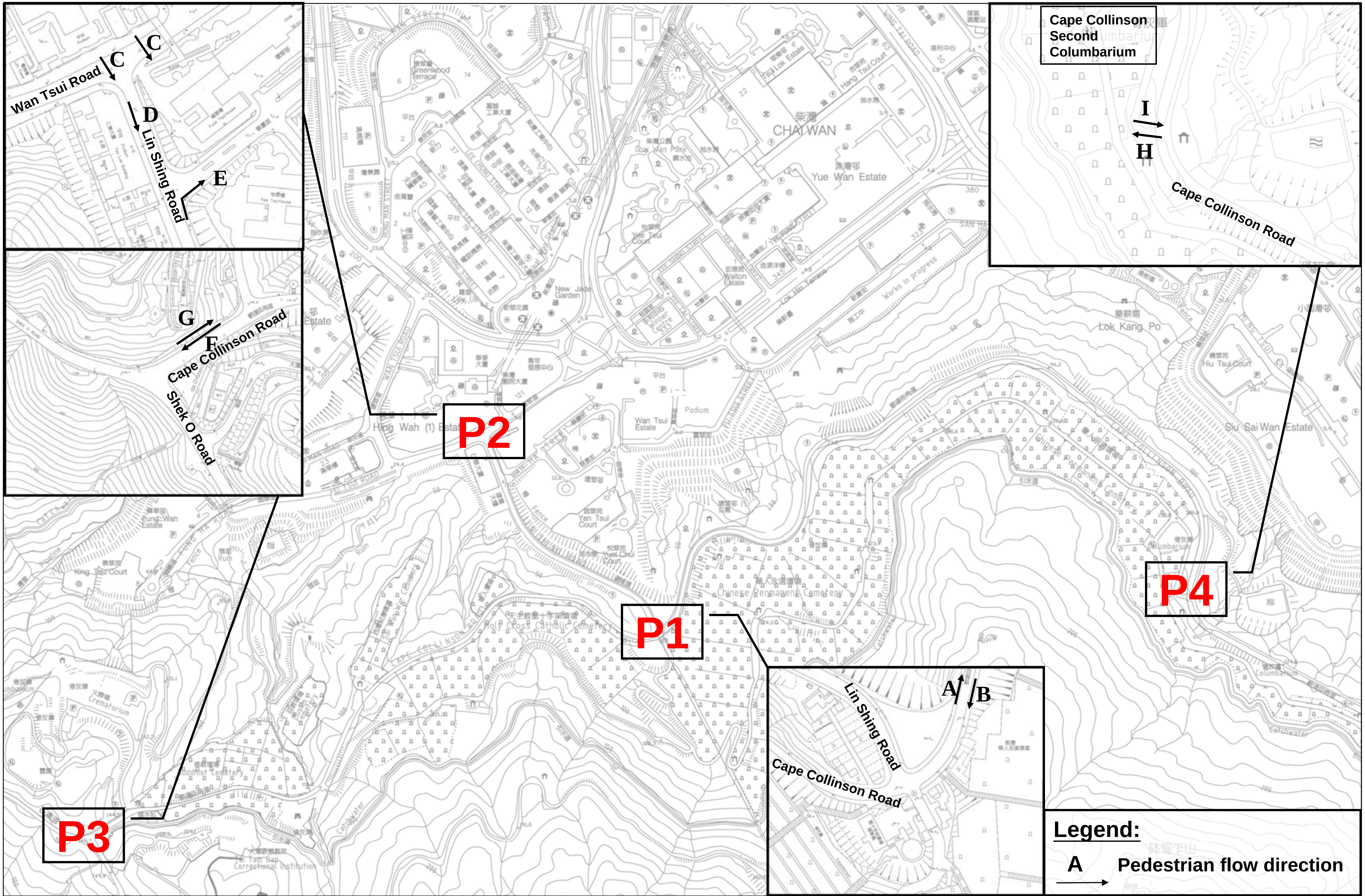


Client: ARCHITECTURAL SERVICES DEPARTMENT	Consulting Engineer: Halcrow, Halcrow China Ltd.	Contract No.: CPM301_15/10	TRAFFIC IMPACT ASSESSMENT REPORT
		Project Title: TRAFFIC IMPACT ASSESSMENT STUDY FOR COLUMBARIUM DEVELOPMENT AT CAPE COLLINSON ROAD, CHAI WAN	Figure Title: LOCATIONS OF BUS STOP / TERMINUS AND GMB TERMINUS IN THE VICINITY OF CHAI WAN CEMETERIES

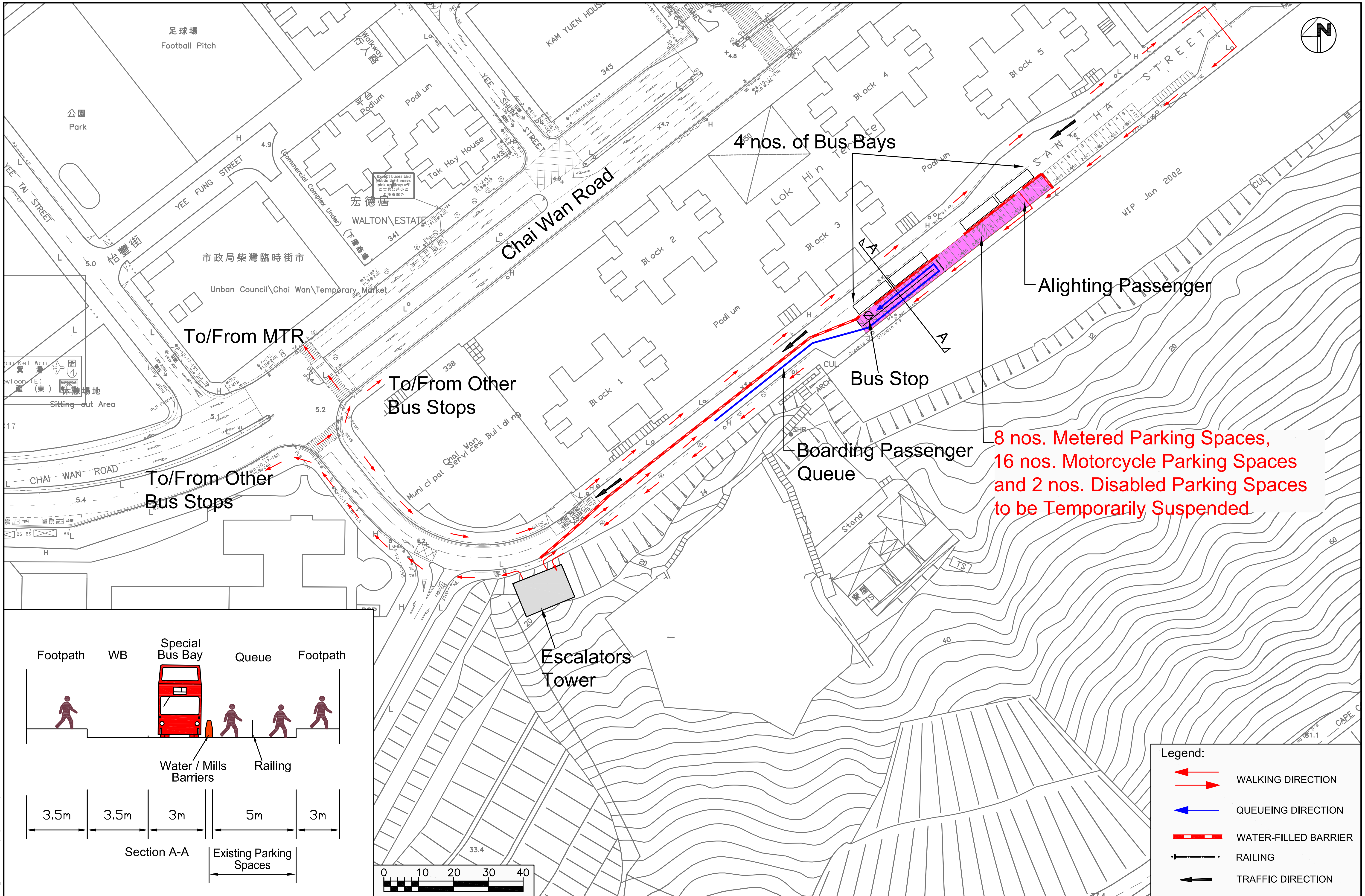
FIGURE 2.1		
Checked: OC	Scale: -	Rev.: 0
Designed: YC	Drawn: -	Date: 01/07/2011



Client	Consulting Engineer	Contract No.: CPM301_15/10	TRAFFIC IMPACT ASSESSMENT REPORT	FIGURE 2.2
ARCHITECTURAL SERVICES DEPARTMENT	Halcrow Halcrow China Ltd.	Project Title: TRAFFIC IMPACT ASSESSMENT STUDY FOR COLUMBARIUM DEVELOPMENT AT CAPE COLLINSON ROAD, CHAI WAN	Figure Title: LOCATIONS OF TRAFFIC AND PEDESTRIANS SURVEY (SHEET 1 OF 2)	Checked: OC; Scale: -; Rev.: 0 Designed: YC; Drawn: -; Date: 11/05/2011



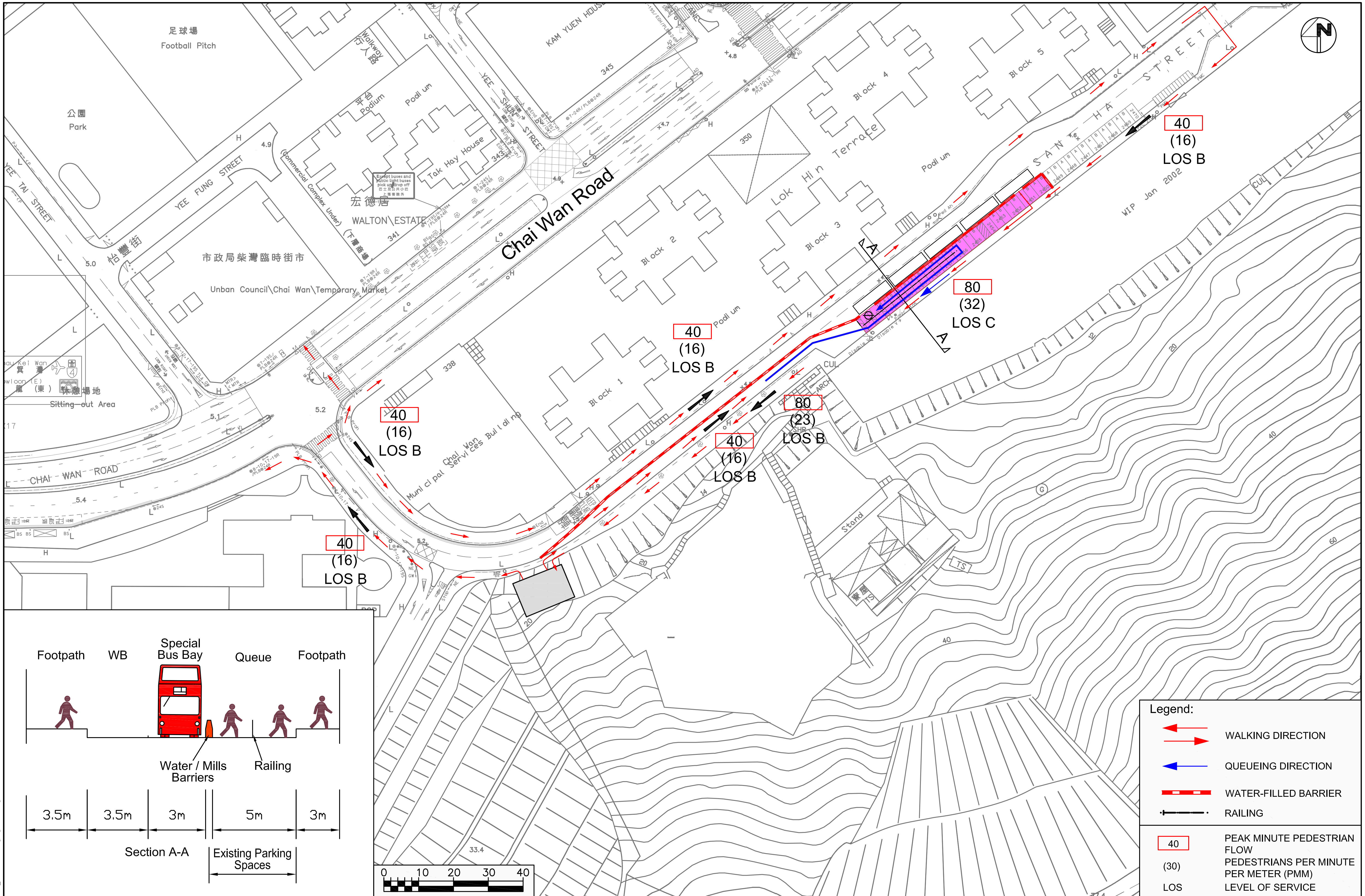
Client: ARCHITECTURAL SERVICES DEPARTMENT	Consulting Engineer: Halcrow / Halcrow China Ltd.	Contract No.: CPM301_15/10	TRAFFIC IMPACT ASSESSMENT REPORT	FIGURE 2.3
		Project Title: TRAFFIC IMPACT ASSESSMENT STUDY FOR COLUMBARIUM DEVELOPMENT AT CAPE COLLINSON ROAD, CHAI WAN	Figure Title: 2011 OBSERVED PEDESTRIAN FLOWS CRITICAL LOCATION	Checked: OC; Scale: -; Rev.: 1; Designed: YC; Drawn: -; Date: 17/08/2011



Client: ARCHITECTURAL SERVICES DEPARTMENT	Consulting Engineer: Halcrow — Halcrow China Ltd.	Contract No.: CPM301_15/10	TRAFFIC REVIEW REPORT
		Project Title: TRAFFIC IMPACT ASSESSMENT STUDY FOR COLUMBARIUM DEVELOPMENT AT CAPE COLLINSON ROAD, CHAI WAN	Drawing Title: SPECIAL BUS SERVICES AT SAN HA STREET

FIGURE 4.1

Checked	Scale	Rev.
OC	1: 1000	B
Designed	**Drawn**	**Date**
JZ	SX	14/11/2013



Client: ARCHITECTURAL SERVICES DEPARTMENT	Consulting Engineer: Halcrow, Halcrow China Ltd.	Contract No.: CPM301_15/10 Project Title: TRAFFIC IMPACT ASSESSMENT STUDY FOR COLUMBARIUM DEVELOPMENT AT CAPE COLLINSON ROAD, CHAI WAN	TRAFFIC REVIEW REPORT Drawing Title: LEVEL OF SERVICES AT FOOTPATHS ALONG SAN HA STREET

FIGURE 4.2

Checked	Scale	Rev.
OC	1: 1000	-
Designed	**Drawn**	**Date**
JZ	SX	14/11/2013

Client: ARCHITECTURAL SERVICES DEPARTMENT	Consulting Engineer: Halcrow — Halcrow China Ltd.	Contract No.: CPM301_15/10	TRAFFIC REVIEW REPORT — FIGURE 4.3
		Project Title: TRAFFIC IMPACT ASSESSMENT STUDY FOR COLUMBARIUM DEVELOPMENT AT CAPE COLLINSON ROAD, CHAI WAN	Drawing Title: SPECIAL BUS SERVICES AT HENG FA CHUEN – OPTION 1

Checked	Scale	Rev.
OC	1: 600	B
Designed	**Drawn**	**Date**
JZ	SX	28/01/2014

$USERNAME$ $$$$DATE$TIME$$$$

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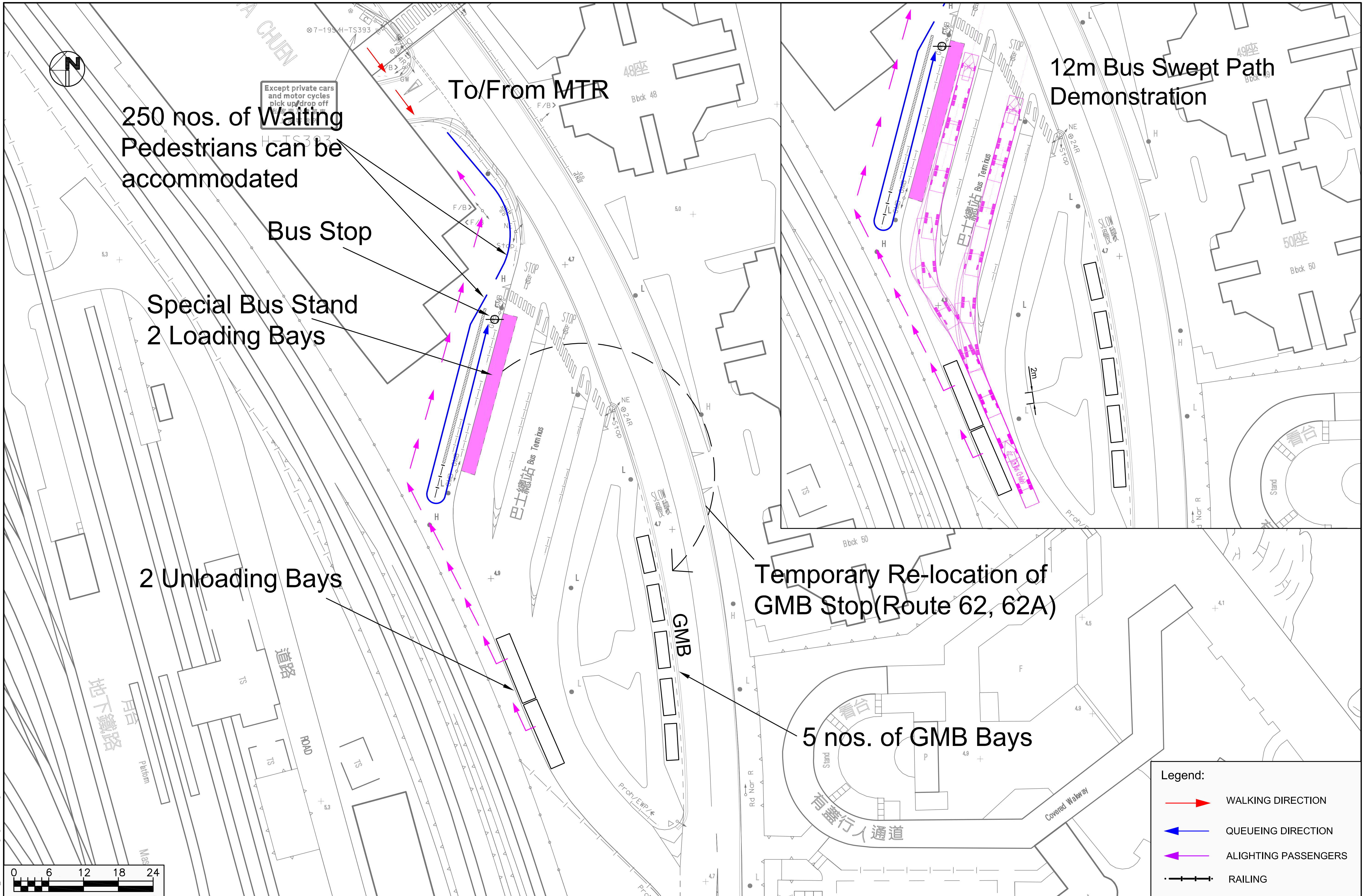
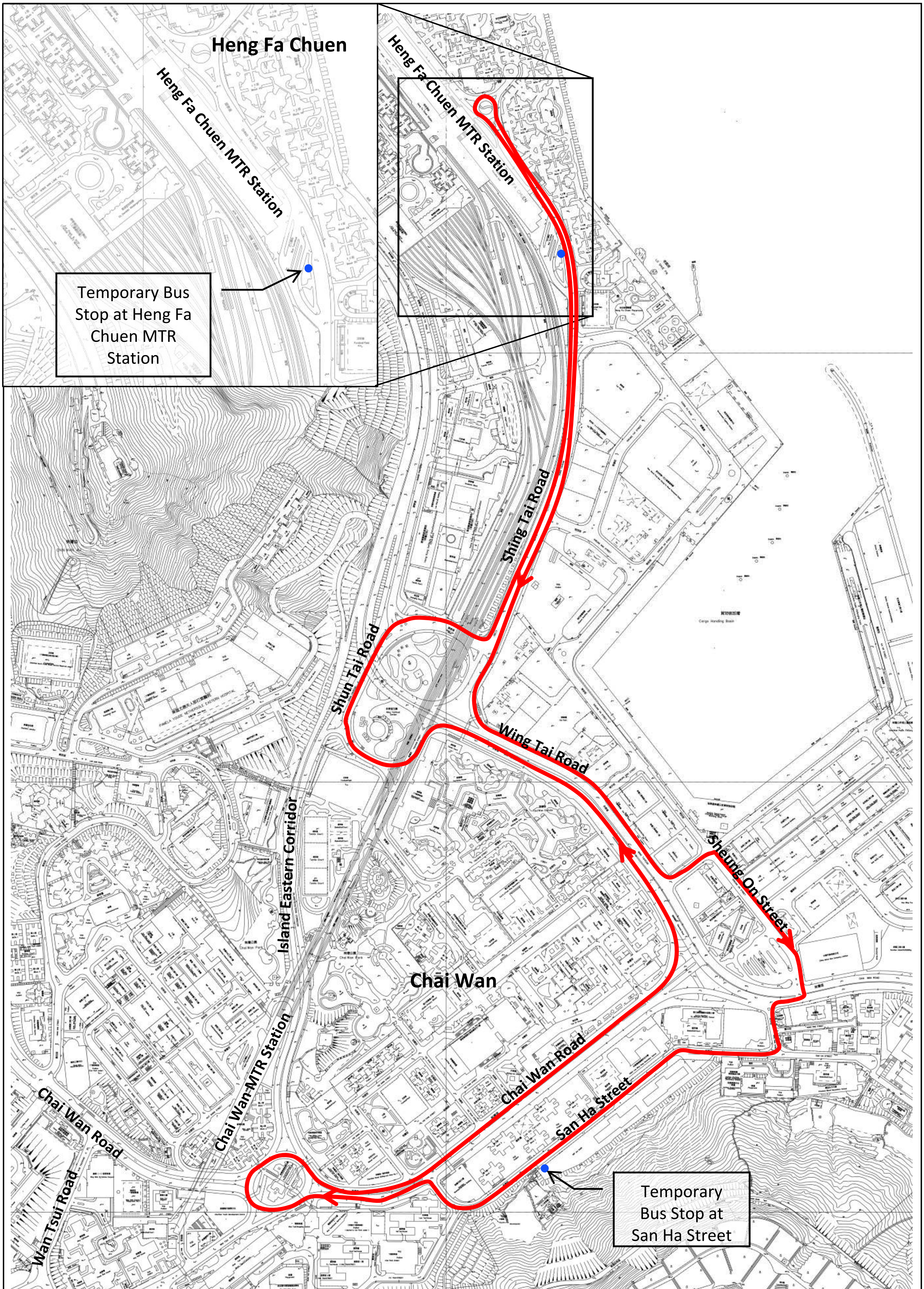


Client: ARCHITECTURAL SERVICES DEPARTMENT	Consulting Engineer: Halcrow Halcrow China Ltd.	Contract No.: CPM301_15/10	TRAFFIC REVIEW REPORT
		Project Title: TRAFFIC IMPACT ASSESSMENT STUDY FOR COLUMBARIUM DEVELOPMENT AT CAPE COLLINSON ROAD, CHAI WAN	Drawing Title: SPECIAL BUS SERVICES AT HENG FA CHUEN - OPTION 2

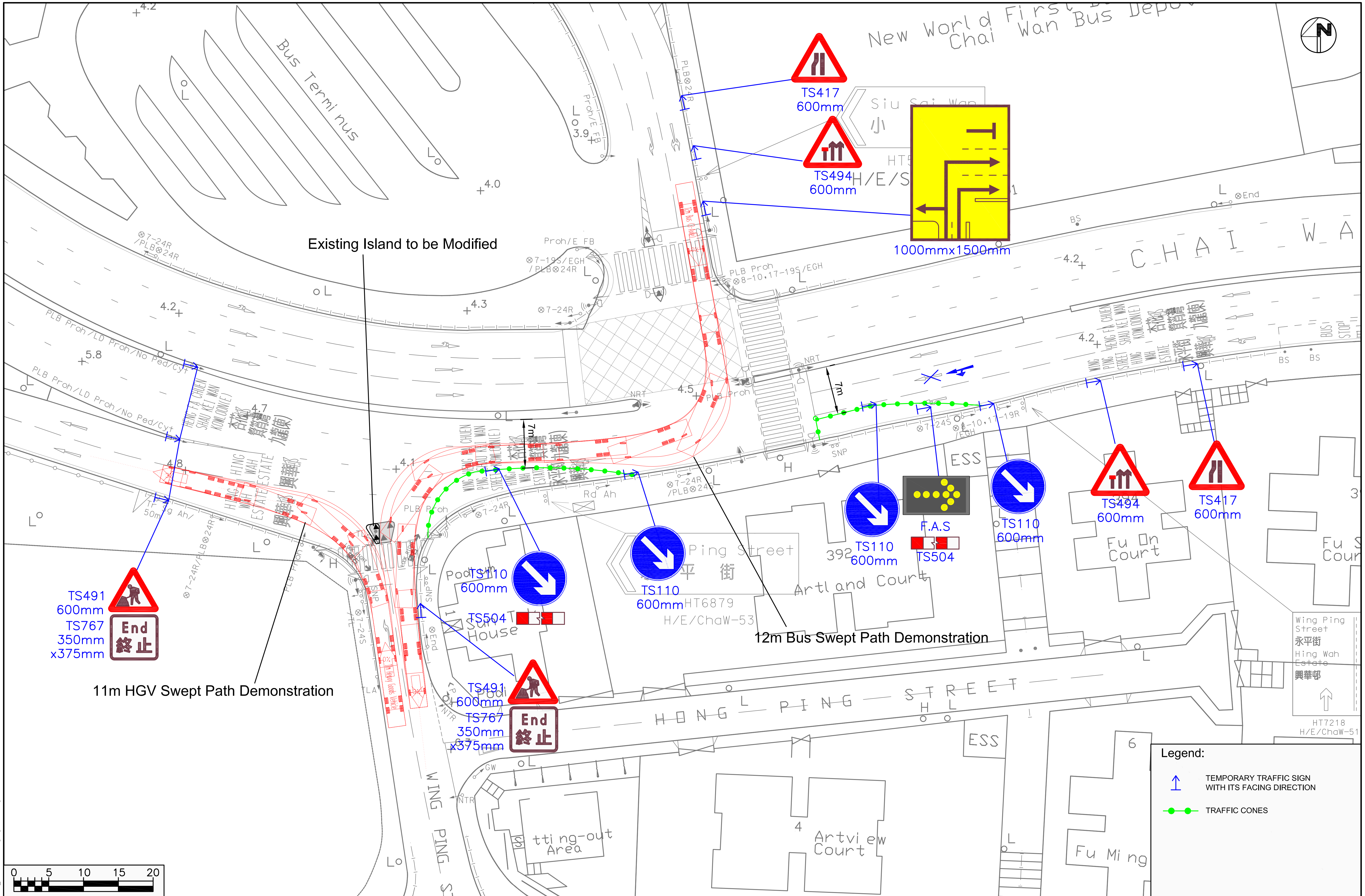
FIGURE 4.4		
Checked: OC	Scale: 1: 600	Rev.: B
Designed: JZ	Drawn: SX	Date: 28/01/2014

$USERNAME$ $$$$$$$$$$$$$$$FILENAME$$$$$$$$$$$$$$$ $$$$DATE$TIME$$$$

X:\Ozzo\80510_Cape Collinson_CH2M\Data\dwg\Figure 4.4B.dwg 2014/01/29 16:38:15



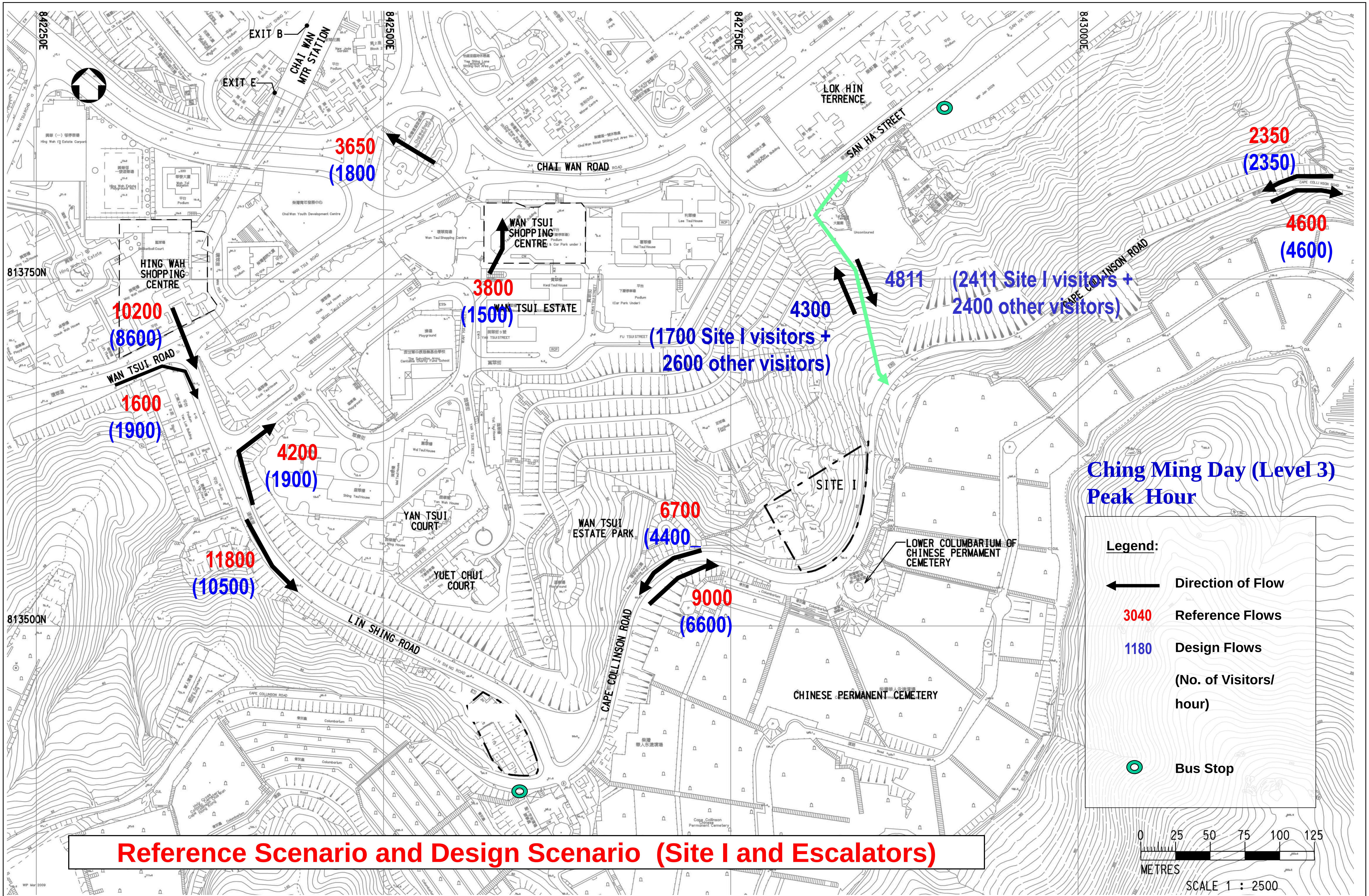
Client	Consulting Engineer	Agreement No.: CPM301_15/10	FIGURE 4.5
ARCHITECTURAL SERVICES DEPARTMENT	Halcrow Halcrow China Ltd.	TRAFFIC IMPACT ASSESSMENT STUDY FOR COLUMBARIUM DEVELOPMENT AT CAPE COLLINSON ROAD, CHAI WAN	POSSIBLE NEW SPECIAL BUS ROUTE (HENG FA CHUEN – SAN HA STREET)



Client: ARCHITECTURAL SERVICES DEPARTMENT	Consulting Engineer: Halcrow, Halcrow China Ltd.	Contract No.: CPM301_15/10	TRAFFIC REVIEW REPORT
		Project Title: TRAFFIC IMPACT ASSESSMENT STUDY FOR COLUMBARIUM DEVELOPMENT AT CAPE COLLINSON ROAD, CHAI WAN	Drawing Title: MODIFICATION AT JUNCTION OF CHAI WAN ROAD AND WING PING STREET

FIGURE 4.6

Checked	Scale	Rev.
OC	1: 500	-
Designed	Drawn	Date
JZ	SX	14/11/2013



Client: ARCHITECTURAL SERVICES DEPARTMENT	Consulting Engineer: Halcrow, Halcrow China Ltd.	Contract No.: CPM301_15/10	TRAFFIC IMPACT ASSESSMENT REPORT
		Project Title: TRAFFIC IMPACT ASSESSMENT STUDY FOR COLUMBARIUM DEVELOPMENT AT CAPE COLLINSON ROAD, CHAI WAN	Figure Title: Peak Hour Pedestrian Flows on Ching Ming Day Reference and Design Flows

FIGURE 5.1		
Checked: OC	Scale: -	Rev.: 0
Designed: YC	Drawn: -	Date: 21/11/2011

Appendix A

Hong Kong Police Force –
Historic Grave Sweeper Data visiting
Chai Wan Cemeteries

清明節掃墓人數

Ching Ming 2009		
2009-03-15 (SUN)	Level 1	4,920
2009-03-21 (SAT)	Level 1	4,020
2009-03-22 (SUN)	Level 1	15,940
2009-03-28 (SAT)	Level 1	3,940
2009-03-29 (SUN)	Level 2	14,930
2009-04-04 (SAT) Ching Ming Festival	Level 3	102,800
2009-04-05 (SUN)	Level 2	6,590
2009-04-10 (FRI) Easter Festival	Level 1	4,950
2009-04-11 (SAT) Easter Festival	Level 1	3,060
2009-04-12 (SUN) Easter Festival	Level 1	6,400
2009-04-13 (MON) Easter Festival	Level 1	1,995
2009-04-18 (SAT)	Level 1	5,075
2009-04-19 (SUN)	Level 1	11,145
2009-04-26 (SAT)	STA	6,100
	Total:	191,865

Ching Ming 2010		
2010-03-14 (SUN)	Level 1	3,955
2010-03-20 (SAT)	Level 1	3,480
2010-03-21 (SUN)	Level 1	11,960
2010-03-27 (SAT)	Level 1	5,320
2010-03-28 (SUN)	Level 1	23,470
2010-04-02 (FRI) Easter Festival	Level 2	7,300
2010-04-03 (SAT) Easter Festival	Level 2	5,900
2010-04-04 (SUN) Easter Festival	Level 2	8,035
2010-04-05 (MON) Ching Ming Festival	Level 3	40,070
2010-04-06 (TUE) Easter Festival	Level 2	8,540
2010-04-10 (SAT)	Level 1	5,120
2010-04-11 (SUN)	Level 1	22,135
2010-04-17 (SAT)	Level 1	4,135
2010-04-18 (SUN)	Level 1	15,185
2010-04-24 (SAT)	Level 1	3,392
2010-04-25 (SUN)	Level 1	17,320
2010-05-01 (SAT)	Level 1	4,038
2010-05-02 (SUN)	Level 1	2,680
2010-05-08 (SAT)	STA	500
2010-05-09 (SUN)	STA	800
2010-05-15 (SAT)	STA	80
	Total:	193,415

Ching Ming 2011		
2011-03-06 (SUN)	Level 1	3,336
2011-03-12 (SAT)	Level 1	3,345
2011-03-13 (SUN)	Level 2	18,250
2011-03-19 (SAT)	Level 1	4,035
2011-03-20 (SUN)	Level 2	13,140
2011-03-26 (SAT)	Level 1	5,990
2011-03-27 (SUN)	Level 2	19,320
2011-04-02 (SAT)	Level 2	16,635
2011-04-03 (SUN)	Level 3	43,565
2011-04-05 (TUE) Ching Ming Festival	Level 3	70,920
2011-04-09 (SAT)	Level 2	13,875
2011-04-10 (SUN)	Level 2	28,990
2011-04-16 (SAT)	Level 1	4180
2011-04-17 (SUN)	Level 2	16,609
2011-04-22 (FRI)	Level 1	4,720
2011-04-23 (SAT)	Level 1	4,485
2011-04-24 (SUN)	Level 1	12,145
2011-04-25 (MON)	Level 1	4,245
2011-04-30 (SAT)	Level 1	6,225
2011-05-01 (SUN)	Level 1	12,685
2011-05-02 (MON)	Level 1	3,355
	Total :	310,050

Ching Ming 2012		
2012-03-04 (SUN)	Level 1	7,280
2012-03-10 (SAT)	Level 1	1,325
2012-03-11 (SUN)	Level 2	4,005
2012-03-17 (SAT)	Level 1	2,220
2012-03-18 (SUN)	Level 2	9,005
2012-03-24 (SAT)	Level 1	5,266
2012-03-25 (SUN)	Level 2	12,100
2012-03-31 (SAT)	Level 2	8,920
2012-04-01 (SUN)	Level 3	43,050
2012-04-04 (WED) Ching Ming Festival	Level 3	45,400
2012-04-06 (FRI) Easter Festival	Level 2	7,100
2011-04-07 (SAT) Easter Festival	Level 2	6,600
2012-04-08 (SUN) Easter Festival	Level 2	9,800
2012-04-09 (MON) Easter Festival	Level 2	8,050
2012-04-14 (SAT)	Level 2	6,330
2012-04-15 (SUN)	Level 2	19,290
2012-04-21 (SAT)	Level 1	1,830
2012-04-22 (SUN)	Level 2	14,000
2012-04-28 (SAT)	Level 1	4,670
2012-04-29 (SUN)	Level 1	2,460
	Total :	218,701

Ching Ming 2013			
2013-03-10 (SUN)	Level 1	4,080	
2013-03-16 (SAT)	Level 1	6,015	
2013-03-17 (SUN)	Level 1	15,220	
2013-03-23 (SAT)	Level 1	6,330	
2013-03-24 (SUN)	Level 2	19,550	
2013-03-29 (FRI) Easter Festival	Level 2	17,940	
2013-03-30 (SAT) Easter Festival	Level 2	14,380	
2013-03-31 (SUN)	Level 2	18,260	
2013-04-01 (MON) Easter Festival	Level 3	14,750	
2013-04-04 (THU) Ching Ming Festival	Level 3	93,600	
2013-04-06 (SAT)	Level 2	7,720	1615 hrs down to Level 1
2013-04-07 (SUN)	Level 2	32,240	
2013-04-13 (SAT)	Level 2	13,450	1620 hrs down to Level 1
2013-04-14 (SUN)	Level 2	27,640	1630 hrs down to Level 1
2013-04-20 (SAT)	Level 1	6,930	
2013-04-21 (SUN)	Level 1	20,800	Bet 0945 & 1615 hrs up to Level 2
2013-04-27 (SAT)	Level 1	8,510	
2013-04-28 (SUN)	Level 1	22,830	Bet 0945 & 1530 hrs up to Level 2
	Total :	350,245	

Ching Ming 2012 (4/3 - 29/4)					
Date	Week	Phase	Peak Time	/Grave sweepers	Total Grave sweepers
04-03-2012	SUN	I	1200 hrs	/1600	7280
10-03-2012	SAT	I	1300 hrs	/250	1325
11-03-2012	SUN	II	1200 hrs	/940	4005
17-03-2012	SAT	I	1200 hrs	/550	2220
18-03-2012	SUN	II	1200 hrs	/1810	9005
24-03-2012	SAT	I	1100 hrs	/930	5266
25-03-2012	SUN	II	1200 hrs	/3300	12100
31-03-2012	SAT	II	1200 hrs	/2250	8920
01-04-2012	SUN	II	1300 hrs	/9600	43050
04-04-2012	WED	III	1400 hrs	/8100	45400
06-04-2012	FRI	II	1200 hrs	/1680	7100
07-04-2012	SAT	II	1200 hrs	/1250	6600
08-04-2012	SUN	II	1300 hrs	/2110	9800
09-04-2012	MON	II	1200 hrs	/2550	8050
14-04-2012	SAT	II	1300 hrs	/1020	6330
15-04-2012	SUN	II	1200 hrs	/4000	19290
21-04-2012	SAT	I	1200 hrs	/320	1830
22-04-2012	SUN	II	1200 hrs	/3340	14000
28-04-2012	SAT	I	1300 hrs	/1210	4670
29-04-2012	SUN	I	1200 hrs	/530	2460
					218701

Ching Ming 2013 (10/3 - 28/4)					
Date	Week	Phase	Peak Time	/Grave sweepers	Total Grave sweepers
10-03-2013	SUN	I	1200 hrs	/900	4080
16-03-2013	SAT	I	1300 hrs	/1275	6015
17-03-2013	SUN	I	1300 hrs	/4080	15220
23-03-2013	SAT	I	1300 hrs	/1105	6330
24-03-2013	SUN	II	1200 hrs	/5140	19550
29-03-2013	FRI	II	1300 hrs	/3800	17940
30-03-2013	SAT	II	1200 hrs	/3800	14380
31-03-2013	SUN.	II	1300 hrs	/3710	18260
01-04-2013	MON	III	1200 hrs	/3410	14750
04-04-2013	THU	III	1300 hrs	/24000	93600
06-04-2013	SAT	II	1300 hrs	/1650	7720
07-04-2013	SUN	II	1300 hrs	/7500	32240
13-04-2013	SAT	II	1300 hrs	/2950	13450
14-04-2013	SUN	II	1500 hrs	/4900	27640
20-04-2013	SAT	I	1200 hrs	/1830	6930
21-04-2013	SUN	I	1100 hrs	/4200	20800
27-04-2013	SAT	I	1300 hrs	/1890	8510
28-04-2013	SUN	I	1200 hrs	/6080	22830
					350245

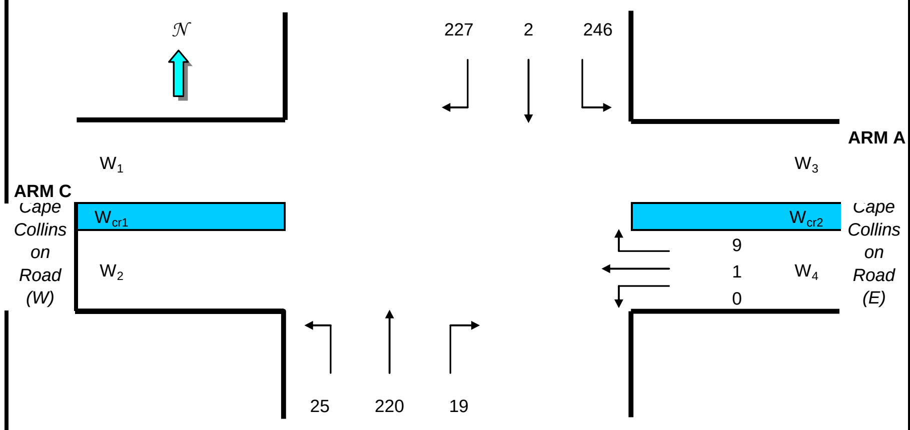
Appendix B1

2011 Peak Hour Junction Assessment Calculation Sheets

Halcrow | **Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at Cape Co** | **Prepared By:** | **KC**
Junction Capacity Analysis | **Checked By:** | **OC**

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2011 Level 1
Time - 2011 Level 1 Peak Hour

ARM D *Lin Shing Rd (N)*



ARM B *Lin Shing Rd (S)*

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{a\text{-}d}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$W_{d\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
$W_{d\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
$Vr_{a\text{-}d}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
$Vl_{d\text{-}c}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)
MAJOR ROAD			(ARM A)
$W_{a\text{-}d}$	=	3.00	(metres)
$Vr_{a\text{-}d}$	=	100	(metres)
$q_{a\text{-}b}$	=	0	(pcu/hr)
$q_{a\text{-}c}$	=	1	(pcu/hr)
$q_{a\text{-}d}$	=	9	(pcu/hr)
MAJOR ROAD			(ARM C)
$W_{c\text{-}b}$	=		(metres)
$Vr_{c\text{-}b}$	=		(metres)
$q_{c\text{-}a}$	=	0	(pcu/hr)
$q_{c\text{-}b}$	=	0	(pcu/hr)
$q_{c\text{-}d}$	=	0	(pcu/hr)
MINOR ROAD			(ARM B)
$W_{b\text{-}a}$	=	5.00	(metres)
$W_{b\text{-}c}$	=	5.00	(metres)
$Vl_{b\text{-}a}$	=	100	(metres)
$Vr_{b\text{-}a}$	=	65	(metres)
$Vr_{b\text{-}c}$	=	0	(metres)
$q_{b\text{-}a}$	=	19	(pcu/hr)
$q_{b\text{-}c}$	=	25	(pcu/hr)
$q_{b\text{-}d}$	=	220	(pcu/hr)
MINOR ROAD			(ARM D)
$W_{d\text{-}a}$	=	3.00	(metres)
$W_{d\text{-}c}$	=	3.00	(metres)
$Vl_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}a}$	=	80	(metres)
$q_{d\text{-}a}$	=	246	(pcu/hr)
$q_{d\text{-}b}$	=	2	(pcu/hr)
$q_{d\text{-}c}$	=	227	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

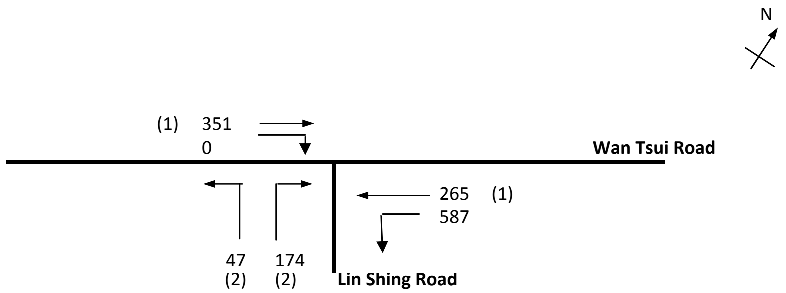
$Q_{b\text{-}a}$	=	540
$Q_{b\text{-}c}$	=	749
$Q_{b\text{-}d}$ is nearside	=	TRUE
$Q_{b\text{-}d}$	=	609
$Q_{d\text{-}a}$	=	674
$Q_{d\text{-}b}$ is nearside	=	TRUE
$Q_{d\text{-}b}$	=	529
$Q_{d\text{-}c}$	=	455
$Q_{c\text{-}b}$	=	439
$Q_{a\text{-}d}$	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

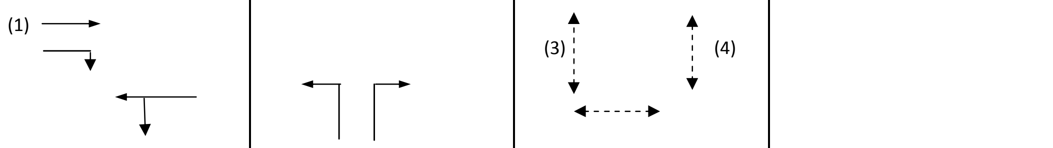
$DFC_{b\text{-}a}$	=	0.035
$DFC_{b\text{-}c}$	=	0.033
$DFC_{b\text{-}d}$	=	0.362
$DFC_{d\text{-}a}$	=	0.365
$DFC_{d\text{-}b}$	=	0.004
$DFC_{d\text{-}c}$	=	0.499
$DFC_{c\text{-}b}$	=	0.000
$DFC_{a\text{-}d}$	=	0.015

Critical DFC = 0.499

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
Junction of Lin Shing Road and Wan Tsui Road	J2LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2011 Level 1 Peak Hour		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.467	
Loss time		L =	35	sec
Total Flow		=	1203	pcu
Co	= (1.5*L+5)/(1-Y)	=	107.8	sec
Cm	= L/(1-Y)	=	65.6	sec
Yult		=	0.638	
R.C.ult	= (Yult-Y)/Y*100%	=	36.6	%
Cp	= 0.9*L/(0.9-Y)	=	72.7	sec
Ymax	= 1-L/C	=	0.708	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	36.6	%



Stage A I = 7 | Stage B I = | Stage C I =

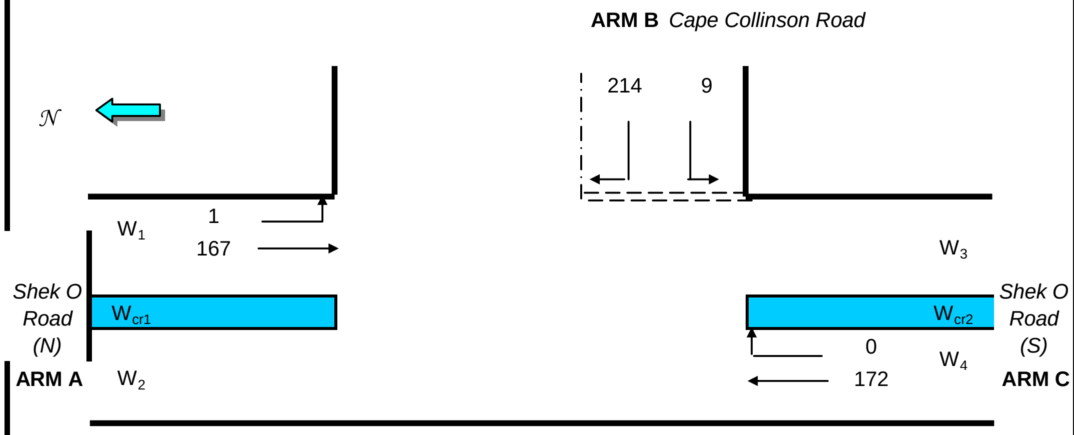
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		351		351	0.00	1915			1915	0.183			33	85	0.259	18	4
ST/LT	A	4.00	1	1	10		N	2015	587	265		852	0.69	1826			1826	0.467	0.467		85	85	0.659	48	5
Ped	B	6.0	3																	30					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road

Design Year - 2011 Level 1

Time - 2011 Level 1 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	1	(pcu/hr)
q_{a-c}	=	167	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	172	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	214	(pcu/hr)
q_{b-c}	=	9	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

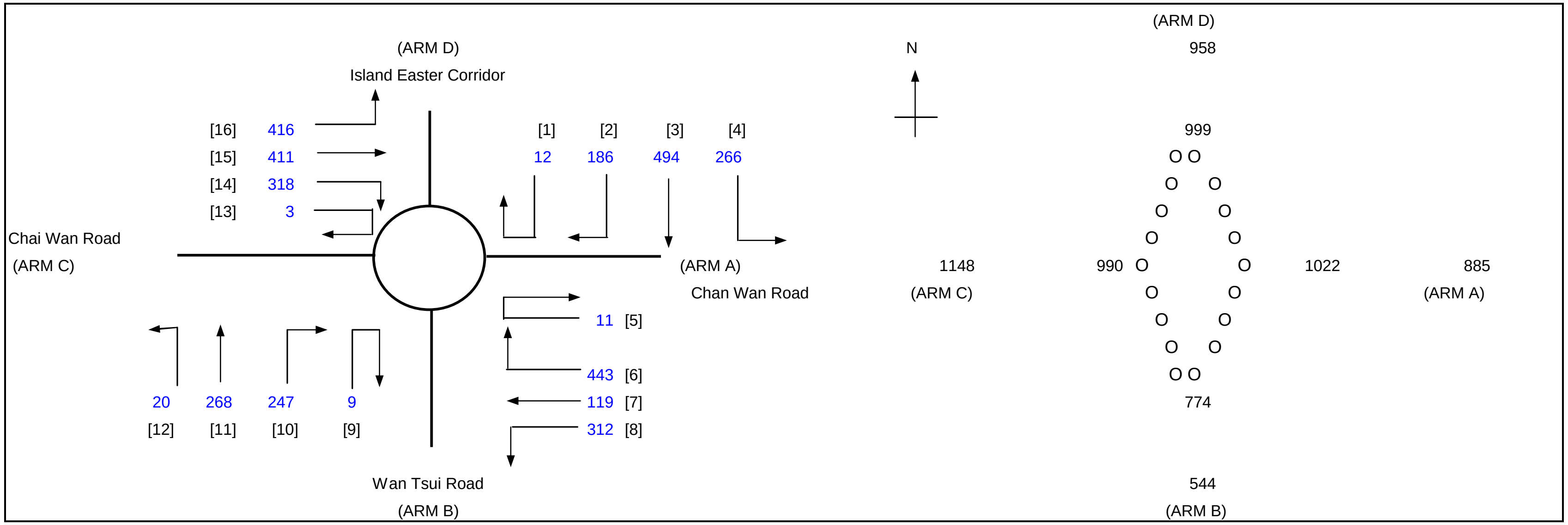
Q_{b-c}	=	699
Q_{c-b}	=	778
Q_{b-a}	=	348

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	0.615
DFC_{b-c}	=	0.013
DFC_{c-b}	=	0.000

Critical DFC = 0.615

	ROUNDABOUT CAPACITY ASSESSMENT			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	J4LV1 Peak Hour	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME : 2011_LV1_Ref_J4.xls	CHECKED BY:	OC	Sep-13
2011 Level 1 Peak Hour			REVIEWED BY:	OC	Sep-13

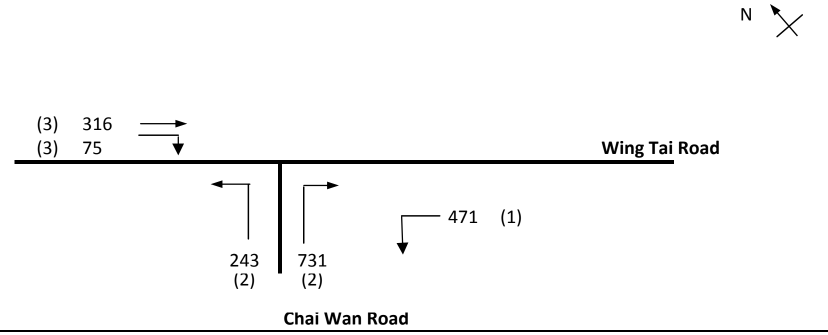


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	885	544	1148	958
Qc	=	Circulating flow across entry (pcu/h)	1022	774	990	999
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1695	1042	1730	1447
DFC	=	Design flow/Capacity = Q/Qe	0.52	0.52	0.66	0.66

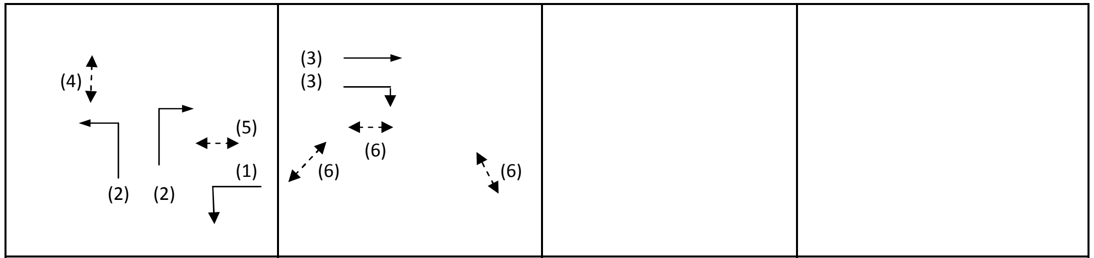
Total In Sum = 2521 PCU

DFC of Critical Approach = 0.66

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2011 Level 1 Peak Hour		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.282	
Loss time		L =	10	sec
Total Flow		=	1836	pcu
Co	= (1.5*L+5)/(1-Y)	=	27.8	sec
Cm	= L/(1-Y)	=	13.9	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	192.8	%
Cp	= 0.9*L/(0.9-Y)	=	14.6	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	187.5	%

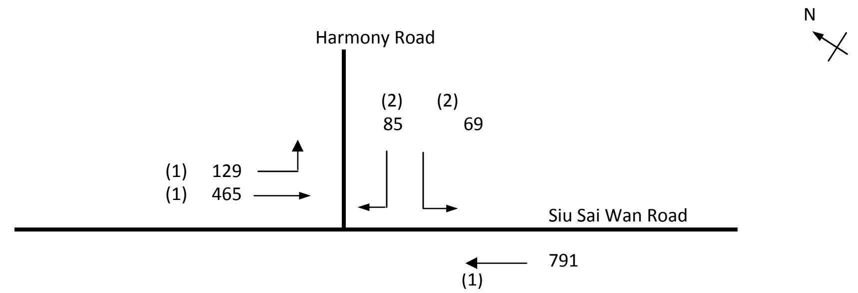


Stage A I = 7 | Stage B I = 5

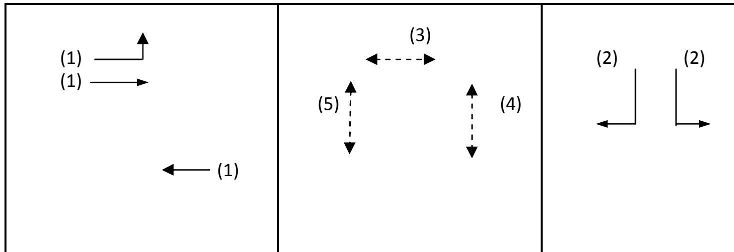
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	471			471	1.00	3857			3857	0.122			39	65	0.187	12	5
LT	A	4.00	2	2	24			4310	243			243	1.00	4056			4056	0.060			19	65	0.092	6	5
RT	A	3.50	2	2	11		y	4070			731	731	1.00	3582			3582	0.204	0.204		65	65	0.313	21	5
ST	B	3.50	3	2			y	4070		316		316	0.00	4070			4070	0.078	0.078		25	25	0.313	18	24
RT	B	4.50	3	2	13		y	4270			75	75	1.00	3828			3828	0.020			6	25	0.079	3	25
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2011 Level 1 Peak Hour		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	100	sec
Sum(y)		Y =	0.244	
Loss time		L =	48	sec
Total Flow		=	1538	pcu
Co	= (1.5*L+5)/(1-Y)	=	101.9	sec
Cm	= L/(1-Y)	=	63.5	sec
Yult		=	0.540	
R.C.ult	= (Yult-Y)/Y*100%	=	121.0	%
Cp	= 0.9*L/(0.9-Y)	=	65.9	sec
Ymax	= 1-L/C	=	0.520	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	91.6	%

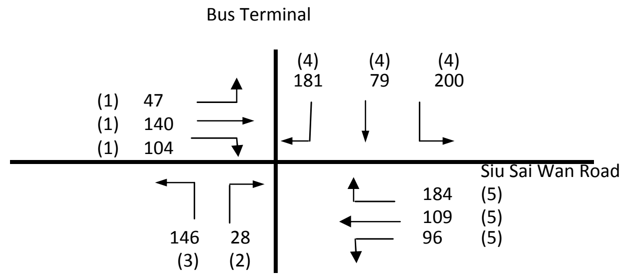


Stage A I = 10 | Stage B I = 15 | Stage C I = 6

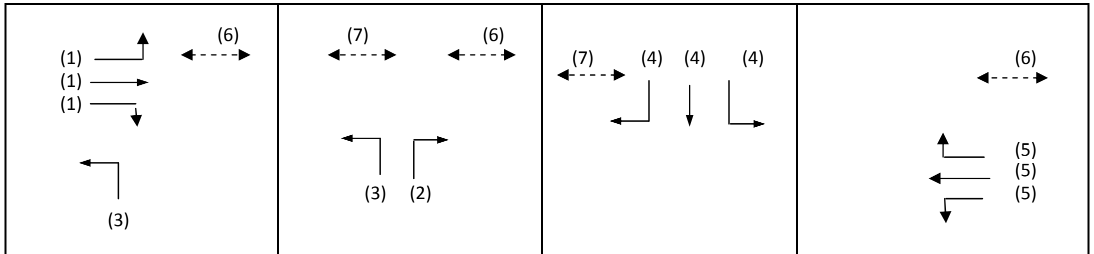
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	129	148		277	0.47	1829			1829	0.151			32	42	0.357	24	14
ST	A	3.20	1	1				2075		317		317	0.00	2075			2075	0.153			32	42	0.360	30	14
ST	A	3.00	1	2			y	3970		791		791	0.00	3970			3970	0.199	0.199		42	42	0.470	36	13
LT	C	3.75	2	1	12		y	1990	69			69	1.00	1769			1769	0.039			8	10	0.404	6	42
RT	C	3.75	2	1	12			2130			85	85	1.00	1893			1893	0.045	0.045		10	10	0.470	12	43
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2011 Level 1 Peak Hour		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.366
Loss time		L =	18 sec
Total Flow		=	1313 pcu
Co	= (1.5*L+5)/(1-Y)	=	50.5 sec
Cm	= L/(1-Y)	=	28.4 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	109.1 %
Cp	= 0.9*L/(0.9-Y)	=	30.3 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	103.8 %

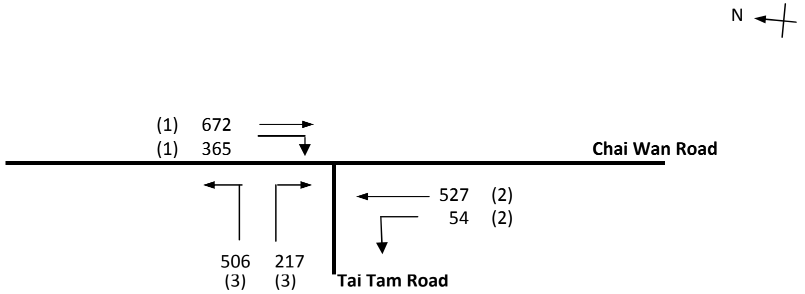


Stage A I = 5	Stage B I = 5	Stage C I = 6	Stage C I = 6

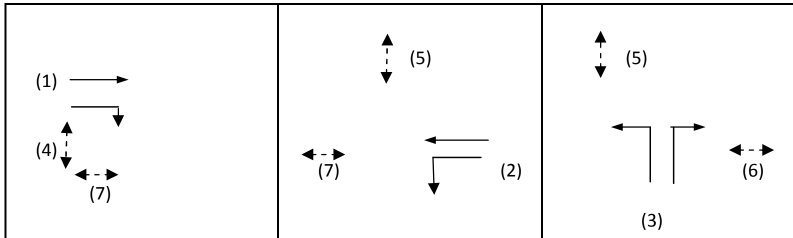
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	47	79		126	0.37	1851			1851	0.068			16	20	0.353	12	31
ST/RT	A	3.30	1	1	12			2085		61	104	165	0.63	1933			1933	0.085	0.085		20	20	0.442	18	32
RT	B	3.50	2	1	12			2105			28	28	1.00	1871			1871	0.015	0.015		4	4	0.442	0	64
LT	A,B	3.75	3	1	13		y	1990	146			146	1.00	1784			1784	0.082			19	29	0.297	18	24
RT	C	3.50	4	1	12			2105			181	181	1.00	1871			1871	0.097			23	37	0.276	18	19
LT/ST	C	3.50	4	1	12		y	1965	200	79		279	0.72	1803			1803	0.155	0.155		37	37	0.442	30	19
ST/RT	D	3.50	5	1	12			2105		0	184	184	1.00	1871			1871	0.098			23	23	0.442	24	29
LT/ST	D	3.50	5	1	11		y	1965	96	109		205	0.47	1848			1848	0.111	0.111		26	26	0.442	24	26
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2011 Level 1 Peak Hour		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	105	sec
Sum(y)		Y =	0.508	
Loss time		L =	18	sec
Total Flow		=	2341	pcu
Co	= (1.5*L+5)/(1-Y)	=	65.0	sec
Cm	= L/(1-Y)	=	36.6	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	50.6	%
Cp	= 0.9*L/(0.9-Y)	=	41.3	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	46.8	%



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		672		672	0.00	4070			4070	0.165			28	28	0.613	42	23
RT	A	3.50	1	1	13			2105			365	365	1.00	1887			1887	0.193	0.193		33	28	0.718	42	28
ST	B	3.50	2	2				4210		527		527	0.00	4210			4210	0.125	0.125		21	21	0.613	36	29
LT	B	3.10	2	1	12		y	1925	54			54	1.00	1711			1711	0.032			5	21	0.155	6	30
LT	C	4.00	3	1	15		y	2015	347			347	1.00	1832			1832	0.189	0.189		32	32	0.613	36	23
LT/RT	C	4.00	3	1	15			2155	159		217	376	1.00	1959			1959	0.192			33	32	0.621	42	23
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at Cape C

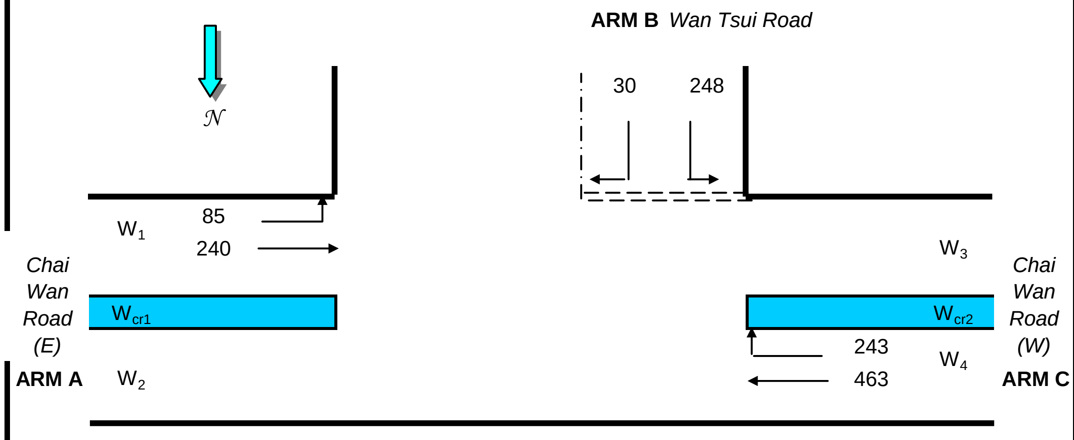
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - **J9: Junciton of Chai Wan Road and Wan Tsui Road**

Design Year - **2011 Level 1**

Time - **2011 Level 1 Peak Hour**



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

$q_{a\text{-}b}$	=	85	(pcu/hr)
$q_{a\text{-}c}$	=	240	(pcu/hr)

MAJOR ROAD (ARM C)

$W_{c\text{-}b}$	=	3.30	(metres)
$Vr_{c\text{-}b}$	=	150	(metres)
$q_{c\text{-}a}$	=	463	(pcu/hr)
$q_{c\text{-}b}$	=	243	(pcu/hr)

MINOR ROAD (ARM B)

$W_{b\text{-}a}$	=	0.00	(metres)
$W_{b\text{-}c}$	=	4.50	(metres)
$Vl_{b\text{-}a}$	=	150	(metres)
$Vr_{b\text{-}a}$	=	150	(metres)
$Vr_{b\text{-}c}$	=	150	(metres)
$q_{b\text{-}a}$	=	30	(pcu/hr)
$q_{b\text{-}c}$	=	248	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

$Q_{b\text{-}c}$	=	791
$Q_{c\text{-}b}$	=	702
$Q_{b\text{-}a}$	=	379

COMPARISION OF DESIGN FLOW TO CAPACITY

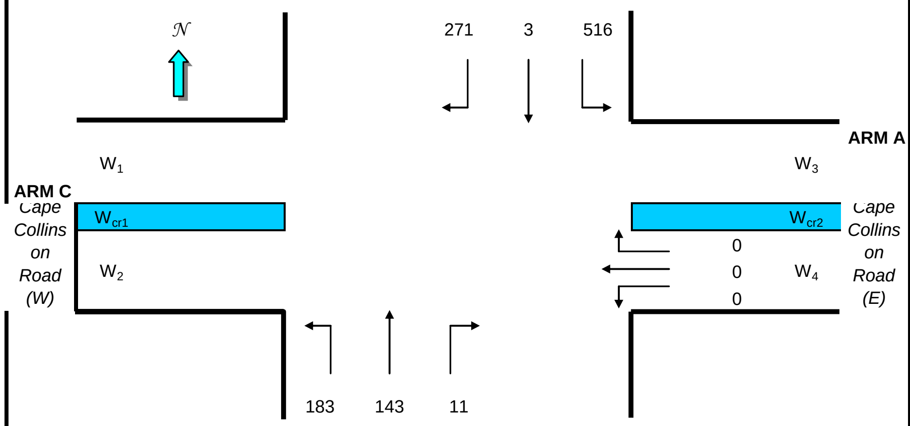
$DFC_{b\text{-}a}$	=	0.079
$DFC_{b\text{-}c}$	=	0.314
$DFC_{c\text{-}b}$	=	0.346

Critical DFC = 0.346

Halcrow	Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at Cape Cc	Prepared By:	KC
	Junction Capacity Analysis	Checked By:	OC

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2011 Level 2
Time - 2011 Level 2 Peak Hour

ARM D *Lin Shing Rd (N)*



ARM B *Lin Shing Rd (S)*

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{a\text{-}d}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$W_{d\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
$W_{d\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
$Vr_{a\text{-}d}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
$Vl_{d\text{-}c}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)
MAJOR ROAD			(ARM A)
$W_{a\text{-}d}$	=	3.00	(metres)
$Vr_{a\text{-}d}$	=	100	(metres)
$q_{a\text{-}b}$	=	0	(pcu/hr)
$q_{a\text{-}c}$	=	0	(pcu/hr)
$q_{a\text{-}d}$	=	0	(pcu/hr)
MAJOR ROAD			(ARM C)
$W_{c\text{-}b}$	=		(metres)
$Vr_{c\text{-}b}$	=		(metres)
$q_{c\text{-}a}$	=	0	(pcu/hr)
$q_{c\text{-}b}$	=	0	(pcu/hr)
$q_{c\text{-}d}$	=	0	(pcu/hr)
MINOR ROAD			(ARM B)
$W_{b\text{-}a}$	=	5.00	(metres)
$W_{b\text{-}c}$	=	5.00	(metres)
$Vl_{b\text{-}a}$	=	100	(metres)
$Vr_{b\text{-}a}$	=	65	(metres)
$Vr_{b\text{-}c}$	=	0	(metres)
$q_{b\text{-}a}$	=	11	(pcu/hr)
$q_{b\text{-}c}$	=	183	(pcu/hr)
$q_{b\text{-}d}$	=	143	(pcu/hr)
MINOR ROAD			(ARM D)
$W_{d\text{-}a}$	=	3.00	(metres)
$W_{d\text{-}c}$	=	3.00	(metres)
$Vl_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}a}$	=	80	(metres)
$q_{d\text{-}a}$	=	516	(pcu/hr)
$q_{d\text{-}b}$	=	3	(pcu/hr)
$q_{d\text{-}c}$	=	271	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

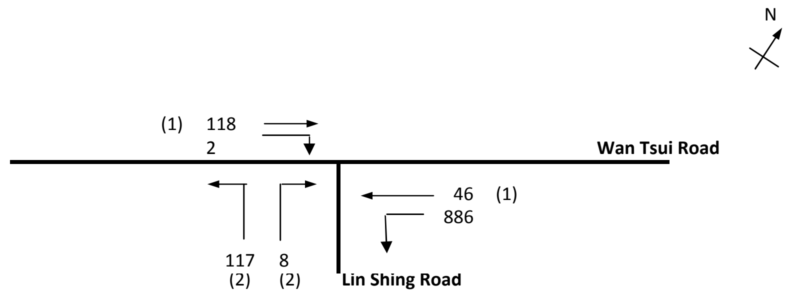
THE CAPACITY OF MOVEMENT

$Q_{b\text{-}a}$	=	455
$Q_{b\text{-}c}$	=	749
$Q_{b\text{-}d}$ is nearside	=	TRUE
$Q_{b\text{-}d}$	=	611
$Q_{d\text{-}a}$	=	674
$Q_{d\text{-}b}$ is nearside	=	TRUE
$Q_{d\text{-}b}$	=	533
$Q_{d\text{-}c}$	=	439
$Q_{c\text{-}b}$	=	437
$Q_{a\text{-}d}$	=	616

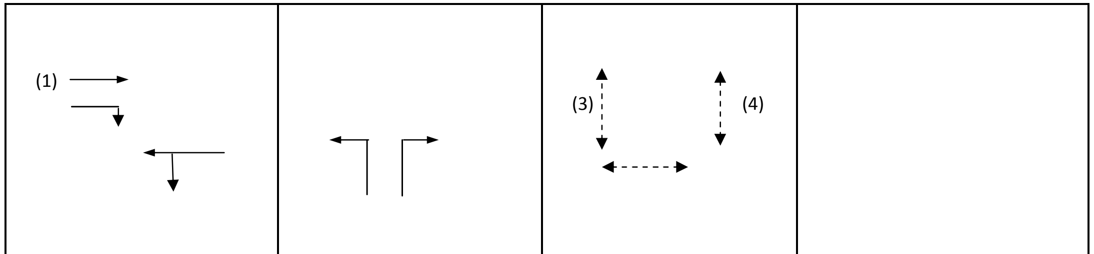
COMPARISION OF DESIGN FLOW
TO CAPACITY

$DFC_{b\text{-}a}$	=	0.024
$DFC_{b\text{-}c}$	=	0.244
$DFC_{b\text{-}d}$	=	0.234
$DFC_{d\text{-}a}$	=	0.765
$DFC_{d\text{-}b}$	=	0.006
$DFC_{d\text{-}c}$	=	0.617
$DFC_{c\text{-}b}$	=	0.000
$DFC_{a\text{-}d}$	=	0.000
Critical DFC	=	**0.765**

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
Junction of Lin Shing Road and Wan Tsui Road	J2LV2 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2011 Level 2 Peak Hour		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.528	
Loss time		L =	45	sec
Total Flow		=	1050	pcu
Co	= (1.5*L+5)/(1-Y)	=	153.8	sec
Cm	= L/(1-Y)	=	95.4	sec
Yult		=	0.563	
R.C.ult	= (Yult-Y)/Y*100%	=	6.4	%
Cp	= 0.9*L/(0.9-Y)	=	109.0	sec
Ymax	= 1-L/C	=	0.625	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	6.4	%

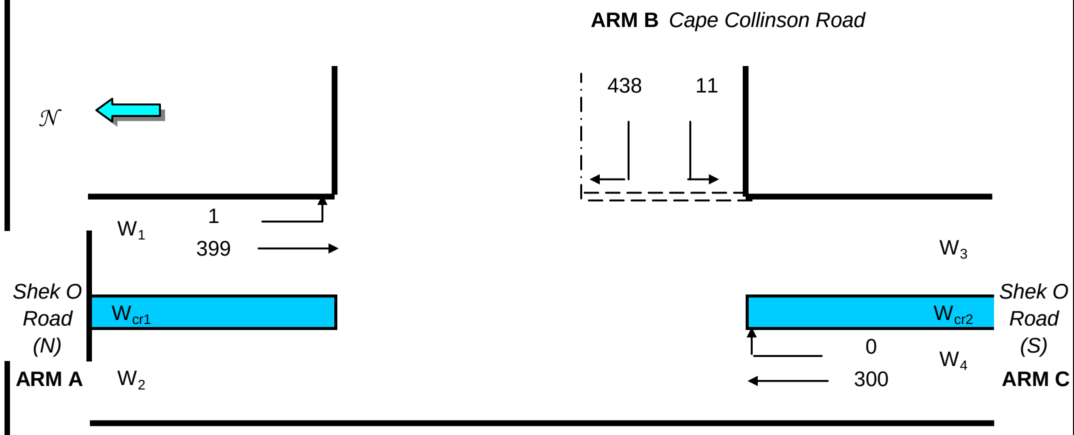


Stage A	I = 7	Stage B	I =	Stage C	I =

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
ST	A	3.00	1	1			N	1915		118		118	0.00	1915			1915	0.062		5	9	75	0.099	6	7
ST/LT	A	4.00	1	1	10		N	2015	886	46		932	0.95	1764			1764	0.528	0.528		75	75	0.846	66	12
Ped	B	6.0	3																	40					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2011 Level 2
Time - 2011 Level 2 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	1	(pcu/hr)
q_{a-c}	=	399	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	300	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	438	(pcu/hr)
q_{b-c}	=	11	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	640
Q_{c-b}	=	712
Q_{b-a}	=	298

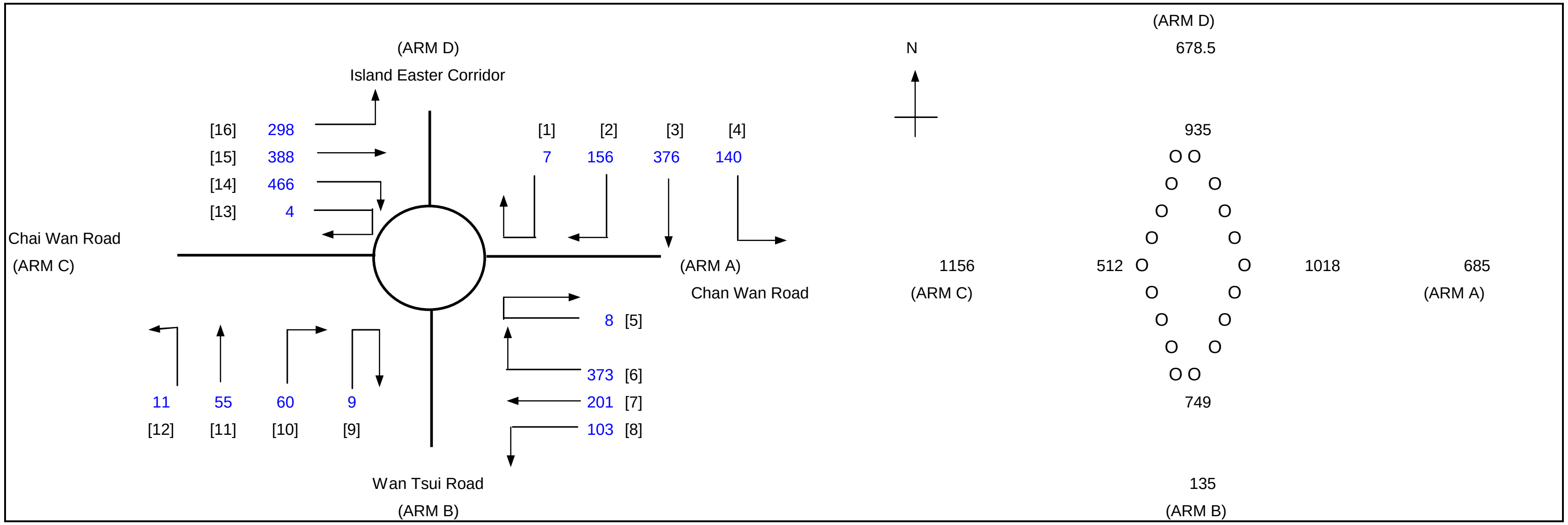
COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	1.470
DFC_{b-c}	=	0.017
DFC_{c-b}	=	0.000

Critical DFC = 1.470

ROUNDABOUT CAPACITY ASSESSMENT

				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	**J4LV2 Peak Hour**	PROJECT NO.:	80510	PREPARED BY: KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME :	2011_LV2_Ref_J4.xls	CHECKED BY: OC	Sep-13
2011 Level 2 Peak Hour				REVIEWED BY: OC	Sep-13

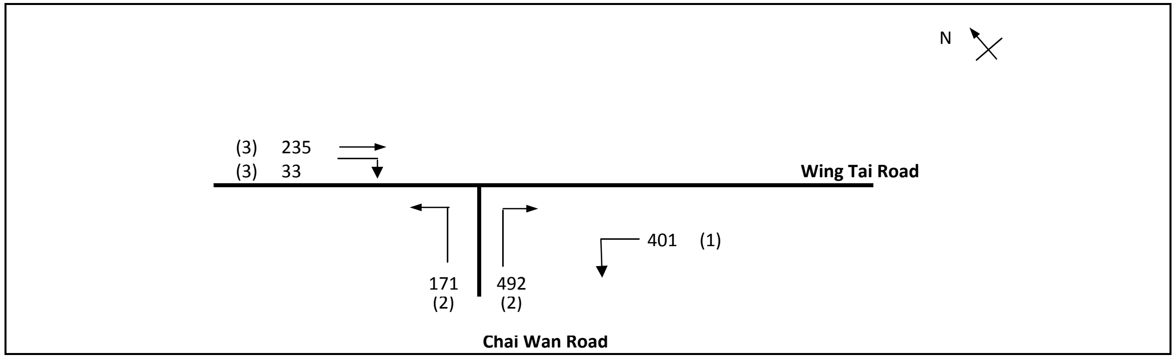


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	685	135	1156	679
Qc	=	Circulating flow across entry (pcu/h)	1018	749	512	935
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1698	1056	2092	1492
DFC	=	Design flow/Capacity = Q/Qe	0.40	0.13	0.55	0.45

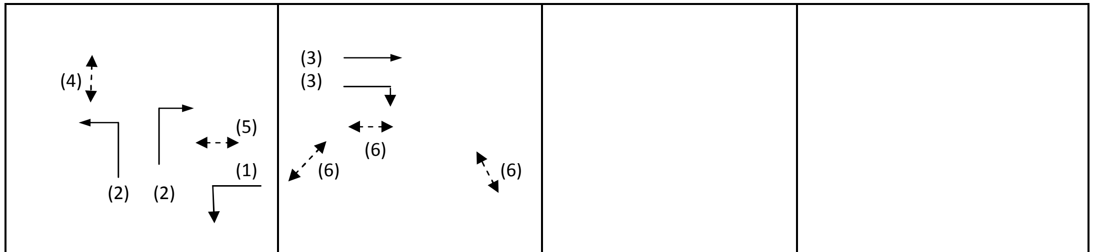
Total In Sum = 2103 PCU

DFC of Critical Approach = 0.55

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV2 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2011 Level 2 Peak Hour		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.195	
Loss time		L =	10	sec
Total Flow		=	1332	pcu
Co	= (1.5*L+5)/(1-Y)	=	24.8	sec
Cm	= L/(1-Y)	=	12.4	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	322.8	%
Cp	= 0.9*L/(0.9-Y)	=	12.8	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	315.2	%

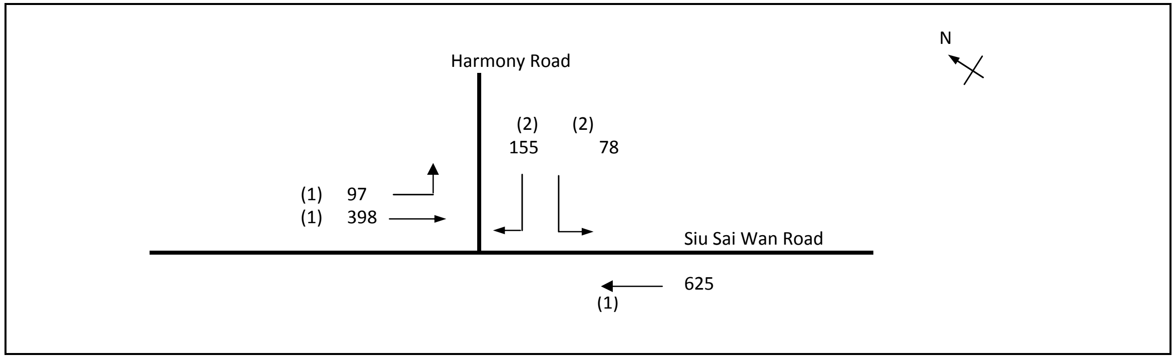


Stage A I = 7 | Stage B I = 5

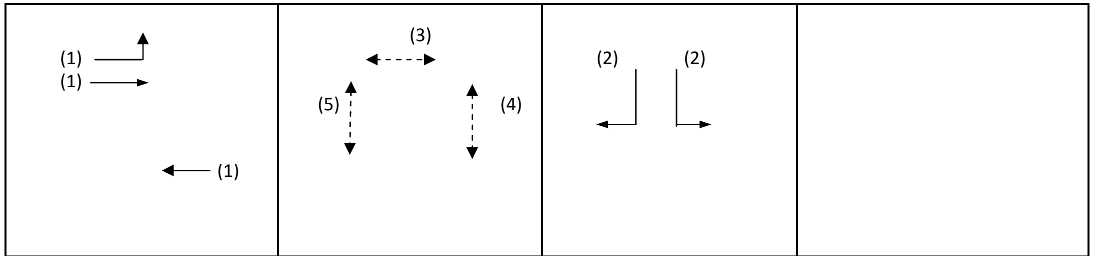
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	401			401	1.00	3857			3857	0.104			48	63	0.164	12	6
LT	A	4.00	2	2	24			4310	171			171	1.00	4056			4056	0.042			19	63	0.067	3	6
RT	A	3.50	2	2	11		y	4070			492	492	1.00	3582			3582	0.137	0.137		63	63	0.217	15	5
ST	B	3.50	3	2			y	4070		235		235	0.00	4070			4070	0.058	0.058		27	27	0.217	12	23
RT	B	4.50	3	2	13		y	4270			33	33	1.00	3828			3828	0.009			4	27	0.032	0	24
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV2 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2011 Level 2 Peak Hour		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	100	sec
Sum(y)		Y =	0.239	
Loss time		L =	48	sec
Total Flow		=	1352	pcu
Co	= (1.5*L+5)/(1-Y)	=	101.2	sec
Cm	= L/(1-Y)	=	63.1	sec
Yult		=	0.540	
R.C.ult	= (Yult-Y)/Y*100%	=	125.8	%
Cp	= 0.9*L/(0.9-Y)	=	65.4	sec
Ymax	= 1-L/C	=	0.520	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	95.7	%

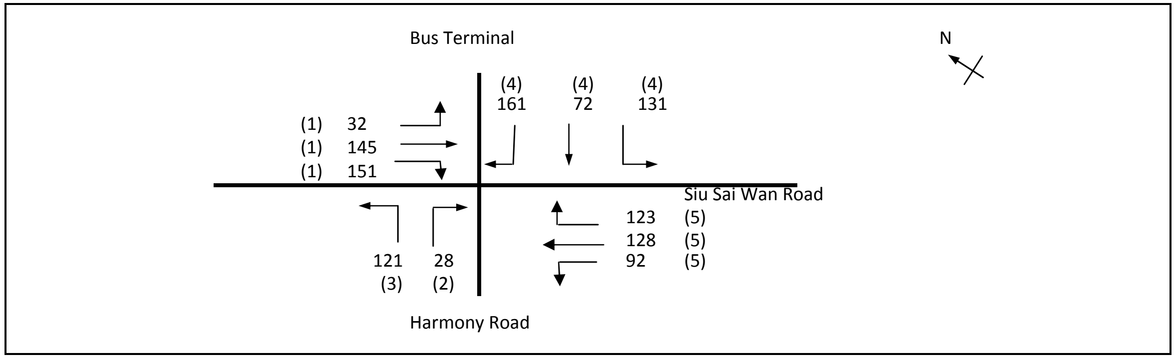


Stage A I = 10 | Stage B I = 15 | Stage C I = 6

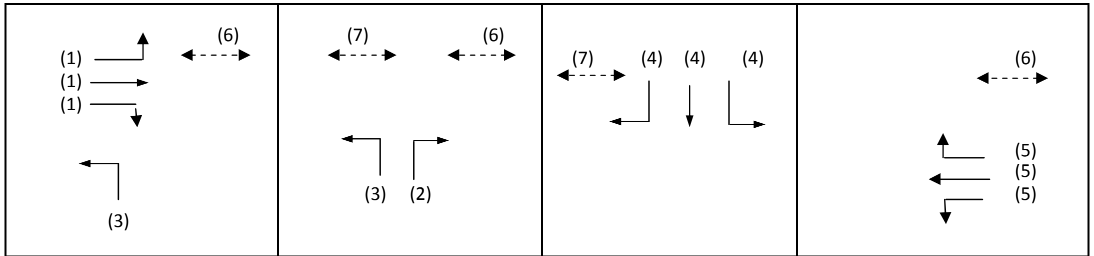
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	97	148		245	0.40	1845			1845	0.133			29	34	0.388	24	19
ST	A	3.20	1	1				2075		250		250	0.00	2075			2075	0.120			26	34	0.351	24	18
ST	A	3.00	1	2			y	3970		625		625	0.00	3970			3970	0.157	0.157		34	34	0.460	33	17
LT	C	3.75	2	1	12		y	1990	78			78	1.00	1769			1769	0.044			10	18	0.248	6	31
RT	C	3.75	2	1	12			2130			155	155	1.00	1893			1893	0.082	0.082		18	18	0.460	18	32
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV2 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2011 Level 2 Peak Hour		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	105	sec
Sum(y)		Y =	0.357	
Loss time		L =	18	sec
Total Flow		=	1183	pcu
Co	= (1.5*L+5)/(1-Y)	=	49.8	sec
Cm	= L/(1-Y)	=	28.0	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	114.2	%
Cp	= 0.9*L/(0.9-Y)	=	29.8	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	108.8	%

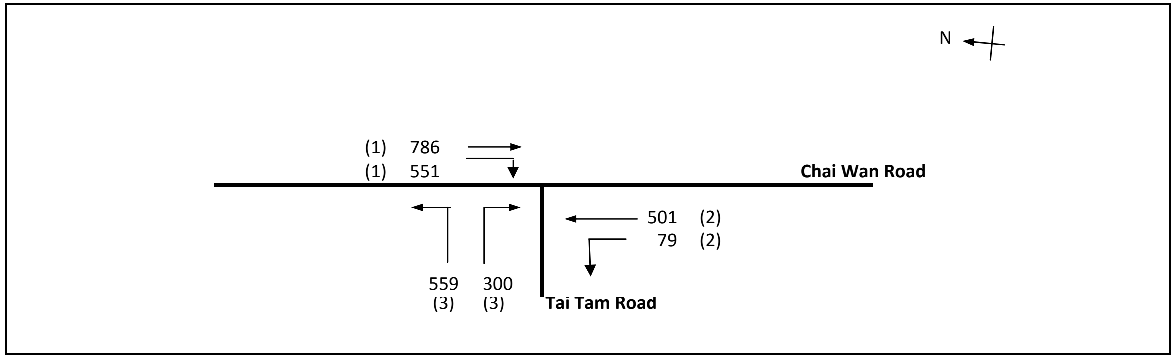


Stage A I = 5	Stage B I = 5	Stage C I = 6	Stage C I = 6

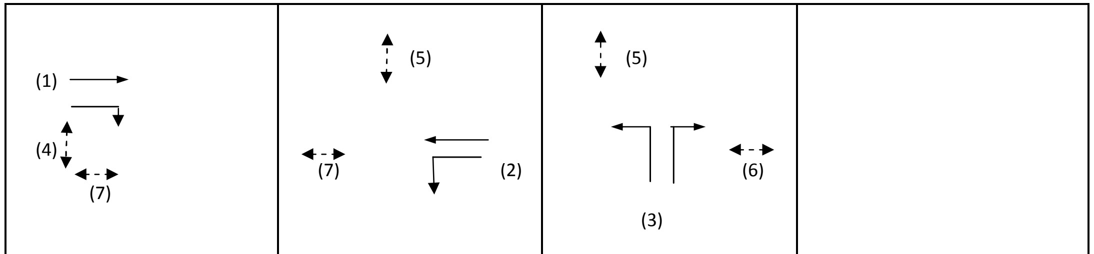
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	32	79		111	0.29	1871			1871	0.059			14	27	0.227	12	25
ST/RT	A	3.30	1	1	12			2085		66	151	216	0.70	1918			1918	0.113	0.113		27	27	0.431	24	25
RT	B	3.50	2	1	12			2105			28	28	1.00	1871			1871	0.015	0.015		4	4	0.431	0	63
LT	A,B	3.75	3	1	13		y	1990	121			121	1.00	1784			1784	0.068			17	36	0.198	12	20
RT	C	3.50	4	1	12			2105			161	161	1.00	1871			1871	0.086			21	27	0.333	18	25
LT/ST	C	3.50	4	1	12		y	1965	131	72		202	0.64	1818			1818	0.111	0.111		27	27	0.431	24	26
ST/RT	D	3.50	5	1	12			2105		0	123	123	1.00	1871			1871	0.066			16	16	0.431	18	36
LT/ST	D	3.50	5	1	11		y	1965	92	128		220	0.42	1859			1859	0.118	0.118		29	29	0.431	24	24
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV2 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2011 Level 2 Peak Hour		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	105	sec
Sum(y)		Y =	0.629	
Loss time		L =	18	sec
Total Flow		=	2776	pcu
Co	= (1.5*L+5)/(1-Y)	=	86.3	sec
Cm	= L/(1-Y)	=	48.6	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	21.6	%
Cp	= 0.9*L/(0.9-Y)	=	59.9	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	18.5	%

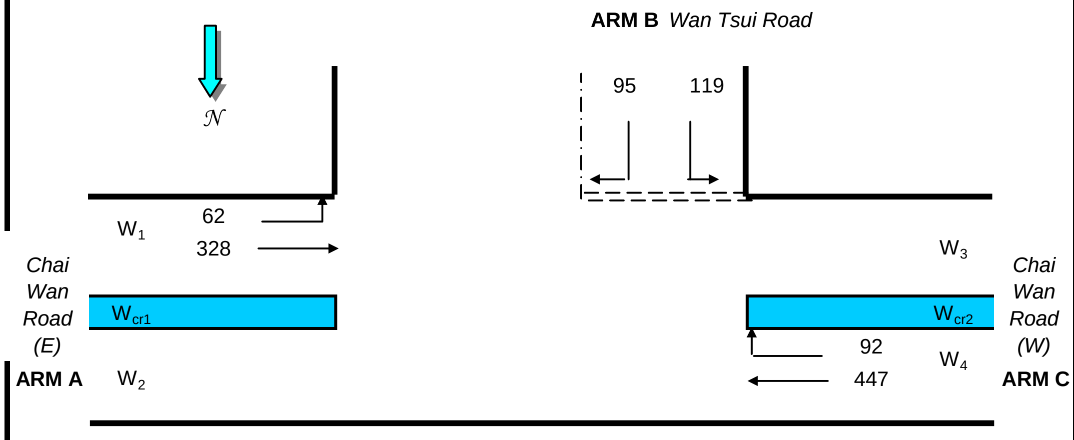


Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		786		786	0.00	4070			4070	0.193			27	27	0.760	51	26
RT	A	3.50	1	1	13			2105			551	551	1.00	1887			1887	0.292	0.292		40	27	1.148	66	34
ST	B	3.50	2	2				4210		501		501	0.00	4210			4210	0.119	0.119		16	16	0.760	36	37
LT	B	3.10	2	1	12		y	1925	79			79	1.00	1711			1711	0.046			6	16	0.295	6	35
LT	C	4.00	3	1	15		y	2015	400			400	1.00	1832			1832	0.218	0.218		30	30	0.760	48	28
LT/RT	C	4.00	3	1	15			2155	159		300	459	1.00	1959			1959	0.234			32	30	0.815	54	31
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road
Design Year - 2011 Level 2
Time - 2011 Level 2 Peak Hour



GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	62	(pcu/hr)
q_{a-c}	=	328	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	447	(pcu/hr)
q_{c-b}	=	92	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	95	(pcu/hr)
q_{b-c}	=	119	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	781
Q_{c-b}	=	695
Q_{b-a}	=	390

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	0.243
DFC_{b-c}	=	0.152
DFC_{c-b}	=	0.132

Critical DFC = 0.243

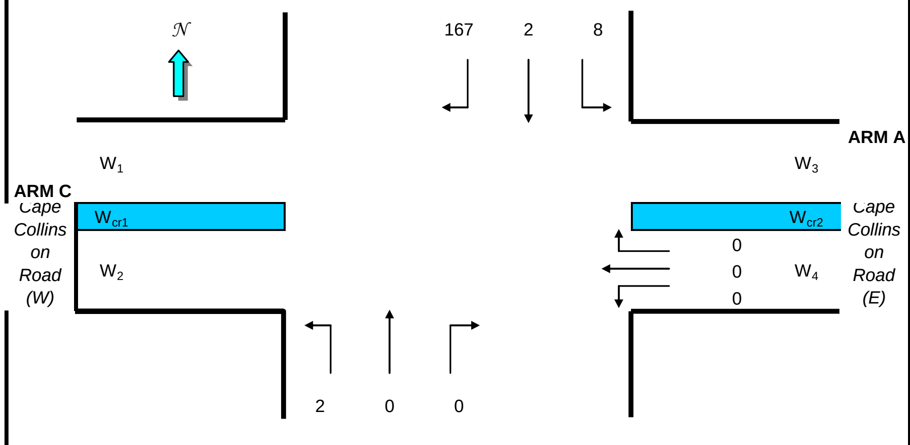
REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

Halcrow	Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at Cape Cc	Prepared By:	KC
	Junction Capacity Analysis	Checked By:	OC

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2011 Level 3
Time - 2011 Level 3 Peak Hour

ARM D *Lin Shing Rd (N)*



ARM B *Lin Shing Rd (S)*

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{a\text{-}d}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$W_{d\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
$W_{d\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
$Vr_{a\text{-}d}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
$Vl_{d\text{-}c}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD		(ARM A)	
$W_{a\text{-}d}$	=	3.00	(metres)
$Vr_{a\text{-}d}$	=	100	(metres)
$q_{a\text{-}b}$	=	0	(pcu/hr)
$q_{a\text{-}c}$	=	0	(pcu/hr)
$q_{a\text{-}d}$	=	0	(pcu/hr)

MAJOR ROAD		(ARM C)	
$W_{c\text{-}b}$	=		(metres)
$Vr_{c\text{-}b}$	=		(metres)
$q_{c\text{-}a}$	=	0	(pcu/hr)
$q_{c\text{-}b}$	=	0	(pcu/hr)
$q_{c\text{-}d}$	=	0	(pcu/hr)

MINOR ROAD		(ARM B)	
$W_{b\text{-}a}$	=	5.00	(metres)
$W_{b\text{-}c}$	=	5.00	(metres)
$Vl_{b\text{-}a}$	=	100	(metres)
$Vr_{b\text{-}a}$	=	65	(metres)
$Vr_{b\text{-}c}$	=	0	(metres)
$q_{b\text{-}a}$	=	0	(pcu/hr)
$q_{b\text{-}c}$	=	2	(pcu/hr)
$q_{b\text{-}d}$	=	0	(pcu/hr)

MINOR ROAD		(ARM D)	
$W_{d\text{-}a}$	=	3.00	(metres)
$W_{d\text{-}c}$	=	3.00	(metres)
$Vl_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}a}$	=	80	(metres)
$q_{d\text{-}a}$	=	8	(pcu/hr)
$q_{d\text{-}b}$	=	2	(pcu/hr)
$q_{d\text{-}c}$	=	167	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

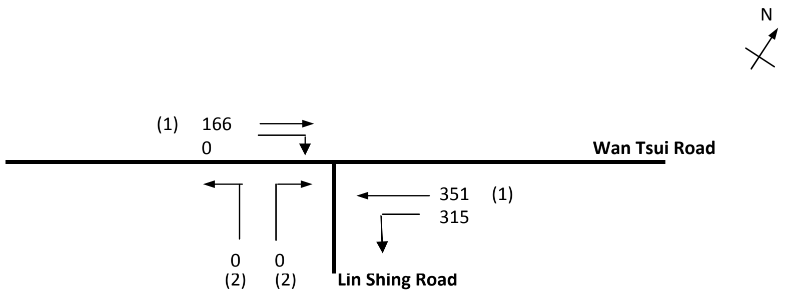
$Q_{b\text{-}a}$	=	623
$Q_{b\text{-}c}$	=	749
$Q_{b\text{-}d}$ is nearside	=	TRUE
$Q_{b\text{-}d}$	=	611
$Q_{d\text{-}a}$	=	674
$Q_{d\text{-}b}$ is nearside	=	TRUE
$Q_{d\text{-}b}$	=	533
$Q_{d\text{-}c}$	=	518
$Q_{c\text{-}b}$	=	437
$Q_{a\text{-}d}$	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

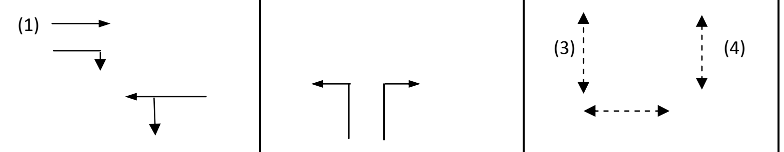
$DFC_{b\text{-}a}$	=	0.000
$DFC_{b\text{-}c}$	=	0.003
$DFC_{b\text{-}d}$	=	0.000
$DFC_{d\text{-}a}$	=	0.012
$DFC_{d\text{-}b}$	=	0.004
$DFC_{d\text{-}c}$	=	0.322
$DFC_{c\text{-}b}$	=	0.000
$DFC_{a\text{-}d}$	=	0.000

Critical DFC = 0.322

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
Junction of Lin Shing Road and Wan Tsui Road	J2LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2011 Level 3 Peak Hour		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.354	
Loss time		L =	55	sec
Total Flow		=	832	pcu
Co	= (1.5*L+5)/(1-Y)	=	135.4	sec
Cm	= L/(1-Y)	=	85.1	sec
Yult		=	0.488	
R.C.ult	= (Yult-Y)/Y*100%	=	37.7	%
Cp	= 0.9*L/(0.9-Y)	=	90.7	sec
Ymax	= 1-L/C	=	0.542	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	37.7	%



Stage A	I = 7	Stage B	I =	Stage C	I =	

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
ST	A	3.00	1	1			N	1915		166		166	0.00	1915			1915	0.087		5	16	65	0.160	12	11
ST/LT	A	4.00	1	1	10		N	2015	315	351		666	0.47	1882			1882	0.354	0.354		65	65	0.653	60	10
Ped	B	6.0	3																	50					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

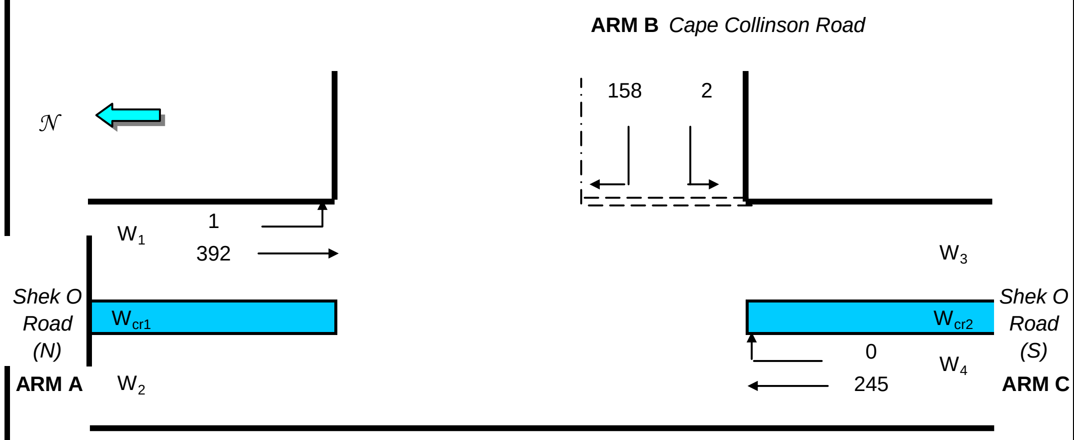
Halcrow

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at Cape C

Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - **J3: J/O Cape Collinson Road and Lin Shing Road**
Design Year - **2011 Level 3**
Time - **2011 Level 3 Peak Hour**



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	1	(pcu/hr)
q_{a-c}	=	392	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	245	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	158	(pcu/hr)
q_{b-c}	=	2	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	642
Q_{c-b}	=	714
Q_{b-a}	=	305

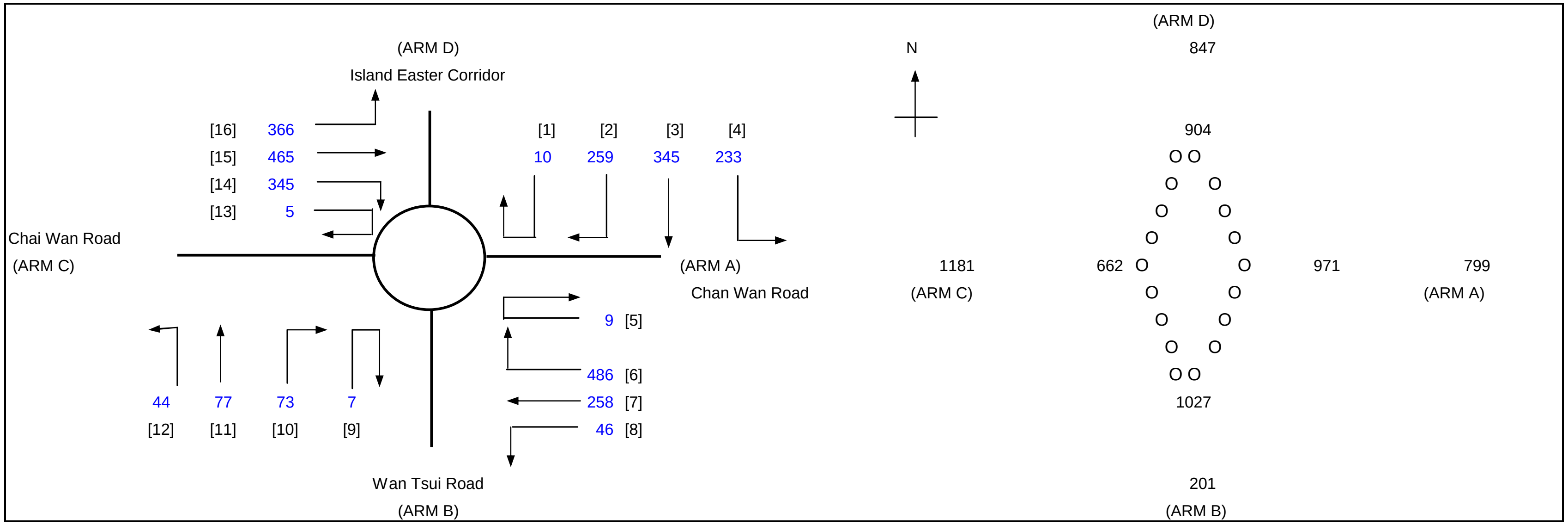
COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	0.519
DFC_{b-c}	=	0.003
DFC_{c-b}	=	0.000

Critical DFC = 0.519

ROUNDABOUT CAPACITY ASSESSMENT

				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	**J4LV3 Peak Hour**	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME : 2011_LV3_Ref_J4.xls	CHECKED BY:	OC	Sep-13
2011 Level 3 Peak Hour			REVIEWED BY:	OC	Sep-13

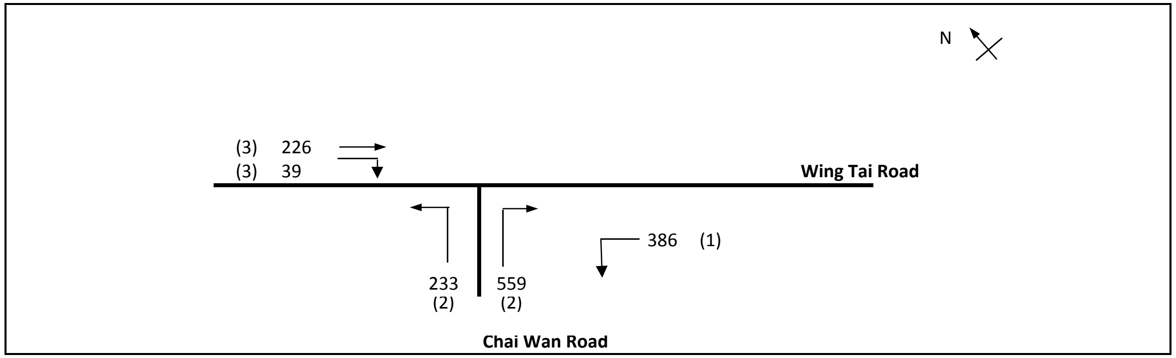


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	799	201	1181	847
Qc	=	Circulating flow across entry (pcu/h)	971	1027	662	904
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1733	901	1978	1514
DFC	=	Design flow/Capacity = Q/Qe	0.46	0.22	0.60	0.56

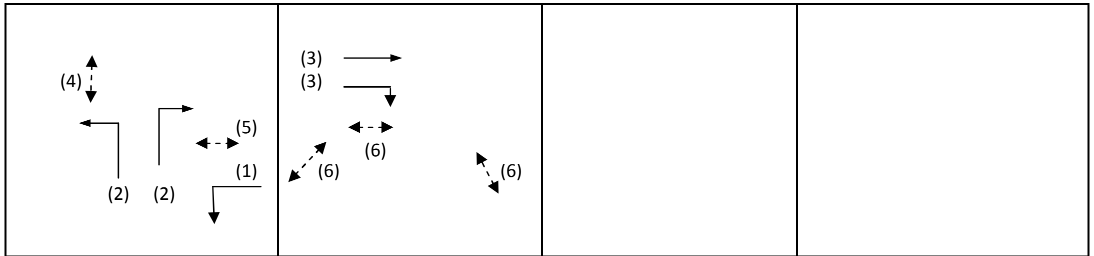
Total In Sum = 2339 PCU

DFC of Critical Approach = 0.60

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2011 Level 3 Peak Hour		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.212	
Loss time		L =	10	sec
Total Flow		=	1443	pcu
Co	= (1.5*L+5)/(1-Y)	=	25.4	sec
Cm	= L/(1-Y)	=	12.7	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	289.9	%
Cp	= 0.9*L/(0.9-Y)	=	13.1	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	282.8	%

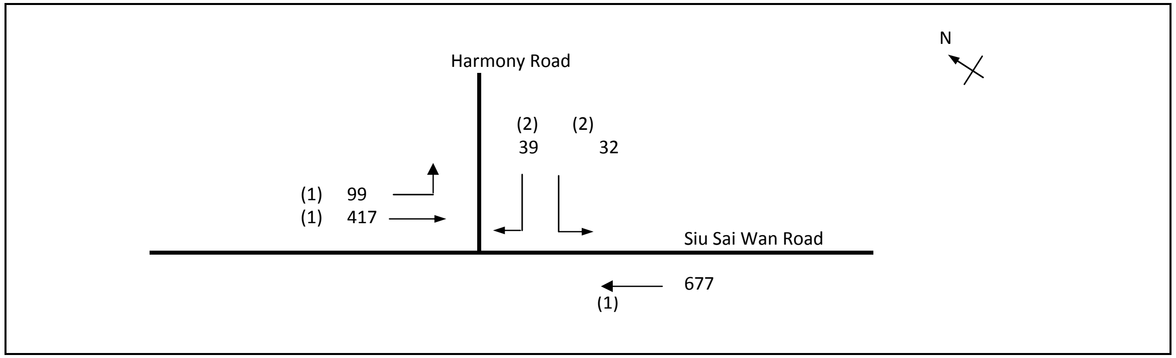


Stage A I = 7	Stage B I = 5		

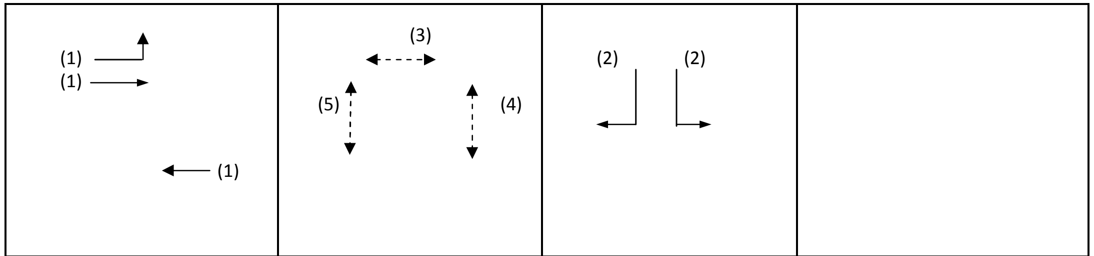
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	386			386	1.00	3857			3857	0.100			43	66	0.151	9	5
LT	A	4.00	2	2	24			4310	233			233	1.00	4056			4056	0.057			24	66	0.087	6	5
RT	A	3.50	2	2	11		y	4070			559	559	1.00	3582			3582	0.156	0.156		66	66	0.235	15	5
ST	B	3.50	3	2			y	4070		226		226	0.00	4070			4070	0.056	0.056		24	24	0.235	12	25
RT	B	4.50	3	2	13		y	4270			39	39	1.00	3828			3828	0.010			4	24	0.043	0	26
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2011 Level 3 Peak Hour		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	100	sec
Sum(y)		Y =	0.191	
Loss time		L =	48	sec
Total Flow		=	1264	pcu
Co	= (1.5*L+5)/(1-Y)	=	95.2	sec
Cm	= L/(1-Y)	=	59.3	sec
Yult		=	0.540	
R.C.ult	= (Yult-Y)/Y*100%	=	182.5	%
Cp	= 0.9*L/(0.9-Y)	=	60.9	sec
Ymax	= 1-L/C	=	0.520	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	144.9	%

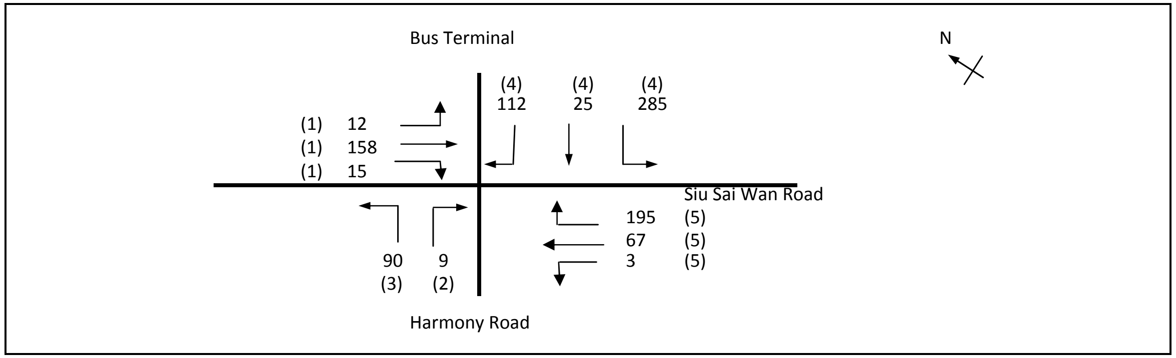


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

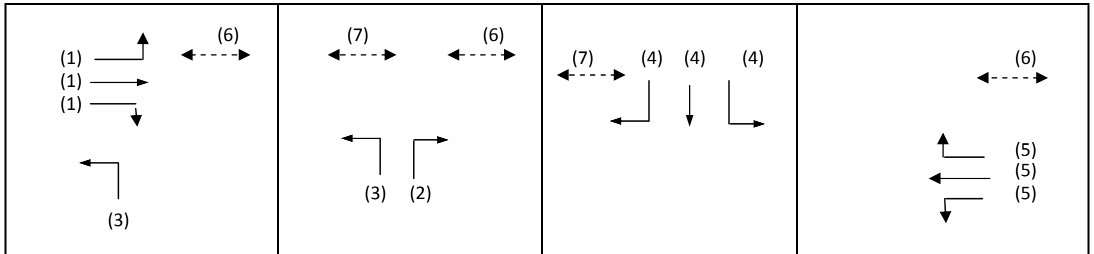
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	99	148		247	0.40	1844			1844	0.134			36	46	0.289	18	12
ST	A	3.20	1	1				2075		269		269	0.00	2075			2075	0.130			35	46	0.279	24	12
ST	A	3.00	1	2			y	3970		677		677	0.00	3970			3970	0.171	0.171		46	46	0.368	30	11
LT	C	3.75	2	1	12		y	1990	32			32	1.00	1769			1769	0.018			5	6	0.323	0	47
RT	C	3.75	2	1	12			2130			39	39	1.00	1893			1893	0.021	0.021		6	6	0.368	6	48
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2011 Level 3 Peak Hour		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.263
Loss time		L =	18 sec
Total Flow		=	971 pcu
Co	= (1.5*L+5)/(1-Y)	=	43.4 sec
Cm	= L/(1-Y)	=	24.4 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	191.4 %
Cp	= 0.9*L/(0.9-Y)	=	25.4 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	184.1 %

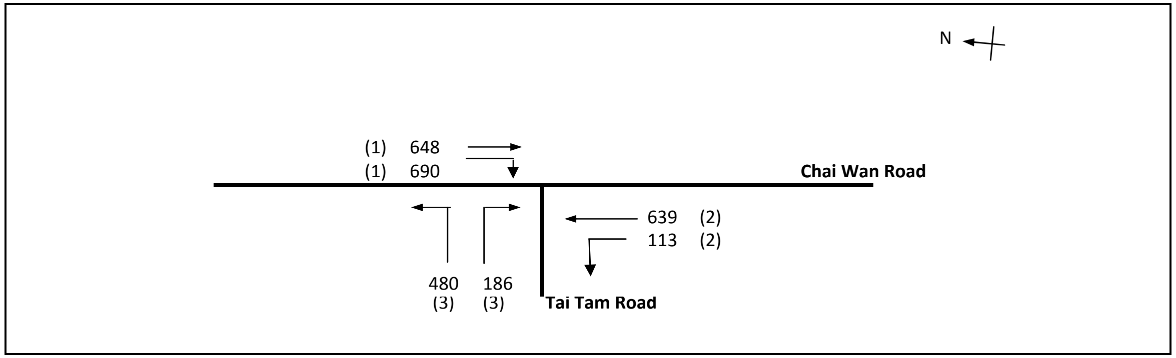


Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

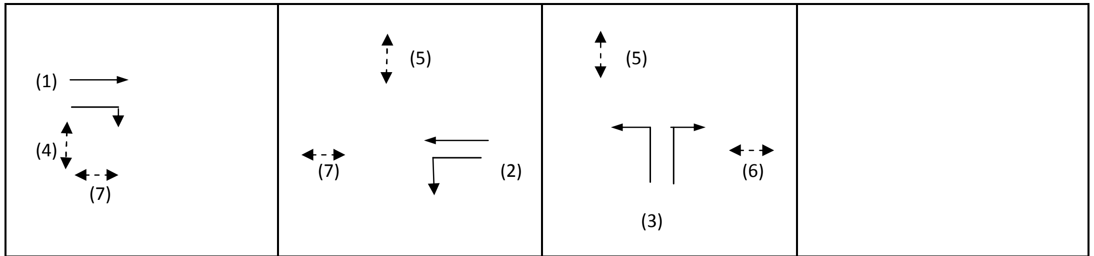
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	12	79		91	0.13	1911			1911	0.048			16	15	0.328	12	36
ST/RT	A	3.30	1	1	12			2085		79	15	94	0.16	2044			2044	0.046	0.046		15	15	0.317	12	35
RT	B	3.50	2	1	12			2105			9	9	1.00	1871			1871	0.005	0.005		2	2	0.317	0	72
LT	A,B	3.75	3	1	13		y	1990	90			90	1.00	1784			1784	0.050			17	22	0.243	12	30
RT	C	3.50	4	1	12			2105			112	112	1.00	1871			1871	0.060			20	58	0.108	6	9
LT/ST	C	3.50	4	1	12		y	1965	285	25		310	0.92	1762			1762	0.176	0.176		58	58	0.317	24	8
ST/RT	D	3.50	5	1	12			2105		0	195	195	1.00	1871			1871	0.104			35	35	0.317	18	20
LT/ST	D	3.50	5	1	11		y	1965	3	67		70	0.04	1954			1954	0.036	0.036		12	12	0.317	6	39
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2011 Level 3 Peak Hour		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	105	sec
Sum(y)		Y =	0.693	
Loss time		L =	18	sec
Total Flow		=	2756	pcu
Co	= (1.5*L+5)/(1-Y)	=	104.1	sec
Cm	= L/(1-Y)	=	58.6	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	10.4	%
Cp	= 0.9*L/(0.9-Y)	=	78.1	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	7.7	%



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		648		648	0.00	4070			4070	0.159			20	20	0.836	45	37
RT	A	3.50	1	1	13			2105			690	690	1.00	1887			1887	0.366	0.366		46	20	1.920	96	43
ST	B	3.50	2	2				4210		639		639	0.00	4210			4210	0.152	0.152		19	19	0.836	45	38
LT	B	3.10	2	1	12		y	1925	113			113	1.00	1711			1711	0.066			8	19	0.364	12	33
LT	C	4.00	3	1	15		y	2015	321			321	1.00	1832			1832	0.175	0.175		22	22	0.836	42	46
LT/RT	C	4.00	3	1	15			2155	159		186	345	1.00	1959			1959	0.176			22	22	0.840	48	45
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow **Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at Cape C**

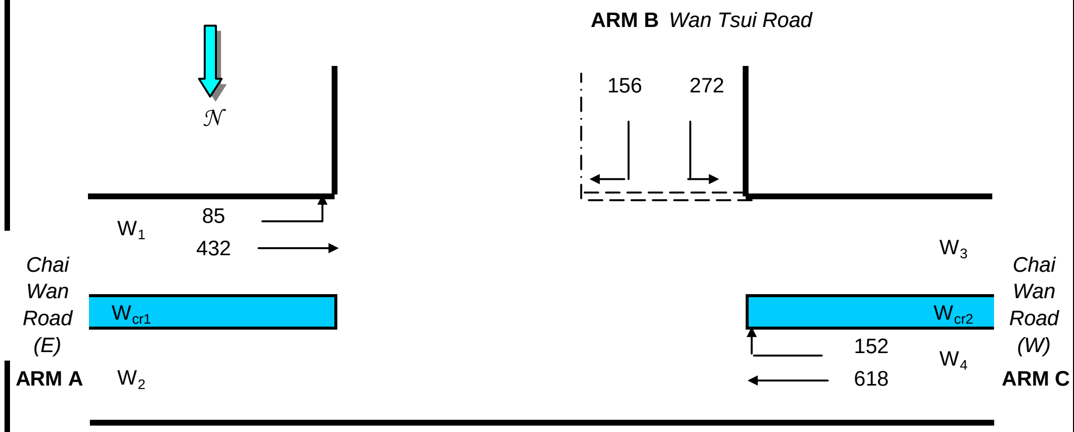
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road

Design Year - 2011 Level 3

Time - 2011 Level 3 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	85	(pcu/hr)
q_{a-c}	=	432	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	618	(pcu/hr)
q_{c-b}	=	152	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	156	(pcu/hr)
q_{b-c}	=	272	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	766
Q_{c-b}	=	680
Q_{b-a}	=	366

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	0.426
DFC_{b-c}	=	0.355
DFC_{c-b}	=	0.224

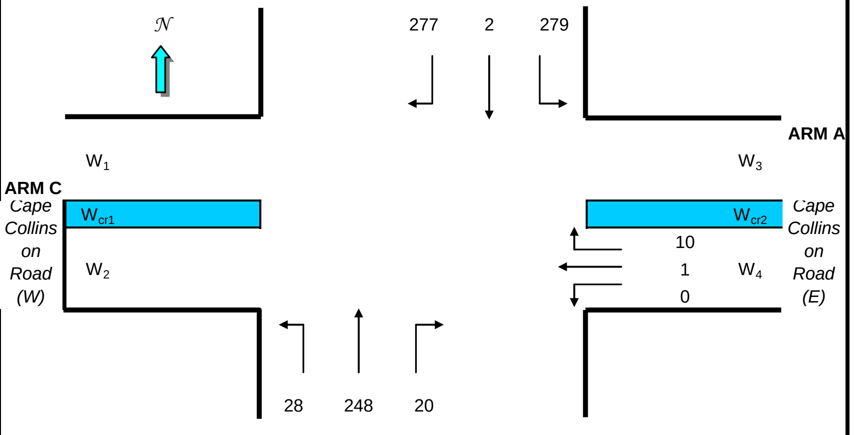
Critical DFC = 0.426

Appendix B2

2016 Peak Hour Junction Assessment Calculation Sheets

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2016 Level 1 - Reference Case
Time - Level 1 Peak Hour

ARM D *Lin Shing Rd (N)*



ARM B *Lin Shing Rd (S)*

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{a\text{-}d}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$W_{d\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
$W_{d\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
$Vr_{a\text{-}d}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
$Vl_{d\text{-}c}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)
MAJOR ROAD (ARM A)			
$W_{a\text{-}d}$	=	3.00	(metres)
$Vr_{a\text{-}d}$	=	100	(metres)
$q_{a\text{-}b}$	=	0	(pcu/hr)
$q_{a\text{-}c}$	=	1.0288	(pcu/hr)
$q_{a\text{-}d}$	=	10.259	(pcu/hr)
MAJOR ROAD (ARM C)			
$W_{c\text{-}b}$	=		(metres)
$Vr_{c\text{-}b}$	=		(metres)
$q_{c\text{-}a}$	=	0	(pcu/hr)
$q_{c\text{-}b}$	=	0	(pcu/hr)
$q_{c\text{-}d}$	=	0	(pcu/hr)
MINOR ROAD (ARM B)			
$W_{b\text{-}a}$	=	5.00	(metres)
$W_{b\text{-}c}$	=	5.00	(metres)
$Vl_{b\text{-}a}$	=	100	(metres)
$Vr_{b\text{-}a}$	=	65	(metres)
$Vr_{b\text{-}c}$	=	0	(metres)
$q_{b\text{-}a}$	=	19.547	(pcu/hr)
$q_{b\text{-}c}$	=	27.719	(pcu/hr)
$q_{b\text{-}d}$	=	248.4	(pcu/hr)
MINOR ROAD (ARM D)			
$W_{d\text{-}a}$	=	3.00	(metres)
$W_{d\text{-}c}$	=	3.00	(metres)
$Vl_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}a}$	=	80	(metres)
$q_{d\text{-}a}$	=	278.63	(pcu/hr)
$q_{d\text{-}b}$	=	2.2652	(pcu/hr)
$q_{d\text{-}c}$	=	276.87	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

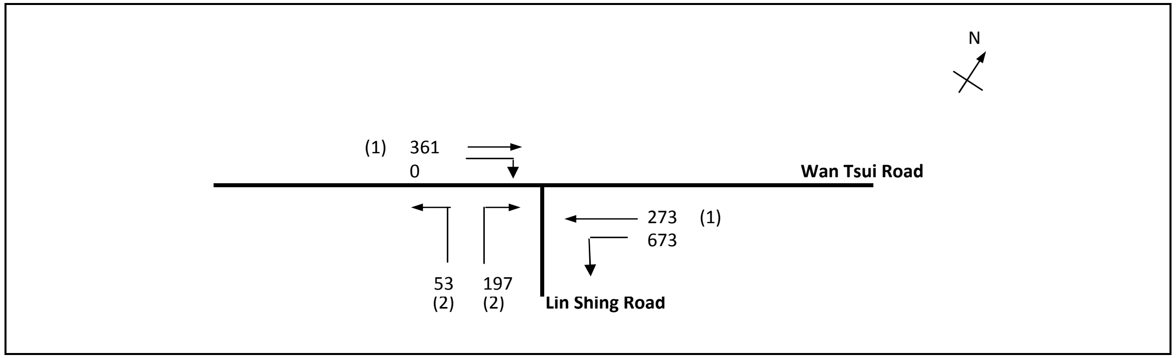
$Q_{b\text{-}a}$	=	522
$Q_{b\text{-}c}$	=	749
$Q_{b\text{-}d}$ is nearside	=	TRUE
$Q_{b\text{-}d}$	=	608
$Q_{d\text{-}a}$	=	674
$Q_{d\text{-}b}$ is nearside	=	TRUE
$Q_{d\text{-}b}$	=	528
$Q_{d\text{-}c}$	=	447
$Q_{c\text{-}b}$	=	439
$Q_{a\text{-}d}$	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

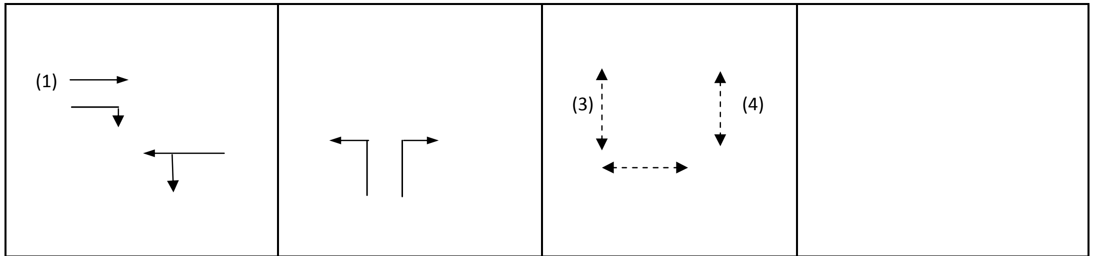
$DFC_{b\text{-}a}$	=	0.037
$DFC_{b\text{-}c}$	=	0.037
$DFC_{b\text{-}d}$	=	0.408
$DFC_{d\text{-}a}$	=	0.413
$DFC_{d\text{-}b}$	=	0.004
$DFC_{d\text{-}c}$	=	0.620
$DFC_{c\text{-}b}$	=	0.000
$DFC_{a\text{-}d}$	=	0.017

Critical DFC = 0.620

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
Junction of Lin Shing Road and Wan Tsui Road	J2LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 1 Peak Hour -Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.519	
Loss time		L =	25	sec
Total Flow		=	1307	pcu
Co	= (1.5*L+5)/(1-Y)	=	88.4	sec
Cm	= L/(1-Y)	=	52.0	sec
Yult		=	0.713	
R.C.ult	= (Yult-Y)/Y*100%	=	37.2	%
Cp	= 0.9*L/(0.9-Y)	=	59.1	sec
Ymax	= 1-L/C	=	0.792	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	37.2	%

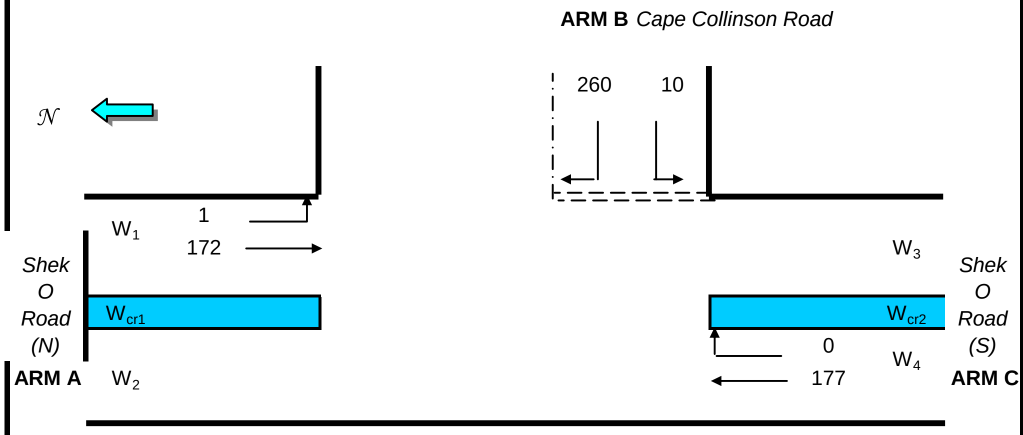


Stage A	I = 7	Stage B	I =	Stage C	I =

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		361		361	0.00	1915			1915	0.189			34	95	0.238	12	2
ST/LT	A	4.00	1	1	10		N	2015	673	273		946	0.71	1821			1821	0.519	0.519		95	95	0.656	36	3
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2016 Ching Ming - Reference Case
Time - Ching Ming Peak Hour



GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	1	(pcu/hr)
q_{a-c}	=	172	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	177	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	260	(pcu/hr)
q_{b-c}	=	10	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	698
Q_{c-b}	=	777
Q_{b-a}	=	347

COMPARISION OF DESIGN FLOW TO CAPACITY

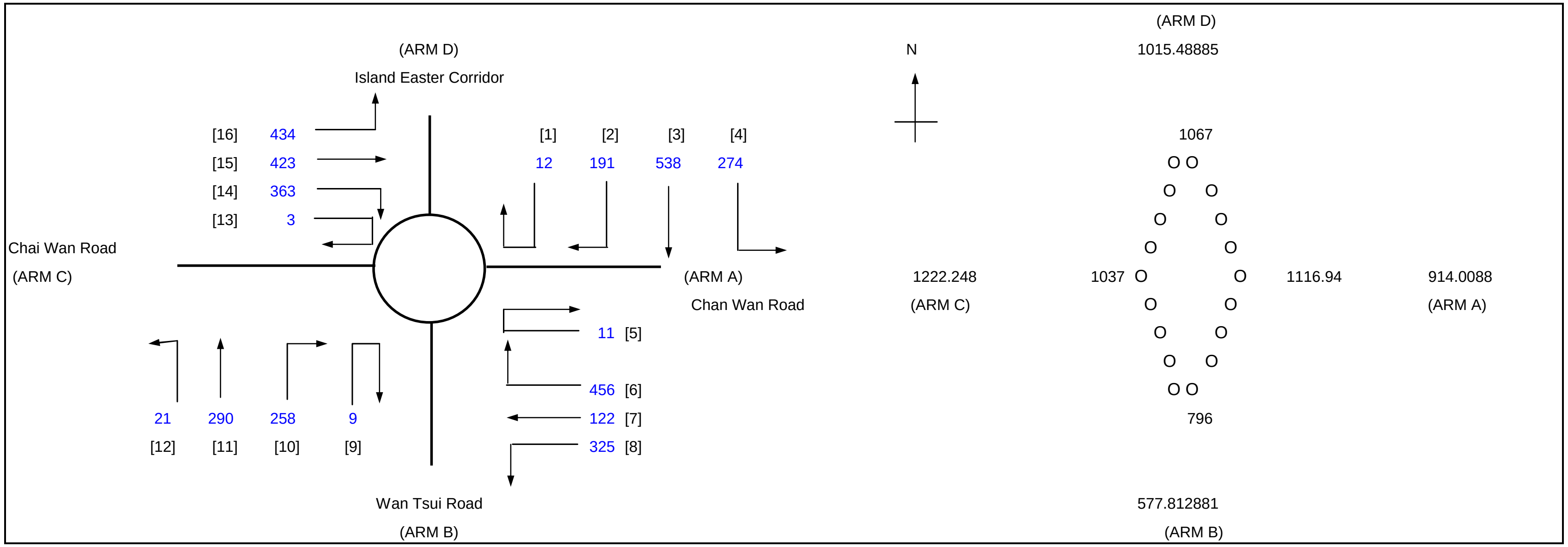
DFC_{b-a}	=	0.749
DFC_{b-c}	=	0.015
DFC_{c-b}	=	0.000

Critical DFC = 0.749

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

	ROUNDABOUT CAPACITY ASSESSMENT			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	J4LV1 Peak Hour	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME: 2016_LV1_Ref_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV1 Peak Hour			REVIEWED BY:	OC	Sep-13

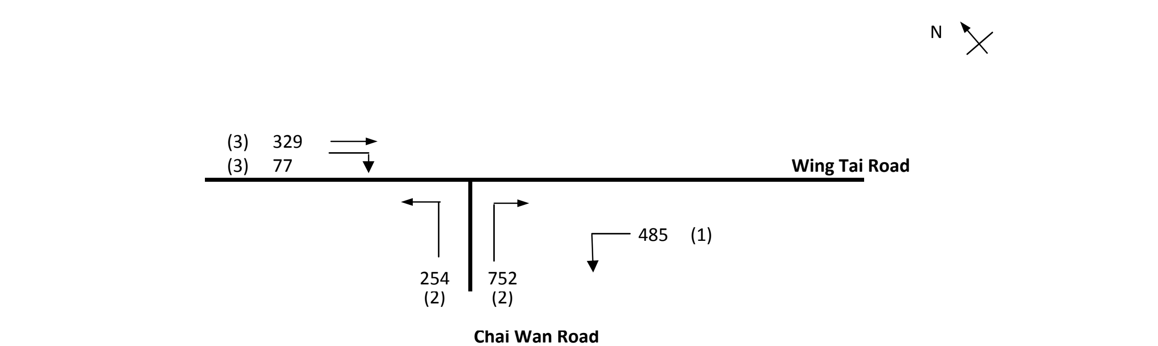


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	914	578	1222	1015
Qc	=	Circulating flow across entry (pcu/h)	1117	796	1037	1067
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1622	1030	1695	1400
DFC	=	Design flow/Capacity = Q/Qe	0.56	0.56	0.72	0.73

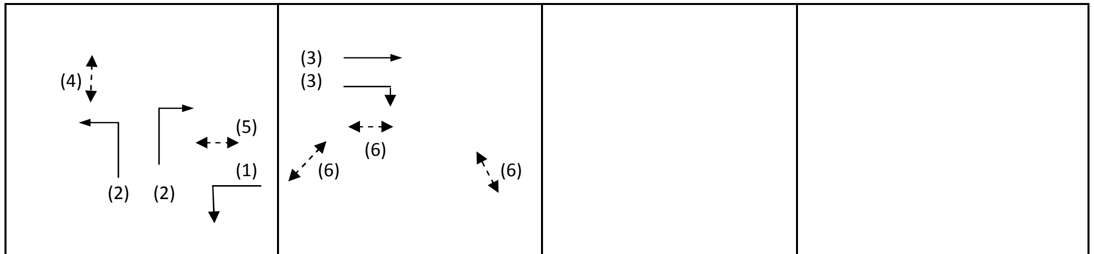
Total In Sum = 2677.223 PCU

DFC of Critical Approach = 0.73

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 1 Peak Hour -Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.291	
Loss time		L =	10	sec
Total Flow		=	1896	pcu
Co	= (1.5*L+5)/(1-Y)	=	28.2	sec
Cm	= L/(1-Y)	=	14.1	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	183.8	%
Cp	= 0.9*L/(0.9-Y)	=	14.8	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	178.6	%

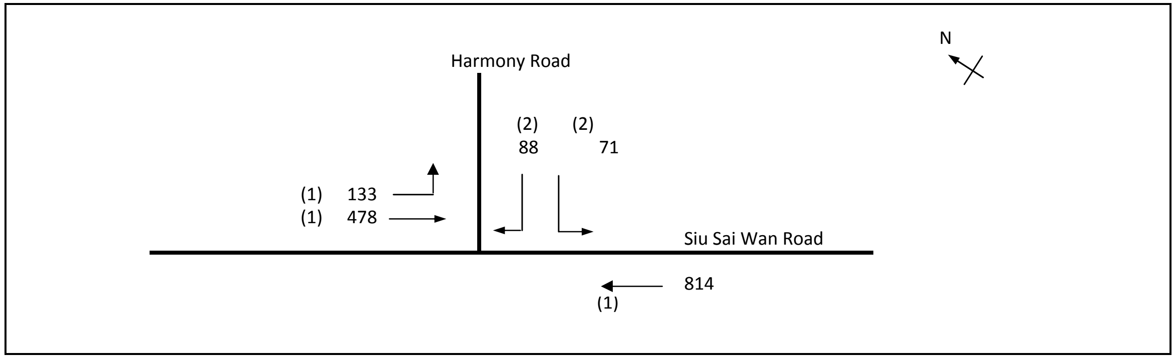


Stage A I = 7 | Stage B I = 5

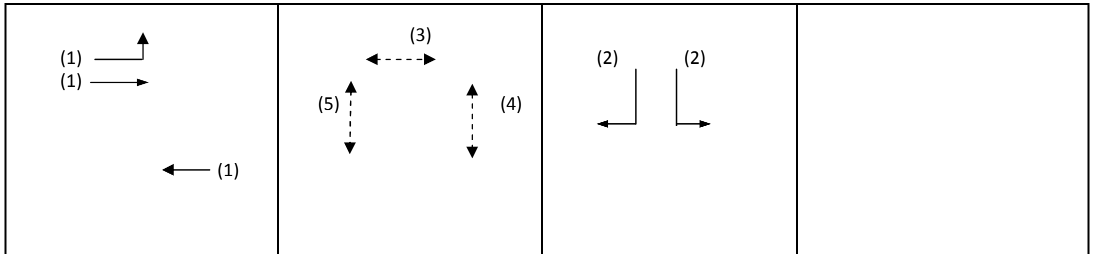
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	485			485	1.00	3857			3857	0.126			39	65	0.193	12	5
LT	A	4.00	2	2	24			4310	254			254	1.00	4056			4056	0.063			19	65	0.096	6	5
RT	A	3.50	2	2	11		y	4070			752	752	1.00	3582			3582	0.210	0.210		65	65	0.323	21	5
ST	B	3.50	3	2			y	4070		329		329	0.00	4070			4070	0.081	0.081		25	25	0.323	18	24
RT	B	4.50	3	2	13		y	4270			77	77	1.00	3828			3828	0.020			6	25	0.081	3	25
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 1 Peak Hour -Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	100	sec
Sum(y)		Y =	0.251	
Loss time		L =	48	sec
Total Flow		=	1583	pcu
Co	= (1.5*L+5)/(1-Y)	=	102.8	sec
Cm	= L/(1-Y)	=	64.1	sec
Yult		=	0.540	
R.C.ult	= (Yult-Y)/Y*100%	=	114.9	%
Cp	= 0.9*L/(0.9-Y)	=	66.6	sec
Ymax	= 1-L/C	=	0.520	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	86.2	%

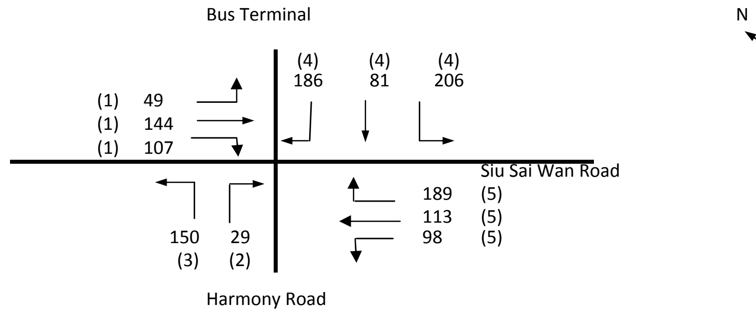


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

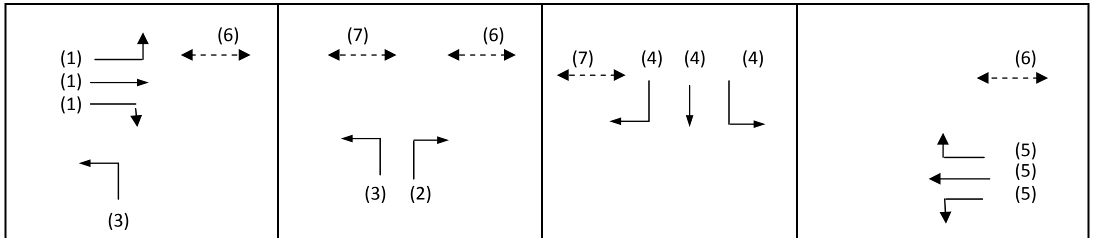
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	133	148		281	0.47	1827			1827	0.154			32	42	0.362	24	14
ST	A	3.20	1	1				2075		330		330	0.00	2075			2075	0.159			33	42	0.375	30	14
ST	A	3.00	1	2			y	3970		814		814	0.00	3970			3970	0.205	0.205		42	42	0.483	39	13
LT	C	3.75	2	1	12		y	1990	71			71	1.00	1769			1769	0.040			8	10	0.416	6	42
RT	C	3.75	2	1	12			2130			88	88	1.00	1893			1893	0.046	0.046		10	10	0.483	12	43
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2016 Level 1 Peak Hour -Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.377
Loss time		L =	18 sec
Total Flow		=	1351 pcu
Co	= (1.5*L+5)/(1-Y)	=	51.4 sec
Cm	= L/(1-Y)	=	28.9 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	102.7 %
Cp	= 0.9*L/(0.9-Y)	=	31.0 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	97.6 %

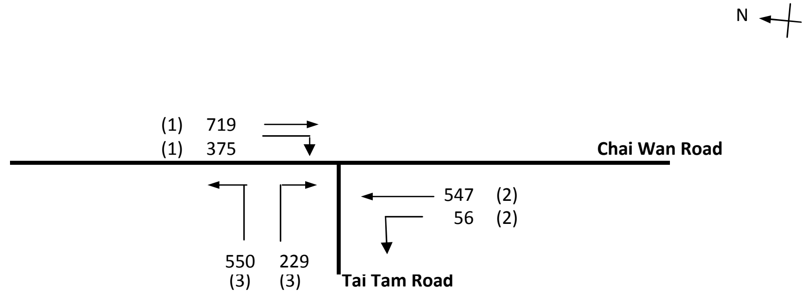


Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

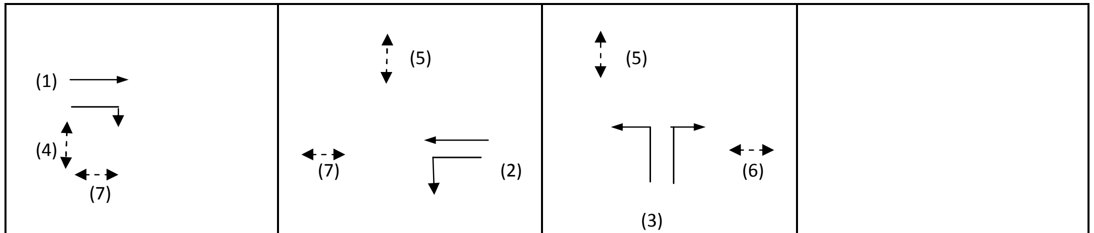
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	49	79		128	0.38	1849			1849	0.069			16	20	0.354	12	31
ST/RT	A	3.30	1	1	12			2085		65	107	172	0.62	1935			1935	0.089	0.089		20	20	0.456	24	31
RT	B	3.50	2	1	12			2105			29	29	1.00	1871			1871	0.015	0.015		4	4	0.456	0	65
LT	A,B	3.75	3	1	13		y	1990	150			150	1.00	1784			1784	0.084			19	29	0.304	18	24
RT	C	3.50	4	1	12			2105			186	186	1.00	1871			1871	0.099			23	37	0.284	18	19
LT/ST	C	3.50	4	1	12		y	1965	206	81		287	0.72	1803			1803	0.159	0.159		37	37	0.456	30	19
ST/RT	D	3.50	5	1	12			2105		0	189	189	1.00	1871			1871	0.101			23	23	0.456	24	29
LT/ST	D	3.50	5	1	11		y	1965	98	113		211	0.47	1848			1848	0.114	0.114		26	26	0.456	24	26
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 1 Peak Hour -Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	105 sec
Sum(y)		Y =	0.542
Loss time		L =	18 sec
Total Flow		=	2476 pcu
Co	= (1.5*L+5)/(1-Y)	=	69.9 sec
Cm	= L/(1-Y)	=	39.3 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	41.0 %
Cp	= 0.9*L/(0.9-Y)	=	45.3 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	37.5 %



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		719		719	0.00	4070			4070	0.177			28	28	0.655	45	24
RT	A	3.50	1	1	13			2105			375	375	1.00	1887			1887	0.199	0.199		32	28	0.738	42	29
ST	B	3.50	2	2				4210		547		547	0.00	4210			4210	0.130	0.130		21	21	0.655	36	30
LT	B	3.10	2	1	12		y	1925	56			56	1.00	1711			1711	0.032			5	21	0.164	6	30
LT	C	4.00	3	1	15		y	2015	391			391	1.00	1832			1832	0.213	0.213		34	34	0.655	42	22
LT/RT	C	4.00	3	1	15			2155	159		229	388	1.00	1959			1959	0.198			32	34	0.607	42	21
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow **Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at**

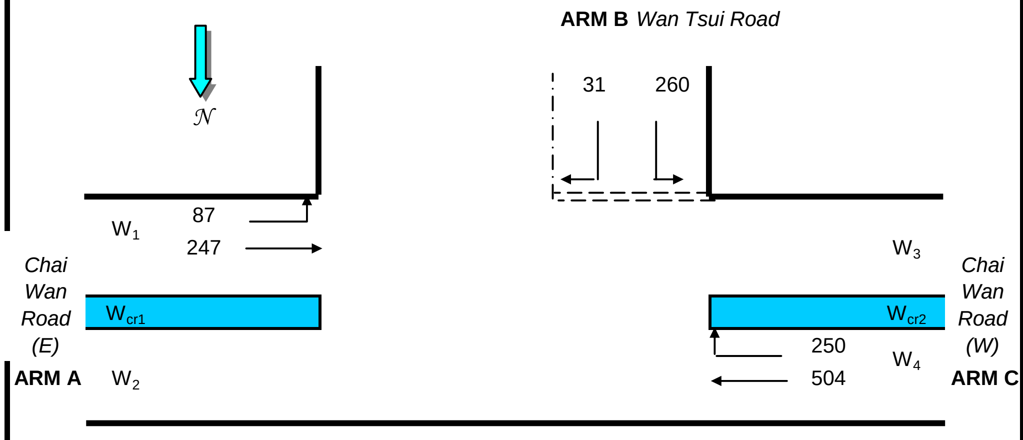
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road

Design Year - 2016 Ching Ming - Reference Case

Time - Ching Ming Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	87	(pcu/hr)
q_{a-c}	=	247	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	504	(pcu/hr)
q_{c-b}	=	250	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	31	(pcu/hr)
q_{b-c}	=	260	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

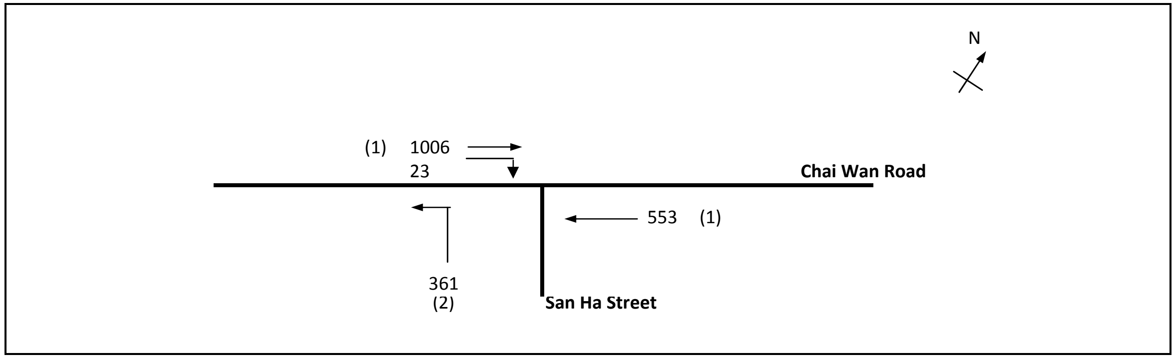
Q_{b-c}	=	790
Q_{c-b}	=	701
Q_{b-a}	=	375

COMPARISION OF DESIGN FLOW TO CAPACITY

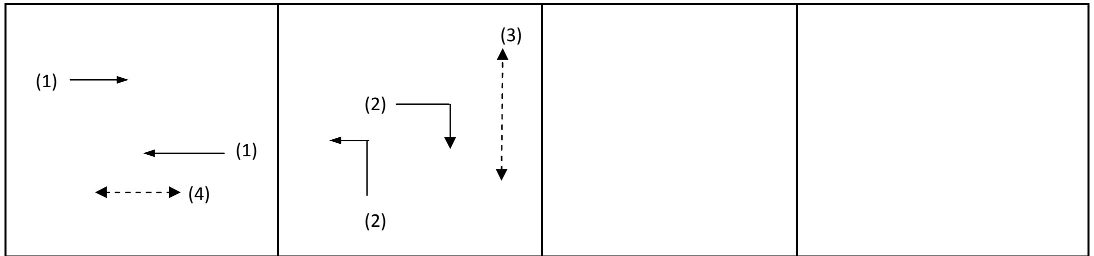
DFC_{b-a}	=	0.082
DFC_{b-c}	=	0.329
DFC_{c-b}	=	0.357

Critical DFC = 0.357

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 1 Peak Hour -Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.464	
Loss time		L =	10	sec
Total Flow		=	1942	pcu
Co	= (1.5*L+5)/(1-Y)	=	37.3	sec
Cm	= L/(1-Y)	=	18.7	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	77.8	%
Cp	= 0.9*L/(0.9-Y)	=	20.6	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	74.6	%

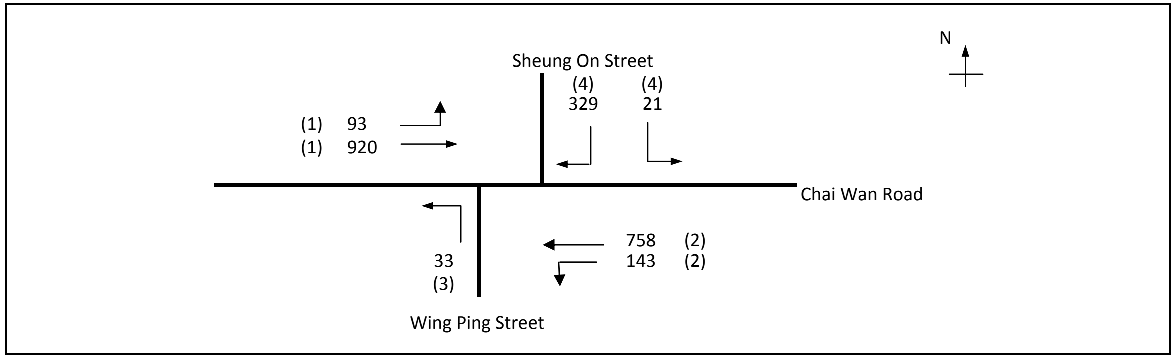


Stage A	I = 6	Stage B	I = 6	Stage C	I =

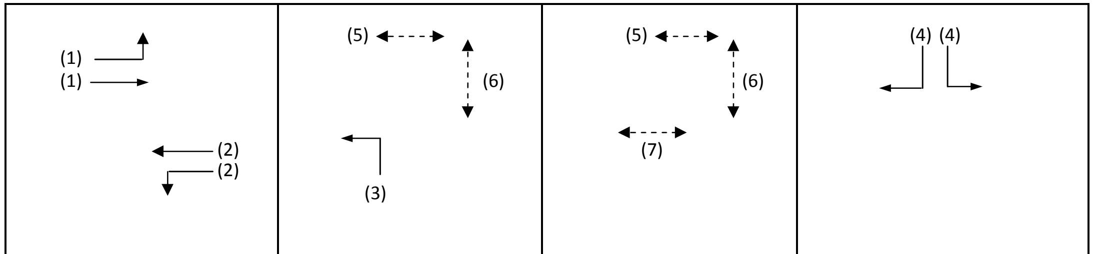
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		1006		1006	0.00	4070			4070	0.247	0.247		48	47	0.526	42	10
ST	A	3.50	1	2	10		N	4070		553		553	0.00	4070			4070	0.136			26	47	0.289	24	11
LT	B	3.00	2	1	10		N	1915	361			361	1.00	1665			1665	0.217	0.217		42	53	0.409	24	9
RT	B	3.50	2	1	12			2105			23	23	1.00	1871			1871	0.012			2	53	0.023	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 1 Peak Hour -Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	120	sec
Sum(y)		Y =	0.283	
Loss time		L =	37	sec
Total Flow		=	2296	pcu
Co	= (1.5*L+5)/(1-Y)	=	84.4	sec
Cm	= L/(1-Y)	=	51.6	sec
Yult		=	0.623	
R.C.ult	= (Yult-Y)/Y*100%	=	120.0	%
Cp	= 0.9*L/(0.9-Y)	=	54.0	sec
Ymax	= 1-L/C	=	0.692	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	120.0	%



Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	93	920		1012	0.09	6105			6105	0.166	0.166		49		0.000	66	54
LT/ST	A	3.30	2	3	12		Y	6115	143	758		901	0.16	5996			5996	0.150			44		0.000	60	54
LT	B	3.50	3	1	9		Y	1965	33			33	1.00	1684			1684	0.020	0.020		6		0.000	6	54
LT/RT	D	3.75	4	2	10		y	4120	21		329	350	1.00	3583			3583	0.098	0.098		29		0.000	33	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

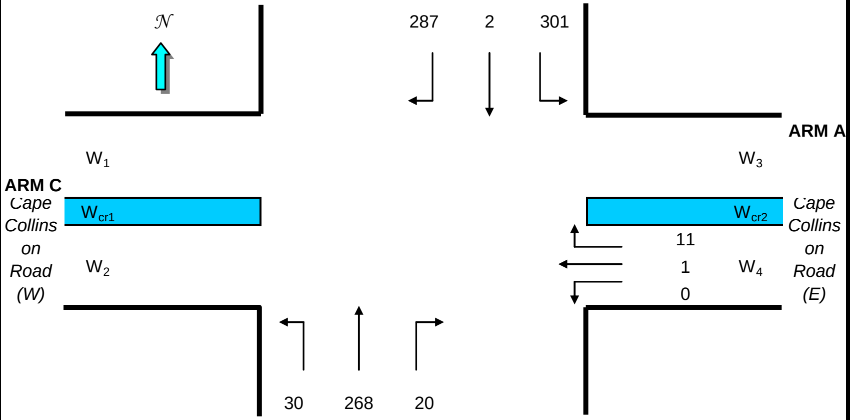
![Halcrow]

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2016 Level 1 - Site 1
Time - Level 1 Peak Hour

ARM D *Lin Shing Rd (N)*



ARM B *Lin Shing Rd (S)*

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{a-d}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
W_{d-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
W_{d-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
Vr_{a-d}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
Vl_{d-c}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)
MAJOR ROAD		(ARM A)	
W_{a-d}	=	3.00	(metres)
Vr_{a-d}	=	100	(metres)
q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	1.0288	(pcu/hr)
q_{a-d}	=	11.259	(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)
q_{c-d}	=	0	(pcu/hr)
MINOR ROAD		(ARM B)	
W_{b-a}	=	5.00	(metres)
W_{b-c}	=	5.00	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	65	(metres)
Vr_{b-c}	=	0	(metres)
q_{b-a}	=	19.547	(pcu/hr)
q_{b-c}	=	29.719	(pcu/hr)
q_{b-d}	=	267.74	(pcu/hr)
MINOR ROAD		(ARM D)	
W_{d-a}	=	3.00	(metres)
W_{d-c}	=	3.00	(metres)
Vl_{d-c}	=	50	(metres)
Vr_{d-c}	=	50	(metres)
Vr_{d-a}	=	80	(metres)
q_{d-a}	=	301.16	(pcu/hr)
q_{d-b}	=	2.4484	(pcu/hr)
q_{d-c}	=	287.26	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

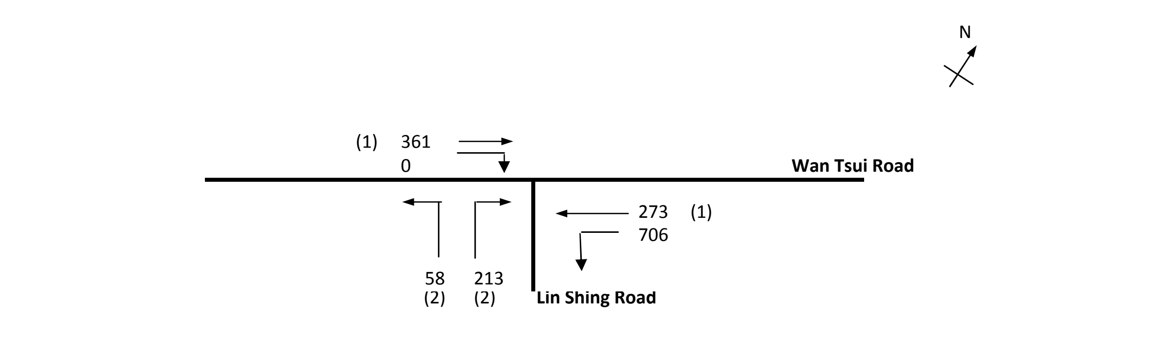
Q_{b-a}	=	514
Q_{b-c}	=	749
Q_{b-d} is nearside	=	TRUE
Q_{b-d}	=	608
Q_{d-a}	=	674
Q_{d-b} is nearside	=	TRUE
Q_{d-b}	=	528
Q_{d-c}	=	441
Q_{c-b}	=	440
Q_{a-d}	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

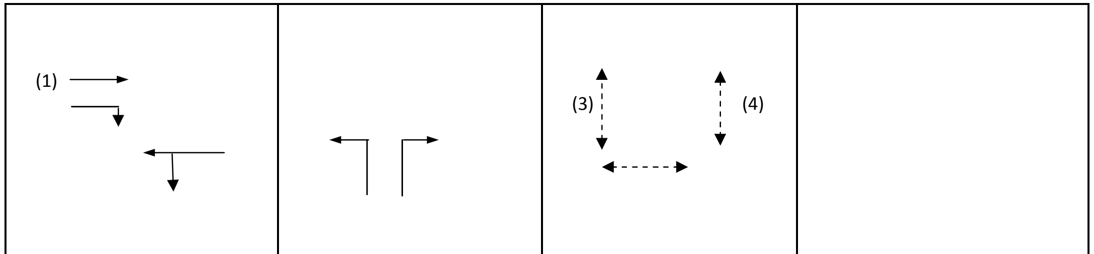
DFC_{b-a}	=	0.038
DFC_{b-c}	=	0.040
DFC_{b-d}	=	0.440
DFC_{d-a}	=	0.447
DFC_{d-b}	=	0.005
DFC_{d-c}	=	0.651
DFC_{c-b}	=	0.000
DFC_{a-d}	=	0.018

Critical DFC = 0.651

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J2: Junction of Lin Shing Road and Wan Tsui Road	J2LV1 - Peak Hour Traffic Flows	FILENAME :/1_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2016 Level 1 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	120 sec
Sum(y)		Y =	0.538
Loss time		L =	25 sec
Total Flow		=	1340 pcu
Co	= (1.5*L+5)/(1-Y)	=	92.0 sec
Cm	= L/(1-Y)	=	54.1 sec
Yult		=	0.713
R.C.ult	= (Yult-Y)/Y*100%	=	32.4 %
Cp	= 0.9*L/(0.9-Y)	=	62.2 sec
Ymax	= 1-L/C	=	0.792
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	32.4 %



Stage A I = 7	Stage B I =	Stage C I =	

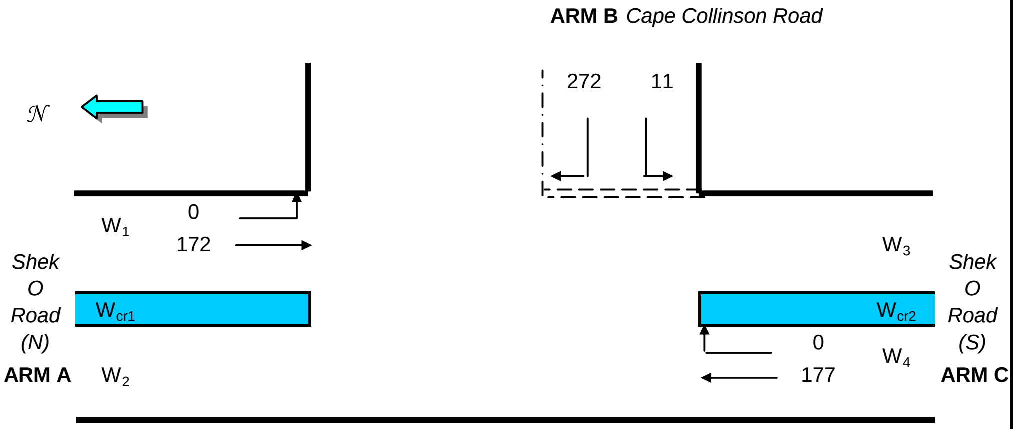
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
ST	A	3.00	1	1			N	1915		361		361	0.00	1915			1915	0.189		5	33	95	0.238	12	2
ST/LT	A	4.00	1	1	10		N	2015	706	273		979	0.72	1818			1818	0.538	0.538		95	95	0.680	36	3
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow **Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at** **Junction Capacity Analysis**

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2016 Level 1 - Site 1
Time - Level 1 Peak Hour



GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	172	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	177	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	272	(pcu/hr)
q_{b-c}	=	11	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	698
Q_{c-b}	=	777
Q_{b-a}	=	347

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	0.783
DFC_{b-c}	=	0.016
DFC_{c-b}	=	0.000

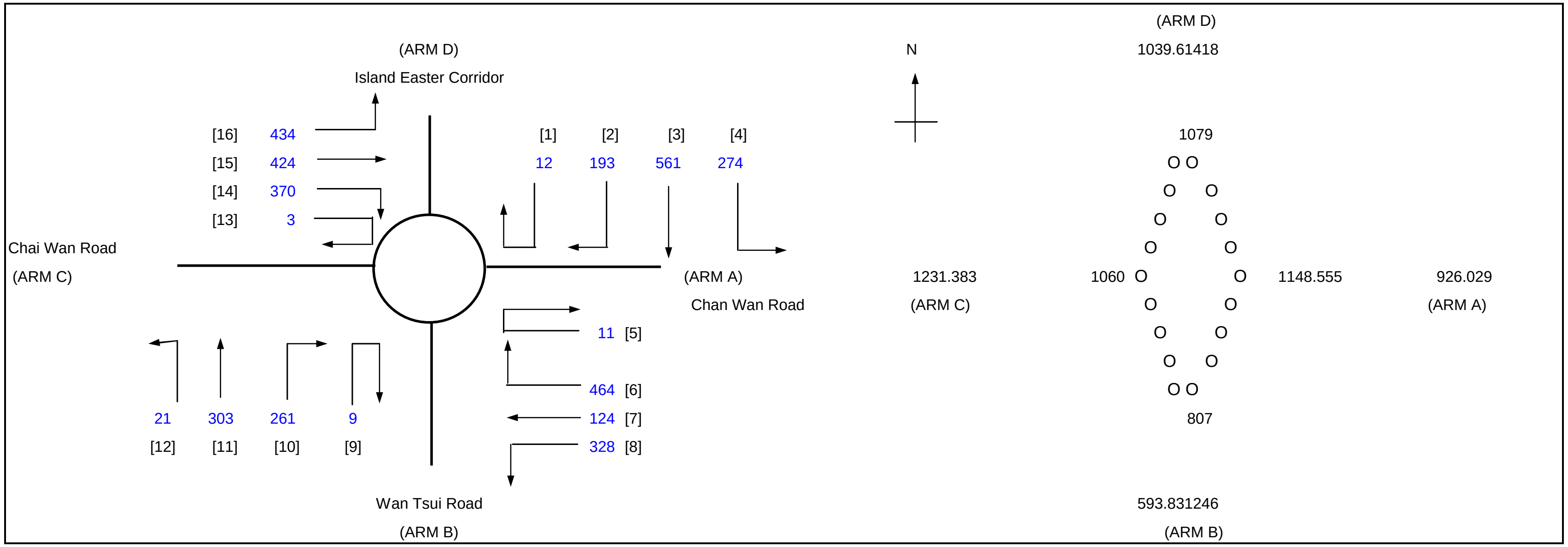
Critical DFC = 0.783

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

ROUNDABOUT CAPACITY ASSESSMENT

			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	**J4LV1 Peak Hour**	PROJECT NO.: 80510 PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME2016_LV1_S1_J2_J5_J6_J7_J8.xls CHECKED BY:	OC	Sep-13
J4LV1 Peak Hour		REVIEWED BY:	OC	Sep-13

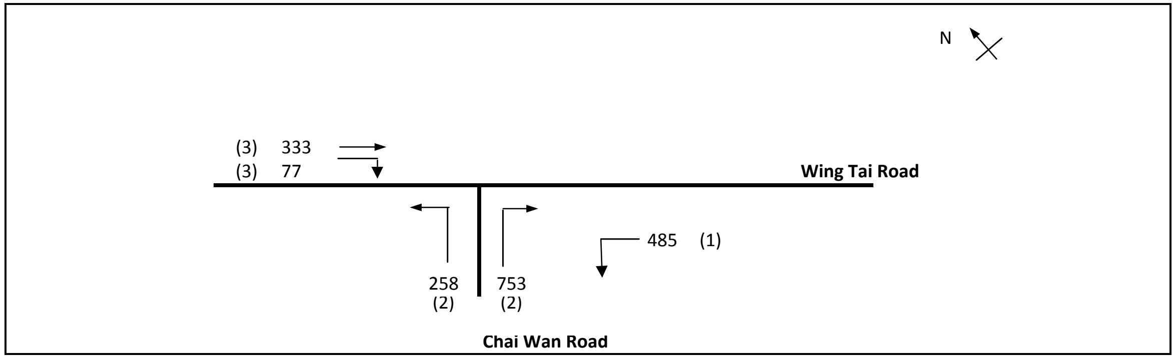


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	926	594	1231	1040
Qc	=	Circulating flow across entry (pcu/h)	1149	807	1060	1079
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1598	1024	1677	1392
DFC	=	Design flow/Capacity = Q/Qe	0.58	0.58	0.73	0.75

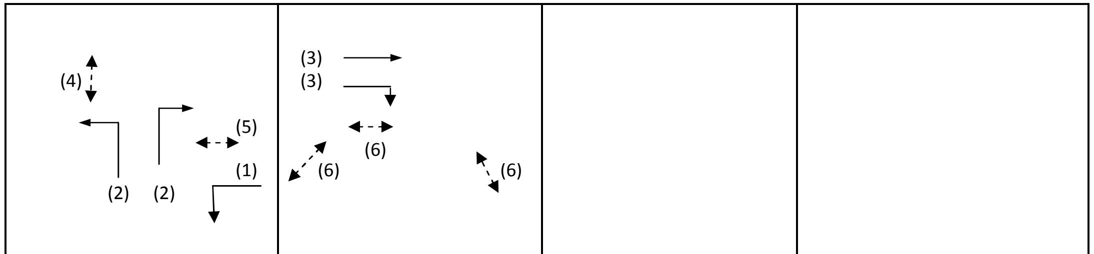
Total In Sum = 2735.389 PCU

DFC of Critical Approach = 0.75

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV1 - Peak Hour Traffic Flows	FILENAME :/1_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 1 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.292	
Loss time		L =	10	sec
Total Flow		=	1905	pcu
Co	= (1.5*L+5)/(1-Y)	=	28.2	sec
Cm	= L/(1-Y)	=	14.1	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	182.5	%
Cp	= 0.9*L/(0.9-Y)	=	14.8	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	177.4	%

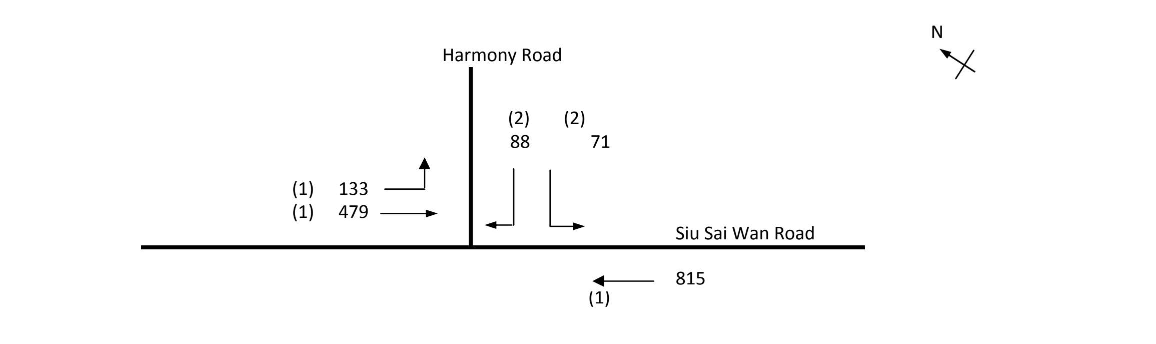


Stage A I = 7 | Stage B I = 5

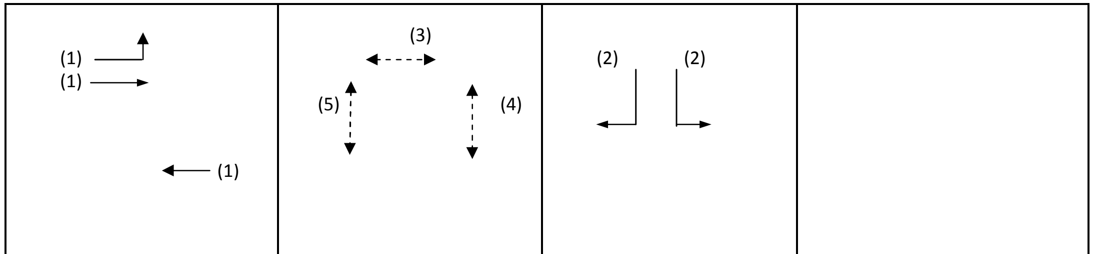
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	485			485	1.00	3857			3857	0.126			39	65	0.194	12	5
LT	A	4.00	2	2	24			4310	258			258	1.00	4056			4056	0.064			20	65	0.098	6	5
RT	A	3.50	2	2	11		y	4070			753	753	1.00	3582			3582	0.210	0.210		65	65	0.324	21	5
ST	B	3.50	3	2			y	4070		333		333	0.00	4070			4070	0.082	0.082		25	25	0.324	18	24
RT	B	4.50	3	2	13		y	4270			77	77	1.00	3828			3828	0.020			6	25	0.080	3	25
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV1 - Peak Hour Traffic Flows	FILENAME :/1_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 1 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	100 sec
Sum(y)		Y =	0.252
Loss time		L =	48 sec
Total Flow		=	1585 pcu
Co	= (1.5*L+5)/(1-Y)	=	102.9 sec
Cm	= L/(1-Y)	=	64.1 sec
Yult		=	0.540
R.C.ult	= (Yult-Y)/Y*100%	=	114.6 %
Cp	= 0.9*L/(0.9-Y)	=	66.6 sec
Ymax	= 1-L/C	=	0.520
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	86.0 %

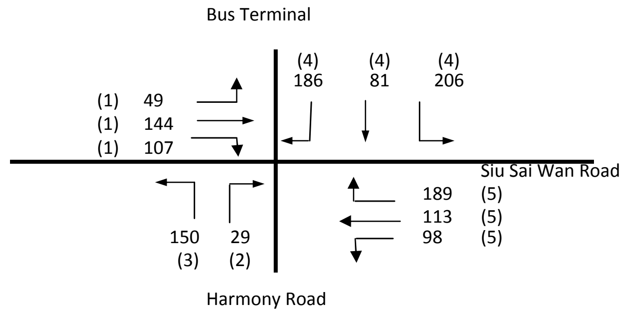


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6	

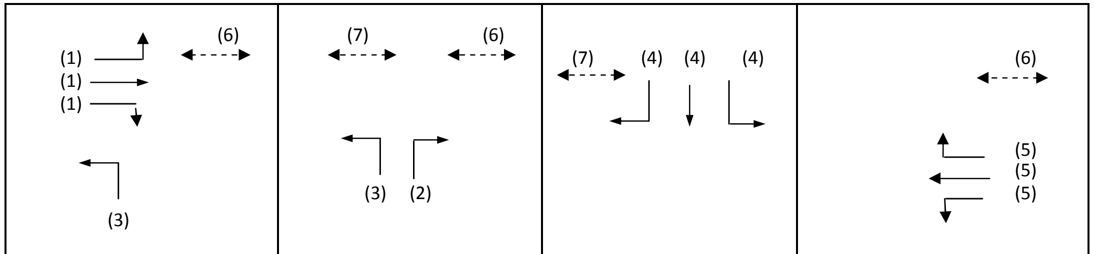
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	133	148		281	0.47	1827			1827	0.154			32	42	0.362	24	14
ST	A	3.20	1	1				2075		331		331	0.00	2075			2075	0.159			33	42	0.376	30	14
ST	A	3.00	1	2			y	3970		815		815	0.00	3970			3970	0.205	0.205		42	42	0.484	39	13
LT	C	3.75	2	1	12		y	1990	71			71	1.00	1769			1769	0.040			8	10	0.417	6	42
RT	C	3.75	2	1	12			2130			88	88	1.00	1893			1893	0.046	0.046		10	10	0.484	12	43
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV1 - Peak Hour Traffic Flows	FILENAME :/1_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 1 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.377
Loss time		L =	18 sec
Total Flow		=	1351 pcu
Co	= (1.5*L+5)/(1-Y)	=	51.4 sec
Cm	= L/(1-Y)	=	28.9 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	102.7 %
Cp	= 0.9*L/(0.9-Y)	=	31.0 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	97.6 %



Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

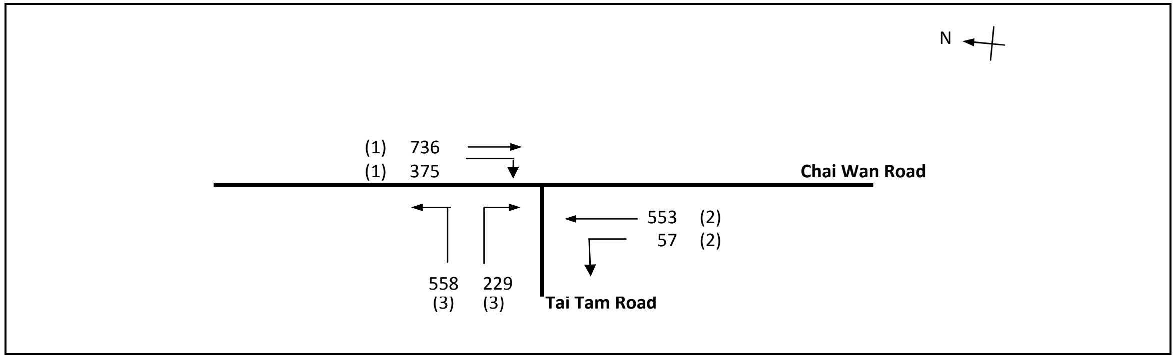
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	49	79		128	0.38	1849			1849	0.069			16	20	0.354	12	31
ST/RT	A	3.30	1	1	12			2085		65	107	172	0.62	1935			1935	0.089	0.089		20	20	0.456	24	31
RT	B	3.50	2	1	12			2105			29	29	1.00	1871			1871	0.015	0.015		4	4	0.456	0	65
LT	A,B	3.75	3	1	13		y	1990	150			150	1.00	1784			1784	0.084			19	29	0.304	18	24
RT	C	3.50	4	1	12			2105			186	186	1.00	1871			1871	0.099			23	37	0.284	18	19
LT/ST	C	3.50	4	1	12		y	1965	206	81		287	0.72	1803			1803	0.159	0.159		37	37	0.456	30	19
ST/RT	D	3.50	5	1	12			2105		0	189	189	1.00	1871			1871	0.101			23	23	0.456	24	29
LT/ST	D	3.50	5	1	11		y	1965	98	113		211	0.47	1848			1848	0.114	0.114		26	26	0.456	24	26
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

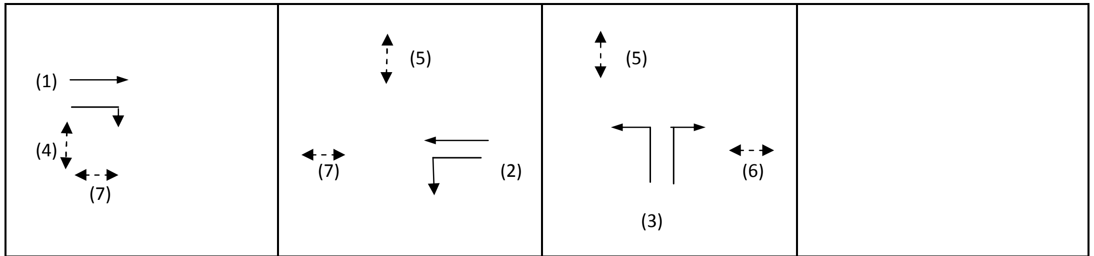
TRAFFIC SIGNAL CALCULATION

TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV1 - Peak Hour Traffic Flows	FILENAME :/1_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 1 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011

INITIALS / DATE



No. of stages per cycle		N =	3	
Cycle time		C =	105	sec
Sum(y)		Y =	0.550	
Loss time		L =	18	sec
Total Flow		=	2508	pcu
Co	= (1.5*L+5)/(1-Y)	=	71.2	sec
Cm	= L/(1-Y)	=	40.0	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	39.0	%
Cp	= 0.9*L/(0.9-Y)	=	46.3	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	35.5	%

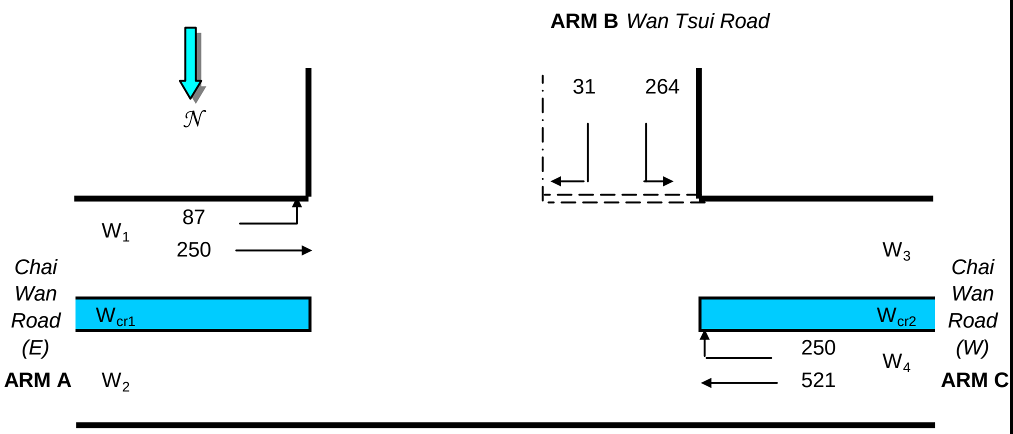


Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		736		736	0.00	4070			4070	0.181			29	29	0.664	45	23
RT	A	3.50	1	1	13			2105			375	375	1.00	1887			1887	0.199	0.199		31	29	0.731	42	29
ST	B	3.50	2	2				4210		553		553	0.00	4210			4210	0.131	0.131		21	21	0.664	36	30
LT	B	3.10	2	1	12		y	1925	57			57	1.00	1711			1711	0.033			5	21	0.167	6	30
LT	C	4.00	3	1	15		y	2015	403			403	1.00	1832			1832	0.220	0.220		35	35	0.664	42	22
LT/RT	C	4.00	3	1	15			2155	155		229	384	1.00	1959			1959	0.196			31	35	0.592	42	21
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road
Design Year - 2016 Level 1 - Site 1
Time - Level 1 Peak Hour



GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	87.445	(pcu/hr)
q_{a-c}	=	249.64	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	521.06	(pcu/hr)
q_{c-b}	=	249.99	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	30.863	(pcu/hr)
q_{b-c}	=	264.37	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	789
Q_{c-b}	=	701
Q_{b-a}	=	374

COMPARISION OF DESIGN FLOW TO CAPACITY

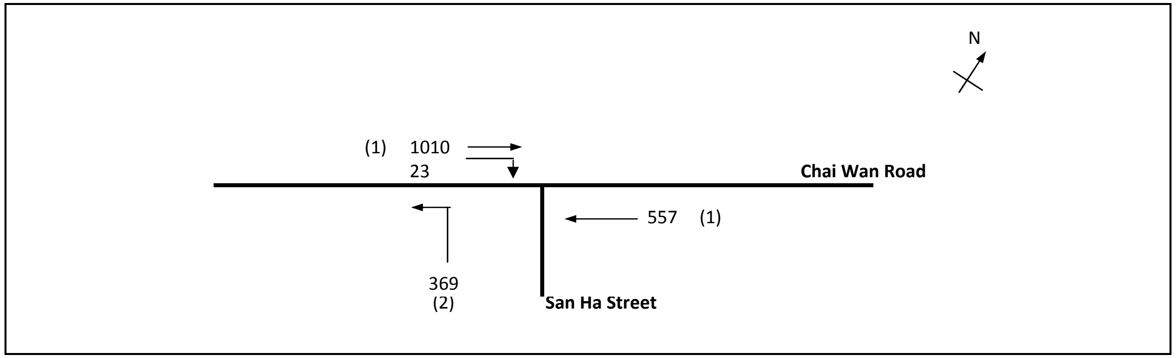
DFC_{b-a}	=	0.082
DFC_{b-c}	=	0.335
DFC_{c-b}	=	0.357

Critical DFC = 0.357

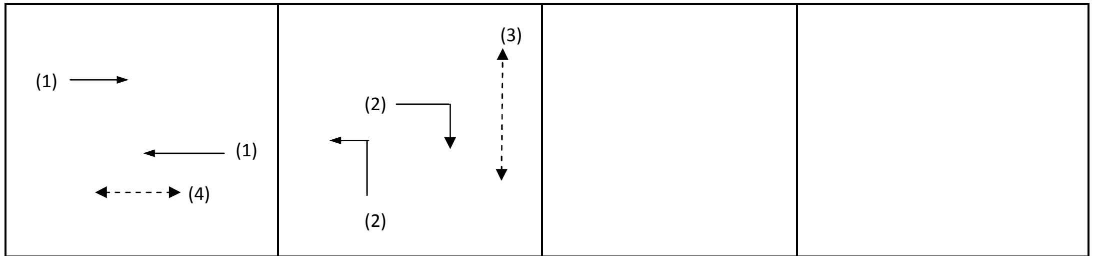
REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV1 - Peak Hour Traffic Flows	FILENAME :/1_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 1 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.470	
Loss time		L =	10	sec
Total Flow		=	1959	pcu
Co	= (1.5*L+5)/(1-Y)	=	37.7	sec
Cm	= L/(1-Y)	=	18.9	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	75.6	%
Cp	= 0.9*L/(0.9-Y)	=	20.9	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	72.4	%

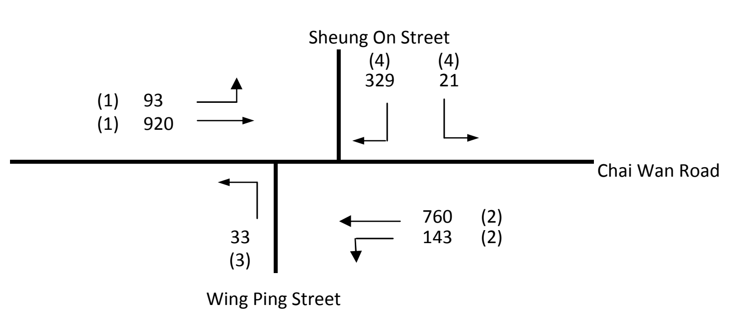


Stage A	I = 6	Stage B	I = 6	Stage C	I =	

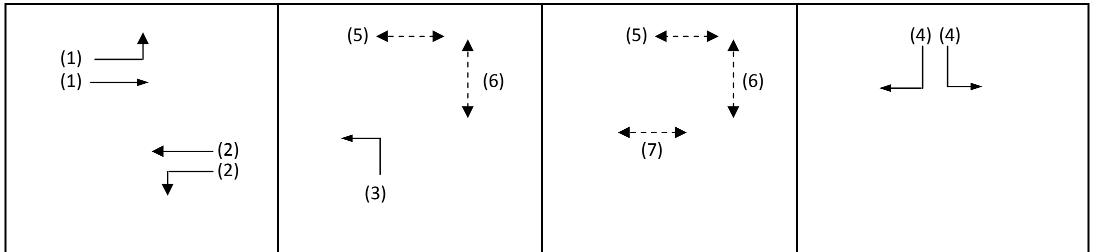
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		1010		1010	0.00	4070			4070	0.248	0.248		48	47	0.528	42	10
ST	A	3.50	1	2	10		N	4070		557		557	0.00	4070			4070	0.137			26	47	0.291	24	11
LT	B	3.00	2	1	10		N	1915	369			369	1.00	1665			1665	0.222	0.222		42	53	0.418	24	9
RT	B	3.50	2	1	12			2105			23	23	1.00	1871			1871	0.012			2	53	0.023	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV1 - Peak Hour Traffic Flows	FILENAME :/1_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2016 Level 1 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	120 sec
Sum(y)		Y =	0.283
Loss time		L =	37 sec
Total Flow		=	2298 pcu
Co	= (1.5*L+5)/(1-Y)	=	84.4 sec
Cm	= L/(1-Y)	=	51.6 sec
Yult		=	0.623
R.C.ult	= (Yult-Y)/Y*100%	=	120.0 %
Cp	= 0.9*L/(0.9-Y)	=	54.0 sec
Ymax	= 1-L/C	=	0.692
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	120.0 %



Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	93	920		1012	0.09	6105			6105	0.166	0.166		49		0.000	66	54
LT/ST	A	3.30	2	3	12		Y	6115	143	760		903	0.16	5996			5996	0.151			44		0.000	60	54
LT	B	3.50	3	1	9		Y	1965	33			33	1.00	1684			1684	0.020	0.020		6		0.000	6	54
LT/RT	D	3.75	4	2	10		y	4120	21		329	350	1.00	3583			3583	0.098	0.098		29		0.000	33	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

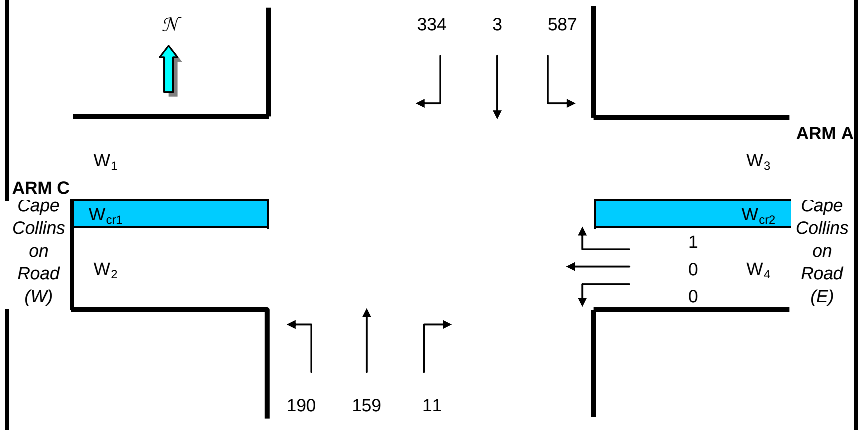
NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2016 Level 2 - Reference Case
Time - Level 2 Peak Hour

ARM D *Lin Shing Rd (N)*



ARM B *Lin Shing Rd (S)*

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{a-d}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
W_{d-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
W_{d-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
Vr_{a-d}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
Vl_{d-c}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

W_{a-d}	=	3.00	(metres)
Vr_{a-d}	=	100	(metres)
q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	0	(pcu/hr)
q_{a-d}	=	1	(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)
q_{c-d}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	5.00	(metres)
W_{b-c}	=	5.00	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	65	(metres)
Vr_{b-c}	=	0	(metres)
q_{b-a}	=	11.316	(pcu/hr)
q_{b-c}	=	190.26	(pcu/hr)
q_{b-d}	=	159.09	(pcu/hr)

MINOR ROAD (ARM D)

W_{d-a}	=	3.00	(metres)
W_{d-c}	=	3.00	(metres)
Vl_{d-c}	=	50	(metres)
Vr_{d-c}	=	50	(metres)
Vr_{d-a}	=	80	(metres)
q_{d-a}	=	586.93	(pcu/hr)
q_{d-b}	=	3.4124	(pcu/hr)
q_{d-c}	=	334.25	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

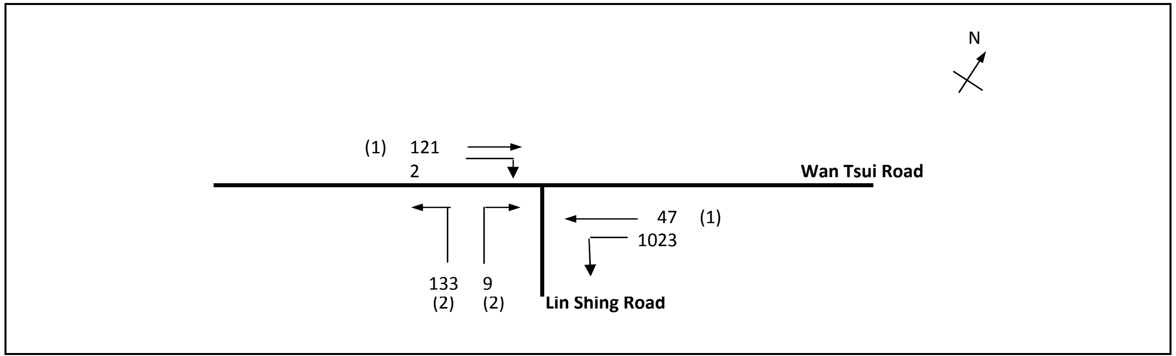
Q_{b-a}	=	424
Q_{b-c}	=	749
Q_{b-d} is nearside	=	TRUE
Q_{b-d}	=	611
Q_{d-a}	=	674
Q_{d-b} is nearside	=	TRUE
Q_{d-b}	=	533
Q_{d-c}	=	433
Q_{c-b}	=	437
Q_{a-d}	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

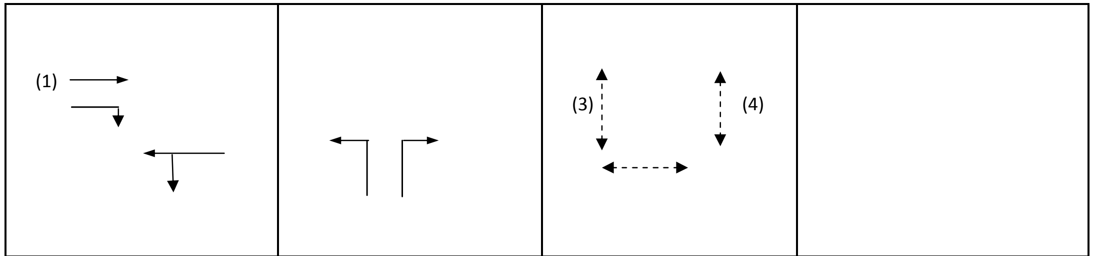
DFC_{b-a}	=	0.027
DFC_{b-c}	=	0.254
DFC_{b-d}	=	0.260
DFC_{d-a}	=	0.870
DFC_{d-b}	=	0.006
DFC_{d-c}	=	0.771
DFC_{c-b}	=	0.000
DFC_{a-d}	=	0.002

Critical DFC = 0.870

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
Junction of Lin Shing Road and Wan Tsui Road	J2LV2 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 2 Hour -Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	120 sec
Sum(y)		Y =	0.608
Loss time		L =	25 sec
Total Flow		=	1192 pcu
Co	= (1.5*L+5)/(1-Y)	=	108.3 sec
Cm	= L/(1-Y)	=	63.7 sec
Yult		=	0.713
R.C.ult	= (Yult-Y)/Y*100%	=	17.3 %
Cp	= 0.9*L/(0.9-Y)	=	76.9 sec
Ymax	= 1-L/C	=	0.792
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	17.3 %



Stage A I = 7	Stage B I =	Stage C I =	

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
ST	A	3.00	1	1			N	1915		121		121	0.00	1915			1915	0.063		5	10	95	0.080	0	2
ST/LT	A	4.00	1	1	10		N	2015	1023	47		1071	0.96	1762			1762	0.608	0.608		95	95	0.767	42	5
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at (

Junction Capacity Analysis

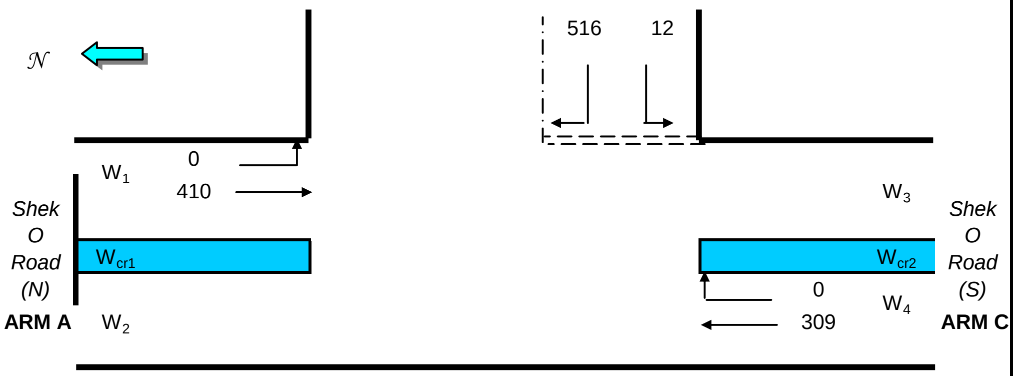
Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road

Design Year - 2016 Level 2 - Reference Case

Time - Level 2 Peak Hour

ARM B *Cape Collinson Road*



GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	410	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	309	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	516	(pcu/hr)
q_{b-c}	=	12	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	637
Q_{c-b}	=	709
Q_{b-a}	=	295

COMPARISION OF DESIGN FLOW TO CAPACITY

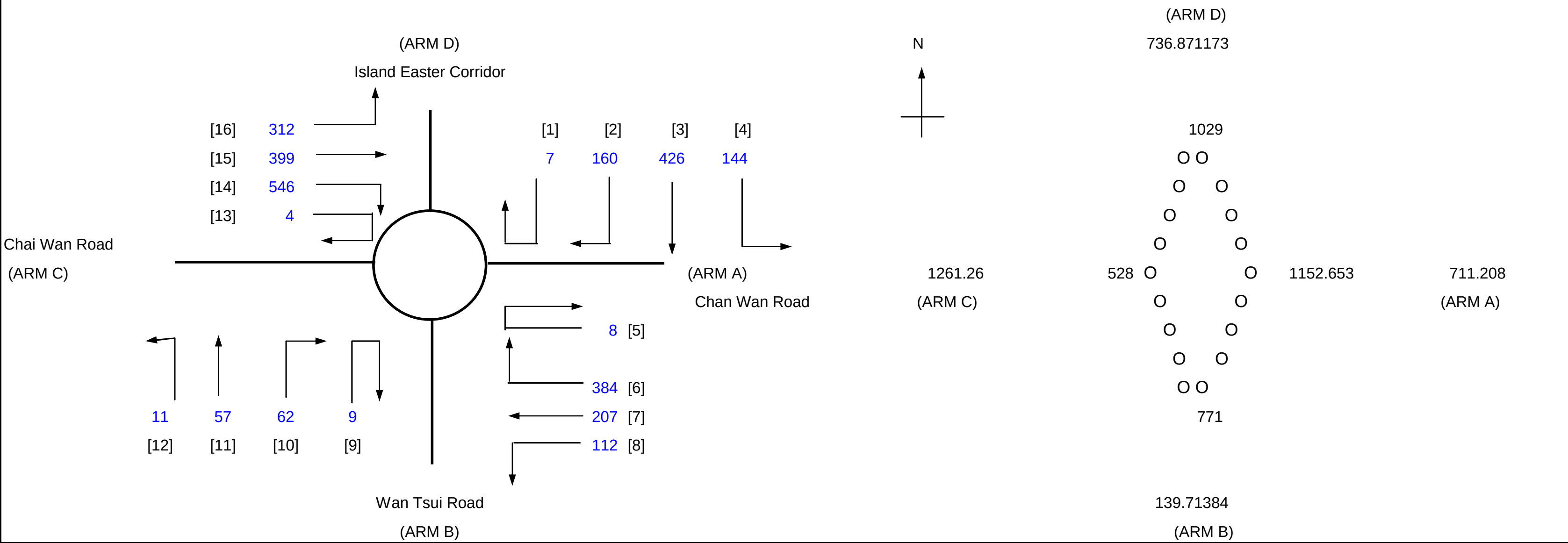
DFC_{b-a}	=	1.748
DFC_{b-c}	=	0.020
DFC_{c-b}	=	0.000

Critical DFC = 1.748

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

	ROUNDABOUT CAPACITY ASSESSMENT			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	**J4LV2 Peak Hour**	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME: 2016_LV2_Ref_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV2 Peak Hour			REVIEWED BY:	OC	Sep-13

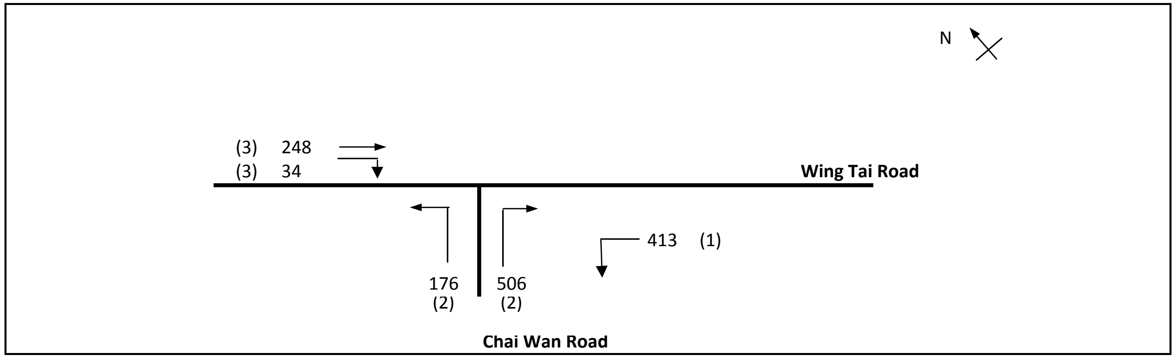


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	711	140	1261	737
Qc	=	Circulating flow across entry (pcu/h)	1153	771	528	1029
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1595	1044	2080	1427
DFC	=	Design flow/Capacity = Q/Qe	0.45	0.13	0.61	0.52

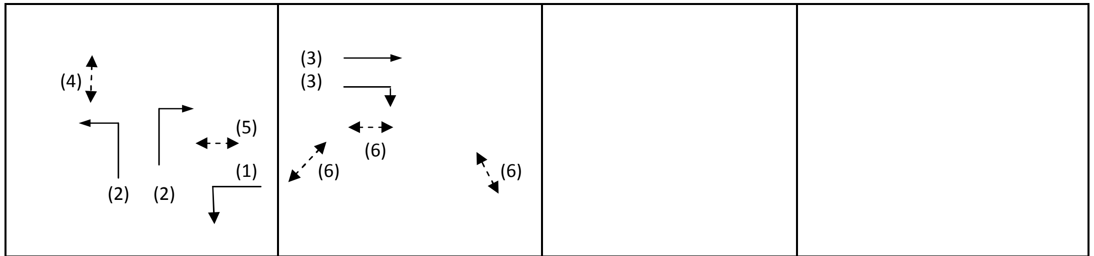
Total In Sum = 2269.694 PCU

DFC of Critical Approach = 0.61

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV2 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 2 Hour -Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.202	
Loss time		L =	10	sec
Total Flow		=	1377	pcu
Co	= (1.5*L+5)/(1-Y)	=	25.1	sec
Cm	= L/(1-Y)	=	12.5	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	307.8	%
Cp	= 0.9*L/(0.9-Y)	=	12.9	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	300.4	%

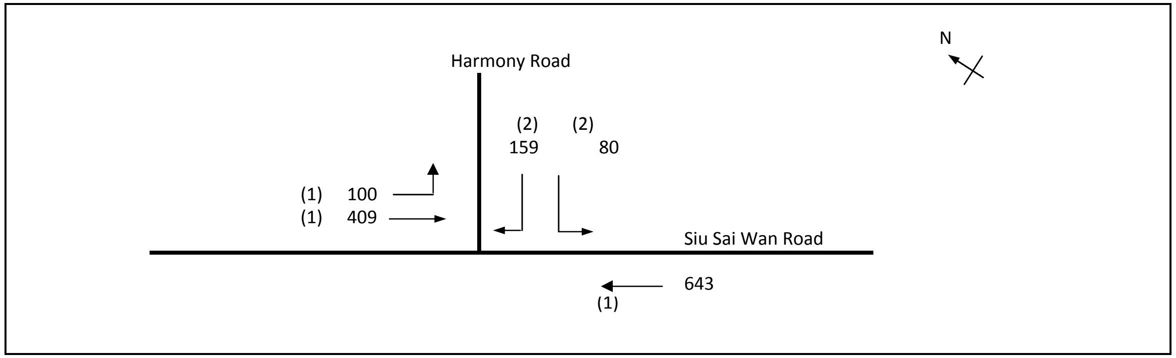


Stage A	I = 7	Stage B	I = 5		

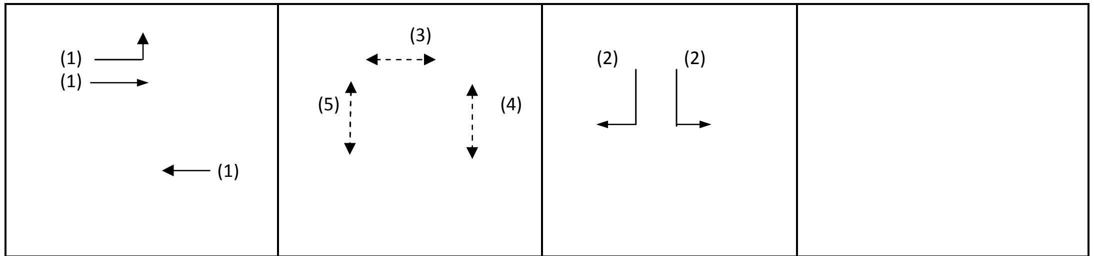
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	413			413	1.00	3857			3857	0.107			48	63	0.170	12	6
LT	A	4.00	2	2	24			4310	176			176	1.00	4056			4056	0.043			19	63	0.069	3	6
RT	A	3.50	2	2	11		y	4070			506	506	1.00	3582			3582	0.141	0.141		63	63	0.225	15	6
ST	B	3.50	3	2			y	4070		248		248	0.00	4070			4070	0.061	0.061		27	27	0.225	15	23
RT	B	4.50	3	2	13		y	4270			34	34	1.00	3828			3828	0.009			4	27	0.033	0	24
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV2 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2016 Level 2 Hour -Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	100	sec
Sum(y)		Y =	0.246	
Loss time		L =	48	sec
Total Flow		=	1391	pcu
Co	= (1.5*L+5)/(1-Y)	=	102.1	sec
Cm	= L/(1-Y)	=	63.7	sec
Yult		=	0.540	
R.C.ult	= (Yult-Y)/Y*100%	=	119.5	%
Cp	= 0.9*L/(0.9-Y)	=	66.1	sec
Ymax	= 1-L/C	=	0.520	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	90.2	%

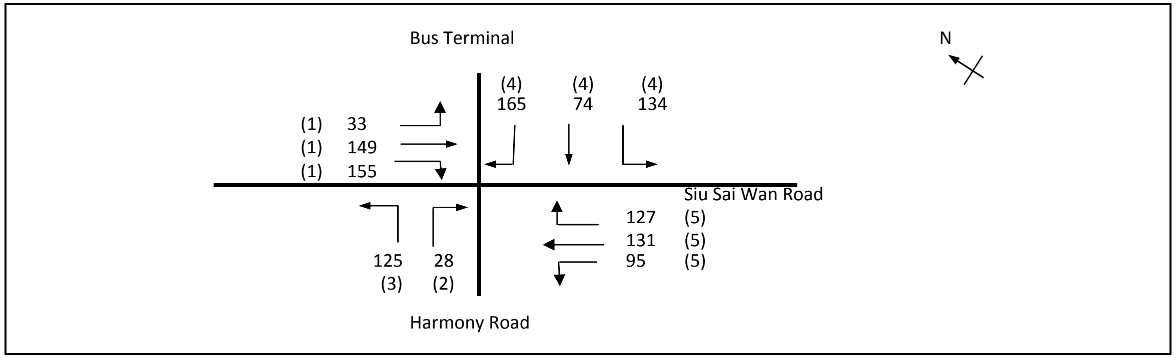


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

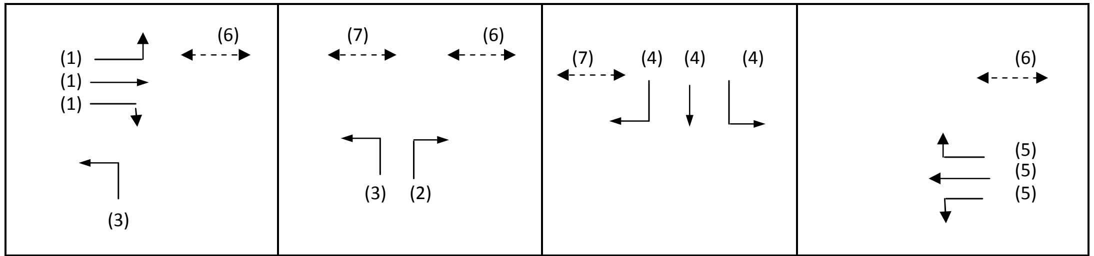
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	100	148		248	0.40	1844			1844	0.134			28	34	0.392	24	19
ST	A	3.20	1	1				2075		261		261	0.00	2075			2075	0.126			27	34	0.367	24	18
ST	A	3.00	1	2			y	3970		643		643	0.00	3970			3970	0.162	0.162		34	34	0.473	33	17
LT	C	3.75	2	1	12		y	1990	80			80	1.00	1769			1769	0.045			10	18	0.255	6	31
RT	C	3.75	2	1	12			2130			159	159	1.00	1893			1893	0.084	0.084		18	18	0.473	18	32
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV2 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 2 Hour -Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	105	sec
Sum(y)		Y =	0.369	
Loss time		L =	18	sec
Total Flow		=	1217	pcu
Co	= (1.5*L+5)/(1-Y)	=	50.7	sec
Cm	= L/(1-Y)	=	28.5	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	107.5	%
Cp	= 0.9*L/(0.9-Y)	=	30.5	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	102.3	%

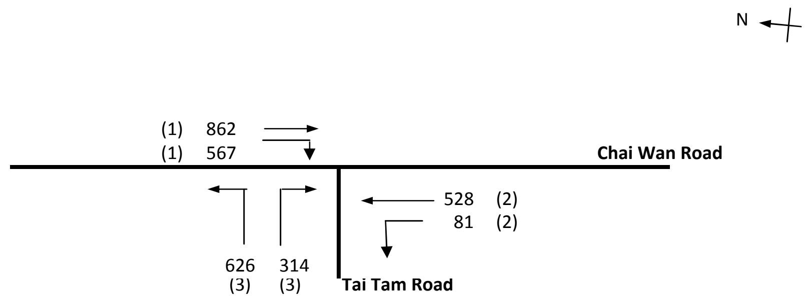


Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

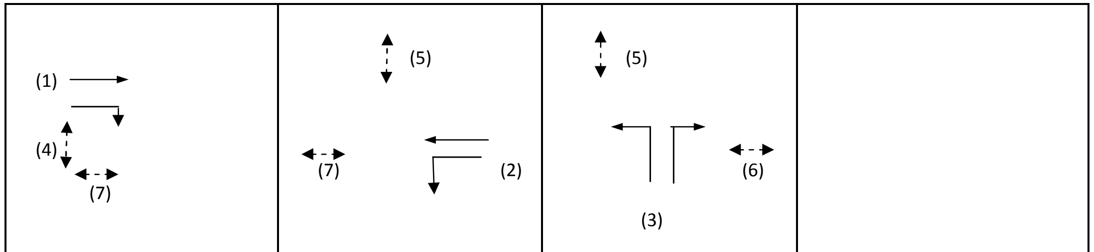
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	33	79		112	0.30	1870			1870	0.060			14	28	0.228	12	25
ST/RT	A	3.30	1	1	12			2085		70	155	225	0.69	1920			1920	0.117	0.117		28	28	0.445	24	25
RT	B	3.50	2	1	12			2105			28	28	1.00	1871			1871	0.015	0.015		4	4	0.445	0	64
LT	A,B	3.75	3	1	13		y	1990	125			125	1.00	1784			1784	0.070			16	36	0.202	12	20
RT	C	3.50	4	1	12			2105			165	165	1.00	1871			1871	0.088			21	27	0.343	18	26
LT/ST	C	3.50	4	1	12		y	1965	134	74		208	0.64	1818			1818	0.115	0.115		27	27	0.445	24	26
ST/RT	D	3.50	5	1	12			2105		0	127	127	1.00	1871			1871	0.068			16	16	0.445	18	36
LT/ST	D	3.50	5	1	11		y	1965	95	131		226	0.42	1859			1859	0.122	0.122		29	29	0.445	24	24
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV2 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2016 Level 2 Hour -Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	105	sec
Sum(y)		Y =	0.681	
Loss time		L =	18	sec
Total Flow		=	2977	pcu
Co	= (1.5*L+5)/(1-Y)	=	100.2	sec
Cm	= L/(1-Y)	=	56.4	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	12.4	%
Cp	= 0.9*L/(0.9-Y)	=	73.8	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	9.6	%



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

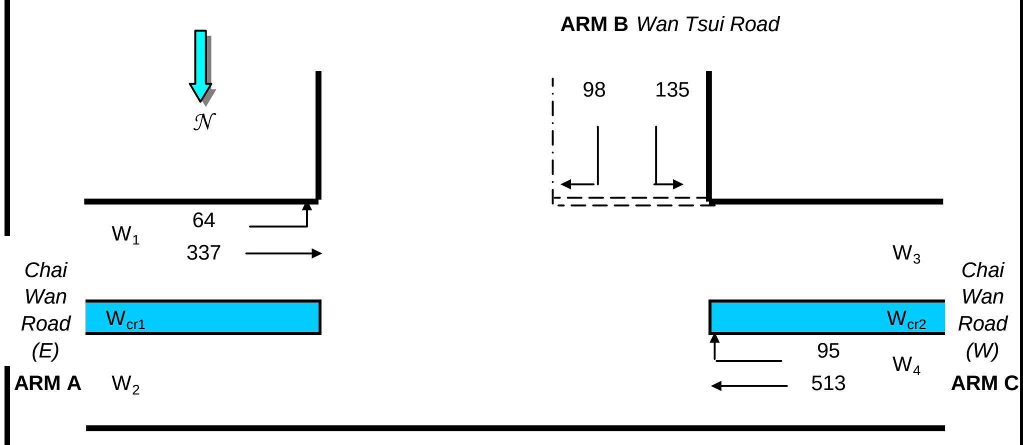
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		862		862	0.00	4070			4070	0.212			27	27	0.821	54	28
RT	A	3.50	1	1	13			2105			567	567	1.00	1887			1887	0.300	0.300		38	27	1.165	72	34
ST	B	3.50	2	2				4210		528		528	0.00	4210			4210	0.125	0.125		16	16	0.821	39	41
LT	B	3.10	2	1	12		y	1925	81			81	1.00	1711			1711	0.047			6	16	0.311	12	35
LT	C	4.00	3	1	15		y	2015	467			467	1.00	1832			1832	0.255	0.255		33	33	0.821	54	30
LT/RT	C	4.00	3	1	15			2155	159		314	473	1.00	1959			1959	0.242			31	33	0.778	54	26
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road

Design Year - 2016 Level 2 - Reference Case

Time - Level 2 Peak Hour



GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	64	(pcu/hr)
q_{a-c}	=	337	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	513	(pcu/hr)
q_{c-b}	=	95	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	98	(pcu/hr)
q_{b-c}	=	135	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	779
Q_{c-b}	=	693
Q_{b-a}	=	386

COMPARISION OF DESIGN FLOW TO CAPACITY

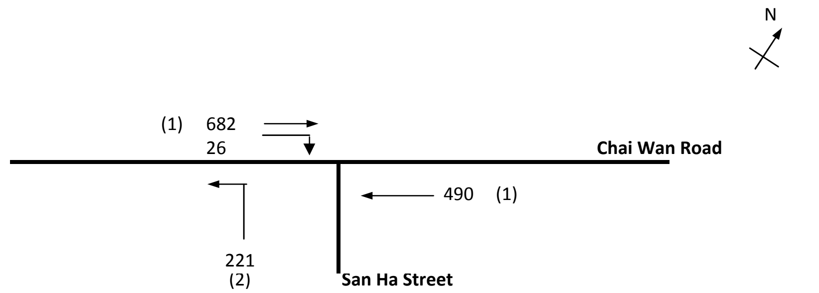
DFC_{b-a}	=	0.253
DFC_{b-c}	=	0.173
DFC_{c-b}	=	0.136

Critical DFC = 0.253

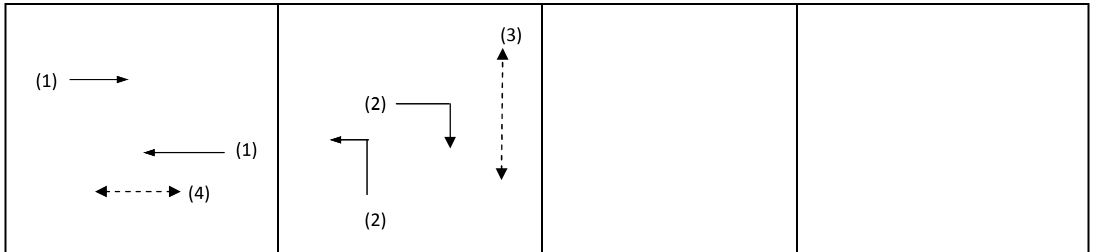
REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV2 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2016 Level 2 Hour -Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	100 sec
Sum(y)		Y =	0.300
Loss time		L =	10 sec
Total Flow		=	1419 pcu
Co	= (1.5*L+5)/(1-Y)	=	28.6 sec
Cm	= L/(1-Y)	=	14.3 sec
Yult		=	0.825
R.C.ult	= (Yult-Y)/Y*100%	=	174.6 %
Cp	= 0.9*L/(0.9-Y)	=	15.0 sec
Ymax	= 1-L/C	=	0.900
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	169.6 %

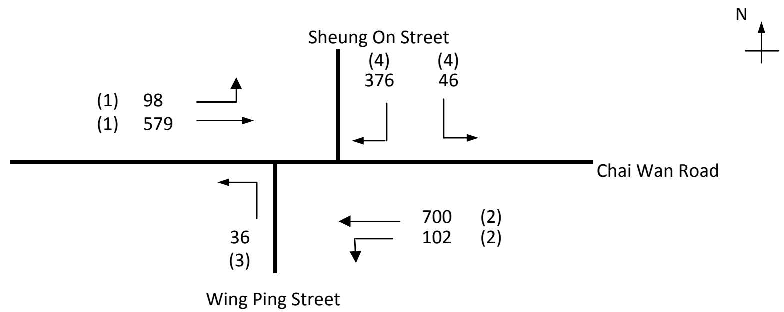


Stage A	I = 6	Stage B	I = 6	Stage C	I =	

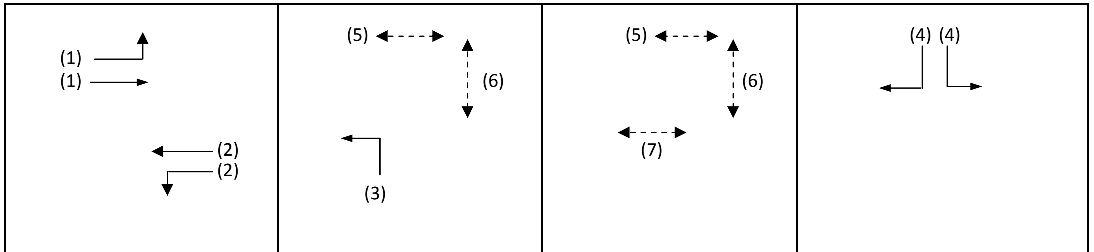
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		682		682	0.00	4070			4070	0.168	0.168		50	47	0.357	30	11
ST	A	3.50	1	2	10		N	4070		490		490	0.00	4070			4070	0.120			36	47	0.256	21	11
LT	B	3.00	2	1	10		N	1915	221			221	1.00	1665			1665	0.133	0.133		40	53	0.251	12	9
RT	B	3.50	2	1	12			2105			26	26	1.00	1871			1871	0.014			4	53	0.026	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV2 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 2 Hour -Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	120	sec
Sum(y)		Y =	0.272	
Loss time		L =	37	sec
Total Flow		=	1937	pcu
Co	= (1.5*L+5)/(1-Y)	=	83.2	sec
Cm	= L/(1-Y)	=	50.9	sec
Yult		=	0.623	
R.C.ult	= (Yult-Y)/Y*100%	=	128.5	%
Cp	= 0.9*L/(0.9-Y)	=	53.1	sec
Ymax	= 1-L/C	=	0.692	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	128.5	%



Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

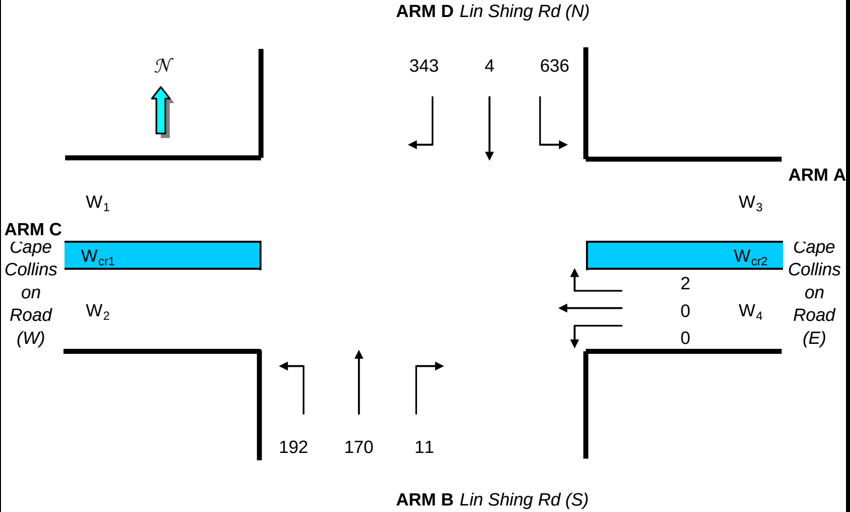
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	98	579		677	0.14	6066			6066	0.112			34		0.000	44	54
LT/ST	A	3.30	2	3	12		Y	6115	102	700		802	0.13	6019			6019	0.133	0.133		41		0.000	52	54
LT	B	3.50	3	1	9		Y	1965	36			36	1.00	1684			1684	0.021	0.021		7		0.000	6	54
LT/RT	D	3.75	4	2	10		y	4120	46		376	422	1.00	3583			3583	0.118	0.118		36		0.000	42	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at
Junction Capacity Analysis

Prepared By:	KC
Checked By:	OC

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2016 Level 2 - Site 1
Time - Level 2 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{a\text{-}d}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$W_{d\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
$W_{d\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
$Vr_{a\text{-}d}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
$Vl_{d\text{-}c}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)
MAJOR ROAD			(ARM A)
$W_{a\text{-}d}$	=	3.00	(metres)
$Vr_{a\text{-}d}$	=	100	(metres)
$q_{a\text{-}b}$	=	0	(pcu/hr)
$q_{a\text{-}c}$	=	0	(pcu/hr)
$q_{a\text{-}d}$	=	2	(pcu/hr)
MAJOR ROAD			(ARM C)
$W_{c\text{-}b}$	=		(metres)
$Vr_{c\text{-}b}$	=		(metres)
$q_{c\text{-}a}$	=	0	(pcu/hr)
$q_{c\text{-}b}$	=	0	(pcu/hr)
$q_{c\text{-}d}$	=	0	(pcu/hr)
MINOR ROAD			(ARM B)
$W_{b\text{-}a}$	=	5.00	(metres)
$W_{b\text{-}c}$	=	5.00	(metres)
$Vl_{b\text{-}a}$	=	100	(metres)
$Vr_{b\text{-}a}$	=	65	(metres)
$Vr_{b\text{-}c}$	=	0	(metres)
$q_{b\text{-}a}$	=	11.316	(pcu/hr)
$q_{b\text{-}c}$	=	192.26	(pcu/hr)
$q_{b\text{-}d}$	=	169.54	(pcu/hr)
MINOR ROAD			(ARM D)
$W_{d\text{-}a}$	=	3.00	(metres)
$W_{d\text{-}c}$	=	3.00	(metres)
$Vl_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}a}$	=	80	(metres)
$q_{d\text{-}a}$	=	636.39	(pcu/hr)
$q_{d\text{-}b}$	=	3.7	(pcu/hr)
$q_{d\text{-}c}$	=	343.17	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

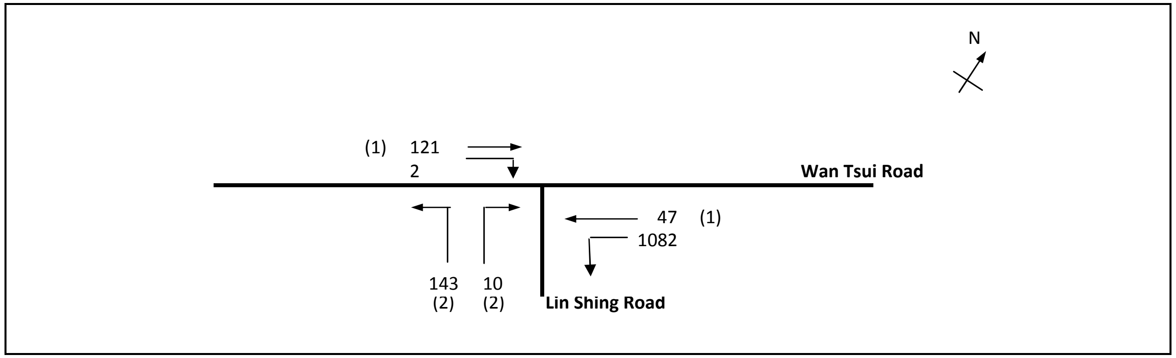
$Q_{b\text{-}a}$	=	407
$Q_{b\text{-}c}$	=	749
$Q_{b\text{-}d}$ is nearside	=	TRUE
$Q_{b\text{-}d}$	=	611
$Q_{d\text{-}a}$	=	674
$Q_{d\text{-}b}$ is nearside	=	TRUE
$Q_{d\text{-}b}$	=	532
$Q_{d\text{-}c}$	=	430
$Q_{c\text{-}b}$	=	437
$Q_{a\text{-}d}$	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

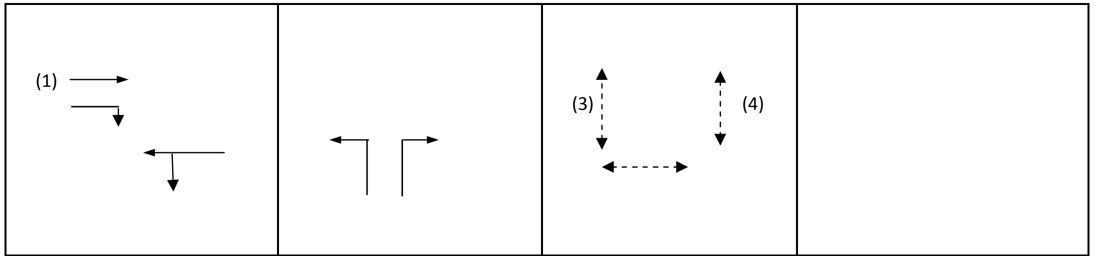
$DFC_{b\text{-}a}$	=	0.028
$DFC_{b\text{-}c}$	=	0.257
$DFC_{b\text{-}d}$	=	0.278
$DFC_{d\text{-}a}$	=	0.944
$DFC_{d\text{-}b}$	=	0.007
$DFC_{d\text{-}c}$	=	0.798
$DFC_{c\text{-}b}$	=	0.000
$DFC_{a\text{-}d}$	=	0.003

Critical DFC = 0.944

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J2: Junction of Lin Shing Road and Wan Tsui Road	J2LV2 - Peak Hour Traffic Flows	FILENAME :/2_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2016 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	120 sec
Sum(y)		Y =	0.641
Loss time		L =	25 sec
Total Flow		=	1251 pcu
Co	= (1.5*L+5)/(1-Y)	=	118.4 sec
Cm	= L/(1-Y)	=	69.6 sec
Yult		=	0.713
R.C.ult	= (Yult-Y)/Y*100%	=	11.2 %
Cp	= 0.9*L/(0.9-Y)	=	86.9 sec
Ymax	= 1-L/C	=	0.792
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	11.2 %



Stage A I = 7	Stage B I =	Stage C I =	

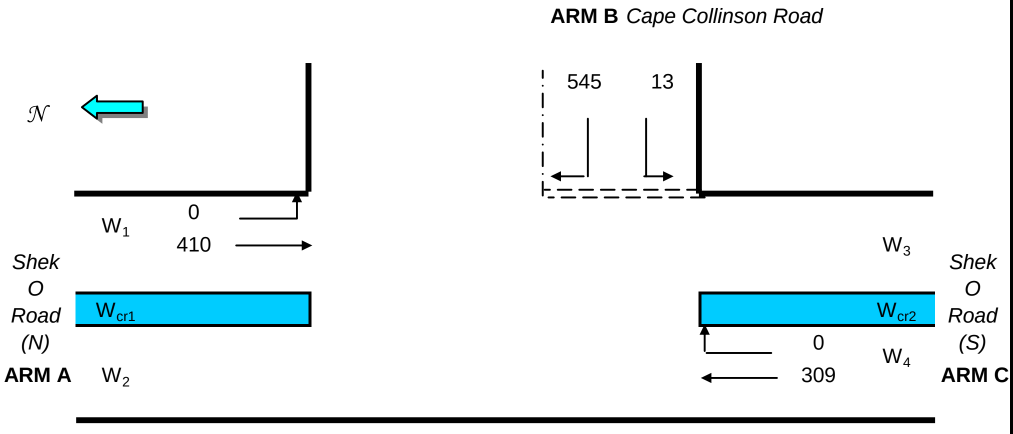
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		121		121	0.00	1915			1915	0.063			9	95	0.080	0	2
ST/LT	A	4.00	1	1	10		N	2015	1082	47		1129	0.96	1762			1762	0.641	0.641		95	95	0.810	42	6
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2016 Level 2 - Site 1
Time - Level 2 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	410	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	309	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	545	(pcu/hr)
q_{b-c}	=	13	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

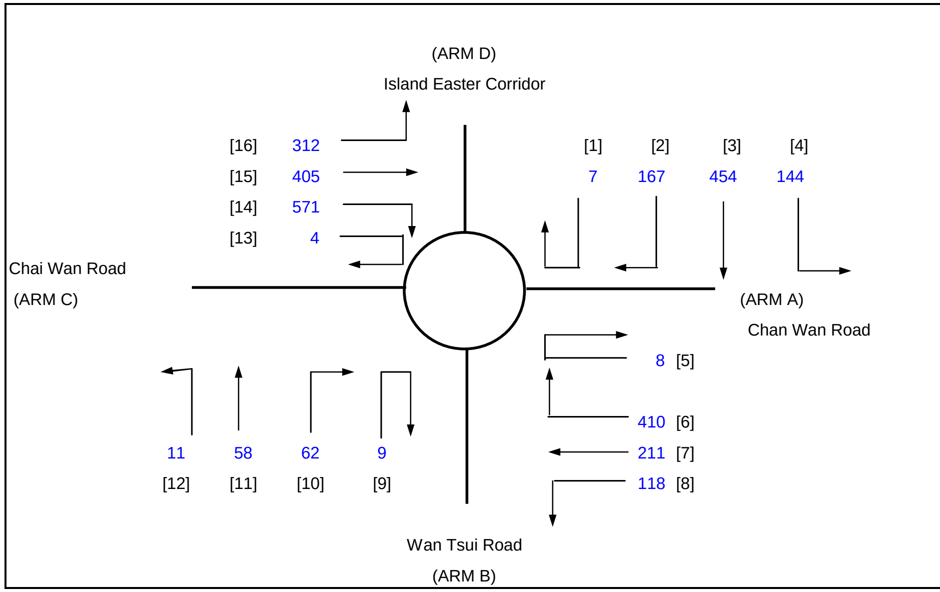
Q_{b-c}	=	637
Q_{c-b}	=	709
Q_{b-a}	=	295

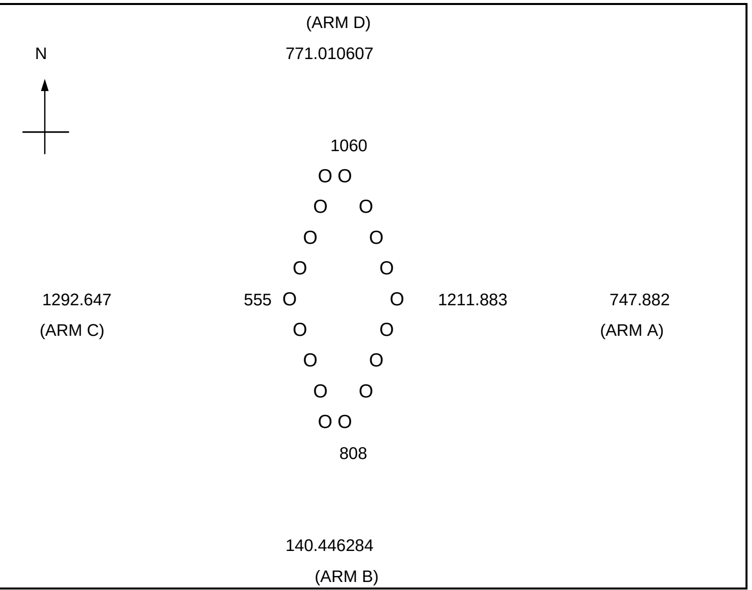
COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	1.847
DFC_{b-c}	=	0.021
DFC_{c-b}	=	0.000

Critical DFC = 1.847

	ROUNDABOUT CAPACITY ASSESSMENT			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	J4LV2 Peak Hour	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME2016_LV2_S1_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV2 Peak Hour			REVIEWED BY:	OC	Sep-13



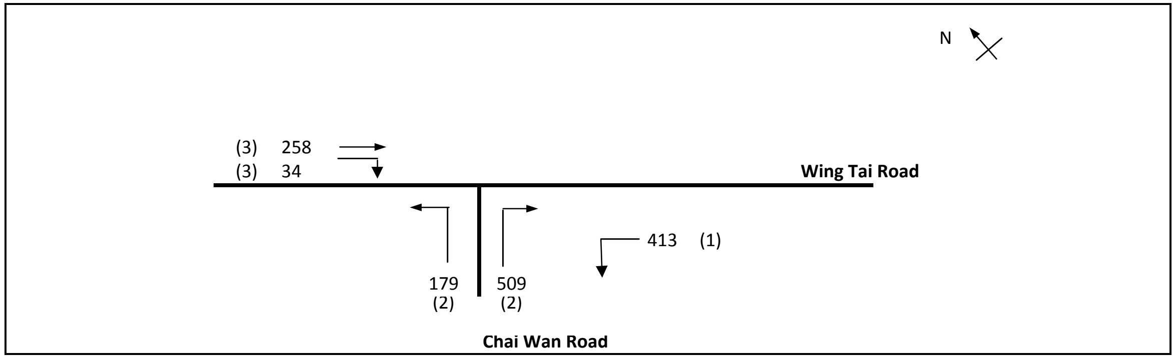


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	748	140	1293	771
Qc	=	Circulating flow across entry (pcu/h)	1212	808	555	1060
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1550	1023	2059	1405
DFC	=	Design flow/Capacity = Q/Qe	0.48	0.14	0.63	0.55

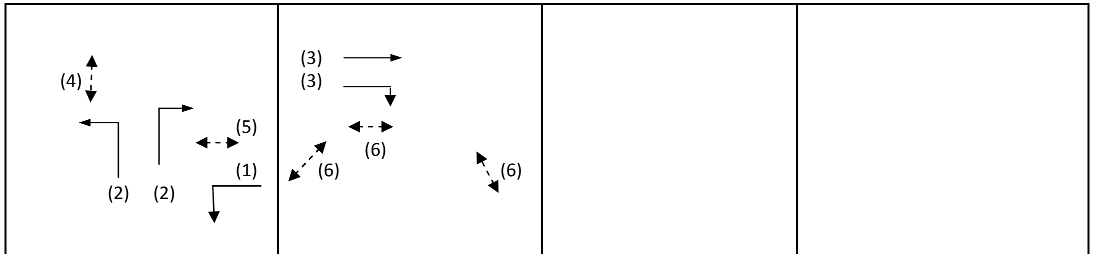
Total In Sum = 2366.89 PCU

DFC of Critical Approach = 0.63

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV2 - Peak Hour Traffic Flows	FILENAME :/2_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.206	
Loss time		L =	10	sec
Total Flow		=	1393	pcu
Co	= (1.5*L+5)/(1-Y)	=	25.2	sec
Cm	= L/(1-Y)	=	12.6	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	301.2	%
Cp	= 0.9*L/(0.9-Y)	=	13.0	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	293.9	%

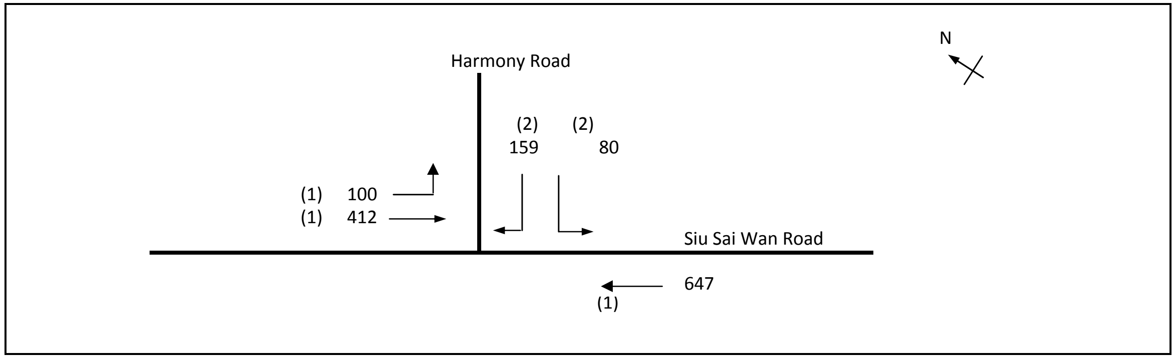


Stage A	I = 7	Stage B	I = 5		

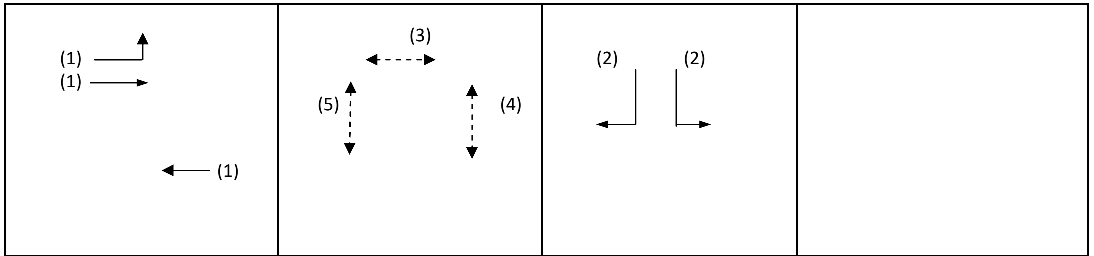
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	413			413	1.00	3857			3857	0.107			47	62	0.172	12	6
LT	A	4.00	2	2	24			4310	179			179	1.00	4056			4056	0.044			19	62	0.071	3	6
RT	A	3.50	2	2	11		y	4070			509	509	1.00	3582			3582	0.142	0.142		62	62	0.228	15	6
ST	B	3.50	3	2			y	4070		258		258	0.00	4070			4070	0.063	0.063		28	28	0.228	15	22
RT	B	4.50	3	2	13		y	4270			34	34	1.00	3828			3828	0.009			4	28	0.032	0	23
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV2 - Peak Hour Traffic Flows	FILENAME :/2_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2016 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	100 sec
Sum(y)		Y =	0.247
Loss time		L =	48 sec
Total Flow		=	1398 pcu
Co	= (1.5*L+5)/(1-Y)	=	102.3 sec
Cm	= L/(1-Y)	=	63.8 sec
Yult		=	0.540
R.C.ult	= (Yult-Y)/Y*100%	=	118.6 %
Cp	= 0.9*L/(0.9-Y)	=	66.2 sec
Ymax	= 1-L/C	=	0.520
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	89.4 %

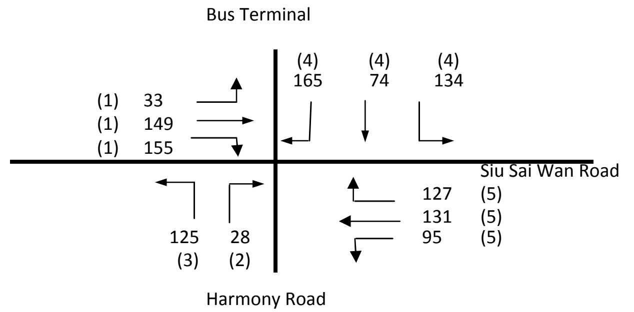


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

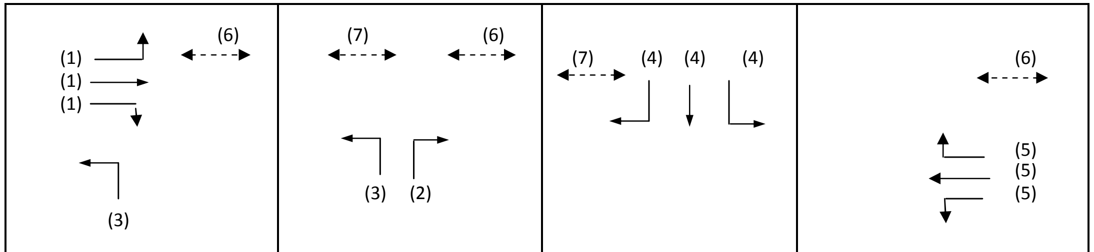
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	100	148		248	0.40	1844			1844	0.134			28	34	0.392	24	18
ST	A	3.20	1	1				2075		264		264	0.00	2075			2075	0.127			27	34	0.371	24	18
ST	A	3.00	1	2			y	3970		647		647	0.00	3970			3970	0.163	0.163		34	34	0.475	33	17
LT	C	3.75	2	1	12		y	1990	80			80	1.00	1769			1769	0.045			10	18	0.257	6	31
RT	C	3.75	2	1	12			2130			159	159	1.00	1893			1893	0.084	0.084		18	18	0.475	18	32
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV2 - Peak Hour Traffic Flows	FILENAME :/2_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.369
Loss time		L =	18 sec
Total Flow		=	1217 pcu
Co	= (1.5*L+5)/(1-Y)	=	50.7 sec
Cm	= L/(1-Y)	=	28.5 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	107.5 %
Cp	= 0.9*L/(0.9-Y)	=	30.5 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	102.3 %

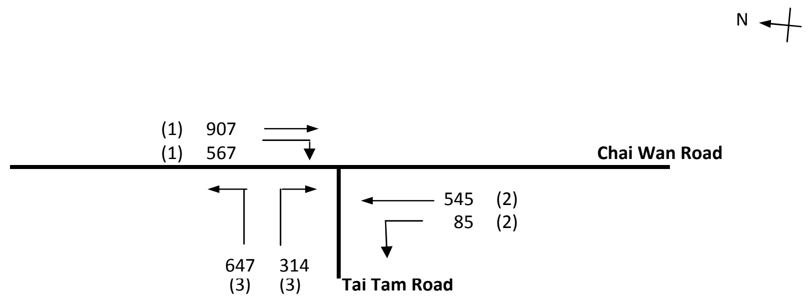


Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

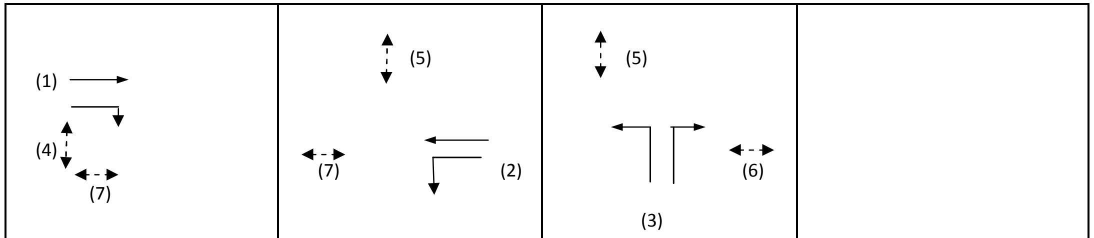
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	33	79		112	0.30	1870			1870	0.060			14	28	0.228	12	25
ST/RT	A	3.30	1	1	12			2085		70	155	225	0.69	1920			1920	0.117	0.117		28	28	0.445	24	25
RT	B	3.50	2	1	12			2105			28	28	1.00	1871			1871	0.015	0.015		4	4	0.445	0	64
LT	A,B	3.75	3	1	13		y	1990	125			125	1.00	1784			1784	0.070			16	36	0.202	12	20
RT	C	3.50	4	1	12			2105			165	165	1.00	1871			1871	0.088			21	27	0.343	18	26
LT/ST	C	3.50	4	1	12		y	1965	134	74		208	0.64	1818			1818	0.115	0.115		27	27	0.445	24	26
ST/RT	D	3.50	5	1	12			2105		0	127	127	1.00	1871			1871	0.068			16	16	0.445	18	36
LT/ST	D	3.50	5	1	11		y	1965	95	131		226	0.42	1859			1859	0.122	0.122		29	29	0.445	24	24
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV2 - Peak Hour Traffic Flows	FILENAME :/2_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2016 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	105 sec
Sum(y)		Y =	0.698
Loss time		L =	18 sec
Total Flow		=	3065 pcu
Co	= (1.5*L+5)/(1-Y)	=	106.1 sec
Cm	= L/(1-Y)	=	59.7 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	9.5 %
Cp	= 0.9*L/(0.9-Y)	=	80.4 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	6.8 %



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		907		907	0.00	4070			4070	0.223			28	28	0.843	57	28
RT	A	3.50	1	1	13			2105			567	567	1.00	1887			1887	0.300	0.300		37	28	1.137	72	34
ST	B	3.50	2	2				4210		545		545	0.00	4210			4210	0.129	0.129		16	16	0.843	39	43
LT	B	3.10	2	1	12		y	1925	85			85	1.00	1711			1711	0.050			6	16	0.325	12	35
LT	C	4.00	3	1	15		y	2015	492			492	1.00	1832			1832	0.269	0.269		33	33	0.843	54	31
LT/RT	C	4.00	3	1	15			2155	155		314	469	1.00	1959			1959	0.239			30	33	0.751	54	25
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

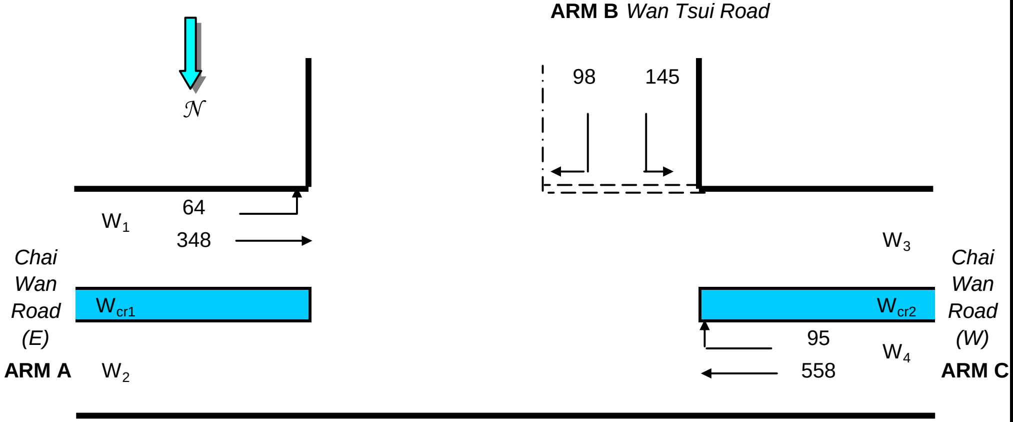
NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at Cape Collinson Road, Chai Wan - Junction Capacity Analysis

Prepared By:	KC
Checked By:	OC

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road
Design Year - 2016 Level 2 - Site 1
Time - Level 2 Peak Hour



GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	63.783	(pcu/hr)
q_{a-c}	=	347.93	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	557.89	(pcu/hr)
q_{c-b}	=	94.646	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	97.733	(pcu/hr)
q_{b-c}	=	145.28	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	778
Q_{c-b}	=	692
Q_{b-a}	=	383

COMPARISION OF DESIGN FLOW TO CAPACITY

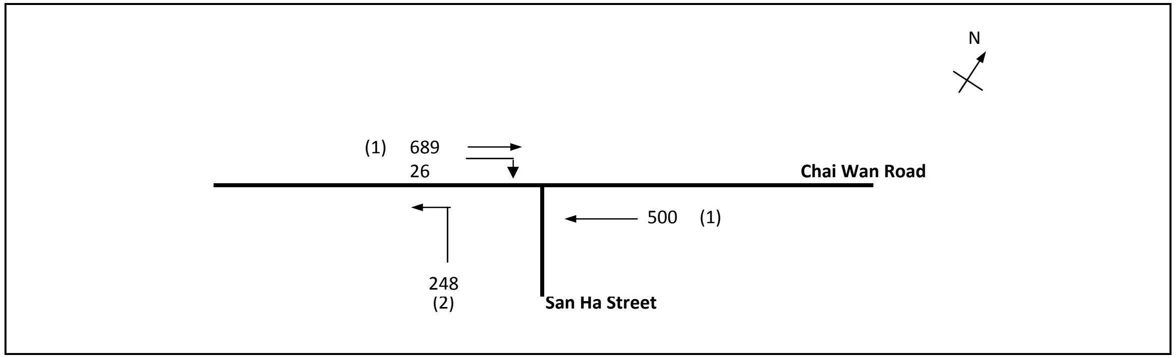
DFC_{b-a}	=	0.255
DFC_{b-c}	=	0.187
DFC_{c-b}	=	0.137

Critical DFC = 0.255

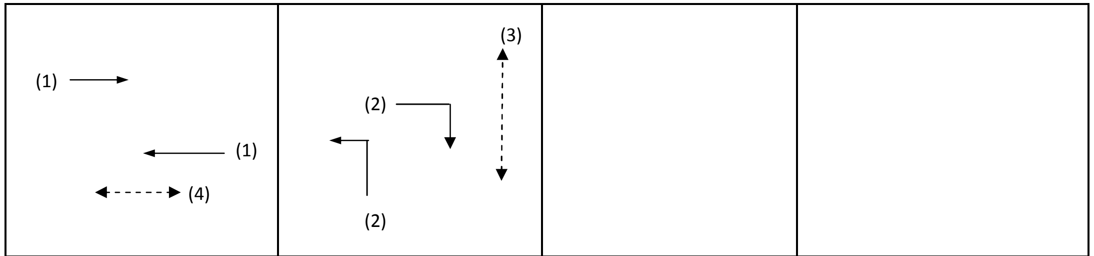
REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV2 - Peak Hour Traffic Flows	FILENAME :/2_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2016 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	100 sec
Sum(y)		Y =	0.318
Loss time		L =	10 sec
Total Flow		=	1462 pcu
Co	= (1.5*L+5)/(1-Y)	=	29.3 sec
Cm	= L/(1-Y)	=	14.7 sec
Yult		=	0.825
R.C.ult	= (Yult-Y)/Y*100%	=	159.4 %
Cp	= 0.9*L/(0.9-Y)	=	15.5 sec
Ymax	= 1-L/C	=	0.900
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	154.6 %

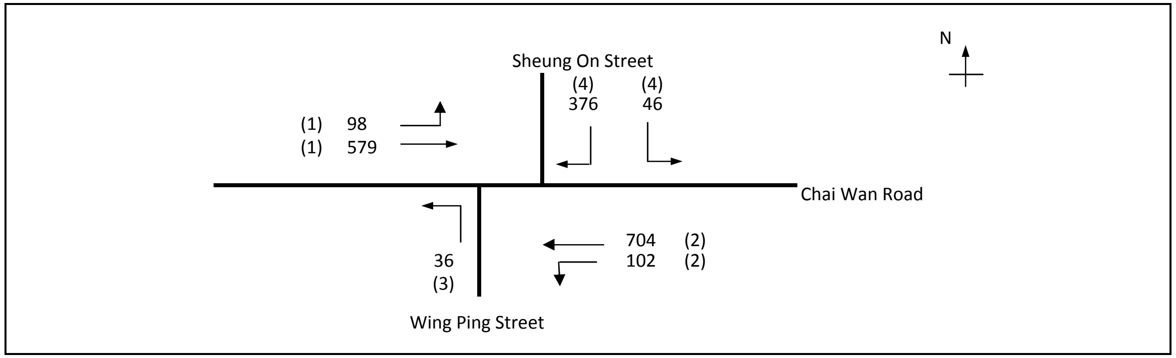


Stage A	I = 6	Stage B	I = 6	Stage C	I =	

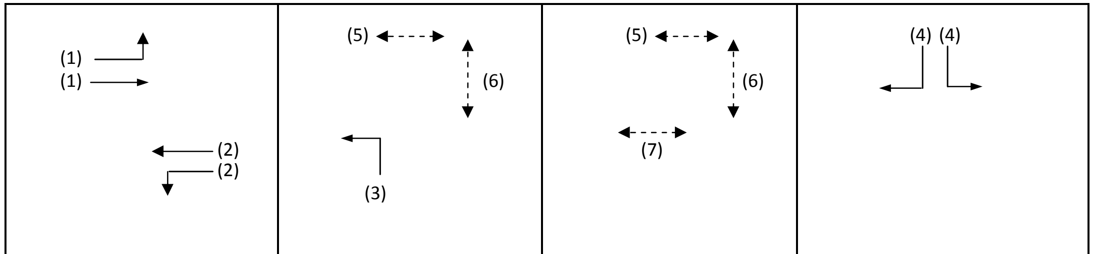
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		689		689	0.00	4070			4070	0.169	0.169		48	47	0.360	30	11
ST	A	3.50	1	2	10		N	4070		500		500	0.00	4070			4070	0.123			35	47	0.261	21	11
LT	B	3.00	2	1	10		N	1915	248			248	1.00	1665			1665	0.149	0.149		42	53	0.281	18	9
RT	B	3.50	2	1	12			2105			26	26	1.00	1871			1871	0.014			4	53	0.026	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV2 - Peak Hour Traffic Flows	FILENAME :/2_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	120 sec
Sum(y)		Y =	0.273
Loss time		L =	37 sec
Total Flow		=	1941 pcu
Co	= (1.5*L+5)/(1-Y)	=	83.2 sec
Cm	= L/(1-Y)	=	50.9 sec
Yult		=	0.623
R.C.ult	= (Yult-Y)/Y*100%	=	127.9 %
Cp	= 0.9*L/(0.9-Y)	=	53.1 sec
Ymax	= 1-L/C	=	0.692
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	127.9 %



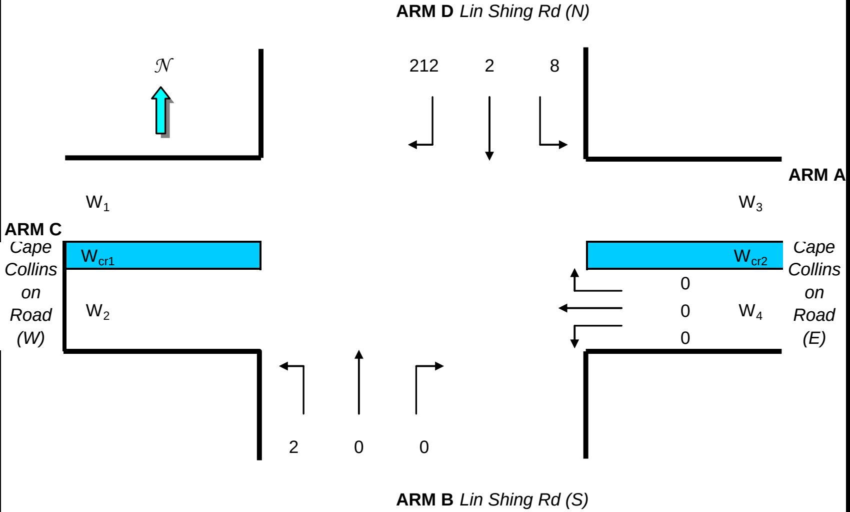
Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	98	579		677	0.14	6066			6066	0.112			34		0.000	44	54
LT/ST	A	3.30	2	3	12		Y	6115	102	704		806	0.13	6020			6020	0.134	0.134		41		0.000	52	54
LT	B	3.50	3	1	9		Y	1965	36			36	1.00	1684			1684	0.021	0.021		6		0.000	6	54
LT/RT	D	3.75	4	2	10		y	4120	46		376	422	1.00	3583			3583	0.118	0.118		36		0.000	42	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow	Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at	Prepared By:	KC
	Junction Capacity Analysis	Checked By:	OC

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2016 Level 3 - Reference Case
Time - Level 3 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{a-d}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
W_{d-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
W_{d-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
Vr_{a-d}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
Vl_{d-c}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)
MAJOR ROAD		(ARM A)	
W_{a-d}	=	3.00	(metres)
Vr_{a-d}	=	100	(metres)
q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	0	(pcu/hr)
q_{a-d}	=	0	(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)
q_{c-d}	=	0	(pcu/hr)
MINOR ROAD		(ARM B)	
W_{b-a}	=	5.00	(metres)
W_{b-c}	=	5.00	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	65	(metres)
Vr_{b-c}	=	0	(metres)
q_{b-a}	=	0	(pcu/hr)
q_{b-c}	=	2.0575	(pcu/hr)
q_{b-d}	=	0	(pcu/hr)
MINOR ROAD		(ARM D)	
W_{d-a}	=	3.00	(metres)
W_{d-c}	=	3.00	(metres)
Vl_{d-c}	=	50	(metres)
Vr_{d-c}	=	50	(metres)
Vr_{d-a}	=	80	(metres)
q_{d-a}	=	8.2301	(pcu/hr)
q_{d-b}	=	2.0575	(pcu/hr)
q_{d-c}	=	212.02	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

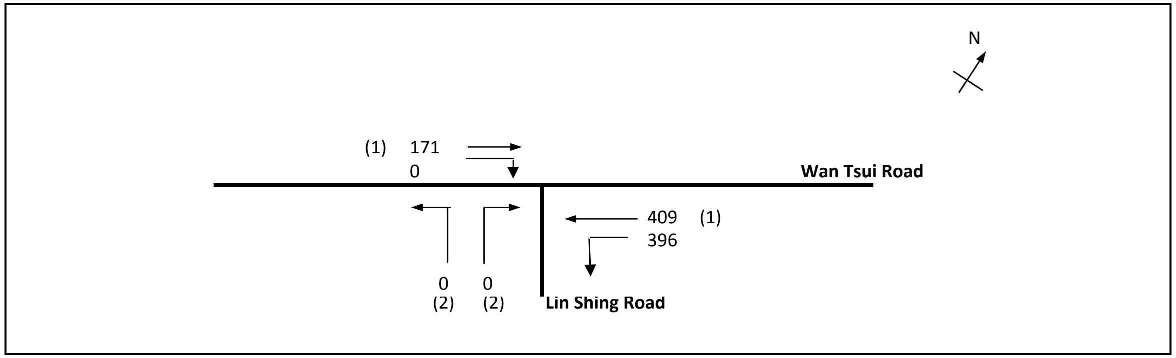
Q_{b-a}	=	617
Q_{b-c}	=	749
Q_{b-d} is nearside	=	TRUE
Q_{b-d}	=	611
Q_{d-a}	=	674
Q_{d-b} is nearside	=	TRUE
Q_{d-b}	=	533
Q_{d-c}	=	518
Q_{c-b}	=	437
Q_{a-d}	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

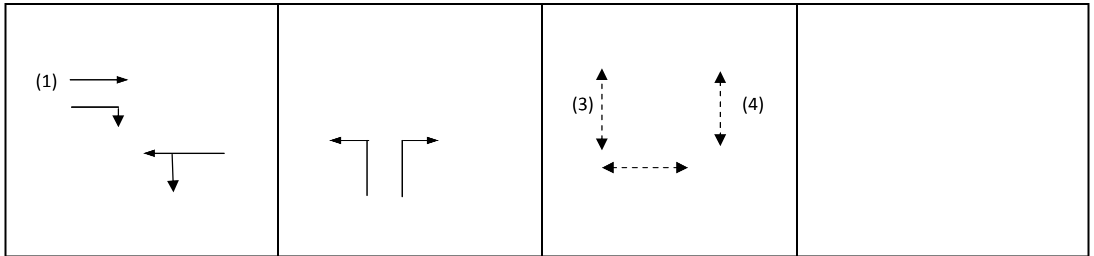
DFC_{b-a}	=	0.000
DFC_{b-c}	=	0.003
DFC_{b-d}	=	0.000
DFC_{d-a}	=	0.012
DFC_{d-b}	=	0.004
DFC_{d-c}	=	0.409
DFC_{c-b}	=	0.000
DFC_{a-d}	=	0.000

Critical DFC = 0.409

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
Junction of Lin Shing Road and Wan Tsui Road	J2LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 3 Peak Hour -Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.429	
Loss time		L =	55	sec
Total Flow		=	976	pcu
Co	= (1.5*L+5)/(1-Y)	=	153.3	sec
Cm	= L/(1-Y)	=	96.4	sec
Yult		=	0.488	
R.C.ult	= (Yult-Y)/Y*100%	=	13.6	%
Cp	= 0.9*L/(0.9-Y)	=	105.1	sec
Ymax	= 1-L/C	=	0.542	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	13.6	%

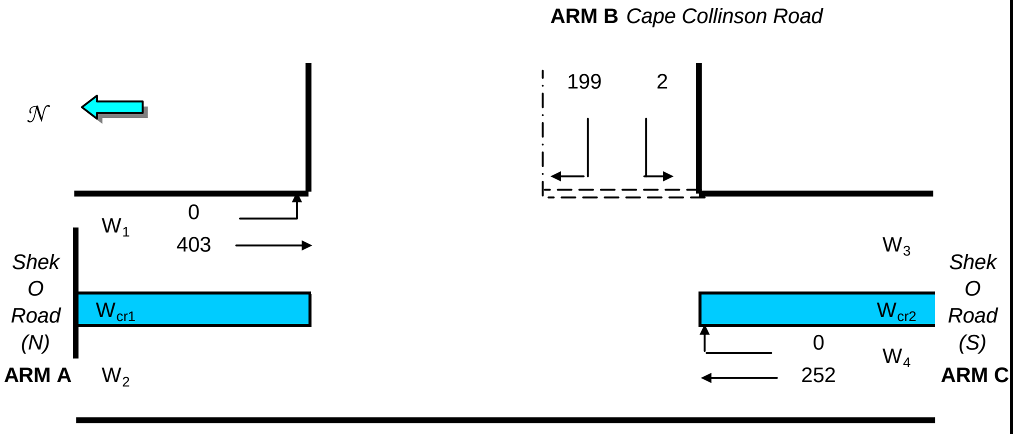


Stage A	I = 7	Stage B	I =	Stage C	I =

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		171		171	0.00	1915			1915	0.089			14	65	0.165	12	11
ST/LT	A	4.00	1	1	10		N	2015	396	409		805	0.49	1877			1877	0.429	0.429		65	65	0.792	72	13
Ped	B	6.0	3									0		6000						50					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2016 Level 3 - Reference Case
Time - Level 3 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	403	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	252	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	199	(pcu/hr)
q_{b-c}	=	2	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	639
Q_{c-b}	=	711
Q_{b-a}	=	302

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	0.657
DFC_{b-c}	=	0.003
DFC_{c-b}	=	0.000

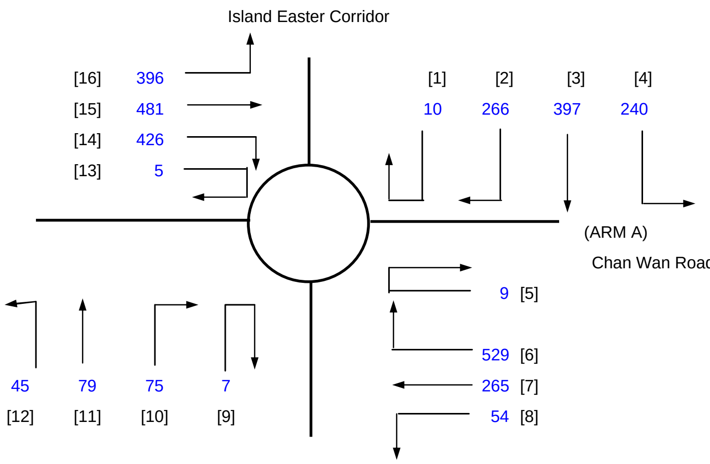
Critical DFC = 0.657

ROUNDABOUT CAPACITY ASSESSMENT

		INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	PROJECT NO.: 80510 PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout	FILENAME: 2016_LV3_Ref_J2_J5_J6_J7_J8.xls CHECKED BY:	OC	Sep-13
J4LV3 Peak Hour	REVIEWED BY:	OC	Sep-13

J4LV3 Peak Hour

(ARM D)
Island Easter Corridor



Wan Tsui Road
(ARM B)

(ARM D)
913.580004

1004

1308.941 (ARM C) 710 — 1112.595 857.4006 (ARM A)

1085

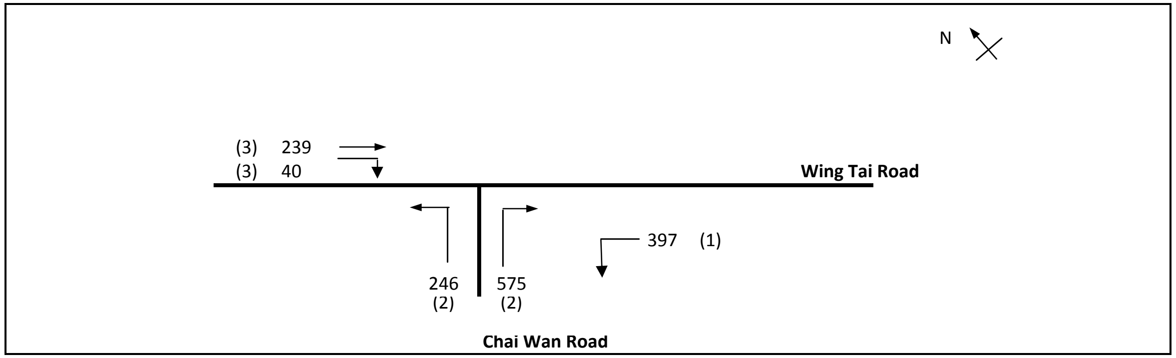
206.781726
(ARM B)

ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	857	207	1309	914
Qc	=	Circulating flow across entry (pcu/h)	1113	1085	710	1004
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1626	869	1942	1444
DFC	=	Design flow/Capacity = Q/Qe	0.53	0.24	0.67	0.63

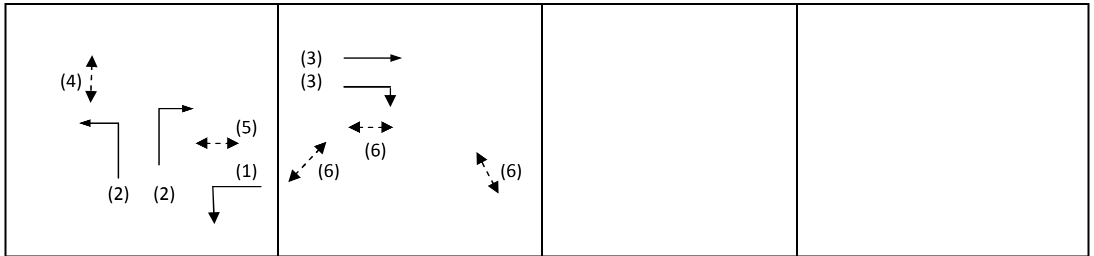
Total In Sum = 2551.645 PCU

DFC of Critical Approach = 0.67

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 3 Peak Hour -Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.219	
Loss time		L =	10	sec
Total Flow		=	1497	pcu
Co	= (1.5*L+5)/(1-Y)	=	25.6	sec
Cm	= L/(1-Y)	=	12.8	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	276.2	%
Cp	= 0.9*L/(0.9-Y)	=	13.2	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	269.3	%

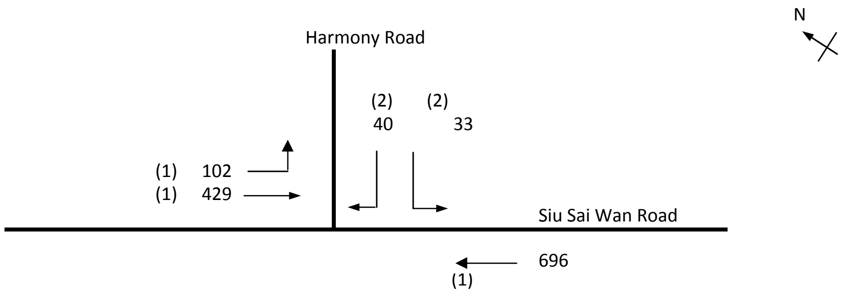


Stage A	I = 7	Stage B	I = 5		

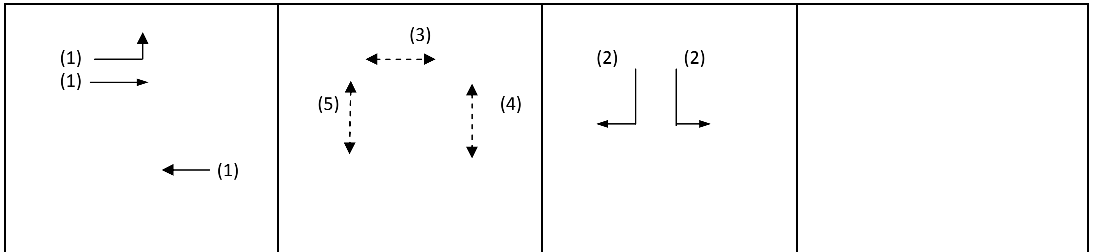
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	397			397	1.00	3857			3857	0.103			42	66	0.156	9	5
LT	A	4.00	2	2	24			4310	246			246	1.00	4056			4056	0.061			25	66	0.092	6	5
RT	A	3.50	2	2	11		y	4070			575	575	1.00	3582			3582	0.161	0.161		66	66	0.244	15	5
ST	B	3.50	3	2			y	4070		239		239	0.00	4070			4070	0.059	0.059		24	24	0.244	15	25
RT	B	4.50	3	2	13		y	4270			40	40	1.00	3828			3828	0.010			4	24	0.043	0	26
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2016 Level 3 Peak Hour -Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	100	sec
Sum(y)		Y =	0.197	
Loss time		L =	48	sec
Total Flow		=	1300	pcu
Co	= (1.5*L+5)/(1-Y)	=	95.8	sec
Cm	= L/(1-Y)	=	59.7	sec
Yult		=	0.540	
R.C.ult	= (Yult-Y)/Y*100%	=	174.6	%
Cp	= 0.9*L/(0.9-Y)	=	61.4	sec
Ymax	= 1-L/C	=	0.520	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	138.0	%

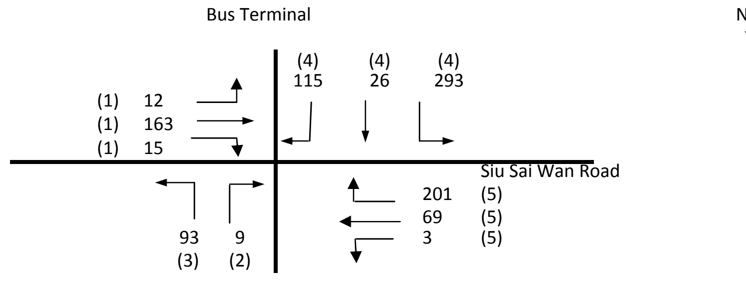


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

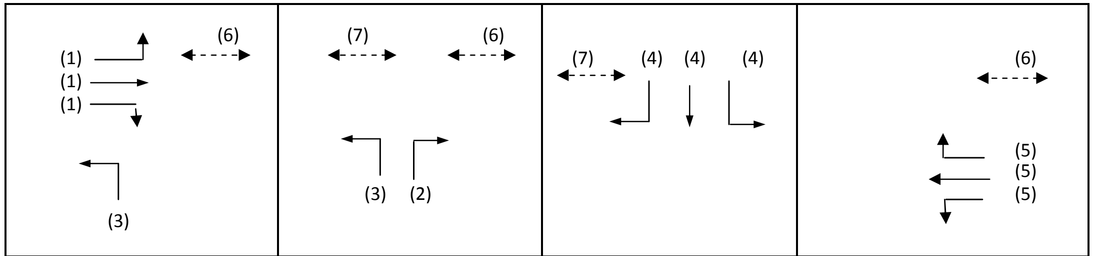
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	102	148		250	0.41	1843			1843	0.136			36	46	0.292	18	12
ST	A	3.20	1	1				2075		281		281	0.00	2075			2075	0.135			36	46	0.292	24	12
ST	A	3.00	1	2			y	3970		696		696	0.00	3970			3970	0.175	0.175		46	46	0.378	30	11
LT	C	3.75	2	1	12		y	1990	33			33	1.00	1769			1769	0.019			5	6	0.332	0	47
RT	C	3.75	2	1	12			2130			40	40	1.00	1893			1893	0.021	0.021		6	6	0.378	6	49
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 3 Peak Hour -Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.342
Loss time		L =	18 sec
Total Flow		=	999 pcu
Co	= (1.5*L+5)/(1-Y)	=	48.6 sec
Cm	= L/(1-Y)	=	27.3 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	124.0 %
Cp	= 0.9*L/(0.9-Y)	=	29.0 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	118.4 %

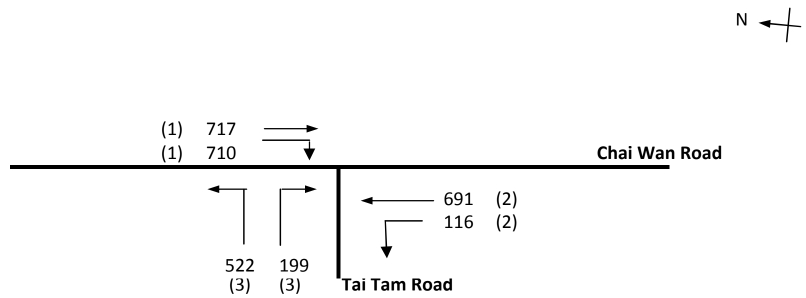


Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

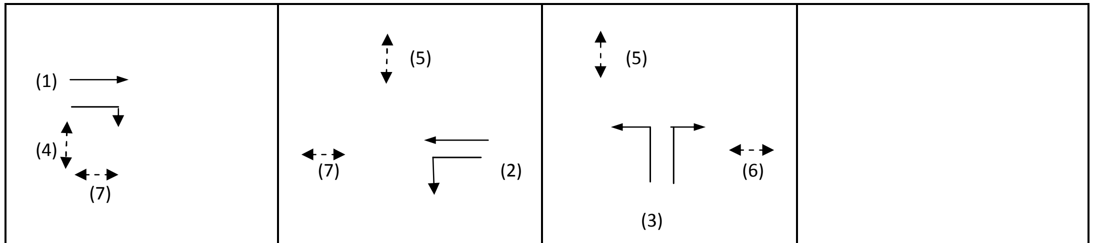
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	12	79		91	0.14	1910			1910	0.048			12	12	0.407	12	40
ST/RT	A	3.30	1	1	12			2085		84	15	99	0.16	2045			2045	0.048	0.048		12	12	0.412	12	40
RT	B	3.50	2	1	12			2105			9	9	1.00	1871			1871	0.005	0.005		1	1	0.412	0	96
LT	A,B	3.75	3	1	13		y	1990	93			93	1.00	1784			1784	0.052			13	19	0.293	12	32
RT	C	3.50	4	1	12			2105			115	115	1.00	1871			1871	0.062			16	46	0.140	6	14
LT/ST	C	3.50	4	1	12		y	1965	293	26		319	0.92	1762			1762	0.181	0.181		46	46	0.412	30	14
ST/RT	D	3.50	5	1	12			2105		0	201	201	1.00	1871			1871	0.107	0.107		27	27	0.412	24	25
LT/ST	D	3.50	5	1	11		y	1965	3	69		72	0.04	1954			1954	0.037			9	9	0.412	6	44
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 3 Peak Hour -Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	105 sec
Sum(y)		Y =	0.723
Loss time		L =	18 sec
Total Flow		=	2955 pcu
Co	= (1.5*L+5)/(1-Y)	=	115.6 sec
Cm	= L/(1-Y)	=	65.0 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	5.8 %
Cp	= 0.9*L/(0.9-Y)	=	91.6 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	3.1 %

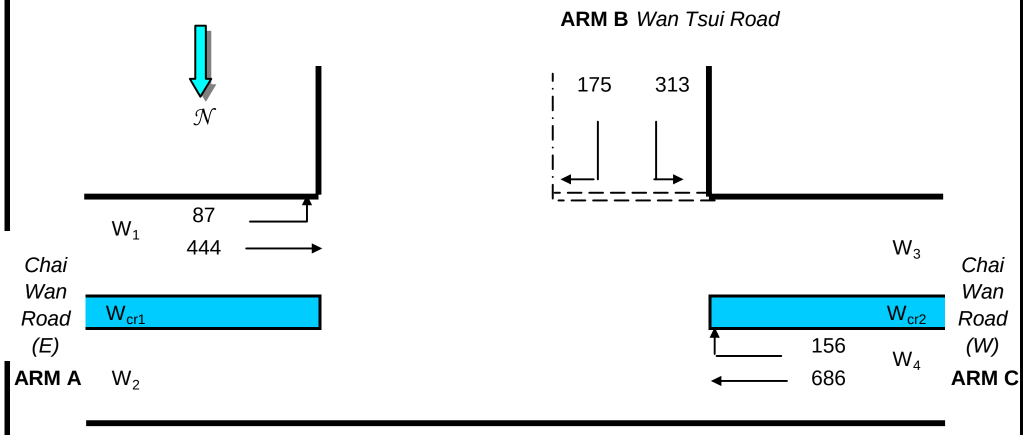


Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		717		717	0.00	4070			4070	0.176			21	21	0.873	48	42
RT	A	3.50	1	1	13			2105			710	710	1.00	1887			1887	0.376	0.376		45	21	1.865	96	42
ST	B	3.50	2	2				4210		691		691	0.00	4210			4210	0.164	0.164		20	20	0.873	48	43
LT	B	3.10	2	1	12		y	1925	116			116	1.00	1711			1711	0.068			8	20	0.361	12	32
LT	C	4.00	3	1	15		y	2015	363			363	1.00	1832			1832	0.198			24	24	0.873	54	35
LT/RT	C	4.00	3	1	15			2155	159		199	358	1.00	1959			1959	0.183	0.183		22	24	0.807	48	38
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road
Design Year - 2016 Level 3 - Reference Case
Time - Level 3 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	87	(pcu/hr)
q_{a-c}	=	444	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	686	(pcu/hr)
q_{c-b}	=	156	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	175	(pcu/hr)
q_{b-c}	=	313	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

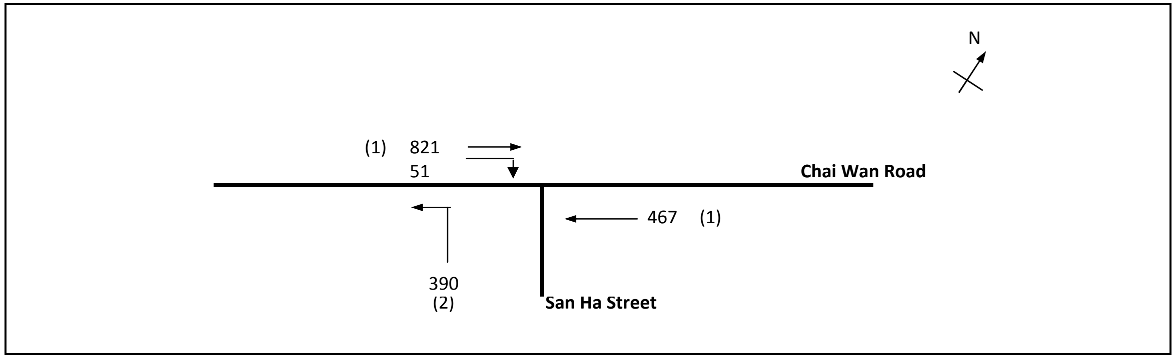
Q_{b-c}	=	764
Q_{c-b}	=	678
Q_{b-a}	=	361

COMPARISION OF DESIGN FLOW TO CAPACITY

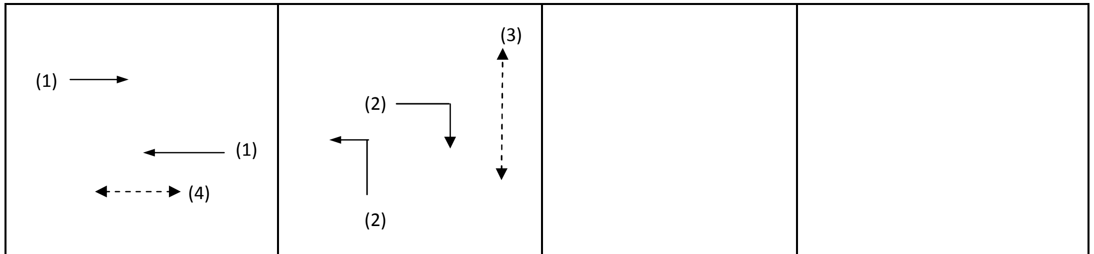
DFC_{b-a}	=	0.484
DFC_{b-c}	=	0.410
DFC_{c-b}	=	0.231

Critical DFC = 0.484

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 3 Peak Hour -Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.436	
Loss time		L =	10	sec
Total Flow		=	1730	pcu
Co	= (1.5*L+5)/(1-Y)	=	35.5	sec
Cm	= L/(1-Y)	=	17.7	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	89.3	%
Cp	= 0.9*L/(0.9-Y)	=	19.4	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	85.8	%

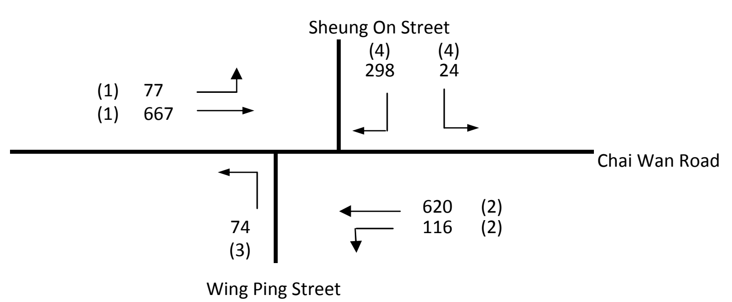


Stage A I = 6 | Stage B I = 6 | Stage C I =

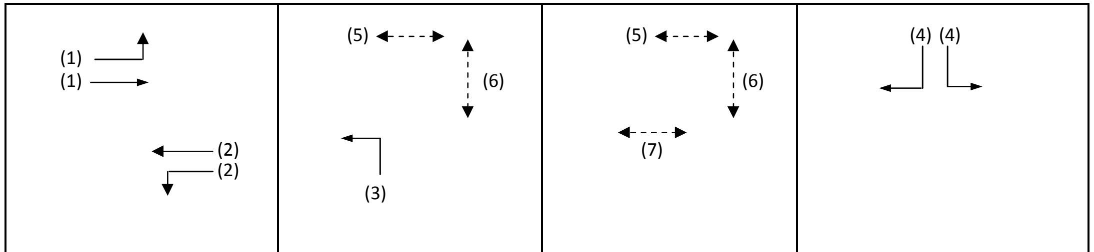
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		821		821	0.00	4070			4070	0.202	0.202		42	47	0.429	36	11
ST	A	3.50	1	2	10		N	4070		467		467	0.00	4070			4070	0.115			24	47	0.244	18	11
LT	B	3.00	2	1	10		N	1915	390			390	1.00	1665			1665	0.234	0.234		48	53	0.442	30	9
RT	B	3.50	2	1	12			2105			51	51	1.00	1871			1871	0.027			6	53	0.052	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2016 Level 3 Peak Hour -Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	120	sec
Sum(y)		Y =	0.257	
Loss time		L =	37	sec
Total Flow		=	1876	pcu
Co	= (1.5*L+5)/(1-Y)	=	81.4	sec
Cm	= L/(1-Y)	=	49.8	sec
Yult		=	0.623	
R.C.ult	= (Yult-Y)/Y*100%	=	142.5	%
Cp	= 0.9*L/(0.9-Y)	=	51.8	sec
Ymax	= 1-L/C	=	0.692	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	142.5	%



Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

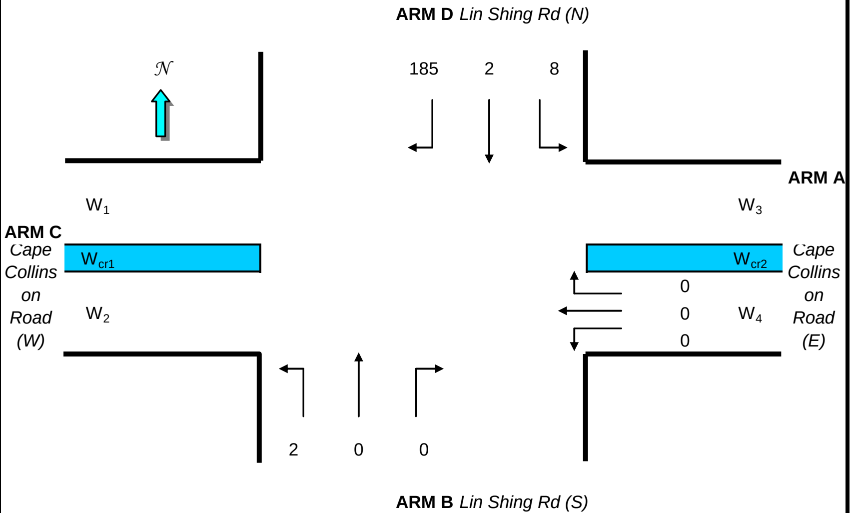
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	77	667		744	0.10	6096			6096	0.122			39		0.000	48	54
LT/ST	A	3.30	2	3	12		Y	6115	116	620		737	0.16	5997			5997	0.123	0.123		40		0.000	48	54
LT	B	3.50	3	1	9		Y	1965	74			74	1.00	1684			1684	0.044	0.044		14		0.000	12	54
LT/RT	D	3.75	4	2	10		y	4120	24		298	322	1.00	3583			3583	0.090	0.090		29		0.000	30	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at
Junction Capacity Analysis

Prepared By: KC
Checked By: OC

Junction layout sketch - **J1: J/O Cape Collinson Road and Lin Shing Road**
Design Year - **2016 Level 3 - Site 1**
Time - **Level 3 Peak Hour**



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{a-d}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
W_{d-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
W_{d-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
Vr_{a-d}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
Vl_{d-c}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

W_{a-d}	=	3.00	(metres)
Vr_{a-d}	=	100	(metres)
q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	0	(pcu/hr)
q_{a-d}	=	0	(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)
q_{c-d}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	5.00	(metres)
W_{b-c}	=	5.00	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	65	(metres)
Vr_{b-c}	=	0	(metres)
q_{b-a}	=	0	(pcu/hr)
q_{b-c}	=	2.0575	(pcu/hr)
q_{b-d}	=	0	(pcu/hr)

MINOR ROAD (ARM D)

W_{d-a}	=	3.00	(metres)
W_{d-c}	=	3.00	(metres)
Vl_{d-c}	=	50	(metres)
Vr_{d-c}	=	50	(metres)
Vr_{d-a}	=	80	(metres)
q_{d-a}	=	8.2301	(pcu/hr)
q_{d-b}	=	2.0575	(pcu/hr)
q_{d-c}	=	184.56	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

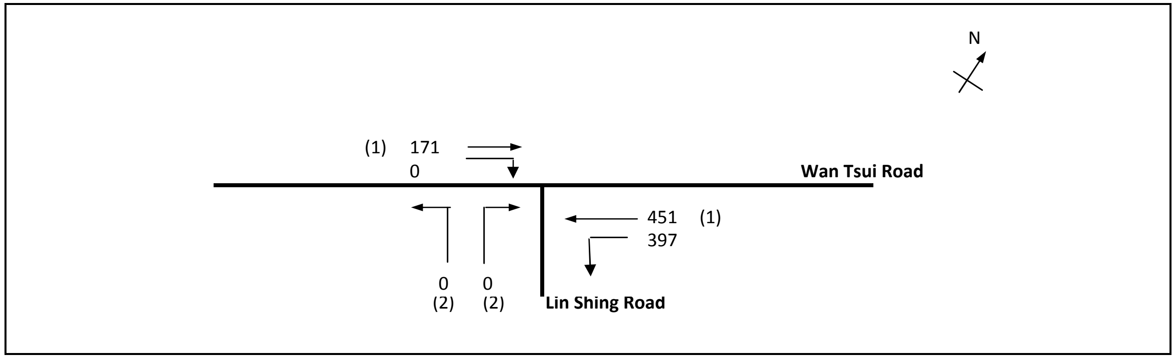
Q_{b-a}	=	621
Q_{b-c}	=	749
Q_{b-d} is nearside	=	TRUE
Q_{b-d}	=	611
Q_{d-a}	=	674
Q_{d-b} is nearside	=	TRUE
Q_{d-b}	=	533
Q_{d-c}	=	518
Q_{c-b}	=	437
Q_{a-d}	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

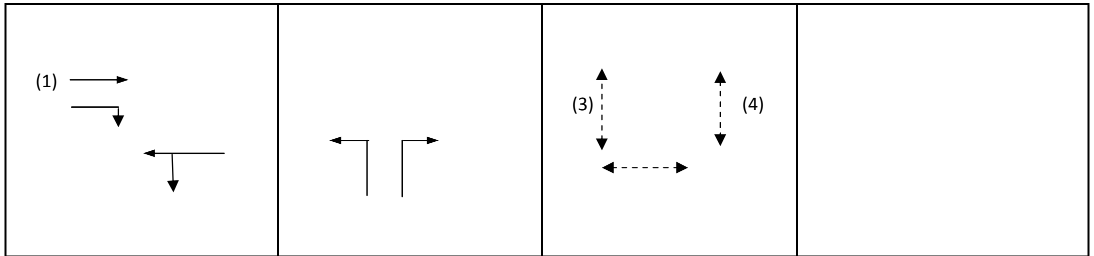
DFC_{b-a}	=	0.000
DFC_{b-c}	=	0.003
DFC_{b-d}	=	0.000
DFC_{d-a}	=	0.012
DFC_{d-b}	=	0.004
DFC_{d-c}	=	0.356
DFC_{c-b}	=	0.000
DFC_{a-d}	=	0.000

Critical DFC = 0.356

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J2: Junction of Lin Shing Road and Wan Tsui Road	J2LV3 - Peak Hour Traffic Flows	FILENAME :/3_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2016 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.451	
Loss time		L =	25	sec
Total Flow		=	1019	pcu
Co	= (1.5*L+5)/(1-Y)	=	77.4	sec
Cm	= L/(1-Y)	=	45.5	sec
Yult		=	0.713	
R.C.ult	= (Yult-Y)/Y*100%	=	58.1	%
Cp	= 0.9*L/(0.9-Y)	=	50.1	sec
Ymax	= 1-L/C	=	0.792	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	58.1	%



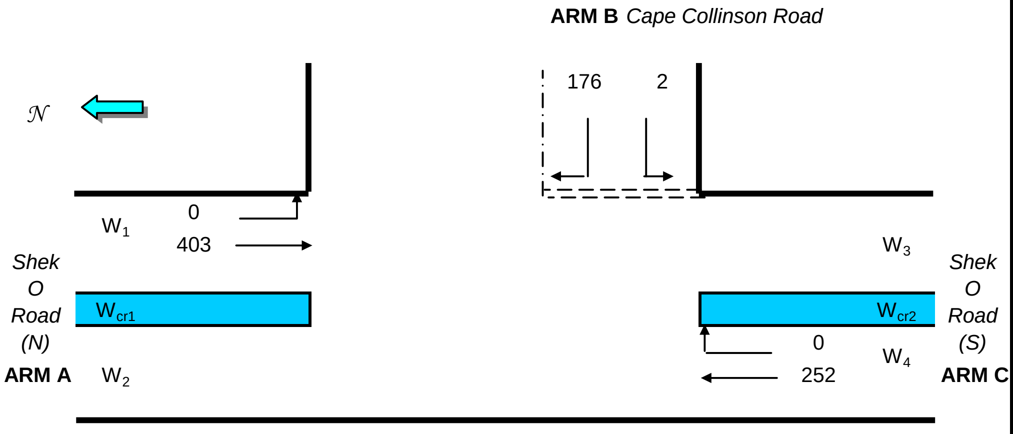
Stage A I = 7	Stage B I =	Stage C I =	

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		171		171	0.00	1915			1915	0.089			19	95	0.113	6	2
ST/LT	A	4.00	1	1	10		N	2015	397	451		849	0.47	1883			1883	0.451	0.451		95	95	0.569	30	3
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow	Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at (	Prepared By:	KC
	Junction Capacity Analysis	Checked By:	OC

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2016 Level 3 - Site 1
Time - Level 3 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	403	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	252	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	176	(pcu/hr)
q_{b-c}	=	2	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

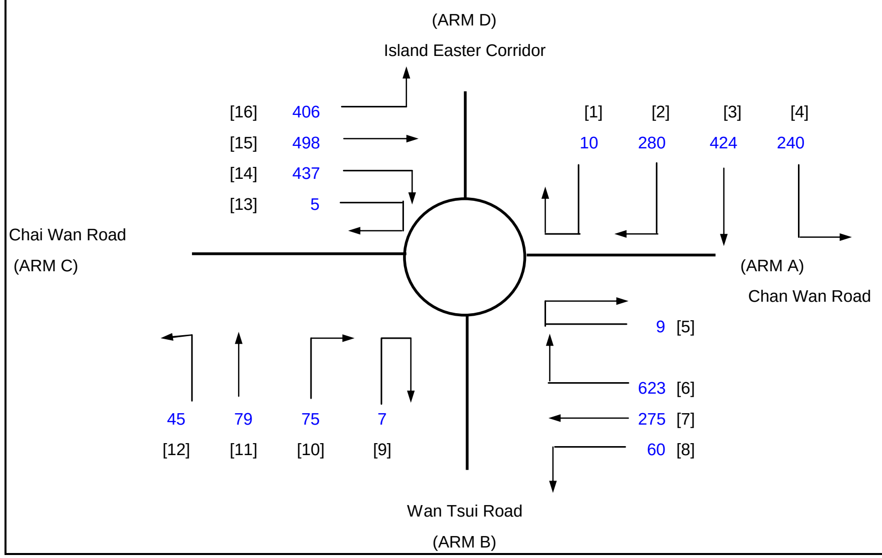
Q_{b-c}	=	639
Q_{c-b}	=	711
Q_{b-a}	=	302

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	0.583
DFC_{b-c}	=	0.003
DFC_{c-b}	=	0.000

Critical DFC = 0.583

	ROUNDABOUT CAPACITY ASSESSMENT			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	J4LV3 Peak Hour	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME2016_LV3_S1_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV3 Peak Hour			REVIEWED BY:	OC	Sep-13



(ARM D)
954.253933

1031

804 1345.847 (ARM C) 1163.689 966.9029 (ARM A)

1203

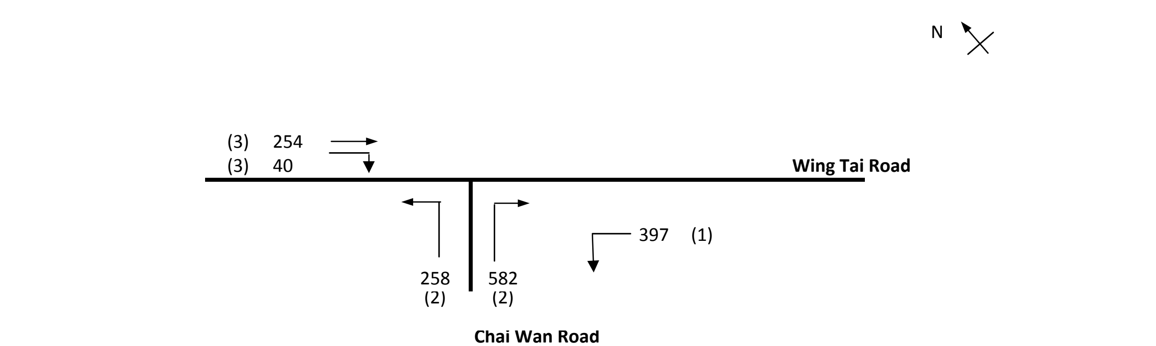
206.781726
(ARM B)

ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	967	207	1346	954
Qc	=	Circulating flow across entry (pcu/h)	1164	1203	804	1031
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1587	804	1871	1425
DFC	=	Design flow/Capacity = Q/Qe	0.61	0.26	0.72	0.67

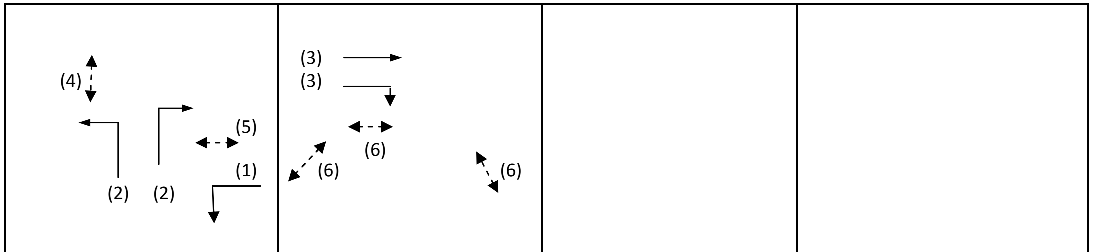
Total In Sum = 2722.742 PCU

DFC of Critical Approach = 0.72

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV3 - Peak Hour Traffic Flows	FILENAME :/3_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2016 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	100 sec
Sum(y)		Y =	0.225
Loss time		L =	10 sec
Total Flow		=	1531 pcu
Co	= (1.5*L+5)/(1-Y)	=	25.8 sec
Cm	= L/(1-Y)	=	12.9 sec
Yult		=	0.825
R.C.ult	= (Yult-Y)/Y*100%	=	266.8 %
Cp	= 0.9*L/(0.9-Y)	=	13.3 sec
Ymax	= 1-L/C	=	0.900
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	260.1 %

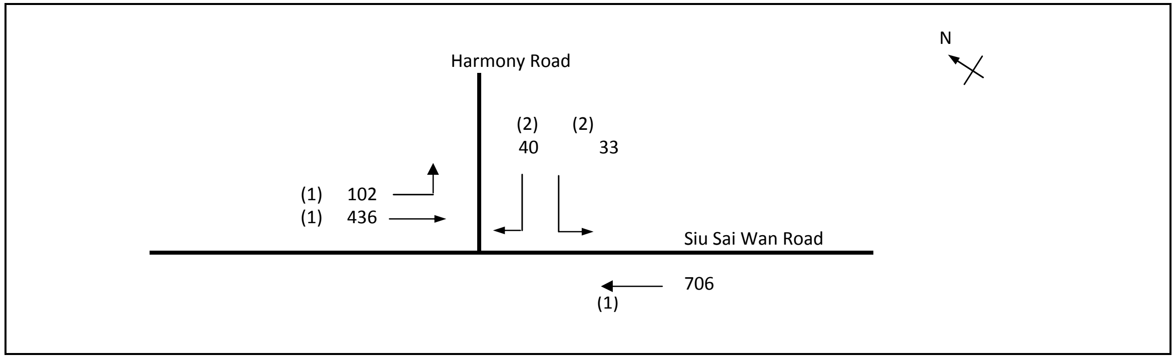


Stage A I = 7 | Stage B I = 5

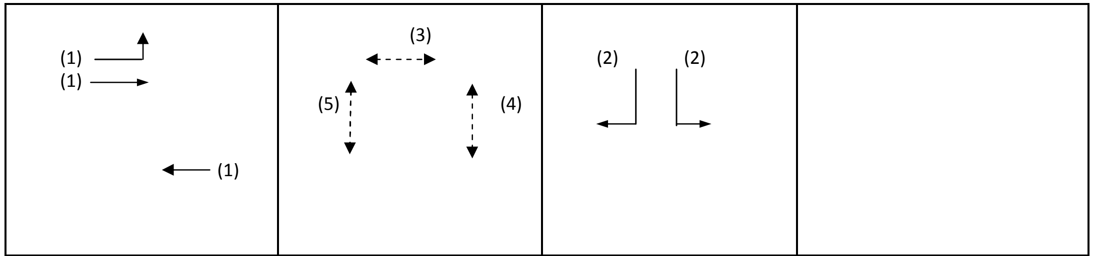
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	397			397	1.00	3857			3857	0.103			41	65	0.158	9	5
LT	A	4.00	2	2	24			4310	258			258	1.00	4056			4056	0.064			25	65	0.098	6	5
RT	A	3.50	2	2	11		y	4070			582	582	1.00	3582			3582	0.162	0.162		65	65	0.250	15	5
ST	B	3.50	3	2			y	4070		254		254	0.00	4070			4070	0.062	0.062		25	25	0.250	15	24
RT	B	4.50	3	2	13		y	4270			40	40	1.00	3828			3828	0.010			4	25	0.042	0	25
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV3 - Peak Hour Traffic Flows	FILENAME :/3_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2016 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	100	sec
Sum(y)		Y =	0.199	
Loss time		L =	48	sec
Total Flow		=	1316	pcu
Co	= (1.5*L+5)/(1-Y)	=	96.1	sec
Cm	= L/(1-Y)	=	59.9	sec
Yult		=	0.540	
R.C.ult	= (Yult-Y)/Y*100%	=	171.4	%
Cp	= 0.9*L/(0.9-Y)	=	61.6	sec
Ymax	= 1-L/C	=	0.520	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	135.2	%

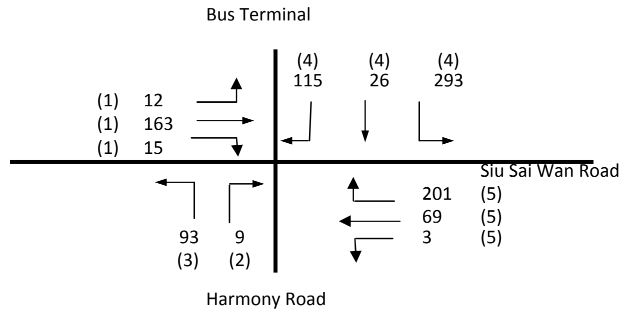


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

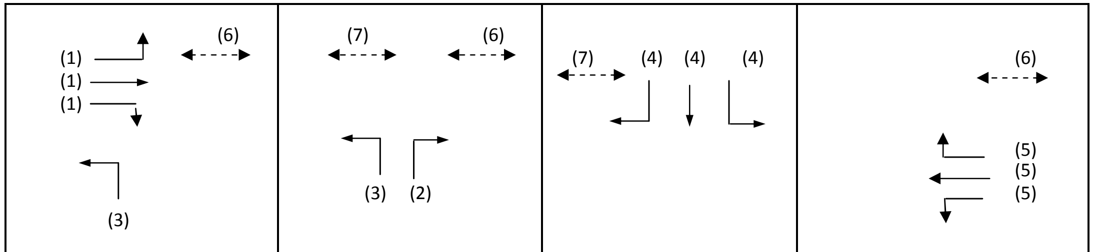
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	102	148		250	0.41	1843			1843	0.136			35	46	0.292	18	12
ST	A	3.20	1	1				2075		288		288	0.00	2075			2075	0.139			36	46	0.299	24	12
ST	A	3.00	1	2			y	3970		706		706	0.00	3970			3970	0.178	0.178		46	46	0.383	30	11
LT	C	3.75	2	1	12		y	1990	33			33	1.00	1769			1769	0.019			5	6	0.336	0	48
RT	C	3.75	2	1	12			2130			40	40	1.00	1893			1893	0.021	0.021		6	6	0.383	6	49
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV3 - Peak Hour Traffic Flows	FILENAME :/3_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2016 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.342
Loss time		L =	18 sec
Total Flow		=	999 pcu
Co	= (1.5*L+5)/(1-Y)	=	48.6 sec
Cm	= L/(1-Y)	=	27.3 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	124.0 %
Cp	= 0.9*L/(0.9-Y)	=	29.0 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	118.4 %

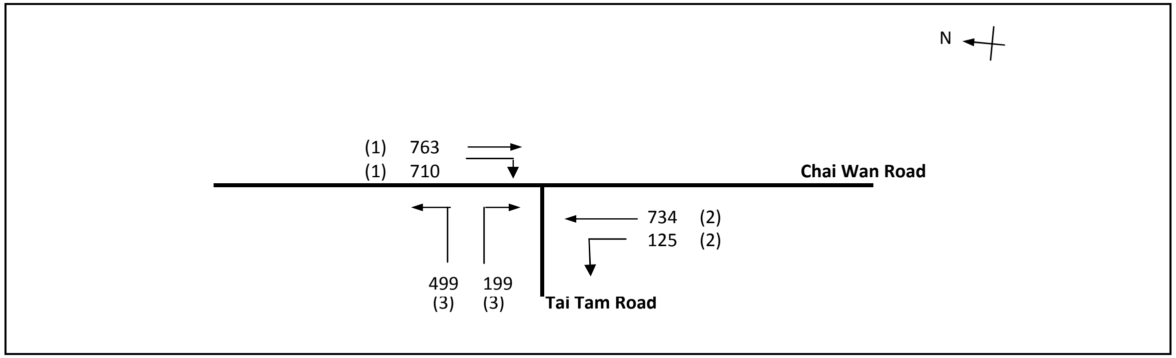


Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

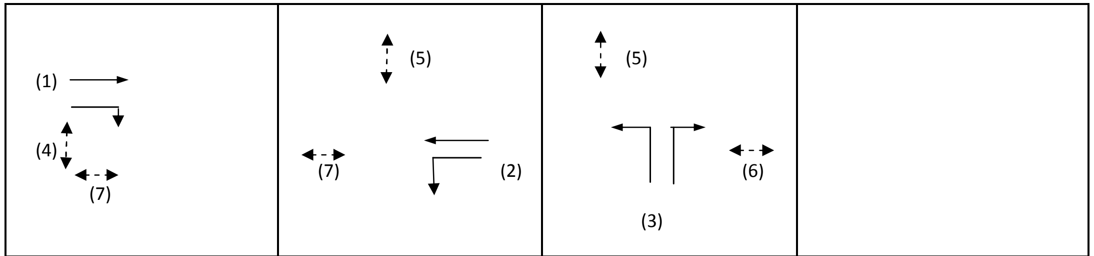
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	12	79		91	0.14	1910			1910	0.048			12	12	0.407	12	40
ST/RT	A	3.30	1	1	12			2085		84	15	99	0.16	2045			2045	0.048	0.048		12	12	0.412	12	40
RT	B	3.50	2	1	12			2105			9	9	1.00	1871			1871	0.005	0.005		1	1	0.412	0	96
LT	A,B	3.75	3	1	13		y	1990	93			93	1.00	1784			1784	0.052			13	19	0.293	12	32
RT	C	3.50	4	1	12			2105			115	115	1.00	1871			1871	0.062			16	46	0.140	6	14
LT/ST	C	3.50	4	1	12		y	1965	293	26		319	0.92	1762			1762	0.181	0.181		46	46	0.412	30	14
ST/RT	D	3.50	5	1	12			2105		0	201	201	1.00	1871			1871	0.107	0.107		27	27	0.412	24	25
LT/ST	D	3.50	5	1	11		y	1965	3	69		72	0.04	1954			1954	0.037			9	9	0.412	6	44
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV3 - Peak Hour Traffic Flows	FILENAME :/3_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	105	sec
Sum(y)		Y =	0.732	
Loss time		L =	18	sec
Total Flow		=	3031	pcu
Co	= (1.5*L+5)/(1-Y)	=	119.2	sec
Cm	= L/(1-Y)	=	67.0	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	4.6	%
Cp	= 0.9*L/(0.9-Y)	=	96.1	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	1.9	%

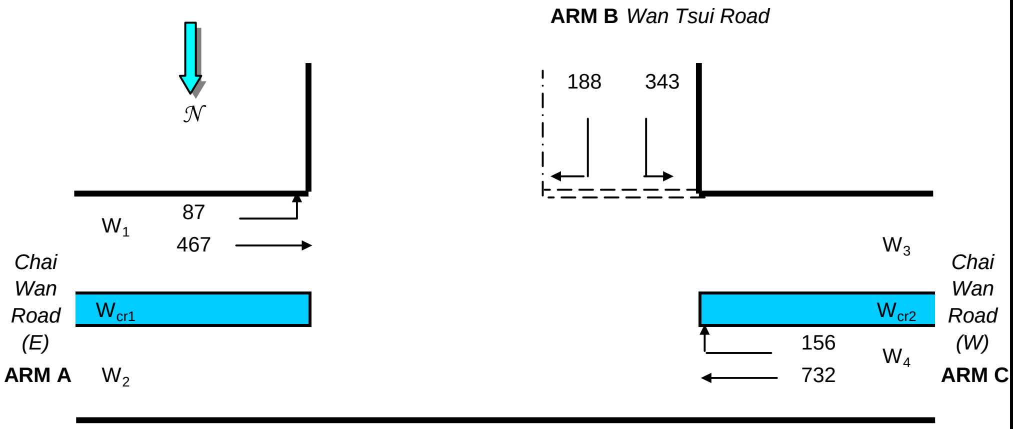


Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		763		763	0.00	4070			4070	0.187			22	22	0.883	51	41
RT	A	3.50	1	1	13			2105			710	710	1.00	1887			1887	0.376	0.376		45	22	1.772	96	41
ST	B	3.50	2	2				4210		734		734	0.00	4210			4210	0.174	0.174		21	21	0.883	51	42
LT	B	3.10	2	1	12		y	1925	125			125	1.00	1711			1711	0.073			9	21	0.371	12	31
LT	C	4.00	3	1	15		y	2015	344			344	1.00	1832			1832	0.188			22	22	0.883	54	36
LT/RT	C	4.00	3	1	15			2155	155		199	354	1.00	1959			1959	0.181	0.181		22	22	0.850	48	36
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road
Design Year - 2016 Level 3 - Site 1
Time - Level 3 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	87.445	(pcu/hr)
q_{a-c}	=	467.39	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	731.88	(pcu/hr)
q_{c-b}	=	156.37	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	187.6	(pcu/hr)
q_{b-c}	=	343.09	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

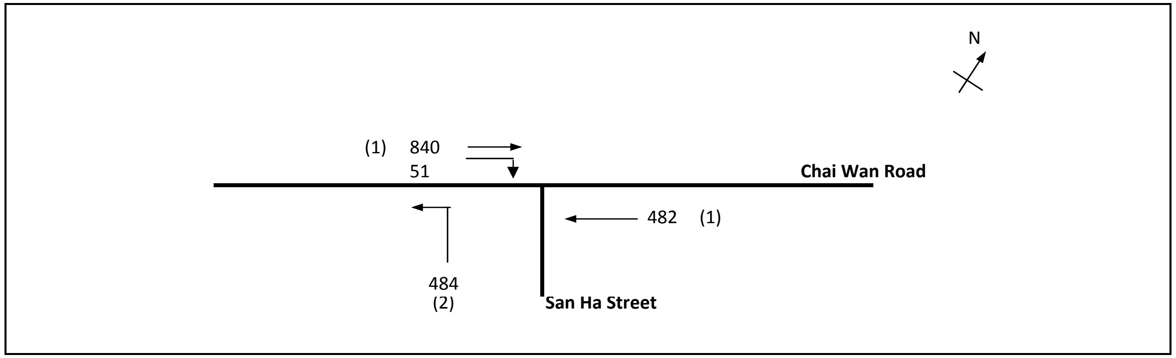
Q_{b-c}	=	761
Q_{c-b}	=	676
Q_{b-a}	=	357

COMPARISION OF DESIGN FLOW TO CAPACITY

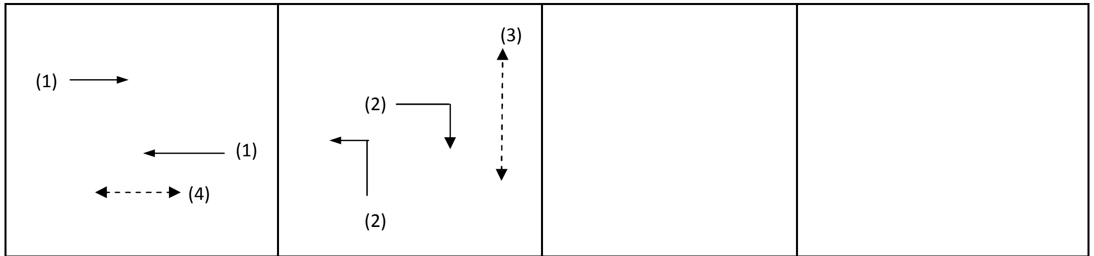
DFC_{b-a}	=	0.525
DFC_{b-c}	=	0.451
DFC_{c-b}	=	0.231

Critical DFC = 0.525

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV3 - Peak Hour Traffic Flows	FILENAME :/3_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.497	
Loss time		L =	10	sec
Total Flow		=	1858	pcu
Co	= (1.5*L+5)/(1-Y)	=	39.8	sec
Cm	= L/(1-Y)	=	19.9	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	65.9	%
Cp	= 0.9*L/(0.9-Y)	=	22.3	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	62.9	%

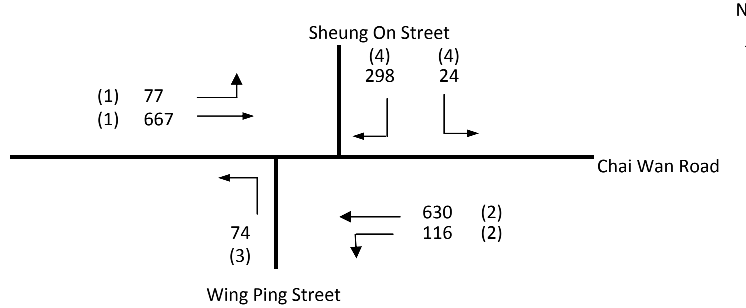


Stage A	I = 6	Stage B	I = 6	Stage C	I =

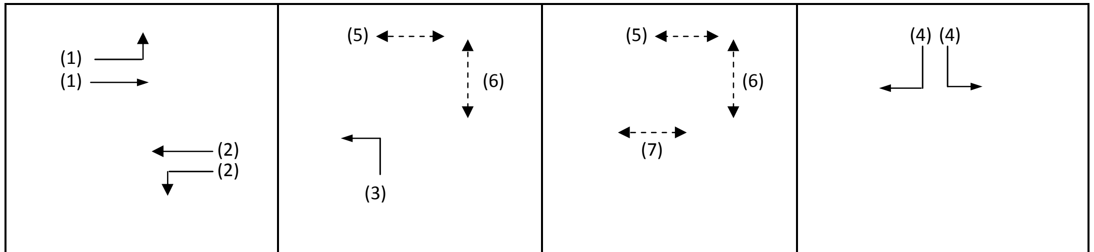
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		840		840	0.00	4070			4070	0.206	0.206		37	47	0.439	36	11
ST	A	3.50	1	2	10		N	4070		482		482	0.00	4070			4070	0.119			21	47	0.252	21	11
LT	B	3.00	2	1	10		N	1915	484			484	1.00	1665			1665	0.291	0.291		53	53	0.549	36	9
RT	B	3.50	2	1	12			2105			51	51	1.00	1871			1871	0.027			5	53	0.052	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV3 - Peak Hour Traffic Flows	FILENAME :/3_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2016 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	120	sec
Sum(y)		Y =	0.258	
Loss time		L =	37	sec
Total Flow		=	1886	pcu
Co	= (1.5*L+5)/(1-Y)	=	81.6	sec
Cm	= L/(1-Y)	=	49.9	sec
Yult		=	0.623	
R.C.ult	= (Yult-Y)/Y*100%	=	141.1	%
Cp	= 0.9*L/(0.9-Y)	=	51.9	sec
Ymax	= 1-L/C	=	0.692	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	141.1	%



Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	77	667		744	0.10	6096			6096	0.122			39		0.000	48	54
LT/ST	A	3.30	2	3	12		Y	6115	116	630		746	0.16	5998			5998	0.124	0.124		40		0.000	48	54
LT	B	3.50	3	1	9		Y	1965	74			74	1.00	1684			1684	0.044	0.044		14		0.000	12	54
LT/RT	D	3.75	4	2	10		y	4120	24		298	322	1.00	3583			3583	0.090	0.090		29		0.000	30	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

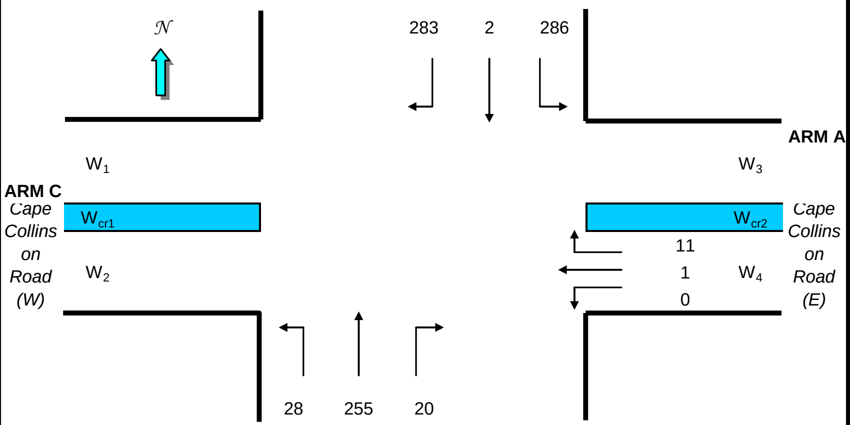
Appendix B3

2021 Peak Hour Junction Assessment Calculation Sheets

Halcrow | **Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at C** | **Prepared By:** | **KC**
Junction Capacity Analysis | **Checked By:** | **OC**

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2021 Level 1 - Reference Case
Time - Level 1 Peak Hour

ARM D *Lin Shing Rd (N)*



ARM B *Lin Shing Rd (S)*

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{a\text{-}d}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$W_{d\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
$W_{d\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
$Vr_{a\text{-}d}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
$Vl_{d\text{-}c}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)
MAJOR ROAD			**(ARM A)**
$W_{a\text{-}d}$	=	3.00	(metres)
$Vr_{a\text{-}d}$	=	100	(metres)
$q_{a\text{-}b}$	=	0	(pcu/hr)
$q_{a\text{-}c}$	=	1.0575	(pcu/hr)
$q_{a\text{-}d}$	=	10.518	(pcu/hr)
MAJOR ROAD			**(ARM C)**
$W_{c\text{-}b}$	=		(metres)
$Vr_{c\text{-}b}$	=		(metres)
$q_{c\text{-}a}$	=	0	(pcu/hr)
$q_{c\text{-}b}$	=	0	(pcu/hr)
$q_{c\text{-}d}$	=	0	(pcu/hr)
MINOR ROAD			**(ARM B)**
$W_{b\text{-}a}$	=	5.00	(metres)
$W_{b\text{-}c}$	=	5.00	(metres)
$Vl_{b\text{-}a}$	=	100	(metres)
$Vr_{b\text{-}a}$	=	65	(metres)
$Vr_{b\text{-}c}$	=	0	(metres)
$q_{b\text{-}a}$	=	20.093	(pcu/hr)
$q_{b\text{-}c}$	=	28	(pcu/hr)
$q_{b\text{-}d}$	=	254.73	(pcu/hr)
MINOR ROAD			**(ARM D)**
$W_{d\text{-}a}$	=	3.00	(metres)
$W_{d\text{-}c}$	=	3.00	(metres)
$Vl_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}a}$	=	80	(metres)
$q_{d\text{-}a}$	=	286	(pcu/hr)
$q_{d\text{-}b}$	=	2	(pcu/hr)
$q_{d\text{-}c}$	=	283	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

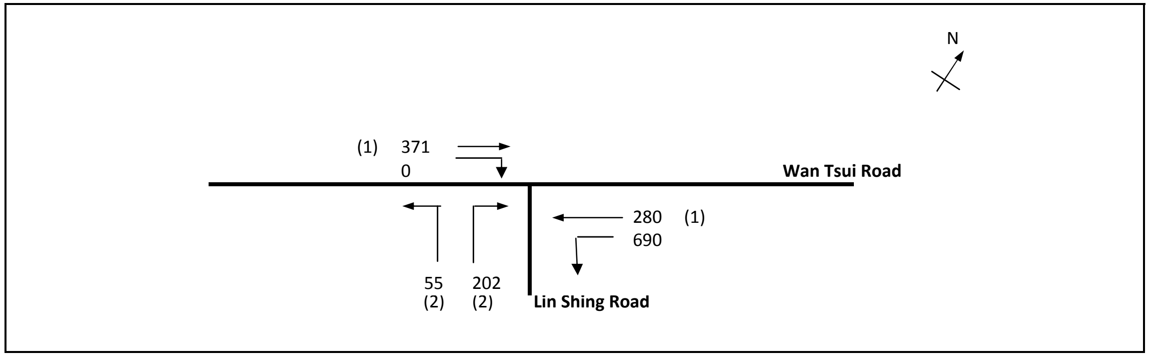
$Q_{b\text{-}a}$	=	519
$Q_{b\text{-}c}$	=	749
$Q_{b\text{-}d}$ is nearside	=	TRUE
$Q_{b\text{-}d}$	=	608
$Q_{d\text{-}a}$	=	674
$Q_{d\text{-}b}$ is nearside	=	TRUE
$Q_{d\text{-}b}$	=	528
$Q_{d\text{-}c}$	=	445
$Q_{c\text{-}b}$	=	440
$Q_{a\text{-}d}$	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

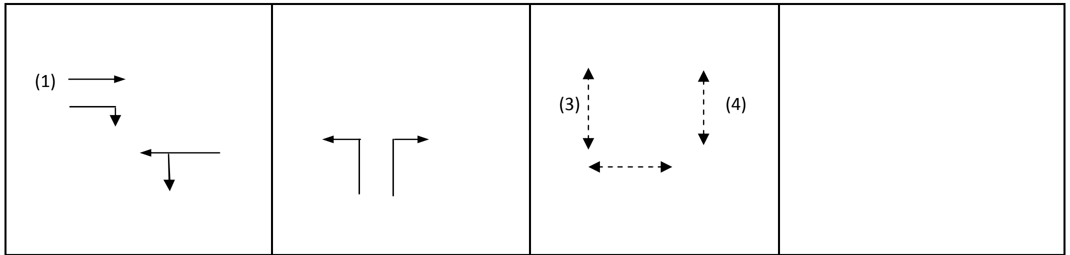
$DFC_{b\text{-}a}$	=	0.039
$DFC_{b\text{-}c}$	=	0.038
$DFC_{b\text{-}d}$	=	0.419
$DFC_{d\text{-}a}$	=	0.424
$DFC_{d\text{-}b}$	=	0.004
$DFC_{d\text{-}c}$	=	0.637
$DFC_{c\text{-}b}$	=	0.000
$DFC_{a\text{-}d}$	=	0.017

Critical DFC = 0.637

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
Junction of Lin Shing Road and Wan Tsui Road	J2LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.533	
Loss time		L =	25	sec
Total Flow		=	1341	pcu
Co	= (1.5*L+5)/(1-Y)	=	91.0	sec
Cm	= L/(1-Y)	=	53.5	sec
Yult		=	0.713	
R.C.ult	= (Yult-Y)/Y*100%	=	33.7	%
Cp	= 0.9*L/(0.9-Y)	=	61.3	sec
Ymax	= 1-L/C	=	0.792	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	33.7	%



Stage A I = 7	Stage B I =	Stage C I =	

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		371		371	0.00	1915			1915	0.194			35	95	0.245	12	2
ST/LT	A	4.00	1	1	10		N	2015	690	280		970	0.71	1821			1821	0.533	0.533		95	95	0.673	36	3
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at

Junction Capacity Analysis

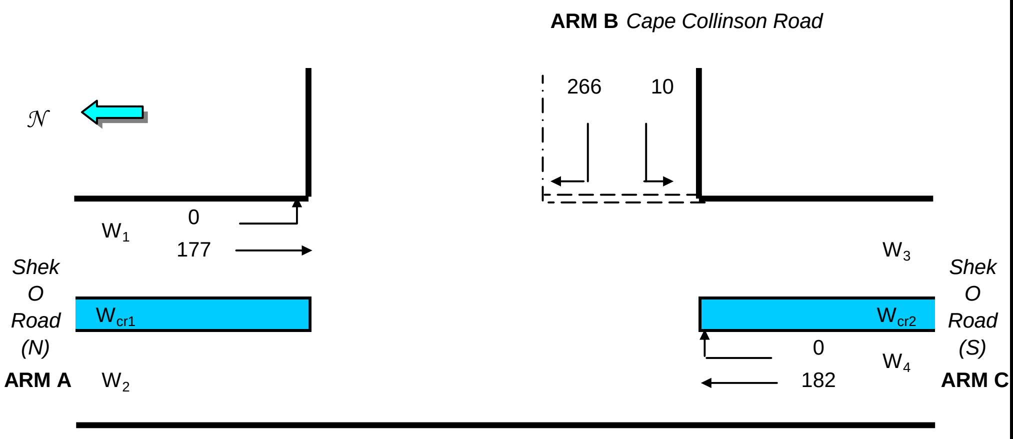
Prepared By: KC

Checked By:

Junction layout sketch - **J3: J/O Cape Collinson Road and Lin Shing Road**

Design Year - **2021 Level 1 - Reference Case**

Time - **Level 1 Peak Hour**



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

$q_{a\text{-}b}$	=	0	(pcu/hr)
$q_{a\text{-}c}$	=	177	(pcu/hr)

MAJOR ROAD (ARM C)

$W_{c\text{-}b}$	=	4.50	(metres)
$Vr_{c\text{-}b}$	=	150	(metres)
$q_{c\text{-}a}$	=	182	(pcu/hr)
$q_{c\text{-}b}$	=	0	(pcu/hr)

MINOR ROAD (ARM B)

$W_{b\text{-}a}$	=	0.00	(metres)
$W_{b\text{-}c}$	=	3.80	(metres)
$Vl_{b\text{-}a}$	=	100	(metres)
$Vr_{b\text{-}a}$	=	100	(metres)
$Vr_{b\text{-}c}$	=	100	(metres)
$q_{b\text{-}a}$	=	266	(pcu/hr)
$q_{b\text{-}c}$	=	10	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

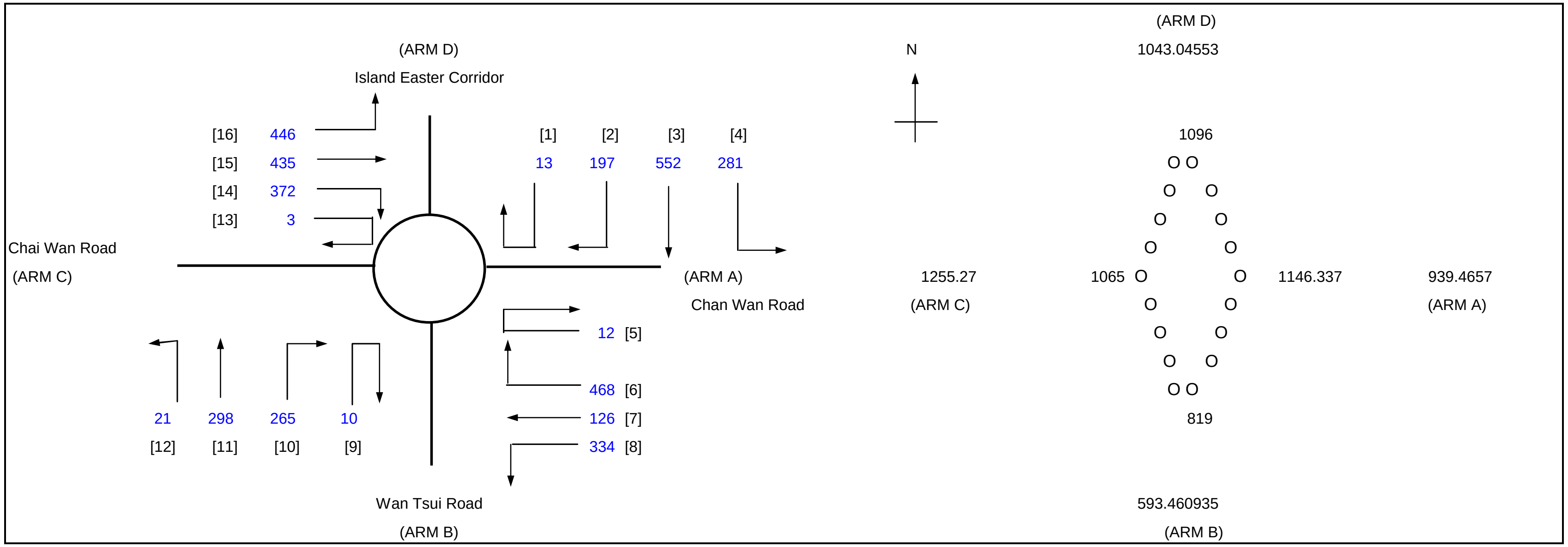
$Q_{b\text{-}c}$	=	697
$Q_{c\text{-}b}$	=	776
$Q_{b\text{-}a}$	=	346

COMPARISION OF DESIGN FLOW TO CAPACITY

$DFC_{b\text{-}a}$	=	0.769
$DFC_{b\text{-}c}$	=	0.015
$DFC_{c\text{-}b}$	=	0.000

Critical DFC = 0.769

	ROUNDABOUT CAPACITY ASSESSMENT			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	**J4LV1 Peak Hour**	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME 2021_LV1_Ref_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV1 Peak Hour			REVIEWED BY:	OC	Sep-13

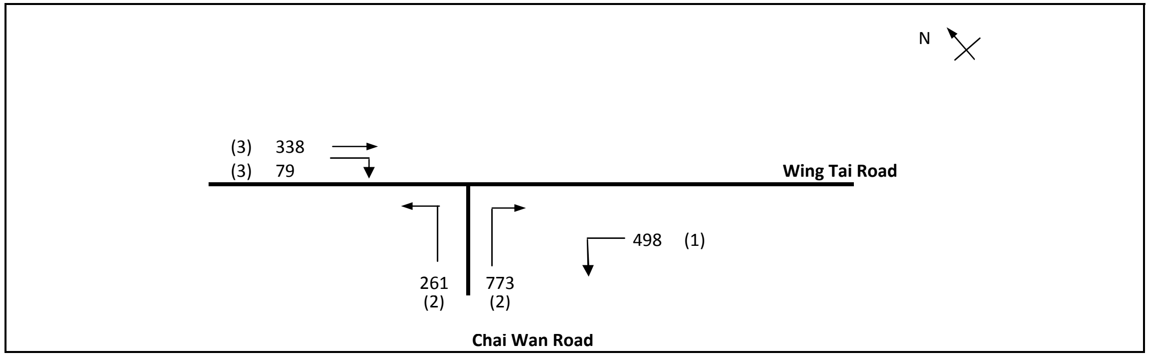


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	939	593	1255	1043
Qc	=	Circulating flow across entry (pcu/h)	1146	819	1065	1096
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1600	1017	1673	1380
DFC	=	Design flow/Capacity = Q/Qe	0.59	0.58	0.75	0.76

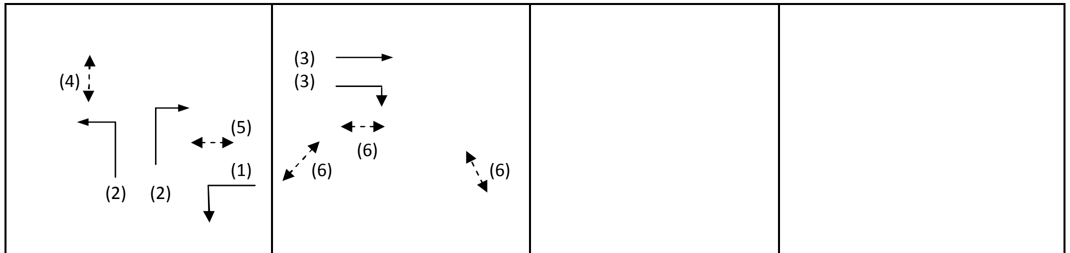
Total In Sum = 2749.739 PCU

DFC of Critical Approach = 0.76

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV1 - Peak Hour Traffic Flows	FILENAME :1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	100 sec
Sum(y)		Y =	0.299
Loss time		L =	10 sec
Total Flow		=	1949 pcu
Co	= (1.5*L+5)/(1-Y)	=	28.5 sec
Cm	= L/(1-Y)	=	14.3 sec
Yult		=	0.825
R.C.ult	= (Yult-Y)/Y*100%	=	176.1 %
Cp	= 0.9*L/(0.9-Y)	=	15.0 sec
Ymax	= 1-L/C	=	0.900
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	171.1 %

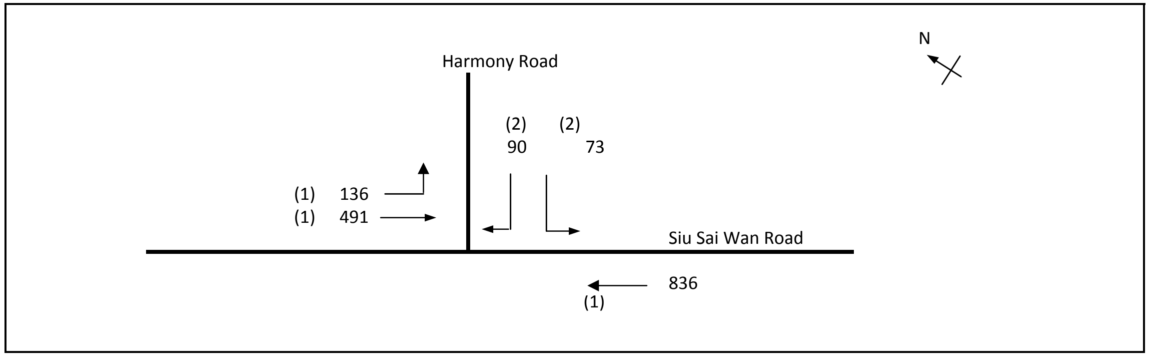


Stage A I = 7 | Stage B I = 5

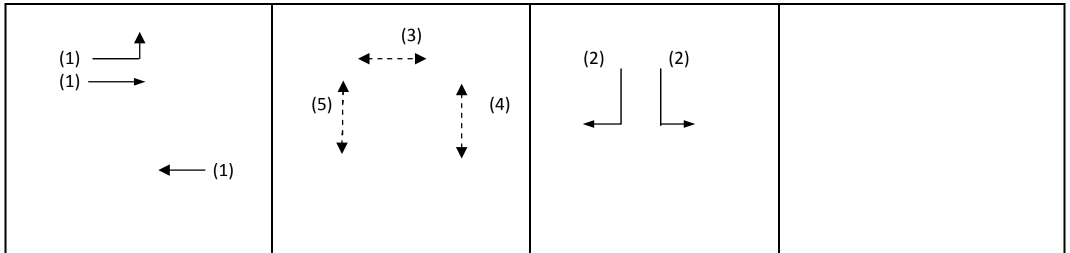
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	498			498	1.00	3857			3857	0.129			39	65	0.199	12	5
LT	A	4.00	2	2	24			4310	261			261	1.00	4056			4056	0.064			19	65	0.099	6	5
RT	A	3.50	2	2	11		y	4070			773	773	1.00	3582			3582	0.216	0.216		65	65	0.332	21	5
ST	B	3.50	3	2			y	4070		338		338	0.00	4070			4070	0.083	0.083		25	25	0.332	21	24
RT	B	4.50	3	2	13		y	4270			79	79	1.00	3828			3828	0.021			6	25	0.083	3	25
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	100	sec
Sum(y)		Y =	0.258	
Loss time		L =	48	sec
Total Flow		=	1627	pcu
Co	= (1.5*L+5)/(1-Y)	=	103.8	sec
Cm	= L/(1-Y)	=	64.7	sec
Yult		=	0.540	
R.C.ult	= (Yult-Y)/Y*100%	=	109.0	%
Cp	= 0.9*L/(0.9-Y)	=	67.3	sec
Ymax	= 1-L/C	=	0.520	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	81.2	%

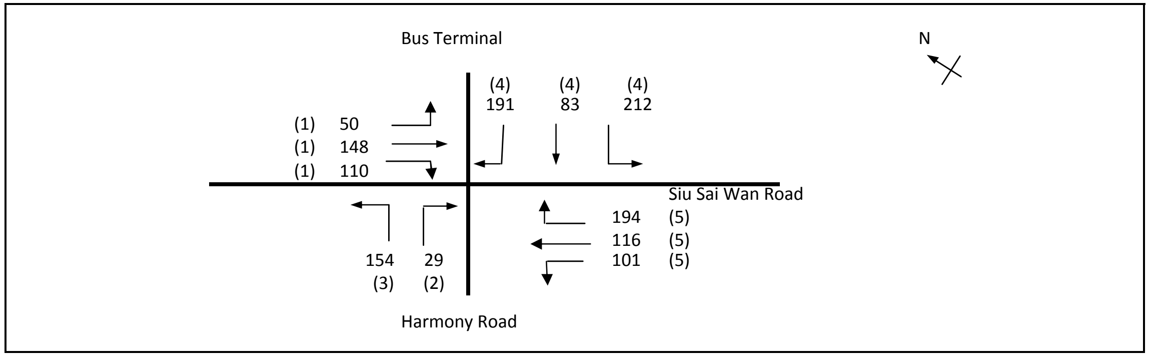


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

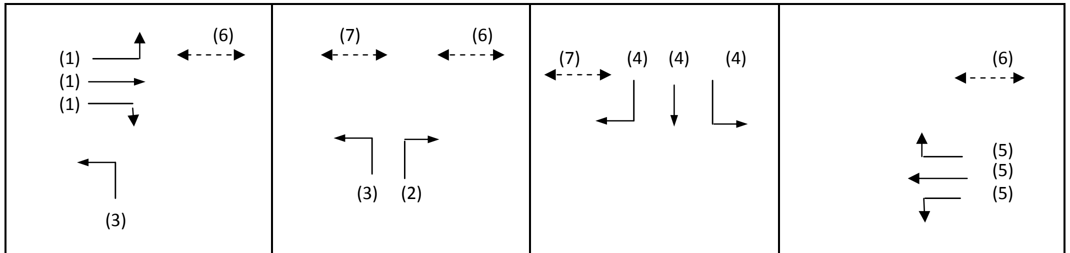
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	136	152		288	0.47	1827			1827	0.158			32	42	0.372	24	14
ST	A	3.20	1	1				2075		339		339	0.00	2075			2075	0.164			33	42	0.386	30	14
ST	A	3.00	1	2			y	3970		836		836	0.00	3970			3970	0.211	0.211		42	42	0.497	39	13
LT	C	3.75	2	1	12		y	1990	73			73	1.00	1769			1769	0.041			8	10	0.428	6	42
RT	C	3.75	2	1	12			2130			90	90	1.00	1893			1893	0.048	0.048		10	10	0.497	12	44
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.375
Loss time		L =	18 sec
Total Flow		=	1389 pcu
Co	= (1.5*L+5)/(1-Y)	=	51.2 sec
Cm	= L/(1-Y)	=	28.8 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	104.2 %
Cp	= 0.9*L/(0.9-Y)	=	30.8 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	99.1 %

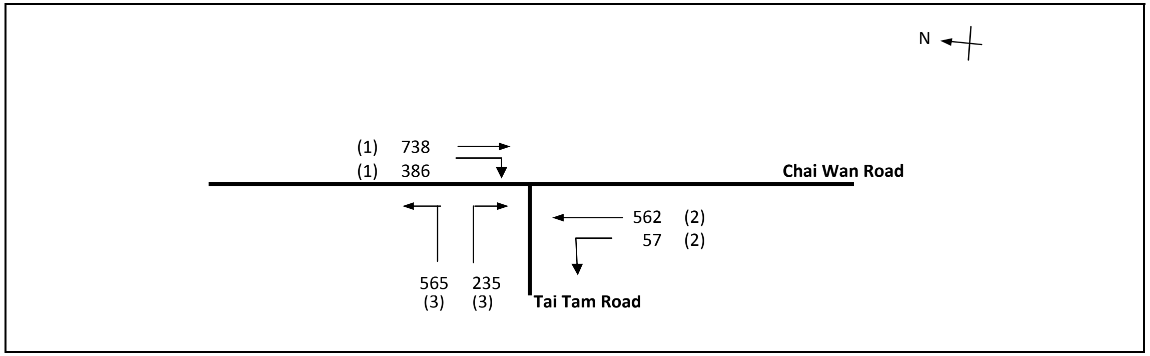


Stage A I = 5	Stage B I = 5	Stage C I = 6	Stage C I = 6

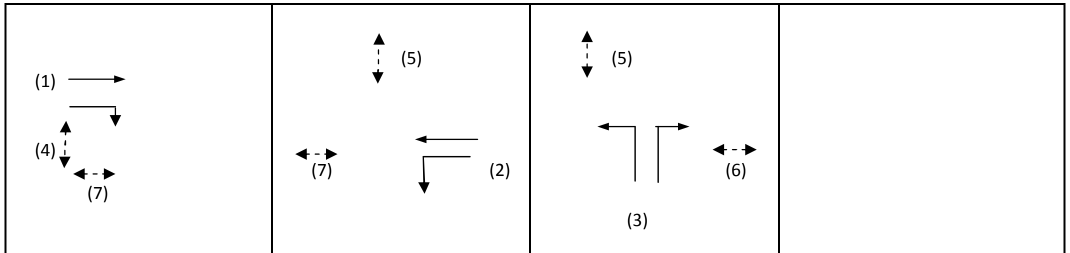
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	50	81		131	0.38	1849			1849	0.071			16	21	0.350	18	30
ST/RT	A	3.30	1	1	12			2085		67	110	177	0.62	1935			1935	0.091	0.091		21	21	0.452	24	31
RT	B	3.50	2	1	12			2105			29	29	1.00	1871			1871	0.016	0.016		4	4	0.452	0	64
LT	A,B	3.75	3	1	13		y	1990	154			154	1.00	1784			1784	0.086			20	30	0.303	18	23
RT	C	3.50	4	1	12			2105			191	191	1.00	1871			1871	0.102			24	38	0.282	18	18
LT/ST	C	3.50	4	1	12		y	1965	212	83		295	0.72	1803			1803	0.164	0.164		38	38	0.452	30	18
ST/RT	D	3.50	5	1	12			2105		0	194	194	1.00	1871			1871	0.104	0.104		24	24	0.452	24	28
LT/ST	D	3.50	5	1	11		y	1965	101	116		217	0.47	1848			1848	0.117			27	27	0.452	24	26
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	105 sec
Sum(y)		Y =	0.557
Loss time		L =	18 sec
Total Flow		=	2543 pcu
Co	= (1.5*L+5)/(1-Y)	=	72.3 sec
Cm	= L/(1-Y)	=	40.7 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	37.3 %
Cp	= 0.9*L/(0.9-Y)	=	47.3 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	33.8 %



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

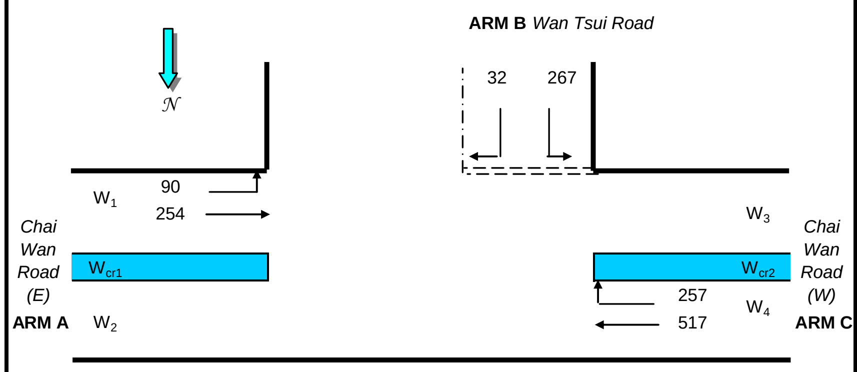
Movement	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		738		738	0.00	4070			4070	0.181			28	28	0.673	45	24
RT	A	3.50	1	1	13			2105			386	386	1.00	1887			1887	0.205	0.205		32	28	0.759	48	30
ST	B	3.50	2	2				4210		562		562	0.00	4210			4210	0.134	0.134		21	21	0.673	39	30
LT	B	3.10	2	1	12		y	1925	57			57	1.00	1711			1711	0.033			5	21	0.168	6	30
LT	C	4.00	3	1	15		y	2015	402			402	1.00	1832			1832	0.219	0.219		34	34	0.673	42	22
LT/RT	C	4.00	3	1	15			2155	163		235	398	1.00	1959			1959	0.203			32	34	0.623	42	21
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow **Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at**
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road
Design Year - 2021 Level 1 - Reference Case
Time - Level 1 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

$q_{a\text{-}b}$	=	89.89	(pcu/hr)
$q_{a\text{-}c}$	=	254	(pcu/hr)

MAJOR ROAD (ARM C)

$W_{c\text{-}b}$	=	3.30	(metres)
$Vr_{c\text{-}b}$	=	150	(metres)
$q_{c\text{-}a}$	=	517	(pcu/hr)
$q_{c\text{-}b}$	=	256.98	(pcu/hr)

MINOR ROAD (ARM B)

$W_{b\text{-}a}$	=	0.00	(metres)
$W_{b\text{-}c}$	=	4.50	(metres)
$Vl_{b\text{-}a}$	=	150	(metres)
$Vr_{b\text{-}a}$	=	150	(metres)
$Vr_{b\text{-}c}$	=	150	(metres)
$q_{b\text{-}a}$	=	32	(pcu/hr)
$q_{b\text{-}c}$	=	267	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

$Q_{b\text{-}c}$	=	789
$Q_{c\text{-}b}$	=	700
$Q_{b\text{-}a}$	=	373

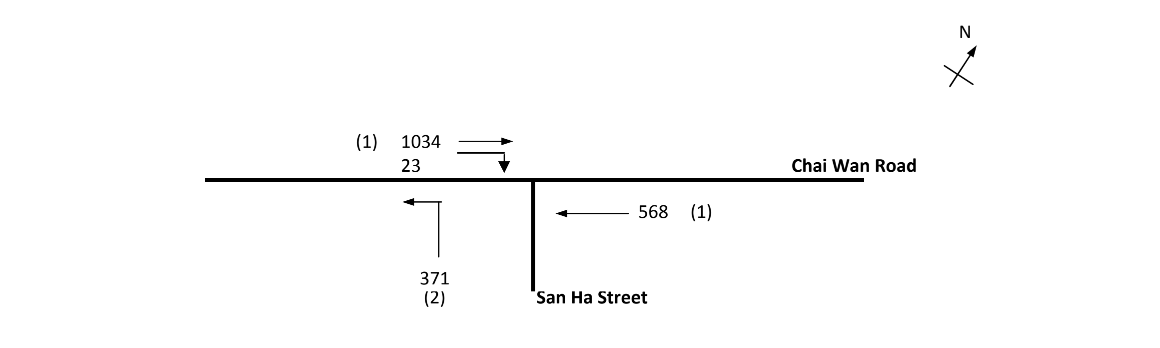
COMPARISION OF DESIGN FLOW TO CAPACITY

$DFC_{b\text{-}a}$	=	0.085
$DFC_{b\text{-}c}$	=	0.339
$DFC_{c\text{-}b}$	=	0.367

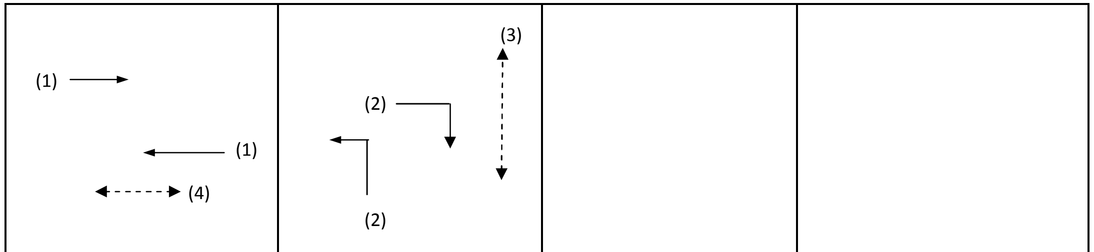
Critical DFC = 0.367

TRAFFIC SIGNAL CALCULATION

				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	100 sec
Sum(y)		Y =	0.477
Loss time		L =	10 sec
Total Flow		=	1996 pcu
Co	= (1.5*L+5)/(1-Y)	=	38.2 sec
Cm	= L/(1-Y)	=	19.1 sec
Yult		=	0.825
R.C.ult	= (Yult-Y)/Y*100%	=	73.0 %
Cp	= 0.9*L/(0.9-Y)	=	21.3 sec
Ymax	= 1-L/C	=	0.900
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	69.9 %

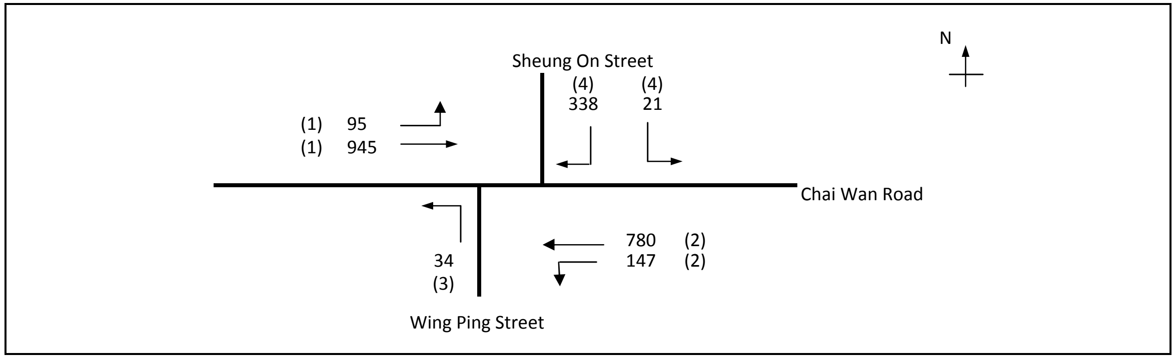


Stage A	I = 6	Stage B	I = 6	Stage C	I =	

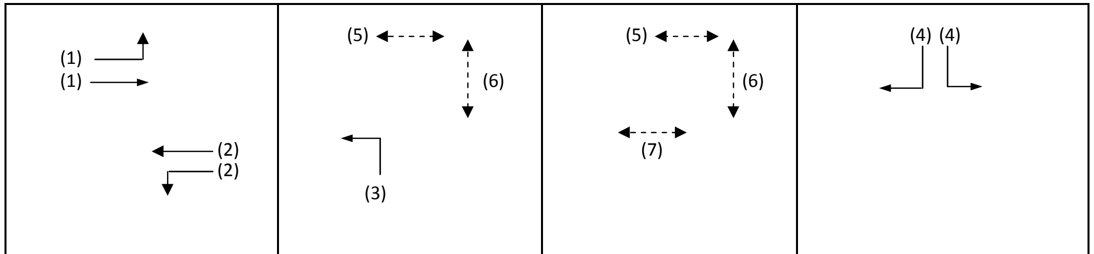
Movement	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		1034		1034	0.00	4070			4070	0.254	0.254		48	47	0.540	45	10
ST	A	3.50	1	2	10		N	4070		568		568	0.00	4070			4070	0.140			26	47	0.297	24	11
LT	B	3.00	2	1	10		N	1915	371			371	1.00	1665			1665	0.223	0.223		42	53	0.421	24	9
RT	B	3.50	2	1	12			2105			23	23	1.00	1871			1871	0.012			2	53	0.023	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	120	sec
Sum(y)		Y =	0.275	
Loss time		L =	37	sec
Total Flow		=	2361	pcu
Co	= (1.5*L+5)/(1-Y)	=	83.4	sec
Cm	= L/(1-Y)	=	51.0	sec
Yult		=	0.623	
R.C.ult	= (Yult-Y)/Y*100%	=	126.4	%
Cp	= 0.9*L/(0.9-Y)	=	53.3	sec
Ymax	= 1-L/C	=	0.692	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	126.4	%



Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

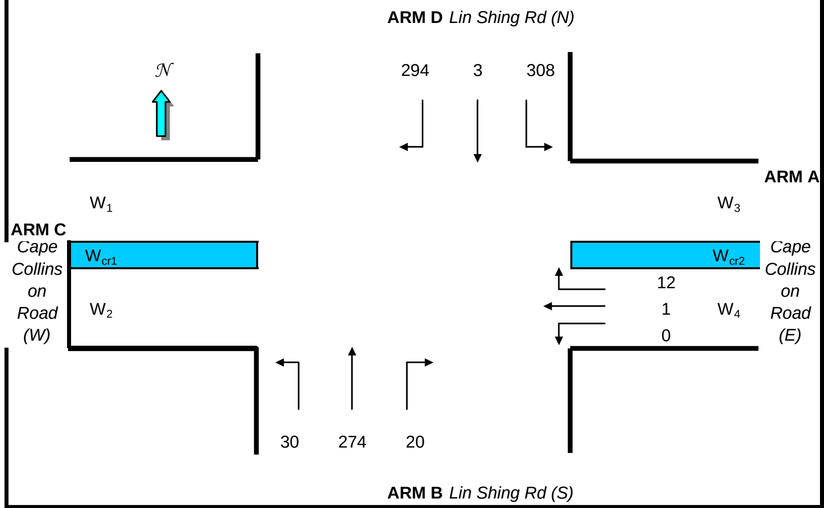
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	95	945		1041	0.09	6105			6105	0.170			51		0.000	68	54
LT/ST	A	3.30	2	3	12		Y	6115	147	780		927	0.16	5996			5996	0.155	0.155		47		0.000	60	54
LT	B	3.50	3	1	9		Y	1965	34			34	1.00	1684			1684	0.020	0.020		6		0.000	6	54
LT/RT	D	3.75	4	2	10		y	4120	21		338	360	1.00	3583			3583	0.100	0.100		30		0.000	33	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road

Design Year - 2021 Level 1 - Site 1

Time - Level 1 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{a\text{-}d}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$W_{d\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
$W_{d\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
$Vr_{a\text{-}d}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
$Vl_{d\text{-}c}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

$W_{a\text{-}d}$	=	3.00	(metres)
$Vr_{a\text{-}d}$	=	100	(metres)
$q_{a\text{-}b}$	=	0	(pcu/hr)
$q_{a\text{-}c}$	=	1.0575	(pcu/hr)
$q_{a\text{-}d}$	=	11.518	(pcu/hr)

MAJOR ROAD (ARM C)

$W_{c\text{-}b}$	=		(metres)
$Vr_{c\text{-}b}$	=		(metres)
$q_{c\text{-}a}$	=	0	(pcu/hr)
$q_{c\text{-}b}$	=	0	(pcu/hr)
$q_{c\text{-}d}$	=	0	(pcu/hr)

MINOR ROAD (ARM B)

$W_{b\text{-}a}$	=	5.00	(metres)
$W_{b\text{-}c}$	=	5.00	(metres)
$Vl_{b\text{-}a}$	=	100	(metres)
$Vr_{b\text{-}a}$	=	65	(metres)
$Vr_{b\text{-}c}$	=	0	(metres)
$q_{b\text{-}a}$	=	20.093	(pcu/hr)
$q_{b\text{-}c}$	=	30.438	(pcu/hr)
$q_{b\text{-}d}$	=	274.07	(pcu/hr)

MINOR ROAD (ARM D)

$W_{d\text{-}a}$	=	3.00	(metres)
$W_{d\text{-}c}$	=	3.00	(metres)
$Vl_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}a}$	=	80	(metres)
$q_{d\text{-}a}$	=	308.23	(pcu/hr)
$q_{d\text{-}b}$	=	2.506	(pcu/hr)
$q_{d\text{-}c}$	=	293.79	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

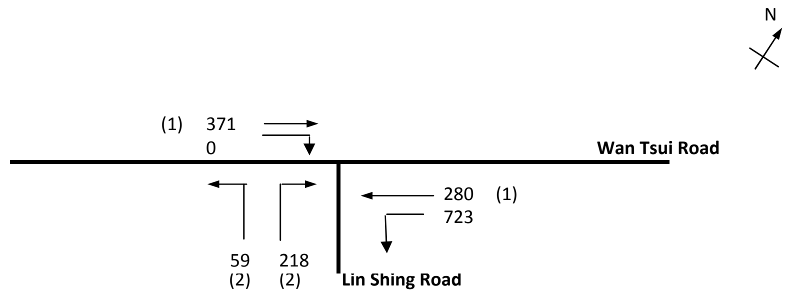
$Q_{b\text{-}a}$	=	510
$Q_{b\text{-}c}$	=	749
$Q_{b\text{-}d}$ is nearside	=	TRUE
$Q_{b\text{-}d}$	=	608
$Q_{d\text{-}a}$	=	674
$Q_{d\text{-}b}$ is nearside	=	TRUE
$Q_{d\text{-}b}$	=	527
$Q_{d\text{-}c}$	=	439
$Q_{c\text{-}b}$	=	440
$Q_{a\text{-}d}$	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

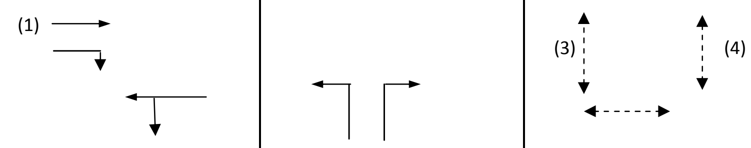
$DFC_{b\text{-}a}$	=	0.039
$DFC_{b\text{-}c}$	=	0.041
$DFC_{b\text{-}d}$	=	0.451
$DFC_{d\text{-}a}$	=	0.457
$DFC_{d\text{-}b}$	=	0.005
$DFC_{d\text{-}c}$	=	0.669
$DFC_{c\text{-}b}$	=	0.000
$DFC_{a\text{-}d}$	=	0.019

Critical DFC = 0.669

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	GK	29-4-2011
J2: Junction of Lin Shing Road and Wan Tsui Road	J2LV1 - Peak Hour Traffic Flows	FILENAME : 2021_LV1_S1.xls	Checked By:	KC	29-4-2011
2021 Level 1 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.552	
Loss time		L =	25	sec
Total Flow		=	1374	pcu
Co	= (1.5*L+5)/(1-Y)	=	94.8	sec
Cm	= L/(1-Y)	=	55.8	sec
Yult		=	0.713	
R.C.ult	= (Yult-Y)/Y*100%	=	29.1	%
Cp	= 0.9*L/(0.9-Y)	=	64.6	sec
Ymax	= 1-L/C	=	0.792	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	29.1	%



Stage A	I = 7	Stage B	I =	Stage C	I =	

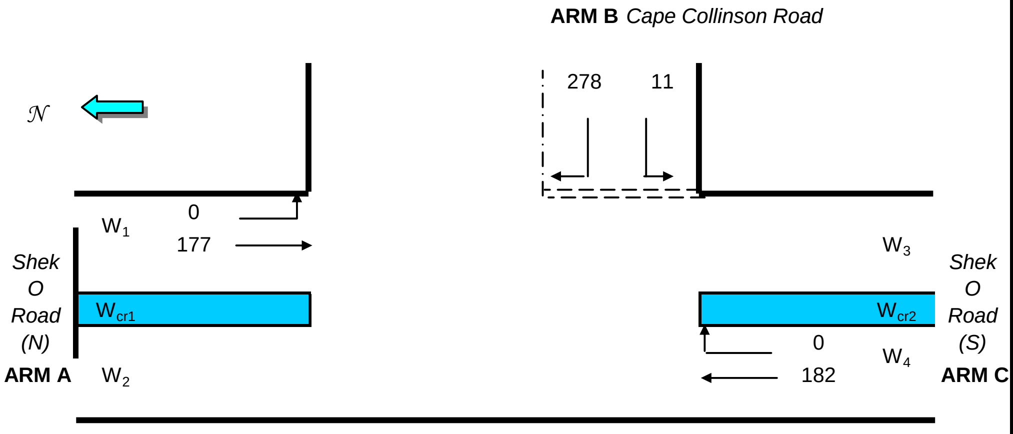
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		371		371	0.00	1915			1915	0.194			33	95	0.245	12	2
ST/LT	A	4.00	1	1	10		N	2015	723	280		1003	0.72	1818			1818	0.552	0.552		95	95	0.697	36	4
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow **Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at** **Prepared By:** **KC**

Junction Capacity Analysis **Checked By:** **OC**

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2021 Level 1 - Site 1
Time - Level 1 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	176.61	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	181.9	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	277.71	(pcu/hr)
q_{b-c}	=	11.286	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	697
Q_{c-b}	=	776
Q_{b-a}	=	346

COMPARISION OF DESIGN FLOW TO CAPACITY

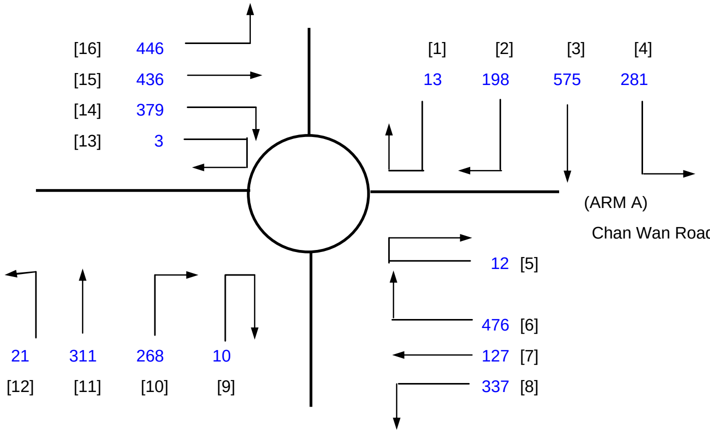
DFC_{b-a}	=	0.804
DFC_{b-c}	=	0.016
DFC_{c-b}	=	0.000

Critical DFC = 0.804

	ROUNDABOUT CAPACITY ASSESSMENT			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	**J4LV1 Peak Hour**	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME : 2021_LV1_S1.xls	CHECKED BY:	OC	Sep-13
J4LV1 Peak Hour			REVIEWED BY:	OC	Sep-13

(ARM D)
Island Easter Corridor

Chai Wan Road
(ARM C)



(ARM A)
Chan Wan Road

Wan Tsui Road
(ARM B)

N

(ARM D)
1067.17086

1108

1264.405 (ARM C)

1089

1177.953

951.4859 (ARM A)

829

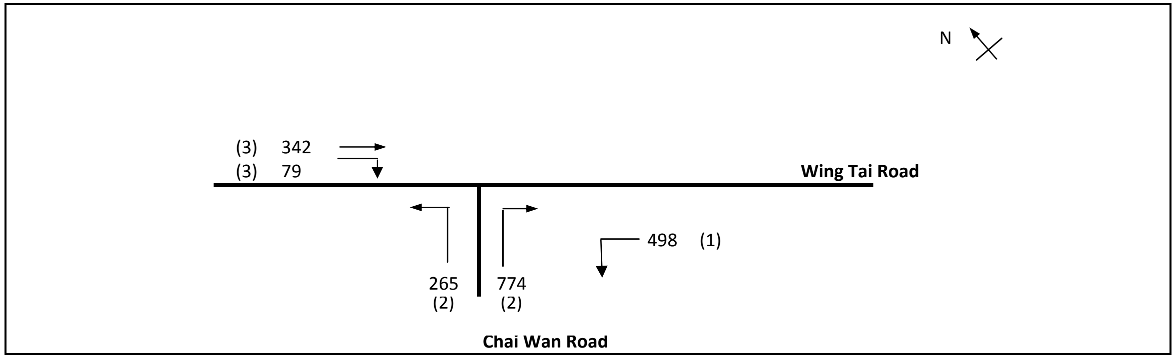
609.479301
(ARM B)

ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	951	609	1264	1067
Qc	=	Circulating flow across entry (pcu/h)	1178	829	1089	1108
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1576	1011	1655	1372
DFC	=	Design flow/Capacity = Q/Qe	0.60	0.60	0.76	0.78

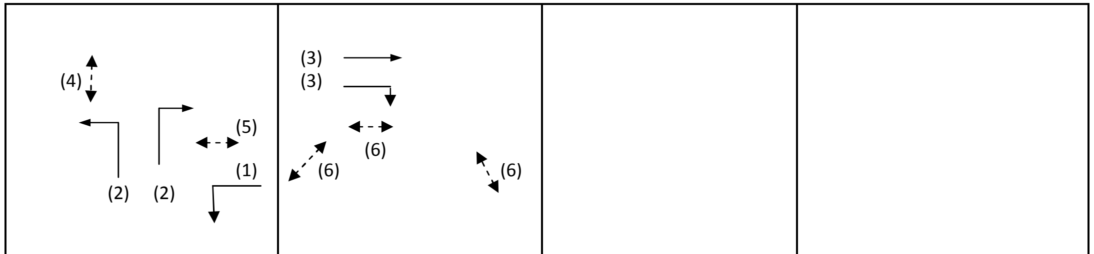
Total In Sum = 2807.905 PCU

DFC of Critical Approach = 0.78

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: GK	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV1 - Peak Hour Traffic Flows	FILENAME : 2021_LV1_S1.xls	Checked By: KC	29-4-2011
2021 Level 1 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.300	
Loss time		L =	10	sec
Total Flow		=	1958	pcu
Co	= (1.5*L+5)/(1-Y)	=	28.6	sec
Cm	= L/(1-Y)	=	14.3	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	174.9	%
Cp	= 0.9*L/(0.9-Y)	=	15.0	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	169.9	%

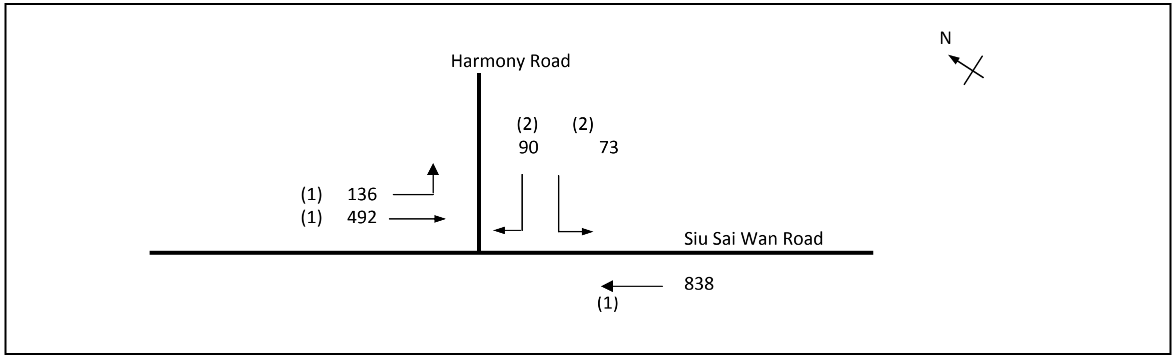


Stage A	I = 7	Stage B	I = 5		

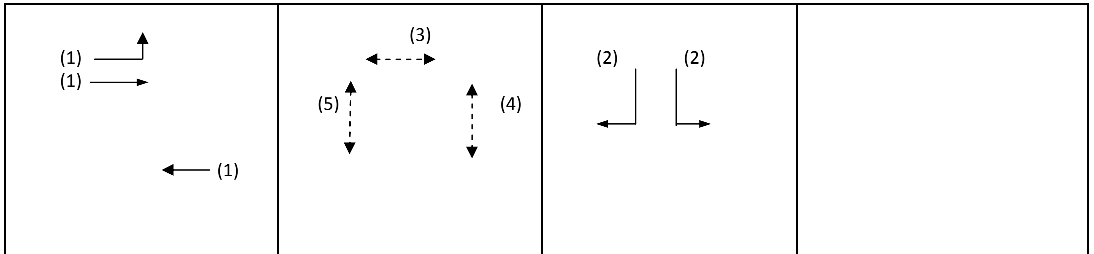
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	498			498	1.00	3857			3857	0.129			39	65	0.199	12	5
LT	A	4.00	2	2	24			4310	265			265	1.00	4056			4056	0.065			20	65	0.101	6	5
RT	A	3.50	2	2	11		y	4070			774	774	1.00	3582			3582	0.216	0.216		65	65	0.333	21	5
ST	B	3.50	3	2			y	4070		342		342	0.00	4070			4070	0.084	0.084		25	25	0.333	21	24
RT	B	4.50	3	2	13		y	4270			79	79	1.00	3828			3828	0.021			6	25	0.082	3	25
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.:	CTLDQS	Prepared By: GK	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV1 - Peak Hour Traffic Flows	FILENAME :	2021_LV1_S1.xls	Checked By: KC	29-4-2011
2021 Level 1 Peak Hour - Site 1		REFERENCE NO.:		Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	100	sec
Sum(y)		Y =	0.259	
Loss time		L =	48	sec
Total Flow		=	1629	pcu
Co	= (1.5*L+5)/(1-Y)	=	103.9	sec
Cm	= L/(1-Y)	=	64.7	sec
Yult		=	0.540	
R.C.ult	= (Yult-Y)/Y*100%	=	108.8	%
Cp	= 0.9*L/(0.9-Y)	=	67.4	sec
Ymax	= 1-L/C	=	0.520	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	81.0	%

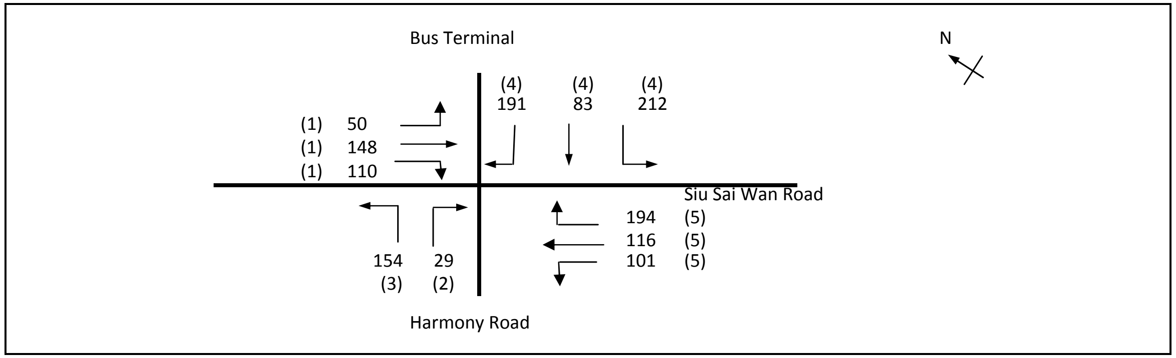


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

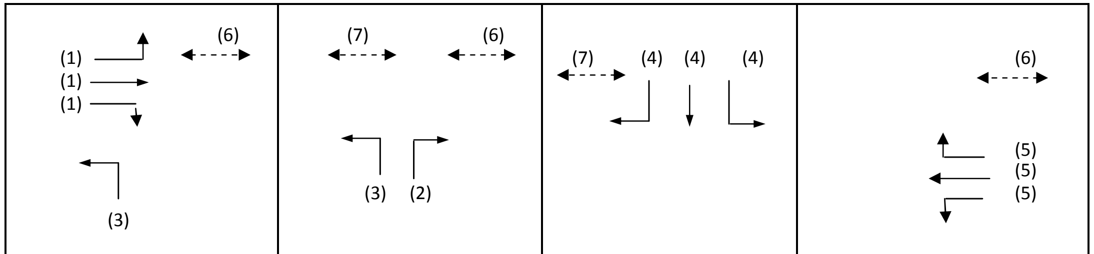
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	136	152		288	0.47	1827			1827	0.158			32	42	0.372	24	14
ST	A	3.20	1	1				2075		340		340	0.00	2075			2075	0.164			33	42	0.386	30	14
ST	A	3.00	1	2			y	3970		838		838	0.00	3970			3970	0.211	0.211		42	42	0.497	39	13
LT	C	3.75	2	1	12		y	1990	73			73	1.00	1769			1769	0.041			8	10	0.428	6	42
RT	C	3.75	2	1	12			2130			90	90	1.00	1893			1893	0.048	0.048		10	10	0.497	12	44
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	GK	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV1 - Peak Hour Traffic Flows	FILENAME : 2021_LV1_S1.xls	Checked By:	KC	29-4-2011
2021 Level 1 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	105	sec
Sum(y)		Y =	0.375	
Loss time		L =	18	sec
Total Flow		=	1389	pcu
Co	= (1.5*L+5)/(1-Y)	=	51.2	sec
Cm	= L/(1-Y)	=	28.8	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	104.2	%
Cp	= 0.9*L/(0.9-Y)	=	30.8	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	99.1	%

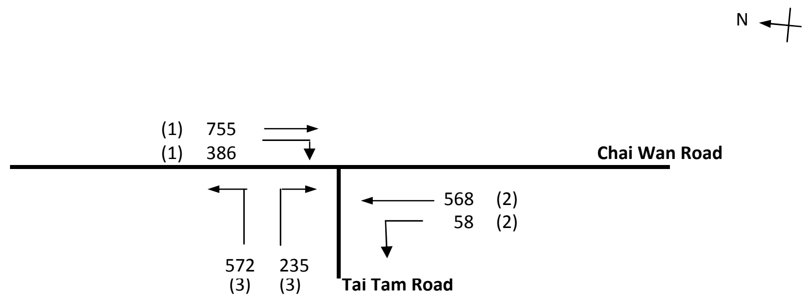


Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

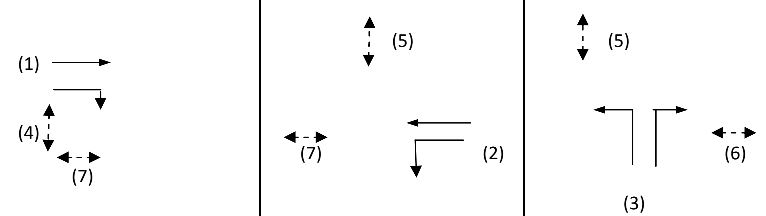
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	50	81		131	0.38	1849			1849	0.071			16	21	0.350	18	30
ST/RT	A	3.30	1	1	12			2085		67	110	177	0.62	1935			1935	0.091	0.091		21	21	0.452	24	31
RT	B	3.50	2	1	12			2105			29	29	1.00	1871			1871	0.016	0.016		4	4	0.452	0	64
LT	A,B	3.75	3	1	13		y	1990	154			154	1.00	1784			1784	0.086			20	30	0.303	18	23
RT	C	3.50	4	1	12			2105			191	191	1.00	1871			1871	0.102			24	38	0.282	18	18
LT/ST	C	3.50	4	1	12		y	1965	212	83		295	0.72	1803			1803	0.164	0.164		38	38	0.452	30	18
ST/RT	D	3.50	5	1	12			2105			194	194	1.00	1871			1871	0.104	0.104		24	24	0.452	24	28
LT/ST	D	3.50	5	1	11		y	1965	101	116		217	0.47	1848			1848	0.117			27	27	0.452	24	26
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.:	CTLDQS	Prepared By: GK	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV1 - Peak Hour Traffic Flows	FILENAME :	2021_LV1_S1.xls	Checked By: KC	29-4-2011
2021 Level 1 Peak Hour - Site 1		REFERENCE NO.:		Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	105	sec
Sum(y)		Y =	0.537	
Loss time		L =	18	sec
Total Flow		=	2575	pcu
Co	= (1.5*L+5)/(1-Y)	=	69.1	sec
Cm	= L/(1-Y)	=	38.9	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	42.5	%
Cp	= 0.9*L/(0.9-Y)	=	44.6	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	38.9	%

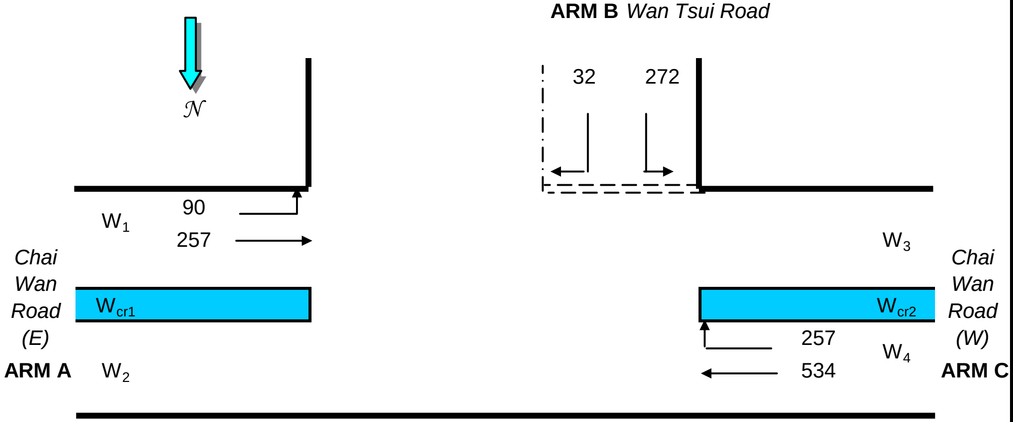


Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.75	1	2			y	4120		755		755	0.00	4120			4120	0.183			30	30	0.648	45	22
RT	A	3.00	1	1	13			2055			386	386	1.00	1842			1842	0.210	0.210		34	30	0.741	48	28
ST	B	3.50	2	2				4210		568		568	0.00	4210			4210	0.135	0.135		22	22	0.648	39	29
LT	B	3.10	2	1	12		y	1925	58			58	1.00	1711			1711	0.034			6	22	0.163	6	29
LT	C	4.00	3	1	15		y	2015	430			430	1.00	1832			1832	0.235			38	38	0.648	48	19
LT/RT	C	4.00	3	1	15			2155	142		235	377	1.00	1959			1959	0.192	0.192		31	38	0.531	42	18
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road
Design Year - 2021 Level 1 - Site 1
Time - Level 1 Peak Hour



GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

MAJOR ROAD (ARM A)

q_{a-b}	=	89.89	(pcu/hr)
q_{a-c}	=	256.55	(pcu/hr)

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	788
Q_{c-b}	=	700
Q_{b-a}	=	372

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	534.38	(pcu/hr)
q_{c-b}	=	256.98	(pcu/hr)

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	0.085
DFC_{b-c}	=	0.344
DFC_{c-b}	=	0.367

Critical DFC = 0.367

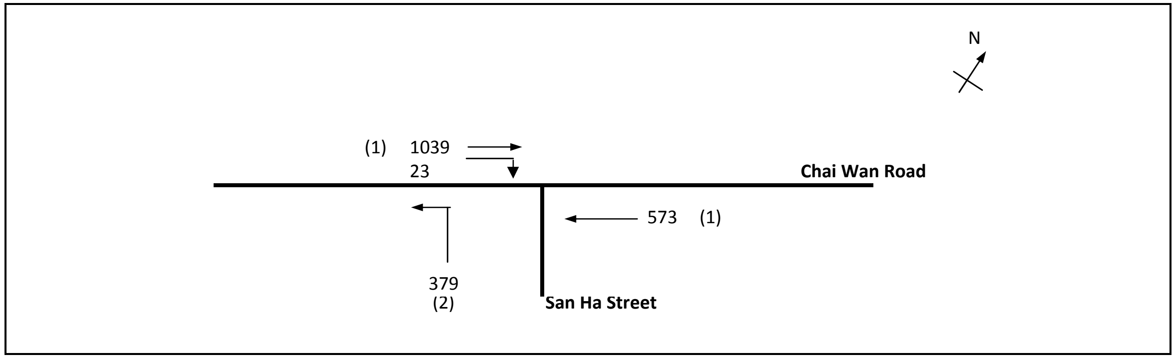
MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	31.726	(pcu/hr)
q_{b-c}	=	271.5	(pcu/hr)

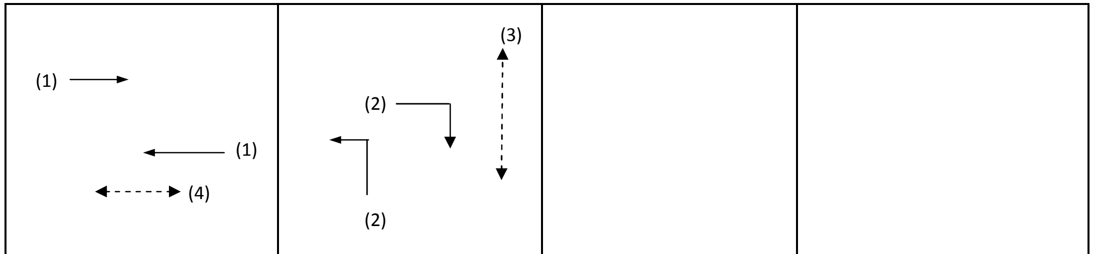
REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	GK	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV1 - Peak Hour Traffic Flows	FILENAME : 2021_LV1_S1.xls	Checked By:	KC	29-4-2011
2021 Level 1 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	100 sec
Sum(y)		Y =	0.483
Loss time		L =	10 sec
Total Flow		=	2013 pcu
Co	= (1.5*L+5)/(1-Y)	=	38.7 sec
Cm	= L/(1-Y)	=	19.3 sec
Yult		=	0.825
R.C.ult	= (Yult-Y)/Y*100%	=	70.9 %
Cp	= 0.9*L/(0.9-Y)	=	21.6 sec
Ymax	= 1-L/C	=	0.900
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	67.8 %

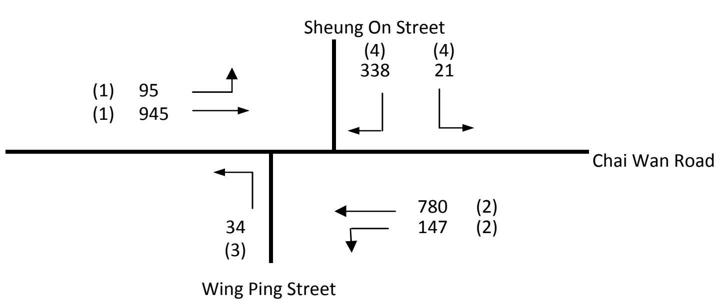


Stage A	I = 6	Stage B	I = 6	Stage C	I =	

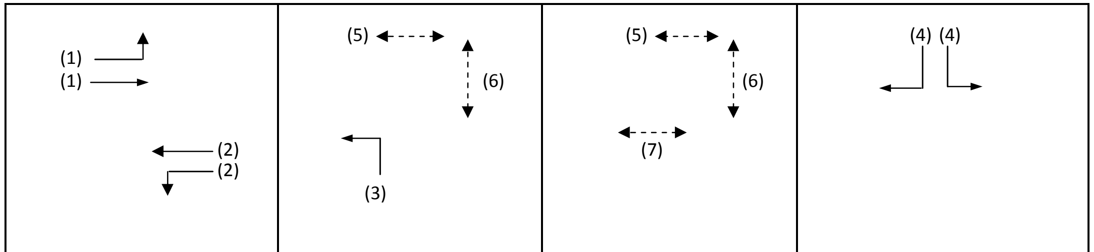
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		1039		1039	0.00	4070			4070	0.255	0.255		48	47	0.543	45	10
ST	A	3.50	1	2	10		N	4070		573		573	0.00	4070			4070	0.141			26	47	0.299	24	11
LT	B	3.00	2	1	10		N	1915	379			379	1.00	1665			1665	0.228	0.228		42	53	0.429	24	9
RT	B	3.50	2	1	12			2105			23	23	1.00	1871			1871	0.012			2	53	0.023	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION					INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.:	CTLDQS	Prepared By:	GK	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV1 - Peak Hour Traffic Flows	FILENAME :	2021_LV1_S1.xls	Checked By:	KC	29-4-2011
2021 Level 1 Peak Hour - Site 1		REFERENCE NO.:		Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	120	sec
Sum(y)		Y =	0.275	
Loss time		L =	37	sec
Total Flow		=	2361	pcu
Co	= (1.5*L+5)/(1-Y)	=	83.4	sec
Cm	= L/(1-Y)	=	51.0	sec
Yult		=	0.623	
R.C.ult	= (Yult-Y)/Y*100%	=	126.4	%
Cp	= 0.9*L/(0.9-Y)	=	53.3	sec
Ymax	= 1-L/C	=	0.692	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	126.4	%



Stage A	I =	8	Stage B	I =	5	Stage C	I =	7	Stage C	I =	6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	95	945		1041	0.09	6105			6105	0.170			51		0.000	68	54
LT/ST	A	3.30	2	3	12		Y	6115	147	780		927	0.16	5996			5996	0.155	0.155		47		0.000	60	54
LT	B	3.50	3	1	9		Y	1965	34			34	1.00	1684			1684	0.020	0.020		6		0.000	6	54
LT/RT	D	3.75	4	2	10		y	4120	21		338	360	1.00	3583			3583	0.100	0.100		30		0.000	33	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow **Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at C**

Junction Capacity Analysis

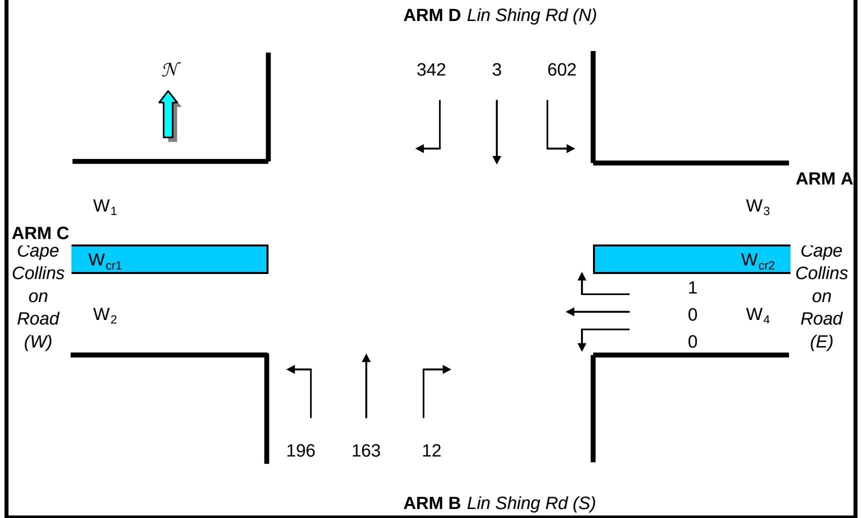
Prepared By: KC

Checked By: OC

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road

Design Year - 2021 Level 2 - Reference Case

Time - Level 2 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{a\text{-}d}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$W_{d\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
$W_{d\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
$Vr_{a\text{-}d}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
$Vl_{d\text{-}c}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

$W_{a\text{-}d}$	=	3.00	(metres)
$Vr_{a\text{-}d}$	=	100	(metres)
$q_{a\text{-}b}$	=	0	(pcu/hr)
$q_{a\text{-}c}$	=	0	(pcu/hr)
$q_{a\text{-}d}$	=	1	(pcu/hr)

MAJOR ROAD (ARM C)

$W_{c\text{-}b}$	=		(metres)
$Vr_{c\text{-}b}$	=		(metres)
$q_{c\text{-}a}$	=	0	(pcu/hr)
$q_{c\text{-}b}$	=	0	(pcu/hr)
$q_{c\text{-}d}$	=	0	(pcu/hr)

MINOR ROAD (ARM B)

$W_{b\text{-}a}$	=	5.00	(metres)
$W_{b\text{-}c}$	=	5.00	(metres)
$Vl_{b\text{-}a}$	=	100	(metres)
$Vr_{b\text{-}a}$	=	65	(metres)
$Vr_{b\text{-}c}$	=	0	(metres)
$q_{b\text{-}a}$	=	11.633	(pcu/hr)
$q_{b\text{-}c}$	=	196	(pcu/hr)
$q_{b\text{-}d}$	=	163.2	(pcu/hr)

MINOR ROAD (ARM D)

$W_{d\text{-}a}$	=	3.00	(metres)
$W_{d\text{-}c}$	=	3.00	(metres)
$Vl_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}a}$	=	80	(metres)
$q_{d\text{-}a}$	=	602	(pcu/hr)
$q_{d\text{-}b}$	=	3	(pcu/hr)
$q_{d\text{-}c}$	=	342	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

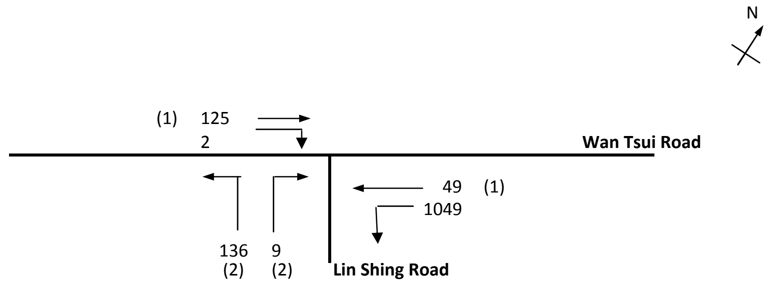
$Q_{b\text{-}a}$	=	418
$Q_{b\text{-}c}$	=	749
$Q_{b\text{-}d}$ is nearside	=	TRUE
$Q_{b\text{-}d}$	=	611
$Q_{d\text{-}a}$	=	674
$Q_{d\text{-}b}$ is nearside	=	TRUE
$Q_{d\text{-}b}$	=	533
$Q_{d\text{-}c}$	=	431
$Q_{c\text{-}b}$	=	437
$Q_{a\text{-}d}$	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

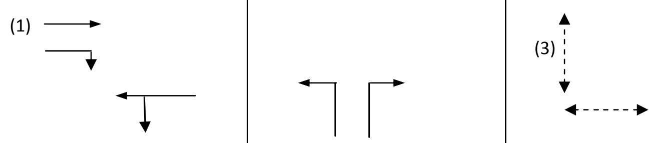
$DFC_{b\text{-}a}$	=	0.028
$DFC_{b\text{-}c}$	=	0.261
$DFC_{b\text{-}d}$	=	0.267
$DFC_{d\text{-}a}$	=	0.892
$DFC_{d\text{-}b}$	=	0.007
$DFC_{d\text{-}c}$	=	0.793
$DFC_{c\text{-}b}$	=	0.000
$DFC_{a\text{-}d}$	=	0.002

Critical DFC = 0.892

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
Junction of Lin Shing Road and Wan Tsui Road	J2LV2 - Peak Hour Traffic Flows	FILENAME :2_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	120 sec
Sum(y)		Y =	0.623
Loss time		L =	25 sec
Total Flow		=	1222 pcu
Co	= (1.5*L+5)/(1-Y)	=	112.7 sec
Cm	= L/(1-Y)	=	66.3 sec
Yult		=	0.713
R.C.ult	= (Yult-Y)/Y*100%	=	14.4 %
Cp	= 0.9*L/(0.9-Y)	=	81.2 sec
Ymax	= 1-L/C	=	0.792
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	14.4 %



Stage A I = 7	Stage B I =	Stage C I =	

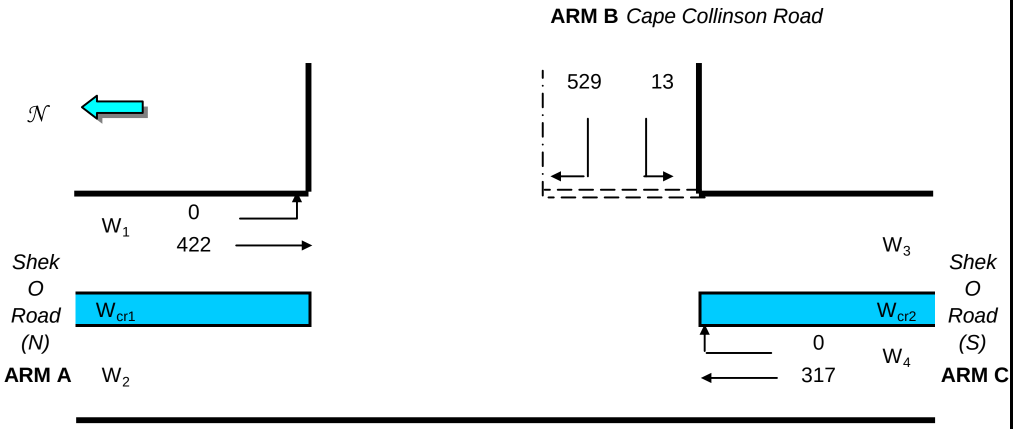
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
ST	A	3.00	1	1			N	1915		125		125	0.00	1915			1915	0.065		5	10	95	0.082	0	2
ST/LT	A	4.00	1	1	10		N	2015	1049	49		1097	0.96	1762			1762	0.623	0.623		95	95	0.787	42	5
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at (
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - **J3: J/O Cape Collinson Road and Lin Shing Road**
Design Year - **2021 Level 2 - Reference Case**
Time - **Level 2 Peak Hour**



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	422	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	317	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	529	(pcu/hr)
q_{b-c}	=	13	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

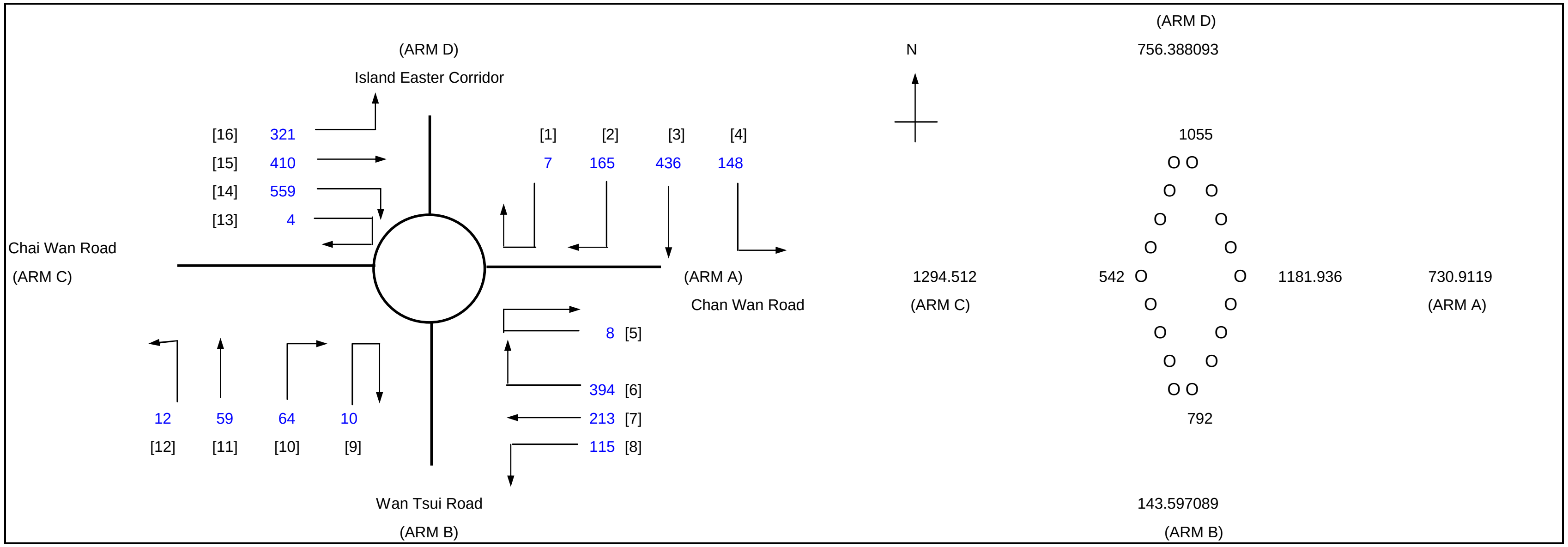
Q_{b-c}	=	634
Q_{c-b}	=	706
Q_{b-a}	=	293

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	1.807
DFC_{b-c}	=	0.020
DFC_{c-b}	=	0.000

Critical DFC = 1.807

	ROUNDABOUT CAPACITY ASSESSMENT			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	J4LV2 Peak Hour	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME: 2021_LV2_Ref_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV2 Peak Hour			REVIEWED BY:	OC	Sep-13

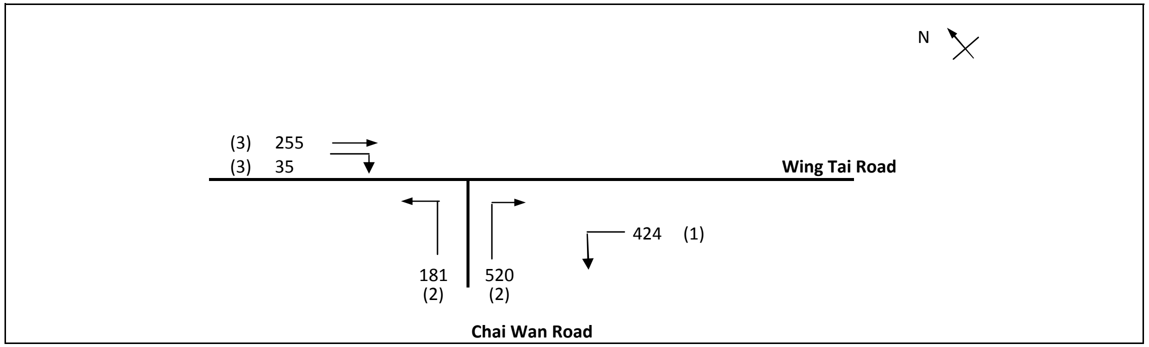


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	731	144	1295	756
Qc	=	Circulating flow across entry (pcu/h)	1182	792	542	1055
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1573	1032	2069	1408
DFC	=	Design flow/Capacity = Q/Qe	0.46	0.14	0.63	0.54

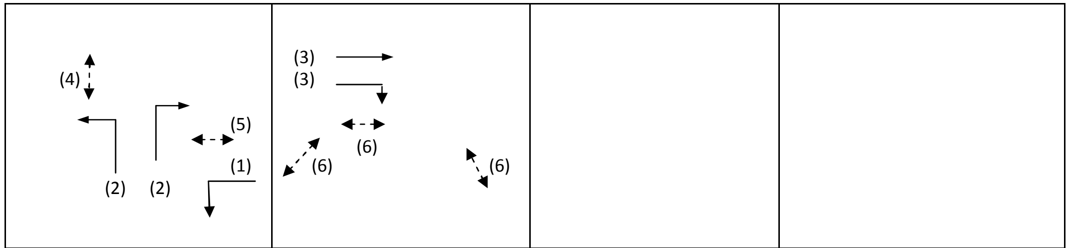
Total In Sum = 2330.186 PCU

DFC of Critical Approach = 0.63

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV2 - Peak Hour Traffic Flows	FILENAME :2_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	100 sec
Sum(y)		Y =	0.208
Loss time		L =	10 sec
Total Flow		=	1415 pcu
Co	= (1.5*L+5)/(1-Y)	=	25.3 sec
Cm	= L/(1-Y)	=	12.6 sec
Yult		=	0.825
R.C.ult	= (Yult-Y)/Y*100%	=	296.8 %
Cp	= 0.9*L/(0.9-Y)	=	13.0 sec
Ymax	= 1-L/C	=	0.900
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	289.6 %



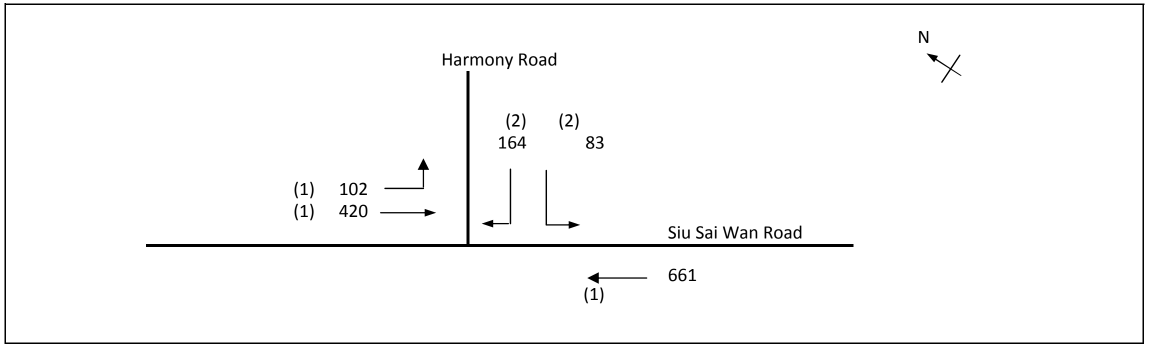
Stage A I = 7 | Stage B I = 5

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	424			424	1.00	3857			3857	0.110			48	63	0.175	12	6
LT	A	4.00	2	2	24			4310	181			181	1.00	4056			4056	0.045			19	63	0.071	3	6
RT	A	3.50	2	2	11		y	4070			520	520	1.00	3582			3582	0.145	0.145		63	63	0.231	15	6
ST	B	3.50	3	2			y	4070		255		255	0.00	4070			4070	0.063	0.063		27	27	0.231	15	23
RT	B	4.50	3	2	13		y	4270			35	35	1.00	3828			3828	0.009			4	27	0.034	0	24
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

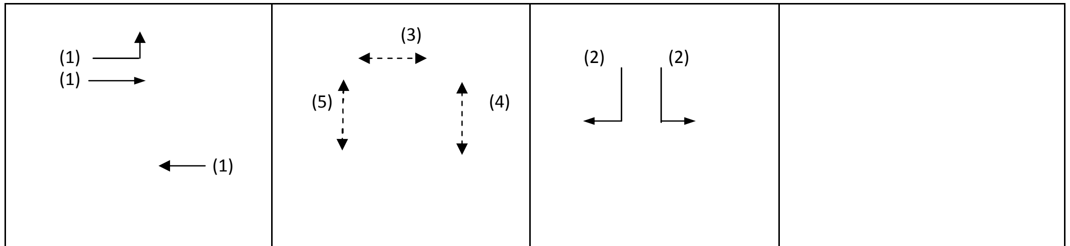
NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION

			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV2 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	100 sec
Sum(y)		Y =	0.253
Loss time		L =	48 sec
Total Flow		=	1430 pcu
Co	= (1.5*L+5)/(1-Y)	=	103.1 sec
Cm	= L/(1-Y)	=	64.2 sec
Yult		=	0.540
R.C.ult	= (Yult-Y)/Y*100%	=	113.5 %
Cp	= 0.9*L/(0.9-Y)	=	66.8 sec
Ymax	= 1-L/C	=	0.520
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	85.1 %

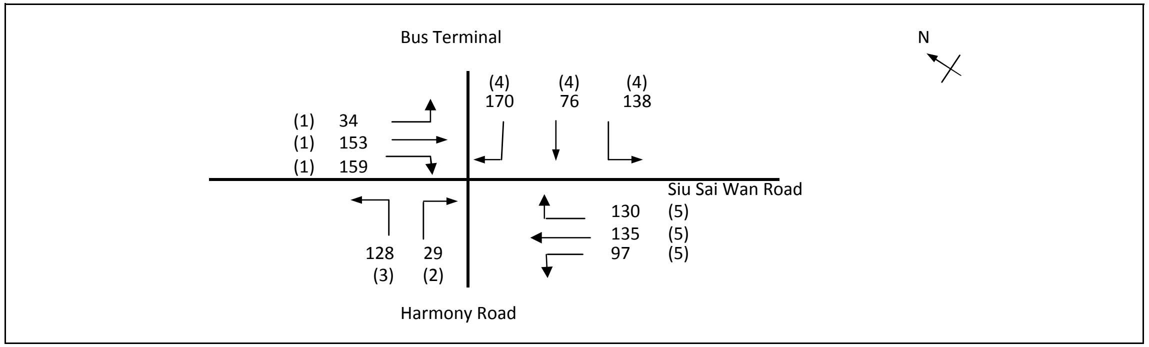


Stage A I = 10 | Stage B I = 15 | Stage C I = 6

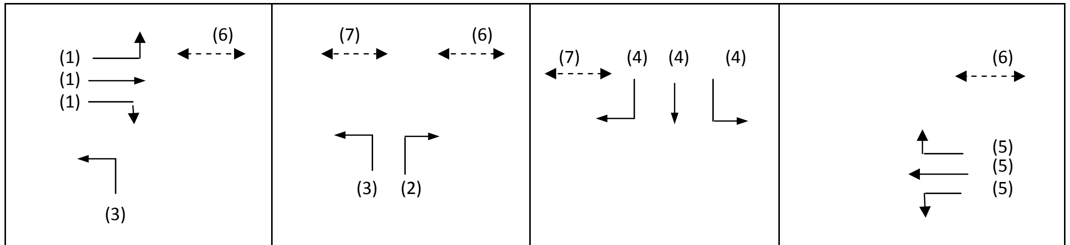
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	102	152		254	0.40	1844			1844	0.138			28	34	0.403	24	19
ST	A	3.20	1	1				2075		268		268	0.00	2075			2075	0.129			27	34	0.378	24	18
ST	A	3.00	1	2			y	3970		661		661	0.00	3970			3970	0.166	0.166		34	34	0.486	36	17
LT	C	3.75	2	1	12		y	1990	83			83	1.00	1769			1769	0.047			10	18	0.263	6	31
RT	C	3.75	2	1	12			2130			164	164	1.00	1893			1893	0.086	0.086		18	18	0.486	18	32
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV2 - Peak Hour Traffic Flows	FILENAME :2_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.323
Loss time		L =	18 sec
Total Flow		=	1251 pcu
Co	= (1.5*L+5)/(1-Y)	=	47.3 sec
Cm	= L/(1-Y)	=	26.6 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	136.5 %
Cp	= 0.9*L/(0.9-Y)	=	28.1 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	130.6 %

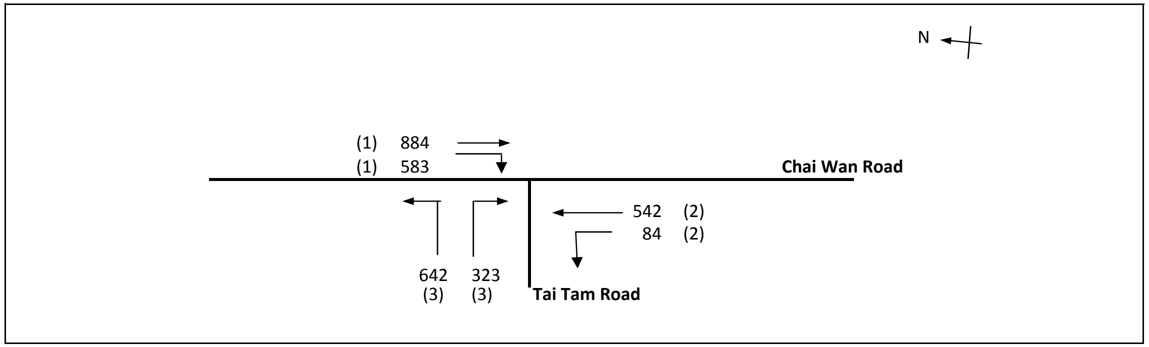


Stage A I = 5	Stage B I = 5	Stage C I = 6	Stage C I = 6

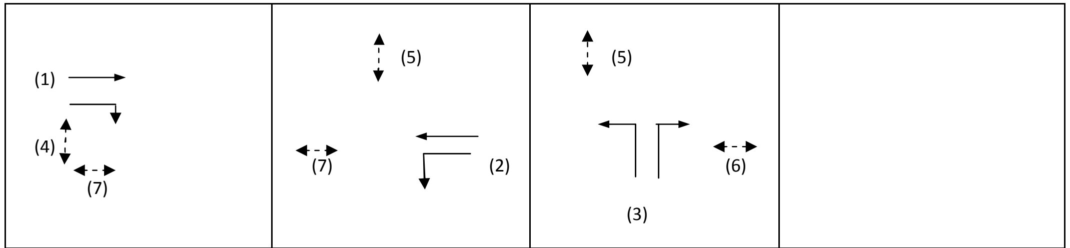
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	34	81		115	0.30	1869			1869	0.062			17	32	0.200	12	22
ST/RT	A	3.30	1	1	12			2085		72	159	231	0.69	1920			1920	0.120	0.120		32	32	0.390	24	22
RT	B	3.50	2	1	12			2105			29	29	1.00	1871			1871	0.016	0.016		4	4	0.390	0	57
LT	A,B	3.75	3	1	13		y	1990	128			128	1.00	1784			1784	0.072			19	42	0.181	12	16
RT	C	3.50	4	1	12			2105			170	170	1.00	1871			1871	0.091			24	32	0.301	18	22
LT/ST	C	3.50	4	1	12		y	1965	138	76		214	0.64	1818			1818	0.118	0.118		32	32	0.390	24	22
ST/RT	D	3.50	5	1	12			2105		0	130	130	1.00	1871			1871	0.070	0.070		19	19	0.390	18	33
LT/ST	D	3.50	5	1	11		y	1965	97	135		233	0.42	1859			1859	0.125			34	34	0.390	24	21
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV2 - Peak Hour Traffic Flows	FILENAME :2_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	105	sec
Sum(y)		Y =	0.699	
Loss time		L =	18	sec
Total Flow		=	3057	pcu
Co	= (1.5*L+5)/(1-Y)	=	106.3	sec
Cm	= L/(1-Y)	=	59.8	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	9.4	%
Cp	= 0.9*L/(0.9-Y)	=	80.6	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	6.7	%



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

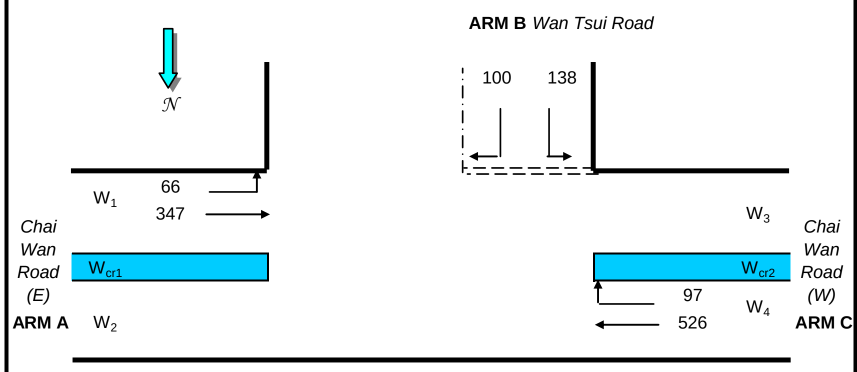
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		884		884	0.00	4070			4070	0.217			27	27	0.844	57	29
RT	A	3.50	1	1	13			2105			583	583	1.00	1887			1887	0.309	0.309		38	27	1.199	72	35
ST	B	3.50	2	2				4210		542		542	0.00	4210			4210	0.129	0.129		16	16	0.844	39	43
LT	B	3.10	2	1	12		y	1925	84			84	1.00	1711			1711	0.049			6	16	0.320	12	35
LT	C	4.00	3	1	15		y	2015	479			479	1.00	1832			1832	0.261	0.261		33	33	0.844	54	32
LT/RT	C	4.00	3	1	15			2155	163		323	486	1.00	1959			1959	0.248			31	33	0.800	54	28
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow **Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at**
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road
Design Year - 2021 Level 2 - Reference Case
Time - Level 2 Peak Hour



GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	65.567	(pcu/hr)
q_{a-c}	=	347	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	526	(pcu/hr)
q_{c-b}	=	97.293	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	100	(pcu/hr)
q_{b-c}	=	138	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	778
Q_{c-b}	=	692
Q_{b-a}	=	384

COMPARISION OF DESIGN FLOW TO CAPACITY

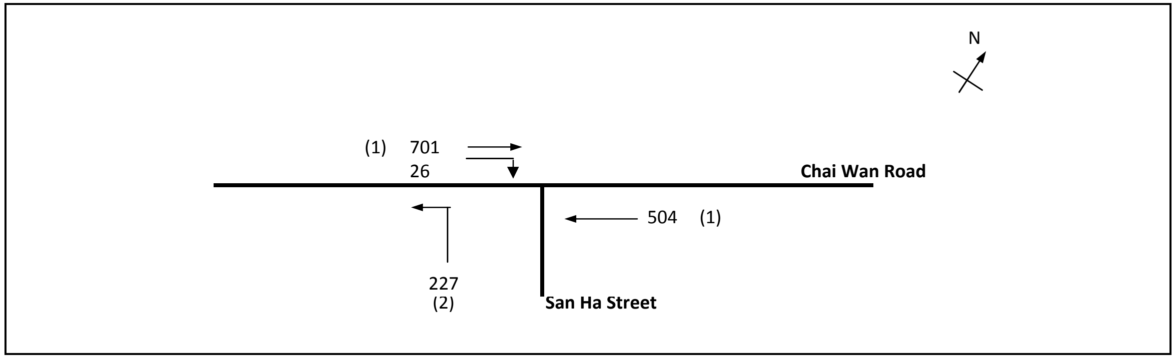
DFC_{b-a}	=	0.262
DFC_{b-c}	=	0.177
DFC_{c-b}	=	0.141

Critical DFC = 0.262

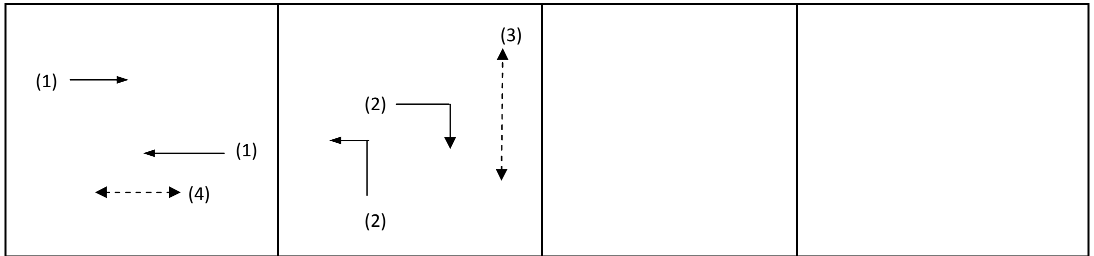
REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV2 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.309	
Loss time		L =	10	sec
Total Flow		=	1459	pcu
Co	= (1.5*L+5)/(1-Y)	=	28.9	sec
Cm	= L/(1-Y)	=	14.5	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	167.1	%
Cp	= 0.9*L/(0.9-Y)	=	15.2	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	162.3	%



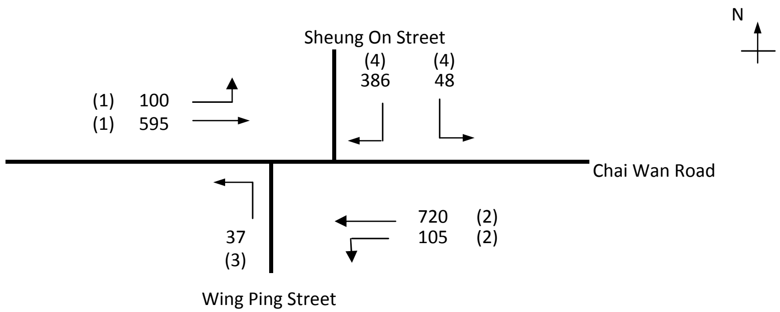
Stage A	I =	6	Stage B	I =	6	Stage C	I =

Movement	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		701		701	0.00	4070			4070	0.172	0.172		50	47	0.367	30	11
ST	A	3.50	1	2	10		N	4070		504		504	0.00	4070			4070	0.124			36	47	0.263	21	11
LT	B	3.00	2	1	10		N	1915	227			227	1.00	1665			1665	0.137	0.137		40	53	0.258	12	9
RT	B	3.50	2	1	12			2105			26	26	1.00	1871			1871	0.014			4	53	0.027	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

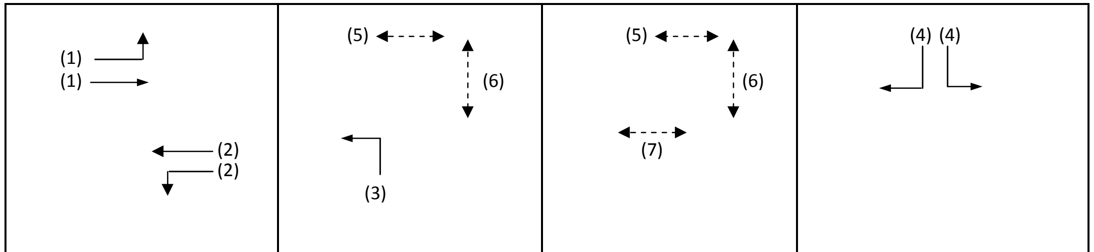
NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV2 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	120	sec
Sum(y)		Y =	0.280	
Loss time		L =	37	sec
Total Flow		=	1991	pcu
Co	= (1.5*L+5)/(1-Y)	=	84.0	sec
Cm	= L/(1-Y)	=	51.4	sec
Yult		=	0.623	
R.C.ult	= (Yult-Y)/Y*100%	=	122.3	%
Cp	= 0.9*L/(0.9-Y)	=	53.7	sec
Ymax	= 1-L/C	=	0.692	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	122.3	%



Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

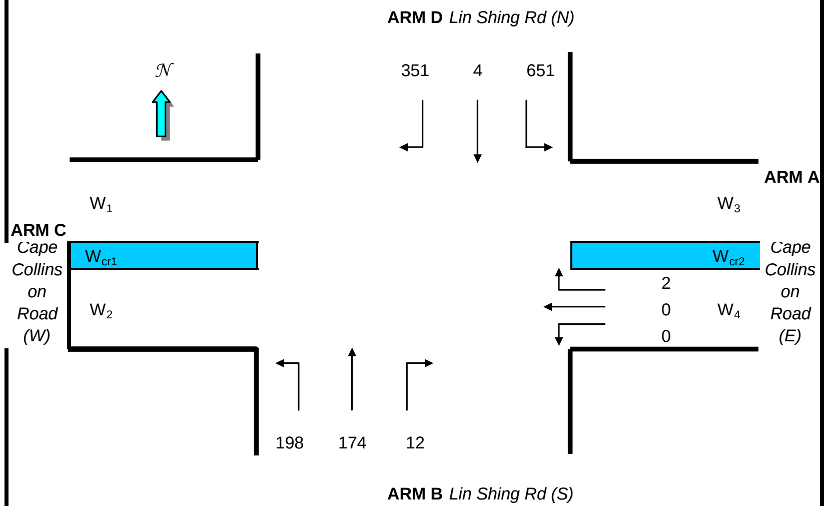
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	100	595		696	0.14	6066			6066	0.115			34		0.000	46	54
LT/ST	A	3.30	2	3	12		Y	6115	105	720		825	0.13	6019			6019	0.137	0.137		41		0.000	54	54
LT	B	3.50	3	1	9		Y	1965	37			37	1.00	1684			1684	0.022	0.022		7		0.000	6	54
LT/RT	D	3.75	4	2	10		y	4120	48		386	434	1.00	3583			3583	0.121	0.121		36		0.000	42	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development a
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2021 Level 2 - Site 1
Time - Level 2 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{a\text{-}d}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$W_{d\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
$W_{d\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
$Vr_{a\text{-}d}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
$Vl_{d\text{-}c}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

$W_{a\text{-}d}$	=	3.00	(metres)
$Vr_{a\text{-}d}$	=	100	(metres)
$q_{a\text{-}b}$	=	0	(pcu/hr)
$q_{a\text{-}c}$	=	0	(pcu/hr)
$q_{a\text{-}d}$	=	2	(pcu/hr)

MAJOR ROAD (ARM C)

$W_{c\text{-}b}$	=		(metres)
$Vr_{c\text{-}b}$	=		(metres)
$q_{c\text{-}a}$	=	0	(pcu/hr)
$q_{c\text{-}b}$	=	0	(pcu/hr)
$q_{c\text{-}d}$	=	0	(pcu/hr)

MINOR ROAD (ARM B)

$W_{b\text{-}a}$	=	5.00	(metres)
$W_{b\text{-}c}$	=	5.00	(metres)
$Vl_{b\text{-}a}$	=	100	(metres)
$Vr_{b\text{-}a}$	=	65	(metres)
$Vr_{b\text{-}c}$	=	0	(metres)
$q_{b\text{-}a}$	=	11.633	(pcu/hr)
$q_{b\text{-}c}$	=	197.53	(pcu/hr)
$q_{b\text{-}d}$	=	173.65	(pcu/hr)

MINOR ROAD (ARM D)

$W_{d\text{-}a}$	=	3.00	(metres)
$W_{d\text{-}c}$	=	3.00	(metres)
$Vl_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}a}$	=	80	(metres)
$q_{d\text{-}a}$	=	651.24	(pcu/hr)
$q_{d\text{-}b}$	=	3.7863	(pcu/hr)
$q_{d\text{-}c}$	=	350.97	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

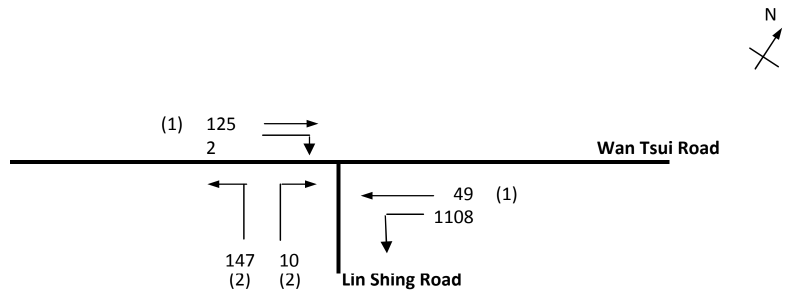
$Q_{b\text{-}a}$	=	402
$Q_{b\text{-}c}$	=	749
$Q_{b\text{-}d}$ is nearside	=	TRUE
$Q_{b\text{-}d}$	=	611
$Q_{d\text{-}a}$	=	674
$Q_{d\text{-}b}$ is nearside	=	TRUE
$Q_{d\text{-}b}$	=	532
$Q_{d\text{-}c}$	=	428
$Q_{c\text{-}b}$	=	437
$Q_{a\text{-}d}$	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

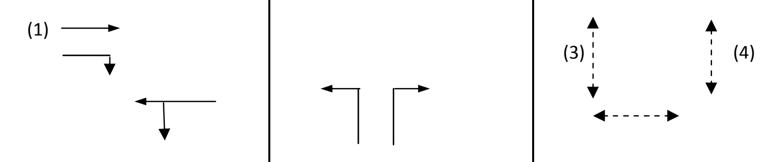
$DFC_{b\text{-}a}$	=	0.029
$DFC_{b\text{-}c}$	=	0.264
$DFC_{b\text{-}d}$	=	0.284
$DFC_{d\text{-}a}$	=	0.966
$DFC_{d\text{-}b}$	=	0.007
$DFC_{d\text{-}c}$	=	0.820
$DFC_{c\text{-}b}$	=	0.000
$DFC_{a\text{-}d}$	=	0.003

Critical DFC = 0.966

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J2: Junction of Lin Shing Road and Wan Tsui Road	J2LV2 - Peak Hour Traffic Flows	FILENAME :/2_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.656	
Loss time		L =	25	sec
Total Flow		=	1281	pcu
Co	= (1.5*L+5)/(1-Y)	=	123.6	sec
Cm	= L/(1-Y)	=	72.7	sec
Yult		=	0.713	
R.C.ult	= (Yult-Y)/Y*100%	=	8.6	%
Cp	= 0.9*L/(0.9-Y)	=	92.3	sec
Ymax	= 1-L/C	=	0.792	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	8.6	%

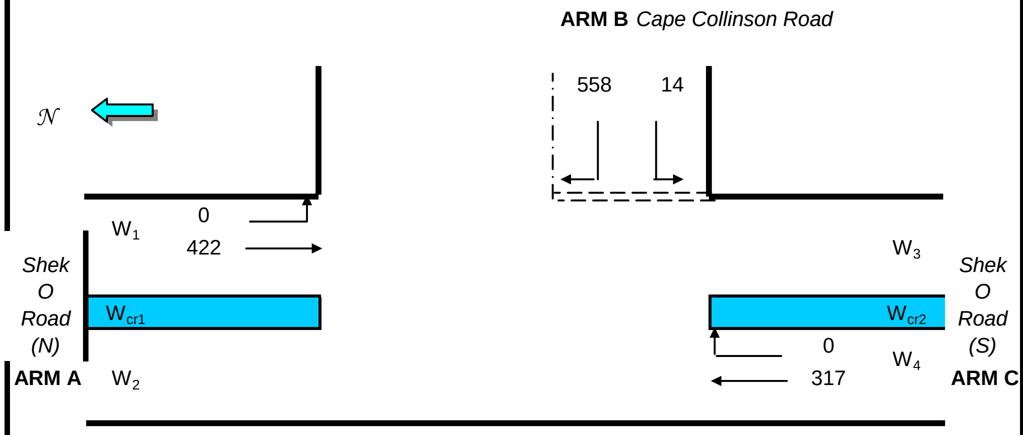


Stage A I = 7	Stage B I =	Stage C I =	

Movement	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		125		125	0.00	1915			1915	0.065			9	95	0.082	0	2
ST/LT	A	4.00	1	1	10		N	2015	1108	49		1156	0.96	1762			1762	0.656	0.656		95	95	0.829	48	6
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2021 Level 2 - Site 1
Time - Level 2 Peak Hour



GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	421.95	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	317.26	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	557.93	(pcu/hr)
q_{b-c}	=	13.782	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	634
Q_{c-b}	=	706
Q_{b-a}	=	293

COMPARISION OF DESIGN FLOW TO CAPACITY

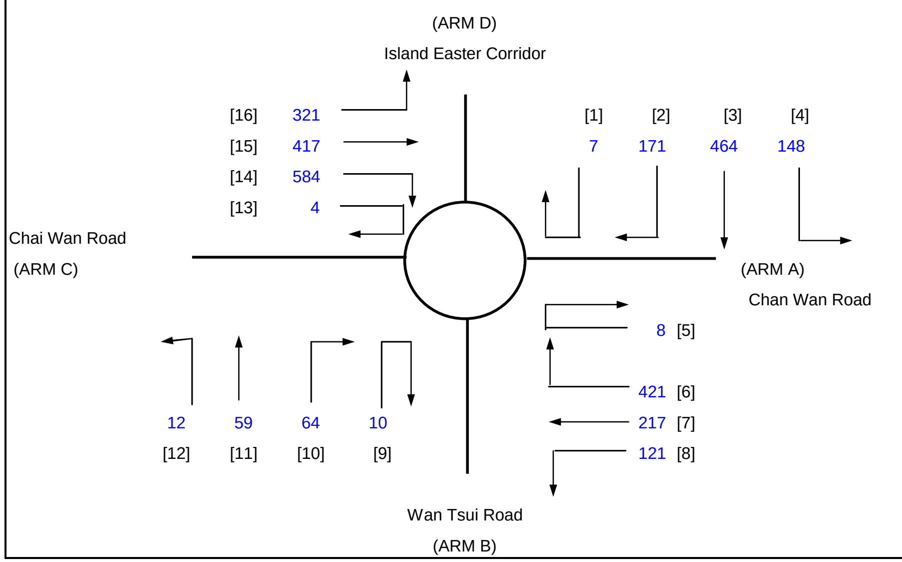
DFC_{b-a}	=	1.907
DFC_{b-c}	=	0.022
DFC_{c-b}	=	0.000

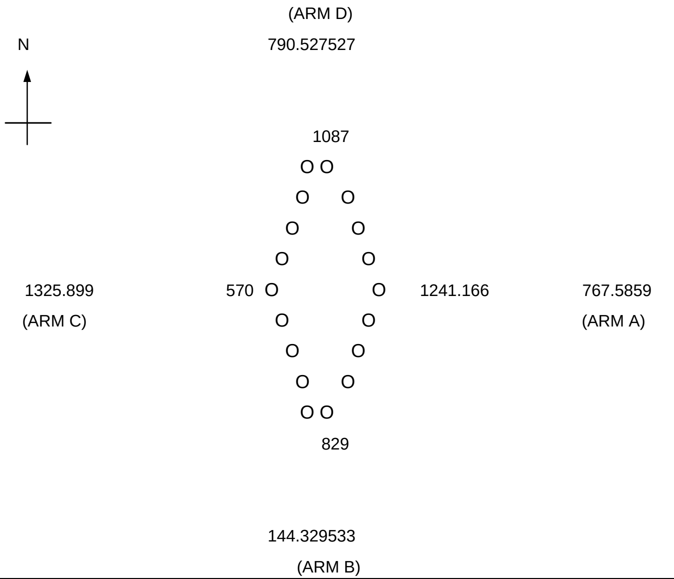
Critical DFC = 1.907

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

	ROUNDABOUT CAPACITY ASSESSMENT			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	**J4LV2 Peak Hour**	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME2021_LV2_S1_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV2 Peak Hour			REVIEWED BY:	OC	Sep-13



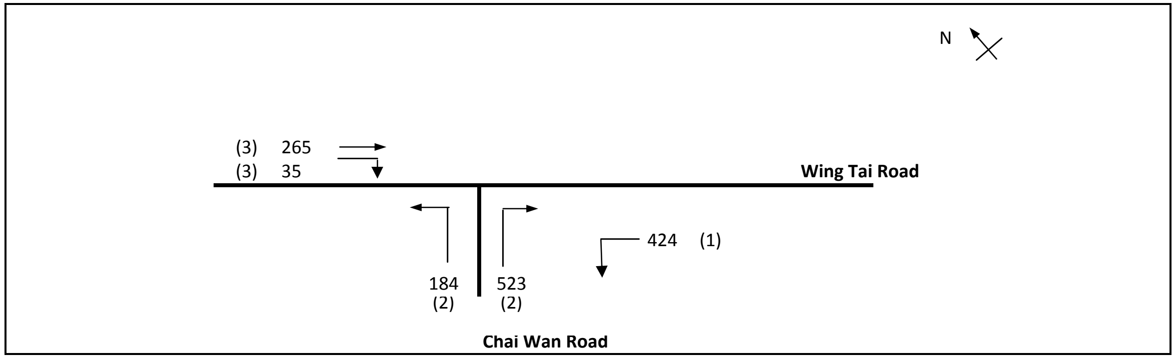


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	768	144	1326	791
Qc	=	Circulating flow across entry (pcu/h)	1241	829	570	1087
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1528	1011	2048	1386
DFC	=	Design flow/Capacity = Q/Qe	0.50	0.14	0.65	0.57

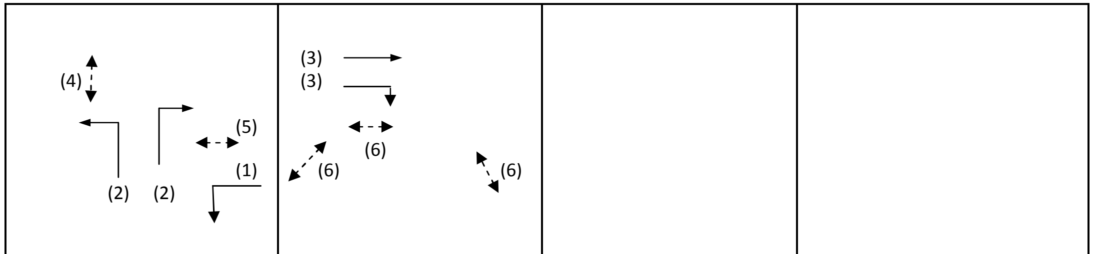
Total In Sum = 2427.383 PCU

DFC of Critical Approach = 0.65

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV2 - Peak Hour Traffic Flows	FILENAME :/2_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.211	
Loss time		L =	10	sec
Total Flow		=	1432	pcu
Co	= (1.5*L+5)/(1-Y)	=	25.4	sec
Cm	= L/(1-Y)	=	12.7	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	290.5	%
Cp	= 0.9*L/(0.9-Y)	=	13.1	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	283.4	%

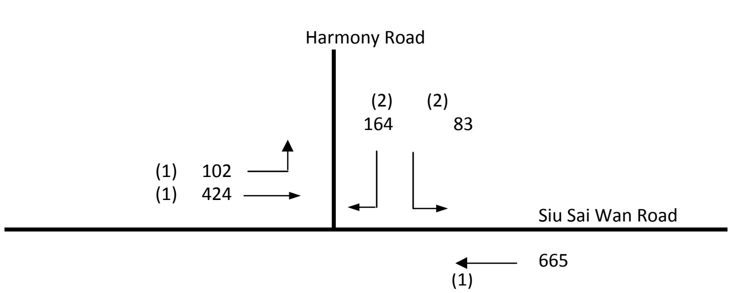


Stage A I = 7 | Stage B I = 5

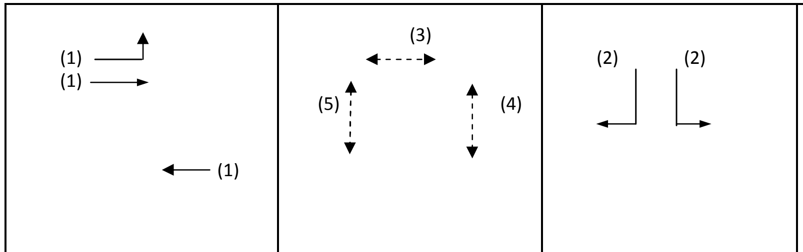
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	424			424	1.00	3857			3857	0.110			47	62	0.177	12	6
LT	A	4.00	2	2	24			4310	184			184	1.00	4056			4056	0.045			19	62	0.073	3	6
RT	A	3.50	2	2	11		y	4070			523	523	1.00	3582			3582	0.146	0.146		62	62	0.235	15	6
ST	B	3.50	3	2			y	4070		265		265	0.00	4070			4070	0.065	0.065		28	28	0.235	15	22
RT	B	4.50	3	2	13		y	4270			35	35	1.00	3828			3828	0.009			4	28	0.033	0	23
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV2 - Peak Hour Traffic Flows	FILENAME :/2_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	100 sec
Sum(y)		Y =	0.254
Loss time		L =	48 sec
Total Flow		=	1437 pcu
Co	= (1.5*L+5)/(1-Y)	=	103.2 sec
Cm	= L/(1-Y)	=	64.3 sec
Yult		=	0.540
R.C.ult	= (Yult-Y)/Y*100%	=	112.6 %
Cp	= 0.9*L/(0.9-Y)	=	66.9 sec
Ymax	= 1-L/C	=	0.520
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	84.3 %

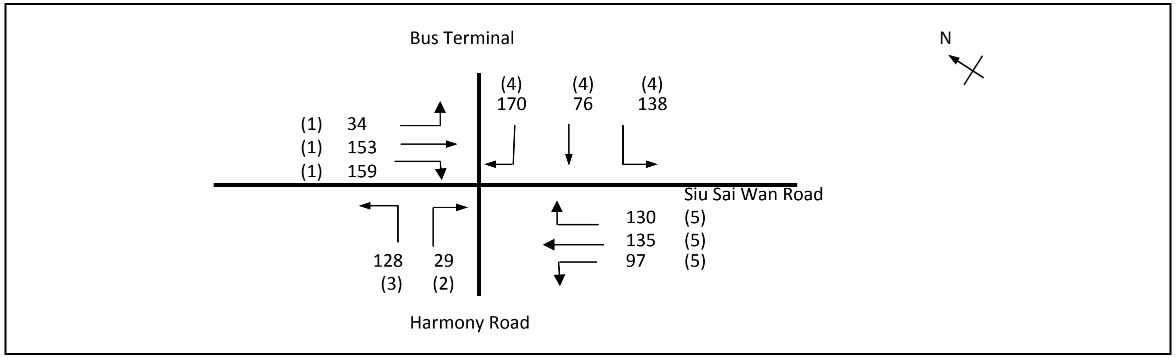


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

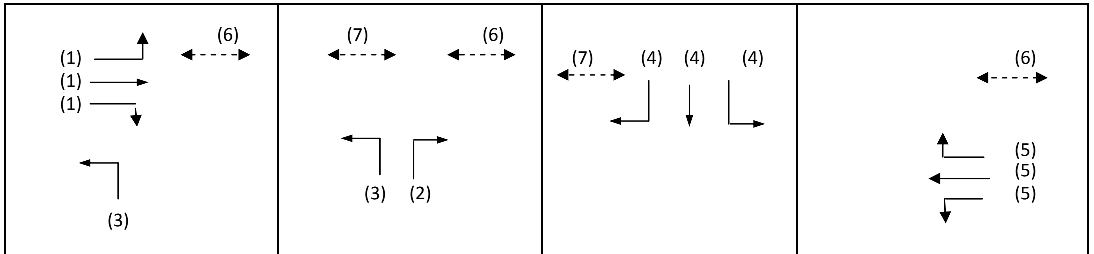
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	102	152		254	0.40	1844			1844	0.138			28	34	0.402	24	18
ST	A	3.20	1	1				2075		272		272	0.00	2075			2075	0.131			27	34	0.382	24	18
ST	A	3.00	1	2			y	3970		665		665	0.00	3970			3970	0.168	0.168		34	34	0.488	36	17
LT	C	3.75	2	1	12		y	1990	83			83	1.00	1769			1769	0.047			10	18	0.264	6	31
RT	C	3.75	2	1	12			2130			164	164	1.00	1893			1893	0.086	0.086		18	18	0.488	18	32
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV2 - Peak Hour Traffic Flows	FILENAME :/2_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.323
Loss time		L =	18 sec
Total Flow		=	1251 pcu
Co	= (1.5*L+5)/(1-Y)	=	47.3 sec
Cm	= L/(1-Y)	=	26.6 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	136.5 %
Cp	= 0.9*L/(0.9-Y)	=	28.1 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	130.6 %

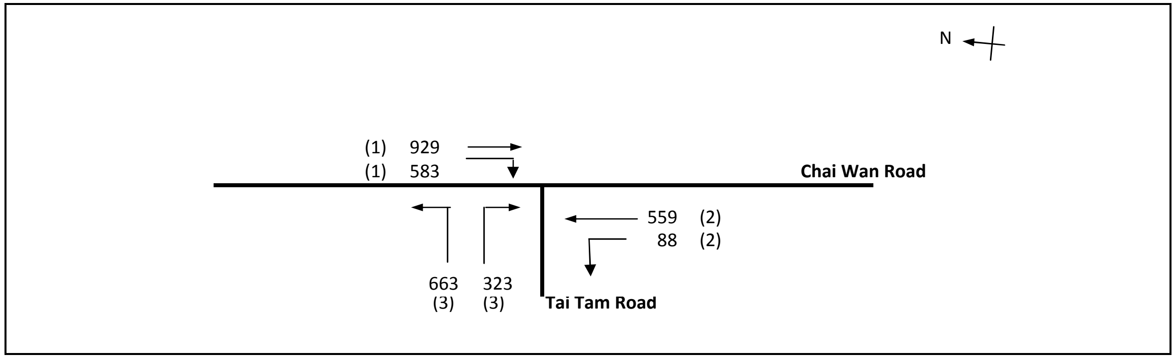


Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

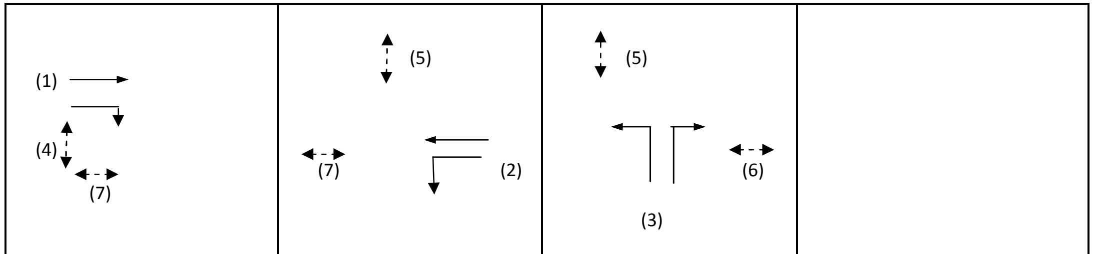
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	34	81		115	0.30	1869			1869	0.062			17	32	0.200	12	22
ST/RT	A	3.30	1	1	12			2085		72	159	231	0.69	1920			1920	0.120	0.120		32	32	0.390	24	22
RT	B	3.50	2	1	12			2105			29	29	1.00	1871			1871	0.016	0.016		4	4	0.390	0	57
LT	A,B	3.75	3	1	13		y	1990	128			128	1.00	1784			1784	0.072			19	42	0.181	12	16
RT	C	3.50	4	1	12			2105			170	170	1.00	1871			1871	0.091			24	32	0.301	18	22
LT/ST	C	3.50	4	1	12		y	1965	138	76		214	0.64	1818			1818	0.118	0.118		32	32	0.390	24	22
ST/RT	D	3.50	5	1	12			2105			130	130	1.00	1871			1871	0.070	0.070		19	19	0.390	18	33
LT/ST	D	3.50	5	1	11		y	1965	97	135		233	0.42	1859			1859	0.125			34	34	0.390	24	21
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV2 - Peak Hour Traffic Flows	FILENAME :/2_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	105 sec
Sum(y)		Y =	0.686
Loss time		L =	18 sec
Total Flow		=	3145 pcu
Co	= (1.5*L+5)/(1-Y)	=	102.0 sec
Cm	= L/(1-Y)	=	57.4 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	11.5 %
Cp	= 0.9*L/(0.9-Y)	=	75.8 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	8.7 %

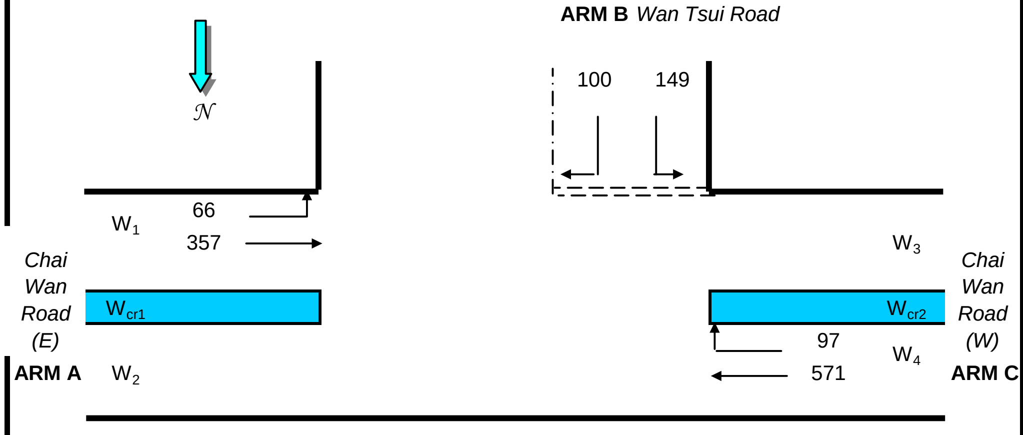


Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.75	1	2			y	4120		929		929	0.00	4120			4120	0.226			29	29	0.828	57	26
RT	A	3.00	1	1	13			2055			583	583	1.00	1842			1842	0.316	0.316		40	29	1.161	72	33
ST	B	3.50	2	2				4210		559		559	0.00	4210			4210	0.133	0.133		17	17	0.828	39	40
LT	B	3.10	2	1	12		y	1925	88			88	1.00	1711			1711	0.051			7	17	0.320	12	34
LT	C	4.00	3	1	15		y	2015	521			521	1.00	1832			1832	0.285			36	36	0.828	54	27
LT/RT	C	4.00	3	1	15			2155	142		323	465	1.00	1959			1959	0.237	0.237		30	36	0.690	48	21
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road
Design Year - 2021 Level 2 - Site 1
Time - Level 2 Peak Hour



GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	65.567	(pcu/hr)
q_{a-c}	=	357.36	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	570.74	(pcu/hr)
q_{c-b}	=	97.293	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	100.47	(pcu/hr)
q_{b-c}	=	148.71	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	777
Q_{c-b}	=	691
Q_{b-a}	=	381

COMPARISION OF DESIGN FLOW TO CAPACITY

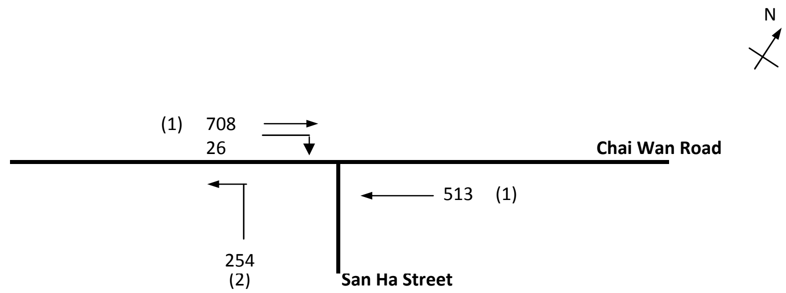
DFC_{b-a}	=	0.264
DFC_{b-c}	=	0.191
DFC_{c-b}	=	0.141

Critical DFC = 0.264

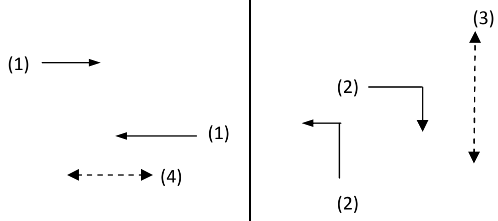
REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV2 - Peak Hour Traffic Flows	FILENAME :/2_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.326	
Loss time		L =	10	sec
Total Flow		=	1502	pcu
Co	= (1.5*L+5)/(1-Y)	=	29.7	sec
Cm	= L/(1-Y)	=	14.8	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	152.7	%
Cp	= 0.9*L/(0.9-Y)	=	15.7	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	148.1	%

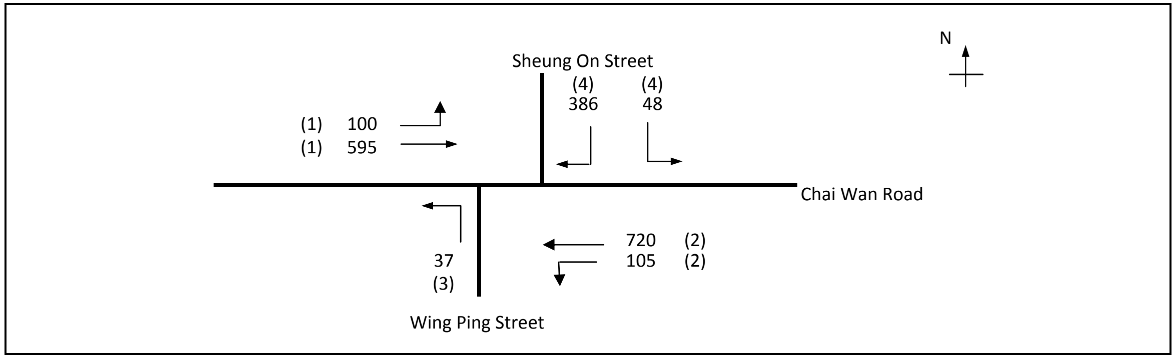


Stage A	I = 6	Stage B	I = 6	Stage C	I =

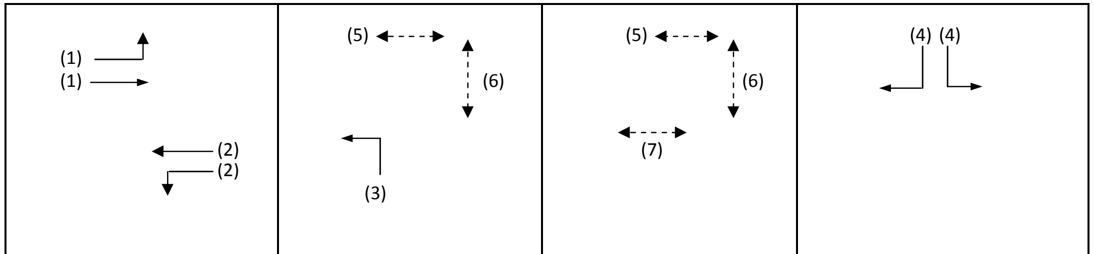
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		708		708	0.00	4070			4070	0.174	0.174		48	47	0.370	30	11
ST	A	3.50	1	2	10		N	4070		513		513	0.00	4070			4070	0.126			35	47	0.268	21	11
LT	B	3.00	2	1	10		N	1915	254			254	1.00	1665			1665	0.153	0.153		42	53	0.288	18	9
RT	B	3.50	2	1	12			2105			26	26	1.00	1871			1871	0.014			4	53	0.027	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION					INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.:	CTLDQS	Prepared By:	KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV2 - Peak Hour Traffic Flows	FILENAME :/2_S1_J2_J5_J6_J7_J8.xls		Checked By:	OC	29-4-2011
2021 Level 2 Peak Hour - Site 1		REFERENCE NO.:		Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	120 sec
Sum(y)		Y =	0.280
Loss time		L =	37 sec
Total Flow		=	1991 pcu
Co	= (1.5*L+5)/(1-Y)	=	84.0 sec
Cm	= L/(1-Y)	=	51.4 sec
Yult		=	0.623
R.C.ult	= (Yult-Y)/Y*100%	=	122.3 %
Cp	= 0.9*L/(0.9-Y)	=	53.7 sec
Ymax	= 1-L/C	=	0.692
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	122.3 %



Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	100	595		696	0.14	6066			6066	0.115			34		0.000	46	54
LT/ST	A	3.30	2	3	12		Y	6115	105	720		825	0.13	6019			6019	0.137	0.137		41		0.000	54	54
LT	B	3.50	3	1	9		Y	1965	37			37	1.00	1684			1684	0.022	0.022		7		0.000	6	54
LT/RT	D	3.75	4	2	10		y	4120	48		386	434	1.00	3583			3583	0.121	0.121		36		0.000	42	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at C

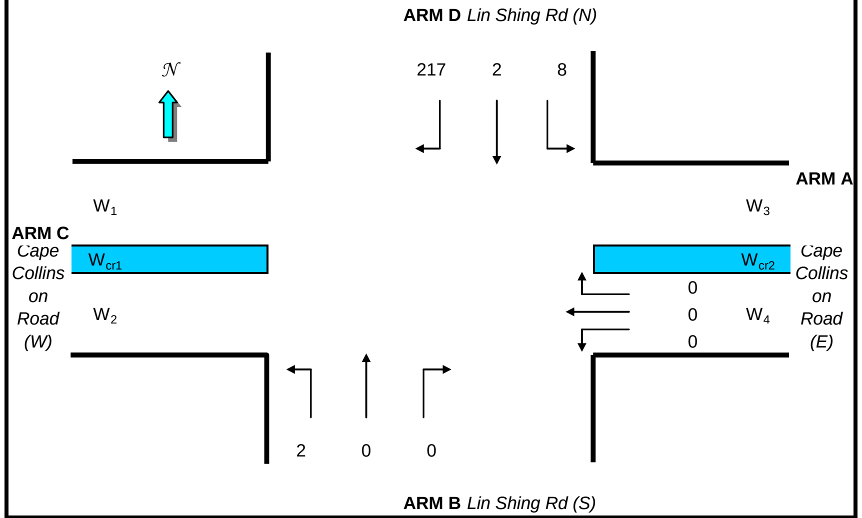
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - **J1: J/O Cape Collinson Road and Lin Shing Road**

Design Year - **2021 Level 3 - Reference Case**

Time - **Level 3 Peak Hour**



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{a-d}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
W_{d-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
W_{d-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
Vr_{a-d}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
Vl_{d-c}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)
MAJOR ROAD			**(ARM A)**
W_{a-d}	=	3.00	(metres)
Vr_{a-d}	=	100	(metres)
q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	0	(pcu/hr)
q_{a-d}	=	0	(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)
q_{c-d}	=	0	(pcu/hr)
MINOR ROAD			**(ARM B)**
W_{b-a}	=	5.00	(metres)
W_{b-c}	=	5.00	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	65	(metres)
Vr_{b-c}	=	0	(metres)
q_{b-a}	=	0	(pcu/hr)
q_{b-c}	=	2	(pcu/hr)
q_{b-d}	=	0	(pcu/hr)
MINOR ROAD			**(ARM D)**
W_{d-a}	=	3.00	(metres)
W_{d-c}	=	3.00	(metres)
Vl_{d-c}	=	50	(metres)
Vr_{d-c}	=	50	(metres)
Vr_{d-a}	=	80	(metres)
q_{d-a}	=	8	(pcu/hr)
q_{d-b}	=	2	(pcu/hr)
q_{d-c}	=	217	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

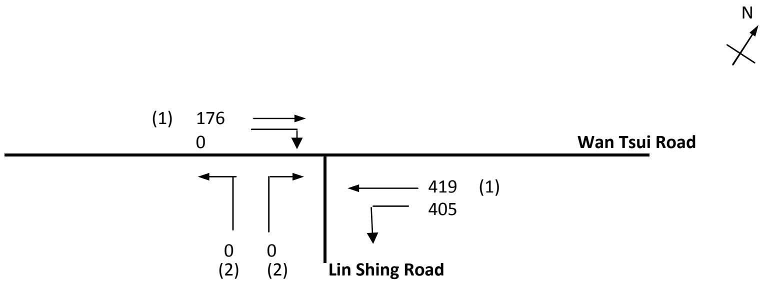
Q_{b-a}	=	616
Q_{b-c}	=	749
Q_{b-d} is nearside	=	TRUE
Q_{b-d}	=	611
Q_{d-a}	=	674
Q_{d-b} is nearside	=	TRUE
Q_{d-b}	=	533
Q_{d-c}	=	518
Q_{c-b}	=	437
Q_{a-d}	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

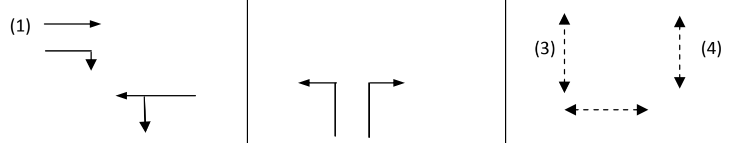
DFC_{b-a}	=	0.000
DFC_{b-c}	=	0.003
DFC_{b-d}	=	0.000
DFC_{d-a}	=	0.013
DFC_{d-b}	=	0.004
DFC_{d-c}	=	0.419
DFC_{c-b}	=	0.000
DFC_{a-d}	=	0.000

Critical DFC = 0.419

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
Junction of Lin Shing Road and Wan Tsui Road	J2LV3 - Peak Hour Traffic Flows	FILENAME :3_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	120 sec
Sum(y)		Y =	0.439
Loss time		L =	25 sec
Total Flow		=	1000 pcu
Co	= (1.5*L+5)/(1-Y)	=	75.8 sec
Cm	= L/(1-Y)	=	44.6 sec
Yult		=	0.713
R.C.ult	= (Yult-Y)/Y*100%	=	62.2 %
Cp	= 0.9*L/(0.9-Y)	=	48.8 sec
Ymax	= 1-L/C	=	0.792
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	62.2 %



Stage A	I = 7	Stage B	I =	Stage C	I =	

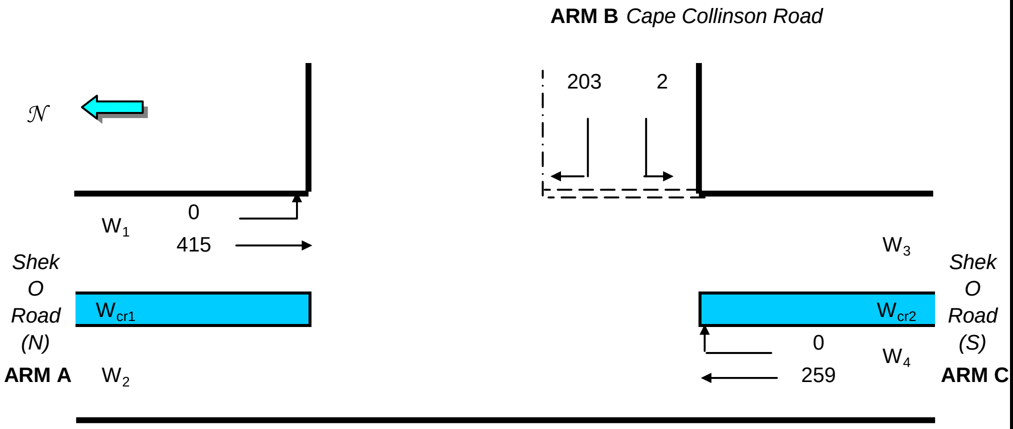
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
ST	A	3.00	1	1			N	1915		176		176	0.00	1915			1915	0.092		5	20	95	0.116	6	2
ST/LT	A	4.00	1	1	10		N	2015	405	419		825	0.49	1877			1877	0.439	0.439		95	95	0.555	30	3
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at
Junction Capacity Analysis

Prepared By: KC
Checked By: OC

Junction layout sketch - **J3: J/O Cape Collinson Road and Lin Shing Road**
Design Year - **2021 Level 3 - Reference Case**
Time - **Level 3 Peak Hour**



GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	415	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	259	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	203	(pcu/hr)
q_{b-c}	=	2	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	636
Q_{c-b}	=	708
Q_{b-a}	=	300

COMPARISION OF DESIGN FLOW TO CAPACITY

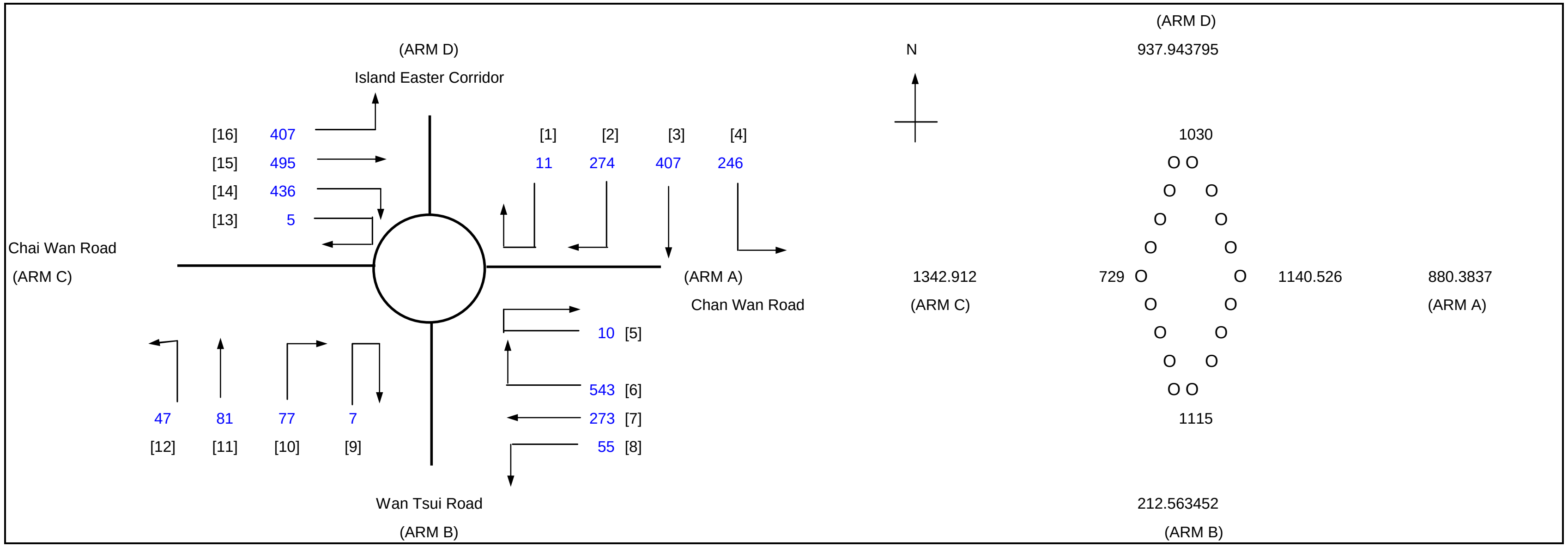
DFC_{b-a}	=	0.678
DFC_{b-c}	=	0.003
DFC_{c-b}	=	0.000

Critical DFC = 0.678

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

	ROUNDABOUT CAPACITY ASSESSMENT			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	J4LV3 Peak Hour	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME: 2021_LV3_Ref_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV3 Peak Hour			REVIEWED BY:	OC	Sep-13

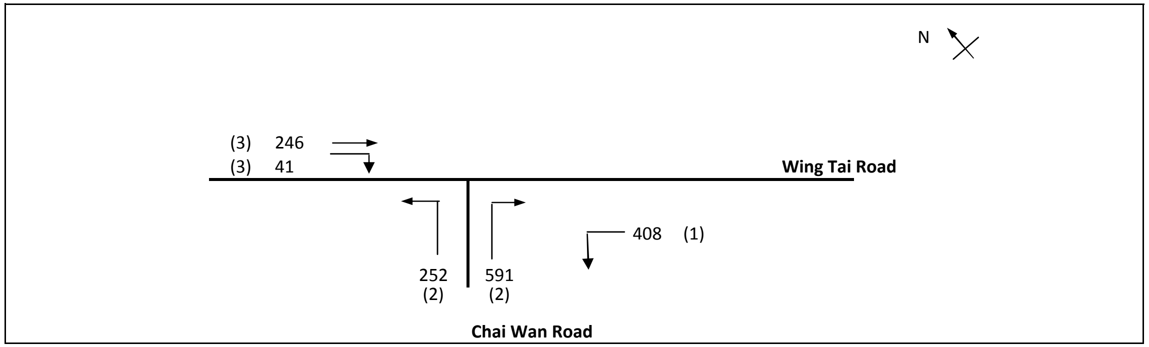


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	880	213	1343	938
Qc	=	Circulating flow across entry (pcu/h)	1141	1115	729	1030
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1604	852	1928	1426
DFC	=	Design flow/Capacity = Q/Qe	0.55	0.25	0.70	0.66

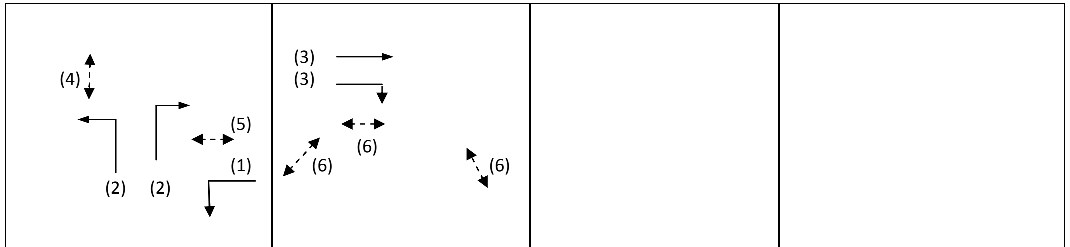
Total In Sum = 2618.926 PCU

DFC of Critical Approach = 0.70

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	100 sec
Sum(y)		Y =	0.225
Loss time		L =	10 sec
Total Flow		=	1539 pcu
Co	= (1.5*L+5)/(1-Y)	=	25.8 sec
Cm	= L/(1-Y)	=	12.9 sec
Yult		=	0.825
R.C.ult	= (Yult-Y)/Y*100%	=	266.0 %
Cp	= 0.9*L/(0.9-Y)	=	13.3 sec
Ymax	= 1-L/C	=	0.900
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	259.4 %

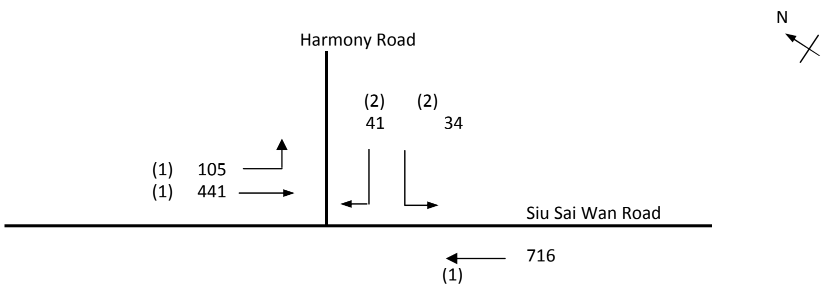


Stage A I = 7 | Stage B I = 5

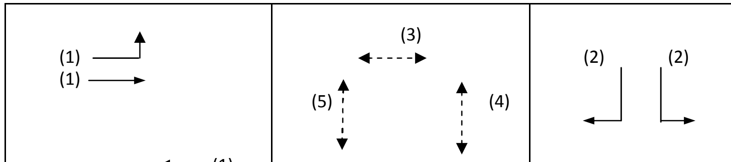
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	408			408	1.00	3857			3857	0.106			42	66	0.161	9	5
LT	A	4.00	2	2	24			4310	252			252	1.00	4056			4056	0.062			25	66	0.094	6	5
RT	A	3.50	2	2	11		y	4070			591	591	1.00	3582			3582	0.165	0.165		66	66	0.250	15	5
ST	B	3.50	3	2			y	4070		246		246	0.00	4070			4070	0.060	0.060		24	24	0.250	15	25
RT	B	4.50	3	2	13		y	4270			41	41	1.00	3828			3828	0.011			4	24	0.045	0	26
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	100	sec
Sum(y)		Y =	0.202	
Loss time		L =	48	sec
Total Flow		=	1337	pcu
Co	= (1.5*L+5)/(1-Y)	=	96.5	sec
Cm	= L/(1-Y)	=	60.2	sec
Yult		=	0.540	
R.C.ult	= (Yult-Y)/Y*100%	=	167.2	%
Cp	= 0.9*L/(0.9-Y)	=	61.9	sec
Ymax	= 1-L/C	=	0.520	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	131.5	%

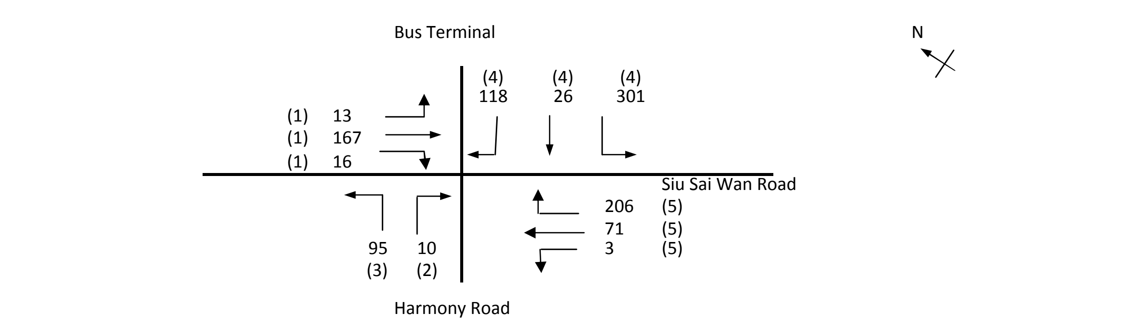


Stage A I = 10 | Stage B I = 15 | Stage C I = 6

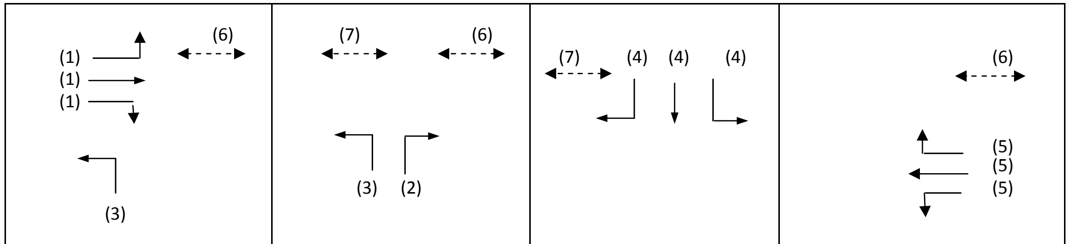
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	105	152		257	0.41	1843			1843	0.139			36	46	0.300	18	12
ST	A	3.20	1	1				2075		289		289	0.00	2075			2075	0.139			36	46	0.300	24	12
ST	A	3.00	1	2			y	3970		716		716	0.00	3970			3970	0.180	0.180		46	46	0.389	30	11
LT	C	3.75	2	1	12		y	1990	34			34	1.00	1769			1769	0.019			5	6	0.341	0	48
RT	C	3.75	2	1	12			2130			41	41	1.00	1893			1893	0.022	0.022		6	6	0.389	6	49
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.351
Loss time		L =	18 sec
Total Flow		=	1027 pcu
Co	= (1.5*L+5)/(1-Y)	=	49.3 sec
Cm	= L/(1-Y)	=	27.7 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	117.9 %
Cp	= 0.9*L/(0.9-Y)	=	29.5 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	112.4 %

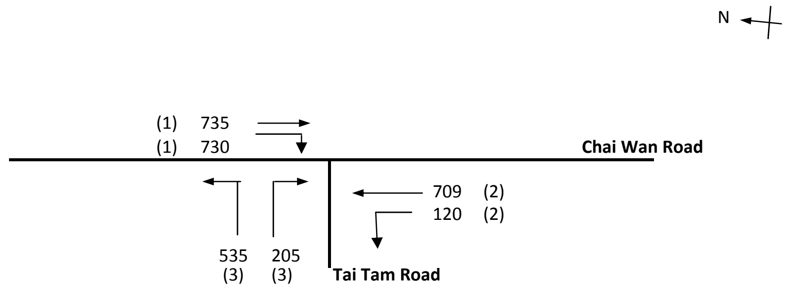


Stage A I = 5	Stage B I = 5	Stage C I = 6	Stage C I = 6

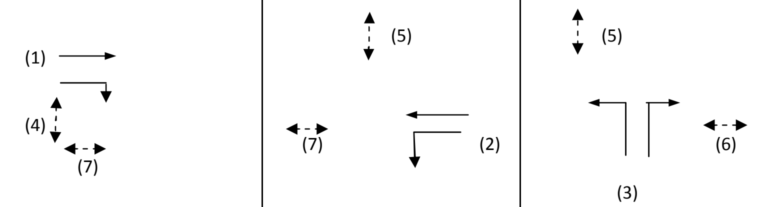
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	13	81		94	0.14	1910			1910	0.049			12	12	0.417	12	40
ST/RT	A	3.30	1	1	12			2085		86	16	102	0.16	2045			2045	0.050	0.050		12	12	0.424	12	40
RT	B	3.50	2	1	12			2105			10	10	1.00	1871			1871	0.005	0.005		1	1	0.424	0	99
LT	A,B	3.75	3	1	13		y	1990	95			95	1.00	1784			1784	0.053			13	19	0.301	12	32
RT	C	3.50	4	1	12			2105			118	118	1.00	1871			1871	0.063			16	46	0.144	6	14
LT/ST	C	3.50	4	1	12		y	1965	301	26		328	0.92	1762			1762	0.186	0.186		46	46	0.424	30	14
ST/RT	D	3.50	5	1	12			2105		0	206	206	1.00	1871			1871	0.110	0.110		27	27	0.424	24	25
LT/ST	D	3.50	5	1	11		y	1965	3	71		74	0.04	1954			1954	0.038			9	9	0.424	6	45
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	105 sec
Sum(y)		Y =	0.758
Loss time		L =	18 sec
Total Flow		=	3034 pcu
Co	= (1.5*L+5)/(1-Y)	=	132.5 sec
Cm	= L/(1-Y)	=	74.5 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	0.9 %
Cp	= 0.9*L/(0.9-Y)	=	114.5 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	-1.7 %



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

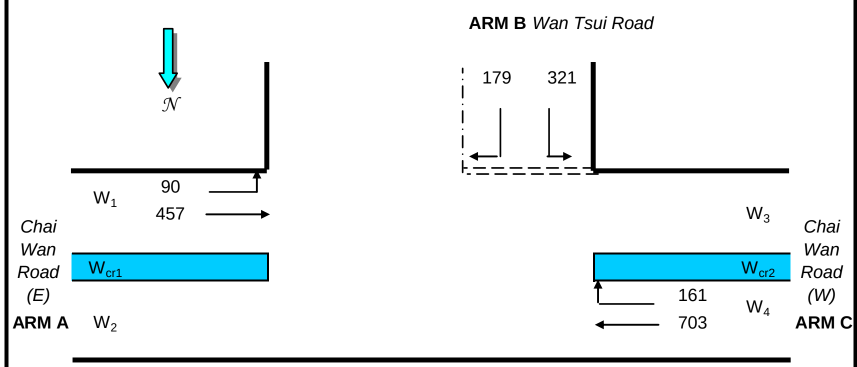
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		735		735	0.00	4070			4070	0.181			21	21	0.915	54	43
RT	A	3.50	1	1	13			2105			730	730	1.00	1887			1887	0.387	0.387		44	21	1.959	102	42
ST	B	3.50	2	2				4210		709		709	0.00	4210			4210	0.168	0.168		19	19	0.915	54	44
LT	B	3.10	2	1	12		y	1925	120			120	1.00	1711			1711	0.070			8	19	0.379	12	32
LT	C	4.00	3	1	15		y	2015	372			372	1.00	1832			1832	0.203	0.203		23	23	0.915	66	35
LT/RT	C	4.00	3	1	15			2155	163		205	368	1.00	1959			1959	0.188			22	23	0.845	48	44
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - **J9: Junciton of Chai Wan Road and Wan Tsui Road**
Design Year - **2021 Level 3 - Reference Case**
Time - **Level 3 Peak Hour**



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	89.89	(pcu/hr)
q_{a-c}	=	457	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	703	(pcu/hr)
q_{c-b}	=	160.74	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	179	(pcu/hr)
q_{b-c}	=	321	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

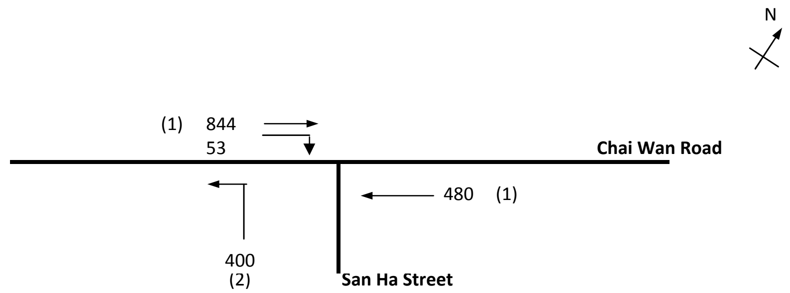
Q_{b-c}	=	763
Q_{c-b}	=	677
Q_{b-a}	=	359

COMPARISION OF DESIGN FLOW TO CAPACITY

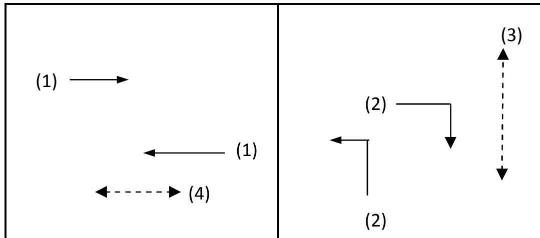
DFC_{b-a}	=	0.500
DFC_{b-c}	=	0.421
DFC_{c-b}	=	0.238

Critical DFC = 0.500

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	100 sec
Sum(y)		Y =	0.447
Loss time		L =	10 sec
Total Flow		=	1777 pcu
Co	= (1.5*L+5)/(1-Y)	=	36.2 sec
Cm	= L/(1-Y)	=	18.1 sec
Yult		=	0.825
R.C.ult	= (Yult-Y)/Y*100%	=	84.4 %
Cp	= 0.9*L/(0.9-Y)	=	19.9 sec
Ymax	= 1-L/C	=	0.900
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	81.0 %

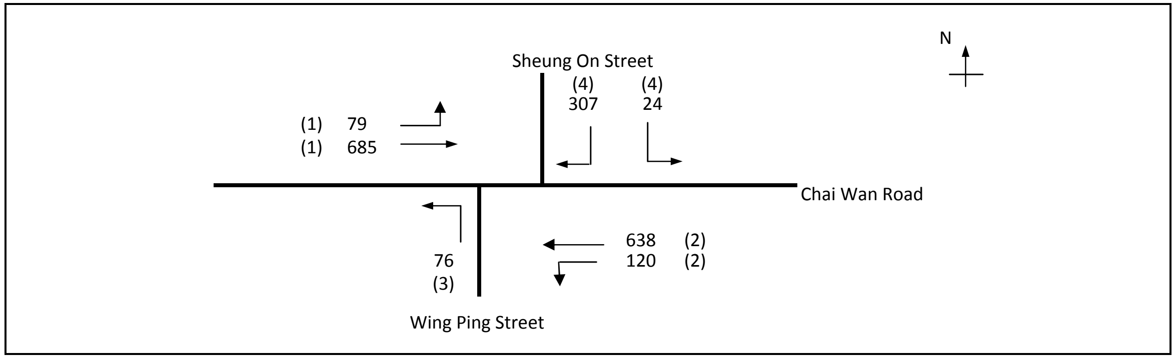


Stage A	I = 6	Stage B	I = 6	Stage C	I =	

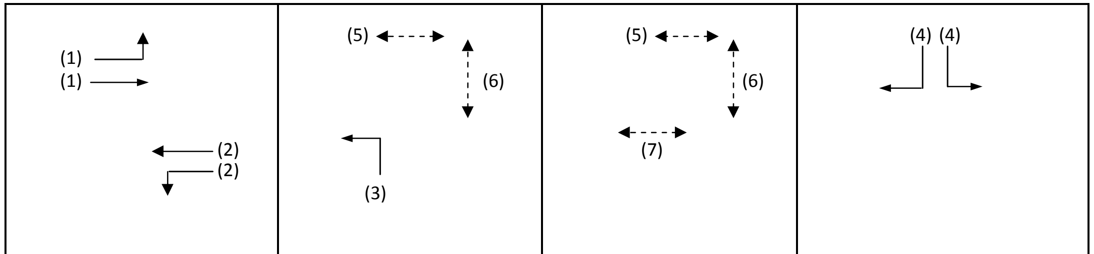
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		844		844	0.00	4070			4070	0.207	0.207		42	47	0.441	36	11
ST	A	3.50	1	2	10		N	4070		480		480	0.00	4070			4070	0.118			24	47	0.251	21	11
LT	B	3.00	2	1	10		N	1915	400			400	1.00	1665			1665	0.240	0.240		48	53	0.453	30	9
RT	B	3.50	2	1	12			2105			53	53	1.00	1871			1871	0.028			6	53	0.053	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	120	sec
Sum(y)		Y =	0.264	
Loss time		L =	37	sec
Total Flow		=	1929	pcu
Co	= (1.5*L+5)/(1-Y)	=	82.2	sec
Cm	= L/(1-Y)	=	50.3	sec
Yult		=	0.623	
R.C.ult	= (Yult-Y)/Y*100%	=	135.9	%
Cp	= 0.9*L/(0.9-Y)	=	52.3	sec
Ymax	= 1-L/C	=	0.692	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	135.9	%

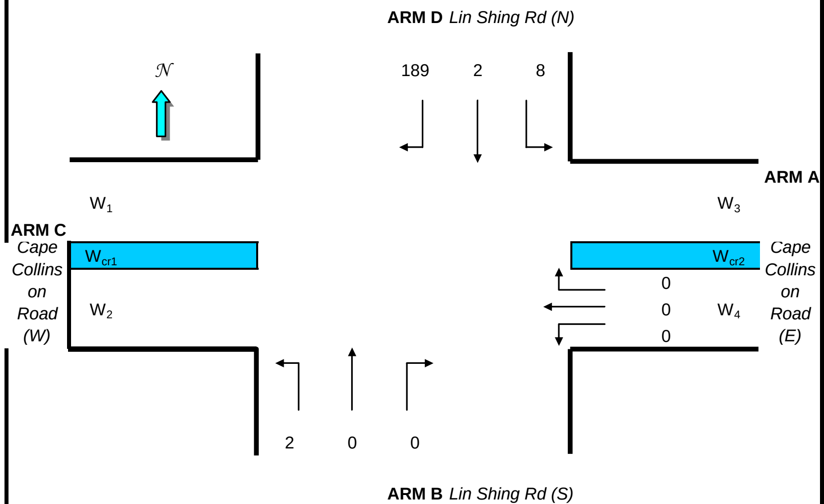


Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	79	685		765	0.10	6096			6096	0.125			39		0.000	50	54
LT/ST	A	3.30	2	3	12		Y	6115	120	638		757	0.16	5997			5997	0.126	0.126		40		0.000	50	54
LT	B	3.50	3	1	9		Y	1965	76			76	1.00	1684			1684	0.045	0.045		14		0.000	12	54
LT/RT	D	3.75	4	2	10		y	4120	24		307	331	1.00	3583			3583	0.092	0.092		29		0.000	33	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - **J1: J/O Cape Collinson Road and Lin Shing Road**
Design Year - **2021 Level 3 - Site 1**
Time - **Level 3 Peak Hour**



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{a-d}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
W_{d-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
W_{d-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
Vr_{a-d}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
Vl_{d-c}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

W_{a-d}	=	3.00	(metres)
Vr_{a-d}	=	100	(metres)
q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	0	(pcu/hr)
q_{a-d}	=	0	(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)
q_{c-d}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	5.00	(metres)
W_{b-c}	=	5.00	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	65	(metres)
Vr_{b-c}	=	0	(metres)
q_{b-a}	=	0	(pcu/hr)
q_{b-c}	=	2.1151	(pcu/hr)
q_{b-d}	=	0	(pcu/hr)

MINOR ROAD (ARM D)

W_{d-a}	=	3.00	(metres)
W_{d-c}	=	3.00	(metres)
Vl_{d-c}	=	50	(metres)
Vr_{d-c}	=	50	(metres)
Vr_{d-a}	=	80	(metres)
q_{d-a}	=	8.4602	(pcu/hr)
q_{d-b}	=	2.1151	(pcu/hr)
q_{d-c}	=	189.37	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

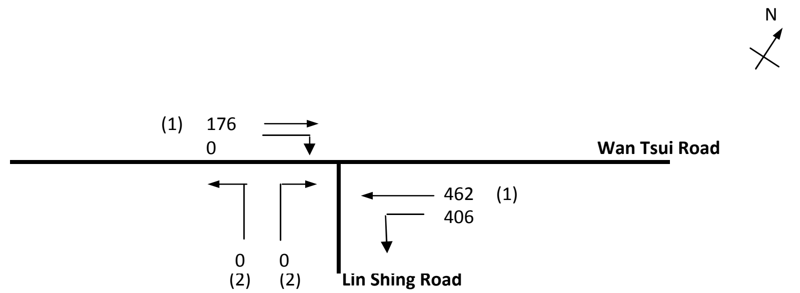
Q_{b-a}	=	620
Q_{b-c}	=	749
Q_{b-d} is nearside	=	TRUE
Q_{b-d}	=	611
Q_{d-a}	=	674
Q_{d-b} is nearside	=	TRUE
Q_{d-b}	=	533
Q_{d-c}	=	518
Q_{c-b}	=	437
Q_{a-d}	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

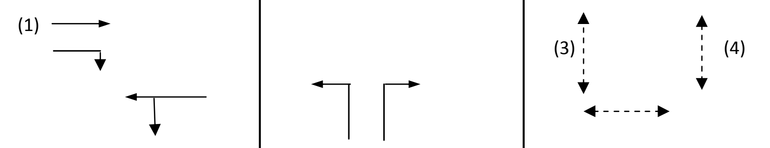
DFC_{b-a}	=	0.000
DFC_{b-c}	=	0.003
DFC_{b-d}	=	0.000
DFC_{d-a}	=	0.013
DFC_{d-b}	=	0.004
DFC_{d-c}	=	0.366
DFC_{c-b}	=	0.000
DFC_{a-d}	=	0.000

Critical DFC = 0.366

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J2: Junction of Lin Shing Road and Wan Tsui Road	J2LV3 - Peak Hour Traffic Flows	FILENAME :/3_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.461	
Loss time		L =	25	sec
Total Flow		=	1043	pcu
Co	= (1.5*L+5)/(1-Y)	=	78.8	sec
Cm	= L/(1-Y)	=	46.4	sec
Yult		=	0.713	
R.C.ult	= (Yult-Y)/Y*100%	=	54.6	%
Cp	= 0.9*L/(0.9-Y)	=	51.2	sec
Ymax	= 1-L/C	=	0.792	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	54.6	%



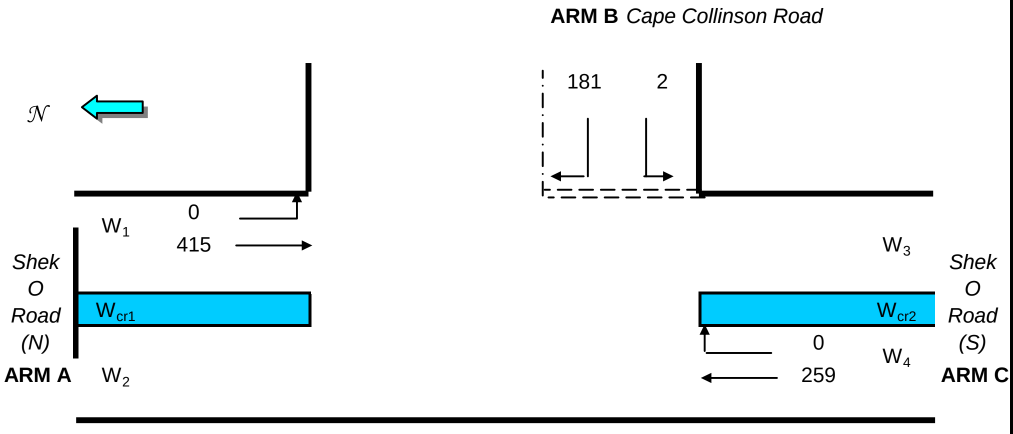
Stage A	I = 7	Stage B	I =	Stage C	I =

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		176		176	0.00	1915			1915	0.092			19	95	0.116	6	2
ST/LT	A	4.00	1	1	10		N	2015	406	462		868	0.47	1883			1883	0.461	0.461		95	95	0.582	36	3
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Prepared By:	KC
Checked By:	OC

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2021 Level 3 - Site 1
Time - Level 3 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	414.55	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	259.09	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	180.61	(pcu/hr)
q_{b-c}	=	2.1151	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

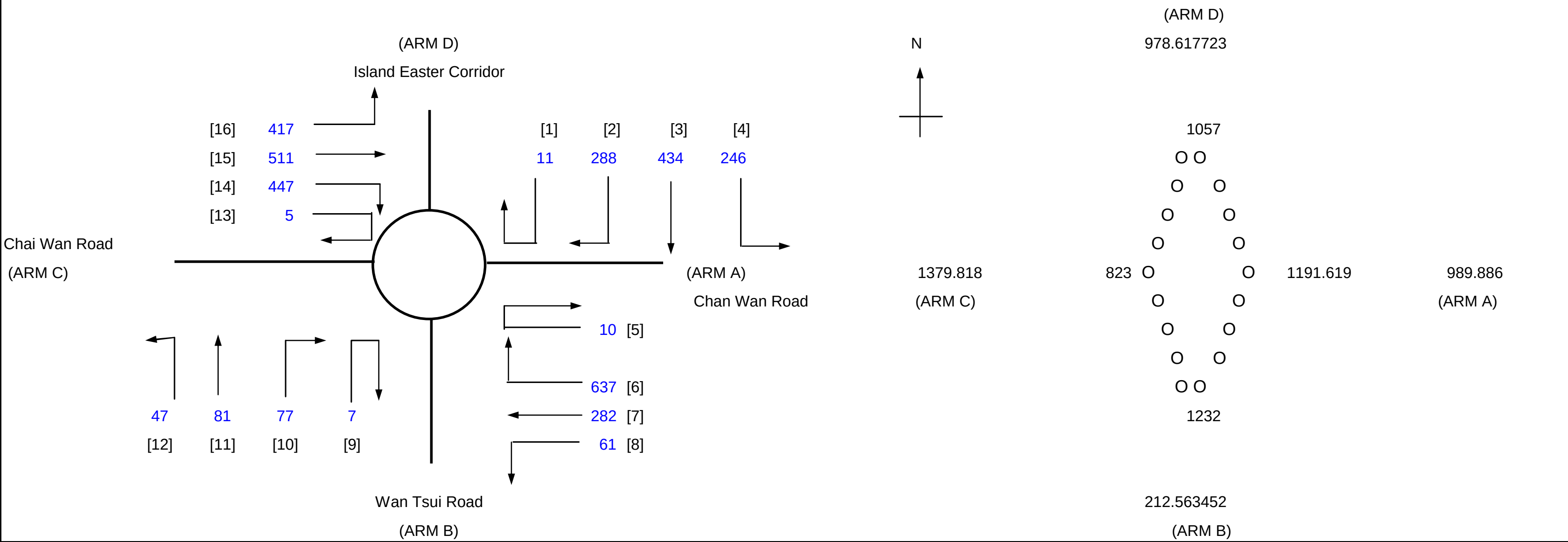
Q_{b-c}	=	636
Q_{c-b}	=	708
Q_{b-a}	=	300

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	0.603
DFC_{b-c}	=	0.003
DFC_{c-b}	=	0.000

Critical DFC = 0.603

	ROUNDABOUT CAPACITY ASSESSMENT			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	J4LV3 Peak Hour	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME2021_LV3_S1_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV3 Peak Hour			REVIEWED BY:	OC	Sep-13

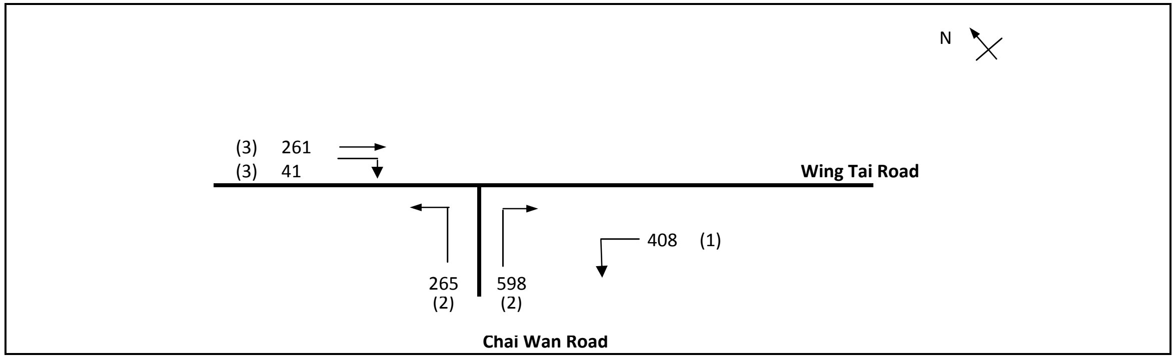


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	990	213	1380	979
Qc	=	Circulating flow across entry (pcu/h)	1192	1232	823	1057
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1565	787	1856	1407
DFC	=	Design flow/Capacity = Q/Qe	0.63	0.27	0.74	0.70

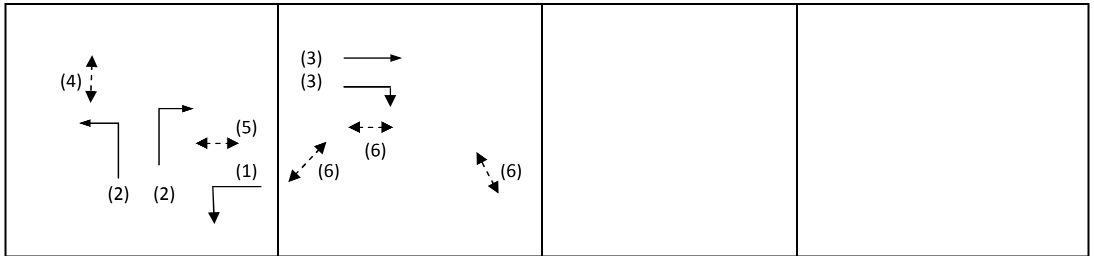
Total In Sum = 2790.023 PCU

DFC of Critical Approach = 0.74

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV3 - Peak Hour Traffic Flows	FILENAME :/3_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.231	
Loss time		L =	10	sec
Total Flow		=	1573	pcu
Co	= (1.5*L+5)/(1-Y)	=	26.0	sec
Cm	= L/(1-Y)	=	13.0	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	257.1	%
Cp	= 0.9*L/(0.9-Y)	=	13.5	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	250.6	%

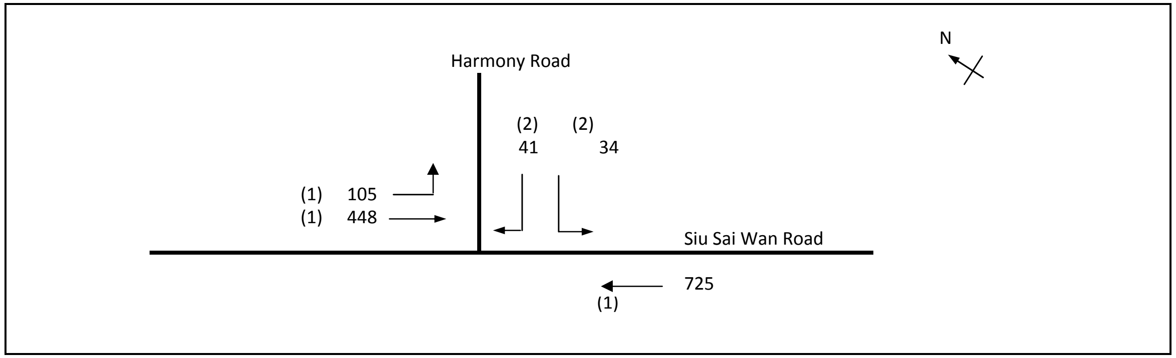


Stage A I = 7 | Stage B I = 5

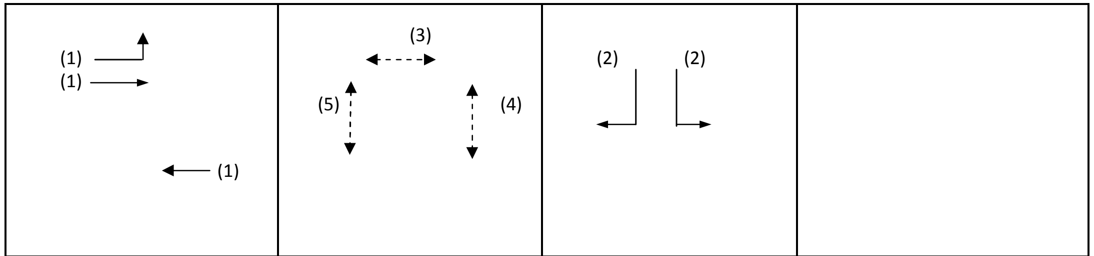
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	408			408	1.00	3857			3857	0.106			41	65	0.163	9	5
LT	A	4.00	2	2	24			4310	265			265	1.00	4056			4056	0.065			25	65	0.100	6	5
RT	A	3.50	2	2	11		y	4070			598	598	1.00	3582			3582	0.167	0.167		65	65	0.257	15	5
ST	B	3.50	3	2			y	4070		261		261	0.00	4070			4070	0.064	0.064		25	25	0.257	15	24
RT	B	4.50	3	2	13		y	4270			41	41	1.00	3828			3828	0.011			4	25	0.043	0	25
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV3 - Peak Hour Traffic Flows	FILENAME :/3_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	100	sec
Sum(y)		Y =	0.204	
Loss time		L =	48	sec
Total Flow		=	1353	pcu
Co	= (1.5*L+5)/(1-Y)	=	96.8	sec
Cm	= L/(1-Y)	=	60.3	sec
Yult		=	0.540	
R.C.ult	= (Yult-Y)/Y*100%	=	164.1	%
Cp	= 0.9*L/(0.9-Y)	=	62.1	sec
Ymax	= 1-L/C	=	0.520	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	128.9	%

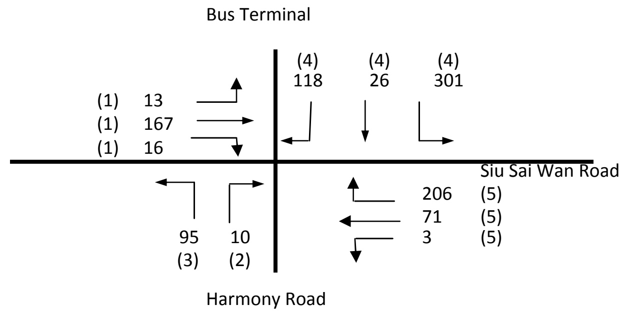


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

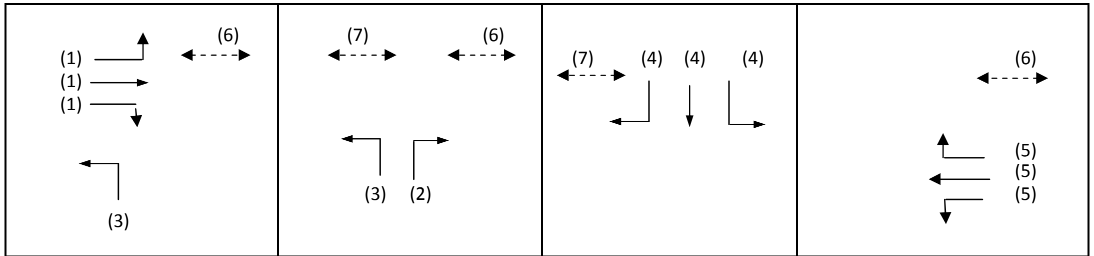
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	105	152		257	0.41	1843			1843	0.139			35	46	0.300	18	12
ST	A	3.20	1	1				2075		296		296	0.00	2075			2075	0.143			36	46	0.307	24	12
ST	A	3.00	1	2			y	3970		725		725	0.00	3970			3970	0.183	0.183		46	46	0.393	30	11
LT	C	3.75	2	1	12		y	1990	34			34	1.00	1769			1769	0.019			5	6	0.345	0	48
RT	C	3.75	2	1	12			2130			41	41	1.00	1893			1893	0.022	0.022		6	6	0.393	6	49
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV3 - Peak Hour Traffic Flows	FILENAME :/3_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	105	sec
Sum(y)		Y =	0.351	
Loss time		L =	18	sec
Total Flow		=	1027	pcu
Co	= (1.5*L+5)/(1-Y)	=	49.3	sec
Cm	= L/(1-Y)	=	27.7	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	117.9	%
Cp	= 0.9*L/(0.9-Y)	=	29.5	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	112.4	%

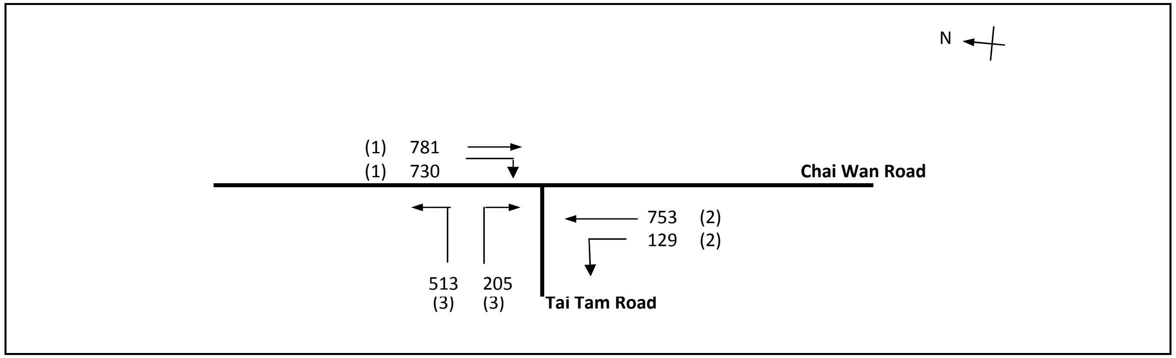


Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

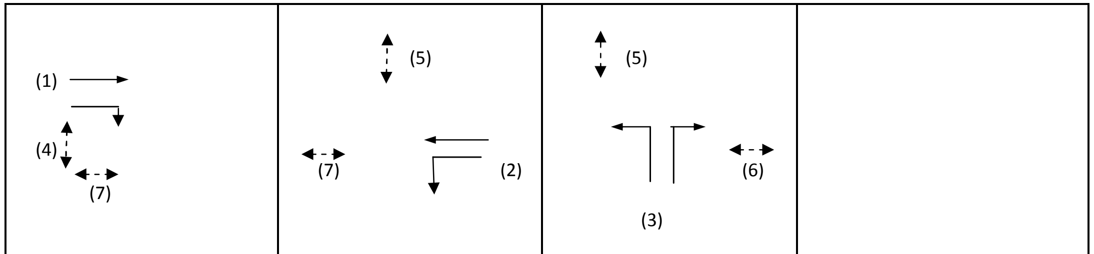
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	13	81		94	0.14	1910			1910	0.049			12	12	0.417	12	40
ST/RT	A	3.30	1	1	12			2085		86	16	102	0.16	2045			2045	0.050	0.050		12	12	0.424	12	40
RT	B	3.50	2	1	12			2105			10	10	1.00	1871			1871	0.005	0.005		1	1	0.424	0	99
LT	A,B	3.75	3	1	13		y	1990	95			95	1.00	1784			1784	0.053			13	19	0.301	12	32
RT	C	3.50	4	1	12			2105			118	118	1.00	1871			1871	0.063			16	46	0.144	6	14
LT/ST	C	3.50	4	1	12		y	1965	301	26		328	0.92	1762			1762	0.186	0.186		46	46	0.424	30	14
ST/RT	D	3.50	5	1	12			2105			206	206	1.00	1871			1871	0.110	0.110		27	27	0.424	24	25
LT/ST	D	3.50	5	1	11		y	1965	3	71		74	0.04	1954			1954	0.038			9	9	0.424	6	45
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV3 - Peak Hour Traffic Flows	FILENAME :/3_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	105 sec
Sum(y)		Y =	0.752
Loss time		L =	18 sec
Total Flow		=	3110 pcu
Co	= (1.5*L+5)/(1-Y)	=	129.0 sec
Cm	= L/(1-Y)	=	72.6 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	1.7 %
Cp	= 0.9*L/(0.9-Y)	=	109.4 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	-0.8 %



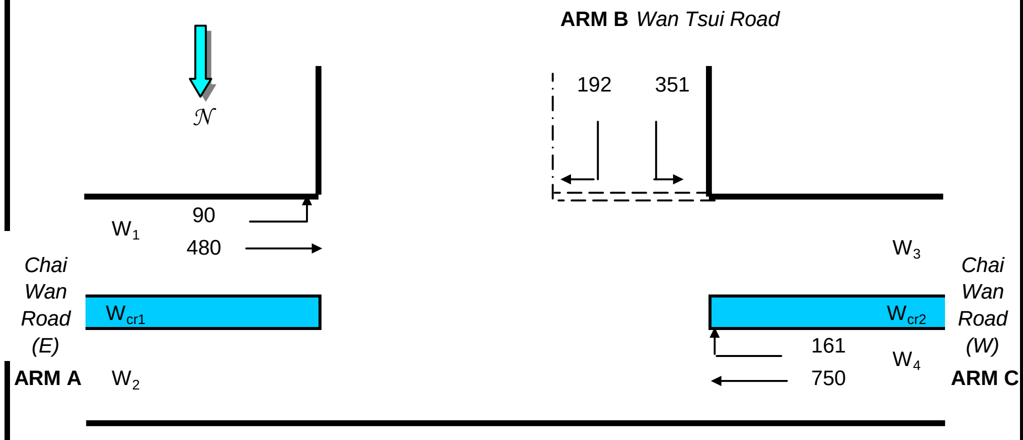
Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.75	1	2			y	4120		781		781	0.00	4120			4120	0.190			22	22	0.907	54	42
RT	A	3.00	1	1	13			2055			730	730	1.00	1842			1842	0.396	0.396		46	22	1.895	96	41
ST	B	3.50	2	2				4210		753		753	0.00	4210			4210	0.179	0.179		21	21	0.907	54	43
LT	B	3.10	2	1	12		y	1925	129			129	1.00	1711			1711	0.075			9	21	0.382	18	31
LT	C	4.00	3	1	15		y	2015	371			371	1.00	1832			1832	0.203			23	23	0.907	60	35
LT/RT	C	4.00	3	1	15			2155	142		205	347	1.00	1959			1959	0.177	0.177		20	23	0.793	42	38
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Prepared By:	KC
Checked By:	OC

Junction layout sketch - **J9: Junciton of Chai Wan Road and Wan Tsui Road**
Design Year - **2021 Level 3 - Site 1**
Time - **Level 3 Peak Hour**



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	89.89	(pcu/hr)
q_{a-c}	=	479.82	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	749.66	(pcu/hr)
q_{c-b}	=	160.74	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	192.09	(pcu/hr)
q_{b-c}	=	350.92	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

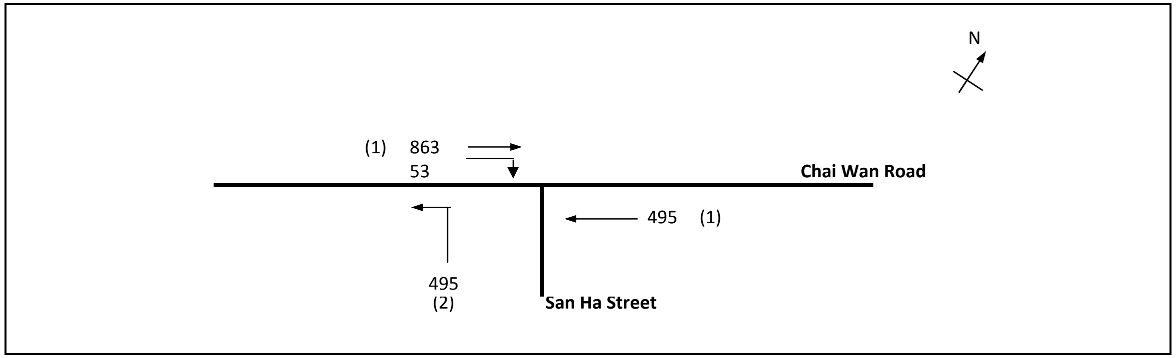
Q_{b-c}	=	760
Q_{c-b}	=	674
Q_{b-a}	=	355

COMPARISION OF DESIGN FLOW TO CAPACITY

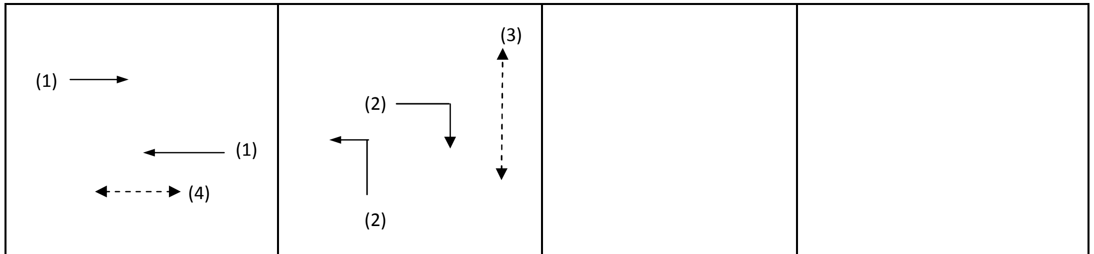
DFC_{b-a}	=	0.542
DFC_{b-c}	=	0.462
DFC_{c-b}	=	0.239

Critical DFC = 0.542

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV3 - Peak Hour Traffic Flows	FILENAME :/3_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.509	
Loss time		L =	10	sec
Total Flow		=	1906	pcu
Co	= (1.5*L+5)/(1-Y)	=	40.7	sec
Cm	= L/(1-Y)	=	20.4	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	62.1	%
Cp	= 0.9*L/(0.9-Y)	=	23.0	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	59.2	%



Stage A	I = 6	Stage B	I = 6	Stage C	I =

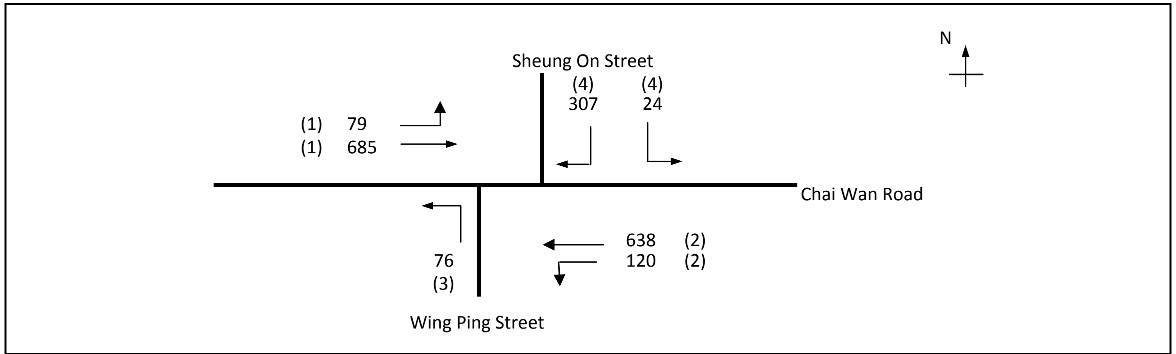
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		863		863	0.00	4070			4070	0.212	0.212		37	47	0.451	36	11
ST	A	3.50	1	2	10		N	4070		495		495	0.00	4070			4070	0.122			22	47	0.259	21	11
LT	B	3.00	2	1	10		N	1915	495			495	1.00	1665			1665	0.297	0.297		53	53	0.560	36	9
RT	B	3.50	2	1	12			2105			53	53	1.00	1871			1871	0.028			5	53	0.053	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

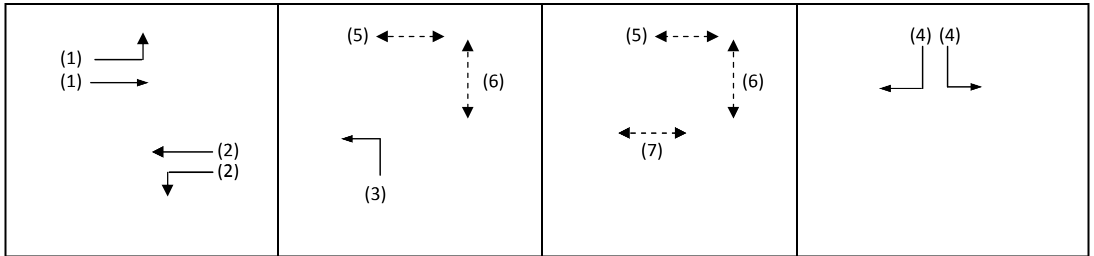
TRAFFIC SIGNAL CALCULATION

TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV3 - Peak Hour Traffic Flows	FILENAME :/3_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011

INITIALS | DATE



No. of stages per cycle		N =	4
Cycle time		C =	120 sec
Sum(y)		Y =	0.264
Loss time		L =	37 sec
Total Flow		=	1929 pcu
Co	= (1.5*L+5)/(1-Y)	=	82.2 sec
Cm	= L/(1-Y)	=	50.3 sec
Yult		=	0.623
R.C.ult	= (Yult-Y)/Y*100%	=	135.9 %
Cp	= 0.9*L/(0.9-Y)	=	52.3 sec
Ymax	= 1-L/C	=	0.692
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	135.9 %



Stage A I = 8 | Stage B I = 5 | Stage C I = 7 | Stage C I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	79	685		765	0.10	6096			6096	0.125			39		0.000	50	54
LT/ST	A	3.30	2	3	12		Y	6115	120	638		757	0.16	5997			5997	0.126	0.126		40		0.000	50	54
LT	B	3.50	3	1	9		Y	1965	76			76	1.00	1684			1684	0.045	0.045		14		0.000	12	54
LT/RT	D	3.75	4	2	10		y	4120	24		307	331	1.00	3583			3583	0.092	0.092		29		0.000	33	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

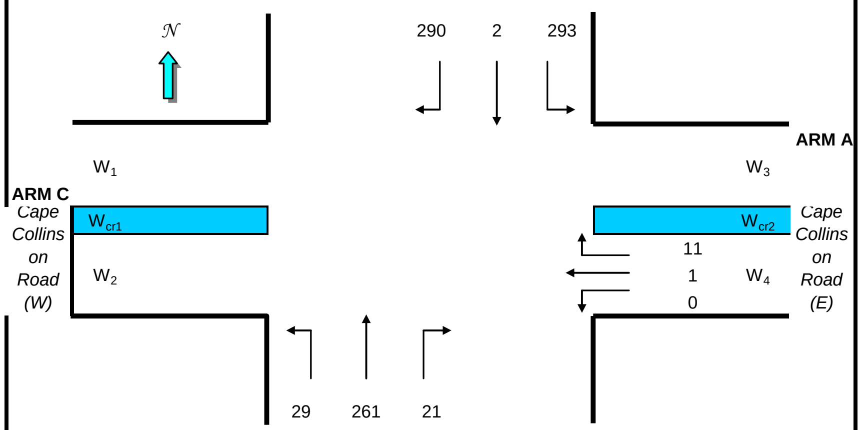
Appendix B4

2026 Peak Hour Junction Assessment Calculation Sheets

Halcrow	Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at C	Prepared By:	KC
	Junction Capacity Analysis	Checked By:	OC

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2026 Level 1 - Reference Case
Time - Level 1 Peak Hour

ARM D *Lin Shing Rd (N)*



ARM B *Lin Shing Rd (S)*

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{a-d}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
W_{d-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
W_{d-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
Vr_{a-d}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
Vl_{d-c}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

W_{a-d}	=	3.00	(metres)
Vr_{a-d}	=	100	(metres)
q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	1.0871	(pcu/hr)
q_{a-d}	=	10.784	(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)
q_{c-d}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	5.00	(metres)
W_{b-c}	=	5.00	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	65	(metres)
Vr_{b-c}	=	0	(metres)
q_{b-a}	=	20.655	(pcu/hr)
q_{b-c}	=	29.177	(pcu/hr)
q_{b-d}	=	261.23	(pcu/hr)

MINOR ROAD (ARM D)

W_{d-a}	=	3.00	(metres)
W_{d-c}	=	3.00	(metres)
Vl_{d-c}	=	50	(metres)
Vr_{d-c}	=	50	(metres)
Vr_{d-a}	=	80	(metres)
q_{d-a}	=	292.98	(pcu/hr)
q_{d-b}	=	2.3819	(pcu/hr)
q_{d-c}	=	290.11	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

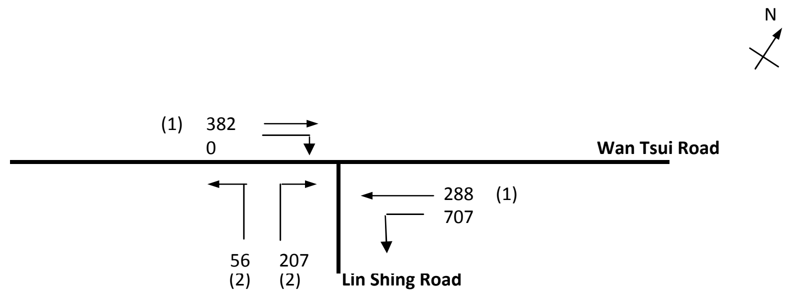
Q_{b-a}	=	516
Q_{b-c}	=	749
Q_{b-d} is nearside	=	TRUE
Q_{b-d}	=	608
Q_{d-a}	=	674
Q_{d-b} is nearside	=	TRUE
Q_{d-b}	=	528
Q_{d-c}	=	443
Q_{c-b}	=	440
Q_{a-d}	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

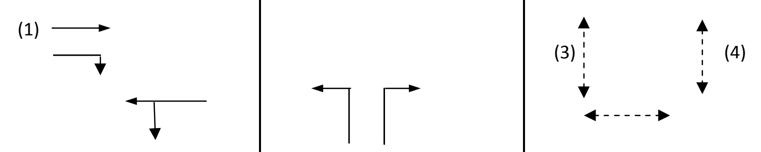
DFC_{b-a}	=	0.040
DFC_{b-c}	=	0.039
DFC_{b-d}	=	0.430
DFC_{d-a}	=	0.434
DFC_{d-b}	=	0.005
DFC_{d-c}	=	0.655
DFC_{c-b}	=	0.000
DFC_{a-d}	=	0.018

Critical DFC = 0.655

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
Junction of Lin Shing Road and Wan Tsui Road	J2LV1 - Peak Hour Traffic Flows	FILENAME : 2026_LV1_Ref.xls	Checked By:	OC	29-4-2011
2026 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.547	
Loss time		L =	25	sec
Total Flow		=	1377	pcu
Co	= (1.5*L+5)/(1-Y)	=	93.7	sec
Cm	= L/(1-Y)	=	55.1	sec
Yult		=	0.713	
R.C.ult	= (Yult-Y)/Y*100%	=	30.4	%
Cp	= 0.9*L/(0.9-Y)	=	63.7	sec
Ymax	= 1-L/C	=	0.792	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	30.4	%



Stage A I = 7	Stage B I =	Stage C I =	

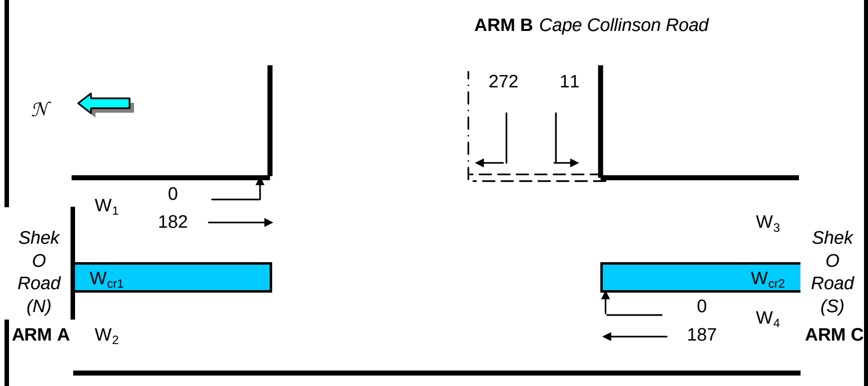
Movement	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		382		382	0.00	1915			1915	0.199			35	95	0.252	12	2
ST/LT	A	4.00	1	1	10		N	2015	707	288		995	0.71	1821			1821	0.547	0.547		95	95	0.690	36	4
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow | **Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at**
Junction Capacity Analysis

Prepared By: KC
Checked By: OC

Junction layout sketch - **J3: J/O Cape Collinson Road and Lin Shing Road**
Design Year - **2026 Level 1 - Reference Case**
Time - **Level 1 Peak Hour**



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	181.55	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	186.98	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	272.24	(pcu/hr)
q_{b-c}	=	10.723	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

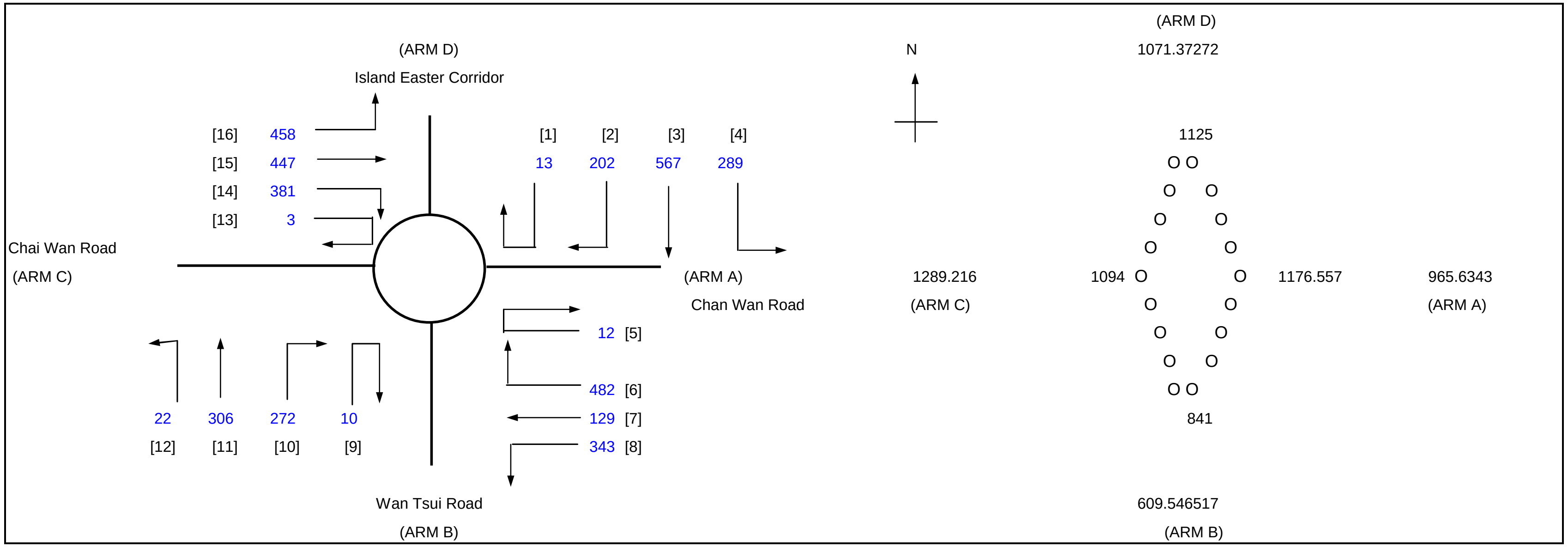
Q_{b-c}	=	696
Q_{c-b}	=	775
Q_{b-a}	=	344

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	0.791
DFC_{b-c}	=	0.015
DFC_{c-b}	=	0.000

Critical DFC = 0.791

	ROUNDABOUT CAPACITY ASSESSMENT			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	J4LV1 Peak Hour	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME : 2026_LV1_Ref.xls	CHECKED BY:	OC	Sep-13
J4LV1 Peak Hour			REVIEWED BY:	OC	Sep-13

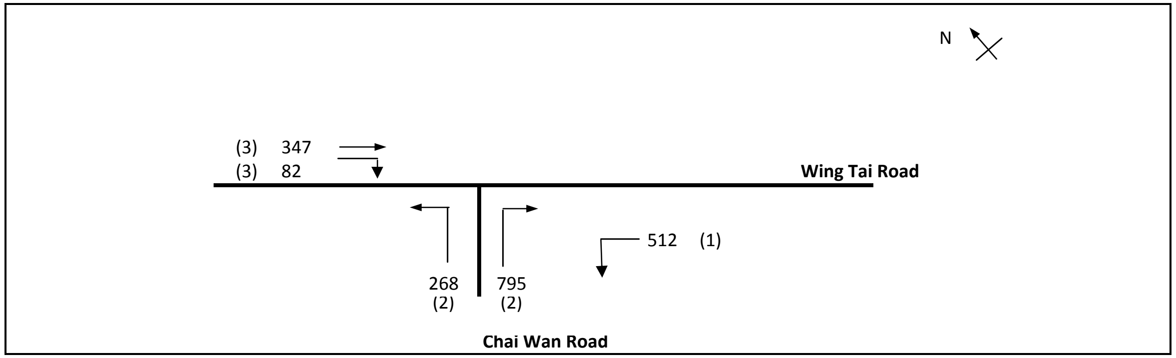


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	966	610	1289	1071
Qc	=	Circulating flow across entry (pcu/h)	1177	841	1094	1125
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1577	1004	1651	1360
DFC	=	Design flow/Capacity = Q/Qe	0.61	0.61	0.78	0.79

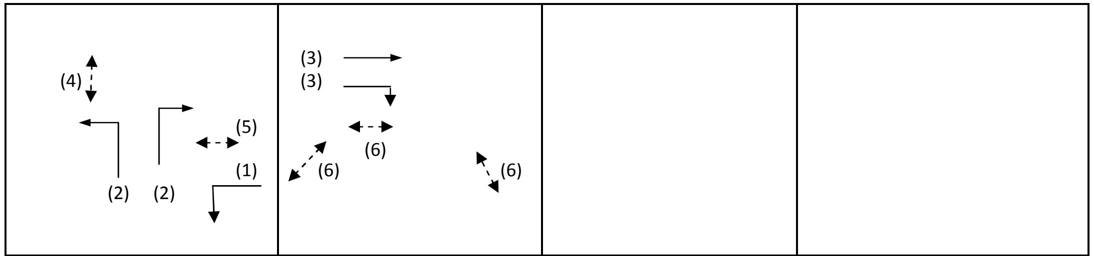
Total In Sum = 2824.283 PCU

DFC of Critical Approach = 0.79

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV1 - Peak Hour Traffic Flows	FILENAME : 2026_LV1_Ref.xls	Checked By:	OC	29-4-2011
2026 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.307	
Loss time		L =	10	sec
Total Flow		=	2003	pcu
Co	= (1.5*L+5)/(1-Y)	=	28.9	sec
Cm	= L/(1-Y)	=	14.4	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	168.6	%
Cp	= 0.9*L/(0.9-Y)	=	15.2	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	163.7	%



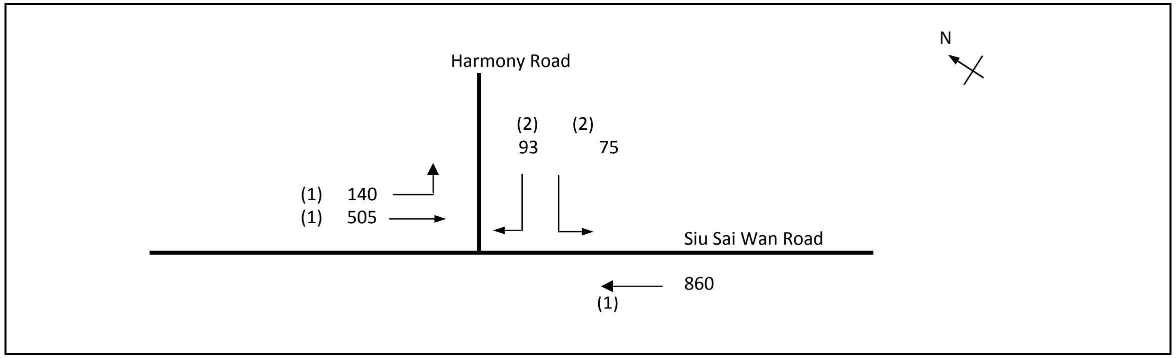
Stage A	I = 7	Stage B	I = 5		

Movement	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	512			512	1.00	3857			3857	0.133			39	65	0.204	12	5
LT	A	4.00	2	2	24			4310	268			268	1.00	4056			4056	0.066			19	65	0.102	6	5
RT	A	3.50	2	2	11		y	4070			795	795	1.00	3582			3582	0.222	0.222		65	65	0.341	21	5
ST	B	3.50	3	2			y	4070		347		347	0.00	4070			4070	0.085	0.085		25	25	0.341	21	24
RT	B	4.50	3	2	13		y	4270			82	82	1.00	3828			3828	0.021			6	25	0.085	3	25
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

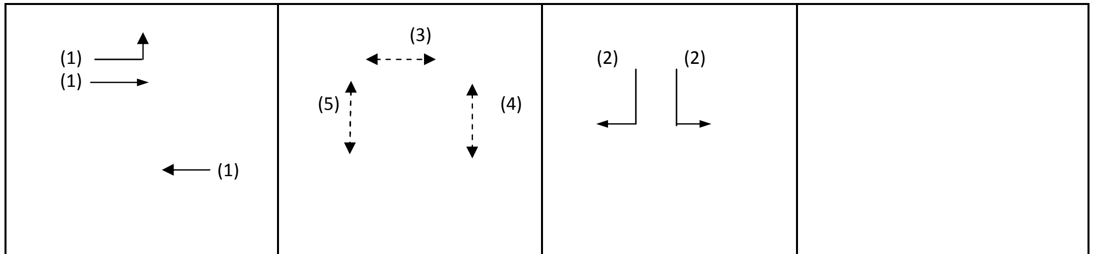
NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION

				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV1 - Peak Hour Traffic Flows	FILENAME : 2026_LV1_Ref.xls	Checked By:	OC	29-4-2011
2026 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	100	sec
Sum(y)		Y =	0.266	
Loss time		L =	48	sec
Total Flow		=	1672	pcu
Co	= (1.5*L+5)/(1-Y)	=	104.8	sec
Cm	= L/(1-Y)	=	65.4	sec
Yult		=	0.540	
R.C.ult	= (Yult-Y)/Y*100%	=	103.3	%
Cp	= 0.9*L/(0.9-Y)	=	68.1	sec
Ymax	= 1-L/C	=	0.520	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	76.2	%

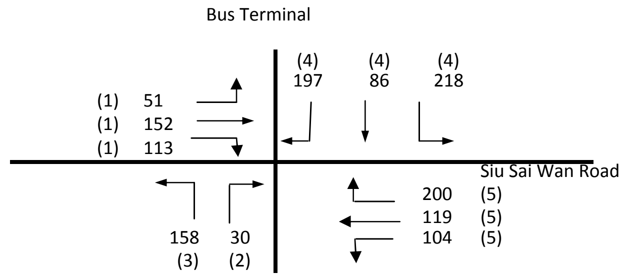


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

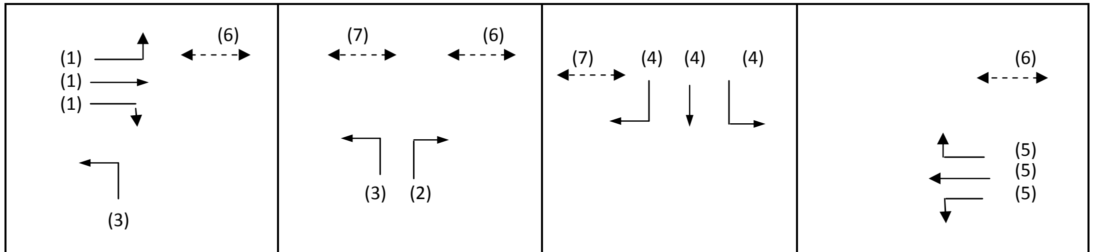
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	140	156		296	0.47	1827			1827	0.162			32	42	0.382	24	14
ST	A	3.20	1	1				2075		349		349	0.00	2075			2075	0.168			33	42	0.397	30	14
ST	A	3.00	1	2			y	3970		860		860	0.00	3970			3970	0.217	0.217		42	42	0.511	39	13
LT	C	3.75	2	1	12		y	1990	75			75	1.00	1769			1769	0.042			8	10	0.440	6	43
RT	C	3.75	2	1	12			2130			93	93	1.00	1893			1893	0.049	0.049		10	10	0.511	12	44
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV1 - Peak Hour Traffic Flows	FILENAME : 2026_LV1_Ref.xls	Checked By: OC	29-4-2011
2026 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	105	sec
Sum(y)		Y =	0.385	
Loss time		L =	18	sec
Total Flow		=	1427	pcu
Co	= (1.5*L+5)/(1-Y)	=	52.0	sec
Cm	= L/(1-Y)	=	29.3	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	98.8	%
Cp	= 0.9*L/(0.9-Y)	=	31.4	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	93.8	%

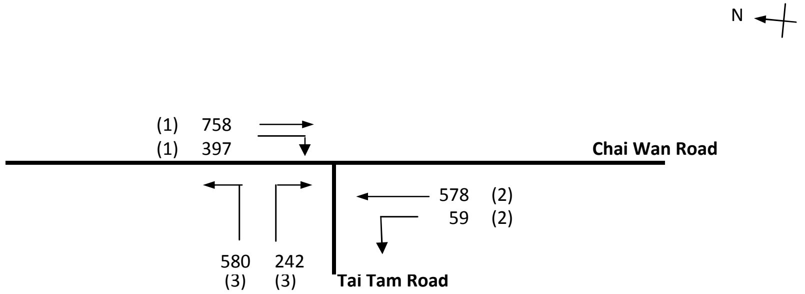


Stage A I = 5 | Stage B I = 5 | Stage C I = 6 | Stage C I = 6

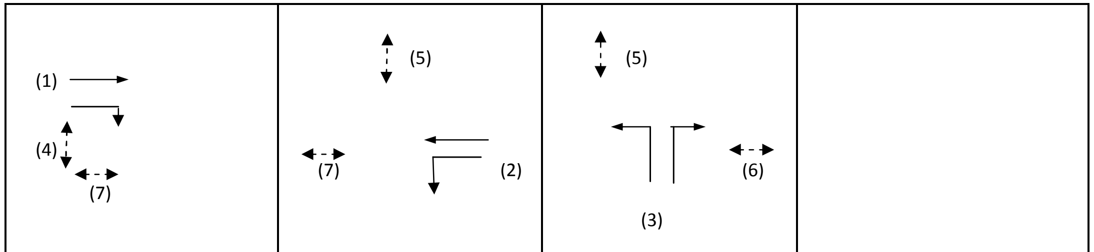
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	51	84		135	0.38	1849			1849	0.073			17	21	0.363	18	30
ST/RT	A	3.30	1	1	12			2085		68	113	181	0.62	1934			1934	0.094	0.094		21	21	0.464	24	31
RT	B	3.50	2	1	12			2105			30	30	1.00	1871			1871	0.016	0.016		4	4	0.464	0	65
LT	A,B	3.75	3	1	13		y	1990	158			158	1.00	1784			1784	0.089			20	30	0.312	18	24
RT	C	3.50	4	1	12			2105			197	197	1.00	1871			1871	0.105			24	38	0.290	18	18
LT/ST	C	3.50	4	1	12		y	1965	218	86		303	0.72	1803			1803	0.168	0.168		38	38	0.464	30	18
ST/RT	D	3.50	5	1	12			2105		0	200	200	1.00	1871			1871	0.107	0.107		24	24	0.464	24	28
LT/ST	D	3.50	5	1	11		y	1965	104	119		223	0.47	1848			1848	0.121			27	27	0.464	24	26
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV1 - Peak Hour Traffic Flows	FILENAME : 2026_LV1_Ref.xls	Checked By: OC	29-4-2011
2026 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	105 sec
Sum(y)		Y =	0.572
Loss time		L =	18 sec
Total Flow		=	2612 pcu
Co	= (1.5*L+5)/(1-Y)	=	74.8 sec
Cm	= L/(1-Y)	=	42.1 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	33.7 %
Cp	= 0.9*L/(0.9-Y)	=	49.4 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	30.3 %



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

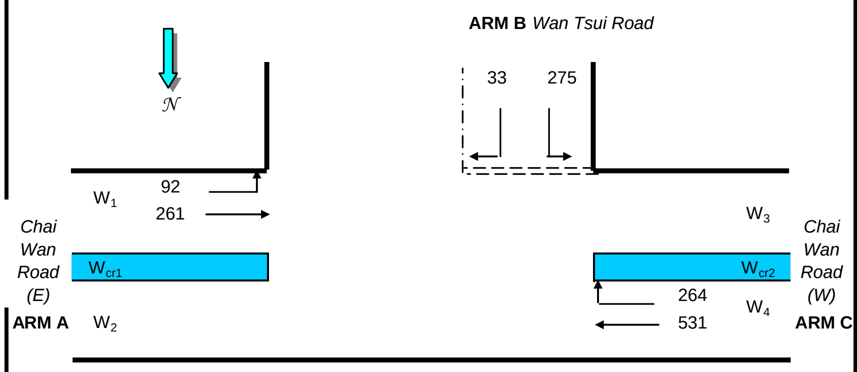
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		758		758	0.00	4070			4070	0.186			28	28	0.691	48	24
RT	A	3.50	1	1	13			2105			397	397	1.00	1887			1887	0.210	0.210		32	28	0.780	48	31
ST	B	3.50	2	2				4210		578		578	0.00	4210			4210	0.137	0.137		21	21	0.691	39	30
LT	B	3.10	2	1	12		y	1925	59			59	1.00	1711			1711	0.034			5	21	0.173	6	30
LT	C	4.00	3	1	15		y	2015	412			412	1.00	1832			1832	0.225	0.225		34	34	0.691	48	23
LT/RT	C	4.00	3	1	15			2155	168		242	410	1.00	1959			1959	0.209			32	34	0.642	48	22
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow **Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at**
Junction Capacity Analysis

Prepared By: KC
Checked By: OC

Junction layout sketch - **J9: Junciton of Chai Wan Road and Wan Tsui Road**
Design Year - **2026 Level 1 - Reference Case**
Time - **Level 1 Peak Hour**



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	92.403	(pcu/hr)
q_{a-c}	=	260.9	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	530.62	(pcu/hr)
q_{c-b}	=	264.16	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	32.613	(pcu/hr)
q_{b-c}	=	274.51	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

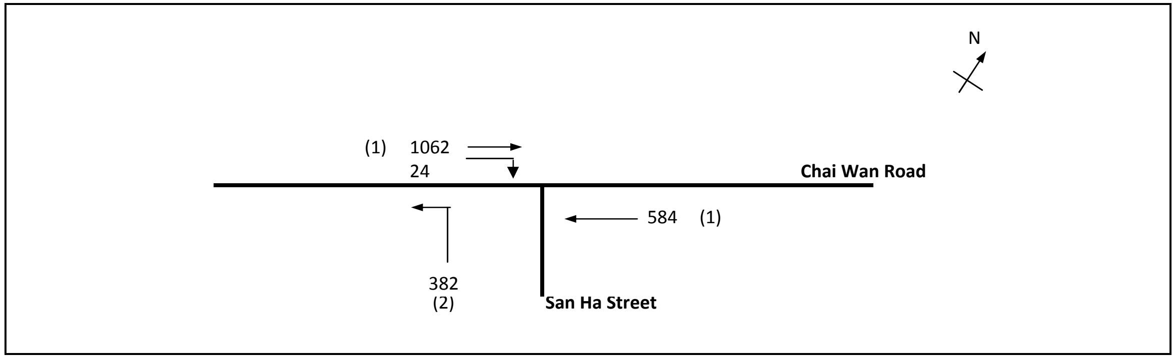
Q_{b-c}	=	788
Q_{c-b}	=	699
Q_{b-a}	=	371

COMPARISION OF DESIGN FLOW TO CAPACITY

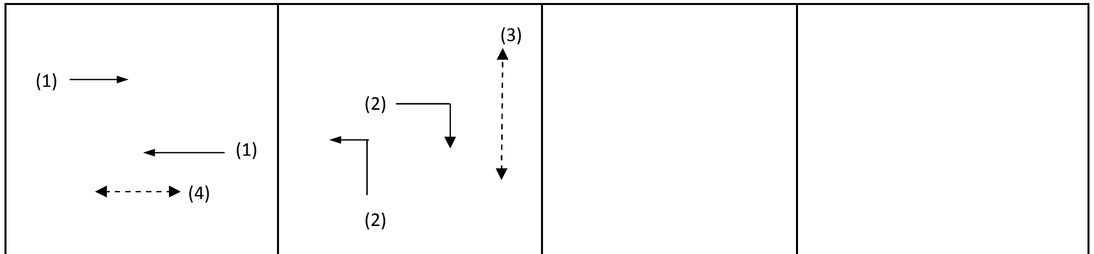
DFC_{b-a}	=	0.088
DFC_{b-c}	=	0.348
DFC_{c-b}	=	0.378

Critical DFC = 0.378

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV1 - Peak Hour Traffic Flows	FILENAME : 2026_LV1_Ref.xls	Checked By:	OC	29-4-2011
2026 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.490	
Loss time		L =	10	sec
Total Flow		=	2052	pcu
Co	= (1.5*L+5)/(1-Y)	=	39.2	sec
Cm	= L/(1-Y)	=	19.6	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	68.3	%
Cp	= 0.9*L/(0.9-Y)	=	22.0	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	65.2	%

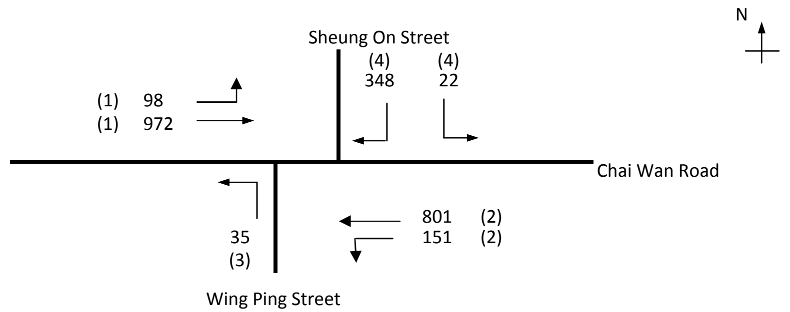


Stage A	I = 6	Stage B	I = 6	Stage C	I =

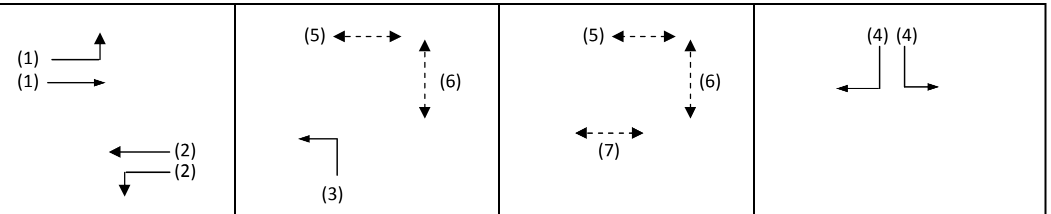
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		1062		1062	0.00	4070			4070	0.261	0.261		48	47	0.555	45	10
ST	A	3.50	1	2	10		N	4070		584		584	0.00	4070			4070	0.144			26	47	0.305	24	11
LT	B	3.00	2	1	10		N	1915	382			382	1.00	1665			1665	0.229	0.229		42	53	0.432	24	9
RT	B	3.50	2	1	12			2105			24	24	1.00	1871			1871	0.013			2	53	0.024	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV1 - Peak Hour Traffic Flows	FILENAME : 2026_LV1_Ref.xls	Checked By: OC	29-4-2011
2026 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	120	sec
Sum(y)		Y =	0.283	
Loss time		L =	37	sec
Total Flow		=	2427	pcu
Co	= (1.5*L+5)/(1-Y)	=	84.3	sec
Cm	= L/(1-Y)	=	51.6	sec
Yult		=	0.623	
R.C.ult	= (Yult-Y)/Y*100%	=	120.2	%
Cp	= 0.9*L/(0.9-Y)	=	53.9	sec
Ymax	= 1-L/C	=	0.692	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	120.2	%



Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

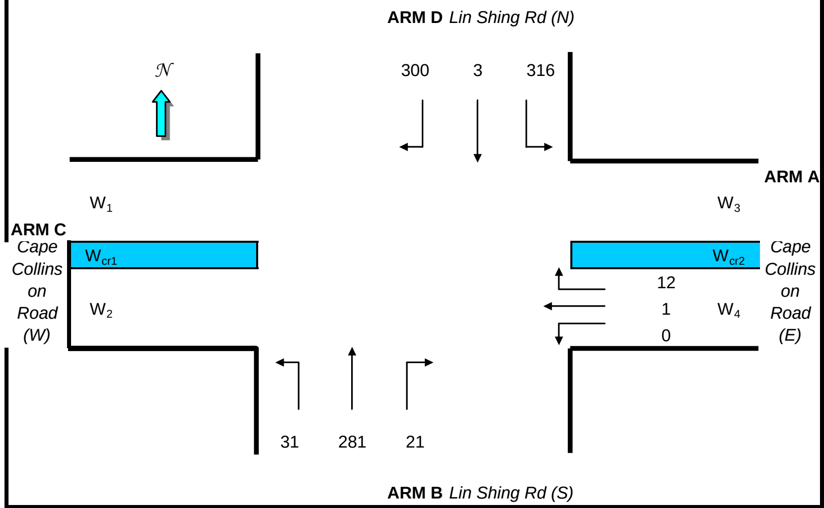
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	98	972		1070	0.09	6105			6105	0.175			51		0.000	70	54
LT/ST	A	3.30	2	3	12		Y	6115	151	801		953	0.16	5996			5996	0.159	0.159		47		0.000	62	54
LT	B	3.50	3	1	9		Y	1965	35			35	1.00	1684			1684	0.021	0.021		6		0.000	6	54
LT/RT	D	3.75	4	2	10		y	4120	22		348	370	1.00	3583			3583	0.103	0.103		30		0.000	36	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development a
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - **J1: J/O Cape Collinson Road and Lin Shing Road**
Design Year - **2026 Level 1 - Site 1**
Time - **Level 1 Peak Hour**



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{a\text{-}d}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$W_{d\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
$W_{d\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
$Vr_{a\text{-}d}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
$Vl_{d\text{-}c}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)
MAJOR ROAD			(ARM A)
$W_{a\text{-}d}$	=	3.00	(metres)
$Vr_{a\text{-}d}$	=	100	(metres)
$q_{a\text{-}b}$	=	0	(pcu/hr)
$q_{a\text{-}c}$	=	1.0871	(pcu/hr)
$q_{a\text{-}d}$	=	11.784	(pcu/hr)
MAJOR ROAD			(ARM C)
$W_{c\text{-}b}$	=		(metres)
$Vr_{c\text{-}b}$	=		(metres)
$q_{c\text{-}a}$	=	0	(pcu/hr)
$q_{c\text{-}b}$	=	0	(pcu/hr)
$q_{c\text{-}d}$	=	0	(pcu/hr)
MINOR ROAD			(ARM B)
$W_{b\text{-}a}$	=	5.00	(metres)
$W_{b\text{-}c}$	=	5.00	(metres)
$Vl_{b\text{-}a}$	=	100	(metres)
$Vr_{b\text{-}a}$	=	65	(metres)
$Vr_{b\text{-}c}$	=	0	(metres)
$q_{b\text{-}a}$	=	20.655	(pcu/hr)
$q_{b\text{-}c}$	=	31.177	(pcu/hr)
$q_{b\text{-}d}$	=	280.58	(pcu/hr)
MINOR ROAD			(ARM D)
$W_{d\text{-}a}$	=	3.00	(metres)
$W_{d\text{-}c}$	=	3.00	(metres)
$Vl_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}a}$	=	80	(metres)
$q_{d\text{-}a}$	=	315.51	(pcu/hr)
$q_{d\text{-}b}$	=	2.5651	(pcu/hr)
$q_{d\text{-}c}$	=	300.5	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

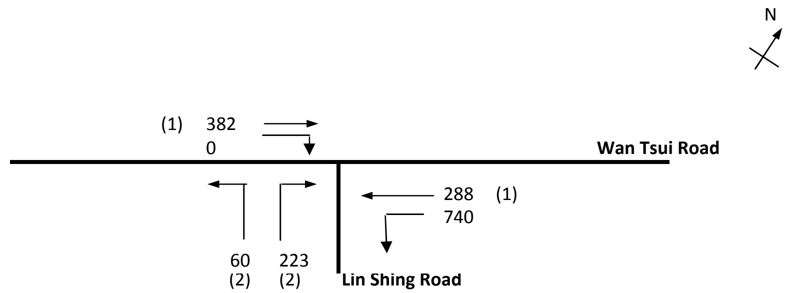
$Q_{b\text{-}a}$	=	507
$Q_{b\text{-}c}$	=	749
$Q_{b\text{-}d}$ is nearside	=	TRUE
$Q_{b\text{-}d}$	=	608
$Q_{d\text{-}a}$	=	674
$Q_{d\text{-}b}$ is nearside	=	TRUE
$Q_{d\text{-}b}$	=	527
$Q_{d\text{-}c}$	=	437
$Q_{c\text{-}b}$	=	440
$Q_{a\text{-}d}$	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

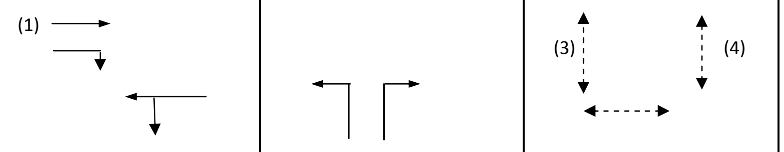
$DFC_{b\text{-}a}$	=	0.041
$DFC_{b\text{-}c}$	=	0.042
$DFC_{b\text{-}d}$	=	0.462
$DFC_{d\text{-}a}$	=	0.468
$DFC_{d\text{-}b}$	=	0.005
$DFC_{d\text{-}c}$	=	0.687
$DFC_{c\text{-}b}$	=	0.000
$DFC_{a\text{-}d}$	=	0.019

Critical DFC = **0.687**

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J2: Junction of Lin Shing Road and Wan Tsui Road	J2LV1 - Peak Hour Traffic Flows	FILENAME :/1_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2026 Level 1 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	120 sec
Sum(y)		Y =	0.565
Loss time		L =	25 sec
Total Flow		=	1410 pcu
Co	= (1.5*L+5)/(1-Y)	=	97.8 sec
Cm	= L/(1-Y)	=	57.5 sec
Yult		=	0.713
R.C.ult	= (Yult-Y)/Y*100%	=	26.0 %
Cp	= 0.9*L/(0.9-Y)	=	67.3 sec
Ymax	= 1-L/C	=	0.792
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	26.0 %



Stage A I = 7	Stage B I =	Stage C I =	

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		382		382	0.00	1915			1915	0.199			33	95	0.252	12	2
ST/LT	A	4.00	1	1	10		N	2015	740	288		1028	0.72	1819			1819	0.565	0.565		95	95	0.714	42	4
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at | **Prepared By:** **KC**

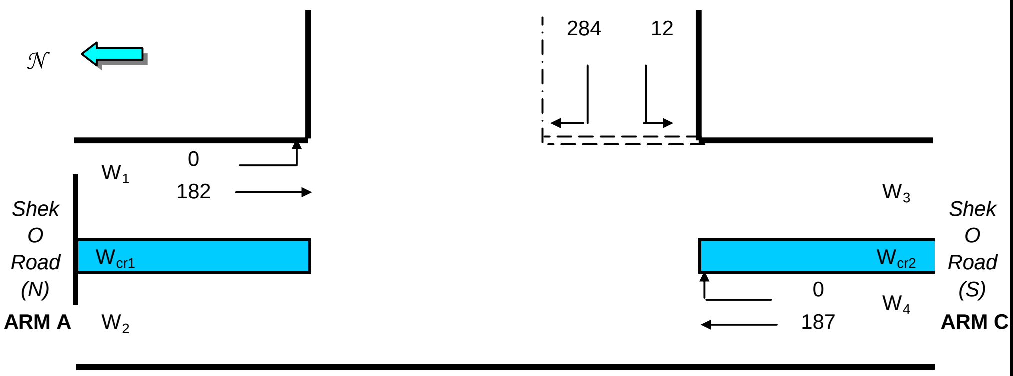
Junction Capacity Analysis | **Checked By:** **OC**

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road

Design Year - 2026 Level 1 - Site 1

Time - Level 1 Peak Hour

ARM B *Cape Collinson Road*



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	181.55	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	186.98	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	284.04	(pcu/hr)
q_{b-c}	=	11.552	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

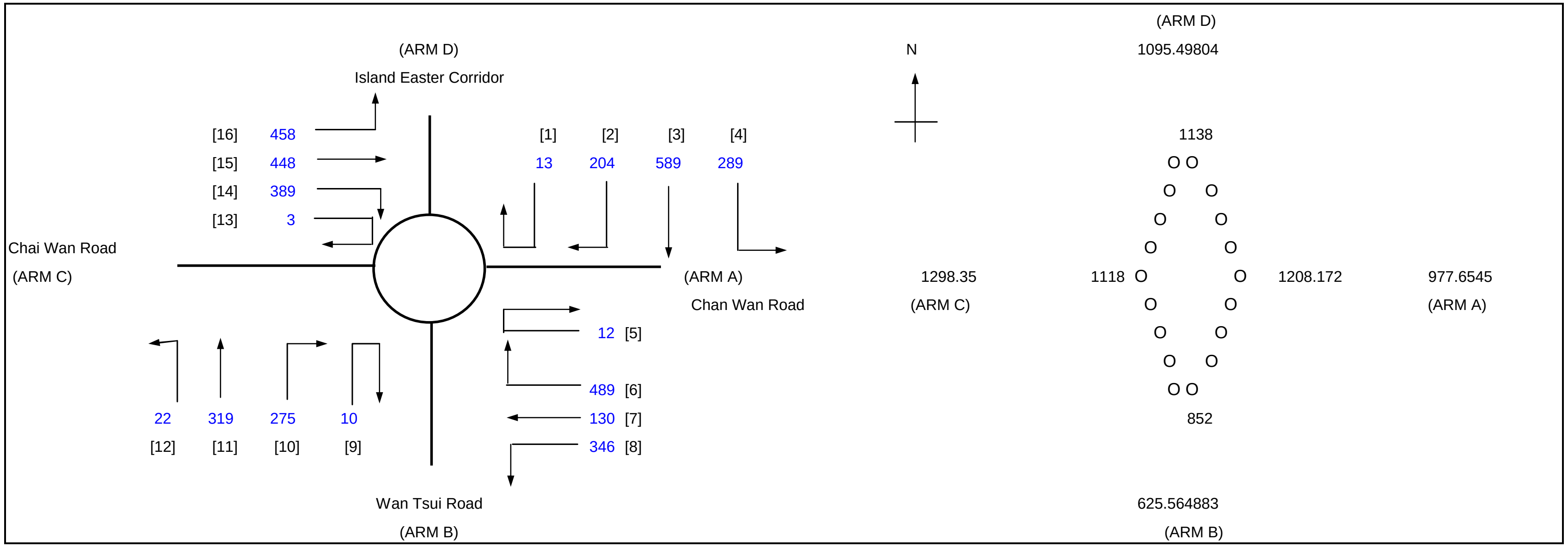
Q_{b-c}	=	696
Q_{c-b}	=	775
Q_{b-a}	=	344

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	0.825
DFC_{b-c}	=	0.017
DFC_{c-b}	=	0.000

Critical DFC = 0.825

	ROUNDABOUT CAPACITY ASSESSMENT			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	J4LV1 Peak Hour	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME2026_LV1_S1_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV1 Peak Hour			REVIEWED BY:	OC	Sep-13

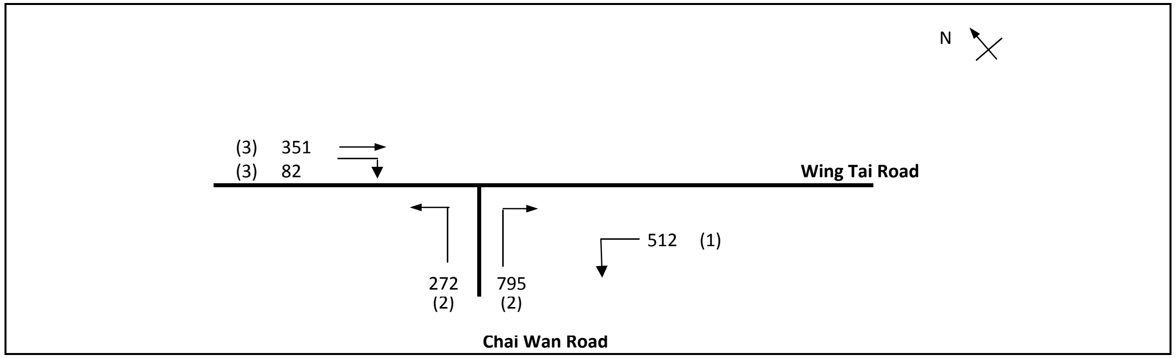


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	978	626	1298	1095
Qc	=	Circulating flow across entry (pcu/h)	1208	852	1118	1138
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1553	999	1633	1351
DFC	=	Design flow/Capacity = Q/Qe	0.63	0.63	0.80	0.81

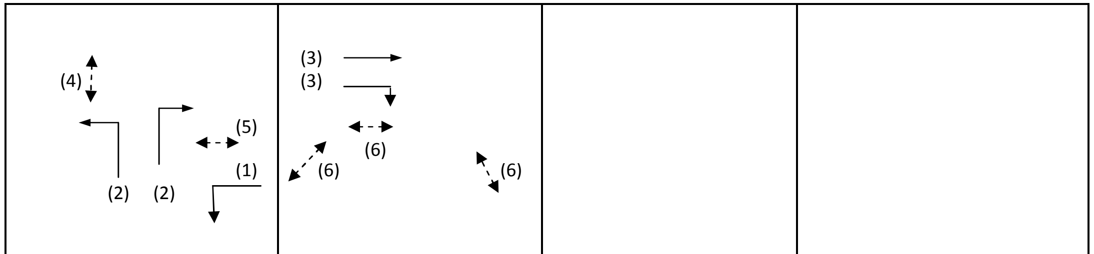
Total In Sum = 2882.449 PCU

DFC of Critical Approach = 0.81

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV1 - Peak Hour Traffic Flows	FILENAME :/1_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2026 Level 1 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	100 sec
Sum(y)		Y =	0.308
Loss time		L =	10 sec
Total Flow		=	2012 pcu
Co	= (1.5*L+5)/(1-Y)	=	28.9 sec
Cm	= L/(1-Y)	=	14.5 sec
Yult		=	0.825
R.C.ult	= (Yult-Y)/Y*100%	=	167.5 %
Cp	= 0.9*L/(0.9-Y)	=	15.2 sec
Ymax	= 1-L/C	=	0.900
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	162.6 %

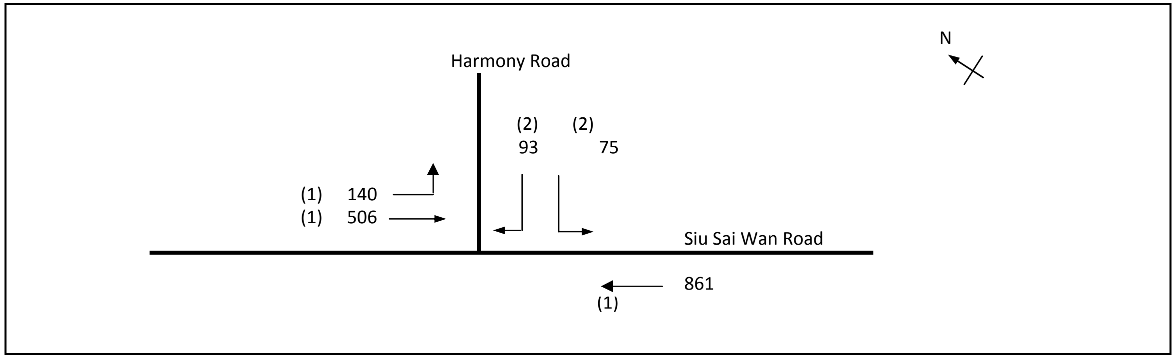


Stage A	I = 7	Stage B	I = 5		

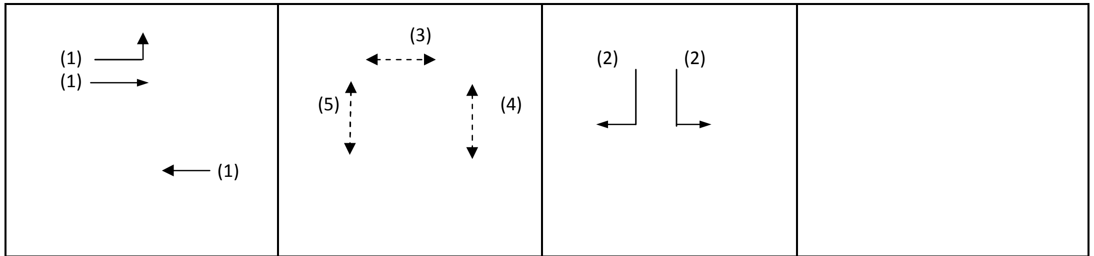
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	512			512	1.00	3857			3857	0.133			39	65	0.205	15	5
LT	A	4.00	2	2	24			4310	272			272	1.00	4056			4056	0.067			20	65	0.103	6	5
RT	A	3.50	2	2	11		y	4070			795	795	1.00	3582			3582	0.222	0.222		65	65	0.343	21	5
ST	B	3.50	3	2			y	4070		351		351	0.00	4070			4070	0.086	0.086		25	25	0.343	21	24
RT	B	4.50	3	2	13		y	4270			82	82	1.00	3828			3828	0.021			6	25	0.085	3	25
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV1 - Peak Hour Traffic Flows	FILENAME :/1_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2026 Level 1 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	100 sec
Sum(y)		Y =	0.266
Loss time		L =	48 sec
Total Flow		=	1674 pcu
Co	= (1.5*L+5)/(1-Y)	=	104.9 sec
Cm	= L/(1-Y)	=	65.4 sec
Yult		=	0.540
R.C.ult	= (Yult-Y)/Y*100%	=	103.1 %
Cp	= 0.9*L/(0.9-Y)	=	68.1 sec
Ymax	= 1-L/C	=	0.520
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	76.0 %

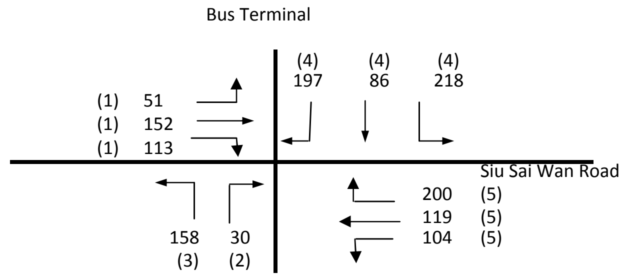


Stage A I = 10	Stage B I = 15	Stage C I = 6	

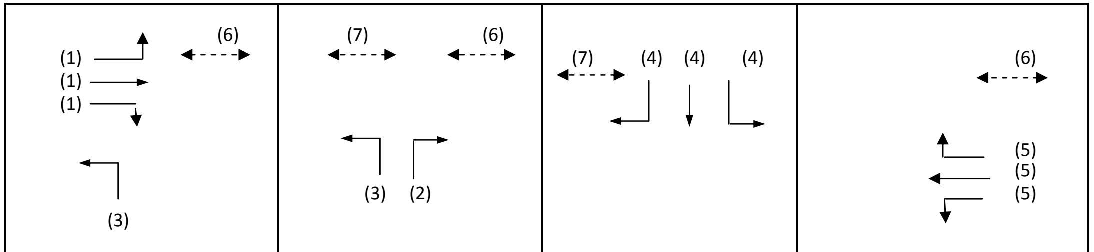
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	140	156		296	0.47	1827			1827	0.162			32	42	0.382	24	14
ST	A	3.20	1	1				2075		350		350	0.00	2075			2075	0.169			33	42	0.397	30	14
ST	A	3.00	1	2			y	3970		861		861	0.00	3970			3970	0.217	0.217		42	42	0.511	39	13
LT	C	3.75	2	1	12		y	1990	75			75	1.00	1769			1769	0.042			8	10	0.440	6	43
RT	C	3.75	2	1	12			2130			93	93	1.00	1893			1893	0.049	0.049		10	10	0.511	12	44
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV1 - Peak Hour Traffic Flows	FILENAME :/1_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2026 Level 1 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	105	sec
Sum(y)		Y =	0.399	
Loss time		L =	18	sec
Total Flow		=	1427	pcu
Co	= (1.5*L+5)/(1-Y)	=	53.2	sec
Cm	= L/(1-Y)	=	29.9	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	91.9	%
Cp	= 0.9*L/(0.9-Y)	=	32.3	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	87.1	%

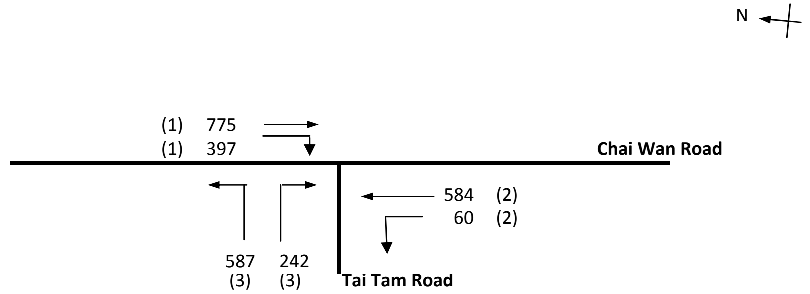


Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

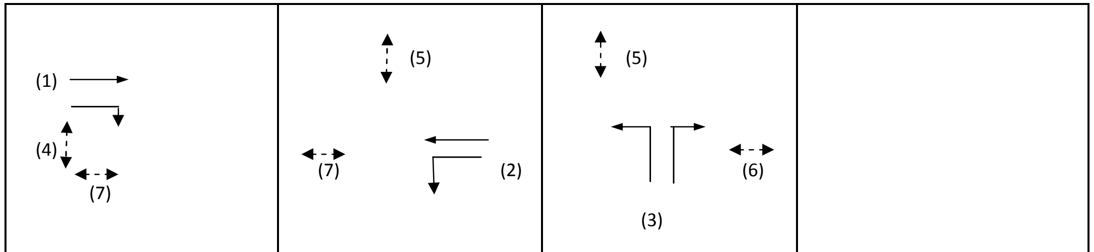
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	51	84		135	0.38	1849			1849	0.073			16	20	0.376	18	31
ST/RT	A	3.30	1	1	12			2085		68	113	181	0.62	1934			1934	0.094	0.094		20	20	0.481	24	32
RT	B	3.50	2	1	12			2105			30	30	1.00	1871			1871	0.016	0.016		4	4	0.481	0	67
LT	A,B	3.75	3	1	13		y	1990	158			158	1.00	1784			1784	0.089			19	29	0.322	18	24
RT	C	3.50	4	1	12			2105			197	197	1.00	1871			1871	0.105			23	37	0.300	18	19
LT/ST	C	3.50	4	1	12		y	1965	218	86		303	0.72	1803			1803	0.168	0.168		37	37	0.481	30	19
ST/RT	D	3.50	5	1	12			2105		0	200	200	1.00	1871			1871	0.107			23	23	0.481	24	29
LT/ST	D	3.50	5	1	11		y	1965	104	119		223	0.47	1848			1848	0.121	0.121		26	26	0.481	24	27
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV1 - Peak Hour Traffic Flows	FILENAME :/1_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2026 Level 1 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	105	sec
Sum(y)		Y =	0.583	
Loss time		L =	18	sec
Total Flow		=	2645	pcu
Co	= (1.5*L+5)/(1-Y)	=	76.7	sec
Cm	= L/(1-Y)	=	43.1	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	31.3	%
Cp	= 0.9*L/(0.9-Y)	=	51.0	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	28.0	%



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

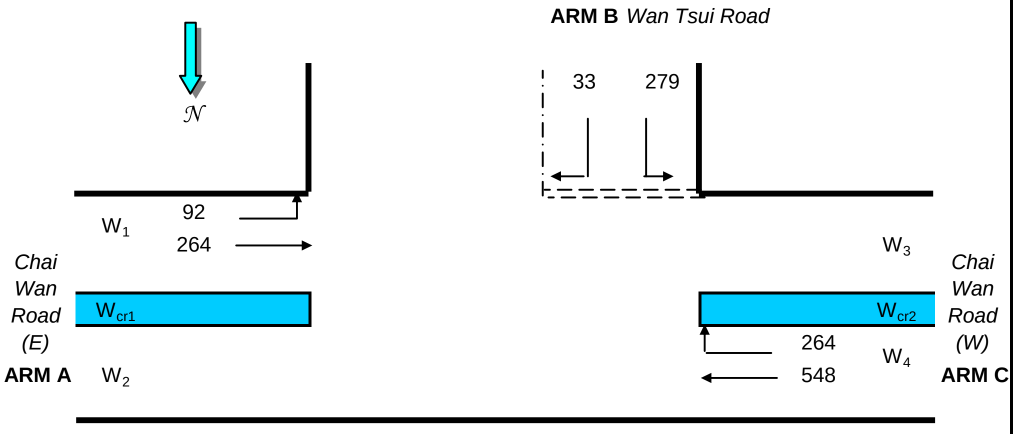
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		775		775	0.00	4070			4070	0.190			28	28	0.703	48	24
RT	A	3.75	1	1	13			2130			397	397	1.00	1910			1910	0.208	0.208		31	28	0.767	48	30
ST	B	3.50	2	2				4210		584		584	0.00	4210			4210	0.139	0.139		21	21	0.703	39	31
LT	B	3.10	2	1	12		y	1925	60			60	1.00	1711			1711	0.035			5	21	0.177	6	30
LT	C	4.00	3	1	15		y	2015	432			432	1.00	1832			1832	0.236	0.236		35	35	0.703	48	22
LT/RT	C	4.00	3	1	15			2155	155		242	397	1.00	1959			1959	0.202			30	35	0.603	42	20
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road

Design Year - 2026 Level 1 - Site 1

Time - Level 1 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	92.403	(pcu/hr)
q_{a-c}	=	263.64	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	548.07	(pcu/hr)
q_{c-b}	=	264.16	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	32.613	(pcu/hr)
q_{b-c}	=	278.83	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

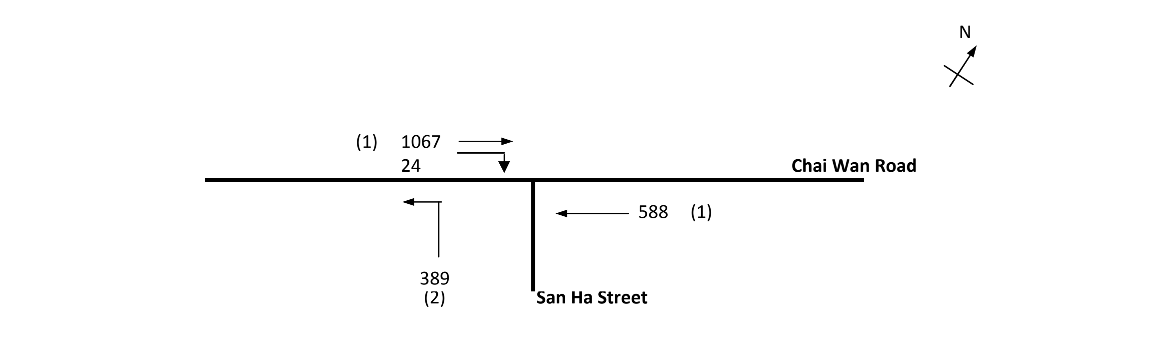
Q_{b-c}	=	787
Q_{c-b}	=	699
Q_{b-a}	=	370

COMPARISION OF DESIGN FLOW TO CAPACITY

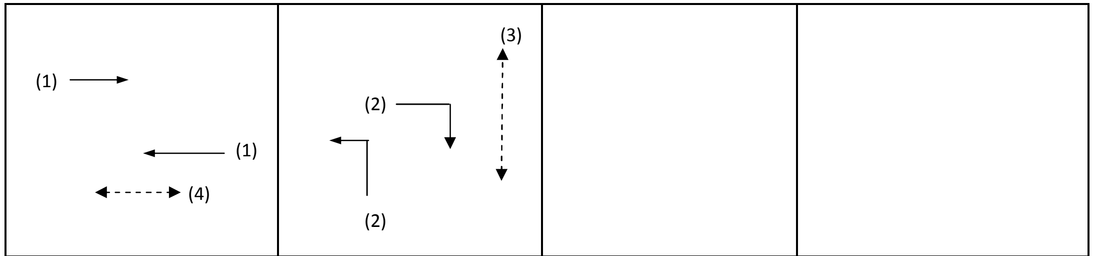
DFC_{b-a}	=	0.088
DFC_{b-c}	=	0.354
DFC_{c-b}	=	0.378

Critical DFC = 0.378

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV1 - Peak Hour Traffic Flows	FILENAME :/1_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2026 Level 1 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	100 sec
Sum(y)		Y =	0.496
Loss time		L =	10 sec
Total Flow		=	2069 pcu
Co	= (1.5*L+5)/(1-Y)	=	39.7 sec
Cm	= L/(1-Y)	=	19.8 sec
Yult		=	0.825
R.C.ult	= (Yult-Y)/Y*100%	=	66.3 %
Cp	= 0.9*L/(0.9-Y)	=	22.3 sec
Ymax	= 1-L/C	=	0.900
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	63.3 %

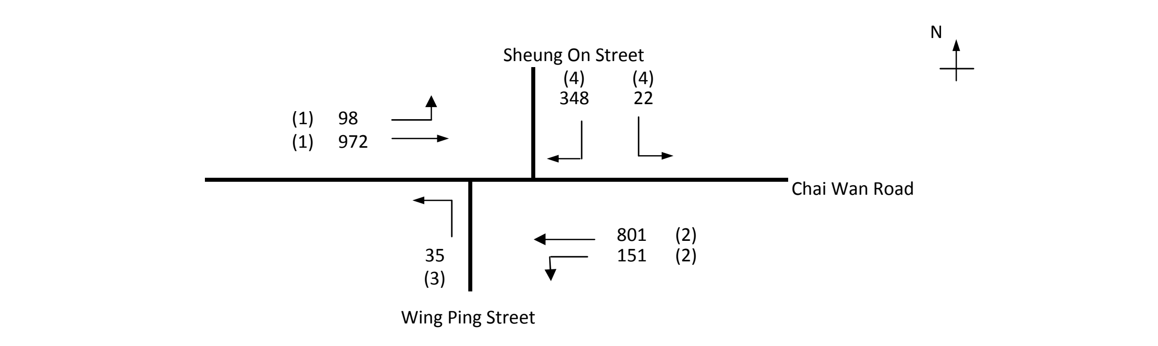


Stage A I = 6	Stage B I = 6	Stage C I =	

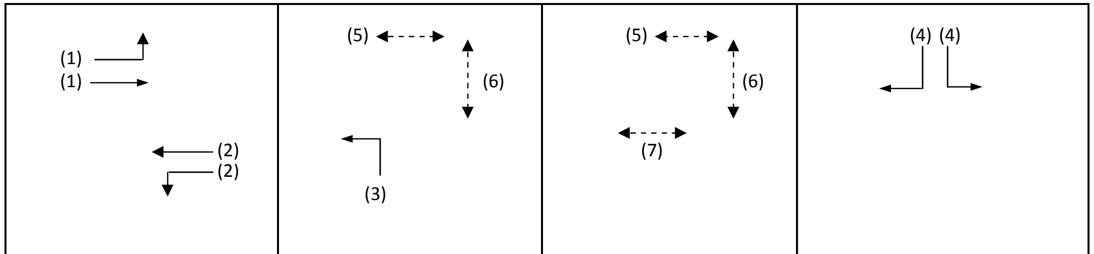
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		1067		1067	0.00	4070			4070	0.262	0.262		48	47	0.558	45	10
ST	A	3.50	1	2	10		N	4070		588		588	0.00	4070			4070	0.145			26	47	0.308	24	11
LT	B	3.00	2	1	10		N	1915	389			389	1.00	1665			1665	0.234	0.234		42	53	0.441	30	9
RT	B	3.50	2	1	12			2105			24	24	1.00	1871			1871	0.013			2	53	0.024	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV1 - Peak Hour Traffic Flows	FILENAME :/1_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2026 Level 1 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	120	sec
Sum(y)		Y =	0.299	
Loss time		L =	37	sec
Total Flow		=	2427	pcu
Co	= (1.5*L+5)/(1-Y)	=	86.3	sec
Cm	= L/(1-Y)	=	52.8	sec
Yult		=	0.623	
R.C.ult	= (Yult-Y)/Y*100%	=	108.2	%
Cp	= 0.9*L/(0.9-Y)	=	55.4	sec
Ymax	= 1-L/C	=	0.692	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	108.2	%



Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

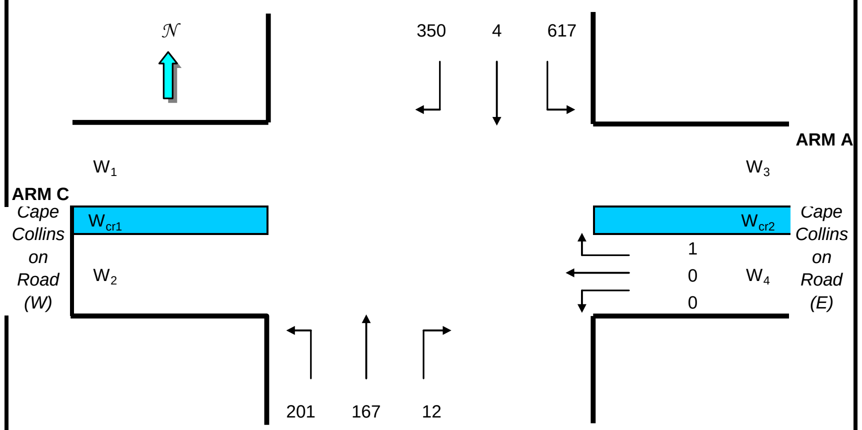
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	98	972		1070	0.09	6105			6105	0.175	0.175		49		0.000	70	54
LT/ST	A	3.30	2	3	12		Y	6115	151	801		953	0.16	5996			5996	0.159			44		0.000	62	54
LT	B	3.50	3	1	9		Y	1965	35			35	1.00	1684			1684	0.021	0.021		6		0.000	6	54
LT/RT	D	3.75	4	2	10		y	4120	22		348	370	1.00	3583			3583	0.103	0.103		29		0.000	36	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at C	Prepared By:	KC
Junction Capacity Analysis	Checked By:	OC

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2026 Level 2 - Reference Case
Time - Level 2 Peak Hour

ARM D *Lin Shing Rd (N)*



ARM B *Lin Shing Rd (S)*

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)
MAJOR ROAD			(ARM A)
W_{a-d}	=	3.00	(metres)
Vr_{a-d}	=	100	(metres)
q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	0	(pcu/hr)
q_{a-d}	=	1	(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)
q_{c-d}	=	0	(pcu/hr)
MINOR ROAD			(ARM B)
W_{b-a}	=	5.00	(metres)
W_{b-c}	=	5.00	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	65	(metres)
Vr_{b-c}	=	0	(metres)
q_{b-a}	=	11.958	(pcu/hr)
q_{b-c}	=	200.94	(pcu/hr)
q_{b-d}	=	167.43	(pcu/hr)
MINOR ROAD			(ARM D)
W_{d-a}	=	3.00	(metres)
W_{d-c}	=	3.00	(metres)
Vl_{d-c}	=	50	(metres)
Vr_{d-c}	=	50	(metres)
Vr_{d-a}	=	80	(metres)
q_{d-a}	=	617.03	(pcu/hr)
q_{d-b}	=	3.5874	(pcu/hr)
q_{d-c}	=	350.06	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

Q_{b-a}	=	413
Q_{b-c}	=	749
Q_{b-d} is nearside	=	TRUE
Q_{b-d}	=	611
Q_{d-a}	=	674
Q_{d-b} is nearside	=	TRUE
Q_{d-b}	=	533
Q_{d-c}	=	429
Q_{c-b}	=	437
Q_{a-d}	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

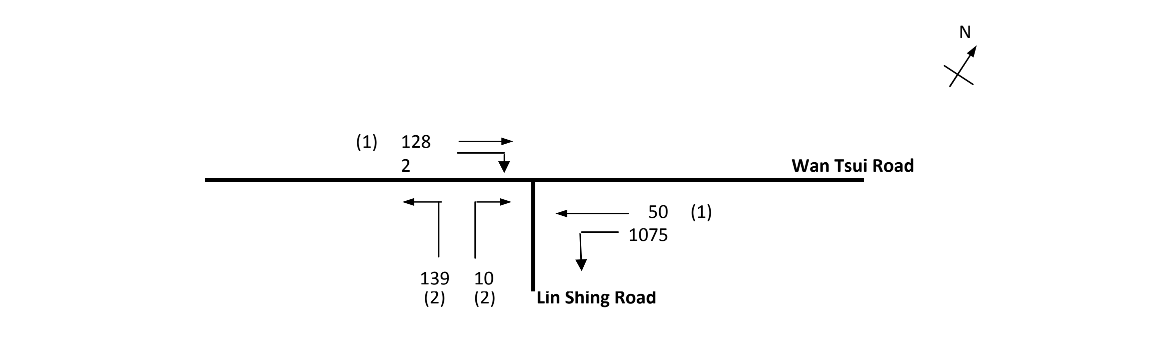
DFC_{b-a}	=	0.029
DFC_{b-c}	=	0.268
DFC_{b-d}	=	0.274
DFC_{d-a}	=	0.915
DFC_{d-b}	=	0.007
DFC_{d-c}	=	0.816
DFC_{c-b}	=	0.000
DFC_{a-d}	=	0.002

Critical DFC = 0.915

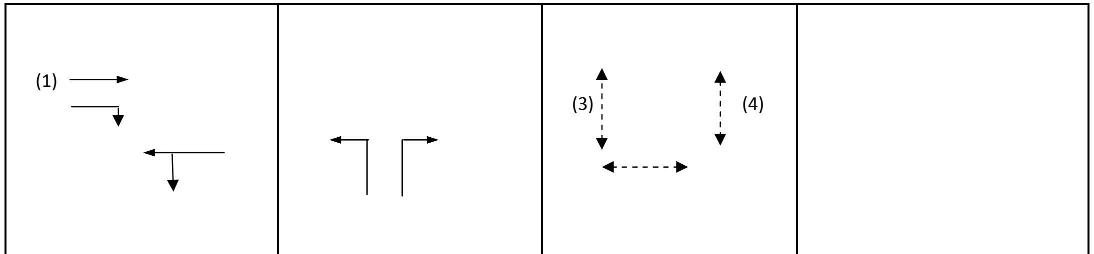
REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{a-d}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
W_{d-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
W_{d-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
Vr_{a-d}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
Vl_{d-c}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
Junction of Lin Shing Road and Wan Tsui Road	J2LV2 - Peak Hour Traffic Flows	FILENAME : 2026_LV2_Ref.xls	Checked By:	OC	29-4-2011
2026 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.638	
Loss time		L =	25	sec
Total Flow		=	1253	pcu
Co	= (1.5*L+5)/(1-Y)	=	117.5	sec
Cm	= L/(1-Y)	=	69.1	sec
Yult		=	0.713	
R.C.ult	= (Yult-Y)/Y*100%	=	11.6	%
Cp	= 0.9*L/(0.9-Y)	=	86.0	sec
Ymax	= 1-L/C	=	0.792	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	11.6	%



Stage A I = 7	Stage B I =	Stage C I =	

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		128		128	0.00	1915			1915	0.067			10	95	0.085	0	2
ST/LT	A	4.00	1	1	10		N	2015	1075	50		1125	0.96	1762			1762	0.638	0.638		95	95	0.806	42	6
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development a

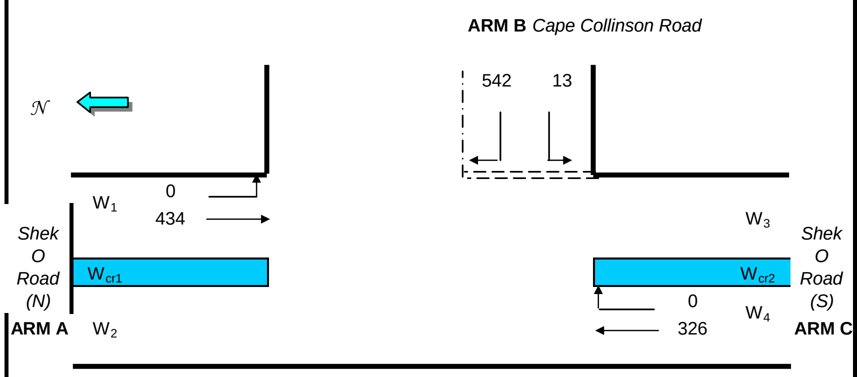
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road

Design Year - 2026 Level 2 - Reference Case

Time - Level 2 Peak Hour



GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	433.75	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	326.13	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	541.59	(pcu/hr)
q_{b-c}	=	13.1	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	631
Q_{c-b}	=	703
Q_{b-a}	=	290

COMPARISION OF DESIGN FLOW TO CAPACITY

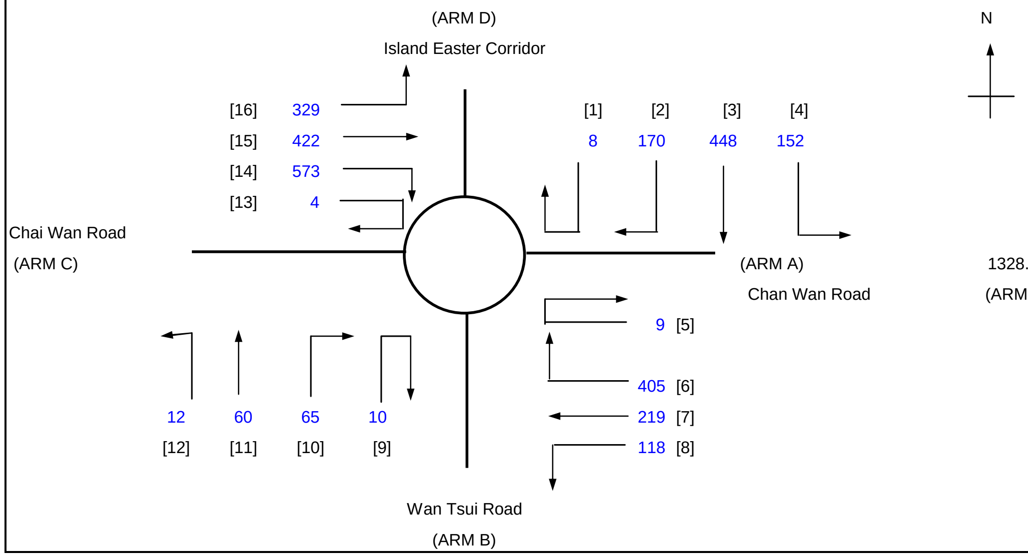
DFC_{b-a}	=	1.869
DFC_{b-c}	=	0.021
DFC_{c-b}	=	0.000

Critical DFC = 1.869

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

	ROUNDABOUT CAPACITY ASSESSMENT		INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	J4LV2 Peak Hour	PROJECT NO.: 80510	PREPARED BY: KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME : 2026_LV2_Ref.xls	CHECKED BY: OC	Sep-13
J4LV2 Peak Hour			REVIEWED BY: OC	Sep-13



(ARM D)
776.450717

1083

1328.694 (ARM C) 557 — 1212.037 — 751.1668 (ARM A)

814

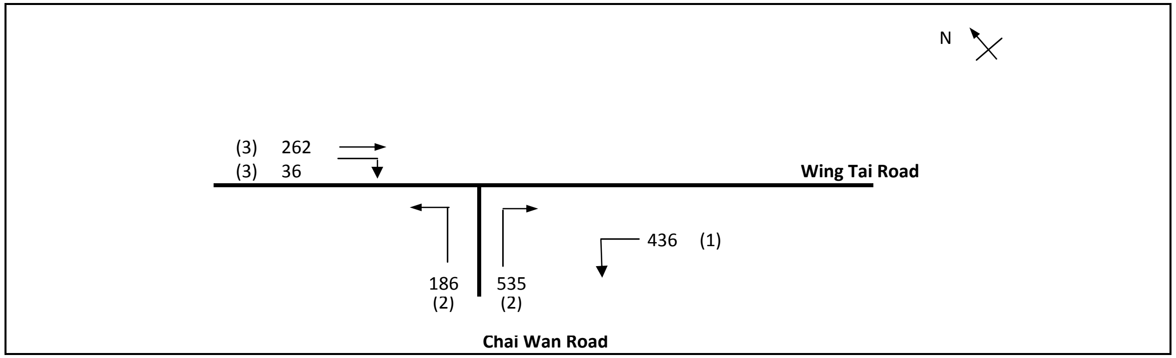
147.588915
(ARM B)

ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	751	148	1329	776
Qc	=	Circulating flow across entry (pcu/h)	1212	814	557	1083
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1550	1020	2058	1389
DFC	=	Design flow/Capacity = Q/Qe	0.48	0.14	0.65	0.56

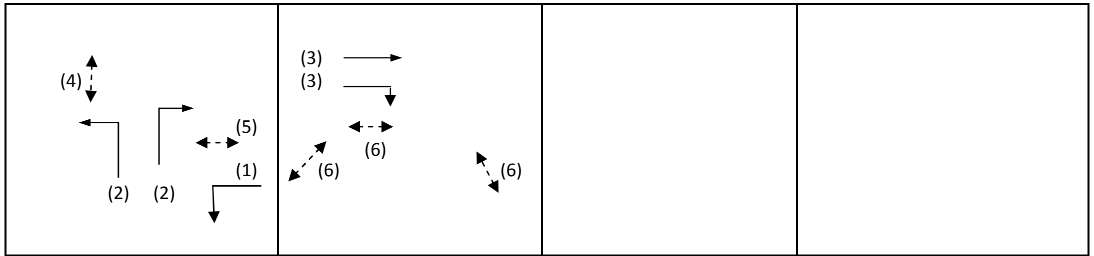
Total In Sum = 2392.37 PCU

DFC of Critical Approach = 0.65

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV2 - Peak Hour Traffic Flows	FILENAME : 2026_LV2_Ref.xls	Checked By:	OC	29-4-2011
2026 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.214	
Loss time		L =	10	sec
Total Flow		=	1455	pcu
Co	= (1.5*L+5)/(1-Y)	=	25.4	sec
Cm	= L/(1-Y)	=	12.7	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	286.1	%
Cp	= 0.9*L/(0.9-Y)	=	13.1	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	279.0	%

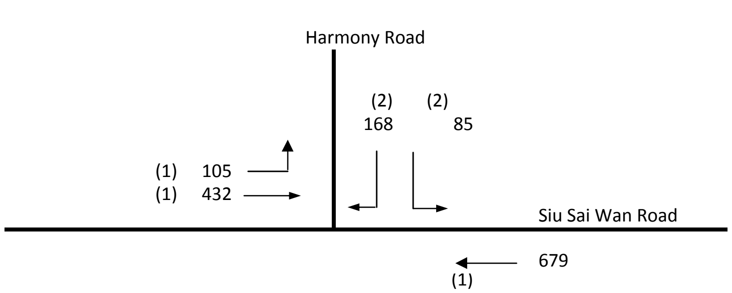


Stage A	I =	7	Stage B	I =	5		

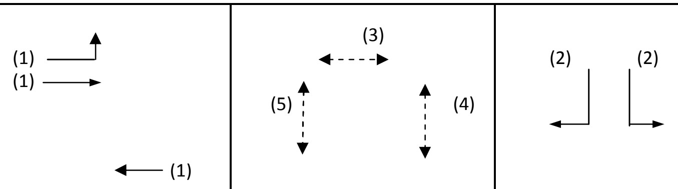
Movement	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	436			436	1.00	3857			3857	0.113			48	63	0.180	12	6
LT	A	4.00	2	2	24			4310	186			186	1.00	4056			4056	0.046			19	63	0.073	3	6
RT	A	3.50	2	2	11		y	4070			535	535	1.00	3582			3582	0.149	0.149		63	63	0.237	15	5
ST	B	3.50	3	2			y	4070		262		262	0.00	4070			4070	0.064	0.064		27	27	0.237	15	23
RT	B	4.50	3	2	13		y	4270			36	36	1.00	3828			3828	0.009			4	27	0.035	0	24
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV2 - Peak Hour Traffic Flows	FILENAME : 2026_LV2_Ref.xls	Checked By:	OC	29-4-2011
2026 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	100 sec
Sum(y)		Y =	0.260
Loss time		L =	48 sec
Total Flow		=	1470 pcu
Co	= (1.5*L+5)/(1-Y)	=	104.1 sec
Cm	= L/(1-Y)	=	64.9 sec
Yult		=	0.540
R.C.ult	= (Yult-Y)/Y*100%	=	107.7 %
Cp	= 0.9*L/(0.9-Y)	=	67.5 sec
Ymax	= 1-L/C	=	0.520
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	80.0 %

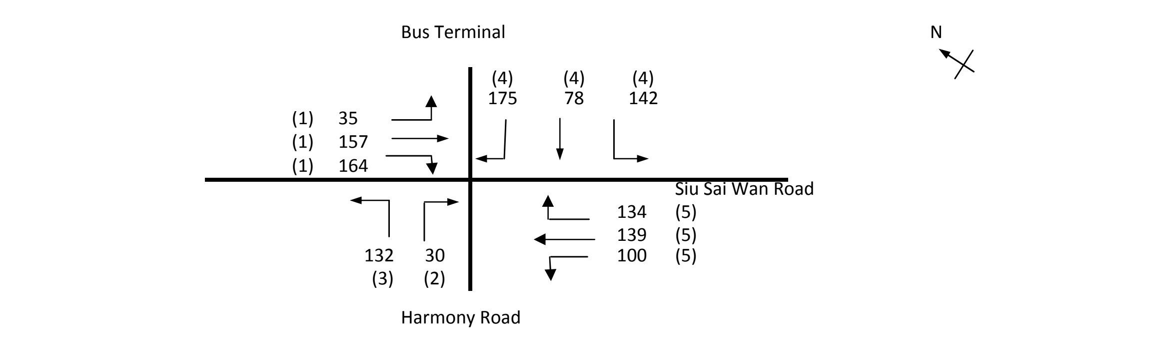


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6	

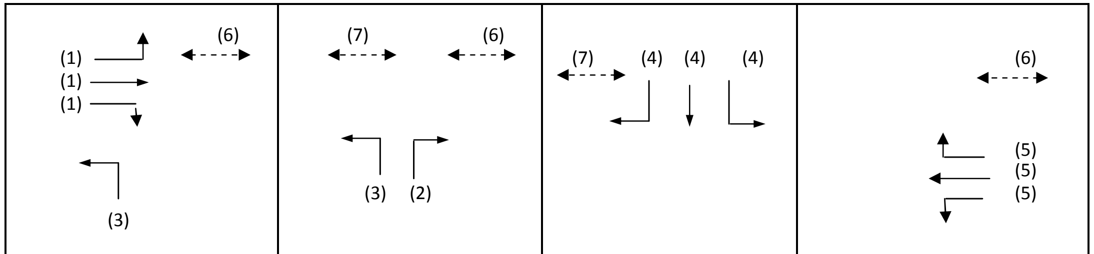
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	105	156		261	0.40	1844			1844	0.142			28	34	0.414	24	19
ST	A	3.20	1	1				2075		276		276	0.00	2075			2075	0.133			27	34	0.389	30	18
ST	A	3.00	1	2			y	3970		679		679	0.00	3970			3970	0.171	0.171		34	34	0.500	36	17
LT	C	3.75	2	1	12		y	1990	85			85	1.00	1769			1769	0.048			10	18	0.270	6	31
RT	C	3.75	2	1	12			2130			168	168	1.00	1893			1893	0.089	0.089		18	18	0.500	18	33
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV2 - Peak Hour Traffic Flows	FILENAME : 2026_LV2_Ref.xls	Checked By:	OC	29-4-2011
2026 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.389
Loss time		L =	18 sec
Total Flow		=	1286 pcu
Co	= (1.5*L+5)/(1-Y)	=	52.4 sec
Cm	= L/(1-Y)	=	29.5 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	96.5 %
Cp	= 0.9*L/(0.9-Y)	=	31.7 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	91.6 %



Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

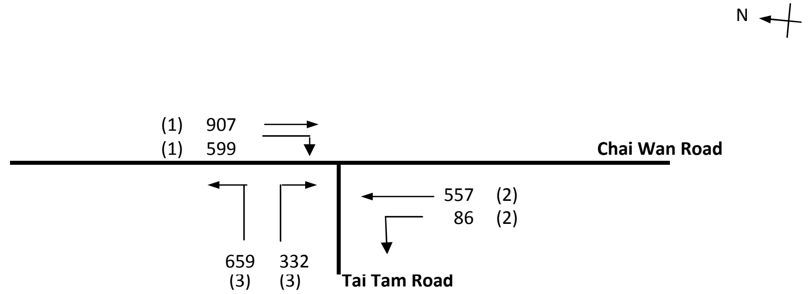
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	35	84		119	0.29	1870			1870	0.064			14	28	0.242	12	25
ST/RT	A	3.30	1	1	12			2085		73	164	237	0.69	1919			1919	0.124	0.124		28	28	0.470	30	25
RT	B	3.50	2	1	12			2105			30	30	1.00	1871			1871	0.016	0.016		4	4	0.470	0	66
LT	A,B	3.75	3	1	13		y	1990	132			132	1.00	1784			1784	0.074			16	36	0.214	12	20
RT	C	3.50	4	1	12			2105			175	175	1.00	1871			1871	0.093			21	27	0.363	18	26
LT/ST	C	3.50	4	1	12		y	1965	142	78		220	0.64	1818			1818	0.121	0.121		27	27	0.470	24	26
ST/RT	D	3.50	5	1	12			2105		0	134	134	1.00	1871			1871	0.072			16	16	0.470	18	37
LT/ST	D	3.50	5	1	11		y	1965	100	139		239	0.42	1859			1859	0.129	0.129		29	29	0.470	30	25
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

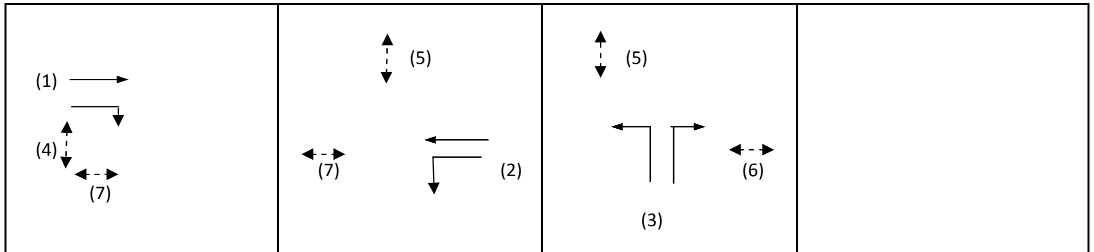
TRAFFIC SIGNAL CALCULATION

TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV2 - Peak Hour Traffic Flows	FILENAME : 2026_LV2_Ref.xls	Checked By:	OC	29-4-2011
2026 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011

INITIALS / DATE



No. of stages per cycle		N =	3	
Cycle time		C =	105	sec
Sum(y)		Y =	0.717	
Loss time		L =	18	sec
Total Flow		=	3139	pcu
Co	= (1.5*L+5)/(1-Y)	=	113.2	sec
Cm	= L/(1-Y)	=	63.7	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	6.6	%
Cp	= 0.9*L/(0.9-Y)	=	88.7	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	3.9	%



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

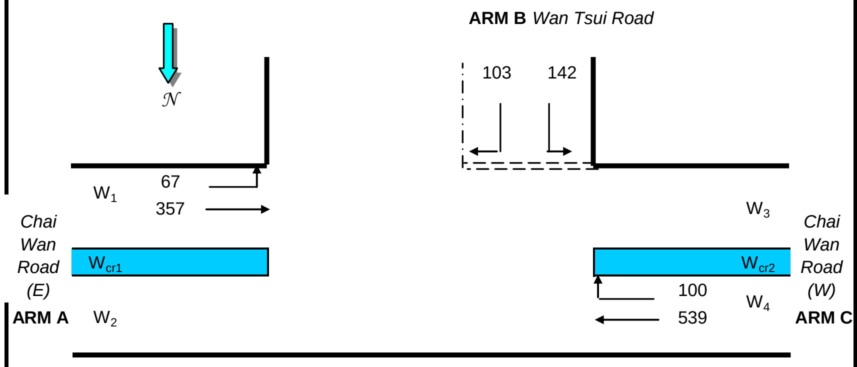
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		907		907	0.00	4070			4070	0.223			27	27	0.866	57	39
RT	A	3.50	1	1	13			2105			599	599	1.00	1887			1887	0.317	0.317		38	27	1.233	72	35
ST	B	3.50	2	2				4210		557		557	0.00	4210			4210	0.132	0.132		16	16	0.866	39	45
LT	B	3.10	2	1	12		y	1925	86			86	1.00	1711			1711	0.050			6	16	0.329	12	35
LT	C	4.00	3	1	15		y	2015	491			491	1.00	1832			1832	0.268	0.268		32	32	0.866	54	29
LT/RT	C	4.00	3	1	15			2155	168		332	500	1.00	1959			1959	0.255			31	32	0.825	60	29
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow **Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at**
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - **J9: Junciton of Chai Wan Road and Wan Tsui Road**
Design Year - **2026 Level 2 - Reference Case**
Time - **Level 2 Peak Hour**



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	67.4	(pcu/hr)
q_{a-c}	=	356.57	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	538.93	(pcu/hr)
q_{c-b}	=	100.01	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	103.27	(pcu/hr)
q_{b-c}	=	141.51	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

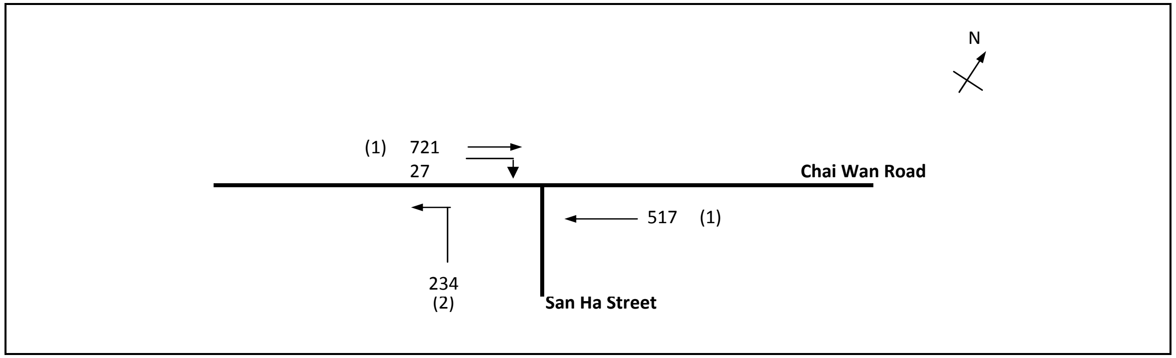
Q_{b-c}	=	777
Q_{c-b}	=	691
Q_{b-a}	=	382

COMPARISION OF DESIGN FLOW TO CAPACITY

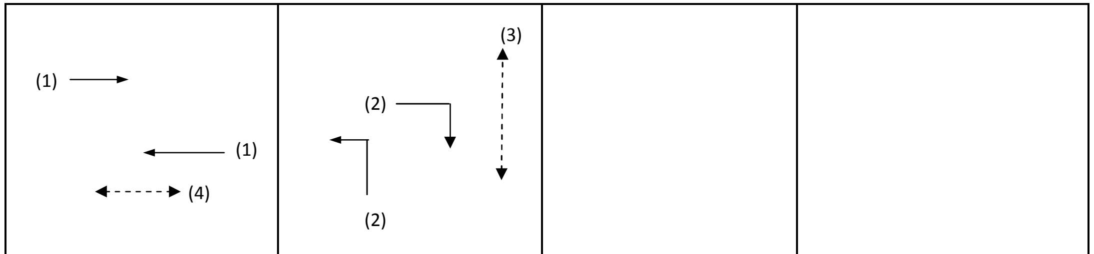
DFC_{b-a}	=	0.270
DFC_{b-c}	=	0.182
DFC_{c-b}	=	0.145

Critical DFC = 0.270

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV2 - Peak Hour Traffic Flows	FILENAME : 2026_LV2_Ref.xls	Checked By: OC	29-4-2011
2026 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.317	
Loss time		L =	10	sec
Total Flow		=	1499	pcu
Co	= (1.5*L+5)/(1-Y)	=	29.3	sec
Cm	= L/(1-Y)	=	14.7	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	159.9	%
Cp	= 0.9*L/(0.9-Y)	=	15.5	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	155.1	%

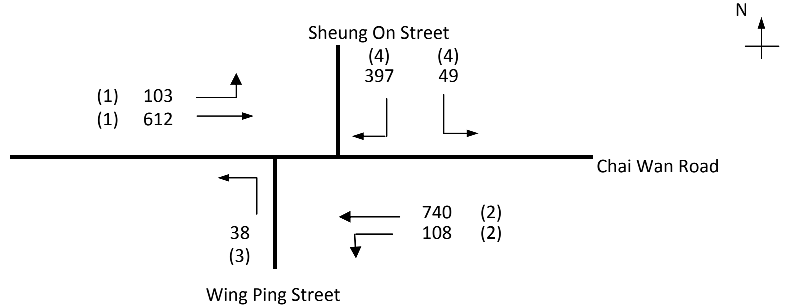


Stage A	I = 6	Stage B	I = 6	Stage C	I =	

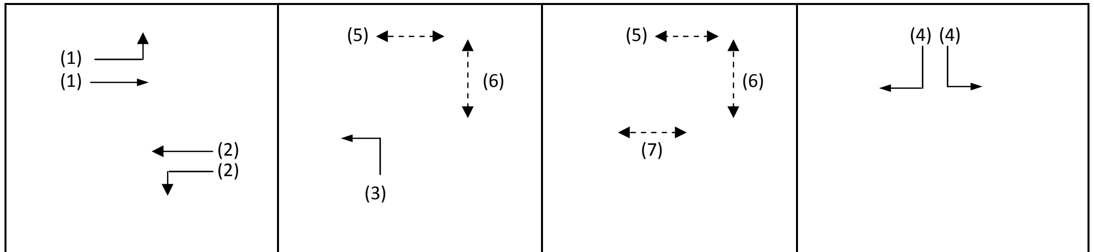
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		721		721	0.00	4070			4070	0.177	0.177		50	47	0.377	30	11
ST	A	3.50	1	2	10		N	4070		517		517	0.00	4070			4070	0.127			36	47	0.271	21	11
LT	B	3.00	2	1	10		N	1915	234			234	1.00	1665			1665	0.140	0.140		40	53	0.265	18	9
RT	B	3.50	2	1	12			2105			27	27	1.00	1871			1871	0.015			4	53	0.027	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV2 - Peak Hour Traffic Flows	FILENAME : 2026_LV2_Ref.xls	Checked By:	OC	29-4-2011
2026 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	120	sec
Sum(y)		Y =	0.288	
Loss time		L =	37	sec
Total Flow		=	2047	pcu
Co	= (1.5*L+5)/(1-Y)	=	85.0	sec
Cm	= L/(1-Y)	=	52.0	sec
Yult		=	0.623	
R.C.ult	= (Yult-Y)/Y*100%	=	116.2	%
Cp	= 0.9*L/(0.9-Y)	=	54.4	sec
Ymax	= 1-L/C	=	0.692	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	116.2	%



Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	103	612		715	0.14	6066			6066	0.118			34		0.000	46	54
LT/ST	A	3.30	2	3	12		Y	6115	108	740		848	0.13	6019			6019	0.141	0.141		41		0.000	56	54
LT	B	3.50	3	1	9		Y	1965	38			38	1.00	1684			1684	0.023	0.023		7		0.000	6	54
LT/RT	D	3.75	4	2	10		y	4120	49		397	446	1.00	3583			3583	0.124	0.124		36		0.000	42	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development a

Junction Capacity Analysis

Prepared By: KC

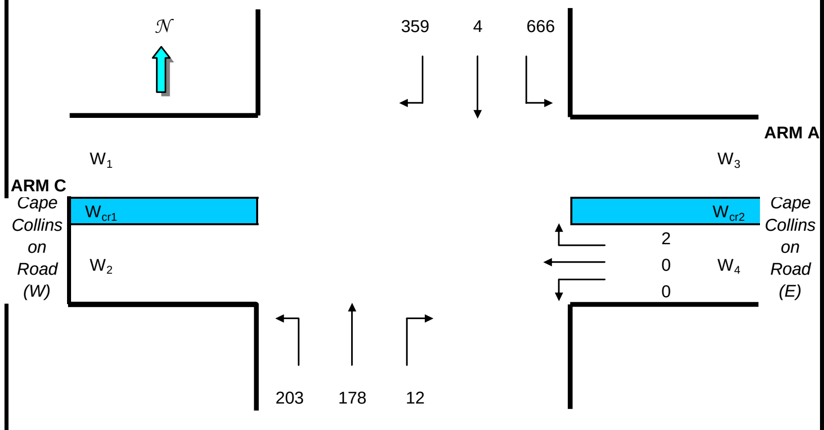
Checked By: OC

Junction layout sketch - **J1: J/O Cape Collinson Road and Lin Shing Road**

Design Year - **2026 Level 2 - Site 1**

Time - **Level 2 Peak Hour**

ARM D *Lin Shing Rd (N)*



ARM B *Lin Shing Rd (S)*

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{a-d}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
W_{d-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
W_{d-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
Vr_{a-d}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
Vl_{d-c}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

W_{a-d}	=	3.00	(metres)
Vr_{a-d}	=	100	(metres)
q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	0	(pcu/hr)
q_{a-d}	=	2	(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)
q_{c-d}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	5.00	(metres)
W_{b-c}	=	5.00	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	65	(metres)
Vr_{b-c}	=	0	(metres)
q_{b-a}	=	11.958	(pcu/hr)
q_{b-c}	=	202.94	(pcu/hr)
q_{b-d}	=	177.88	(pcu/hr)

MINOR ROAD (ARM D)

W_{d-a}	=	3.00	(metres)
W_{d-c}	=	3.00	(metres)
Vl_{d-c}	=	50	(metres)
Vr_{d-c}	=	50	(metres)
Vr_{d-a}	=	80	(metres)
q_{d-a}	=	666.49	(pcu/hr)
q_{d-b}	=	3.875	(pcu/hr)
q_{d-c}	=	358.98	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

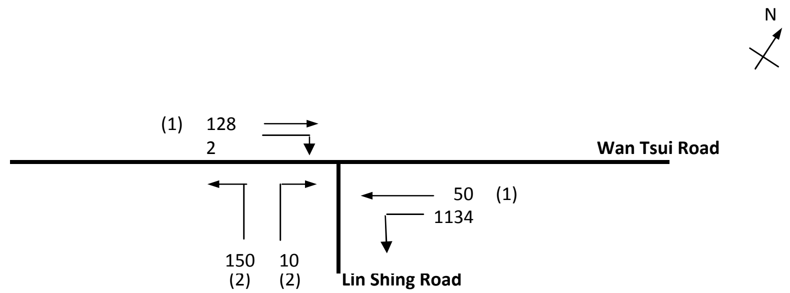
Q_{b-a}	=	396
Q_{b-c}	=	749
Q_{b-d} is nearside	=	TRUE
Q_{b-d}	=	611
Q_{d-a}	=	674
Q_{d-b} is nearside	=	TRUE
Q_{d-b}	=	532
Q_{d-c}	=	425
Q_{c-b}	=	437
Q_{a-d}	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

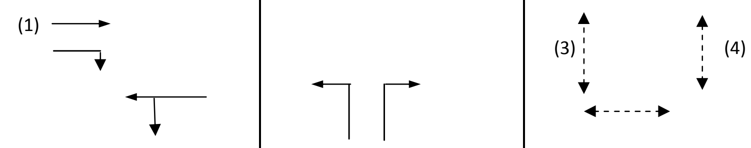
DFC_{b-a}	=	0.030
DFC_{b-c}	=	0.271
DFC_{b-d}	=	0.291
DFC_{d-a}	=	0.988
DFC_{d-b}	=	0.007
DFC_{d-c}	=	0.844
DFC_{c-b}	=	0.000
DFC_{a-d}	=	0.003

Critical DFC = 0.988

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J2: Junction of Lin Shing Road and Wan Tsui Road	J2LV2 - Peak Hour Traffic Flows	FILENAME :/2_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2026 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	120 sec
Sum(y)		Y =	0.672
Loss time		L =	25 sec
Total Flow		=	1312 pcu
Co	= (1.5*L+5)/(1-Y)	=	129.5 sec
Cm	= L/(1-Y)	=	76.2 sec
Yult		=	0.713
R.C.ult	= (Yult-Y)/Y*100%	=	6.1 %
Cp	= 0.9*L/(0.9-Y)	=	98.6 sec
Ymax	= 1-L/C	=	0.792
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	6.1 %

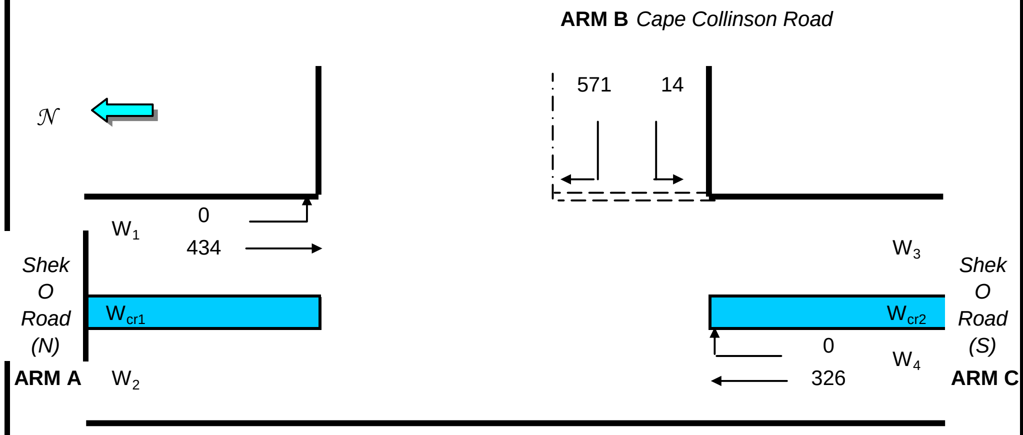


Stage A I = 7	Stage B I =	Stage C I =	

Movement	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
ST	A	3.00	1	1			N	1915		128		128	0.00	1915			1915	0.067		5	9	95	0.085	0	2
ST/LT	A	4.00	1	1	10		N	2015	1134	50		1184	0.96	1762			1762	0.672	0.672		95	95	0.849	48	7
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2026 Level 2 - Site 1
Time - Level 2 Peak Hour



GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	433.75	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	326.13	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	570.88	(pcu/hr)
q_{b-c}	=	14.107	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	631
Q_{c-b}	=	703
Q_{b-a}	=	290

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	1.970
DFC_{b-c}	=	0.022
DFC_{c-b}	=	0.000

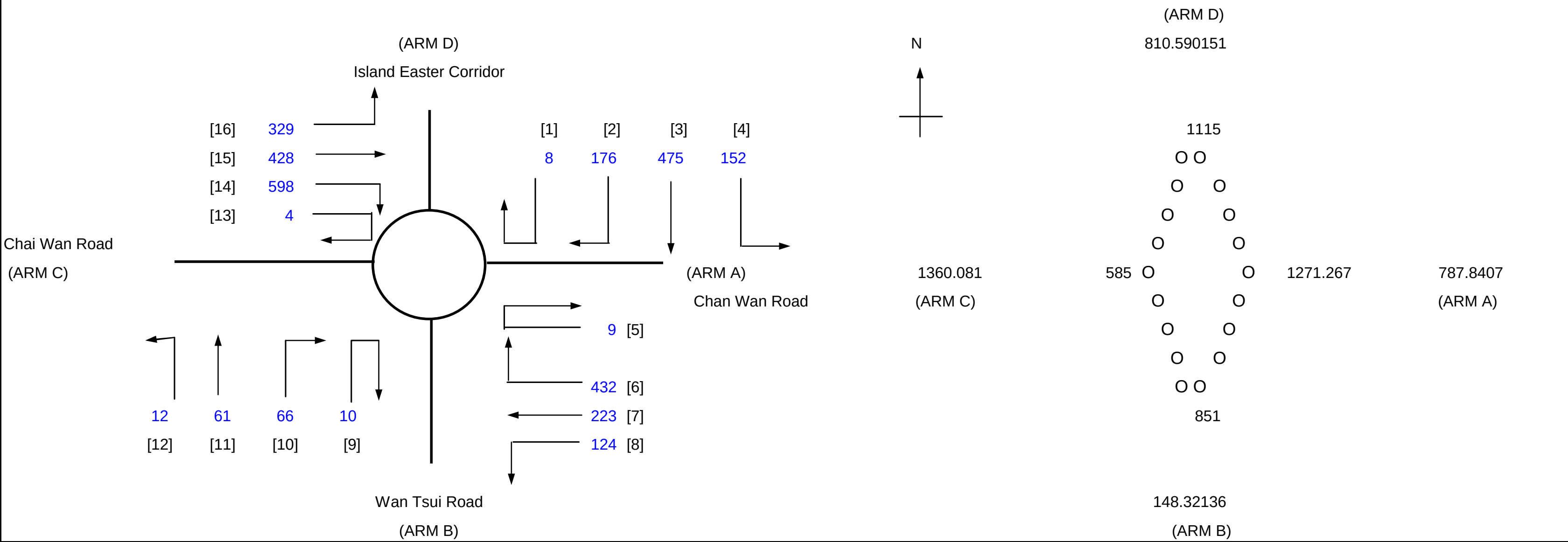
Critical DFC = 1.970

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

ROUNDABOUT CAPACITY ASSESSMENT

				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	**J4LV2 Peak Hour**	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME2026_LV2_S1_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV2 Peak Hour			REVIEWED BY:	OC	Sep-13

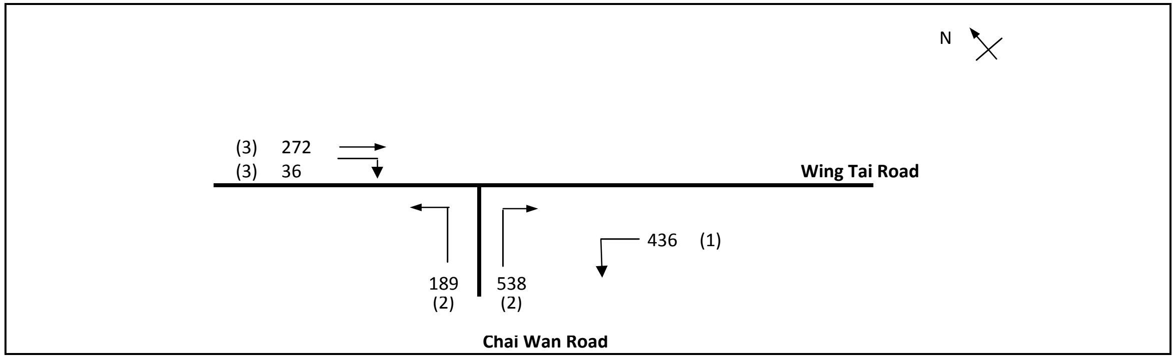


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	788	148	1360	811
Qc	=	Circulating flow across entry (pcu/h)	1271	851	585	1115
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1505	999	2037	1367
DFC	=	Design flow/Capacity = Q/Qe	0.52	0.15	0.67	0.59

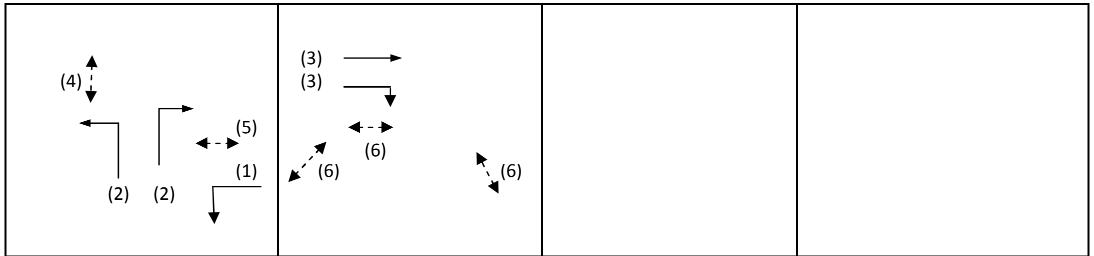
Total In Sum = 2489.567 PCU

DFC of Critical Approach = 0.67

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV2 - Peak Hour Traffic Flows	FILENAME :/2_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2026 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.217	
Loss time		L =	10	sec
Total Flow		=	1471	pcu
Co	= (1.5*L+5)/(1-Y)	=	25.5	sec
Cm	= L/(1-Y)	=	12.8	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	280.2	%
Cp	= 0.9*L/(0.9-Y)	=	13.2	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	273.2	%

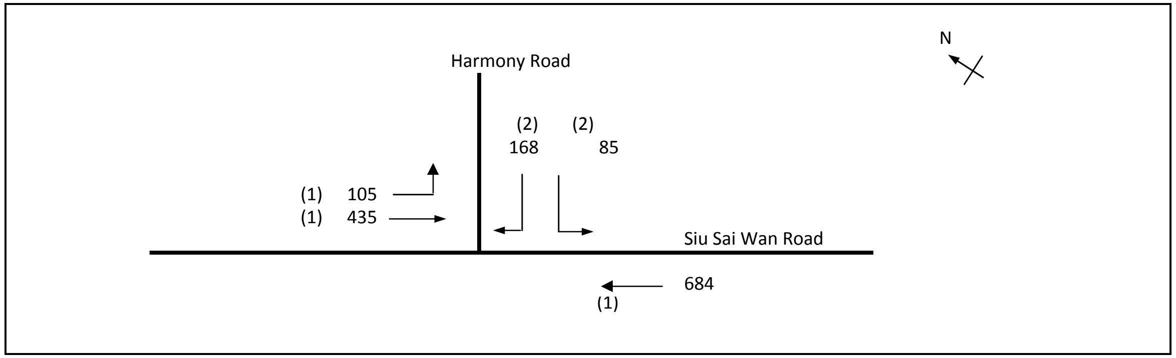


Stage A	I = 7	Stage B	I = 5		

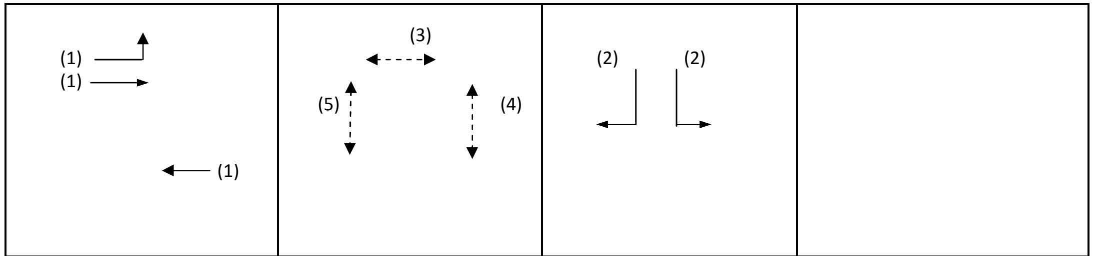
Movement	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	436			436	1.00	3857			3857	0.113			47	62	0.181	12	6
LT	A	4.00	2	2	24			4310	189			189	1.00	4056			4056	0.047			19	62	0.075	3	6
RT	A	3.50	2	2	11		y	4070			538	538	1.00	3582			3582	0.150	0.150		62	62	0.241	15	6
ST	B	3.50	3	2			y	4070		272		272	0.00	4070			4070	0.067	0.067		28	28	0.241	15	22
RT	B	4.50	3	2	13		y	4270			36	36	1.00	3828			3828	0.009			4	28	0.034	0	23
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV2 - Peak Hour Traffic Flows	FILENAME :/2_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2026 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	100	sec
Sum(y)		Y =	0.261	
Loss time		L =	48	sec
Total Flow		=	1477	pcu
Co	= (1.5*L+5)/(1-Y)	=	104.2	sec
Cm	= L/(1-Y)	=	65.0	sec
Yult		=	0.540	
R.C.ult	= (Yult-Y)/Y*100%	=	106.9	%
Cp	= 0.9*L/(0.9-Y)	=	67.6	sec
Ymax	= 1-L/C	=	0.520	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	79.3	%

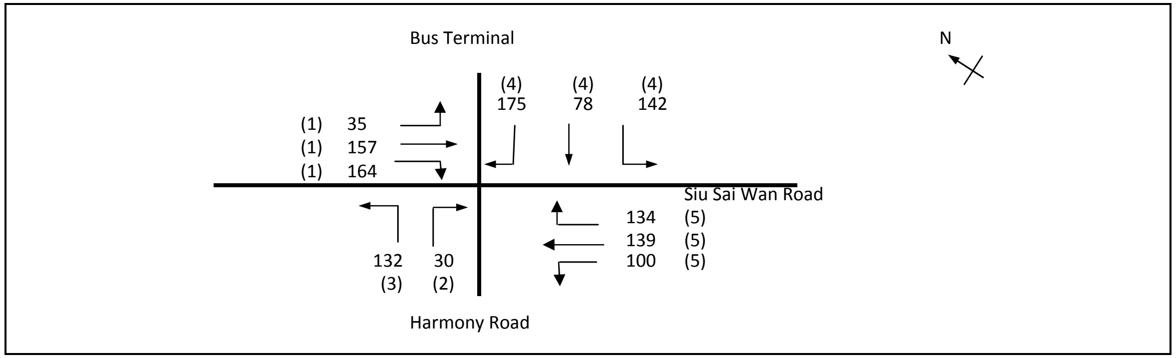


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

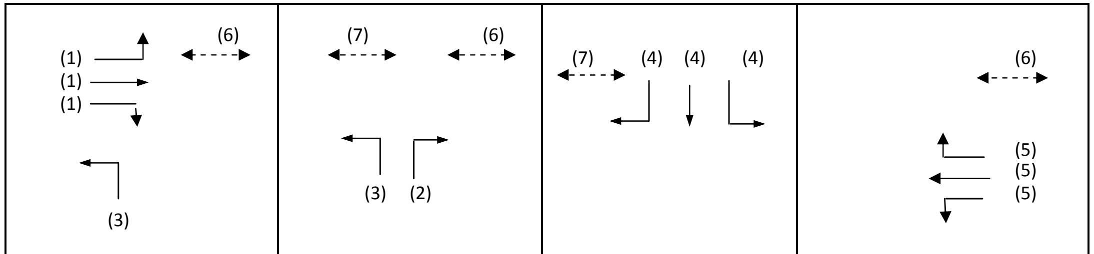
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	105	156		261	0.40	1844			1844	0.142			28	34	0.413	24	18
ST	A	3.20	1	1				2075		279		279	0.00	2075			2075	0.135			27	34	0.392	30	18
ST	A	3.00	1	2			y	3970		684		684	0.00	3970			3970	0.172	0.172		34	34	0.502	36	17
LT	C	3.75	2	1	12		y	1990	85			85	1.00	1769			1769	0.048			10	18	0.271	6	31
RT	C	3.75	2	1	12			2130			168	168	1.00	1893			1893	0.089	0.089		18	18	0.502	18	33
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV2 - Peak Hour Traffic Flows	FILENAME :/2_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2026 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.389
Loss time		L =	18 sec
Total Flow		=	1286 pcu
Co	= (1.5*L+5)/(1-Y)	=	52.4 sec
Cm	= L/(1-Y)	=	29.5 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	96.5 %
Cp	= 0.9*L/(0.9-Y)	=	31.7 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	91.6 %

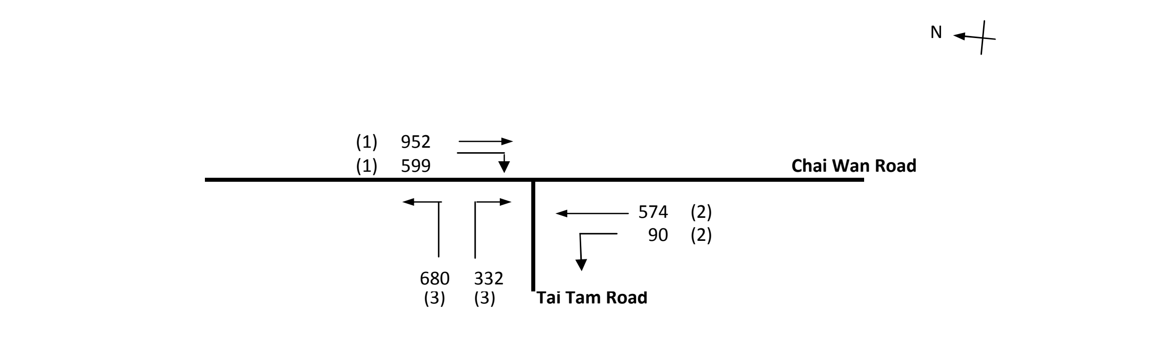


Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

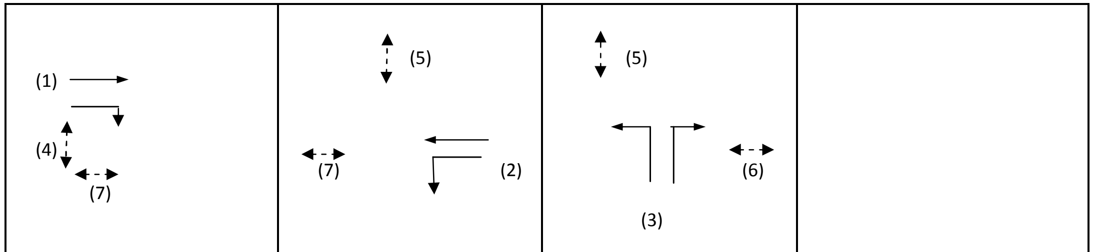
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	35	84		119	0.29	1870			1870	0.064			14	28	0.242	12	25
ST/RT	A	3.30	1	1	12			2085		73	164	237	0.69	1919			1919	0.124	0.124		28	28	0.470	30	25
RT	B	3.50	2	1	12			2105			30	30	1.00	1871			1871	0.016	0.016		4	4	0.470	0	66
LT	A,B	3.75	3	1	13		y	1990	132			132	1.00	1784			1784	0.074			16	36	0.214	12	20
RT	C	3.50	4	1	12			2105			175	175	1.00	1871			1871	0.093			21	27	0.363	18	26
LT/ST	C	3.50	4	1	12		y	1965	142	78		220	0.64	1818			1818	0.121	0.121		27	27	0.470	24	26
ST/RT	D	3.50	5	1	12			2105		0	134	134	1.00	1871			1871	0.072			16	16	0.470	18	37
LT/ST	D	3.50	5	1	11		y	1965	100	139		239	0.42	1859			1859	0.129	0.129		29	29	0.470	30	25
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV2 - Peak Hour Traffic Flows	FILENAME :/2_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2026 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	105	sec
Sum(y)		Y =	0.736	
Loss time		L =	18	sec
Total Flow		=	3227	pcu
Co	= (1.5*L+5)/(1-Y)	=	121.4	sec
Cm	= L/(1-Y)	=	68.3	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	3.9	%
Cp	= 0.9*L/(0.9-Y)	=	99.1	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	1.3	%



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

Movement	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		952		952	0.00	4070			4070	0.234			28	28	0.889	60	39
RT	A	3.75	1	1	13			2130			599	599	1.00	1910			1910	0.314	0.314		37	28	1.191	72	34
ST	B	3.50	2	2				4210		574		574	0.00	4210			4210	0.136	0.136		16	16	0.889	42	45
LT	B	3.10	2	1	12		y	1925	90			90	1.00	1711			1711	0.053			6	16	0.343	12	35
LT	C	4.00	3	1	15		y	2015	525			525	1.00	1832			1832	0.286	0.286		34	34	0.889	60	28
LT/RT	C	4.00	3	1	15			2155	155		332	487	1.00	1959			1959	0.248			29	34	0.771	54	25
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at (

Junction Capacity Analysis

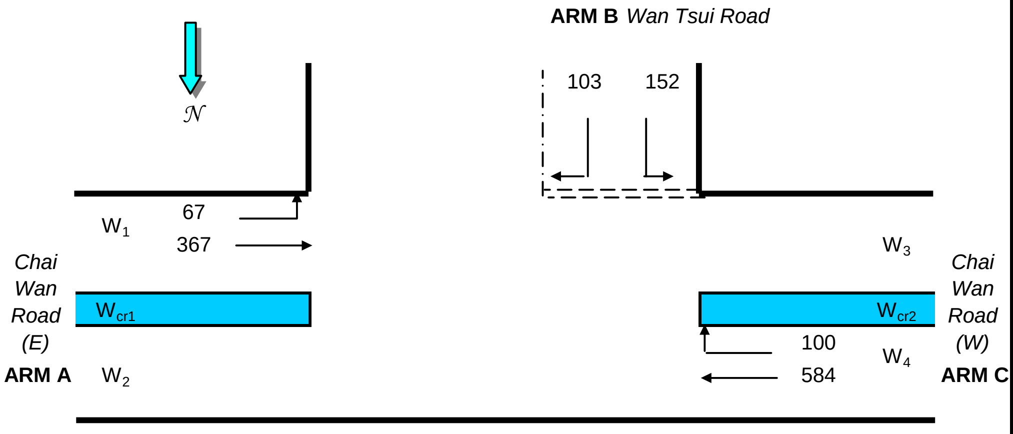
Prepared By: KC

Checked By: OC

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road

Design Year - 2026 Level 2 - Site 1

Time - Level 2 Peak Hour



GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

$q_{a\text{-}b}$	=	67.4	(pcu/hr)
$q_{a\text{-}c}$	=	367.06	(pcu/hr)

MAJOR ROAD (ARM C)

$W_{c\text{-}b}$	=	3.30	(metres)
$Vr_{c\text{-}b}$	=	150	(metres)
$q_{c\text{-}a}$	=	583.96	(pcu/hr)
$q_{c\text{-}b}$	=	100.01	(pcu/hr)

MINOR ROAD (ARM B)

$W_{b\text{-}a}$	=	0.00	(metres)
$W_{b\text{-}c}$	=	4.50	(metres)
$Vl_{b\text{-}a}$	=	150	(metres)
$Vr_{b\text{-}a}$	=	150	(metres)
$Vr_{b\text{-}c}$	=	150	(metres)
$q_{b\text{-}a}$	=	103.27	(pcu/hr)
$q_{b\text{-}c}$	=	152.22	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

$Q_{b\text{-}c}$	=	775
$Q_{c\text{-}b}$	=	690
$Q_{b\text{-}a}$	=	379

COMPARISION OF DESIGN FLOW TO CAPACITY

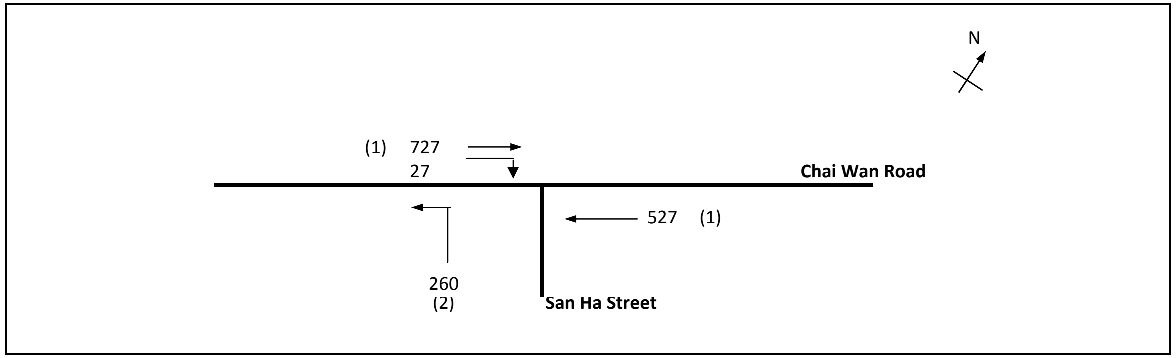
$DFC_{b\text{-}a}$	=	0.272
$DFC_{b\text{-}c}$	=	0.196
$DFC_{c\text{-}b}$	=	0.145

Critical DFC = 0.272

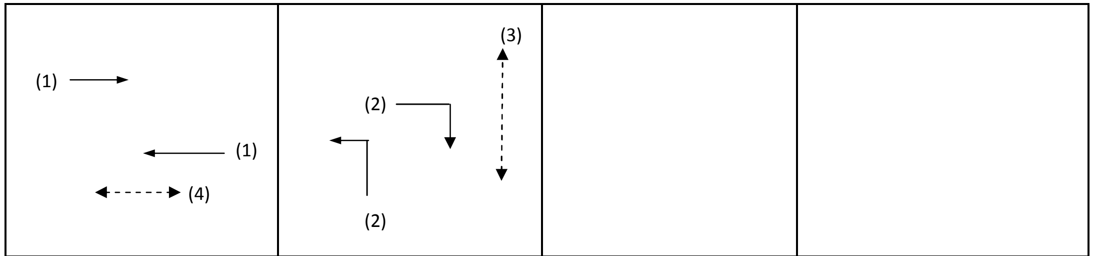
REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV2 - Peak Hour Traffic Flows	FILENAME :/2_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2026 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.335	
Loss time		L =	10	sec
Total Flow		=	1542	pcu
Co	= (1.5*L+5)/(1-Y)	=	30.1	sec
Cm	= L/(1-Y)	=	15.0	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	146.2	%
Cp	= 0.9*L/(0.9-Y)	=	15.9	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	141.7	%

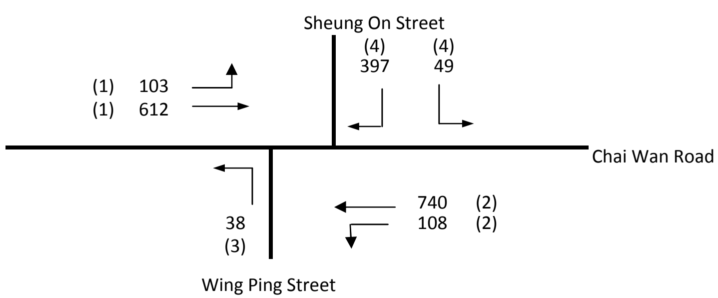


Stage A	I = 6	Stage B	I = 6	Stage C	I =	

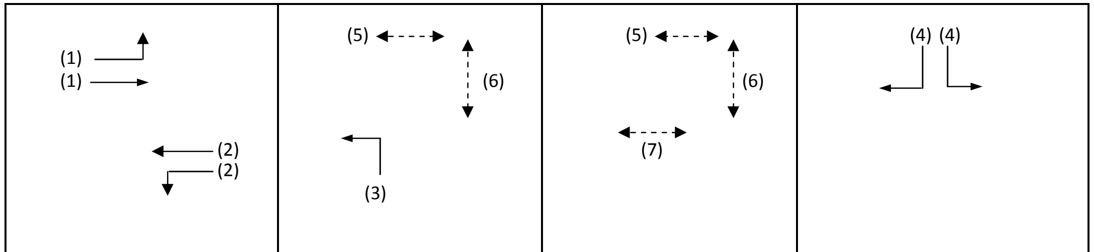
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		727		727	0.00	4070			4070	0.179	0.179		48	47	0.380	30	11
ST	A	3.50	1	2	10		N	4070		527		527	0.00	4070			4070	0.130			35	47	0.276	21	11
LT	B	3.00	2	1	10		N	1915	260			260	1.00	1665			1665	0.156	0.156		42	53	0.295	18	9
RT	B	3.50	2	1	12			2105			27	27	1.00	1871			1871	0.015			4	53	0.027	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV2 - Peak Hour Traffic Flows	FILENAME :/2_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2026 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	120	sec
Sum(y)		Y =	0.288	
Loss time		L =	37	sec
Total Flow		=	2047	pcu
Co	= (1.5*L+5)/(1-Y)	=	85.0	sec
Cm	= L/(1-Y)	=	52.0	sec
Yult		=	0.623	
R.C.ult	= (Yult-Y)/Y*100%	=	116.2	%
Cp	= 0.9*L/(0.9-Y)	=	54.4	sec
Ymax	= 1-L/C	=	0.692	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	116.2	%



Stage A I = 8	Stage B I = 5	Stage C I = 7	Stage C I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	103	612		715	0.14	6066			6066	0.118			34		0.000	46	54
LT/ST	A	3.30	2	3	12		Y	6115	108	740		848	0.13	6019			6019	0.141	0.141		41		0.000	56	54
LT	B	3.50	3	1	9		Y	1965	38			38	1.00	1684			1684	0.023	0.023		7		0.000	6	54
LT/RT	D	3.75	4	2	10		y	4120	49		397	446	1.00	3583			3583	0.124	0.124		36		0.000	42	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at C

Junction Capacity Analysis

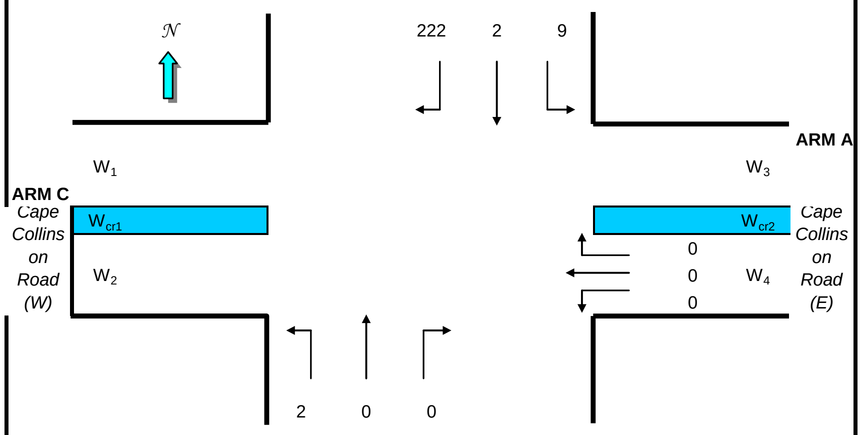
Prepared By:	KC
Checked By:	OC

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road

Design Year - 2026 Level 3 - Reference Case

Time - Level 3 Peak Hour

ARM D *Lin Shing Rd (N)*



ARM B *Lin Shing Rd (S)*

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{a-d}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
W_{d-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
W_{d-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
Vr_{a-d}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
Vl_{d-c}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

W_{a-d}	=	3.00	(metres)
Vr_{a-d}	=	100	(metres)
q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	0	(pcu/hr)
q_{a-d}	=	0	(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)
q_{c-d}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	5.00	(metres)
W_{b-c}	=	5.00	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	65	(metres)
Vr_{b-c}	=	0	(metres)
q_{b-a}	=	0	(pcu/hr)
q_{b-c}	=	2.1742	(pcu/hr)
q_{b-d}	=	0	(pcu/hr)

MINOR ROAD (ARM D)

W_{d-a}	=	3.00	(metres)
W_{d-c}	=	3.00	(metres)
Vl_{d-c}	=	50	(metres)
Vr_{d-c}	=	50	(metres)
Vr_{d-a}	=	80	(metres)
q_{d-a}	=	8.6968	(pcu/hr)
q_{d-b}	=	2.1742	(pcu/hr)
q_{d-c}	=	221.76	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

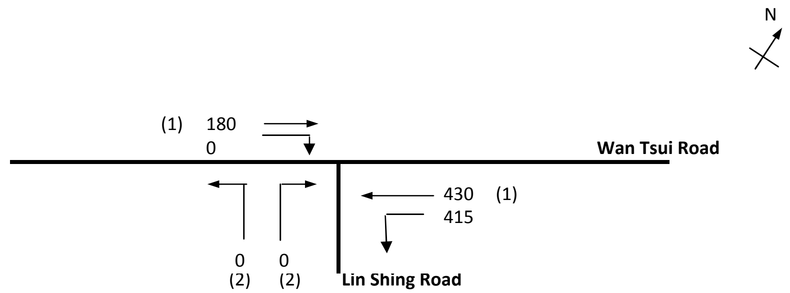
Q_{b-a}	=	615
Q_{b-c}	=	749
Q_{b-d} is nearside	=	TRUE
Q_{b-d}	=	611
Q_{d-a}	=	674
Q_{d-b} is nearside	=	TRUE
Q_{d-b}	=	533
Q_{d-c}	=	518
Q_{c-b}	=	437
Q_{a-d}	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

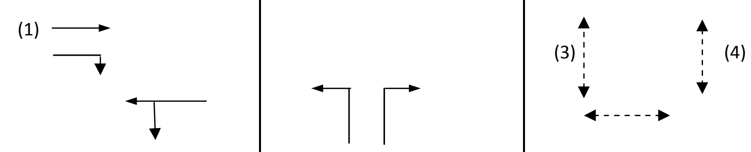
DFC_{b-a}	=	0.000
DFC_{b-c}	=	0.003
DFC_{b-d}	=	0.000
DFC_{d-a}	=	0.013
DFC_{d-b}	=	0.004
DFC_{d-c}	=	0.428
DFC_{c-b}	=	0.000
DFC_{a-d}	=	0.000

Critical DFC = 0.428

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
Junction of Lin Shing Road and Wan Tsui Road	J2LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2026 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.450	
Loss time		L =	25	sec
Total Flow		=	1025	pcu
Co	= (1.5*L+5)/(1-Y)	=	77.3	sec
Cm	= L/(1-Y)	=	45.4	sec
Yult		=	0.713	
R.C.ult	= (Yult-Y)/Y*100%	=	58.4	%
Cp	= 0.9*L/(0.9-Y)	=	50.0	sec
Ymax	= 1-L/C	=	0.792	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	58.4	%



Stage A	I = 7	Stage B	I =	Stage C	I =

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		180		180	0.00	1915			1915	0.094			20	95	0.119	6	2
ST/LT	A	4.00	1	1	10		N	2015	415	430		844	0.49	1877			1877	0.450	0.450		95	95	0.568	30	3
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development a

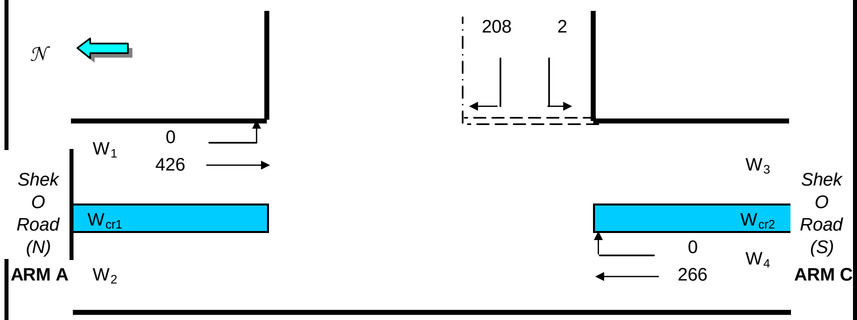
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road

Design Year - 2026 Level 3 - Reference Case

Time - Level 3 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	426.14	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	266.34	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	207.75	(pcu/hr)
q_{b-c}	=	2.1742	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

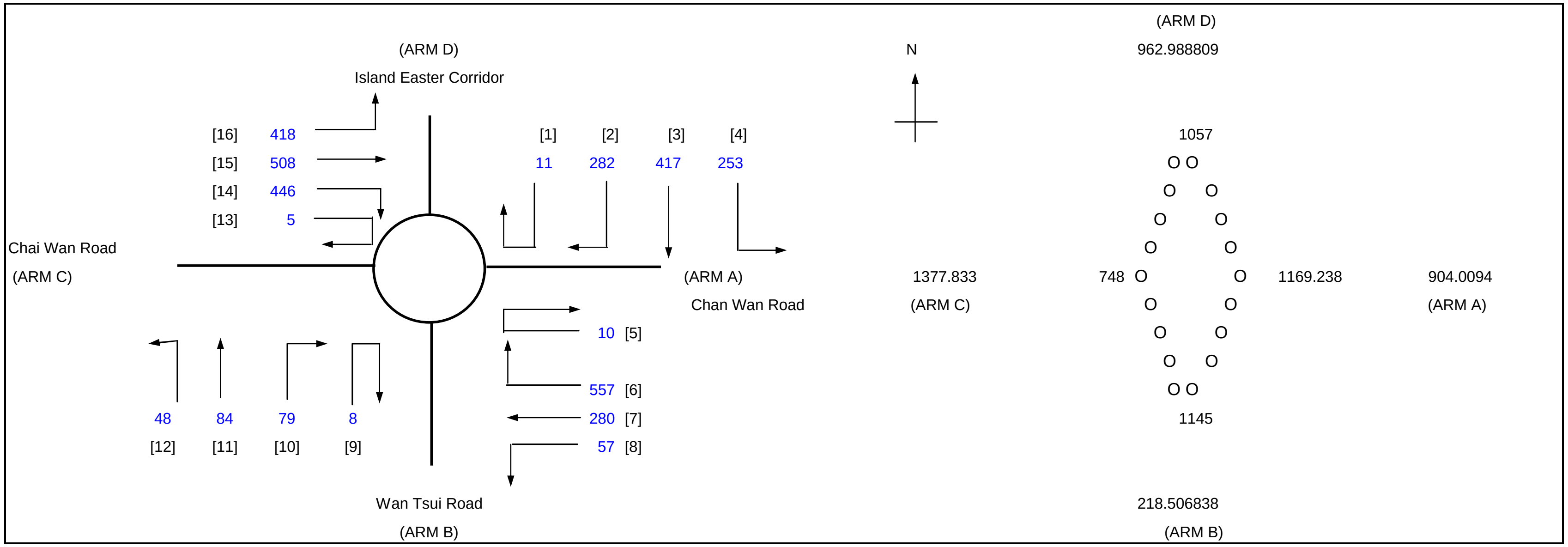
Q_{b-c}	=	633
Q_{c-b}	=	705
Q_{b-a}	=	297

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	0.700
DFC_{b-c}	=	0.003
DFC_{c-b}	=	0.000

Critical DFC = 0.700

	ROUNDABOUT CAPACITY ASSESSMENT			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	J4LV3 Peak Hour	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME: 2026_LV3_Ref_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV3 Peak Hour			REVIEWED BY:	OC	Sep-13

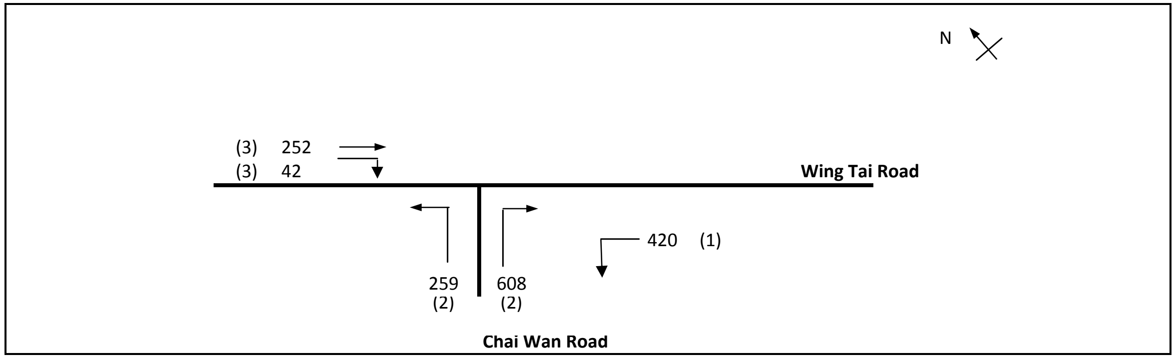


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	904	219	1378	963
Qc	=	Circulating flow across entry (pcu/h)	1169	1145	748	1057
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1582	836	1913	1407
DFC	=	Design flow/Capacity = Q/Qe	0.57	0.26	0.72	0.68

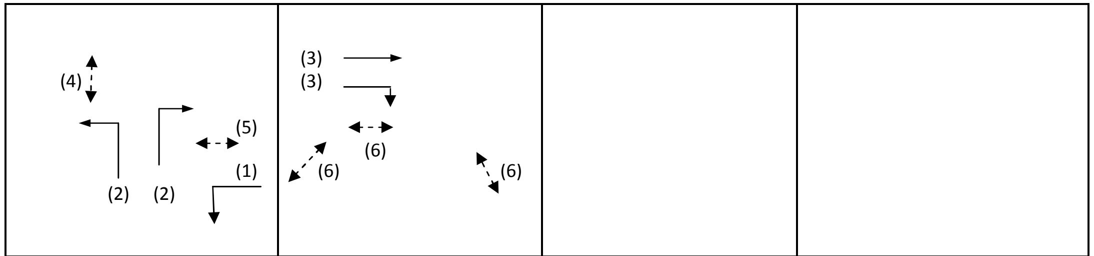
Total In Sum = 2688.088 PCU

DFC of Critical Approach = 0.72

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2026 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.232	
Loss time		L =	10	sec
Total Flow		=	1581	pcu
Co	= (1.5*L+5)/(1-Y)	=	26.0	sec
Cm	= L/(1-Y)	=	13.0	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	256.1	%
Cp	= 0.9*L/(0.9-Y)	=	13.5	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	249.7	%

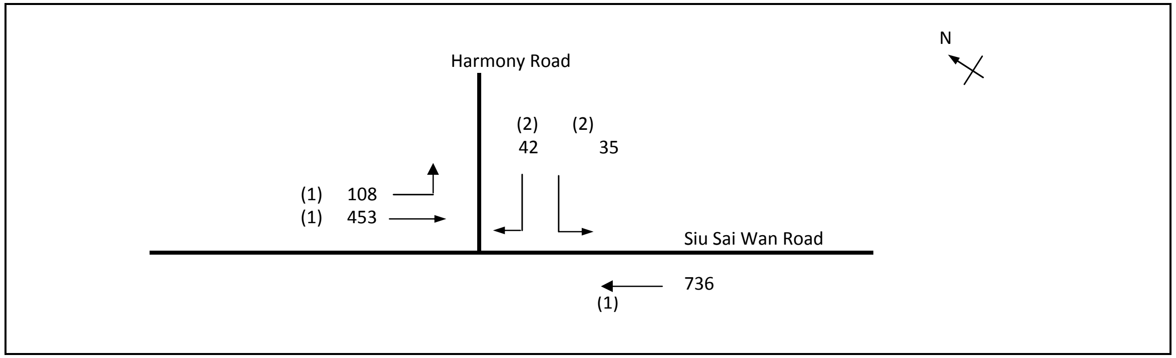


Stage A I = 7 | Stage B I = 5

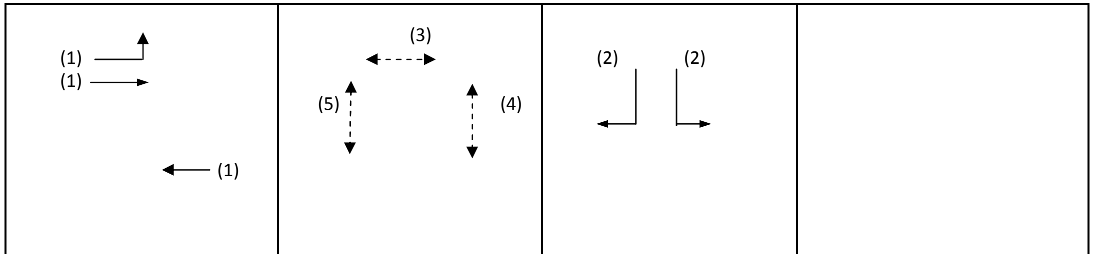
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	420			420	1.00	3857			3857	0.109			42	66	0.165	9	5
LT	A	4.00	2	2	24			4310	259			259	1.00	4056			4056	0.064			25	66	0.097	6	5
RT	A	3.50	2	2	11		y	4070			608	608	1.00	3582			3582	0.170	0.170		66	66	0.257	15	5
ST	B	3.50	3	2			y	4070		252		252	0.00	4070			4070	0.062	0.062		24	24	0.257	15	25
RT	B	4.50	3	2	13		y	4270			42	42	1.00	3828			3828	0.011			4	24	0.046	0	26
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2026 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	100	sec
Sum(y)		Y =	0.208	
Loss time		L =	48	sec
Total Flow		=	1374	pcu
Co	= (1.5*L+5)/(1-Y)	=	97.2	sec
Cm	= L/(1-Y)	=	60.6	sec
Yult		=	0.540	
R.C.ult	= (Yult-Y)/Y*100%	=	159.9	%
Cp	= 0.9*L/(0.9-Y)	=	62.4	sec
Ymax	= 1-L/C	=	0.520	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	125.2	%

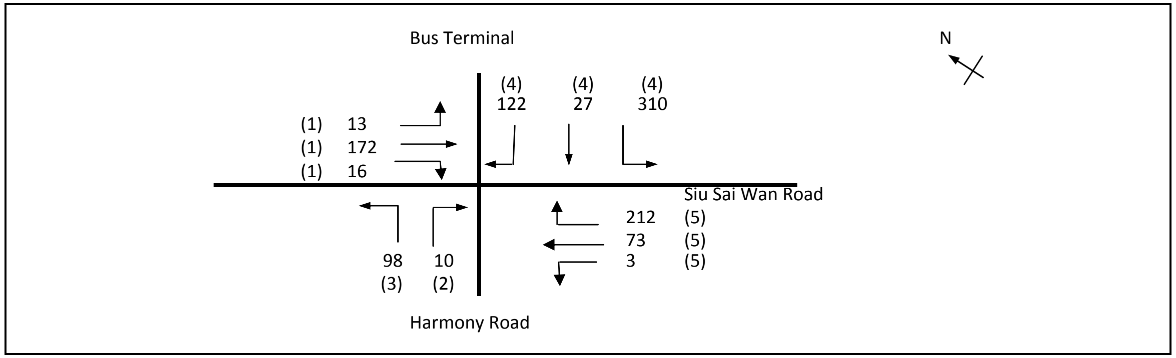


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

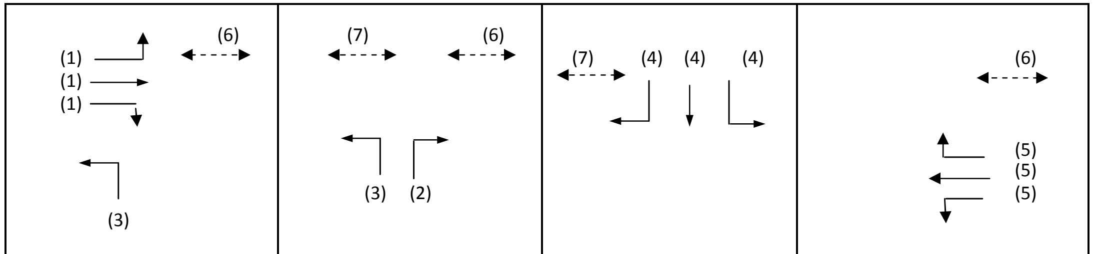
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	108	156		264	0.41	1842			1842	0.143			36	46	0.308	18	12
ST	A	3.20	1	1				2075		297		297	0.00	2075			2075	0.143			36	46	0.309	24	12
ST	A	3.00	1	2			y	3970		736		736	0.00	3970			3970	0.185	0.185		46	46	0.400	30	11
LT	C	3.75	2	1	12		y	1990	35			35	1.00	1769			1769	0.020			5	6	0.351	0	48
RT	C	3.75	2	1	12			2130			42	42	1.00	1893			1893	0.022	0.022		6	6	0.400	6	49
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2026 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.361
Loss time		L =	18 sec
Total Flow		=	1056 pcu
Co	= (1.5*L+5)/(1-Y)	=	50.0 sec
Cm	= L/(1-Y)	=	28.2 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	112.1 %
Cp	= 0.9*L/(0.9-Y)	=	30.0 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	106.8 %

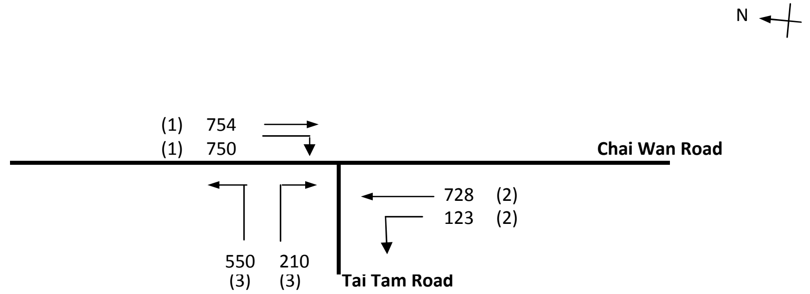


Stage A I = 5	Stage B I = 5	Stage C I = 6	Stage C I = 6

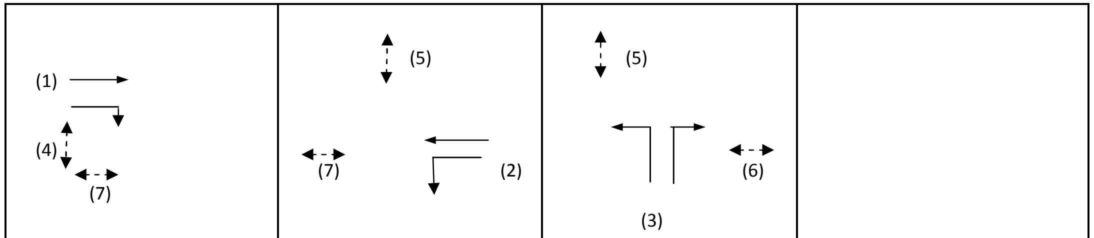
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	13	84		97	0.13	1910			1910	0.051			12	12	0.435	12	41
ST/RT	A	3.30	1	1	12			2085		88	16	104	0.16	2045			2045	0.051	0.051		12	12	0.435	12	40
RT	B	3.50	2	1	12			2105			10	10	1.00	1871			1871	0.005	0.005		1	1	0.435	0	101
LT	A,B	3.75	3	1	13		y	1990	98			98	1.00	1784			1784	0.055			13	19	0.311	12	33
RT	C	3.50	4	1	12			2105			122	122	1.00	1871			1871	0.065			16	46	0.148	6	14
LT/ST	C	3.50	4	1	12		y	1965	310	27		337	0.92	1762			1762	0.191	0.191		46	46	0.435	30	14
ST/RT	D	3.50	5	1	12			2105		0	212	212	1.00	1871			1871	0.113	0.113		27	27	0.435	24	25
LT/ST	D	3.50	5	1	11		y	1965	3	73		76	0.04	1954			1954	0.039			9	9	0.435	12	45
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2026 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	105 sec
Sum(y)		Y =	0.764
Loss time		L =	18 sec
Total Flow		=	3116 pcu
Co	= (1.5*L+5)/(1-Y)	=	135.3 sec
Cm	= L/(1-Y)	=	76.1 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	0.2 %
Cp	= 0.9*L/(0.9-Y)	=	118.7 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	-2.3 %



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

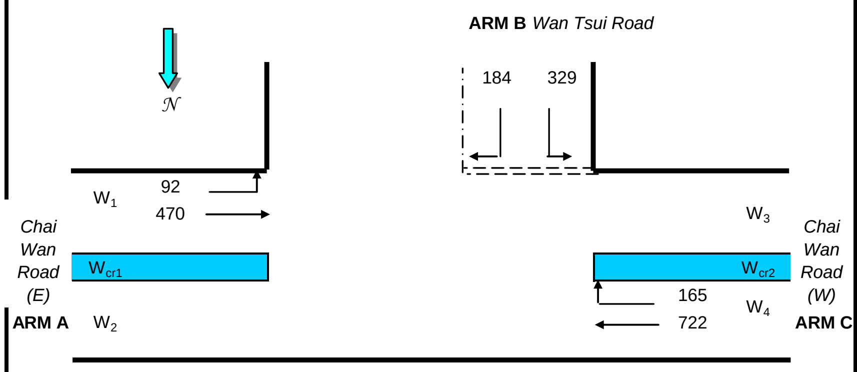
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		754		754	0.00	4070			4070	0.185			21	21	0.922	54	42
RT	A	3.50	1	1	13			2105			750	750	1.00	1887			1887	0.397	0.397		45	21	1.976	102	42
ST	B	3.50	2	2				4210		728		728	0.00	4210			4210	0.173	0.173		20	20	0.922	54	43
LT	B	3.10	2	1	12		y	1925	123			123	1.00	1711			1711	0.072			8	20	0.382	12	32
LT	C	4.00	3	1	15		y	2015	382			382	1.00	1832			1832	0.208			24	24	0.922	66	35
LT/RT	C	4.00	3	1	15			2155	168		210	378	1.00	1959			1959	0.193	0.193		22	24	0.854	48	35
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow **Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at**
Junction Capacity Analysis

Prepared By: KC
Checked By: OC

Junction layout sketch - **J9: Junciton of Chai Wan Road and Wan Tsui Road**
Design Year - **2026 Level 3 - Reference Case**
Time - **Level 3 Peak Hour**



GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	92.403	(pcu/hr)
q_{a-c}	=	469.63	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	721.77	(pcu/hr)
q_{c-b}	=	165.24	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	184	(pcu/hr)
q_{b-c}	=	329.31	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	761
Q_{c-b}	=	675
Q_{b-a}	=	356

COMPARISION OF DESIGN FLOW TO CAPACITY

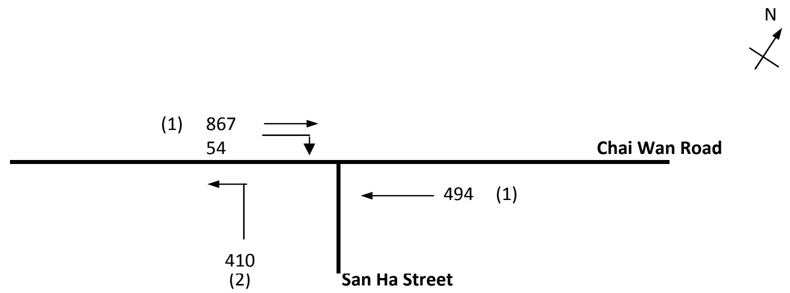
DFC_{b-a}	=	0.516
DFC_{b-c}	=	0.433
DFC_{c-b}	=	0.245

Critical DFC = 0.516

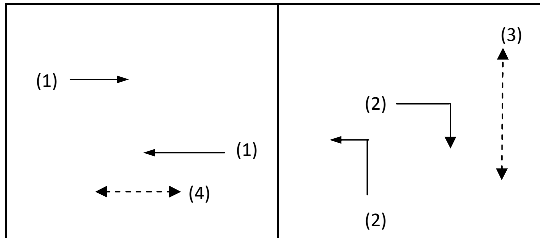
REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2026 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.459	
Loss time		L =	10	sec
Total Flow		=	1825	pcu
Co	= (1.5*L+5)/(1-Y)	=	37.0	sec
Cm	= L/(1-Y)	=	18.5	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	79.5	%
Cp	= 0.9*L/(0.9-Y)	=	20.4	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	76.3	%



Stage A I = 6 | Stage B I = 6 | Stage C I =

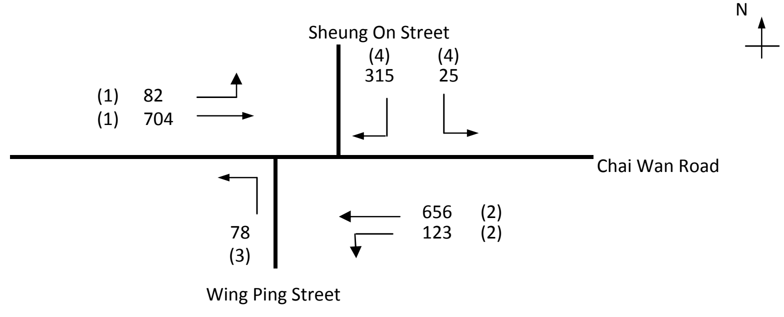
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		867		867	0.00	4070			4070	0.213	0.213		42	47	0.453	36	11
ST	A	3.50	1	2	10		N	4070		494		494	0.00	4070			4070	0.121			24	47	0.258	21	11
LT	B	3.00	2	1	10		N	1915	410			410	1.00	1665			1665	0.246	0.246		48	53	0.465	30	9
RT	B	3.50	2	1	12			2105			54	54	1.00	1871			1871	0.029			6	53	0.055	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

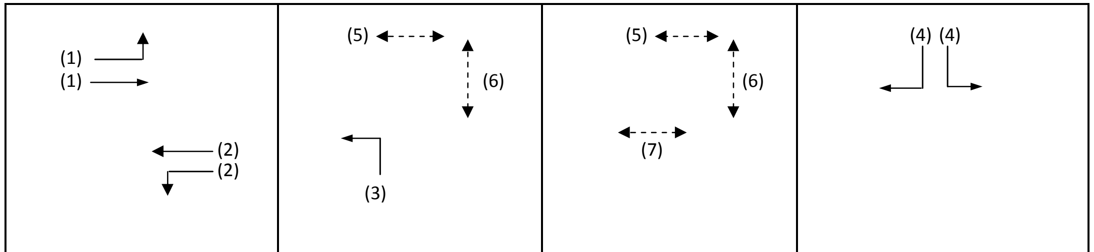
TRAFFIC SIGNAL CALCULATION

TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV3 - Peak Hour Traffic Flows	FILENAME 3_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2026 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011

INITIALS DATE



No. of stages per cycle		N =	4
Cycle time		C =	120 sec
Sum(y)		Y =	0.271
Loss time		L =	37 sec
Total Flow		=	1983 pcu
Co	= (1.5*L+5)/(1-Y)	=	83.0 sec
Cm	= L/(1-Y)	=	50.8 sec
Yult		=	0.623
R.C.ult	= (Yult-Y)/Y*100%	=	129.5 %
Cp	= 0.9*L/(0.9-Y)	=	53.0 sec
Ymax	= 1-L/C	=	0.692
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	129.5 %



Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	82	704		786	0.10	6096			6096	0.129			39		0.000	52	54
LT/ST	A	3.30	2	3	12		Y	6115	123	656		778	0.16	5997			5997	0.130	0.130		40		0.000	50	54
LT	B	3.50	3	1	9		Y	1965	78			78	1.00	1684			1684	0.046	0.046		14		0.000	12	54
LT/RT	D	3.75	4	2	10		y	4120	25		315	340	1.00	3583			3583	0.095	0.095		29		0.000	33	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development a

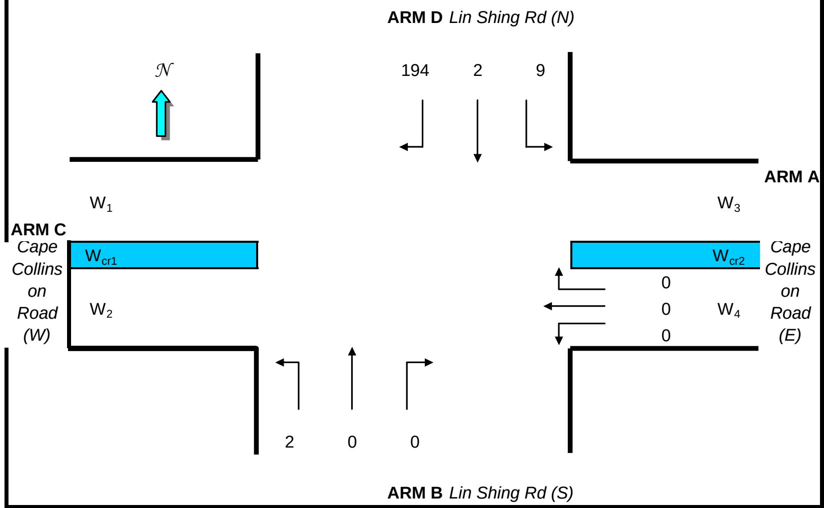
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road

Design Year - 2026 Level 3 - Site 1

Time - Level 3 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{a\text{-}d}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$W_{d\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
$W_{d\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
$Vr_{a\text{-}d}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
$Vl_{d\text{-}c}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

$W_{a\text{-}d}$	=	3.00	(metres)
$Vr_{a\text{-}d}$	=	100	(metres)
$q_{a\text{-}b}$	=	0	(pcu/hr)
$q_{a\text{-}c}$	=	0	(pcu/hr)
$q_{a\text{-}d}$	=	0	(pcu/hr)

MAJOR ROAD (ARM C)

$W_{c\text{-}b}$	=		(metres)
$Vr_{c\text{-}b}$	=		(metres)
$q_{c\text{-}a}$	=	0	(pcu/hr)
$q_{c\text{-}b}$	=	0	(pcu/hr)
$q_{c\text{-}d}$	=	0	(pcu/hr)

MINOR ROAD (ARM B)

$W_{b\text{-}a}$	=	5.00	(metres)
$W_{b\text{-}c}$	=	5.00	(metres)
$Vl_{b\text{-}a}$	=	100	(metres)
$Vr_{b\text{-}a}$	=	65	(metres)
$Vr_{b\text{-}c}$	=	0	(metres)
$q_{b\text{-}a}$	=	0	(pcu/hr)
$q_{b\text{-}c}$	=	2.1742	(pcu/hr)
$q_{b\text{-}d}$	=	0	(pcu/hr)

MINOR ROAD (ARM D)

$W_{d\text{-}a}$	=	3.00	(metres)
$W_{d\text{-}c}$	=	3.00	(metres)
$Vl_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}a}$	=	80	(metres)
$q_{d\text{-}a}$	=	8.6968	(pcu/hr)
$q_{d\text{-}b}$	=	2.1742	(pcu/hr)
$q_{d\text{-}c}$	=	194.3	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

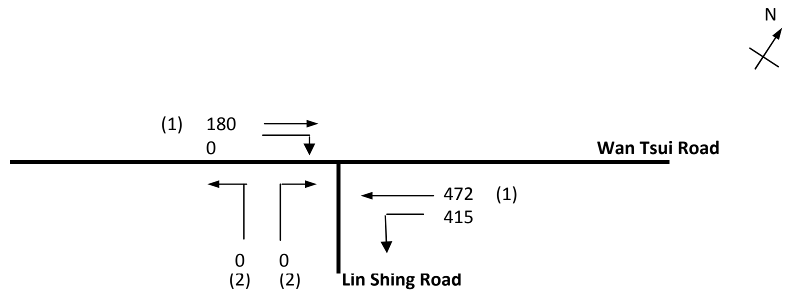
$Q_{b\text{-}a}$	=	619
$Q_{b\text{-}c}$	=	749
$Q_{b\text{-}d}$ is nearside	=	TRUE
$Q_{b\text{-}d}$	=	611
$Q_{d\text{-}a}$	=	674
$Q_{d\text{-}b}$ is nearside	=	TRUE
$Q_{d\text{-}b}$	=	533
$Q_{d\text{-}c}$	=	518
$Q_{c\text{-}b}$	=	437
$Q_{a\text{-}d}$	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

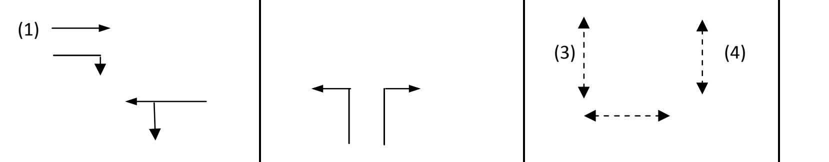
$DFC_{b\text{-}a}$	=	0.000
$DFC_{b\text{-}c}$	=	0.003
$DFC_{b\text{-}d}$	=	0.000
$DFC_{d\text{-}a}$	=	0.013
$DFC_{d\text{-}b}$	=	0.004
$DFC_{d\text{-}c}$	=	0.375
$DFC_{c\text{-}b}$	=	0.000
$DFC_{a\text{-}d}$	=	0.000

Critical DFC = 0.375

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J2: Junction of Lin Shing Road and Wan Tsui Road	J2LV3 - Peak Hour Traffic Flows	FILENAME :/3_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2026 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	120 sec
Sum(y)		Y =	0.471
Loss time		L =	25 sec
Total Flow		=	1068 pcu
Co	= (1.5*L+5)/(1-Y)	=	80.4 sec
Cm	= L/(1-Y)	=	47.3 sec
Yult		=	0.713
R.C.ult	= (Yult-Y)/Y*100%	=	51.2 %
Cp	= 0.9*L/(0.9-Y)	=	52.5 sec
Ymax	= 1-L/C	=	0.792
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	51.2 %



Stage A I = 7 | Stage B I = | Stage C I =

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		180		180	0.00	1915			1915	0.094			19	95	0.119	6	2
ST/LT	A	4.00	1	1	10		N	2015	415	472		887	0.47	1883			1883	0.471	0.471		95	95	0.595	36	3
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

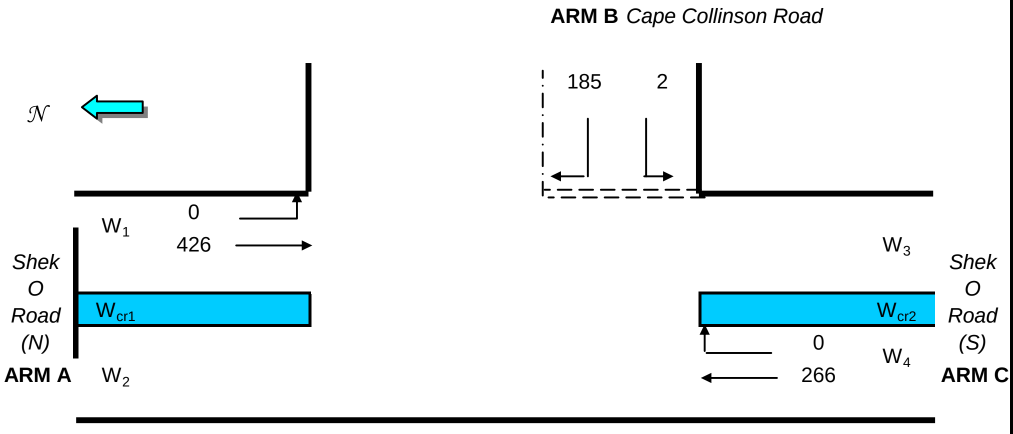
Halcrow **Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at** **Prepared By:** **KC**

Junction Capacity Analysis **Checked By:** **OC**

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road

Design Year - 2026 Level 3 - Site 1

Time - Level 3 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	426.14	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	266.34	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	185.28	(pcu/hr)
q_{b-c}	=	2.1742	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

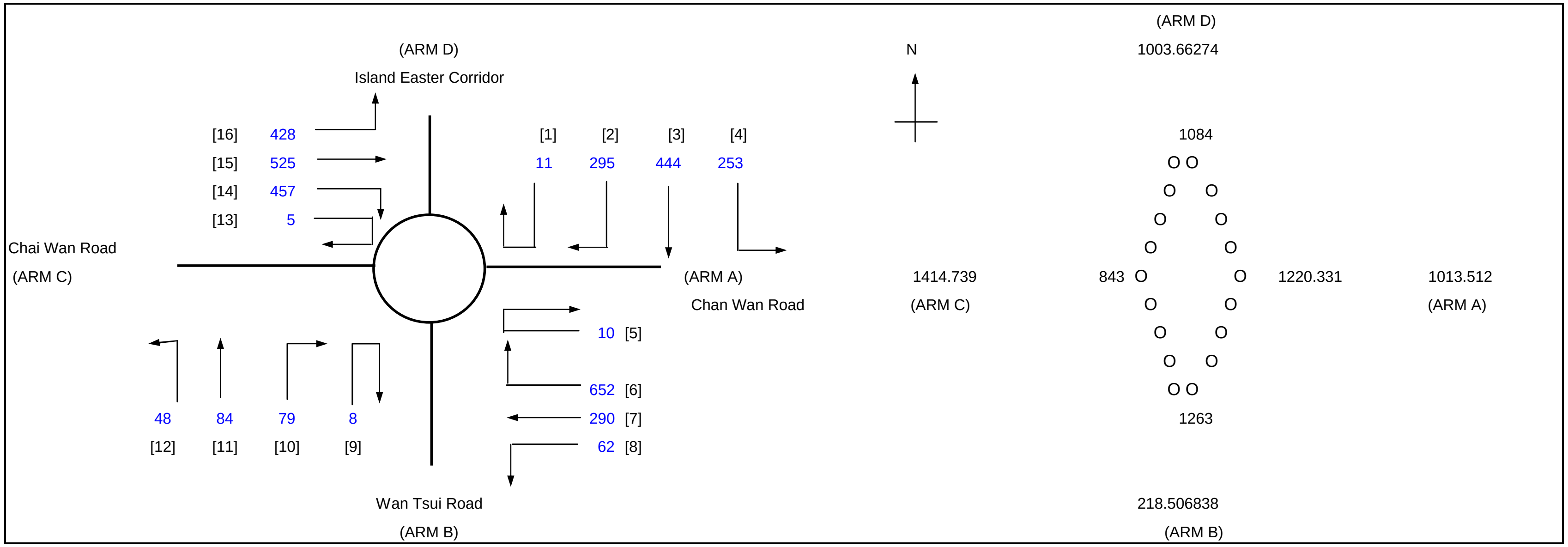
Q_{b-c}	=	633
Q_{c-b}	=	705
Q_{b-a}	=	297

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	0.624
DFC_{b-c}	=	0.003
DFC_{c-b}	=	0.000

Critical DFC = 0.624

	ROUNDABOUT CAPACITY ASSESSMENT			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	**J4LV3 Peak Hour**	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME2026_LV3_S1_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV3 Peak Hour			REVIEWED BY:	OC	Sep-13

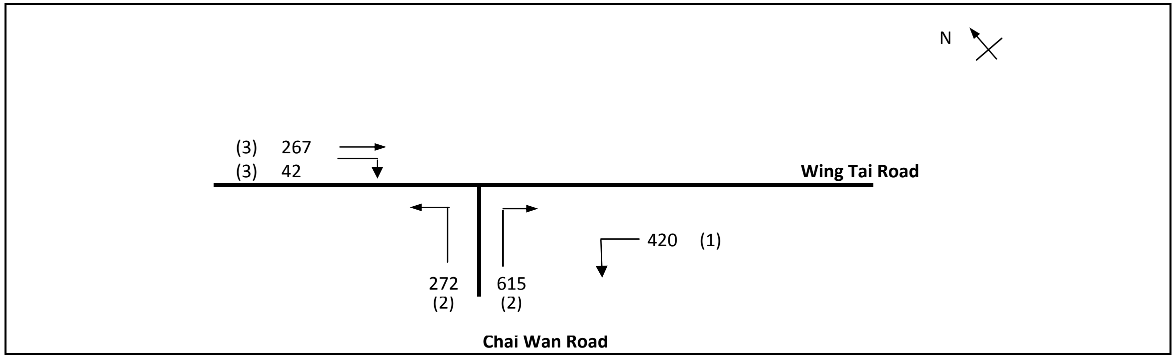


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	1014	219	1415	1004
Qc	=	Circulating flow across entry (pcu/h)	1220	1263	843	1084
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1543	770	1841	1389
DFC	=	Design flow/Capacity = Q/Qe	0.66	0.28	0.77	0.72

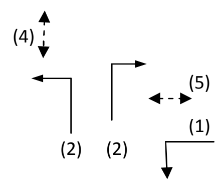
Total In Sum = 2859.185 PCU

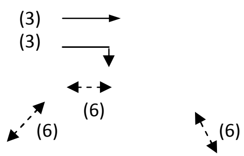
DFC of Critical Approach = 0.77

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV3 - Peak Hour Traffic Flows	FILENAME :/3_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2026 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.237	
Loss time		L =	10	sec
Total Flow		=	1616	pcu
Co	= (1.5*L+5)/(1-Y)	=	26.2	sec
Cm	= L/(1-Y)	=	13.1	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	247.7	%
Cp	= 0.9*L/(0.9-Y)	=	13.6	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	241.4	%



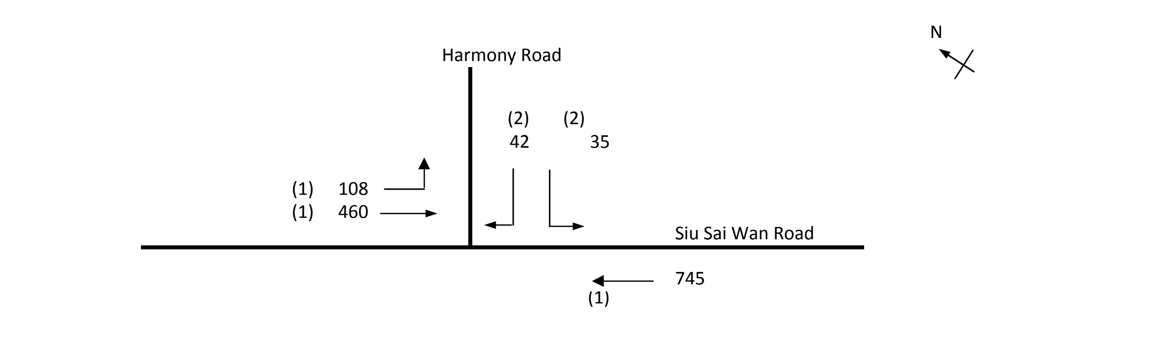


Stage A	I = 7	Stage B	I = 5		

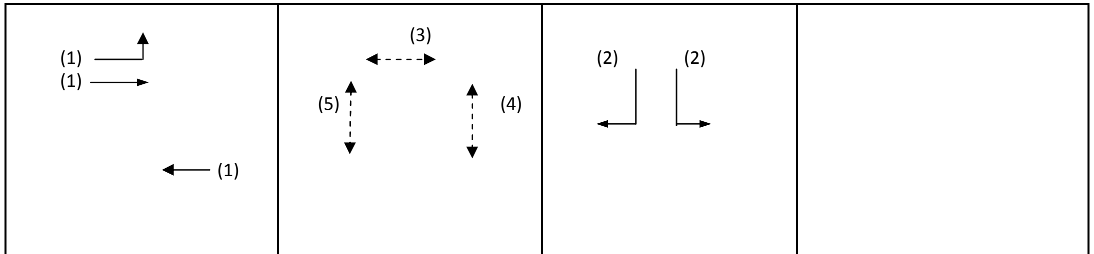
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	420			420	1.00	3857			3857	0.109			41	65	0.167	12	5
LT	A	4.00	2	2	24			4310	272			272	1.00	4056			4056	0.067			25	65	0.103	6	5
RT	A	3.50	2	2	11		y	4070			615	615	1.00	3582			3582	0.172	0.172		65	65	0.264	15	5
ST	B	3.50	3	2			y	4070		267		267	0.00	4070			4070	0.066	0.066		25	25	0.264	15	24
RT	B	4.50	3	2	13		y	4270			42	42	1.00	3828			3828	0.011			4	25	0.044	0	25
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV3 - Peak Hour Traffic Flows	FILENAME :/3_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2026 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	100 sec
Sum(y)		Y =	0.210
Loss time		L =	48 sec
Total Flow		=	1390 pcu
Co	= (1.5*L+5)/(1-Y)	=	97.5 sec
Cm	= L/(1-Y)	=	60.8 sec
Yult		=	0.540
R.C.ult	= (Yult-Y)/Y*100%	=	157.0 %
Cp	= 0.9*L/(0.9-Y)	=	62.6 sec
Ymax	= 1-L/C	=	0.520
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	122.8 %

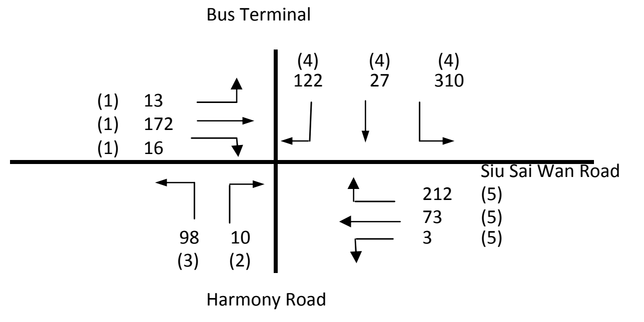


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

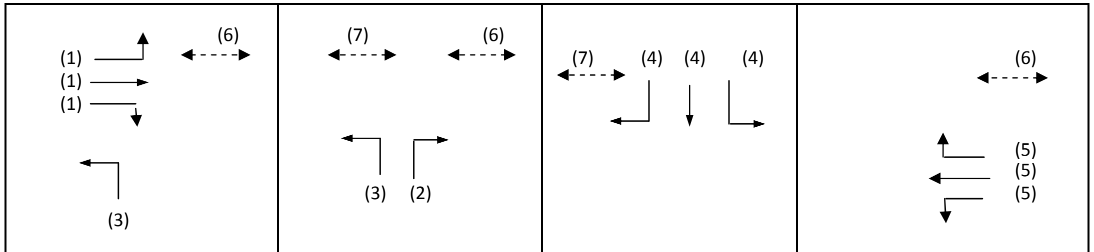
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	108	156		264	0.41	1842			1842	0.143			35	46	0.308	18	12
ST	A	3.20	1	1				2075		304		304	0.00	2075			2075	0.147			36	46	0.316	24	12
ST	A	3.00	1	2			y	3970		745		745	0.00	3970			3970	0.188	0.188		46	46	0.404	33	11
LT	C	3.75	2	1	12		y	1990	35			35	1.00	1769			1769	0.020			5	6	0.355	0	48
RT	C	3.75	2	1	12			2130			42	42	1.00	1893			1893	0.022	0.022		6	6	0.404	6	50
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV3 - Peak Hour Traffic Flows	FILENAME :/3_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2026 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	105	sec
Sum(y)		Y =	0.361	
Loss time		L =	18	sec
Total Flow		=	1056	pcu
Co	= (1.5*L+5)/(1-Y)	=	50.0	sec
Cm	= L/(1-Y)	=	28.2	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	112.1	%
Cp	= 0.9*L/(0.9-Y)	=	30.0	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	106.8	%

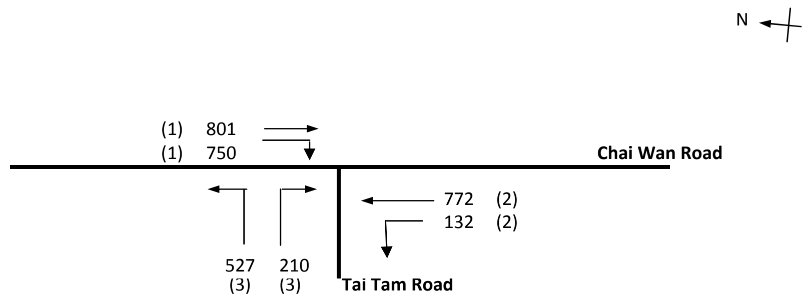


Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

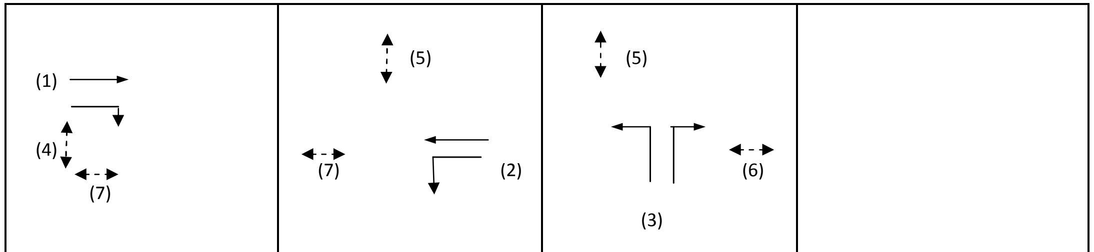
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	13	84		97	0.13	1910			1910	0.051			12	12	0.435	12	41
ST/RT	A	3.30	1	1	12			2085		88	16	104	0.16	2045			2045	0.051	0.051		12	12	0.435	12	40
RT	B	3.50	2	1	12			2105			10	10	1.00	1871			1871	0.005	0.005		1	1	0.435	0	101
LT	A,B	3.75	3	1	13		y	1990	98			98	1.00	1784			1784	0.055			13	19	0.311	12	33
RT	C	3.50	4	1	12			2105			122	122	1.00	1871			1871	0.065			16	46	0.148	6	14
LT/ST	C	3.50	4	1	12		y	1965	310	27		337	0.92	1762			1762	0.191	0.191		46	46	0.435	30	14
ST/RT	D	3.50	5	1	12			2105		0	212	212	1.00	1871			1871	0.113	0.113		27	27	0.435	24	25
LT/ST	D	3.50	5	1	11		y	1965	3	73		76	0.04	1954			1954	0.039			9	9	0.435	12	45
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV3 - Peak Hour Traffic Flows	FILENAME :/3_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2026 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	105	sec
Sum(y)		Y =	0.763	
Loss time		L =	18	sec
Total Flow		=	3192	pcu
Co	= (1.5*L+5)/(1-Y)	=	134.8	sec
Cm	= L/(1-Y)	=	75.8	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	0.3	%
Cp	= 0.9*L/(0.9-Y)	=	117.9	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	-2.2	%

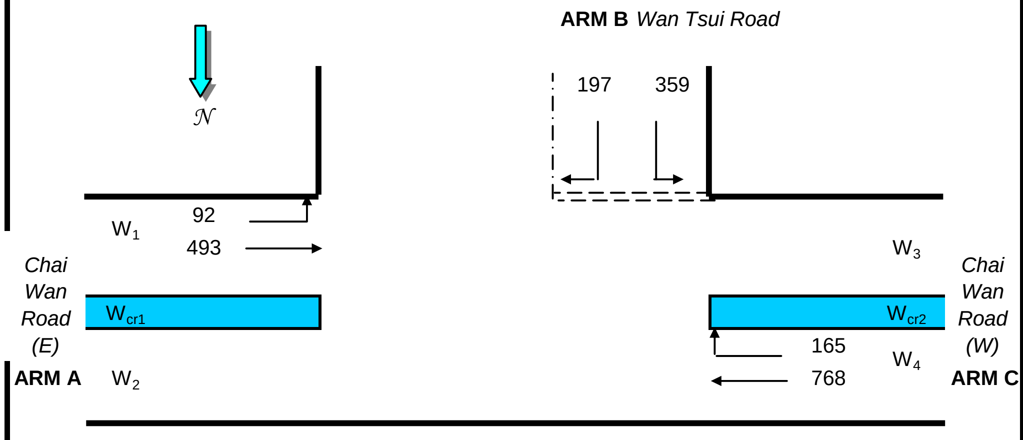


Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		801		801	0.00	4070			4070	0.197			22	22	0.920	57	42
RT	A	3.75	1	1	13			2130			750	750	1.00	1910			1910	0.393	0.393		45	22	1.838	102	41
ST	B	3.50	2	2				4210		772		772	0.00	4210			4210	0.183	0.183		21	21	0.920	57	43
LT	B	3.10	2	1	12		y	1925	132			132	1.00	1711			1711	0.077			9	21	0.387	18	31
LT	C	4.00	3	1	15		y	2015	372			372	1.00	1832			1832	0.203			23	23	0.920	66	36
LT/RT	C	4.00	3	1	15			2155	155		210	365	1.00	1959			1959	0.186	0.186		21	23	0.845	48	44
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road
Design Year - 2026 Level 3 - Site 1
Time - Level 3 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	92.403	(pcu/hr)
q_{a-c}	=	492.59	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	767.93	(pcu/hr)
q_{c-b}	=	165.24	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	196.7	(pcu/hr)
q_{b-c}	=	358.96	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

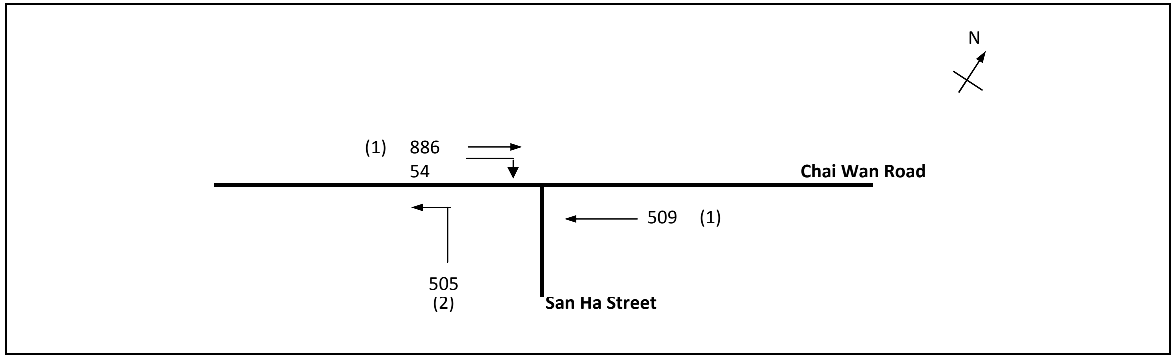
Q_{b-c}	=	758
Q_{c-b}	=	672
Q_{b-a}	=	352

COMPARISION OF DESIGN FLOW TO CAPACITY

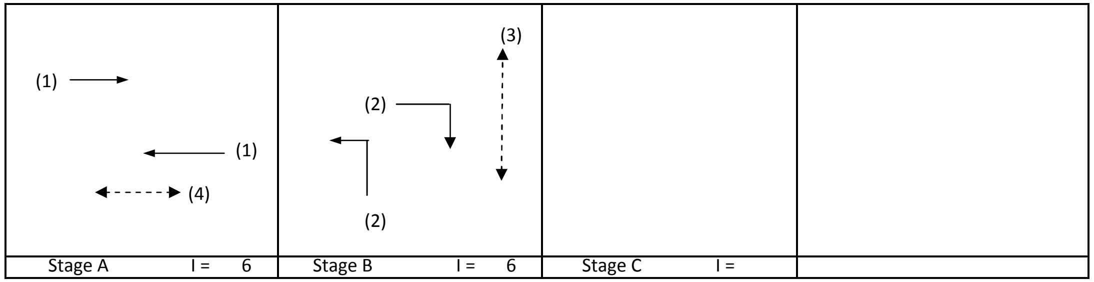
DFC_{b-a}	=	0.559
DFC_{b-c}	=	0.474
DFC_{c-b}	=	0.246

Critical DFC = 0.559

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV3 - Peak Hour Traffic Flows	FILENAME :/3_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2026 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



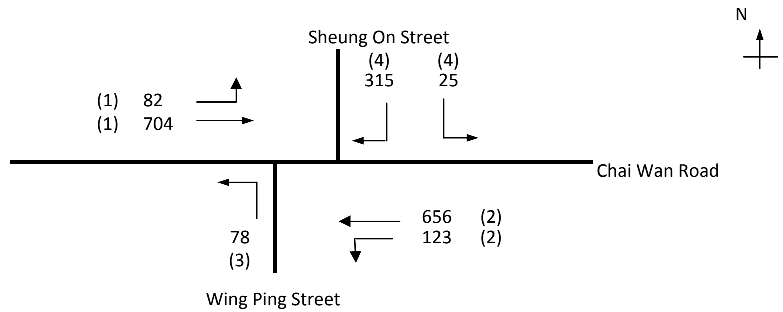
No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.521	
Loss time		L =	10	sec
Total Flow		=	1954	pcu
Co	= (1.5*L+5)/(1-Y)	=	41.7	sec
Cm	= L/(1-Y)	=	20.9	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	58.4	%
Cp	= 0.9*L/(0.9-Y)	=	23.7	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	55.5	%



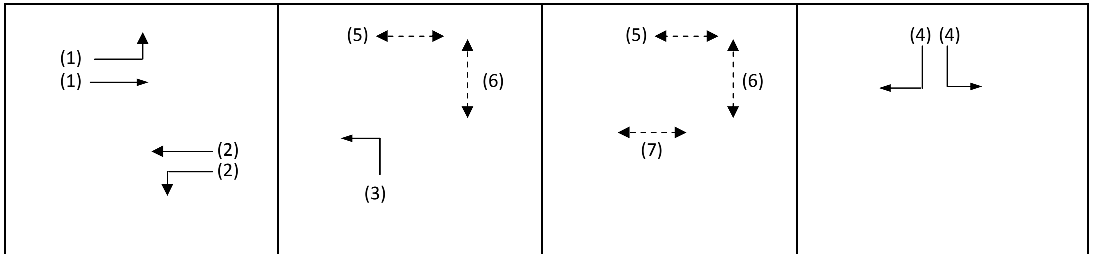
Movement	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		886		886	0.00	4070			4070	0.218	0.218		38	47	0.463	39	11
ST	A	3.50	1	2	10		N	4070		509		509	0.00	4070			4070	0.125			22	47	0.266	21	11
LT	B	3.00	2	1	10		N	1915	505			505	1.00	1665			1665	0.303	0.303		52	53	0.572	36	9
RT	B	3.50	2	1	12			2105			54	54	1.00	1871			1871	0.029			5	53	0.055	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV3 - Peak Hour Traffic Flows	FILENAME :/3_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2026 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	120 sec
Sum(y)		Y =	0.271
Loss time		L =	37 sec
Total Flow		=	1983 pcu
Co	= (1.5*L+5)/(1-Y)	=	83.0 sec
Cm	= L/(1-Y)	=	50.8 sec
Yult		=	0.623
R.C.ult	= (Yult-Y)/Y*100%	=	129.5 %
Cp	= 0.9*L/(0.9-Y)	=	53.0 sec
Ymax	= 1-L/C	=	0.692
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	129.5 %



Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	82	704		786	0.10	6096			6096	0.129			39		0.000	52	54
LT/ST	A	3.30	2	3	12		Y	6115	123	656		778	0.16	5997			5997	0.130	0.130		40		0.000	50	54
LT	B	3.50	3	1	9		Y	1965	78			78	1.00	1684			1684	0.046	0.046		14		0.000	12	54
LT/RT	D	3.75	4	2	10		y	4120	25		315	340	1.00	3583			3583	0.095	0.095		29		0.000	33	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

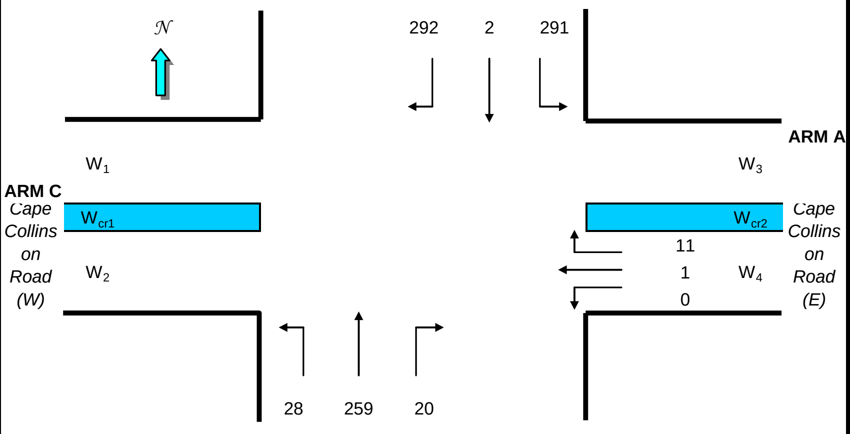
NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Appendix B5

2021 Sensitivity Test 1
Peak Hour Junction Assessment
Calculation Sheets

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2021 Level 1 - Reference Case
Time - Level 1 Peak Hour

ARM D *Lin Shing Rd (N)*



ARM B *Lin Shing Rd (S)*

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{a-d}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
W_{d-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
W_{d-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
Vr_{a-d}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
Vl_{d-c}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

W_{a-d}	=	3.00	(metres)
Vr_{a-d}	=	100	(metres)
q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	1.0575	(pcu/hr)
q_{a-d}	=	10.518	(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)
q_{c-d}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	5.00	(metres)
W_{b-c}	=	5.00	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	65	(metres)
Vr_{b-c}	=	0	(metres)
q_{b-a}	=	20.093	(pcu/hr)
q_{b-c}	=	28	(pcu/hr)
q_{b-d}	=	259.34	(pcu/hr)

MINOR ROAD (ARM D)

W_{d-a}	=	3.00	(metres)
W_{d-c}	=	3.00	(metres)
Vl_{d-c}	=	50	(metres)
Vr_{d-c}	=	50	(metres)
Vr_{d-a}	=	80	(metres)
q_{d-a}	=	291	(pcu/hr)
q_{d-b}	=	2	(pcu/hr)
q_{d-c}	=	292	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

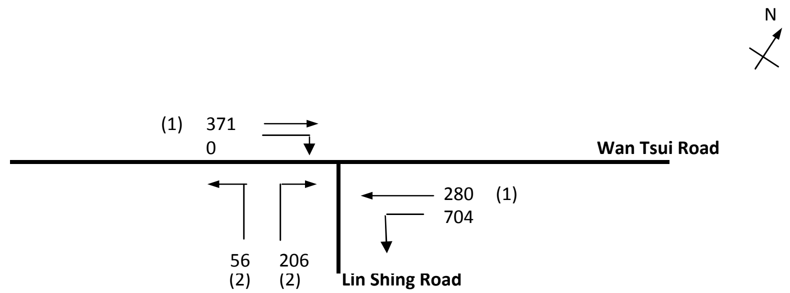
Q_{b-a}	=	516
Q_{b-c}	=	749
Q_{b-d} is nearside	=	TRUE
Q_{b-d}	=	608
Q_{d-a}	=	674
Q_{d-b} is nearside	=	TRUE
Q_{d-b}	=	528
Q_{d-c}	=	444
Q_{c-b}	=	440
Q_{a-d}	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

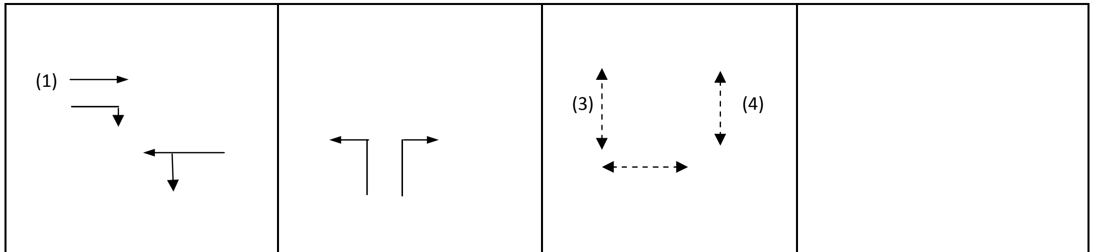
DFC_{b-a}	=	0.039
DFC_{b-c}	=	0.038
DFC_{b-d}	=	0.426
DFC_{d-a}	=	0.431
DFC_{d-b}	=	0.004
DFC_{d-c}	=	0.658
DFC_{c-b}	=	0.000
DFC_{a-d}	=	0.017

Critical DFC = 0.658

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
Junction of Lin Shing Road and Wan Tsui Road	J2LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	120 sec
Sum(y)		Y =	0.541
Loss time		L =	25 sec
Total Flow		=	1355 pcu
Co	= (1.5*L+5)/(1-Y)	=	92.5 sec
Cm	= L/(1-Y)	=	54.4 sec
Yult		=	0.713
R.C.ult	= (Yult-Y)/Y*100%	=	31.8 %
Cp	= 0.9*L/(0.9-Y)	=	62.6 sec
Ymax	= 1-L/C	=	0.792
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	31.8 %



Stage A I = 7	Stage B I =	Stage C I =	

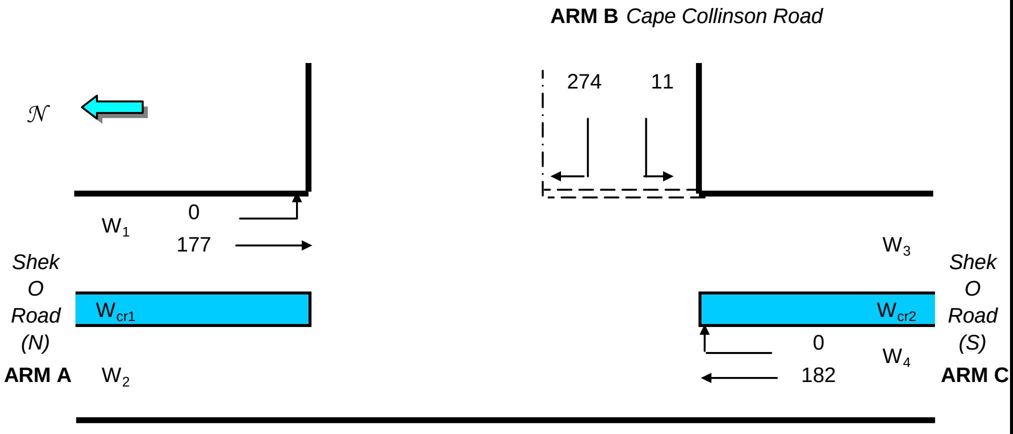
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		371		371	0.00	1915			1915	0.194			34	95	0.245	12	2
ST/LT	A	4.00	1	1	10		N	2015	704	280		984	0.72	1820			1820	0.541	0.541		95	95	0.683	36	3
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at (
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2021 Level 1 - Reference Case
Time - Level 1 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	177	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	182	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	274	(pcu/hr)
q_{b-c}	=	11	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

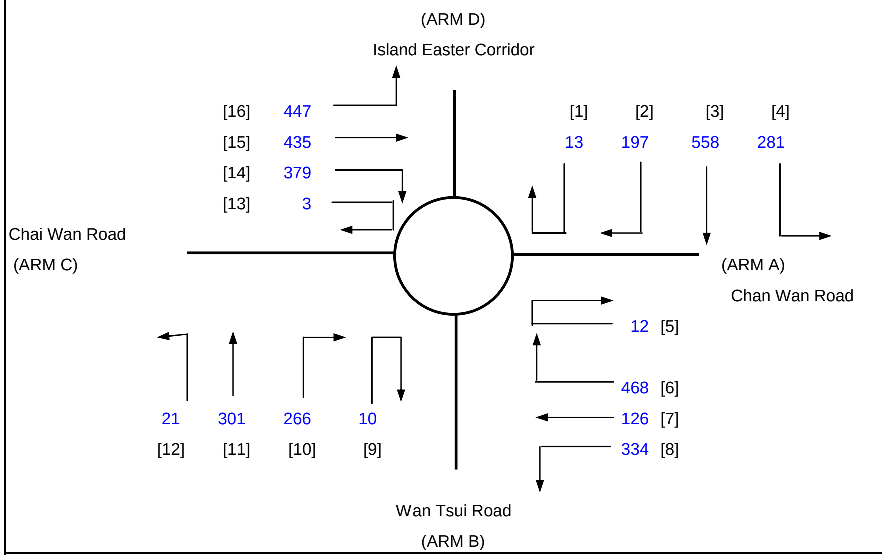
Q_{b-c}	=	697
Q_{c-b}	=	776
Q_{b-a}	=	346

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	0.792
DFC_{b-c}	=	0.015
DFC_{c-b}	=	0.000

Critical DFC = 0.792

	ROUNDABOUT CAPACITY ASSESSMENT			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	J4LV1 Peak Hour	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME :J4LV1_Sen1_Ref_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV1 Peak Hour			REVIEWED BY:	OC	Sep-13



(ARM D)
1049.032

1104

1263.52 (ARM C) 1069 1159.45 940.176 (ARM A)

819

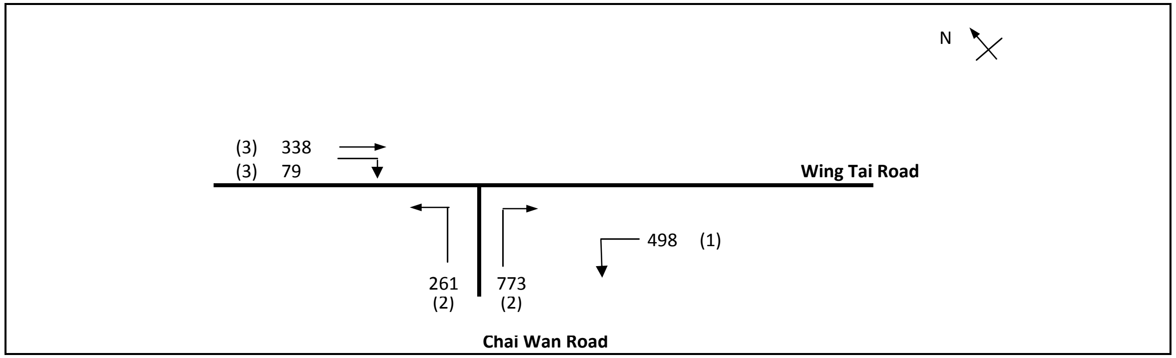
597.0939
(ARM B)

ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	940	597	1264	1049
Qc	=	Circulating flow across entry (pcu/h)	1159	819	1069	1104
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1590	1017	1670	1375
DFC	=	Design flow/Capacity = Q/Qe	0.59	0.59	0.76	0.76

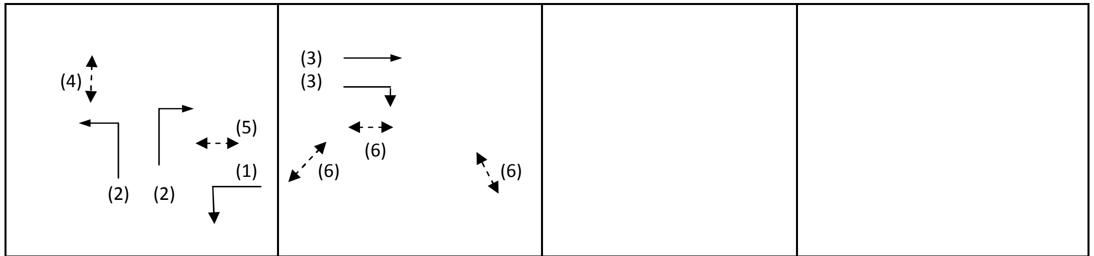
Total In Sum = 2766.48 PCU

DFC of Critical Approach = 0.76

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.299	
Loss time		L =	10	sec
Total Flow		=	1950	pcu
Co	= (1.5*L+5)/(1-Y)	=	28.5	sec
Cm	= L/(1-Y)	=	14.3	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	175.9	%
Cp	= 0.9*L/(0.9-Y)	=	15.0	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	170.9	%

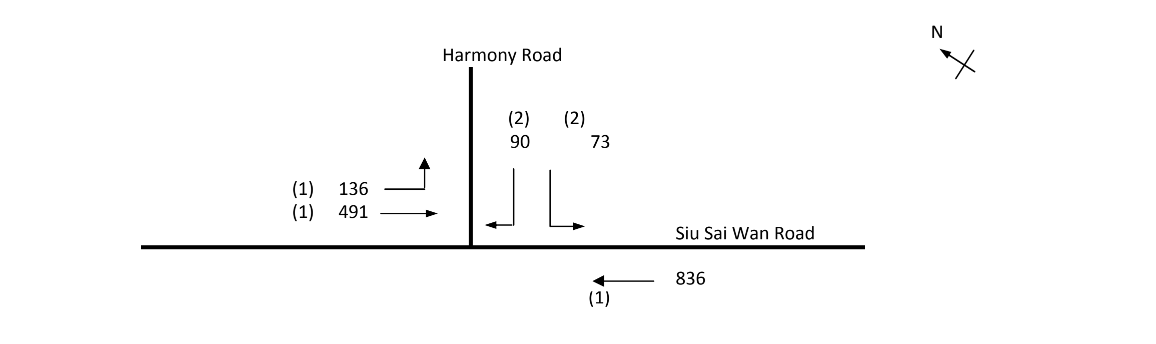


Stage A	I = 7	Stage B	I = 5		

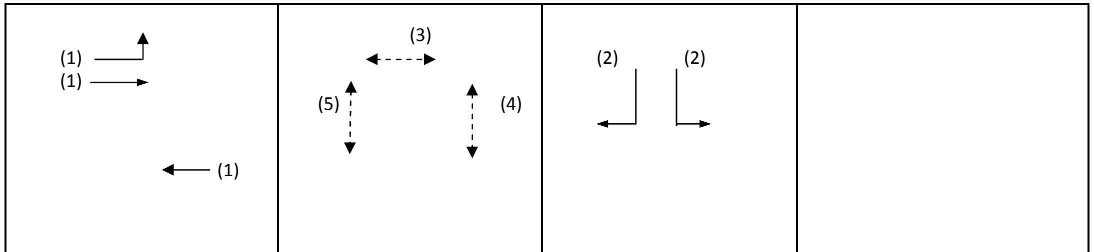
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	498			498	1.00	3857			3857	0.129			39	65	0.199	12	5
LT	A	4.00	2	2	24			4310	261			261	1.00	4056			4056	0.064			19	65	0.099	6	5
RT	A	3.50	2	2	11		y	4070			773	773	1.00	3582			3582	0.216	0.216		65	65	0.332	21	5
ST	B	3.50	3	2			y	4070		338		338	0.00	4070			4070	0.083	0.083		25	25	0.332	21	24
RT	B	4.50	3	2	13		y	4270			79	79	1.00	3828			3828	0.021			6	25	0.083	3	25
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	100	sec
Sum(y)		Y =	0.258	
Loss time		L =	48	sec
Total Flow		=	1627	pcu
Co	= (1.5*L+5)/(1-Y)	=	103.8	sec
Cm	= L/(1-Y)	=	64.7	sec
Yult		=	0.540	
R.C.ult	= (Yult-Y)/Y*100%	=	109.0	%
Cp	= 0.9*L/(0.9-Y)	=	67.3	sec
Ymax	= 1-L/C	=	0.520	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	81.2	%

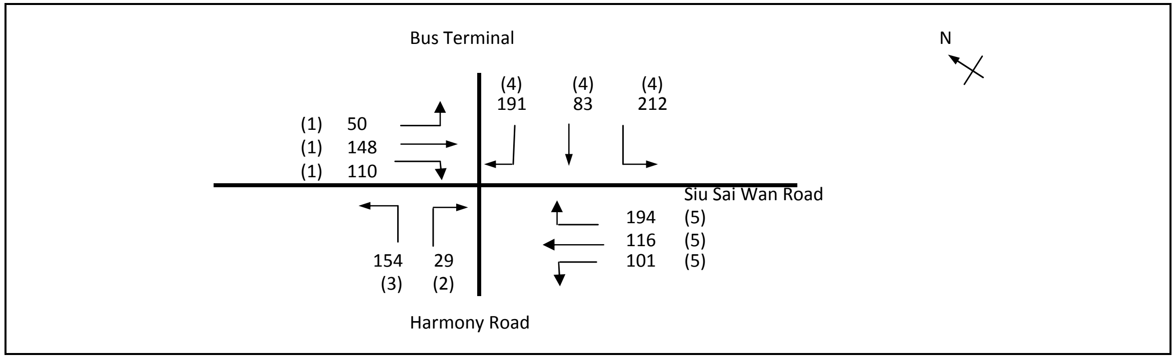


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

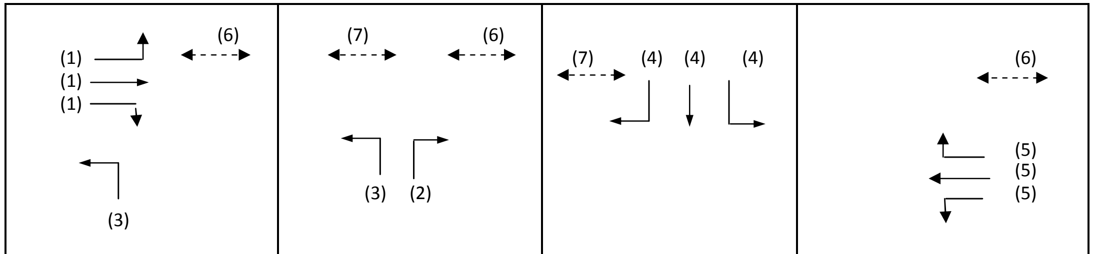
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	136	152		288	0.47	1827			1827	0.158			32	42	0.372	24	14
ST	A	3.20	1	1				2075		339		339	0.00	2075			2075	0.164			33	42	0.386	30	14
ST	A	3.00	1	2			y	3970		836		836	0.00	3970			3970	0.211	0.211		42	42	0.497	39	13
LT	C	3.75	2	1	12		y	1990	73			73	1.00	1769			1769	0.041			8	10	0.428	6	42
RT	C	3.75	2	1	12			2130			90	90	1.00	1893			1893	0.048	0.048		10	10	0.497	12	44
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.375
Loss time		L =	18 sec
Total Flow		=	1389 pcu
Co	= (1.5*L+5)/(1-Y)	=	51.2 sec
Cm	= L/(1-Y)	=	28.8 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	104.2 %
Cp	= 0.9*L/(0.9-Y)	=	30.8 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	99.1 %

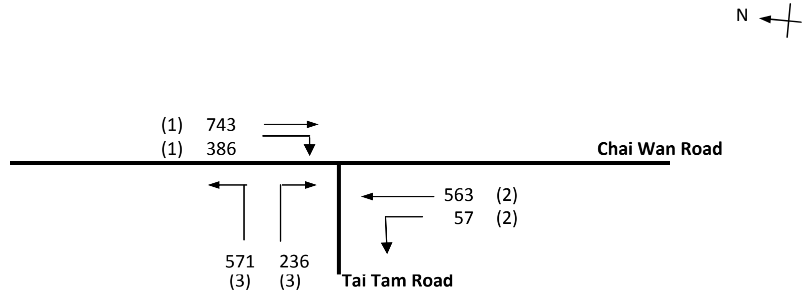


Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

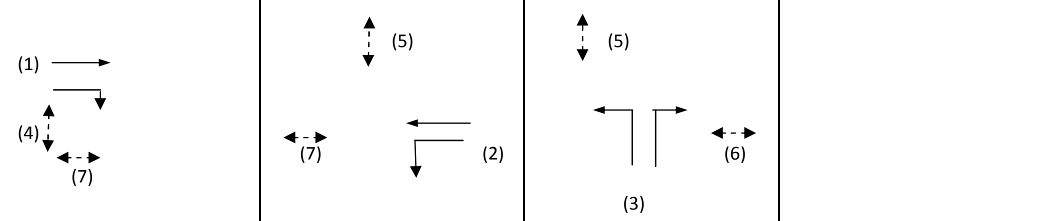
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	50	81		131	0.38	1849			1849	0.071			16	21	0.350	18	30
ST/RT	A	3.30	1	1	12			2085		67	110	177	0.62	1935			1935	0.091	0.091		21	21	0.452	24	31
RT	B	3.50	2	1	12			2105			29	29	1.00	1871			1871	0.016	0.016		4	4	0.452	0	64
LT	A,B	3.75	3	1	13		y	1990	154			154	1.00	1784			1784	0.086			20	30	0.303	18	23
RT	C	3.50	4	1	12			2105			191	191	1.00	1871			1871	0.102			24	38	0.282	18	18
LT/ST	C	3.50	4	1	12		y	1965	212	83		295	0.72	1803			1803	0.164	0.164		38	38	0.452	30	18
ST/RT	D	3.50	5	1	12			2105		0	194	194	1.00	1871			1871	0.104	0.104		24	24	0.452	24	28
LT/ST	D	3.50	5	1	11		y	1965	101	116		217	0.47	1848			1848	0.117			27	27	0.452	24	26
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	105 sec
Sum(y)		Y =	0.561
Loss time		L =	18 sec
Total Flow		=	2556 pcu
Co	= (1.5*L+5)/(1-Y)	=	72.9 sec
Cm	= L/(1-Y)	=	41.0 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	36.4 %
Cp	= 0.9*L/(0.9-Y)	=	47.8 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	33.0 %



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6	

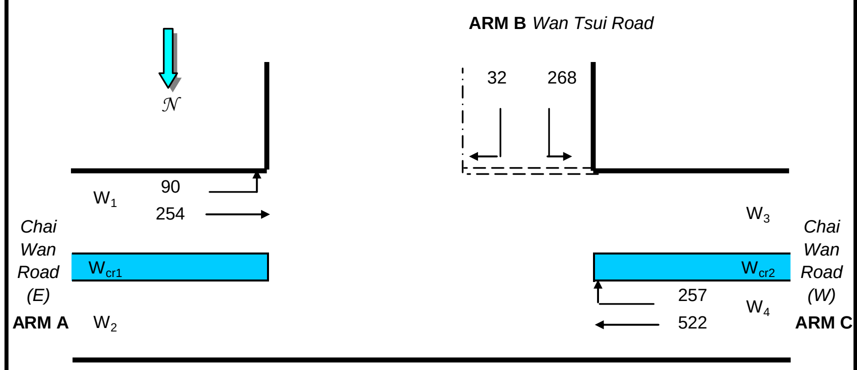
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		743		743	0.00	4070			4070	0.183			28	28	0.677	45	24
RT	A	3.50	1	1	13			2105			386	386	1.00	1887			1887	0.205	0.205		32	28	0.758	48	30
ST	B	3.50	2	2				4210		563		563	0.00	4210			4210	0.134	0.134		21	21	0.677	39	30
LT	B	3.10	2	1	12		y	1925	57			57	1.00	1711			1711	0.033			5	21	0.169	6	30
LT	C	4.00	3	1	15		y	2015	408			408	1.00	1832			1832	0.222	0.222		35	35	0.677	42	22
LT/RT	C	4.00	3	1	15			2155	163		236	399	1.00	1959			1959	0.204			32	35	0.620	42	21
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow **Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at**
Junction Capacity Analysis

Prepared By: KC
Checked By:

Junction layout sketch - **J9: Junciton of Chai Wan Road and Wan Tsui Road**
Design Year - **2021 Level 1 - Reference Case**
Time - **Level 1 Peak Hour**



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	89.89	(pcu/hr)
q_{a-c}	=	254	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	522	(pcu/hr)
q_{c-b}	=	256.98	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	32	(pcu/hr)
q_{b-c}	=	268	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

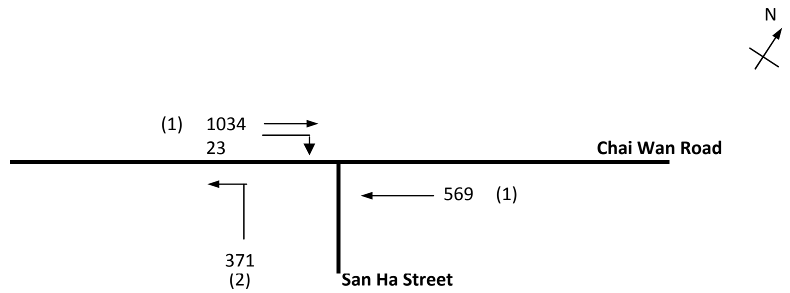
Q_{b-c}	=	789
Q_{c-b}	=	700
Q_{b-a}	=	373

COMPARISION OF DESIGN FLOW TO CAPACITY

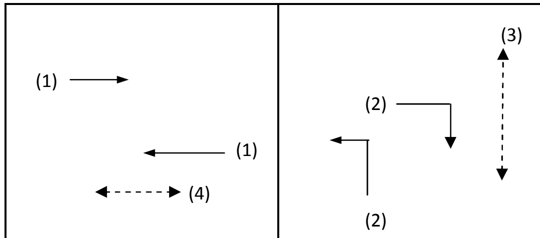
DFC_{b-a}	=	0.085
DFC_{b-c}	=	0.340
DFC_{c-b}	=	0.367

Critical DFC **=** **0.367**

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.477	
Loss time		L =	10	sec
Total Flow		=	1998	pcu
Co	= (1.5*L+5)/(1-Y)	=	38.2	sec
Cm	= L/(1-Y)	=	19.1	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	72.9	%
Cp	= 0.9*L/(0.9-Y)	=	21.3	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	69.8	%

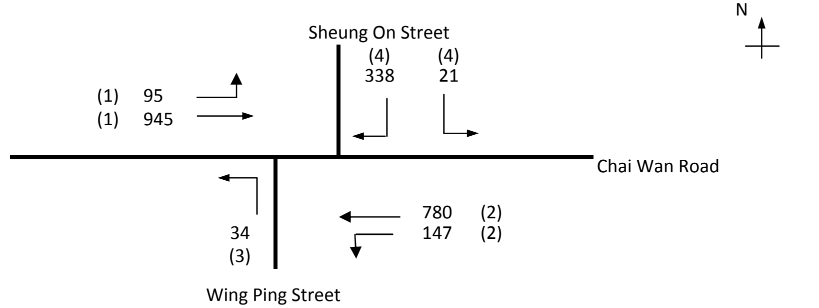


Stage A	I = 6	Stage B	I = 6	Stage C	I =

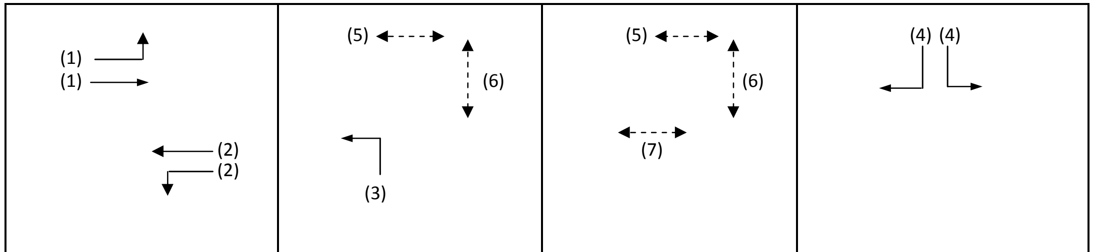
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		1034		1034	0.00	4070			4070	0.254	0.254		48	47	0.541	45	10
ST	A	3.50	1	2	10		N	4070		569		569	0.00	4070			4070	0.140			26	47	0.297	24	11
LT	B	3.00	2	1	10		N	1915	371			371	1.00	1665			1665	0.223	0.223		42	53	0.421	24	9
RT	B	3.50	2	1	12			2105			23	23	1.00	1871			1871	0.012			2	53	0.023	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV1 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	120 sec
Sum(y)		Y =	0.275
Loss time		L =	37 sec
Total Flow		=	2361 pcu
Co	= (1.5*L+5)/(1-Y)	=	83.4 sec
Cm	= L/(1-Y)	=	51.0 sec
Yult		=	0.623
R.C.ult	= (Yult-Y)/Y*100%	=	126.4 %
Cp	= 0.9*L/(0.9-Y)	=	53.3 sec
Ymax	= 1-L/C	=	0.692
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	126.4 %



Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	95	945		1041	0.09	6105			6105	0.170			51		0.000	68	54
LT/ST	A	3.30	2	3	12		Y	6115	147	780		927	0.16	5996			5996	0.155	0.155		47		0.000	60	54
LT	B	3.50	3	1	9		Y	1965	34			34	1.00	1684			1684	0.020	0.020		6		0.000	6	54
LT/RT	D	3.75	4	2	10		y	4120	21		338	360	1.00	3583			3583	0.100	0.100		30		0.000	33	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

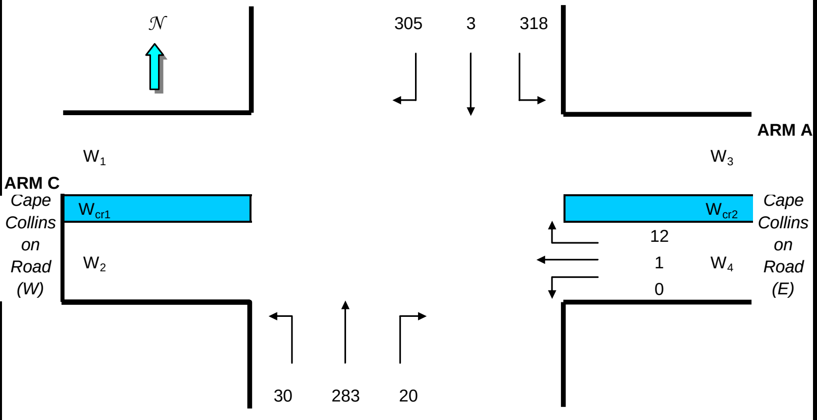
Halcrow	Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development a	Prepared By:	KC
	Junction Capacity Analysis	Checked By:	OC

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road

Design Year - 2021 Level 1 - Site 1

Time - Level 1 Peak Hour

ARM D *Lin Shing Rd (N)*



ARM B *Lin Shing Rd (S)*

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{a\text{-}d}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$W_{d\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
$W_{d\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
$Vr_{a\text{-}d}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
$Vl_{d\text{-}c}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)
MAJOR ROAD		(ARM A)	
$W_{a\text{-}d}$	=	3.00	(metres)
$Vr_{a\text{-}d}$	=	100	(metres)
$q_{a\text{-}b}$	=	0	(pcu/hr)
$q_{a\text{-}c}$	=	1.0575	(pcu/hr)
$q_{a\text{-}d}$	=	11.518	(pcu/hr)
MAJOR ROAD		(ARM C)	
$W_{c\text{-}b}$	=		(metres)
$Vr_{c\text{-}b}$	=		(metres)
$q_{c\text{-}a}$	=	0	(pcu/hr)
$q_{c\text{-}b}$	=	0	(pcu/hr)
$q_{c\text{-}d}$	=	0	(pcu/hr)
MINOR ROAD		(ARM B)	
$W_{b\text{-}a}$	=	5.00	(metres)
$W_{b\text{-}c}$	=	5.00	(metres)
$Vl_{b\text{-}a}$	=	100	(metres)
$Vr_{b\text{-}a}$	=	65	(metres)
$Vr_{b\text{-}c}$	=	0	(metres)
$q_{b\text{-}a}$	=	20.093	(pcu/hr)
$q_{b\text{-}c}$	=	30.438	(pcu/hr)
$q_{b\text{-}d}$	=	282.76	(pcu/hr)
MINOR ROAD		(ARM D)	
$W_{d\text{-}a}$	=	3.00	(metres)
$W_{d\text{-}c}$	=	3.00	(metres)
$Vl_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}a}$	=	80	(metres)
$q_{d\text{-}a}$	=	317.85	(pcu/hr)
$q_{d\text{-}b}$	=	2.5841	(pcu/hr)
$q_{d\text{-}c}$	=	304.53	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

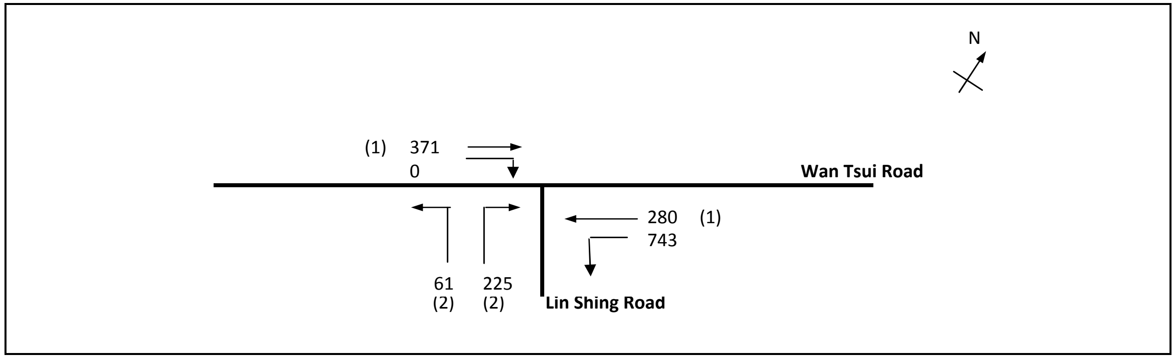
$Q_{b\text{-}a}$	=	506
$Q_{b\text{-}c}$	=	749
$Q_{b\text{-}d}$ is nearside	=	TRUE
$Q_{b\text{-}d}$	=	608
$Q_{d\text{-}a}$	=	674
$Q_{d\text{-}b}$ is nearside	=	TRUE
$Q_{d\text{-}b}$	=	527
$Q_{d\text{-}c}$	=	437
$Q_{c\text{-}b}$	=	440
$Q_{a\text{-}d}$	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

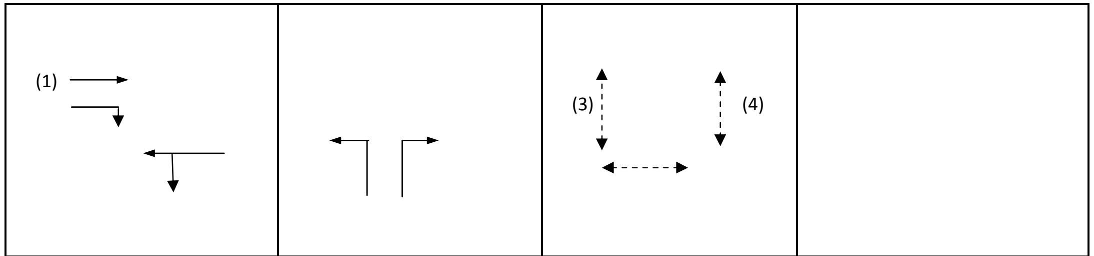
$DFC_{b\text{-}a}$	=	0.040
$DFC_{b\text{-}c}$	=	0.041
$DFC_{b\text{-}d}$	=	0.465
$DFC_{d\text{-}a}$	=	0.471
$DFC_{d\text{-}b}$	=	0.005
$DFC_{d\text{-}c}$	=	0.696
$DFC_{c\text{-}b}$	=	0.000
$DFC_{a\text{-}d}$	=	0.019

Critical DFC = 0.696

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: GK	29-4-2011
J2: Junction of Lin Shing Road and Wan Tsui Road	J2LV1 - Peak Hour Traffic Flows	FILENAME :1_S1_J2_J5_J6_J7_J8.xls	Checked By: KC	29-4-2011
2021 Ching Ming Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	120 sec
Sum(y)		Y =	0.563
Loss time		L =	25 sec
Total Flow		=	1395 pcu
Co	= (1.5*L+5)/(1-Y)	=	97.3 sec
Cm	= L/(1-Y)	=	57.3 sec
Yult		=	0.713
R.C.ult	= (Yult-Y)/Y*100%	=	26.5 %
Cp	= 0.9*L/(0.9-Y)	=	66.8 sec
Ymax	= 1-L/C	=	0.792
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	26.5 %

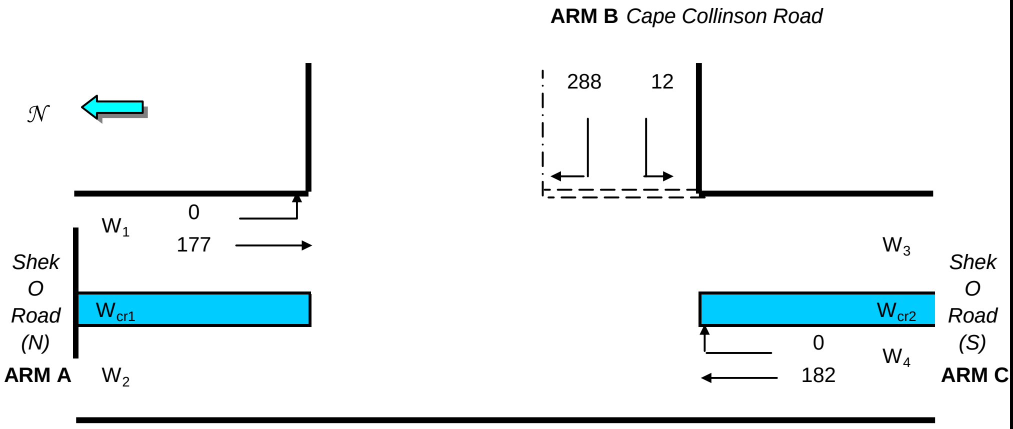


Stage A	I = 7	Stage B	I =	Stage C	I =

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
ST	A	3.00	1	1			N	1915		371		371	0.00	1915			1915	0.194		5	33	95	0.245	12	2
ST/LT	A	4.00	1	1	10		N	2015	743	280		1024	0.73	1817			1817	0.563	0.563		95	95	0.712	42	4
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2021 Level 1 - Site 1
Time - Level 1 Peak Hour



GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

$q_{a\text{-}b}$	=	0	(pcu/hr)
$q_{a\text{-}c}$	=	176.61	(pcu/hr)

MAJOR ROAD (ARM C)

$W_{c\text{-}b}$	=	4.50	(metres)
$Vr_{c\text{-}b}$	=	150	(metres)
$q_{c\text{-}a}$	=	181.9	(pcu/hr)
$q_{c\text{-}b}$	=	0	(pcu/hr)

MINOR ROAD (ARM B)

$W_{b\text{-}a}$	=	0.00	(metres)
$W_{b\text{-}c}$	=	3.80	(metres)
$Vl_{b\text{-}a}$	=	100	(metres)
$Vr_{b\text{-}a}$	=	100	(metres)
$Vr_{b\text{-}c}$	=	100	(metres)
$q_{b\text{-}a}$	=	287.99	(pcu/hr)
$q_{b\text{-}c}$	=	11.639	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

$Q_{b\text{-}c}$	=	697
$Q_{c\text{-}b}$	=	776
$Q_{b\text{-}a}$	=	346

COMPARISION OF DESIGN FLOW TO CAPACITY

$DFC_{b\text{-}a}$	=	0.833
$DFC_{b\text{-}c}$	=	0.017
$DFC_{c\text{-}b}$	=	0.000

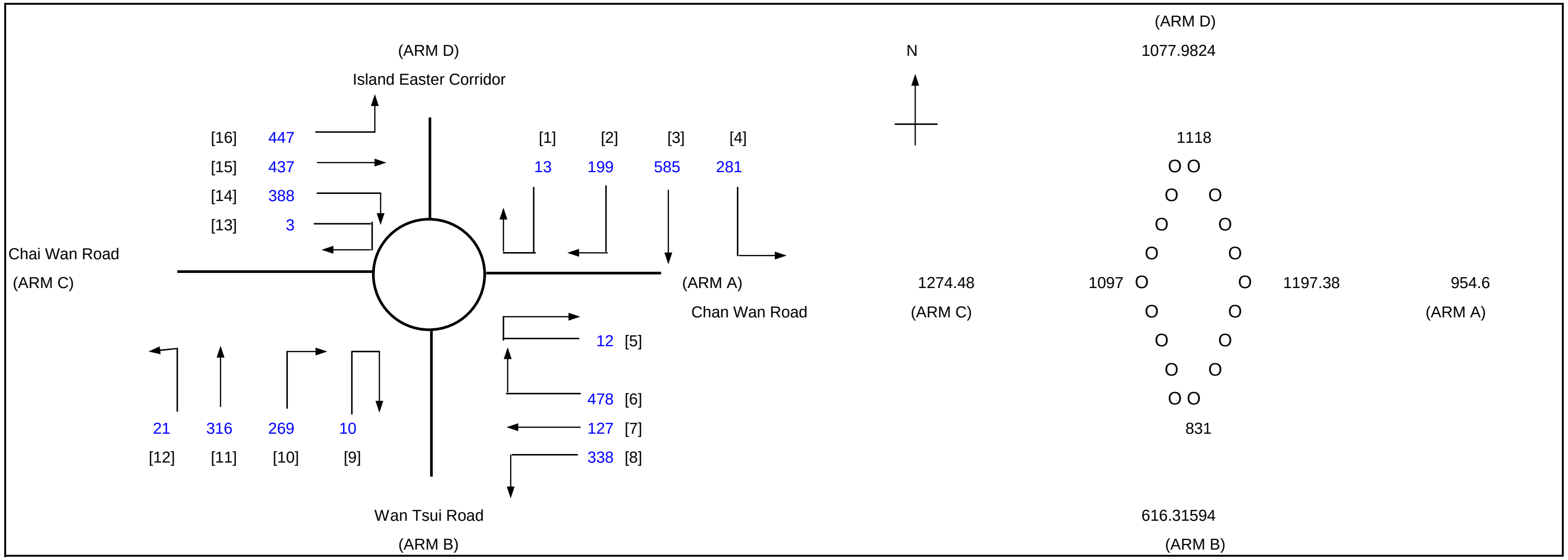
Critical DFC = 0.833

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

ROUNDABOUT CAPACITY ASSESSMENT

				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	**J4LV1 Peak Hour**	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME: _LV1_Sen1_S1_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV1 Peak Hour			REVIEWED BY:	OC	Sep-13

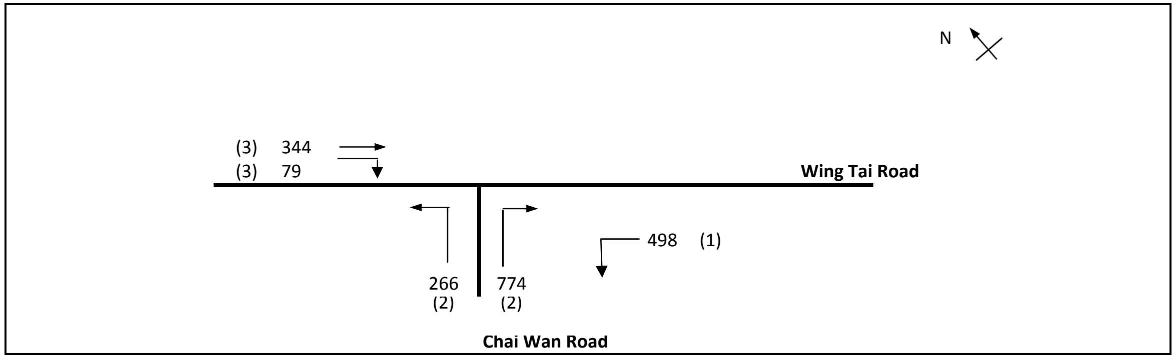


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	955	616	1274	1078
Qc	=	Circulating flow across entry (pcu/h)	1197	831	1097	1118
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1561	1010	1649	1365
DFC	=	Design flow/Capacity = Q/Qe	0.61	0.61	0.77	0.79

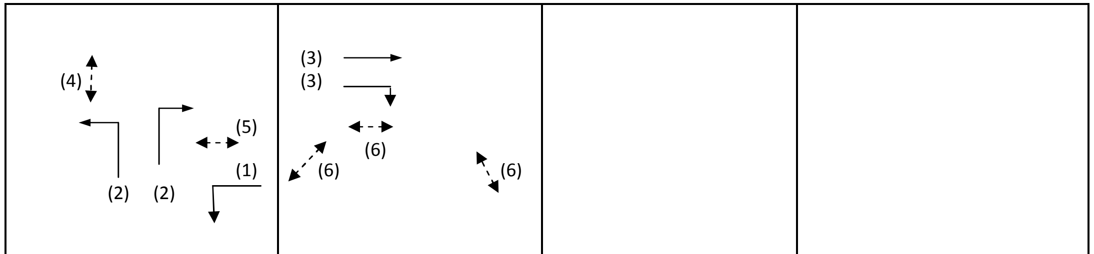
Total In Sum = 2836.28 PCU

DFC of Critical Approach = 0.79

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	GK	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV1 - Peak Hour Traffic Flows	FILENAME :1_S1_J2_J5_J6_J7_J8.xls	Checked By:	KC	29-4-2011
2021 Ching Ming Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	100 sec
Sum(y)		Y =	0.301
Loss time		L =	10 sec
Total Flow		=	1961 pcu
Co	= (1.5*L+5)/(1-Y)	=	28.6 sec
Cm	= L/(1-Y)	=	14.3 sec
Yult		=	0.825
R.C.ult	= (Yult-Y)/Y*100%	=	174.5 %
Cp	= 0.9*L/(0.9-Y)	=	15.0 sec
Ymax	= 1-L/C	=	0.900
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	169.5 %

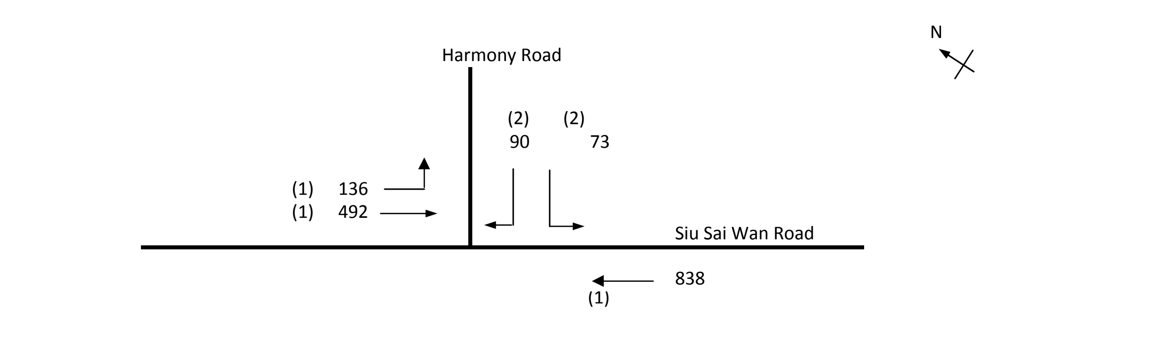


Stage A I = 7 Stage B I = 5

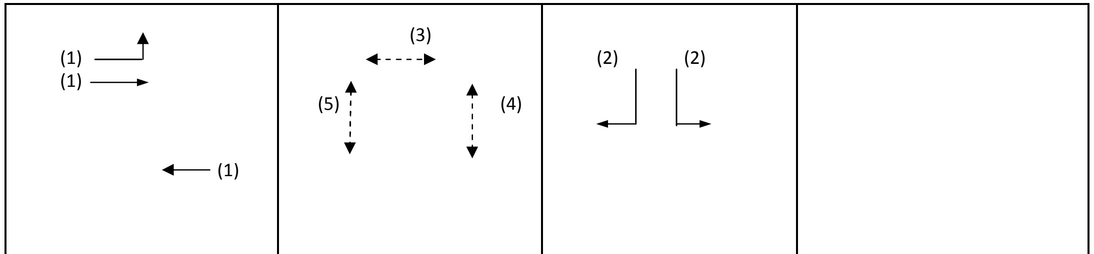
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	498			498	1.00	3857			3857	0.129			39	65	0.200	12	5
LT	A	4.00	2	2	24			4310	266			266	1.00	4056			4056	0.066			20	65	0.101	6	5
RT	A	3.50	2	2	11		y	4070			774	774	1.00	3582			3582	0.216	0.216		65	65	0.334	21	5
ST	B	3.50	3	2			y	4070		344		344	0.00	4070			4070	0.084	0.084		25	25	0.334	21	24
RT	B	4.50	3	2	13		y	4270			79	79	1.00	3828			3828	0.021			6	25	0.082	3	25
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	GK	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV1 - Peak Hour Traffic Flows	FILENAME :1_S1_J2_J5_J6_J7_J8.xls	Checked By:	KC	29-4-2011
2021 Ching Ming Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	100 sec
Sum(y)		Y =	0.259
Loss time		L =	48 sec
Total Flow		=	1629 pcu
Co	= (1.5*L+5)/(1-Y)	=	103.9 sec
Cm	= L/(1-Y)	=	64.7 sec
Yult		=	0.540
R.C.ult	= (Yult-Y)/Y*100%	=	108.8 %
Cp	= 0.9*L/(0.9-Y)	=	67.4 sec
Ymax	= 1-L/C	=	0.520
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	80.9 %

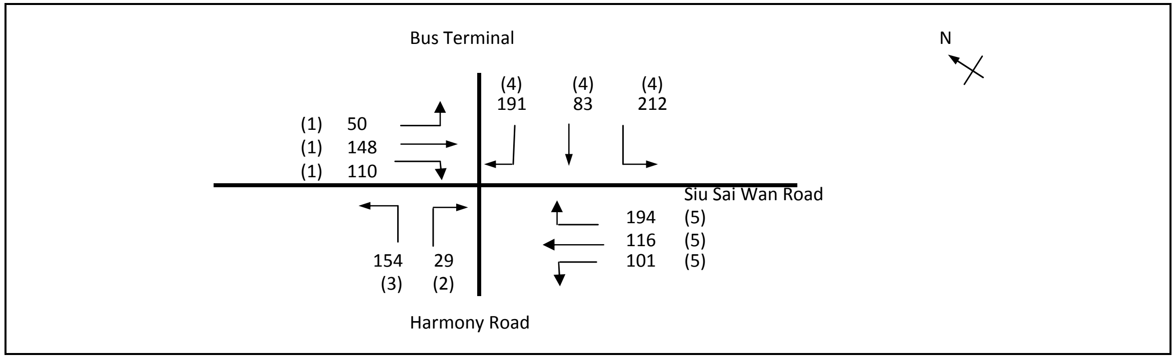


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

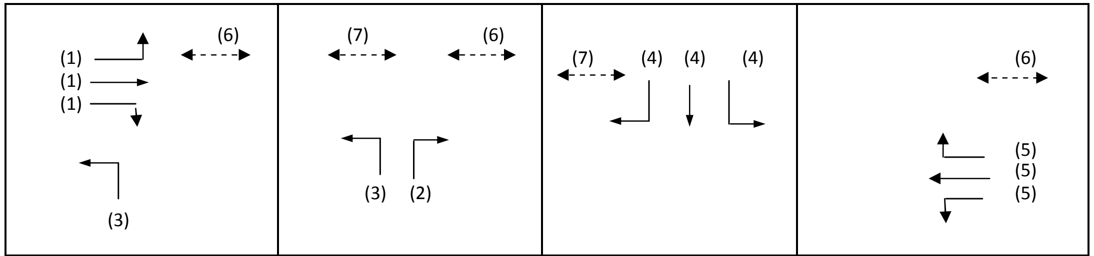
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	136	152		288	0.47	1827			1827	0.158			32	42	0.372	24	14
ST	A	3.20	1	1				2075		340		340	0.00	2075			2075	0.164			33	42	0.387	30	14
ST	A	3.00	1	2			y	3970		838		838	0.00	3970			3970	0.211	0.211		42	42	0.497	39	13
LT	C	3.75	2	1	12		y	1990	73			73	1.00	1769			1769	0.041			8	10	0.428	6	42
RT	C	3.75	2	1	12			2130			90	90	1.00	1893			1893	0.048	0.048		10	10	0.497	12	44
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	GK	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV1 - Peak Hour Traffic Flows	FILENAME :1_S1_J2_J5_J6_J7_J8.xls	Checked By:	KC	29-4-2011
2021 Ching Ming Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	105	sec
Sum(y)		Y =	0.388	
Loss time		L =	18	sec
Total Flow		=	1389	pcu
Co	= (1.5*L+5)/(1-Y)	=	52.3	sec
Cm	= L/(1-Y)	=	29.4	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	97.1	%
Cp	= 0.9*L/(0.9-Y)	=	31.6	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	92.1	%

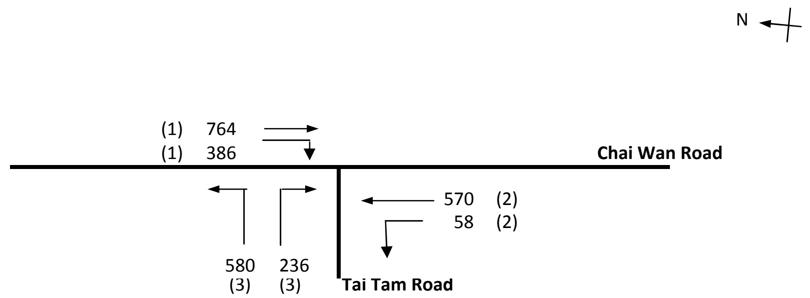


Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

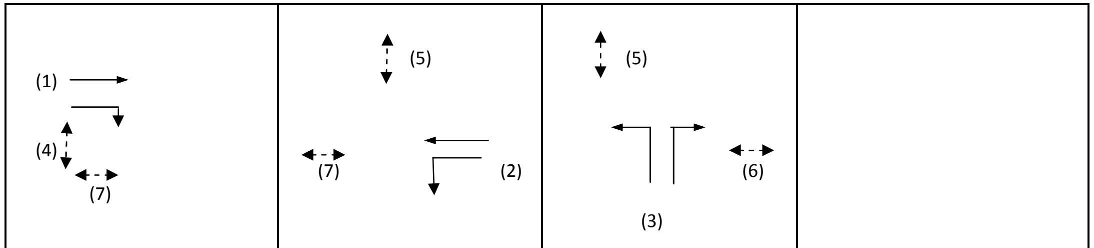
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	50	81		131	0.38	1849			1849	0.071			16	20	0.363	18	31
ST/RT	A	3.30	1	1	12			2085		67	110	177	0.62	1935			1935	0.091	0.091		20	20	0.468	24	32
RT	B	3.50	2	1	12			2105			29	29	1.00	1871			1871	0.016	0.016		4	4	0.468	0	66
LT	A,B	3.75	3	1	13		y	1990	154			154	1.00	1784			1784	0.086			19	29	0.312	18	24
RT	C	3.50	4	1	12			2105			191	191	1.00	1871			1871	0.102			23	37	0.292	18	19
LT/ST	C	3.50	4	1	12		y	1965	212	83		295	0.72	1803			1803	0.164	0.164		37	37	0.468	30	19
ST/RT	D	3.50	5	1	12			2105			194	194	1.00	1871			1871	0.104			23	23	0.468	24	29
LT/ST	D	3.50	5	1	11		y	1965	101	116		217	0.47	1848			1848	0.117	0.117		26	26	0.468	24	27
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: GK	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV1 - Peak Hour Traffic Flows	FILENAME :1_S1_J2_J5_J6_J7_J8.xls	Checked By: KC	29-4-2011
2021 Ching Ming Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	105	sec
Sum(y)		Y =	0.584	
Loss time		L =	18	sec
Total Flow		=	2595	pcu
Co	= (1.5*L+5)/(1-Y)	=	76.9	sec
Cm	= L/(1-Y)	=	43.3	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	31.0	%
Cp	= 0.9*L/(0.9-Y)	=	51.3	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	27.7	%



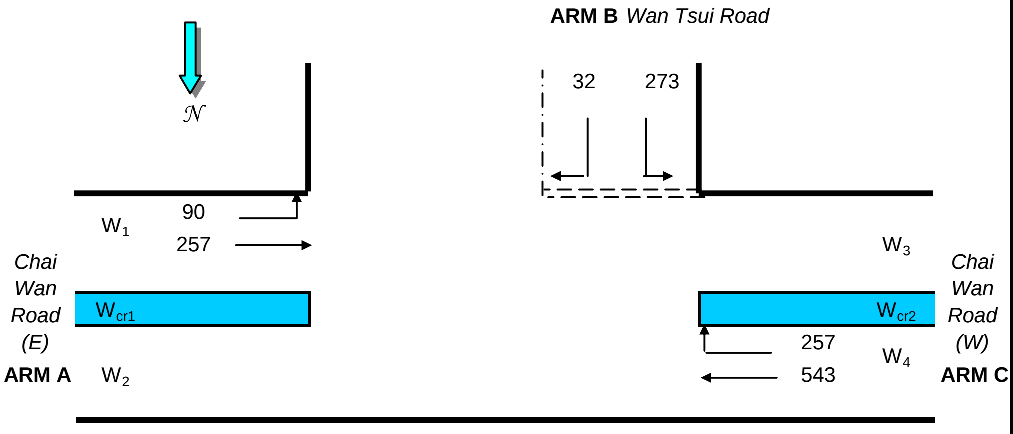
Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.75	1	2			y	4120		764		764	0.00	4120			4120	0.186			28	28	0.705	48	24
RT	A	3.00	1	1	13			2055			386	386	1.00	1842			1842	0.210	0.210		31	28	0.796	48	33
ST	B	3.50	2	2				4210		570		570	0.00	4210			4210	0.135	0.135		20	20	0.705	39	31
LT	B	3.10	2	1	12		y	1925	58			58	1.00	1711			1711	0.034			5	20	0.178	6	31
LT	C	4.00	3	1	15		y	2015	438			438	1.00	1832			1832	0.239	0.239		36	36	0.705	48	22
LT/RT	C	4.00	3	1	15			2155	142		236	378	1.00	1959			1959	0.193			29	36	0.569	42	20
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Prepared By:	KC
Checked By:	OC

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road
Design Year - 2021 Level 1 - Site 1
Time - Level 1 Peak Hour



GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	89.89	(pcu/hr)
q_{a-c}	=	257.1	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	543.33	(pcu/hr)
q_{c-b}	=	256.98	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	31.726	(pcu/hr)
q_{b-c}	=	273.35	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	788
Q_{c-b}	=	700
Q_{b-a}	=	372

COMPARISION OF DESIGN FLOW TO CAPACITY

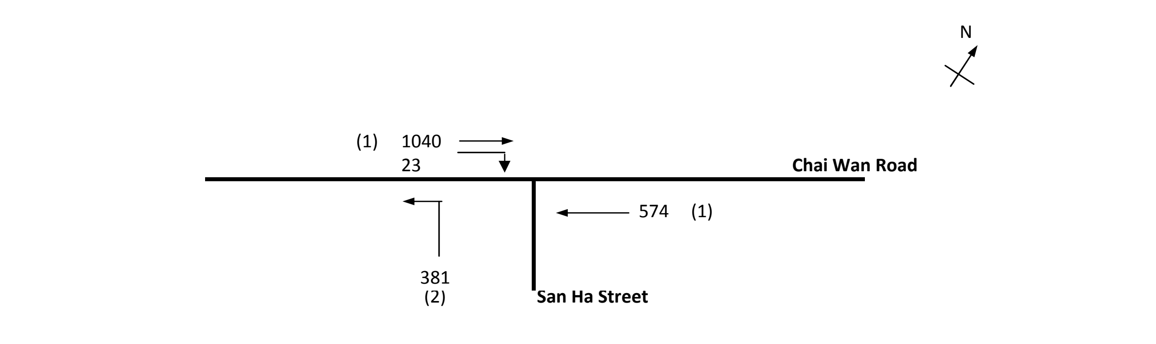
DFC_{b-a}	=	0.085
DFC_{b-c}	=	0.347
DFC_{c-b}	=	0.367

Critical DFC = 0.367

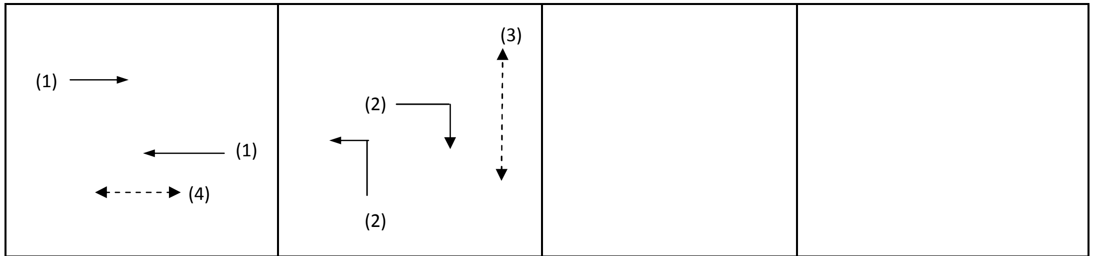
REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	GK	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV1 - Peak Hour Traffic Flows	FILENAME :1_S1_J2_J5_J6_J7_J8.xls	Checked By:	KC	29-4-2011
2021 Ching Ming Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.484	
Loss time		L =	10	sec
Total Flow		=	2018	pcu
Co	= (1.5*L+5)/(1-Y)	=	38.8	sec
Cm	= L/(1-Y)	=	19.4	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	70.4	%
Cp	= 0.9*L/(0.9-Y)	=	21.6	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	67.3	%

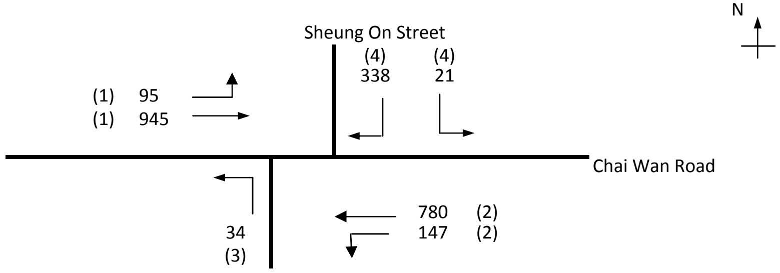


Stage A	I = 6	Stage B	I = 6	Stage C	I =

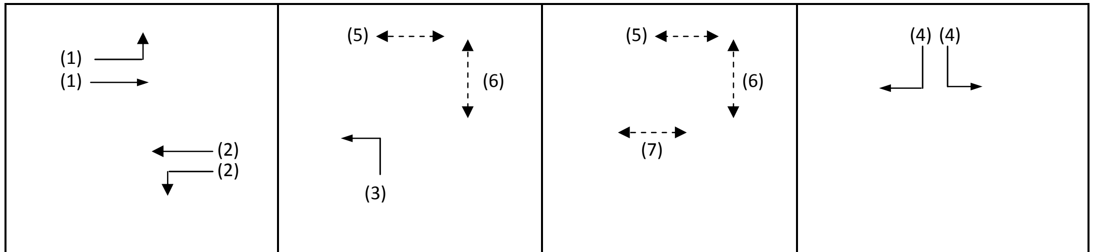
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		1040		1040	0.00	4070			4070	0.256	0.256		48	47	0.544	45	10
ST	A	3.50	1	2	10		N	4070		574		574	0.00	4070			4070	0.141			26	47	0.300	24	11
LT	B	3.00	2	1	10		N	1915	381			381	1.00	1665			1665	0.229	0.229		42	53	0.431	24	9
RT	B	3.50	2	1	12			2105			23	23	1.00	1871			1871	0.012			2	53	0.023	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: GK	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV1 - Peak Hour Traffic Flows	FILENAME :1_S1_J2_J5_J6_J7_J8.xls	Checked By: KC	29-4-2011
2021 Ching Ming Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	120 sec
Sum(y)		Y =	0.291
Loss time		L =	37 sec
Total Flow		=	2361 pcu
Co	= (1.5*L+5)/(1-Y)	=	85.3 sec
Cm	= L/(1-Y)	=	52.2 sec
Yult		=	0.623
R.C.ult	= (Yult-Y)/Y*100%	=	114.0 %
Cp	= 0.9*L/(0.9-Y)	=	54.7 sec
Ymax	= 1-L/C	=	0.692
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	114.0 %



Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	95	945		1041	0.09	6105			6105	0.170	0.170		49		0.000	68	54
LT/ST	A	3.30	2	3	12		Y	6115	147	780		927	0.16	5996			5996	0.155			44		0.000	60	54
LT	B	3.50	3	1	9		Y	1965	34			34	1.00	1684			1684	0.020	0.020		6		0.000	6	54
LT/RT	D	3.75	4	2	10		y	4120	21		338	360	1.00	3583			3583	0.100	0.100		29		0.000	33	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at C

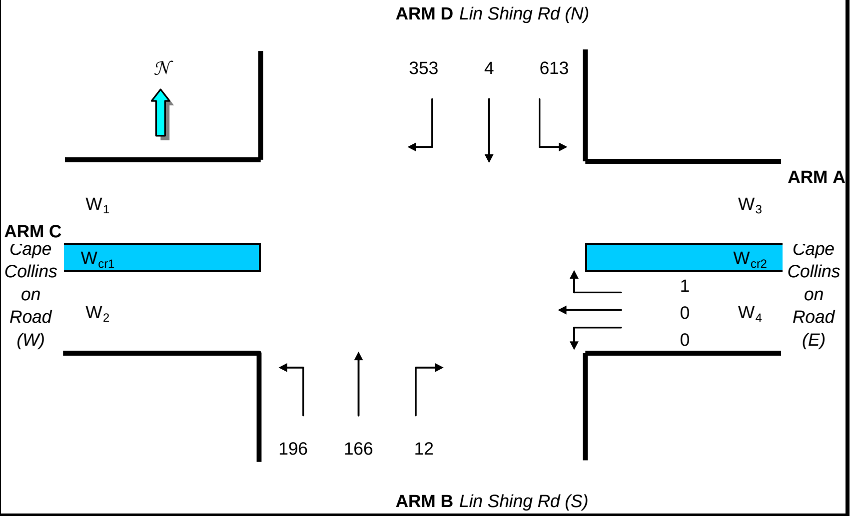
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road

Design Year - 2021 Level 2 - Reference Case

Time - Level 2 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{a\text{-}d}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$W_{d\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
$W_{d\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
$Vr_{a\text{-}d}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
$Vl_{d\text{-}c}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)
MAJOR ROAD			(ARM A)
$W_{a\text{-}d}$	=	3.00	(metres)
$Vr_{a\text{-}d}$	=	100	(metres)
$q_{a\text{-}b}$	=	0	(pcu/hr)
$q_{a\text{-}c}$	=	0	(pcu/hr)
$q_{a\text{-}d}$	=	1	(pcu/hr)
MAJOR ROAD			(ARM C)
$W_{c\text{-}b}$	=		(metres)
$Vr_{c\text{-}b}$	=		(metres)
$q_{c\text{-}a}$	=	0	(pcu/hr)
$q_{c\text{-}b}$	=	0	(pcu/hr)
$q_{c\text{-}d}$	=	0	(pcu/hr)
MINOR ROAD			(ARM B)
$W_{b\text{-}a}$	=	5.00	(metres)
$W_{b\text{-}c}$	=	5.00	(metres)
$Vl_{b\text{-}a}$	=	100	(metres)
$Vr_{b\text{-}a}$	=	65	(metres)
$Vr_{b\text{-}c}$	=	0	(metres)
$q_{b\text{-}a}$	=	11.633	(pcu/hr)
$q_{b\text{-}c}$	=	196	(pcu/hr)
$q_{b\text{-}d}$	=	165.8	(pcu/hr)
MINOR ROAD			(ARM D)
$W_{d\text{-}a}$	=	3.00	(metres)
$W_{d\text{-}c}$	=	3.00	(metres)
$Vl_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}a}$	=	80	(metres)
$q_{d\text{-}a}$	=	613	(pcu/hr)
$q_{d\text{-}b}$	=	4	(pcu/hr)
$q_{d\text{-}c}$	=	353	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

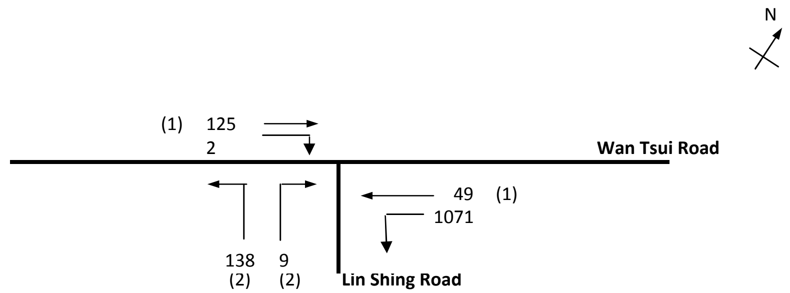
$Q_{b\text{-}a}$	=	413
$Q_{b\text{-}c}$	=	749
$Q_{b\text{-}d}$ is nearside	=	TRUE
$Q_{b\text{-}d}$	=	611
$Q_{d\text{-}a}$	=	674
$Q_{d\text{-}b}$ is nearside	=	TRUE
$Q_{d\text{-}b}$	=	533
$Q_{d\text{-}c}$	=	431
$Q_{c\text{-}b}$	=	437
$Q_{a\text{-}d}$	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

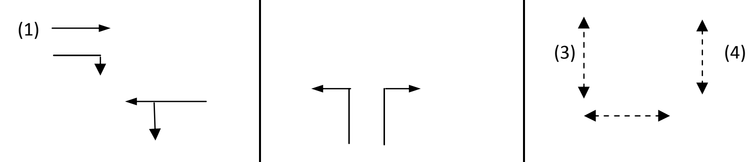
$DFC_{b\text{-}a}$	=	0.028
$DFC_{b\text{-}c}$	=	0.261
$DFC_{b\text{-}d}$	=	0.271
$DFC_{d\text{-}a}$	=	0.909
$DFC_{d\text{-}b}$	=	0.007
$DFC_{d\text{-}c}$	=	0.820
$DFC_{c\text{-}b}$	=	0.000
$DFC_{a\text{-}d}$	=	0.002

Critical DFC = 0.909

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
Junction of Lin Shing Road and Wan Tsui Road	J2LV2 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	120 sec
Sum(y)		Y =	0.636
Loss time		L =	25 sec
Total Flow		=	1245 pcu
Co	= (1.5*L+5)/(1-Y)	=	116.6 sec
Cm	= L/(1-Y)	=	68.6 sec
Yult		=	0.713
R.C.ult	= (Yult-Y)/Y*100%	=	12.1 %
Cp	= 0.9*L/(0.9-Y)	=	85.1 sec
Ymax	= 1-L/C	=	0.792
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	12.1 %



Stage A	I = 7	Stage B	I =	Stage C	I =	

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		125		125	0.00	1915			1915	0.065			10	95	0.082	0	2
ST/LT	A	4.00	1	1	10		N	2015	1071	49		1120	0.96	1762			1762	0.636	0.636		95	95	0.803	42	6
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at

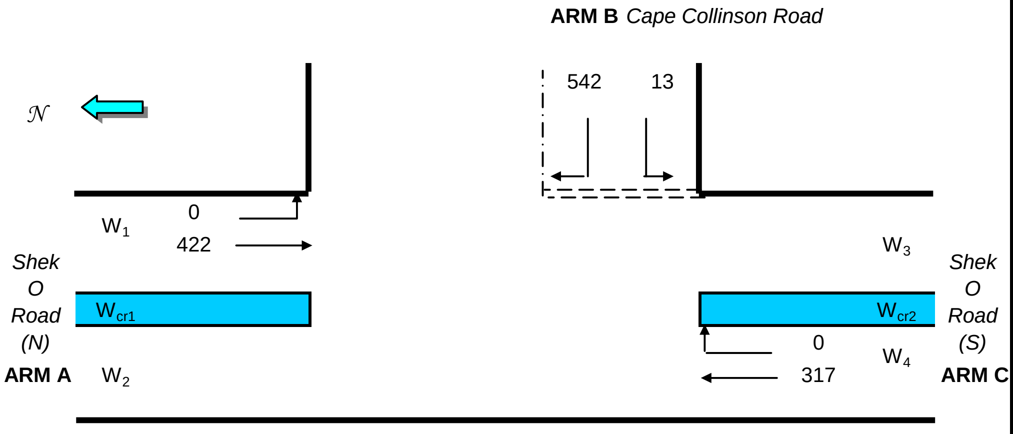
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road

Design Year - 2021 Level 2 - Reference Case

Time - Level 2 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	422	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	317	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	542	(pcu/hr)
q_{b-c}	=	13	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	634
Q_{c-b}	=	706
Q_{b-a}	=	293

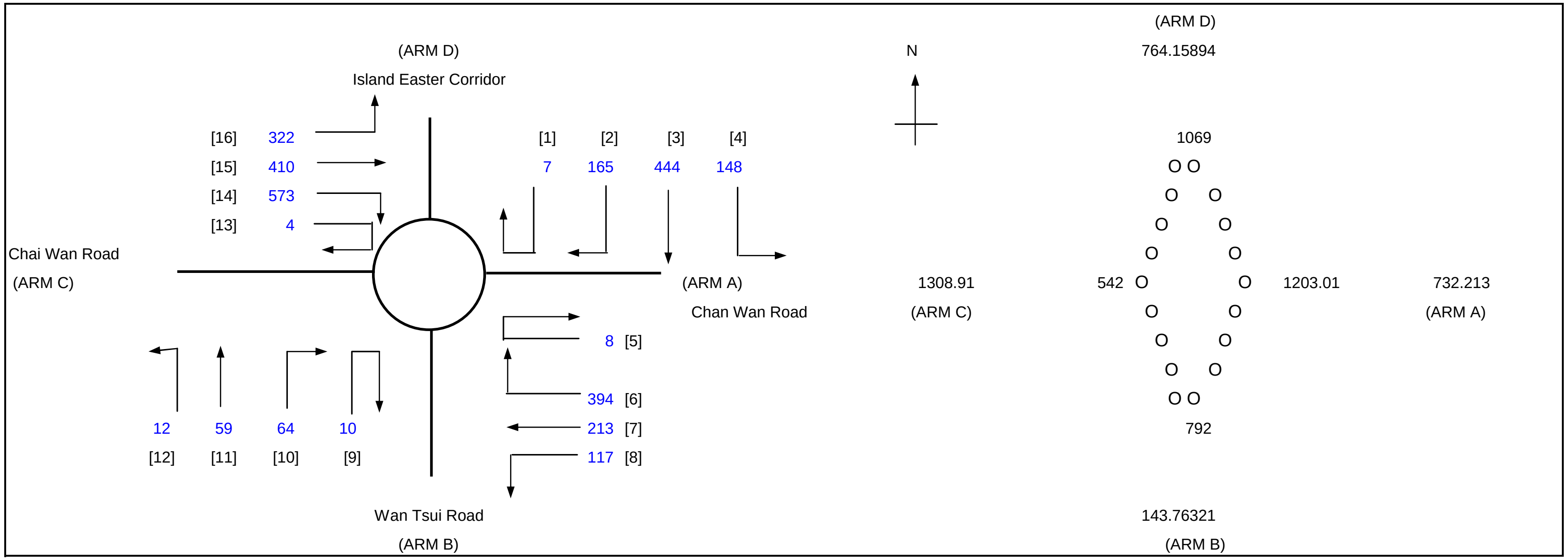
COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	1.852
DFC_{b-c}	=	0.021
DFC_{c-b}	=	0.000

Critical DFC = 1.852

ROUNDABOUT CAPACITY ASSESSMENT

				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	**J4LV2 Peak Hour**	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME :LV2_Sen1_Ref_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV2 Peak Hour			REVIEWED BY:	OC	Sep-13

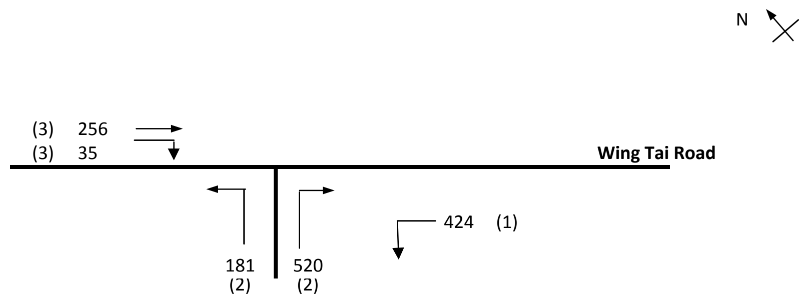


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	732	144	1309	764
Qc	=	Circulating flow across entry (pcu/h)	1203	792	542	1069
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1557	1032	2069	1399
DFC	=	Design flow/Capacity = Q/Qe	0.47	0.14	0.63	0.55

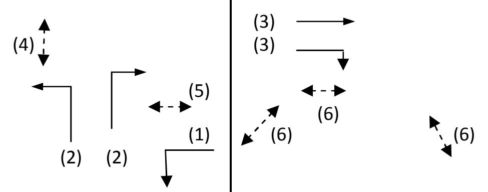
Total In Sum = 2351.43 PCU

DFC of Critical Approach = 0.63

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV2 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	100 sec
Sum(y)		Y =	0.208
Loss time		L =	10 sec
Total Flow		=	1417 pcu
Co	= (1.5*L+5)/(1-Y)	=	25.3 sec
Cm	= L/(1-Y)	=	12.6 sec
Yult		=	0.825
R.C.ult	= (Yult-Y)/Y*100%	=	296.2 %
Cp	= 0.9*L/(0.9-Y)	=	13.0 sec
Ymax	= 1-L/C	=	0.900
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	289.0 %

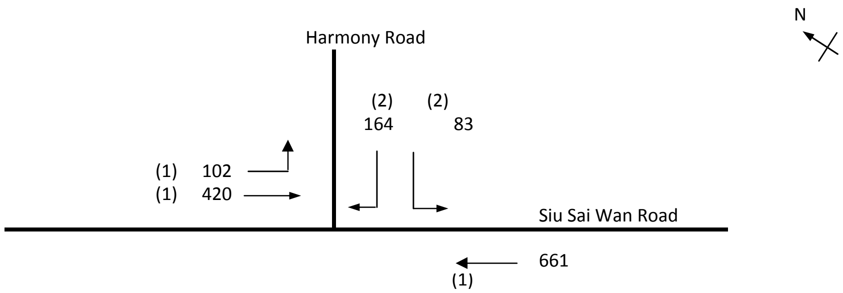


Stage A I = 7 | Stage B I = 5

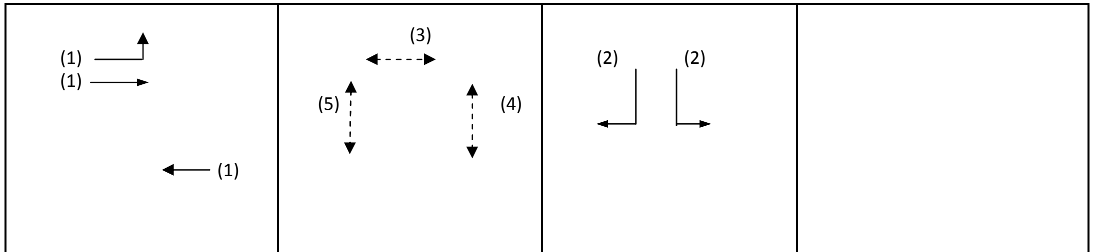
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	424			424	1.00	3857			3857	0.110			48	63	0.175	12	6
LT	A	4.00	2	2	24			4310	181			181	1.00	4056			4056	0.045			19	63	0.071	3	6
RT	A	3.50	2	2	11		y	4070			520	520	1.00	3582			3582	0.145	0.145		63	63	0.231	15	6
ST	B	3.50	3	2			y	4070		256		256	0.00	4070			4070	0.063	0.063		27	27	0.231	15	23
RT	B	4.50	3	2	13		y	4270			35	35	1.00	3828			3828	0.009			4	27	0.033	0	24
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV2 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	100 sec
Sum(y)		Y =	0.253
Loss time		L =	48 sec
Total Flow		=	1430 pcu
Co	= (1.5*L+5)/(1-Y)	=	103.1 sec
Cm	= L/(1-Y)	=	64.2 sec
Yult		=	0.540
R.C.ult	= (Yult-Y)/Y*100%	=	113.5 %
Cp	= 0.9*L/(0.9-Y)	=	66.8 sec
Ymax	= 1-L/C	=	0.520
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	85.1 %

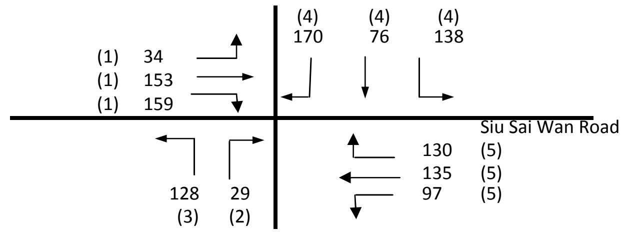


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

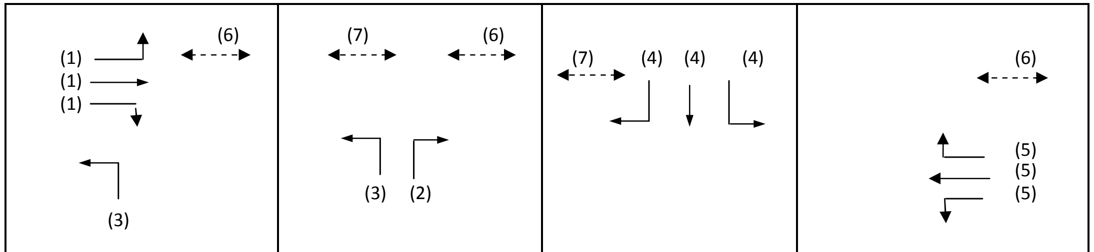
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	102	152		254	0.40	1844			1844	0.138			28	34	0.403	24	19
ST	A	3.20	1	1				2075		268		268	0.00	2075			2075	0.129			27	34	0.378	24	18
ST	A	3.00	1	2			y	3970		661		661	0.00	3970			3970	0.166	0.166		34	34	0.486	36	17
LT	C	3.75	2	1	12		y	1990	83			83	1.00	1769			1769	0.047			10	18	0.263	6	31
RT	C	3.75	2	1	12			2130			164	164	1.00	1893			1893	0.086	0.086		18	18	0.486	18	32
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV2 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.379
Loss time		L =	18 sec
Total Flow		=	1251 pcu
Co	= (1.5*L+5)/(1-Y)	=	51.5 sec
Cm	= L/(1-Y)	=	29.0 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	101.8 %
Cp	= 0.9*L/(0.9-Y)	=	31.1 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	96.8 %

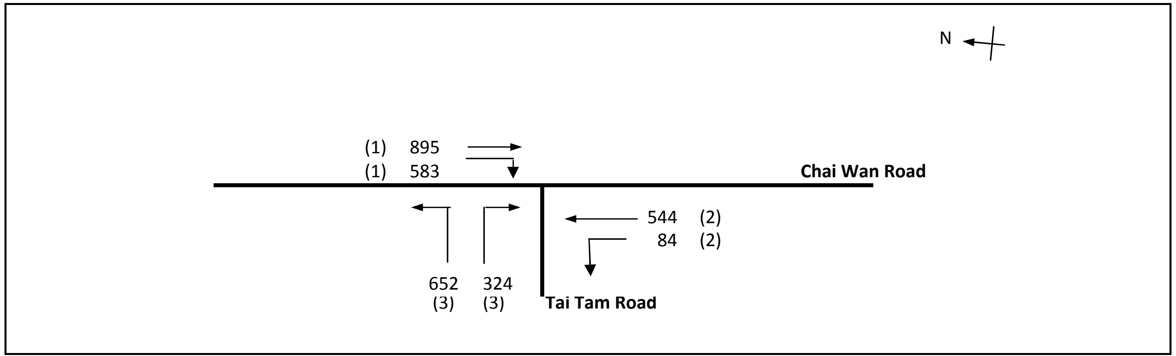


Stage A I = 5 | Stage B I = 5 | Stage C I = 6 | Stage C I = 6

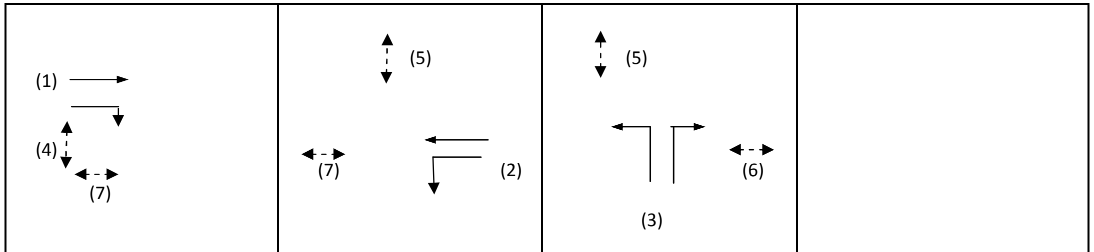
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	34	81		115	0.30	1869			1869	0.062			14	28	0.234	12	25
ST/RT	A	3.30	1	1	12			2085		72	159	231	0.69	1920			1920	0.120	0.120		28	28	0.457	24	25
RT	B	3.50	2	1	12			2105			29	29	1.00	1871			1871	0.016	0.016		4	4	0.457	0	65
LT	A,B	3.75	3	1	13		y	1990	128			128	1.00	1784			1784	0.072			16	36	0.208	12	19
RT	C	3.50	4	1	12			2105			170	170	1.00	1871			1871	0.091			21	27	0.353	18	26
LT/ST	C	3.50	4	1	12		y	1965	138	76		214	0.64	1818			1818	0.118	0.118		27	27	0.457	24	26
ST/RT	D	3.50	5	1	12			2105		0	130	130	1.00	1871			1871	0.070			16	16	0.457	18	36
LT/ST	D	3.50	5	1	11		y	1965	97	135		233	0.42	1859			1859	0.125	0.125		29	29	0.457	24	24
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV2 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	105	sec
Sum(y)		Y =	0.705	
Loss time		L =	18	sec
Total Flow		=	3081	pcu
Co	= (1.5*L+5)/(1-Y)	=	108.5	sec
Cm	= L/(1-Y)	=	61.0	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	8.5	%
Cp	= 0.9*L/(0.9-Y)	=	83.1	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	5.8	%



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		895		895	0.00	4070			4070	0.220			27	27	0.851	57	38
RT	A	3.50	1	1	13			2105			583	583	1.00	1887			1887	0.309	0.309		38	27	1.195	72	34
ST	B	3.50	2	2				4210		544		544	0.00	4210			4210	0.129	0.129		16	16	0.851	39	44
LT	B	3.10	2	1	12		y	1925	84			84	1.00	1711			1711	0.049			6	16	0.321	12	35
LT	C	4.00	3	1	15		y	2015	489			489	1.00	1832			1832	0.267	0.267		33	33	0.851	54	29
LT/RT	C	4.00	3	1	15			2155	163		324	487	1.00	1959			1959	0.249			31	33	0.792	54	27
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at

Junction Capacity Analysis

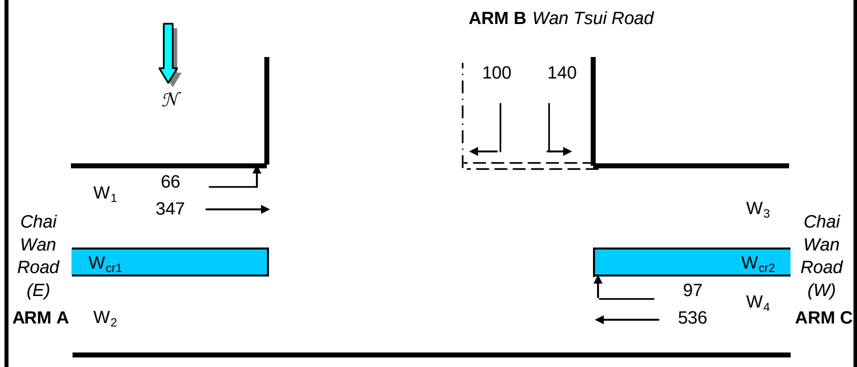
Prepared By: KC

Checked By: OC

Junction layout sketch - **J9: Junciton of Chai Wan Road and Wan Tsui Road**

Design Year - **2021 Level 2 - Reference Case**

Time - **Level 2 Peak Hour**



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	65.567	(pcu/hr)
q_{a-c}	=	347	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	536	(pcu/hr)
q_{c-b}	=	97.293	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	100	(pcu/hr)
q_{b-c}	=	140	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

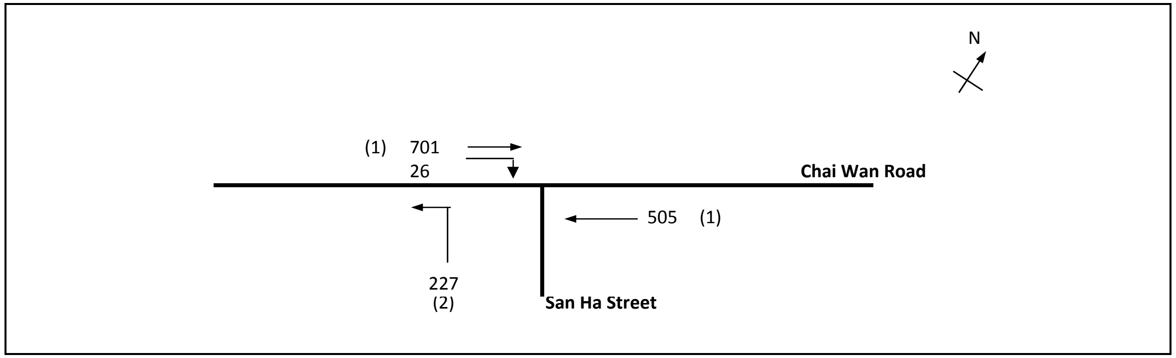
Q_{b-c}	=	778
Q_{c-b}	=	692
Q_{b-a}	=	384

COMPARISION OF DESIGN FLOW TO CAPACITY

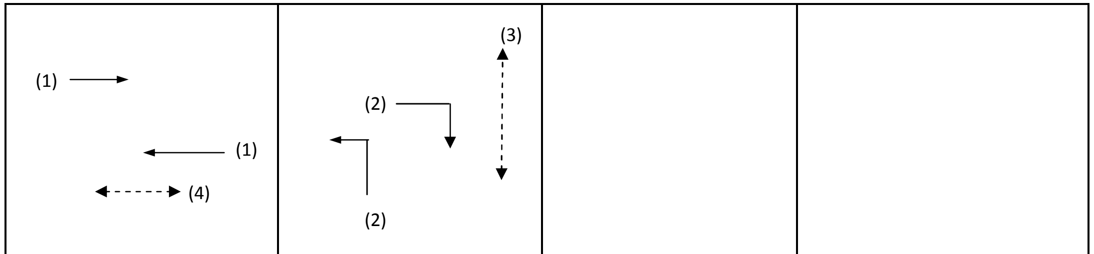
DFC_{b-a}	=	0.262
DFC_{b-c}	=	0.180
DFC_{c-b}	=	0.141

Critical DFC = 0.262

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV2 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	100 sec
Sum(y)		Y =	0.309
Loss time		L =	10 sec
Total Flow		=	1460 pcu
Co	= (1.5*L+5)/(1-Y)	=	28.9 sec
Cm	= L/(1-Y)	=	14.5 sec
Yult		=	0.825
R.C.ult	= (Yult-Y)/Y*100%	=	167.1 %
Cp	= 0.9*L/(0.9-Y)	=	15.2 sec
Ymax	= 1-L/C	=	0.900
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	162.3 %

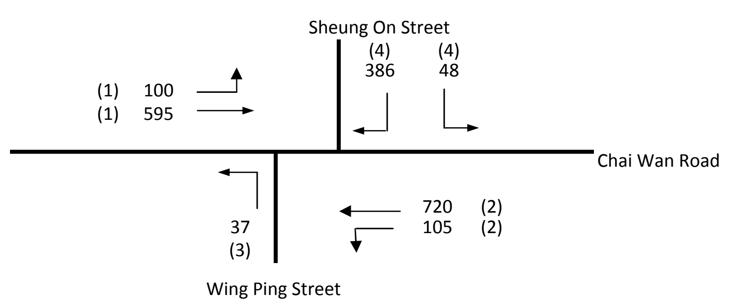


Stage A	I = 6	Stage B	I = 6	Stage C	I =

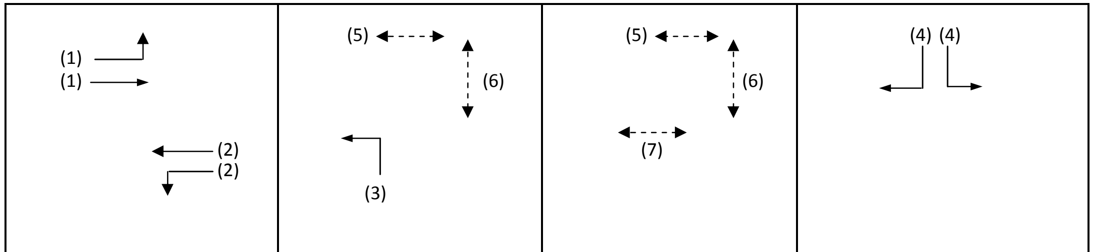
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		701		701	0.00	4070			4070	0.172	0.172		50	47	0.367	30	11
ST	A	3.50	1	2	10		N	4070		505		505	0.00	4070			4070	0.124			36	47	0.264	21	11
LT	B	3.00	2	1	10		N	1915	227			227	1.00	1665			1665	0.137	0.137		40	53	0.258	12	9
RT	B	3.50	2	1	12			2105			26	26	1.00	1871			1871	0.014			4	53	0.027	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV2 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	120	sec
Sum(y)		Y =	0.280	
Loss time		L =	37	sec
Total Flow		=	1991	pcu
Co	= (1.5*L+5)/(1-Y)	=	84.0	sec
Cm	= L/(1-Y)	=	51.4	sec
Yult		=	0.623	
R.C.ult	= (Yult-Y)/Y*100%	=	122.3	%
Cp	= 0.9*L/(0.9-Y)	=	53.7	sec
Ymax	= 1-L/C	=	0.692	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	122.3	%



Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	100	595		696	0.14	6066			6066	0.115			34		0.000	46	54
LT/ST	A	3.30	2	3	12		Y	6115	105	720		825	0.13	6019			6019	0.137	0.137		41		0.000	54	54
LT	B	3.50	3	1	9		Y	1965	37			37	1.00	1684			1684	0.022	0.022		7		0.000	6	54
LT/RT	D	3.75	4	2	10		y	4120	48		386	434	1.00	3583			3583	0.121	0.121		36		0.000	42	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development a

Junction Capacity Analysis

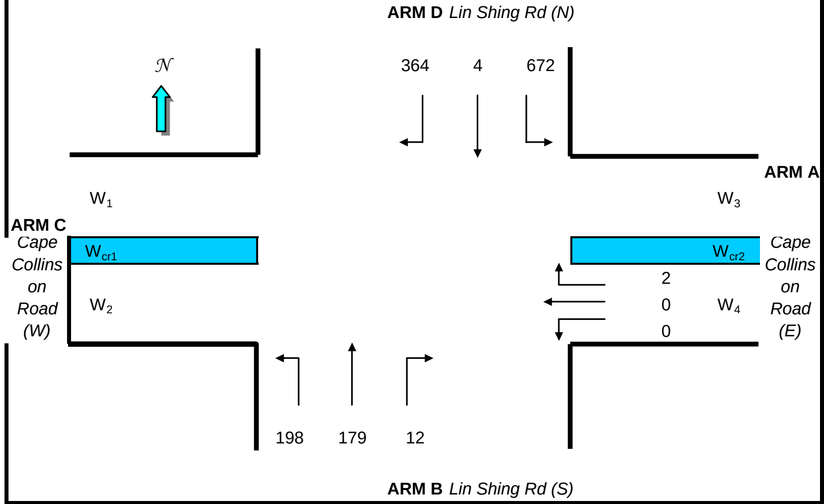
Prepared By: KC

Checked By: OC

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road

Design Year - 2021 Level 2 - Site 1

Time - Level 2 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{a\text{-}d}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$W_{d\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
$W_{d\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
$Vr_{a\text{-}d}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
$Vl_{d\text{-}c}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

$W_{a\text{-}d}$	=	3.00	(metres)
$Vr_{a\text{-}d}$	=	100	(metres)
$q_{a\text{-}b}$	=	0	(pcu/hr)
$q_{a\text{-}c}$	=	0	(pcu/hr)
$q_{a\text{-}d}$	=	2	(pcu/hr)

MAJOR ROAD (ARM C)

$W_{c\text{-}b}$	=		(metres)
$Vr_{c\text{-}b}$	=		(metres)
$q_{c\text{-}a}$	=	0	(pcu/hr)
$q_{c\text{-}b}$	=	0	(pcu/hr)
$q_{c\text{-}d}$	=	0	(pcu/hr)

MINOR ROAD (ARM B)

$W_{b\text{-}a}$	=	5.00	(metres)
$W_{b\text{-}c}$	=	5.00	(metres)
$Vl_{b\text{-}a}$	=	100	(metres)
$Vr_{b\text{-}a}$	=	65	(metres)
$Vr_{b\text{-}c}$	=	0	(metres)
$q_{b\text{-}a}$	=	11.633	(pcu/hr)
$q_{b\text{-}c}$	=	197.53	(pcu/hr)
$q_{b\text{-}d}$	=	178.53	(pcu/hr)

MINOR ROAD (ARM D)

$W_{d\text{-}a}$	=	3.00	(metres)
$W_{d\text{-}c}$	=	3.00	(metres)
$Vl_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}a}$	=	80	(metres)
$q_{d\text{-}a}$	=	672.35	(pcu/hr)
$q_{d\text{-}b}$	=	3.909	(pcu/hr)
$q_{d\text{-}c}$	=	363.85	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

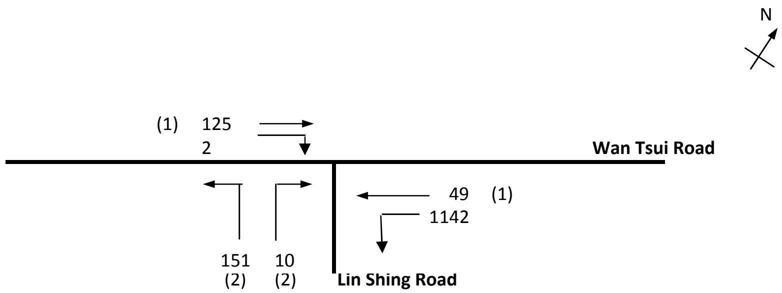
$Q_{b\text{-}a}$	=	393
$Q_{b\text{-}c}$	=	749
$Q_{b\text{-}d}$ is nearside	=	TRUE
$Q_{b\text{-}d}$	=	611
$Q_{d\text{-}a}$	=	674
$Q_{d\text{-}b}$ is nearside	=	TRUE
$Q_{d\text{-}b}$	=	532
$Q_{d\text{-}c}$	=	427
$Q_{c\text{-}b}$	=	437
$Q_{a\text{-}d}$	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

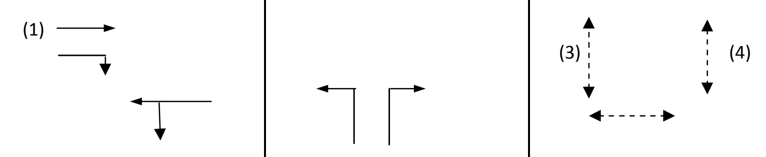
$DFC_{b\text{-}a}$	=	0.030
$DFC_{b\text{-}c}$	=	0.264
$DFC_{b\text{-}d}$	=	0.292
$DFC_{d\text{-}a}$	=	0.997
$DFC_{d\text{-}b}$	=	0.007
$DFC_{d\text{-}c}$	=	0.853
$DFC_{c\text{-}b}$	=	0.000
$DFC_{a\text{-}d}$	=	0.003

Critical DFC = 0.997

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J2: Junction of Lin Shing Road and Wan Tsui Road	J2LV2 - Peak Hour Traffic Flows	FILENAME :1_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.676	
Loss time		L =	25	sec
Total Flow		=	1315	pcu
Co	= (1.5*L+5)/(1-Y)	=	131.0	sec
Cm	= L/(1-Y)	=	77.1	sec
Yult		=	0.713	
R.C.ult	= (Yult-Y)/Y*100%	=	5.4	%
Cp	= 0.9*L/(0.9-Y)	=	100.3	sec
Ymax	= 1-L/C	=	0.792	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	5.4	%



Stage A I = 7	Stage B I =	Stage C I =	

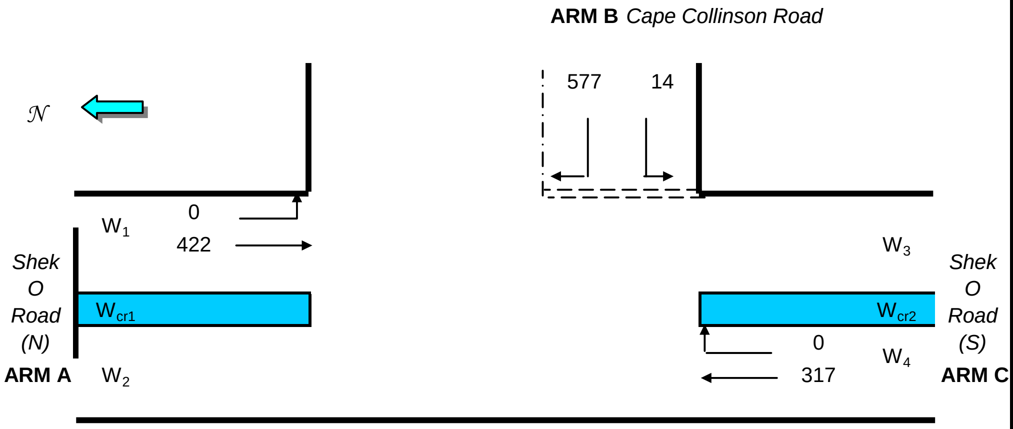
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
ST	A	3.00	1	1			N	1915		125		125	0.00	1915			1915	0.065		5	9	95	0.082	0	2
ST/LT	A	4.00	1	1	10		N	2015	1142	49		1190	0.96	1762			1762	0.676	0.676		95	95	0.854	48	4
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road

Design Year - 2021 Level 2 - Site 1

Time - Level 2 Peak Hour



GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	421.95	(pcu/hr)

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	634
Q_{c-b}	=	706
Q_{b-a}	=	293

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	317.26	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	1.972
DFC_{b-c}	=	0.022
DFC_{c-b}	=	0.000

Critical DFC = 1.972

MINOR ROAD (ARM B)

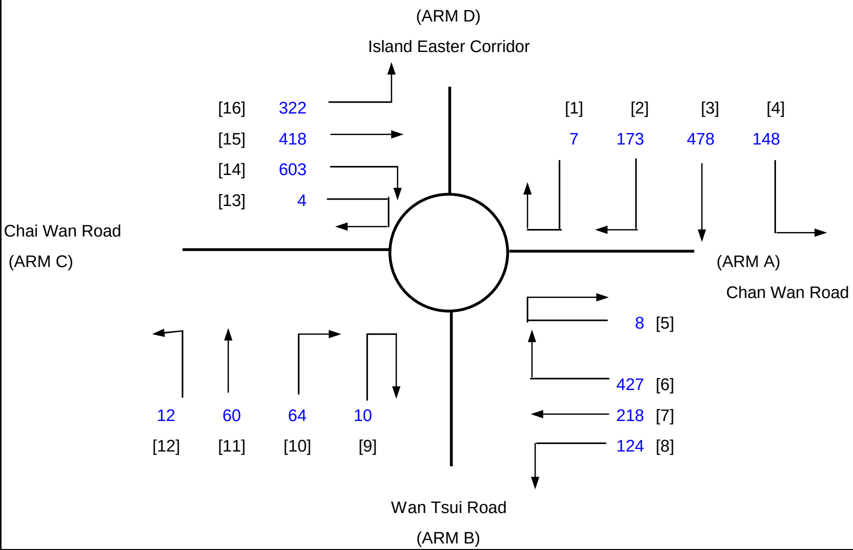
W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	576.87	(pcu/hr)
q_{b-c}	=	14.212	(pcu/hr)

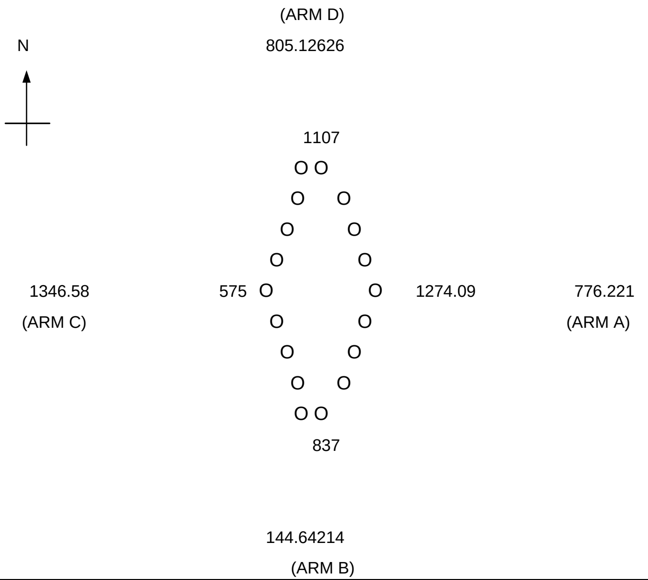
REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

ROUNDABOUT CAPACITY ASSESSMENT

					INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	J4LV2 Peak Hour	PROJECT NO.:	80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME:	J_LV2_Sen1_S1_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV2 Peak Hour				REVIEWED BY:	OC	Sep-13



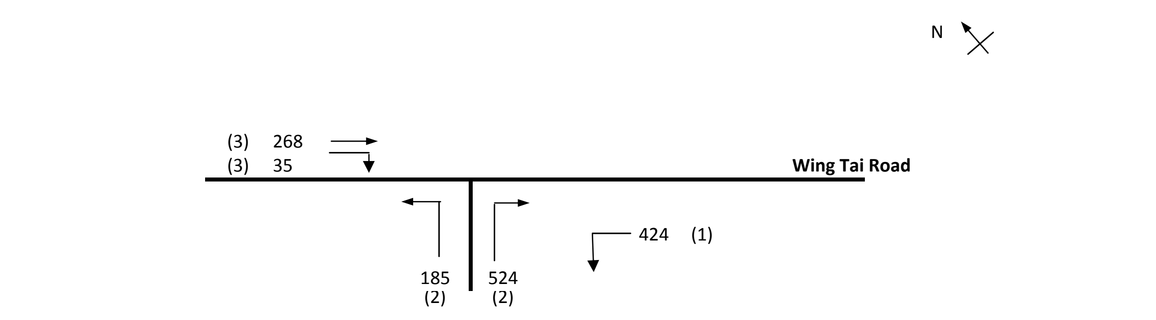


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	776	145	1347	805
Qc	=	Circulating flow across entry (pcu/h)	1274	837	575	1107
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1503	1007	2044	1373
DFC	=	Design flow/Capacity = Q/Qe	0.52	0.14	0.66	0.59

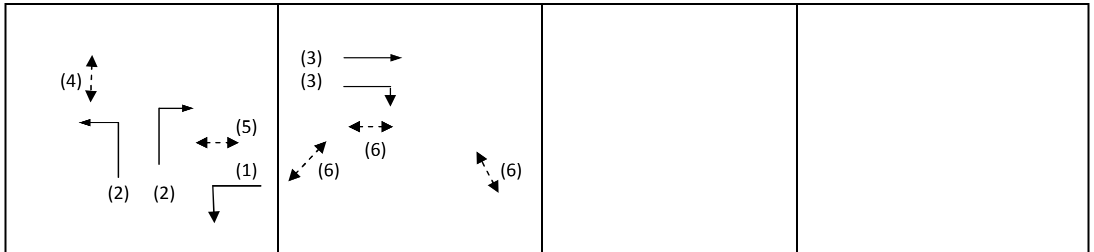
Total In Sum = 2468.06 PCU

DFC of Critical Approach = 0.66

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV2 - Peak Hour Traffic Flows	FILENAME :1_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.212	
Loss time		L =	10	sec
Total Flow		=	1436	pcu
Co	= (1.5*L+5)/(1-Y)	=	25.4	sec
Cm	= L/(1-Y)	=	12.7	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	288.7	%
Cp	= 0.9*L/(0.9-Y)	=	13.1	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	281.7	%



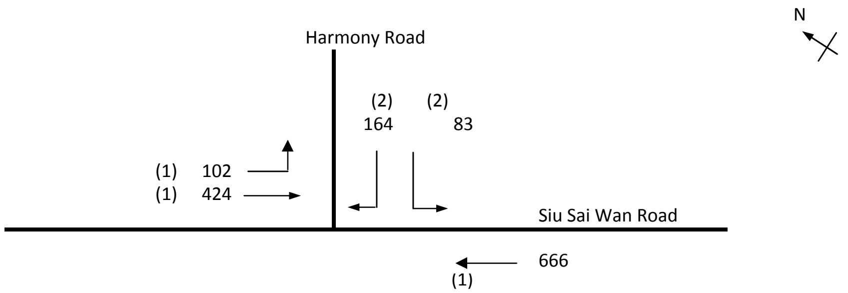
Stage A	I = 7	Stage B	I = 5		

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	424			424	1.00	3857			3857	0.110			47	62	0.177	12	6
LT	A	4.00	2	2	24			4310	185			185	1.00	4056			4056	0.046			19	62	0.073	3	6
RT	A	3.50	2	2	11		y	4070			524	524	1.00	3582			3582	0.146	0.146		62	62	0.236	15	6
ST	B	3.50	3	2			y	4070		268		268	0.00	4070			4070	0.066	0.066		28	28	0.236	15	22
RT	B	4.50	3	2	13		y	4270			35	35	1.00	3828			3828	0.009			4	28	0.033	0	23
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

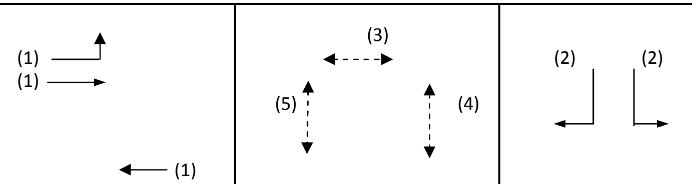
NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION

				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV2 - Peak Hour Traffic Flows	FILENAME :1_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	100 sec
Sum(y)		Y =	0.254
Loss time		L =	48 sec
Total Flow		=	1439 pcu
Co	= (1.5*L+5)/(1-Y)	=	103.2 sec
Cm	= L/(1-Y)	=	64.4 sec
Yult		=	0.540
R.C.ult	= (Yult-Y)/Y*100%	=	112.5 %
Cp	= 0.9*L/(0.9-Y)	=	66.9 sec
Ymax	= 1-L/C	=	0.520
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	84.1 %

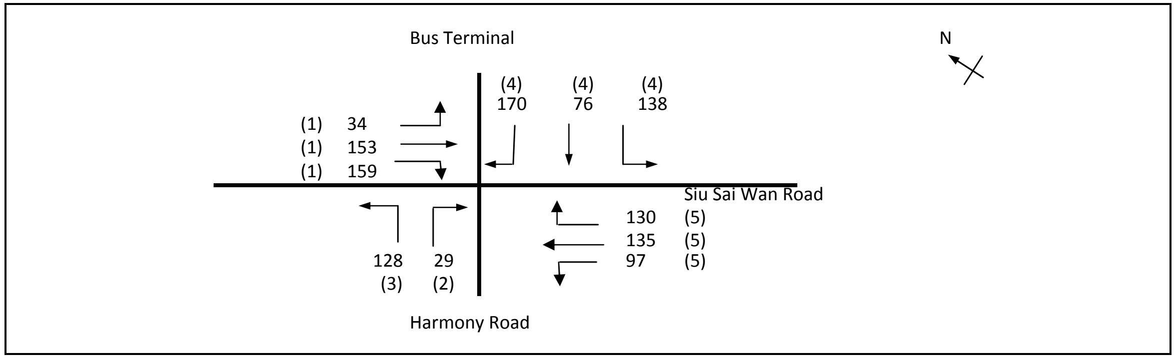


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

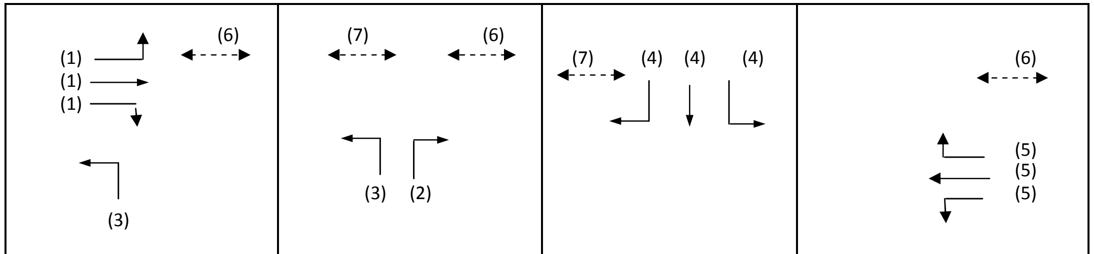
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	102	152		254	0.40	1844			1844	0.138			28	34	0.402	24	18
ST	A	3.20	1	1				2075		272		272	0.00	2075			2075	0.131			27	34	0.382	24	18
ST	A	3.00	1	2			y	3970		666		666	0.00	3970			3970	0.168	0.168		34	34	0.489	36	17
LT	C	3.75	2	1	12		y	1990	83			83	1.00	1769			1769	0.047			10	18	0.264	6	31
RT	C	3.75	2	1	12			2130			164	164	1.00	1893			1893	0.086	0.086		18	18	0.489	18	32
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV2 - Peak Hour Traffic Flows	FILENAME :1_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.379
Loss time		L =	18 sec
Total Flow		=	1251 pcu
Co	= (1.5*L+5)/(1-Y)	=	51.5 sec
Cm	= L/(1-Y)	=	29.0 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	101.8 %
Cp	= 0.9*L/(0.9-Y)	=	31.1 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	96.8 %

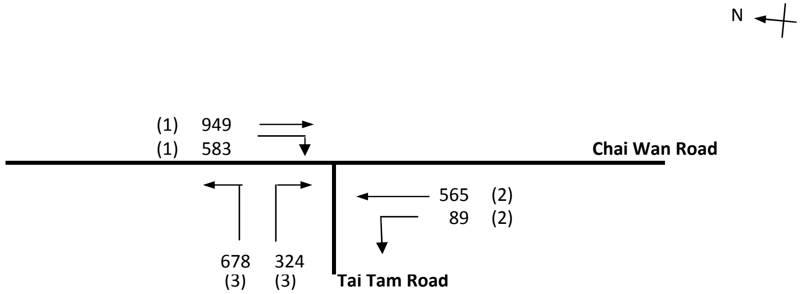


Stage A I = 5	Stage B I = 5	Stage C I = 6	Stage C I = 6

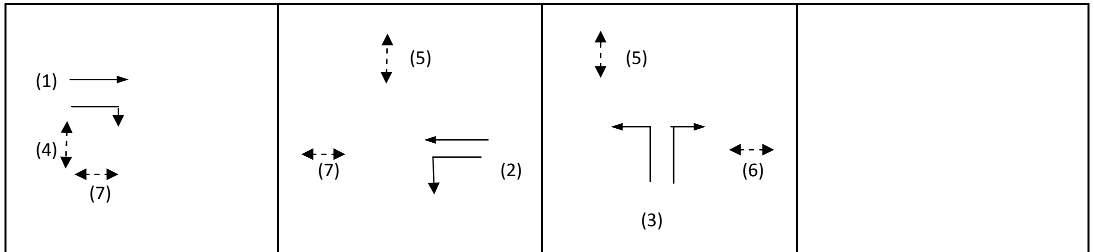
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	34	81		115	0.30	1869			1869	0.062			14	28	0.234	12	25
ST/RT	A	3.30	1	1	12			2085		72	159	231	0.69	1920			1920	0.120	0.120		28	28	0.457	24	25
RT	B	3.50	2	1	12			2105			29	29	1.00	1871			1871	0.016	0.016		4	4	0.457	0	65
LT	A,B	3.75	3	1	13		y	1990	128			128	1.00	1784			1784	0.072			16	36	0.208	12	19
RT	C	3.50	4	1	12			2105			170	170	1.00	1871			1871	0.091			21	27	0.353	18	26
LT/ST	C	3.50	4	1	12		y	1965	138	76		214	0.64	1818			1818	0.118	0.118		27	27	0.457	24	26
ST/RT	D	3.50	5	1	12			2105			130	130	1.00	1871			1871	0.070			16	16	0.457	18	36
LT/ST	D	3.50	5	1	11		y	1965	97	135		233	0.42	1859			1859	0.125	0.125		29	29	0.457	24	24
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV2 - Peak Hour Traffic Flows	FILENAME :1_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	105	sec
Sum(y)		Y =	0.743	
Loss time		L =	18	sec
Total Flow		=	3186	pcu
Co	= (1.5*L+5)/(1-Y)	=	124.5	sec
Cm	= L/(1-Y)	=	70.0	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	3.0	%
Cp	= 0.9*L/(0.9-Y)	=	103.1	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	0.4	%



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

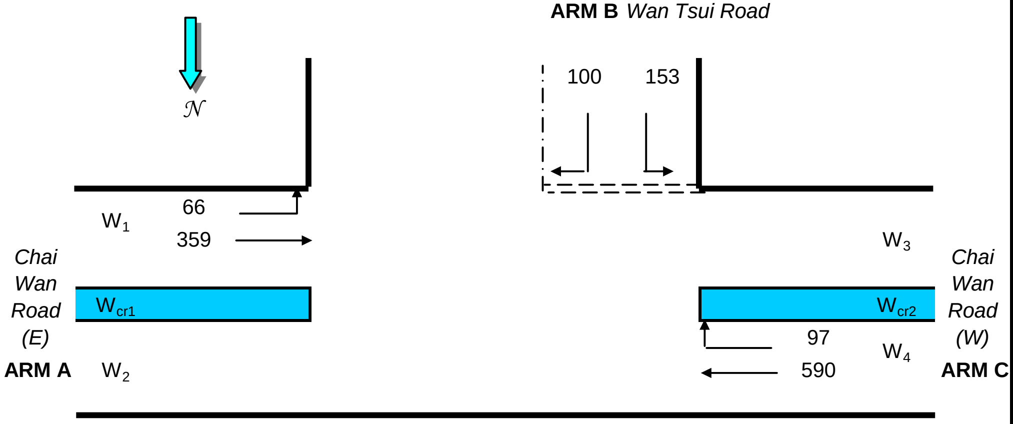
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.75	1	2			y	4120		949		949	0.00	4120			4120	0.230			27	27	0.897	60	39
RT	A	3.00	1	1	13			2055			583	583	1.00	1842			1842	0.316	0.316		37	27	1.231	72	35
ST	B	3.50	2	2				4210		565		565	0.00	4210			4210	0.134	0.134		16	16	0.897	45	45
LT	B	3.10	2	1	12		y	1925	89			89	1.00	1711			1711	0.052			6	16	0.346	12	36
LT	C	4.00	3	1	15		y	2015	536			536	1.00	1832			1832	0.292	0.292		34	34	0.897	66	28
LT/RT	C	4.00	3	1	15			2155	142		324	466	1.00	1959			1959	0.238			28	34	0.729	54	23
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road

Design Year - 2021 Level 2 - Site 1

Time - Level 2 Peak Hour



GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	65.567	(pcu/hr)
q_{a-c}	=	359.46	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	590.35	(pcu/hr)
q_{c-b}	=	97.293	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	100.47	(pcu/hr)
q_{b-c}	=	153.28	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	776
Q_{c-b}	=	691
Q_{b-a}	=	380

COMPARISION OF DESIGN FLOW TO CAPACITY

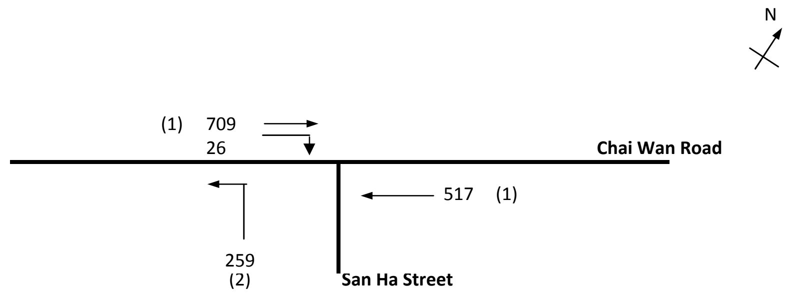
DFC_{b-a}	=	0.264
DFC_{b-c}	=	0.197
DFC_{c-b}	=	0.141

Critical DFC = 0.264

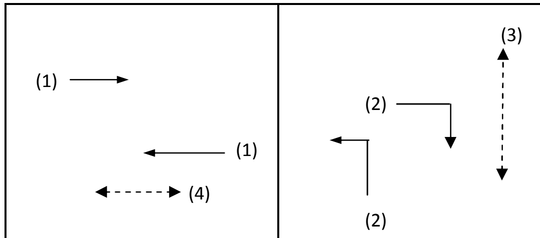
REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV2 - Peak Hour Traffic Flows	FILENAME :1_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.330	
Loss time		L =	10	sec
Total Flow		=	1512	pcu
Co	= (1.5*L+5)/(1-Y)	=	29.9	sec
Cm	= L/(1-Y)	=	14.9	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	150.0	%
Cp	= 0.9*L/(0.9-Y)	=	15.8	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	145.4	%

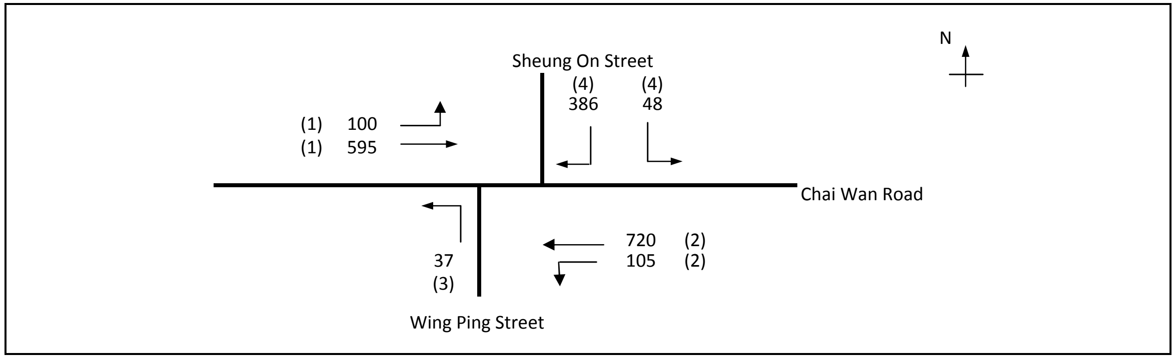


Stage A I = 6 | Stage B I = 6 | Stage C I =

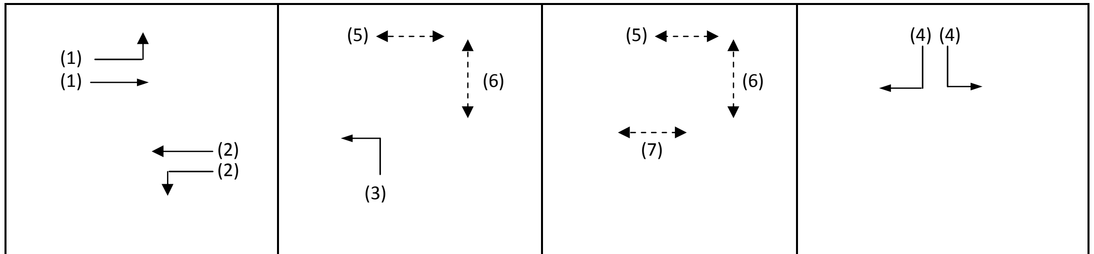
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		709		709	0.00	4070			4070	0.174	0.174		48	47	0.371	30	11
ST	A	3.50	1	2	10		N	4070		517		517	0.00	4070			4070	0.127			35	47	0.270	21	11
LT	B	3.00	2	1	10		N	1915	259			259	1.00	1665			1665	0.156	0.156		42	53	0.294	18	9
RT	B	3.50	2	1	12			2105			26	26	1.00	1871			1871	0.014			4	53	0.027	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV2 - Peak Hour Traffic Flows	FILENAME :1_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	120	sec
Sum(y)		Y =	0.280	
Loss time		L =	37	sec
Total Flow		=	1991	pcu
Co	= (1.5*L+5)/(1-Y)	=	84.0	sec
Cm	= L/(1-Y)	=	51.4	sec
Yult		=	0.623	
R.C.ult	= (Yult-Y)/Y*100%	=	122.3	%
Cp	= 0.9*L/(0.9-Y)	=	53.7	sec
Ymax	= 1-L/C	=	0.692	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	122.3	%



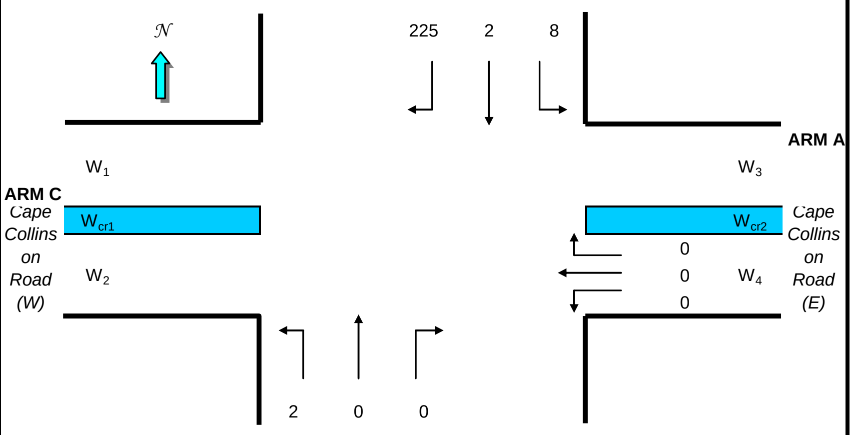
Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	100	595		696	0.14	6066			6066	0.115			34		0.000	46	54
LT/ST	A	3.30	2	3	12		Y	6115	105	720		825	0.13	6019			6019	0.137	0.137		41		0.000	54	54
LT	B	3.50	3	1	9		Y	1965	37			37	1.00	1684			1684	0.022	0.022		7		0.000	6	54
LT/RT	D	3.75	4	2	10		y	4120	48		386	434	1.00	3583			3583	0.121	0.121		36		0.000	42	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2021 Level 3 - Reference Case
Time - Level 3 Peak Hour

ARM D *Lin Shing Rd (N)*



ARM B *Lin Shing Rd (S)*

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{a-d}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
W_{d-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
W_{d-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
Vr_{a-d}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
Vl_{d-c}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

W_{a-d}	=	3.00	(metres)
Vr_{a-d}	=	100	(metres)
q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	0	(pcu/hr)
q_{a-d}	=	0	(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)
q_{c-d}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	5.00	(metres)
W_{b-c}	=	5.00	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	65	(metres)
Vr_{b-c}	=	0	(metres)
q_{b-a}	=	0	(pcu/hr)
q_{b-c}	=	2	(pcu/hr)
q_{b-d}	=	0	(pcu/hr)

MINOR ROAD (ARM D)

W_{d-a}	=	3.00	(metres)
W_{d-c}	=	3.00	(metres)
Vl_{d-c}	=	50	(metres)
Vr_{d-c}	=	50	(metres)
Vr_{d-a}	=	80	(metres)
q_{d-a}	=	8	(pcu/hr)
q_{d-b}	=	2	(pcu/hr)
q_{d-c}	=	225	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

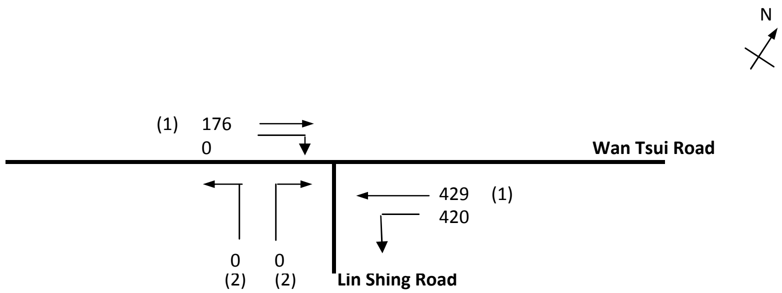
Q_{b-a}	=	615
Q_{b-c}	=	749
Q_{b-d} is nearside	=	TRUE
Q_{b-d}	=	611
Q_{d-a}	=	674
Q_{d-b} is nearside	=	TRUE
Q_{d-b}	=	533
Q_{d-c}	=	518
Q_{c-b}	=	437
Q_{a-d}	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

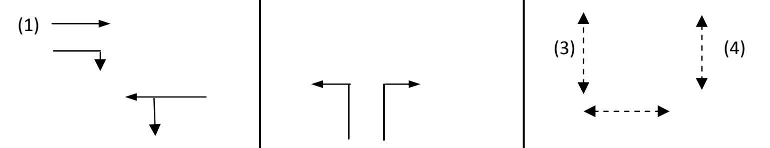
DFC_{b-a}	=	0.000
DFC_{b-c}	=	0.003
DFC_{b-d}	=	0.000
DFC_{d-a}	=	0.013
DFC_{d-b}	=	0.004
DFC_{d-c}	=	0.434
DFC_{c-b}	=	0.000
DFC_{a-d}	=	0.000

Critical DFC = 0.434

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
Junction of Lin Shing Road and Wan Tsui Road	J2LV3 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	120 sec
Sum(y)		Y =	0.452
Loss time		L =	25 sec
Total Flow		=	1024 pcu
Co	= (1.5*L+5)/(1-Y)	=	77.6 sec
Cm	= L/(1-Y)	=	45.7 sec
Yult		=	0.713
R.C.ult	= (Yult-Y)/Y*100%	=	57.5 %
Cp	= 0.9*L/(0.9-Y)	=	50.3 sec
Ymax	= 1-L/C	=	0.792
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	57.5 %



Stage A I = 7	Stage B I =	Stage C I =	

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		176		176	0.00	1915			1915	0.092			19	95	0.116	6	2
ST/LT	A	4.00	1	1	10		N	2015	420	429		849	0.49	1876			1876	0.452	0.452		95	95	0.571	30	3
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at

Junction Capacity Analysis

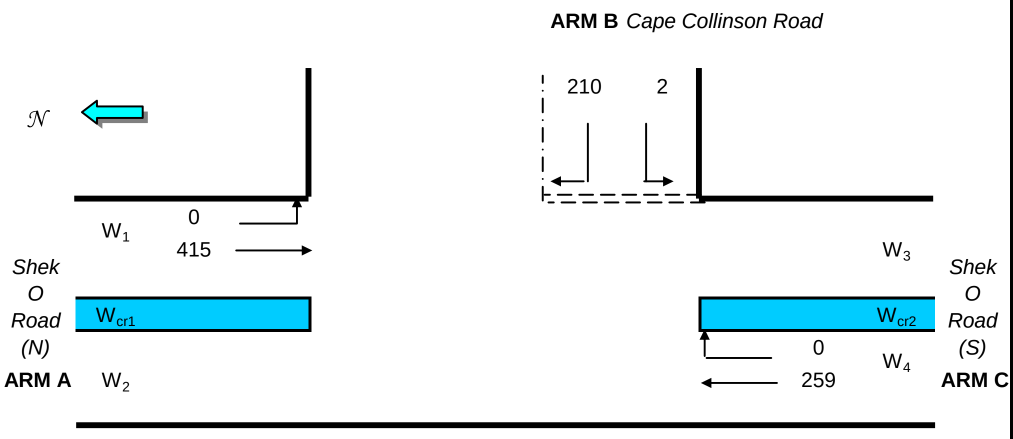
Prepared By: KC

Checked By: OC

Junction layout sketch - **J3: J/O Cape Collinson Road and Lin Shing Road**

Design Year - **2021 Level 3 - Reference Case**

Time - **Level 3 Peak Hour**



GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	415	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	259	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	210	(pcu/hr)
q_{b-c}	=	2	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	636
Q_{c-b}	=	708
Q_{b-a}	=	300

COMPARISION OF DESIGN FLOW TO CAPACITY

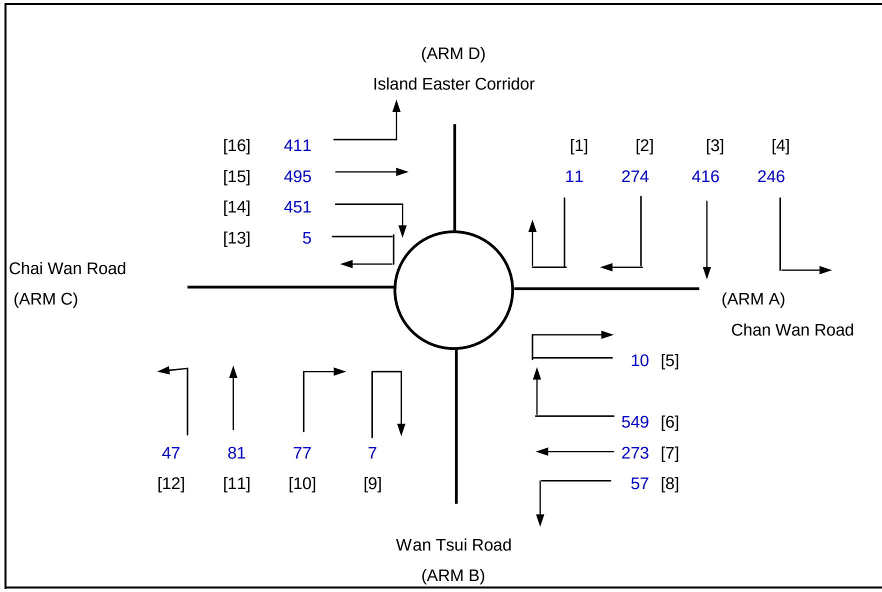
DFC_{b-a}	=	0.702
DFC_{b-c}	=	0.003
DFC_{c-b}	=	0.000

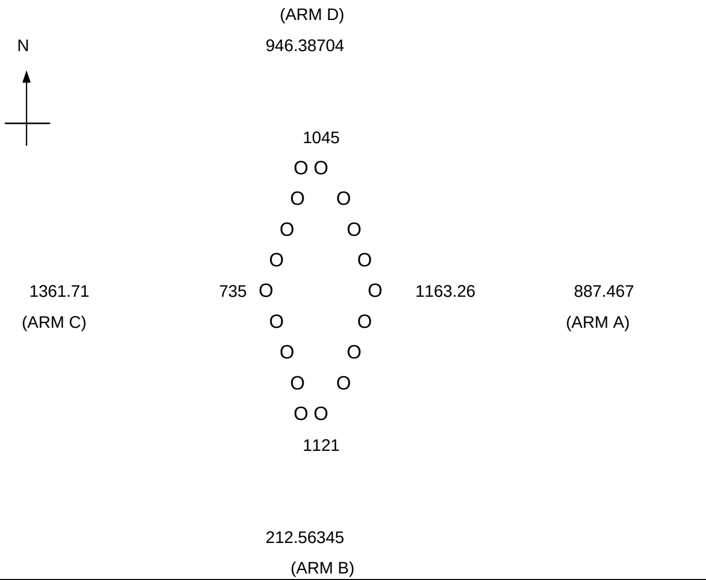
Critical DFC = 0.702

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

	ROUNDABOUT CAPACITY ASSESSMENT			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	J4LV3 Peak Hour	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME :J4LV3_Sen1_Ref_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV3 Peak Hour			REVIEWED BY:	OC	Sep-13



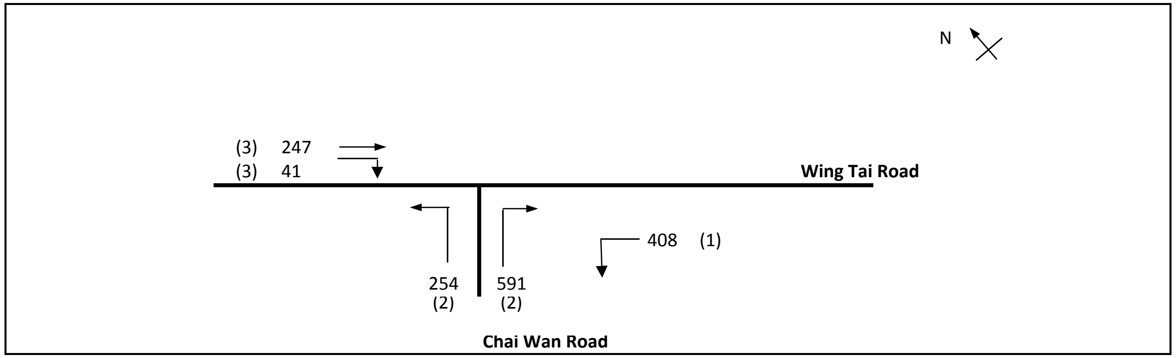


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	887	213	1362	946
Qc	=	Circulating flow across entry (pcu/h)	1163	1121	735	1045
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1587	849	1923	1415
DFC	=	Design flow/Capacity = Q/Qe	0.56	0.25	0.71	0.67

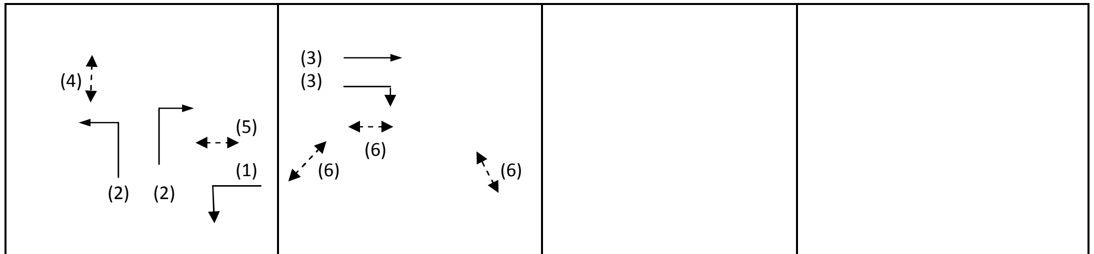
Total In Sum = 2648 PCU

DFC of Critical Approach = 0.71

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV3 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.226	
Loss time		L =	10	sec
Total Flow		=	1541	pcu
Co	= (1.5*L+5)/(1-Y)	=	25.8	sec
Cm	= L/(1-Y)	=	12.9	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	265.5	%
Cp	= 0.9*L/(0.9-Y)	=	13.3	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	258.8	%

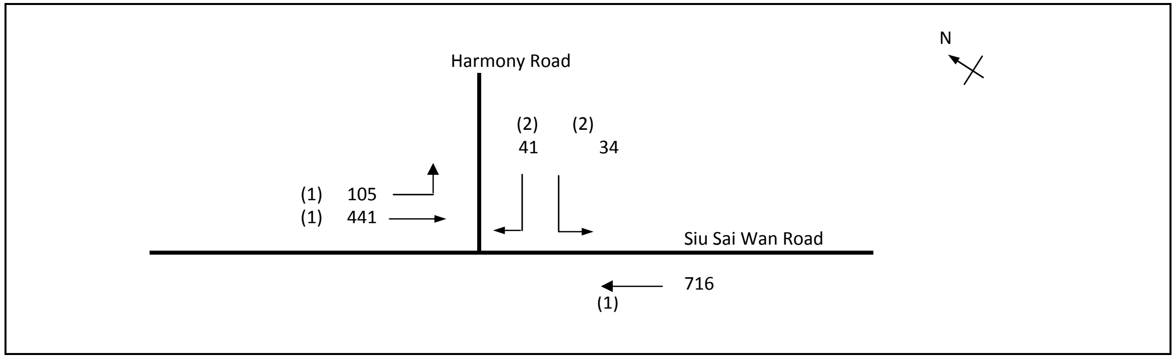


Stage A I = 7 | Stage B I = 5

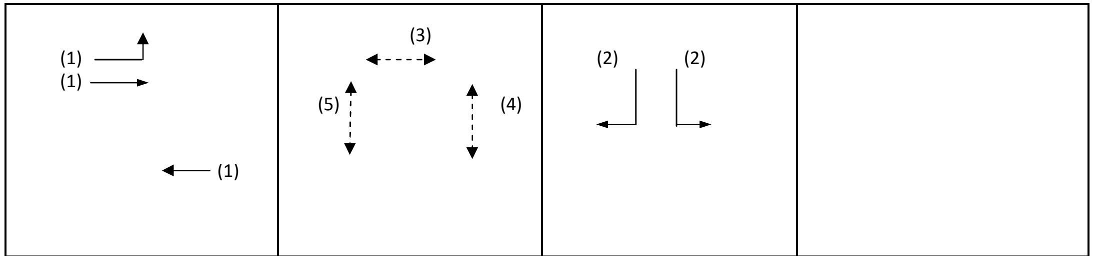
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	408			408	1.00	3857			3857	0.106			42	66	0.161	9	5
LT	A	4.00	2	2	24			4310	254			254	1.00	4056			4056	0.063			25	66	0.095	6	5
RT	A	3.50	2	2	11		y	4070			591	591	1.00	3582			3582	0.165	0.165		66	66	0.251	15	5
ST	B	3.50	3	2			y	4070		247		247	0.00	4070			4070	0.061	0.061		24	24	0.251	15	25
RT	B	4.50	3	2	13		y	4270			41	41	1.00	3828			3828	0.011			4	24	0.045	0	26
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV3 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	100	sec
Sum(y)		Y =	0.202	
Loss time		L =	48	sec
Total Flow		=	1337	pcu
Co	= (1.5*L+5)/(1-Y)	=	96.5	sec
Cm	= L/(1-Y)	=	60.2	sec
Yult		=	0.540	
R.C.ult	= (Yult-Y)/Y*100%	=	167.2	%
Cp	= 0.9*L/(0.9-Y)	=	61.9	sec
Ymax	= 1-L/C	=	0.520	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	131.5	%

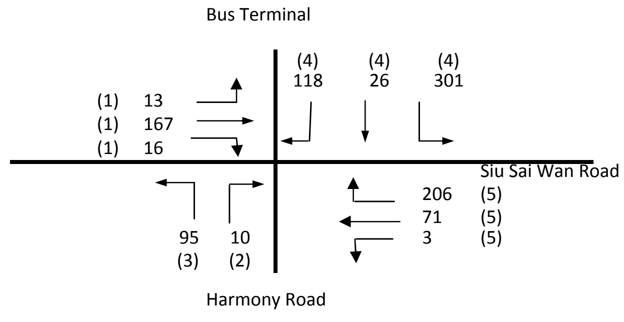


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

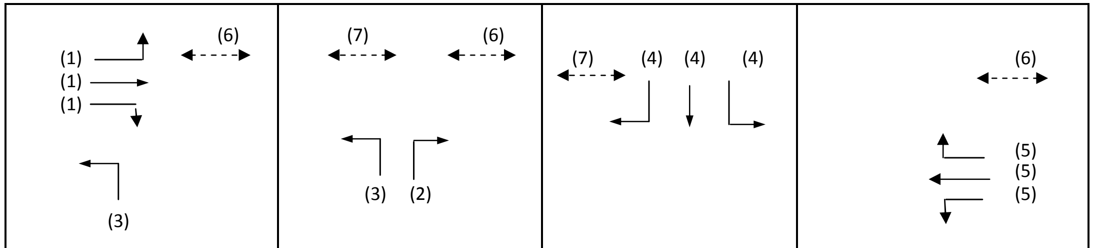
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	105	152		257	0.41	1843			1843	0.139			36	46	0.300	18	12
ST	A	3.20	1	1				2075		289		289	0.00	2075			2075	0.139			36	46	0.300	24	12
ST	A	3.00	1	2			y	3970		716		716	0.00	3970			3970	0.180	0.180		46	46	0.389	30	11
LT	C	3.75	2	1	12		y	1990	34			34	1.00	1769			1769	0.019			5	6	0.341	0	48
RT	C	3.75	2	1	12			2130			41	41	1.00	1893			1893	0.022	0.022		6	6	0.389	6	49
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV3 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.351
Loss time		L =	18 sec
Total Flow		=	1027 pcu
Co	= (1.5*L+5)/(1-Y)	=	49.3 sec
Cm	= L/(1-Y)	=	27.7 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	117.9 %
Cp	= 0.9*L/(0.9-Y)	=	29.5 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	112.4 %

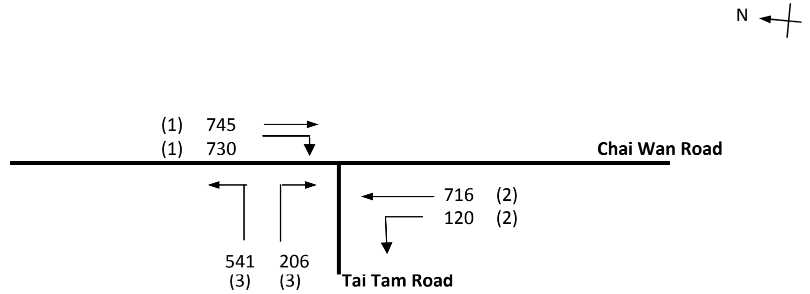


Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

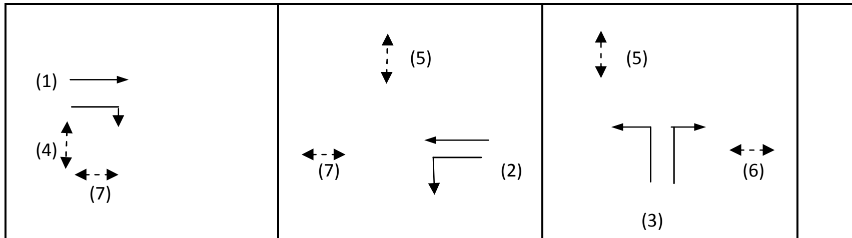
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	13	81		94	0.14	1910			1910	0.049			12	12	0.417	12	40
ST/RT	A	3.30	1	1	12			2085		86	16	102	0.16	2045			2045	0.050	0.050		12	12	0.424	12	40
RT	B	3.50	2	1	12			2105			10	10	1.00	1871			1871	0.005	0.005		1	1	0.424	0	99
LT	A,B	3.75	3	1	13		y	1990	95			95	1.00	1784			1784	0.053			13	19	0.301	12	32
RT	C	3.50	4	1	12			2105			118	118	1.00	1871			1871	0.063			16	46	0.144	6	14
LT/ST	C	3.50	4	1	12		y	1965	301	26		328	0.92	1762			1762	0.186	0.186		46	46	0.424	30	14
ST/RT	D	3.50	5	1	12			2105		0	206	206	1.00	1871			1871	0.110	0.110		27	27	0.424	24	25
LT/ST	D	3.50	5	1	11		y	1965	3	71		74	0.04	1954			1954	0.038			9	9	0.424	6	45
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV3 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	105	sec
Sum(y)		Y =	0.745	
Loss time		L =	18	sec
Total Flow		=	3058	pcu
Co	= (1.5*L+5)/(1-Y)	=	125.6	sec
Cm	= L/(1-Y)	=	70.7	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	2.6	%
Cp	= 0.9*L/(0.9-Y)	=	104.7	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	0.1	%



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		745		745	0.00	4070			4070	0.183			21	21	0.900	51	42
RT	A	3.50	1	1	13			2105			730	730	1.00	1887			1887	0.387	0.387		45	21	1.900	96	42
ST	B	3.50	2	2				4210		716		716	0.00	4210			4210	0.170	0.170		20	20	0.900	51	43
LT	B	3.10	2	1	12		y	1925	120			120	1.00	1711			1711	0.070			8	20	0.369	12	32
LT	C	4.00	3	1	15		y	2015	378			378	1.00	1832			1832	0.206			24	24	0.900	60	35
LT/RT	C	4.00	3	1	15			2155	163		206	369	1.00	1959			1959	0.189	0.189		22	24	0.822	48	39
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at

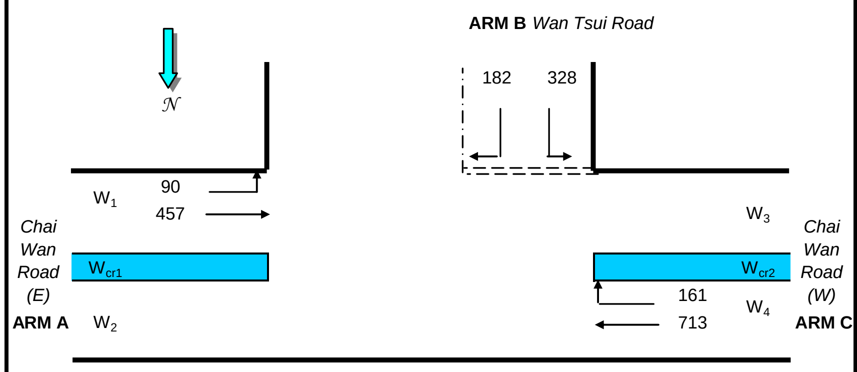
Junction Capacity Analysis

Prepared By:	KC
Checked By:	OC

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road

Design Year - 2021 Level 3 - Reference Case

Time - Level 3 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	89.89	(pcu/hr)
q_{a-c}	=	457	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	713	(pcu/hr)
q_{c-b}	=	160.74	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	182	(pcu/hr)
q_{b-c}	=	328	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

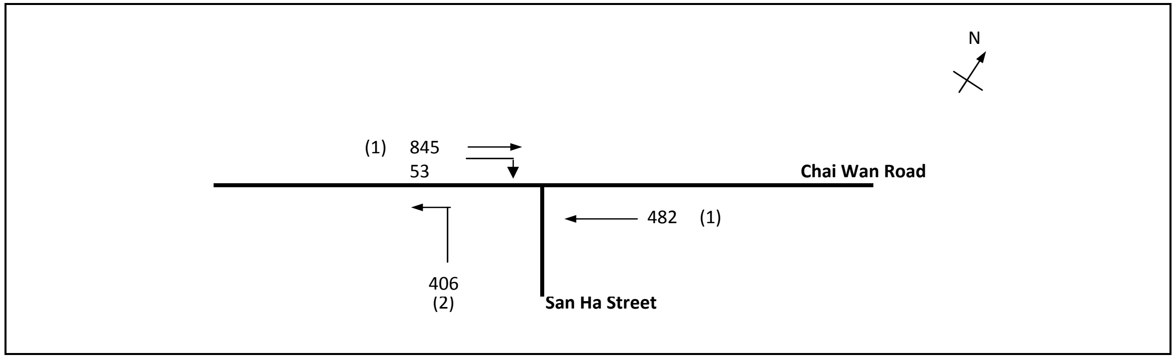
Q_{b-c}	=	763
Q_{c-b}	=	677
Q_{b-a}	=	358

COMPARISION OF DESIGN FLOW TO CAPACITY

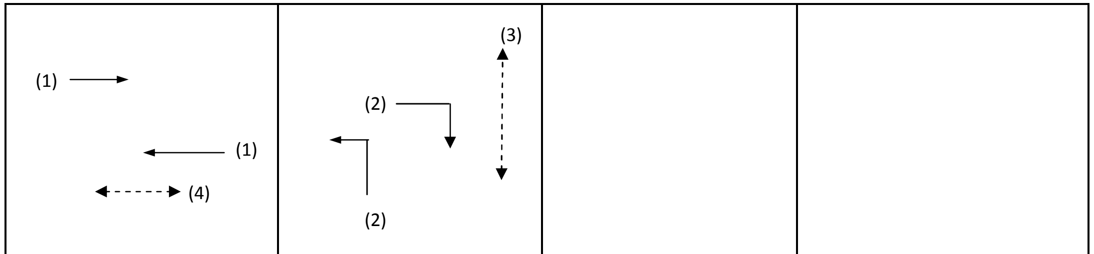
DFC_{b-a}	=	0.509
DFC_{b-c}	=	0.430
DFC_{c-b}	=	0.238

Critical DFC = 0.509

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV3 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.451	
Loss time		L =	10	sec
Total Flow		=	1785	pcu
Co	= (1.5*L+5)/(1-Y)	=	36.4	sec
Cm	= L/(1-Y)	=	18.2	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	82.8	%
Cp	= 0.9*L/(0.9-Y)	=	20.1	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	79.5	%

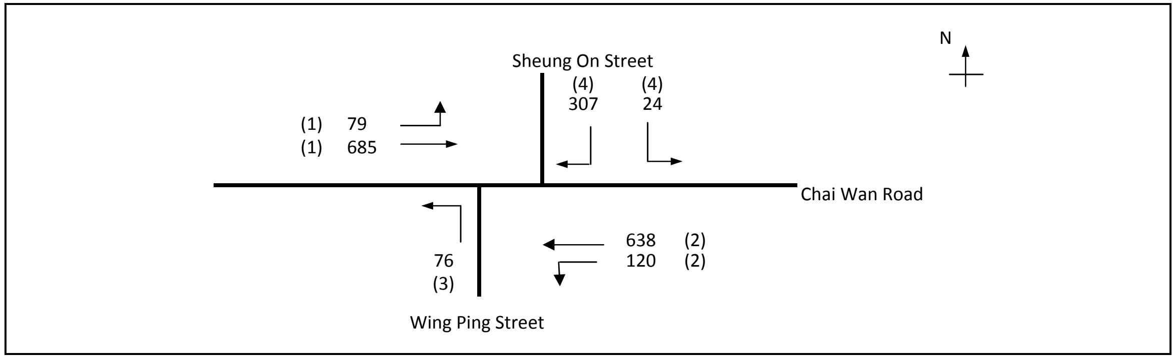


Stage A	I = 6	Stage B	I = 6	Stage C	I =

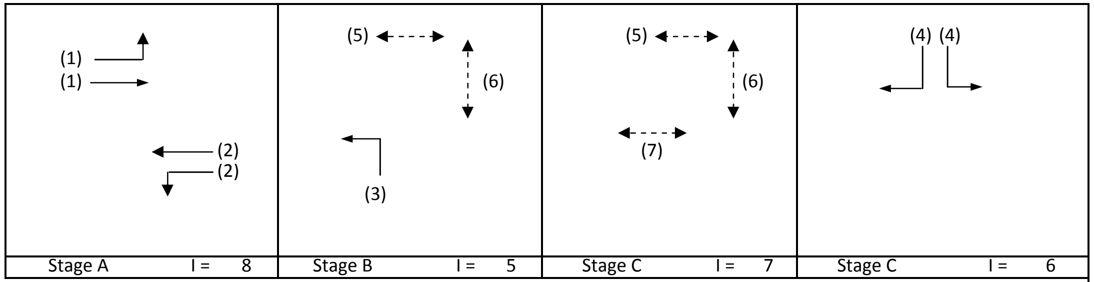
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		845		845	0.00	4070			4070	0.208	0.208		41	47	0.442	36	11
ST	A	3.50	1	2	10		N	4070		482		482	0.00	4070			4070	0.118			24	47	0.252	21	11
LT	B	3.00	2	1	10		N	1915	406			406	1.00	1665			1665	0.244	0.244		49	53	0.460	30	9
RT	B	3.50	2	1	12			2105			53	53	1.00	1871			1871	0.028			6	53	0.053	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV3 - Peak Hour Traffic Flows	FILENAME 1_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	120 sec
Sum(y)		Y =	0.264
Loss time		L =	37 sec
Total Flow		=	1929 pcu
Co	= (1.5*L+5)/(1-Y)	=	82.2 sec
Cm	= L/(1-Y)	=	50.3 sec
Yult		=	0.623
R.C.ult	= (Yult-Y)/Y*100%	=	135.9 %
Cp	= 0.9*L/(0.9-Y)	=	52.3 sec
Ymax	= 1-L/C	=	0.692
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	135.9 %



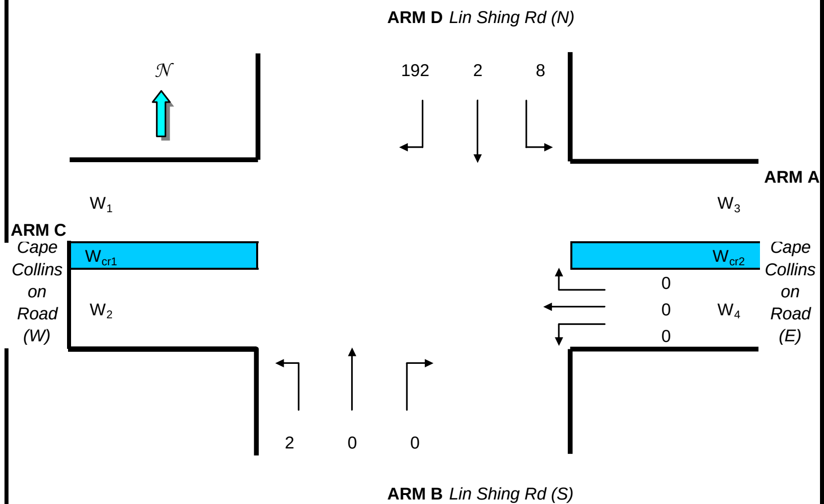
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	79	685		765	0.10	6096			6096	0.125			39		0.000	50	54
LT/ST	A	3.30	2	3	12		Y	6115	120	638		757	0.16	5997			5997	0.126	0.126		40		0.000	50	54
LT	B	3.50	3	1	9		Y	1965	76			76	1.00	1684			1684	0.045	0.045		14		0.000	12	54
LT/RT	D	3.75	4	2	10		y	4120	24		307	331	1.00	3583			3583	0.092	0.092		29		0.000	33	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development a
Junction Capacity Analysis

Prepared By:	KC
Checked By:	OC

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2021 Level 3 - Site 1
Time - Level 3 Peak Hour



GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD		(ARM A)	
$W_{a\text{-}d}$	=	3.00	(metres)
$Vr_{a\text{-}d}$	=	100	(metres)
$q_{a\text{-}b}$	=	0	(pcu/hr)
$q_{a\text{-}c}$	=	0	(pcu/hr)
$q_{a\text{-}d}$	=	0	(pcu/hr)

MAJOR ROAD		(ARM C)	
$W_{c\text{-}b}$	=		(metres)
$Vr_{c\text{-}b}$	=		(metres)
$q_{c\text{-}a}$	=	0	(pcu/hr)
$q_{c\text{-}b}$	=	0	(pcu/hr)
$q_{c\text{-}d}$	=	0	(pcu/hr)

MINOR ROAD		(ARM B)	
$W_{b\text{-}a}$	=	5.00	(metres)
$W_{b\text{-}c}$	=	5.00	(metres)
$Vl_{b\text{-}a}$	=	100	(metres)
$Vr_{b\text{-}a}$	=	65	(metres)
$Vr_{b\text{-}c}$	=	0	(metres)
$q_{b\text{-}a}$	=	0	(pcu/hr)
$q_{b\text{-}c}$	=	2.1151	(pcu/hr)
$q_{b\text{-}d}$	=	0	(pcu/hr)

MINOR ROAD		(ARM D)	
$W_{d\text{-}a}$	=	3.00	(metres)
$W_{d\text{-}c}$	=	3.00	(metres)
$Vl_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}a}$	=	80	(metres)
$q_{d\text{-}a}$	=	8.4602	(pcu/hr)
$q_{d\text{-}b}$	=	2.1151	(pcu/hr)
$q_{d\text{-}c}$	=	191.92	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

$Q_{b\text{-}a}$	=	619
$Q_{b\text{-}c}$	=	749
$Q_{b\text{-}d}$ is nearside	=	TRUE
$Q_{b\text{-}d}$	=	611
$Q_{d\text{-}a}$	=	674
$Q_{d\text{-}b}$ is nearside	=	TRUE
$Q_{d\text{-}b}$	=	533
$Q_{d\text{-}c}$	=	518
$Q_{c\text{-}b}$	=	437
$Q_{a\text{-}d}$	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

$DFC_{b\text{-}a}$	=	0.000
$DFC_{b\text{-}c}$	=	0.003
$DFC_{b\text{-}d}$	=	0.000
$DFC_{d\text{-}a}$	=	0.013
$DFC_{d\text{-}b}$	=	0.004
$DFC_{d\text{-}c}$	=	0.370
$DFC_{c\text{-}b}$	=	0.000
$DFC_{a\text{-}d}$	=	0.000

Critical DFC = 0.370

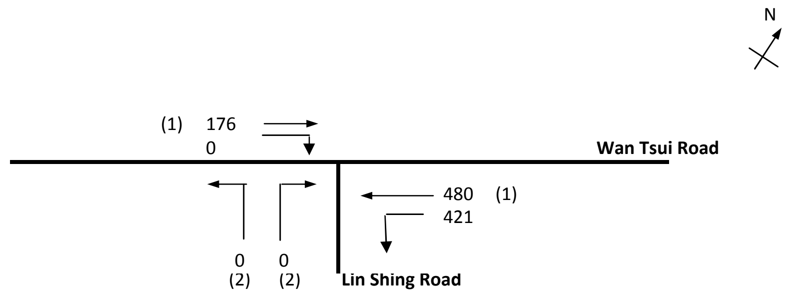
REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{a\text{-}d}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$W_{d\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
$W_{d\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
$Vr_{a\text{-}d}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
$Vl_{d\text{-}c}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

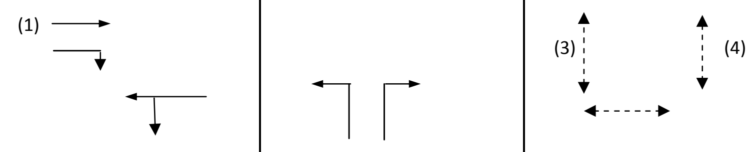
TRAFFIC SIGNAL CALCULATION

TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan	PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J2: Junction of Lin Shing Road and Wan Tsui Road — J2LV3 - Peak Hour Traffic Flows	FILENAME :1_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 3 Peak Hour - Site 1	REFERENCE NO.:	Reviewed By:	OC	3-5-2011

(INITIALS / DATE)



No. of stages per cycle		N =	2
Cycle time		C =	120 sec
Sum(y)		Y =	0.478
Loss time		L =	25 sec
Total Flow		=	1076 pcu
Co	= (1.5*L+5)/(1-Y)	=	81.4 sec
Cm	= L/(1-Y)	=	47.9 sec
Yult		=	0.713
R.C.ult	= (Yult-Y)/Y*100%	=	49.0 %
Cp	= 0.9*L/(0.9-Y)	=	53.3 sec
Ymax	= 1-L/C	=	0.792
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	49.0 %



Stage A	I = 7	Stage B	I =	Stage C	I =

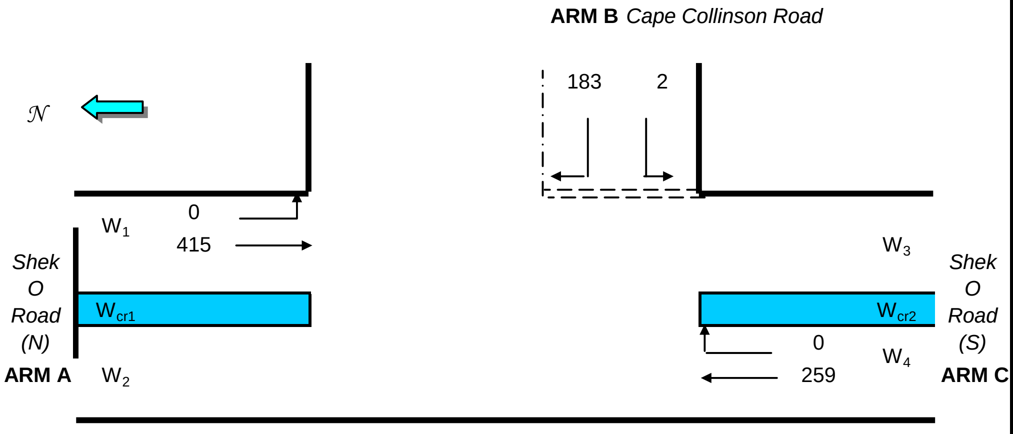
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
ST	A	3.00	1	1			N	1915		176		176	0.00	1915			1915	0.092		5	18	95	0.116	6	2
ST/LT	A	4.00	1	1	10		N	2015	421	480		900	0.47	1883			1883	0.478	0.478		95	95	0.604	36	3
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at (
Junction Capacity Analysis

Prepared By:	KC
Checked By:	OC

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2021 Level 3 - Site 1
Time - Level 3 Peak Hour



GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	414.55	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	259.09	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	183.31	(pcu/hr)
q_{b-c}	=	2.1151	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	636
Q_{c-b}	=	708
Q_{b-a}	=	300

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	0.612
DFC_{b-c}	=	0.003
DFC_{c-b}	=	0.000

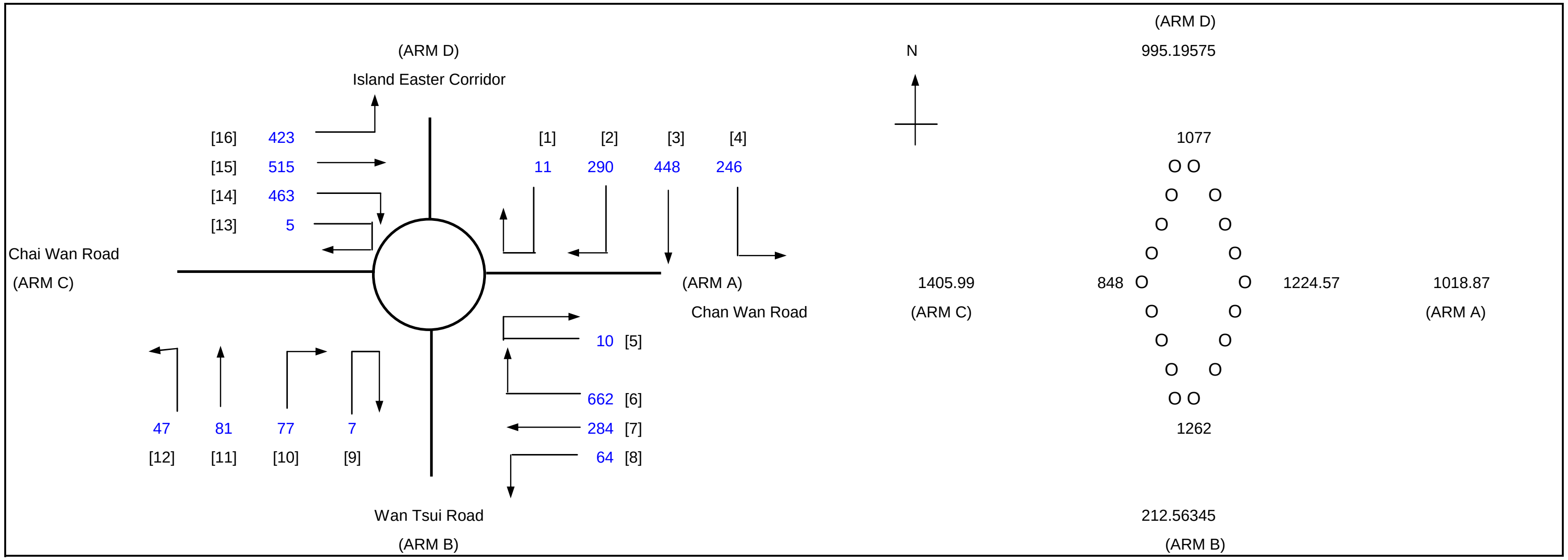
Critical DFC = 0.612

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

ROUNDABOUT CAPACITY ASSESSMENT

				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	J4LV3 Peak Hour	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME: 1_LV3_Sen1_S1_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV3 Peak Hour			REVIEWED BY:	OC	Sep-13



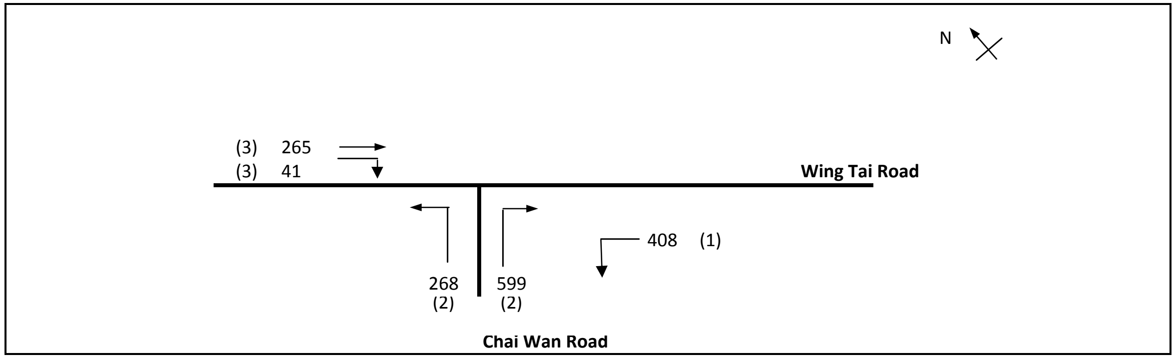
ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	1019	213	1406	995
Qc	=	Circulating flow across entry (pcu/h)	1225	1262	848	1077
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1540	771	1837	1393
DFC	=	Design flow/Capacity = Q/Qe	0.66	0.28	0.77	0.71

Total In Sum = 2853.32 PCU

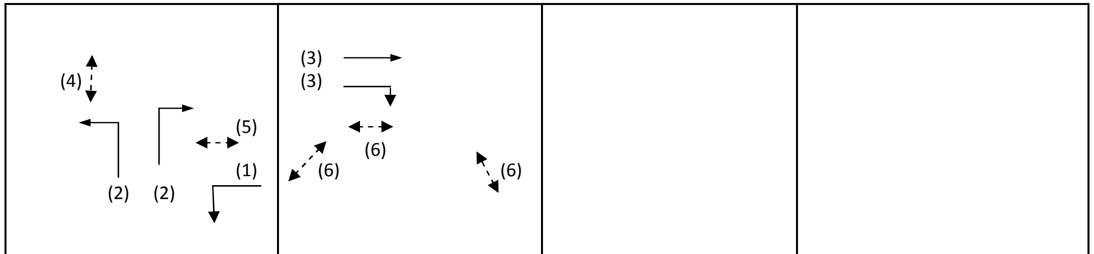
DFC of Critical Approach = 0.77

TRAFFIC SIGNAL CALCULATION

				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV3 - Peak Hour Traffic Flows	FILENAME :1_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.232	
Loss time		L =	10	sec
Total Flow		=	1582	pcu
Co	= (1.5*L+5)/(1-Y)	=	26.1	sec
Cm	= L/(1-Y)	=	13.0	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	254.9	%
Cp	= 0.9*L/(0.9-Y)	=	13.5	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	248.5	%



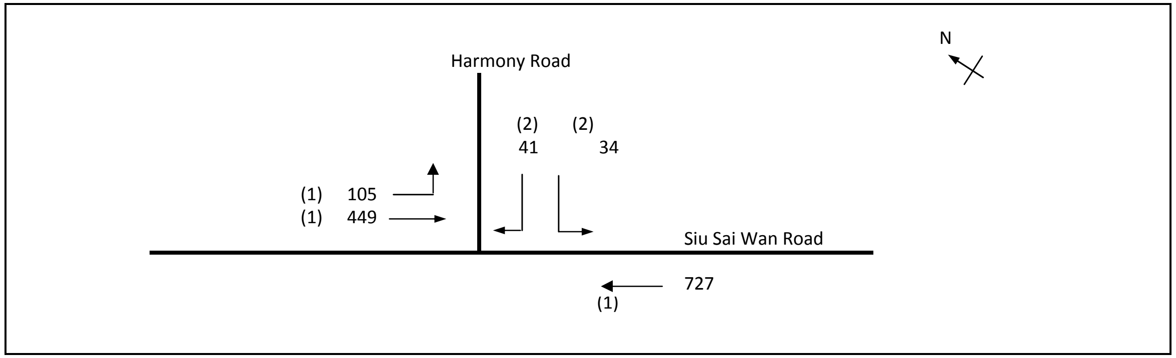
Stage A I = 7 | Stage B I = 5

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	408			408	1.00	3857			3857	0.106			41	65	0.163	9	5
LT	A	4.00	2	2	24			4310	268			268	1.00	4056			4056	0.066			26	65	0.102	6	5
RT	A	3.50	2	2	11		y	4070			599	599	1.00	3582			3582	0.167	0.167		65	65	0.258	15	5
ST	B	3.50	3	2			y	4070		265		265	0.00	4070			4070	0.065	0.065		25	25	0.258	15	24
RT	B	4.50	3	2	13		y	4270			41	41	1.00	3828			3828	0.011			4	25	0.043	0	25
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

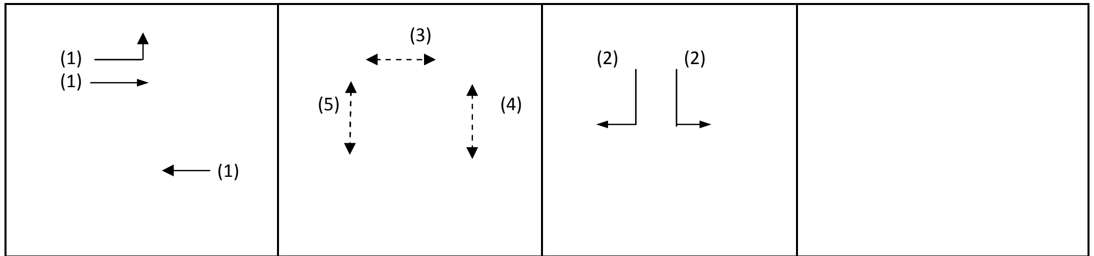
NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION

				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV3 - Peak Hour Traffic Flows	FILENAME :1_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	100	sec
Sum(y)		Y =	0.205	
Loss time		L =	48	sec
Total Flow		=	1356	pcu
Co	= (1.5*L+5)/(1-Y)	=	96.8	sec
Cm	= L/(1-Y)	=	60.4	sec
Yult		=	0.540	
R.C.ult	= (Yult-Y)/Y*100%	=	163.5	%
Cp	= 0.9*L/(0.9-Y)	=	62.1	sec
Ymax	= 1-L/C	=	0.520	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	128.4	%

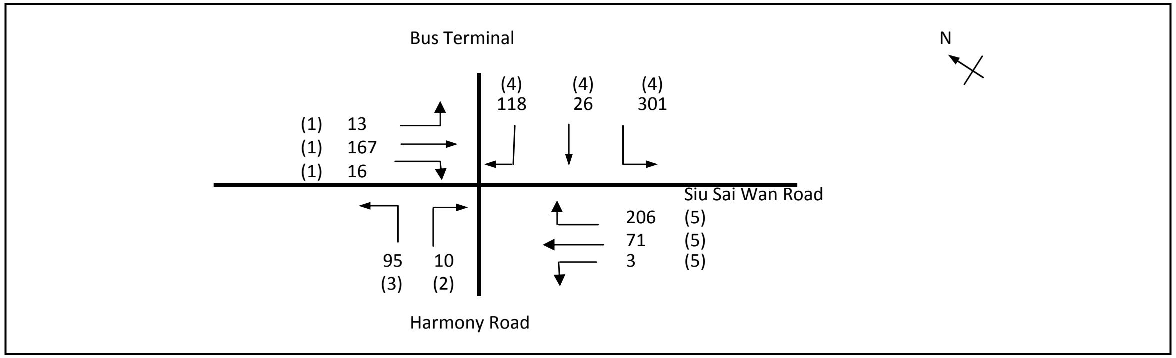


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

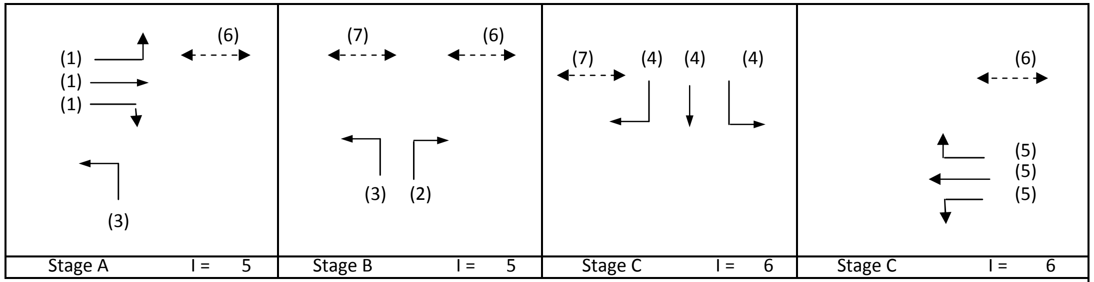
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	105	152		257	0.41	1843			1843	0.139			35	46	0.300	18	12
ST	A	3.20	1	1				2075		297		297	0.00	2075			2075	0.143			36	46	0.308	24	12
ST	A	3.00	1	2			y	3970		727		727	0.00	3970			3970	0.183	0.183		46	46	0.394	30	11
LT	C	3.75	2	1	12		y	1990	34			34	1.00	1769			1769	0.019			5	6	0.346	0	48
RT	C	3.75	2	1	12			2130			41	41	1.00	1893			1893	0.022	0.022		6	6	0.394	6	49
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV3 - Peak Hour Traffic Flows	FILENAME :1_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



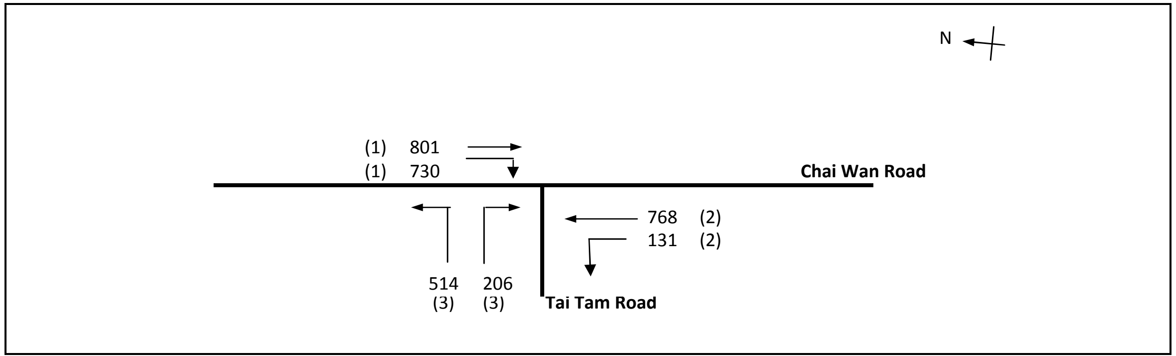
No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.351
Loss time		L =	18 sec
Total Flow		=	1027 pcu
Co	= (1.5*L+5)/(1-Y)	=	49.3 sec
Cm	= L/(1-Y)	=	27.7 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	117.9 %
Cp	= 0.9*L/(0.9-Y)	=	29.5 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	112.4 %



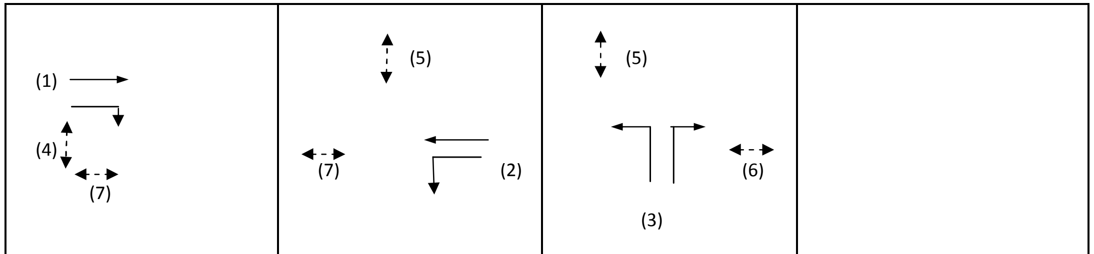
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	13	81		94	0.14	1910			1910	0.049			12	12	0.417	12	40
ST/RT	A	3.30	1	1	12			2085		86	16	102	0.16	2045			2045	0.050	0.050		12	12	0.424	12	40
RT	B	3.50	2	1	12			2105			10	10	1.00	1871			1871	0.005	0.005		1	1	0.424	0	99
LT	A,B	3.75	3	1	13		y	1990	95			95	1.00	1784			1784	0.053			13	19	0.301	12	32
RT	C	3.50	4	1	12			2105			118	118	1.00	1871			1871	0.063			16	46	0.144	6	14
LT/ST	C	3.50	4	1	12		y	1965	301	26		328	0.92	1762			1762	0.186	0.186		46	46	0.424	30	14
ST/RT	D	3.50	5	1	12			2105			206	206	1.00	1871			1871	0.110	0.110		27	27	0.424	24	25
LT/ST	D	3.50	5	1	11		y	1965	3	71		74	0.04	1954			1954	0.038			9	9	0.424	6	45
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV3 - Peak Hour Traffic Flows	FILENAME :1_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	105	sec
Sum(y)		Y =	0.756	
Loss time		L =	18	sec
Total Flow		=	3150	pcu
Co	= (1.5*L+5)/(1-Y)	=	131.4	sec
Cm	= L/(1-Y)	=	73.9	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	1.1	%
Cp	= 0.9*L/(0.9-Y)	=	112.8	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	-1.4	%



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.75	1	2			y	4120		801		801	0.00	4120			4120	0.194			22	22	0.913	54	42
RT	A	3.00	1	1	13			2055			730	730	1.00	1842			1842	0.396	0.396		46	22	1.861	96	41
ST	B	3.50	2	2				4210		768		768	0.00	4210			4210	0.182	0.182		21	21	0.913	54	43
LT	B	3.10	2	1	12		y	1925	131			131	1.00	1711			1711	0.076			9	21	0.382	18	31
LT	C	4.00	3	1	15		y	2015	372			372	1.00	1832			1832	0.203			23	23	0.913	60	35
LT/RT	C	4.00	3	1	15			2155	142		206	348	1.00	1959			1959	0.178	0.178		20	23	0.799	42	38
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at (

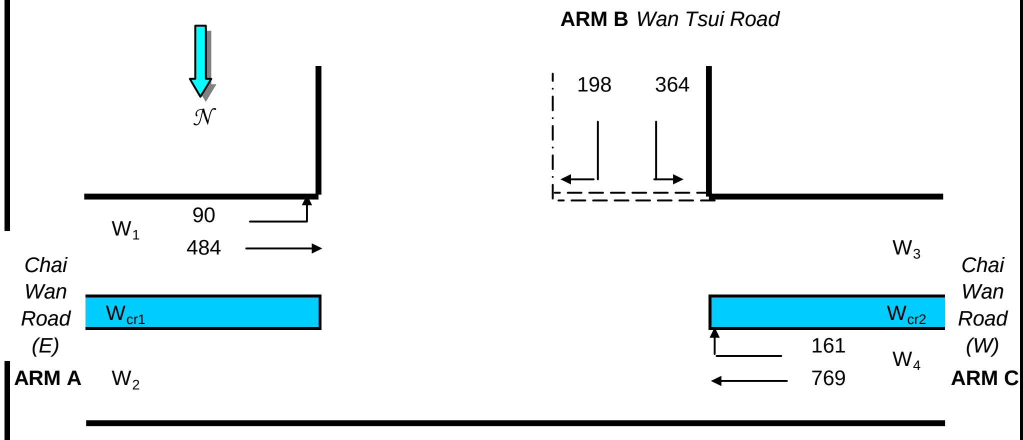
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road

Design Year - 2021 Level 3 - Site 1

Time - Level 3 Peak Hour



GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	89.89	(pcu/hr)
q_{a-c}	=	484.41	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	768.88	(pcu/hr)
q_{c-b}	=	160.74	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	197.51	(pcu/hr)
q_{b-c}	=	363.57	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	759
Q_{c-b}	=	673
Q_{b-a}	=	353

COMPARISION OF DESIGN FLOW TO CAPACITY

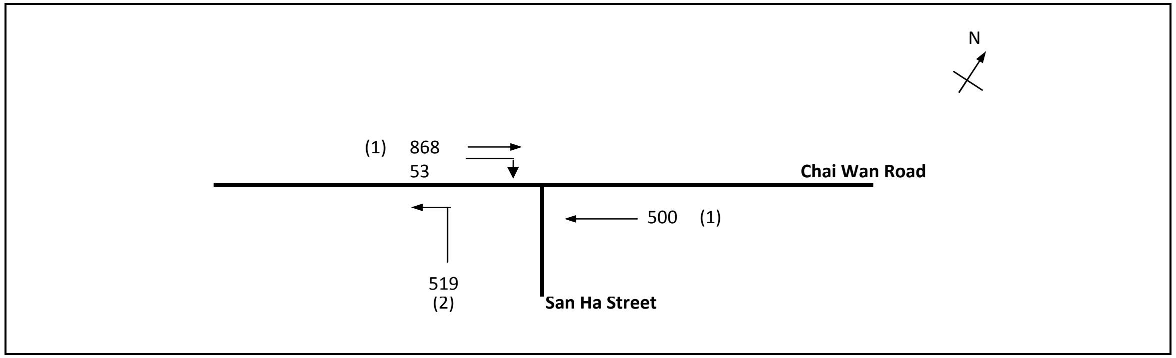
DFC_{b-a}	=	0.559
DFC_{b-c}	=	0.479
DFC_{c-b}	=	0.239

Critical DFC = 0.559

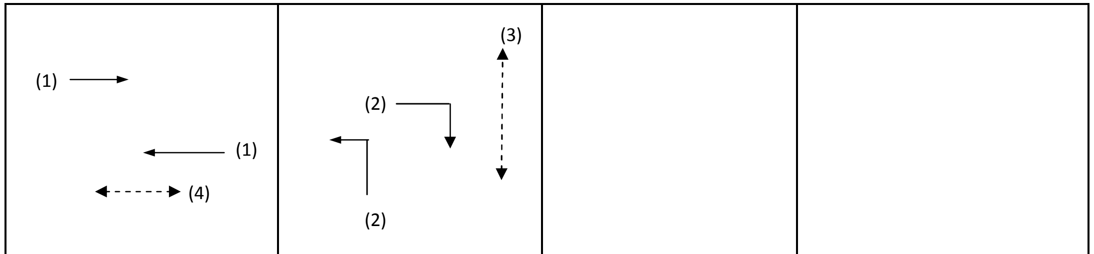
REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV3 - Peak Hour Traffic Flows	FILENAME :1_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.525	
Loss time		L =	10	sec
Total Flow		=	1940	pcu
Co	= (1.5*L+5)/(1-Y)	=	42.1	sec
Cm	= L/(1-Y)	=	21.1	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	57.1	%
Cp	= 0.9*L/(0.9-Y)	=	24.0	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	54.3	%

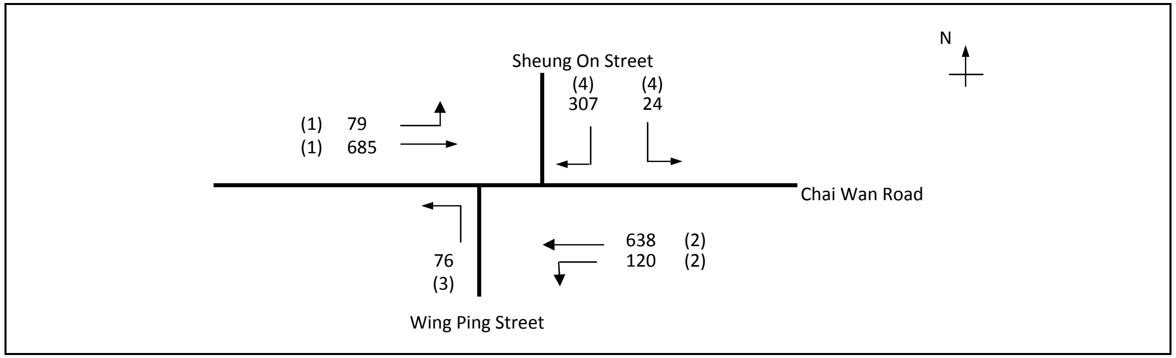


Stage A	I = 6	Stage B	I = 6	Stage C	I =	

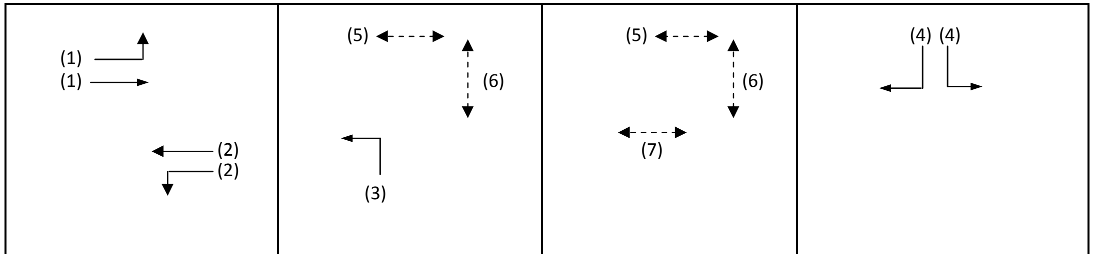
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		868		868	0.00	4070			4070	0.213	0.213		37	47	0.454	36	11
ST	A	3.50	1	2	10		N	4070		500		500	0.00	4070			4070	0.123			21	47	0.261	21	11
LT	B	3.00	2	1	10		N	1915	519			519	1.00	1665			1665	0.312	0.312		53	53	0.588	36	9
RT	B	3.50	2	1	12			2105			53	53	1.00	1871			1871	0.028			5	53	0.053	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV3 - Peak Hour Traffic Flows	FILENAME :1_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	120 sec
Sum(y)		Y =	0.264
Loss time		L =	37 sec
Total Flow		=	1929 pcu
Co	= (1.5*L+5)/(1-Y)	=	82.2 sec
Cm	= L/(1-Y)	=	50.3 sec
Yult		=	0.623
R.C.ult	= (Yult-Y)/Y*100%	=	135.9 %
Cp	= 0.9*L/(0.9-Y)	=	52.3 sec
Ymax	= 1-L/C	=	0.692
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	135.9 %



Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	79	685		765	0.10	6096			6096	0.125			39		0.000	50	54
LT/ST	A	3.30	2	3	12		Y	6115	120	638		757	0.16	5997			5997	0.126	0.126		40		0.000	50	54
LT	B	3.50	3	1	9		Y	1965	76			76	1.00	1684			1684	0.045	0.045		14		0.000	12	54
LT/RT	D	3.75	4	2	10		y	4120	24		307	331	1.00	3583			3583	0.092	0.092		29		0.000	33	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

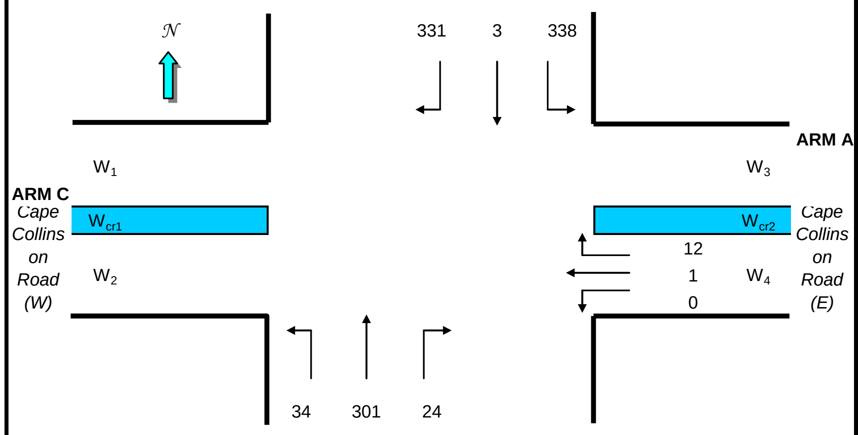
NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Appendix B6

2021 Sensitivity Test 2
Peak Hour Junction Assessment
Calculation Sheets

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2021 Level 1 - Reference Case
Time - Level 1 Peak Hour

ARM D *Lin Shing Rd (N)*



ARM B *Lin Shing Rd (S)*

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{a-d}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
W_{d-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
W_{d-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
Vr_{a-d}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
Vl_{d-c}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

W_{a-d}	=	3.00	(metres)
Vr_{a-d}	=	100	(metres)
q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	1.269	(pcu/hr)
q_{a-d}	=	12.421	(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)
q_{c-d}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	5.00	(metres)
W_{b-c}	=	5.00	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	65	(metres)
Vr_{b-c}	=	0	(metres)
q_{b-a}	=	24.112	(pcu/hr)
q_{b-c}	=	34	(pcu/hr)
q_{b-d}	=	301.26	(pcu/hr)

MINOR ROAD (ARM D)

W_{d-a}	=	3.00	(metres)
W_{d-c}	=	3.00	(metres)
Vl_{d-c}	=	50	(metres)
Vr_{d-c}	=	50	(metres)
Vr_{d-a}	=	80	(metres)
q_{d-a}	=	338	(pcu/hr)
q_{d-b}	=	3	(pcu/hr)
q_{d-c}	=	331	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

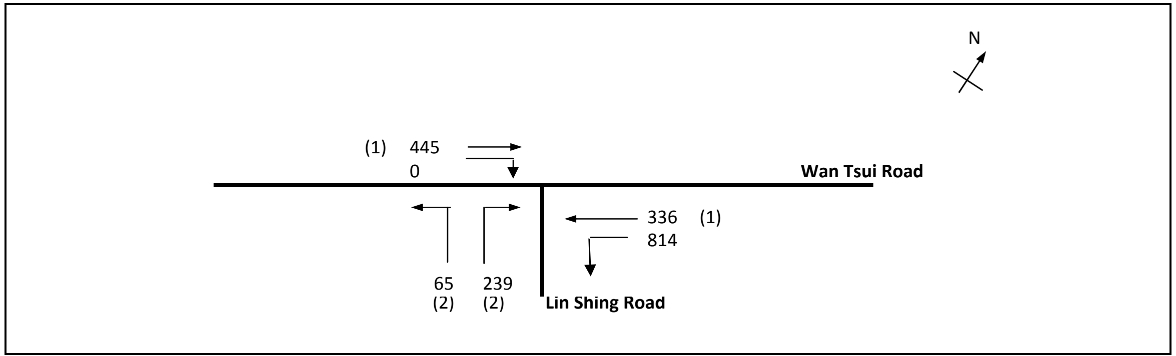
Q_{b-a}	=	496
Q_{b-c}	=	749
Q_{b-d} is nearside	=	TRUE
Q_{b-d}	=	607
Q_{d-a}	=	674
Q_{d-b} is nearside	=	TRUE
Q_{d-b}	=	527
Q_{d-c}	=	431
Q_{c-b}	=	440
Q_{a-d}	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

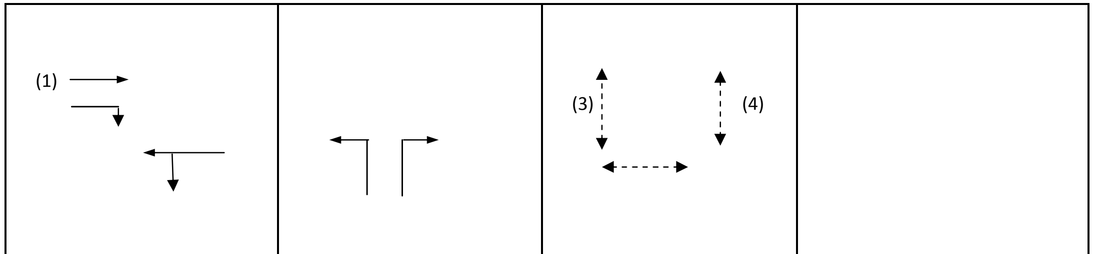
DFC_{b-a}	=	0.049
DFC_{b-c}	=	0.045
DFC_{b-d}	=	0.496
DFC_{d-a}	=	0.501
DFC_{d-b}	=	0.005
DFC_{d-c}	=	0.769
DFC_{c-b}	=	0.000
DFC_{a-d}	=	0.020

Critical DFC = 0.769

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
Junction of Lin Shing Road and Wan Tsui Road	J2LV1 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	120 sec
Sum(y)		Y =	0.631
Loss time		L =	25 sec
Total Flow		=	1596 pcu
Co	= (1.5*L+5)/(1-Y)	=	115.3 sec
Cm	= L/(1-Y)	=	67.8 sec
Yult		=	0.713
R.C.ult	= (Yult-Y)/Y*100%	=	12.8 %
Cp	= 0.9*L/(0.9-Y)	=	83.8 sec
Ymax	= 1-L/C	=	0.792
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	12.8 %



Stage A	I = 7	Stage B	I =	Stage C	I =

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		445		445	0.00	1915			1915	0.233			35	95	0.294	18	2
ST/LT	A	4.00	1	1	10		N	2015	814	336		1150	0.71	1822			1822	0.631	0.631		95	95	0.798	42	5
Ped	B	6.0	3																	20					

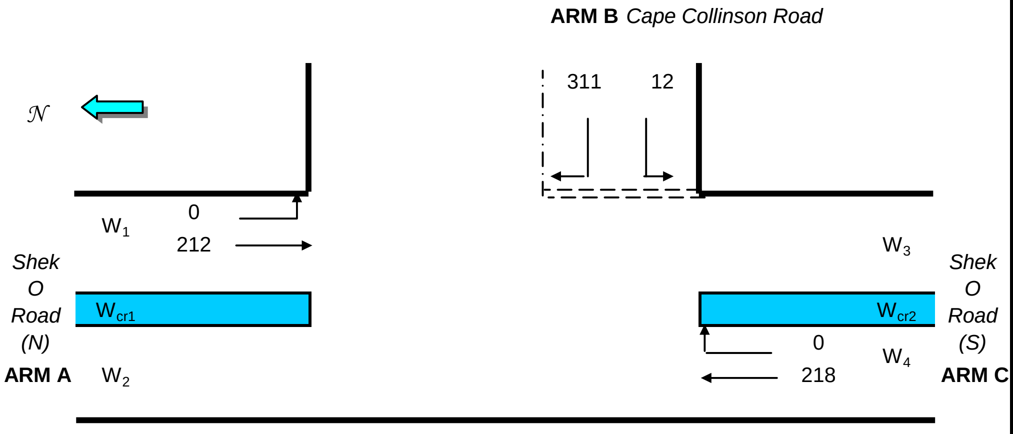
NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at
Junction Capacity Analysis

Prepared By: KC
Checked By:

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2021 Level 1 - Reference Case
Time - Level 1 Peak Hour



GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	212	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	218	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	311	(pcu/hr)
q_{b-c}	=	12	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	688
Q_{c-b}	=	766
Q_{b-a}	=	336

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	0.925
DFC_{b-c}	=	0.018
DFC_{c-b}	=	0.000

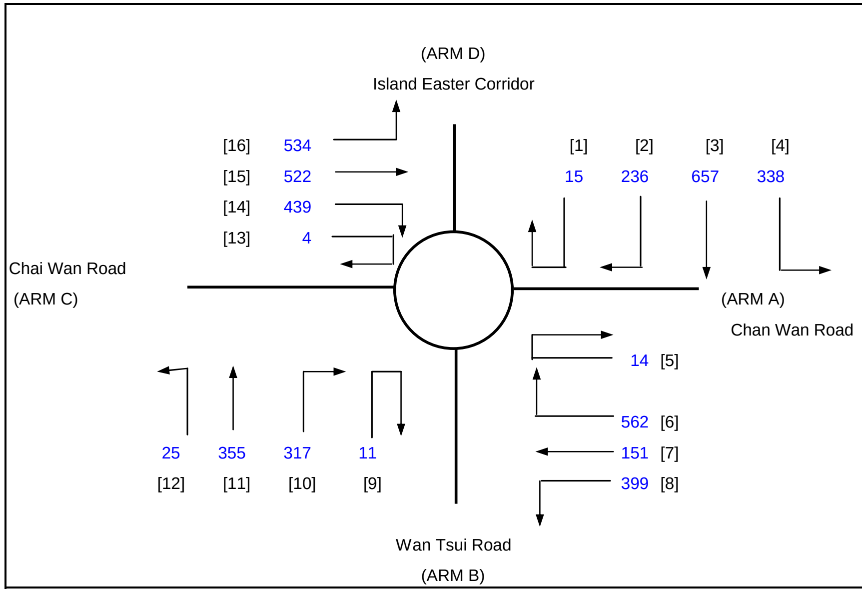
Critical DFC = 0.925

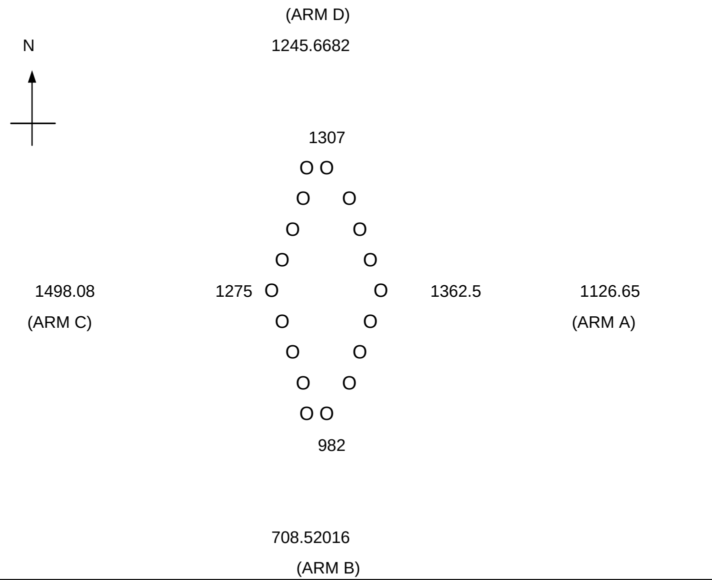
REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

ROUNDABOUT CAPACITY ASSESSMENT

				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	J4LV1 Peak Hour	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME :LV1_Sen2_Ref_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV1 Peak Hour			REVIEWED BY:	OC	Sep-13



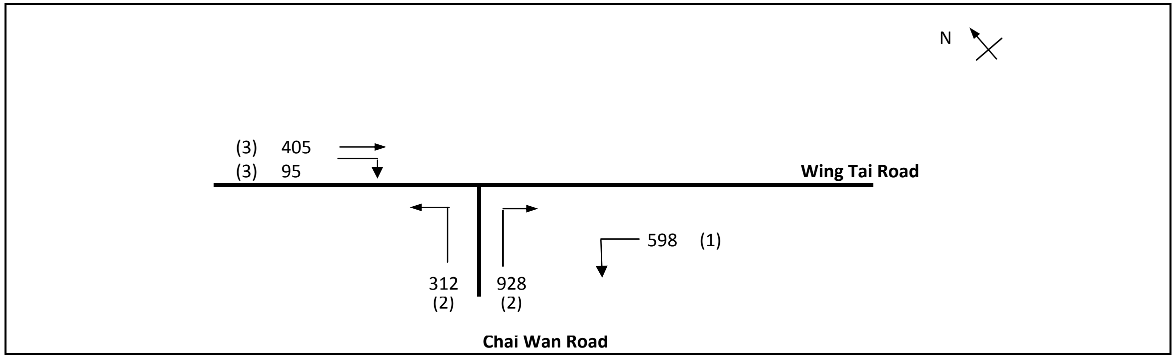


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	1127	709	1498	1246
Qc	=	Circulating flow across entry (pcu/h)	1362	982	1275	1307
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1435	926	1515	1233
DFC	=	Design flow/Capacity = Q/Qe	0.79	0.76	0.99	1.01

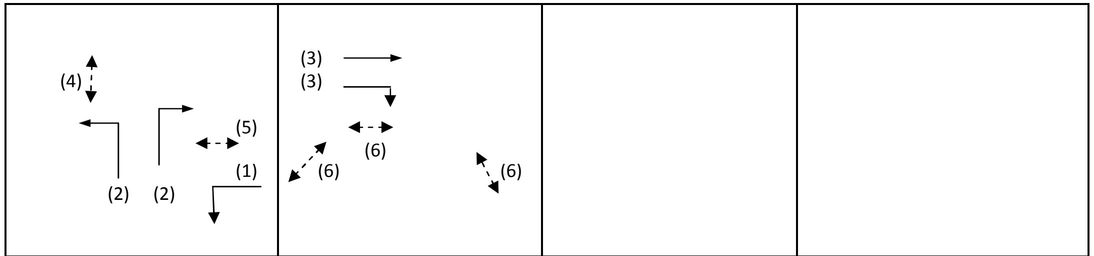
Total In Sum = 3282.95 PCU

DFC of Critical Approach = 1.01

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV1 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.358	
Loss time		L =	10	sec
Total Flow		=	2337	pcu
Co	= (1.5*L+5)/(1-Y)	=	31.2	sec
Cm	= L/(1-Y)	=	15.6	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	130.2	%
Cp	= 0.9*L/(0.9-Y)	=	16.6	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	126.0	%

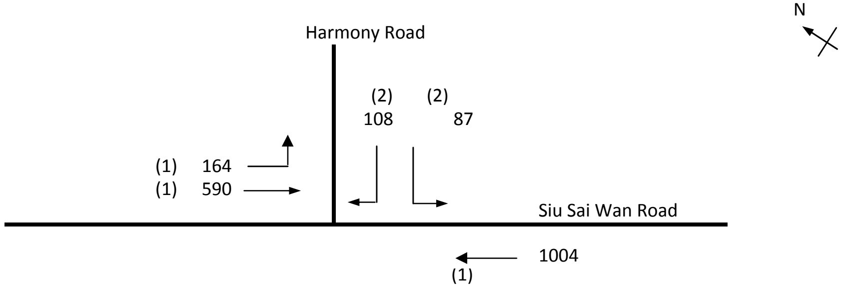


Stage A I = 7 | Stage B I = 5

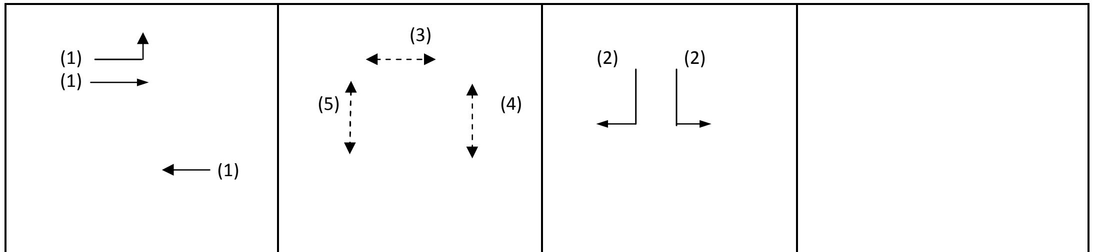
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	598			598	1.00	3857			3857	0.155			39	65	0.238	15	5
LT	A	4.00	2	2	24			4310	312			312	1.00	4056			4056	0.077			19	65	0.118	9	5
RT	A	3.50	2	2	11		y	4070			928	928	1.00	3582			3582	0.259	0.259		65	65	0.398	27	5
ST	B	3.50	3	2			y	4070		405		405	0.00	4070			4070	0.099	0.099		25	25	0.398	24	24
RT	B	4.50	3	2	13		y	4270			95	95	1.00	3828			3828	0.025			6	25	0.100	3	25
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV1 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	100	sec
Sum(y)		Y =	0.310	
Loss time		L =	48	sec
Total Flow		=	1952	pcu
Co	= (1.5*L+5)/(1-Y)	=	111.6	sec
Cm	= L/(1-Y)	=	69.6	sec
Yult		=	0.540	
R.C.ult	= (Yult-Y)/Y*100%	=	74.2	%
Cp	= 0.9*L/(0.9-Y)	=	73.2	sec
Ymax	= 1-L/C	=	0.520	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	51.0	%

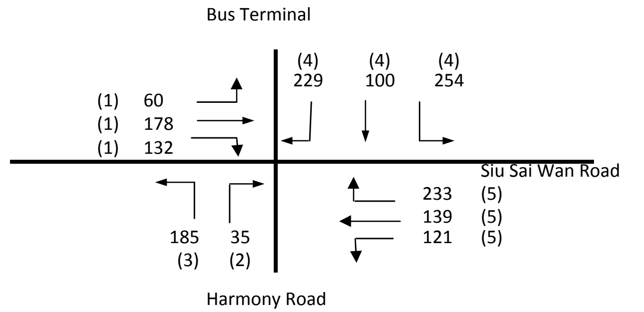


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

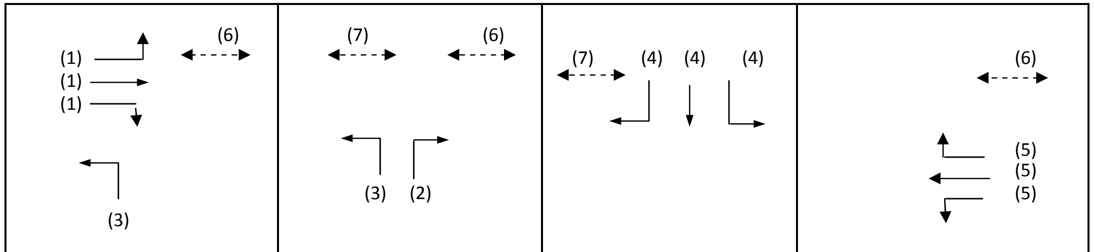
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	164	152		316	0.52	1817			1817	0.174			29	42	0.410	30	14
ST	A	3.20	1	1				2075		438		438	0.00	2075			2075	0.211			35	42	0.497	36	14
ST	A	3.00	1	2			y	3970		1004		1004	0.00	3970			3970	0.253	0.253		42	42	0.596	48	13
LT	C	3.75	2	1	12		y	1990	87			87	1.00	1769			1769	0.049			8	10	0.513	12	45
RT	C	3.75	2	1	12			2130			108	108	1.00	1893			1893	0.057	0.057		10	10	0.596	12	48
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV1 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.474
Loss time		L =	18 sec
Total Flow		=	1666 pcu
Co	= (1.5*L+5)/(1-Y)	=	60.8 sec
Cm	= L/(1-Y)	=	34.2 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	61.6 %
Cp	= 0.9*L/(0.9-Y)	=	38.0 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	57.5 %

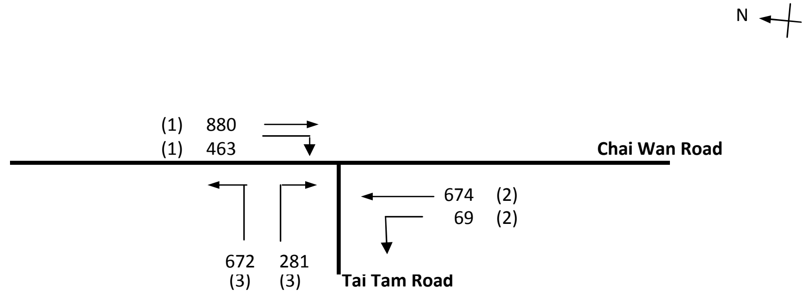


Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

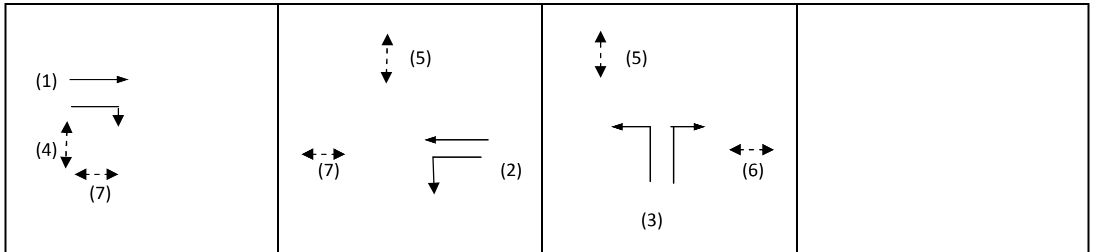
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	60	81		141	0.43	1838			1838	0.077			14	22	0.373	18	30
ST/RT	A	3.30	1	1	12			2085		97	132	228	0.58	1945			1945	0.117	0.117		22	22	0.572	30	32
RT	B	3.50	2	1	12			2105			35	35	1.00	1871			1871	0.019	0.019		3	3	0.572	6	78
LT	A,B	3.75	3	1	13		y	1990	185			185	1.00	1784			1784	0.104			19	30	0.362	18	23
RT	C	3.50	4	1	12			2105			229	229	1.00	1871			1871	0.123			23	36	0.357	24	19
LT/ST	C	3.50	4	1	12		y	1965	254	100		354	0.72	1803			1803	0.196	0.196		36	36	0.572	36	20
ST/RT	D	3.50	5	1	12			2105		0	233	233	1.00	1871			1871	0.125			23	23	0.572	30	31
LT/ST	D	3.50	5	1	11		y	1965	121	139		260	0.47	1848			1848	0.141	0.141		26	26	0.572	30	28
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV1 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	105	sec
Sum(y)		Y =	0.683	
Loss time		L =	18	sec
Total Flow		=	3038	pcu
Co	= (1.5*L+5)/(1-Y)	=	101.0	sec
Cm	= L/(1-Y)	=	56.8	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	12.0	%
Cp	= 0.9*L/(0.9-Y)	=	74.7	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	9.2	%



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

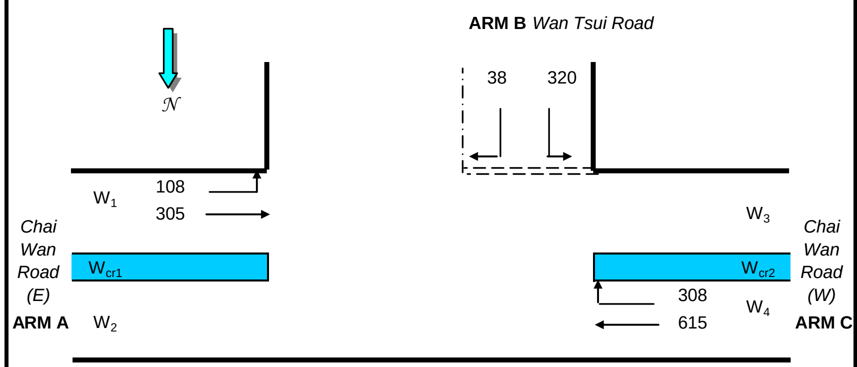
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		880		880	0.00	4070			4070	0.216			28	28	0.824	54	27
RT	A	3.50	1	1	13			2105			463	463	1.00	1887			1887	0.245	0.245		31	28	0.936	78	33
ST	B	3.50	2	2				4210		674		674	0.00	4210			4210	0.160	0.160		20	20	0.824	45	35
LT	B	3.10	2	1	12		y	1925	69			69	1.00	1711			1711	0.040			5	20	0.206	6	31
LT	C	4.00	3	1	15		y	2015	509			509	1.00	1832			1832	0.278	0.278		35	35	0.824	54	27
LT/RT	C	4.00	3	1	15			2155	163		281	444	1.00	1959			1959	0.227			29	35	0.673	48	21
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow **Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at**
Junction Capacity Analysis

Prepared By: KC
Checked By:

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road
Design Year - 2021 Level 1 - Reference Case
Time - Level 1 Peak Hour



GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	107.87	(pcu/hr)
q_{a-c}	=	305	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	615	(pcu/hr)
q_{c-b}	=	308.38	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	38	(pcu/hr)
q_{b-c}	=	320	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	781
Q_{c-b}	=	692
Q_{b-a}	=	358

COMPARISION OF DESIGN FLOW TO CAPACITY

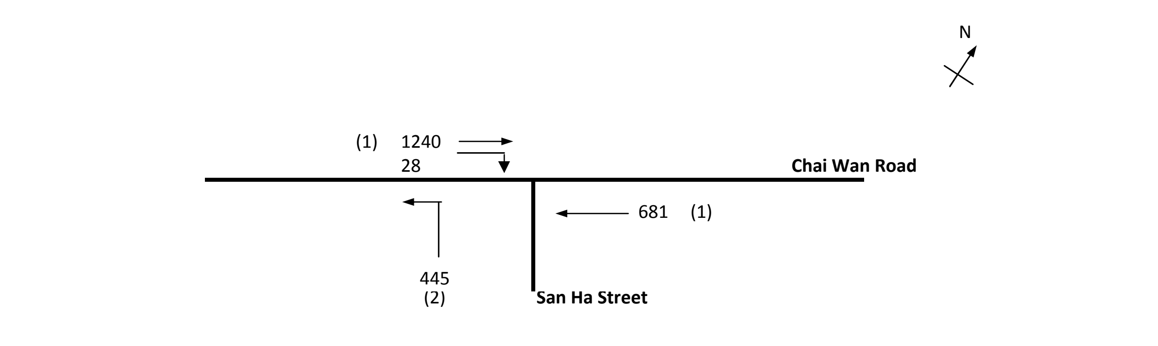
DFC_{b-a}	=	0.106
DFC_{b-c}	=	0.409
DFC_{c-b}	=	0.446

Critical DFC = 0.446

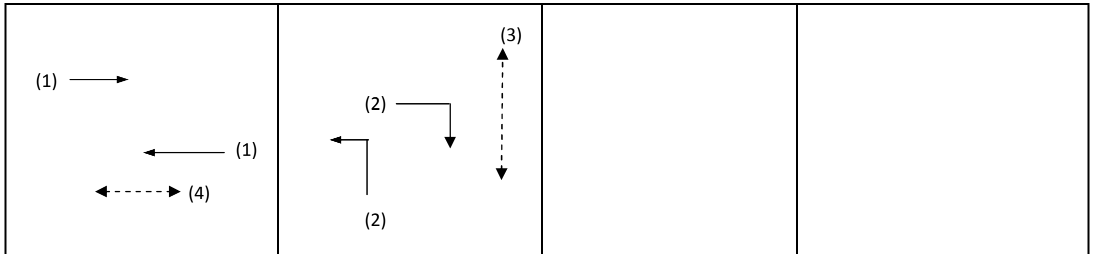
REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV1 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.572	
Loss time		L =	10	sec
Total Flow		=	2394	pcu
Co	= (1.5*L+5)/(1-Y)	=	46.7	sec
Cm	= L/(1-Y)	=	23.4	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	44.2	%
Cp	= 0.9*L/(0.9-Y)	=	27.4	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	41.6	%

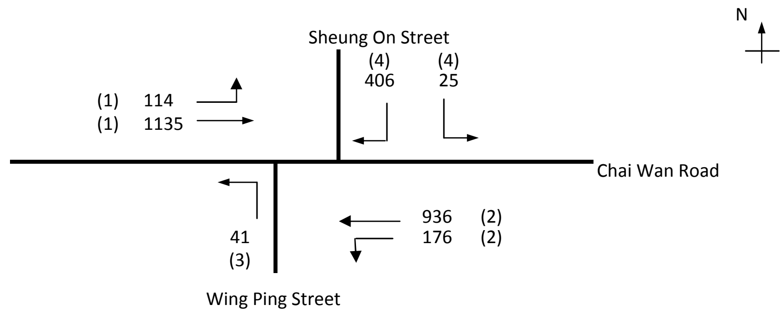


Stage A	I = 6	Stage B	I = 6	Stage C	I =

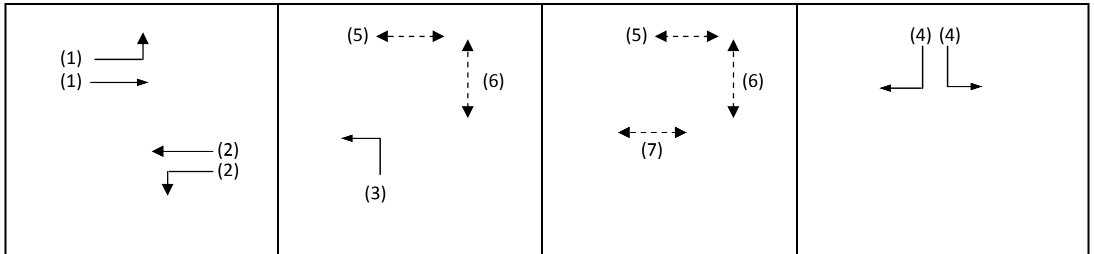
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		1240		1240	0.00	4070			4070	0.305	0.305		48	47	0.648	54	10
ST	A	3.50	1	2	10		N	4070		681		681	0.00	4070			4070	0.167			26	47	0.356	30	11
LT	B	3.00	2	1	10		N	1915	445			445	1.00	1665			1665	0.267	0.267		42	53	0.505	30	9
RT	B	3.50	2	1	12			2105			28	28	1.00	1871			1871	0.015			2	53	0.028	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV1 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 1 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	120 sec
Sum(y)		Y =	0.349
Loss time		L =	37 sec
Total Flow		=	2833 pcu
Co	= (1.5*L+5)/(1-Y)	=	92.9 sec
Cm	= L/(1-Y)	=	56.8 sec
Yult		=	0.623
R.C.ult	= (Yult-Y)/Y*100%	=	78.3 %
Cp	= 0.9*L/(0.9-Y)	=	60.4 sec
Ymax	= 1-L/C	=	0.692
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	78.3 %



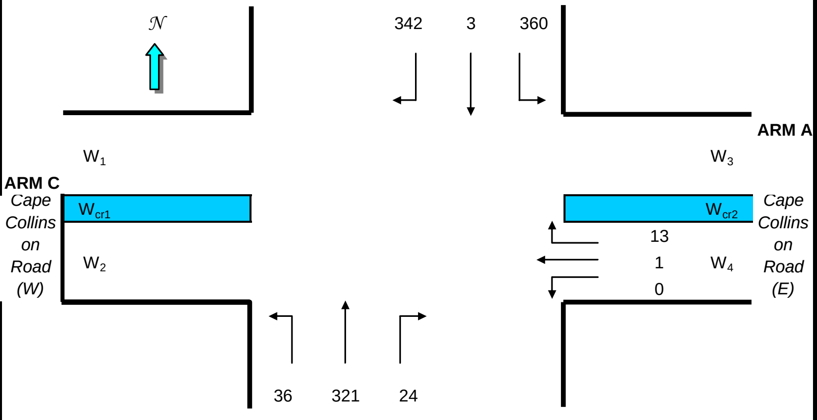
Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	114	1135		1249	0.09	6105			6105	0.205	0.205		49		0.000	82	54
LT/ST	A	3.30	2	3	12		Y	6115	176	936		1112	0.16	5996			5996	0.185			44		0.000	74	54
LT	B	3.50	3	1	9		Y	1965	41			41	1.00	1684			1684	0.024	0.024		6		0.000	6	54
LT/RT	D	3.75	4	2	10		y	4120	25		406	431	1.00	3583			3583	0.120	0.120		29		0.000	42	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2021 Level 1 - Site 1
Time - Level 1 Peak Hour

ARM D *Lin Shing Rd (N)*



ARM B *Lin Shing Rd (S)*

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{a-d}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
W_{d-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
W_{d-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
Vr_{a-d}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
Vl_{d-c}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

W_{a-d}	=	3.00	(metres)
Vr_{a-d}	=	100	(metres)
q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	1.269	(pcu/hr)
q_{a-d}	=	13.421	(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)
q_{c-d}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	5.00	(metres)
W_{b-c}	=	5.00	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	65	(metres)
Vr_{b-c}	=	0	(metres)
q_{b-a}	=	24.112	(pcu/hr)
q_{b-c}	=	35.726	(pcu/hr)
q_{b-d}	=	320.6	(pcu/hr)

MINOR ROAD (ARM D)

W_{d-a}	=	3.00	(metres)
W_{d-c}	=	3.00	(metres)
Vl_{d-c}	=	50	(metres)
Vr_{d-c}	=	50	(metres)
Vr_{d-a}	=	80	(metres)
q_{d-a}	=	360.26	(pcu/hr)
q_{d-b}	=	2.929	(pcu/hr)
q_{d-c}	=	341.8	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

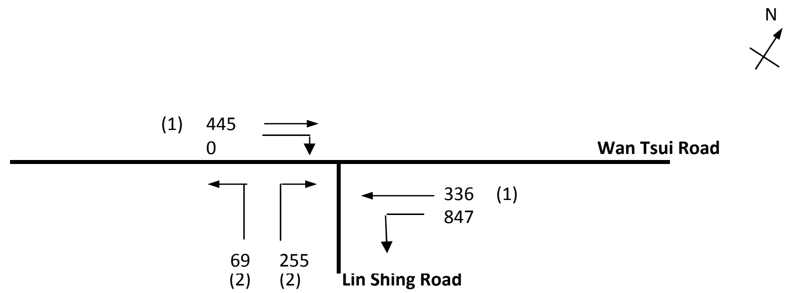
Q_{b-a}	=	487
Q_{b-c}	=	749
Q_{b-d} is nearside	=	TRUE
Q_{b-d}	=	607
Q_{d-a}	=	674
Q_{d-b} is nearside	=	TRUE
Q_{d-b}	=	526
Q_{d-c}	=	426
Q_{c-b}	=	440
Q_{a-d}	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

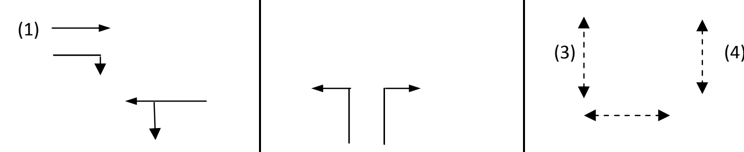
DFC_{b-a}	=	0.050
DFC_{b-c}	=	0.048
DFC_{b-d}	=	0.528
DFC_{d-a}	=	0.534
DFC_{d-b}	=	0.006
DFC_{d-c}	=	0.803
DFC_{c-b}	=	0.000
DFC_{a-d}	=	0.022

Critical DFC = 0.803

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: GK	29-4-2011
J2: Junction of Lin Shing Road and Wan Tsui Road	J2LV1 - Peak Hour Traffic Flows	FILENAME :n2_S1_J2_J5_J6_J7_J8.xls	Checked By: KC	29-4-2011
2021 Ching Ming Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	120 sec
Sum(y)		Y =	0.650
Loss time		L =	25 sec
Total Flow		=	1629 pcu
Co	= (1.5*L+5)/(1-Y)	=	121.6 sec
Cm	= L/(1-Y)	=	71.5 sec
Yult		=	0.713
R.C.ult	= (Yult-Y)/Y*100%	=	9.6 %
Cp	= 0.9*L/(0.9-Y)	=	90.1 sec
Ymax	= 1-L/C	=	0.792
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	9.6 %



Stage A	I = 7	Stage B	I =	Stage C	I =	

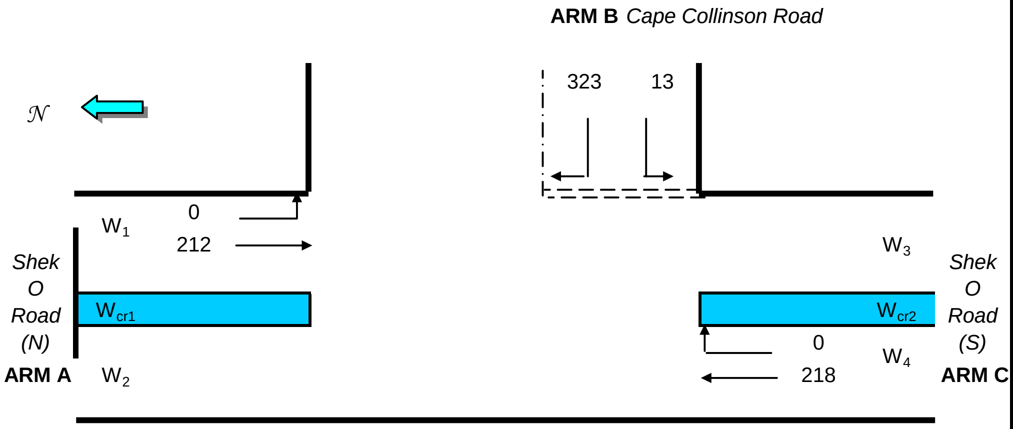
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		445		445	0.00	1915			1915	0.233			34	95	0.294	18	2
ST/LT	A	4.00	1	1	10		N	2015	847	336		1183	0.72	1820			1820	0.650	0.650		95	95	0.822	48	6
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at (
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2021 Level 1 - Site 1
Time - Level 1 Peak Hour



GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	211.93	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	218.27	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	322.98	(pcu/hr)
q_{b-c}	=	13.189	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	688
Q_{c-b}	=	766
Q_{b-a}	=	336

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	0.961
DFC_{b-c}	=	0.019
DFC_{c-b}	=	0.000

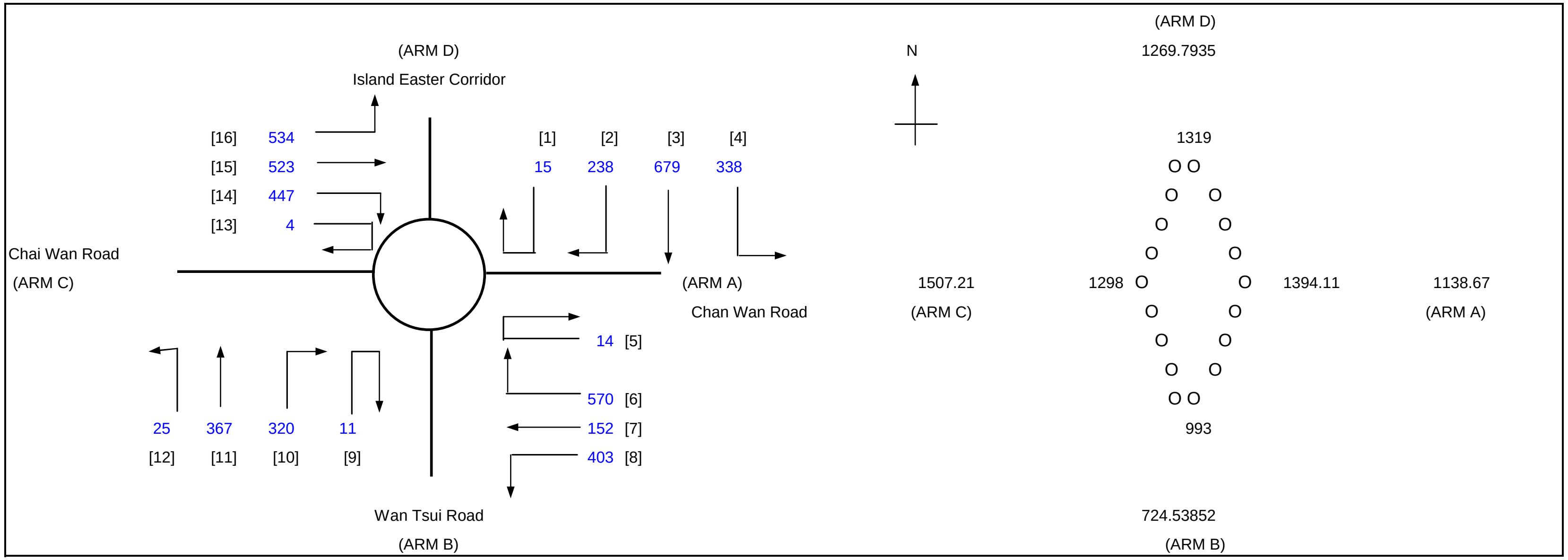
Critical DFC = 0.961

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

ROUNDABOUT CAPACITY ASSESSMENT

						INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	**J4LV1 Peak Hour**	PROJECT NO.:	80510		PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME: J4LV1_Sen2_S1_J2_J5_J6_J7_J8.xls			CHECKED BY:	OC	Sep-13
J4LV1 Peak Hour					REVIEWED BY:	OC	Sep-13



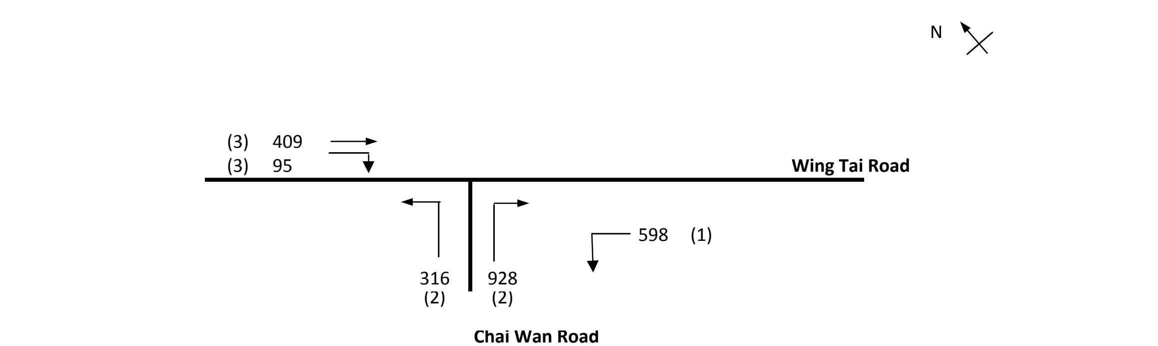
ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	1139	725	1507	1270
Qc	=	Circulating flow across entry (pcu/h)	1394	993	1298	1319
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1411	920	1497	1225
DFC	=	Design flow/Capacity = Q/Qe	0.81	0.79	1.01	1.04

Total In Sum = 3341.11 PCU

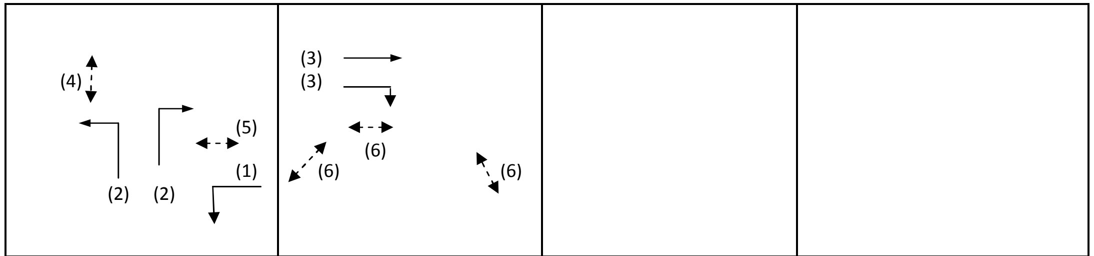
DFC of Critical Approach = 1.04

TRAFFIC SIGNAL CALCULATION

			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: GK	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV1 - Peak Hour Traffic Flows	FILENAME :n2_S1_J2_J5_J6_J7_J8.xls	Checked By: KC	29-4-2011
2021 Ching Ming Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.360	
Loss time		L =	10	sec
Total Flow		=	2346	pcu
Co	= (1.5*L+5)/(1-Y)	=	31.2	sec
Cm	= L/(1-Y)	=	15.6	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	129.4	%
Cp	= 0.9*L/(0.9-Y)	=	16.7	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	125.2	%

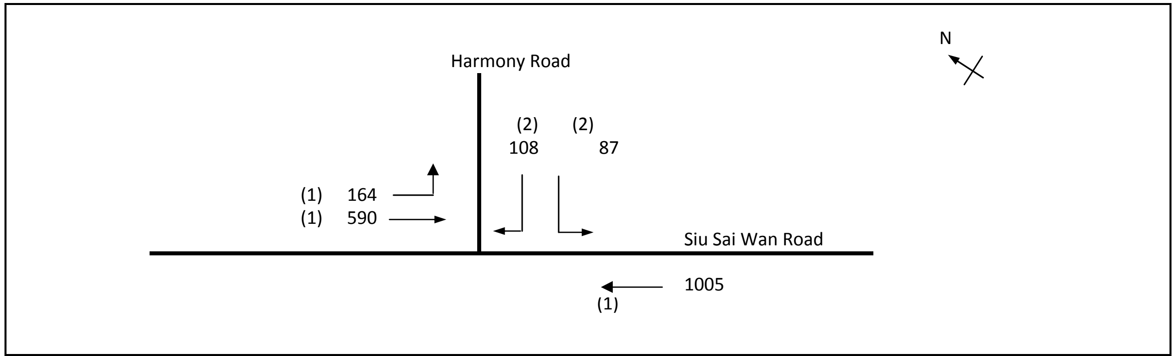


Stage A I = 7 | Stage B I = 5

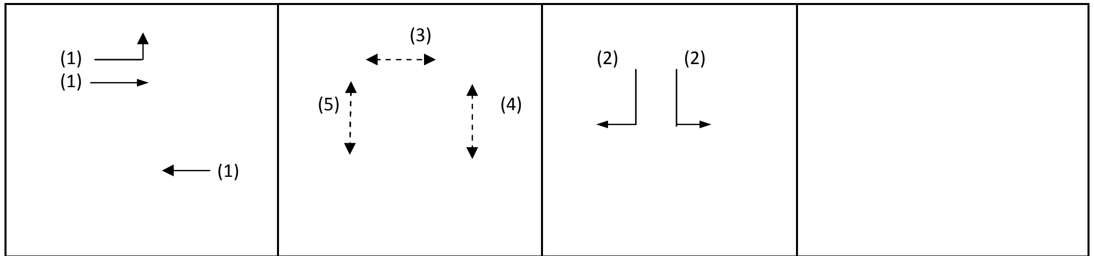
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	598			598	1.00	3857			3857	0.155			39	65	0.239	15	5
LT	A	4.00	2	2	24			4310	316			316	1.00	4056			4056	0.078			19	65	0.120	9	5
RT	A	3.50	2	2	11		y	4070			928	928	1.00	3582			3582	0.259	0.259		65	65	0.400	27	5
ST	B	3.50	3	2			y	4070		409		409	0.00	4070			4070	0.100	0.100		25	25	0.400	24	24
RT	B	4.50	3	2	13		y	4270			95	95	1.00	3828			3828	0.025			6	25	0.099	3	25
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: GK	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV1 - Peak Hour Traffic Flows	FILENAME :2_S1_J2_J5_J6_J7_J8.xls	Checked By: KC	29-4-2011
2021 Ching Ming Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	100 sec
Sum(y)		Y =	0.310
Loss time		L =	48 sec
Total Flow		=	1954 pcu
Co	= (1.5*L+5)/(1-Y)	=	111.6 sec
Cm	= L/(1-Y)	=	69.6 sec
Yult		=	0.540
R.C.ult	= (Yult-Y)/Y*100%	=	74.0 %
Cp	= 0.9*L/(0.9-Y)	=	73.3 sec
Ymax	= 1-L/C	=	0.520
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	50.8 %

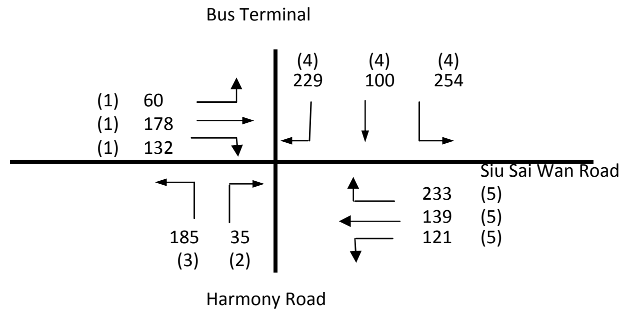


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

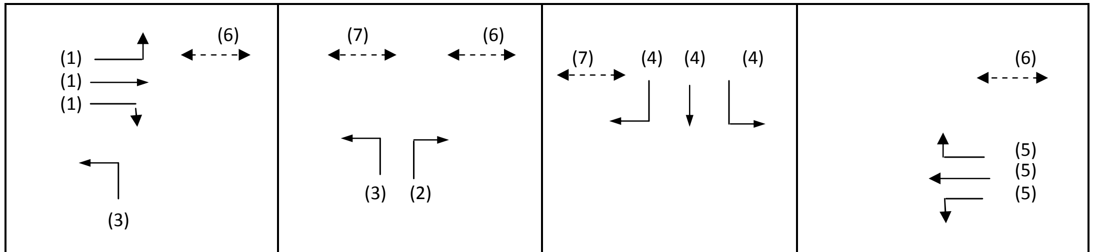
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	164	152		316	0.52	1817			1817	0.174			29	42	0.410	30	14
ST	A	3.20	1	1				2075		438		438	0.00	2075			2075	0.211			35	42	0.498	42	14
ST	A	3.00	1	2			y	3970		1005		1005	0.00	3970			3970	0.253	0.253		42	42	0.597	48	13
LT	C	3.75	2	1	12		y	1990	87			87	1.00	1769			1769	0.049			8	10	0.514	12	45
RT	C	3.75	2	1	12			2130			108	108	1.00	1893			1893	0.057	0.057		10	10	0.597	12	48
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	GK	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV1 - Peak Hour Traffic Flows	FILENAME :n2_S1_J2_J5_J6_J7_J8.xls	Checked By:	KC	29-4-2011
2021 Ching Ming Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	105	sec
Sum(y)		Y =	0.474	
Loss time		L =	18	sec
Total Flow		=	1666	pcu
Co	= (1.5*L+5)/(1-Y)	=	60.8	sec
Cm	= L/(1-Y)	=	34.2	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	61.6	%
Cp	= 0.9*L/(0.9-Y)	=	38.0	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	57.5	%

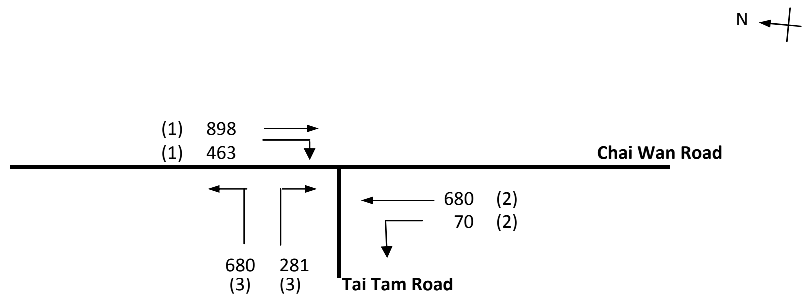


Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

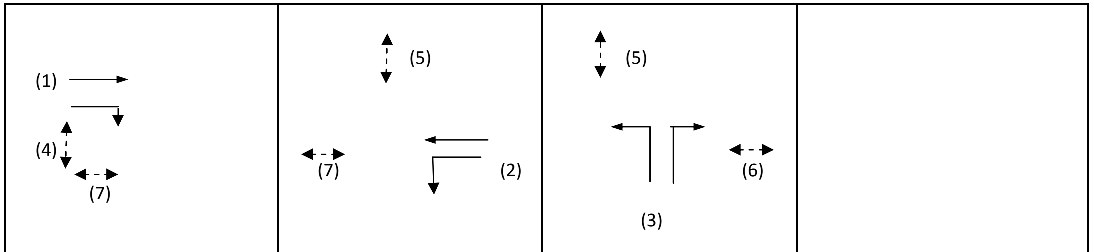
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	60	81		141	0.43	1838			1838	0.077			14	22	0.373	18	30
ST/RT	A	3.30	1	1	12			2085		97	132	228	0.58	1945			1945	0.117	0.117		22	22	0.572	30	32
RT	B	3.50	2	1	12			2105			35	35	1.00	1871			1871	0.019	0.019		3	3	0.572	6	78
LT	A,B	3.75	3	1	13		y	1990	185			185	1.00	1784			1784	0.104			19	30	0.362	18	23
RT	C	3.50	4	1	12			2105			229	229	1.00	1871			1871	0.123			23	36	0.357	24	19
LT/ST	C	3.50	4	1	12		y	1965	254	100		354	0.72	1803			1803	0.196	0.196		36	36	0.572	36	20
ST/RT	D	3.50	5	1	12			2105			233	233	1.00	1871			1871	0.125			23	23	0.572	30	31
LT/ST	D	3.50	5	1	11		y	1965	121	139		260	0.47	1848			1848	0.141	0.141		26	26	0.572	30	28
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: GK	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV1 - Peak Hour Traffic Flows	FILENAME :12_S1_J2_J5_J6_J7_J8.xls	Checked By: KC	29-4-2011
2021 Ching Ming Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	105 sec
Sum(y)		Y =	0.706
Loss time		L =	18 sec
Total Flow		=	3071 pcu
Co	= (1.5*L+5)/(1-Y)	=	108.9 sec
Cm	= L/(1-Y)	=	61.3 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	8.3 %
Cp	= 0.9*L/(0.9-Y)	=	83.6 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	5.6 %



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.75	1	2			y	4120		898		898	0.00	4120			4120	0.218			27	27	0.852	57	39
RT	A	3.00	1	1	13			2055			463	463	1.00	1842			1842	0.251	0.251		31	27	0.984	204	33
ST	B	3.50	2	2				4210		680		680	0.00	4210			4210	0.161	0.161		20	20	0.852	48	43
LT	B	3.10	2	1	12		y	1925	70			70	1.00	1711			1711	0.041			5	20	0.215	6	31
LT	C	4.00	3	1	15		y	2015	538			538	1.00	1832			1832	0.293	0.293		36	36	0.852	60	27
LT/RT	C	4.00	3	1	15			2155	142		281	423	1.00	1959			1959	0.216			27	36	0.627	48	20
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at (

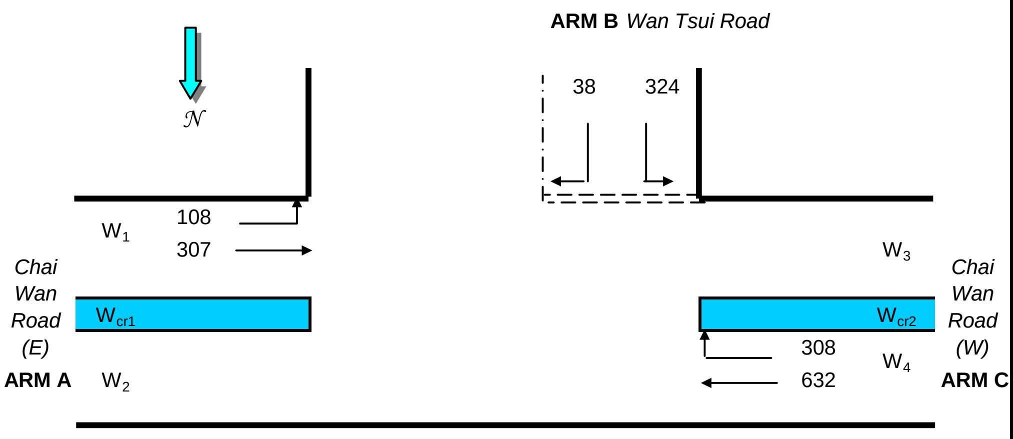
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road

Design Year - 2021 Level 1 - Site 1

Time - Level 1 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	107.87	(pcu/hr)
q_{a-c}	=	307.31	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	632.31	(pcu/hr)
q_{c-b}	=	308.38	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	38.071	(pcu/hr)
q_{b-c}	=	323.95	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

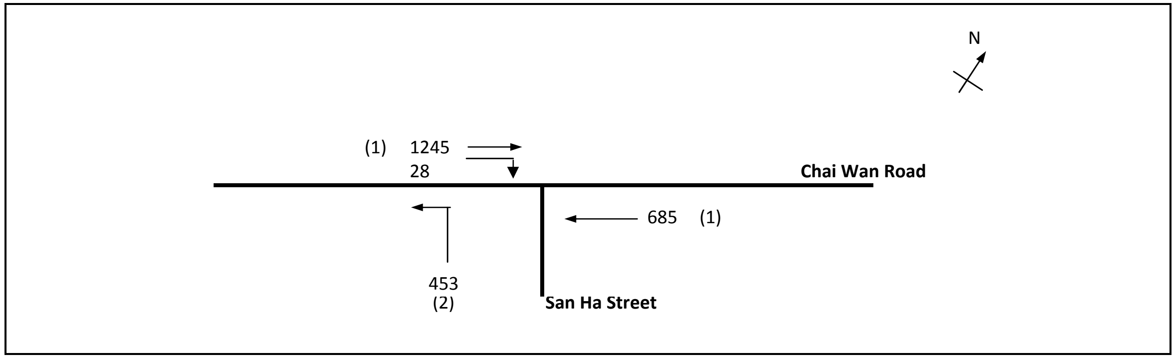
Q_{b-c}	=	781
Q_{c-b}	=	692
Q_{b-a}	=	357

COMPARISION OF DESIGN FLOW TO CAPACITY

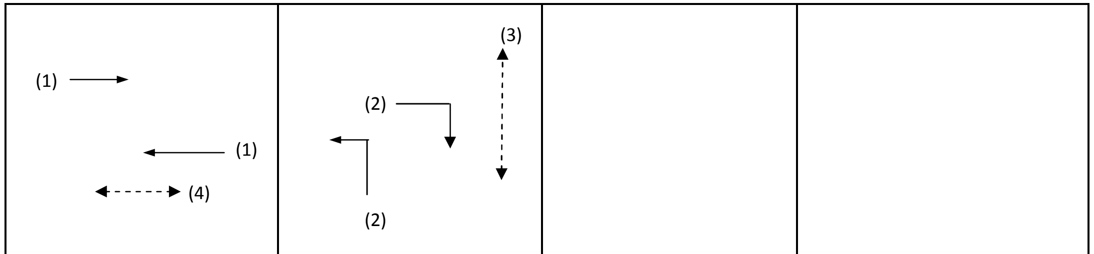
DFC_{b-a}	=	0.107
DFC_{b-c}	=	0.415
DFC_{c-b}	=	0.446

Critical DFC = 0.446

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	GK	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV1 - Peak Hour Traffic Flows	FILENAME n2_S1_J2_J5_J6_J7_J8.xls	Checked By:	KC	29-4-2011
2021 Ching Ming Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.578	
Loss time		L =	10	sec
Total Flow		=	2411	pcu
Co	= (1.5*L+5)/(1-Y)	=	47.4	sec
Cm	= L/(1-Y)	=	23.7	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	42.7	%
Cp	= 0.9*L/(0.9-Y)	=	27.9	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	40.2	%

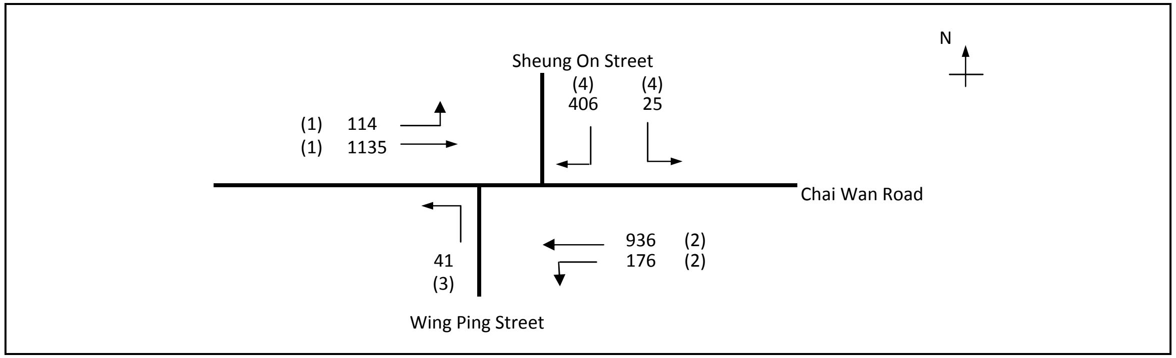


Stage A	I = 6	Stage B	I = 6	Stage C	I =

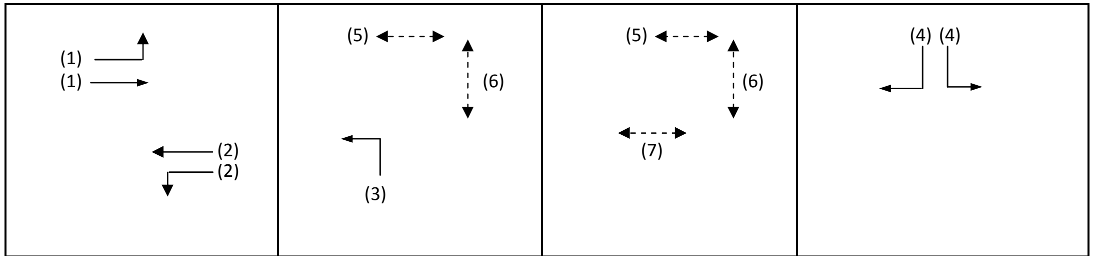
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		1245		1245	0.00	4070			4070	0.306	0.306		48	47	0.651	54	10
ST	A	3.50	1	2	10		N	4070		685		685	0.00	4070			4070	0.168			26	47	0.358	30	11
LT	B	3.00	2	1	10		N	1915	453			453	1.00	1665			1665	0.272	0.272		42	53	0.514	30	9
RT	B	3.50	2	1	12			2105			28	28	1.00	1871			1871	0.015			2	53	0.028	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: GK	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV1 - Peak Hour Traffic Flows	FILENAME :n2_S1_J2_J5_J6_J7_J8.xls	Checked By: KC	29-4-2011
2021 Ching Ming Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	120 sec
Sum(y)		Y =	0.349
Loss time		L =	37 sec
Total Flow		=	2833 pcu
Co	= (1.5*L+5)/(1-Y)	=	92.9 sec
Cm	= L/(1-Y)	=	56.8 sec
Yult		=	0.623
R.C.ult	= (Yult-Y)/Y*100%	=	78.3 %
Cp	= 0.9*L/(0.9-Y)	=	60.4 sec
Ymax	= 1-L/C	=	0.692
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	78.3 %



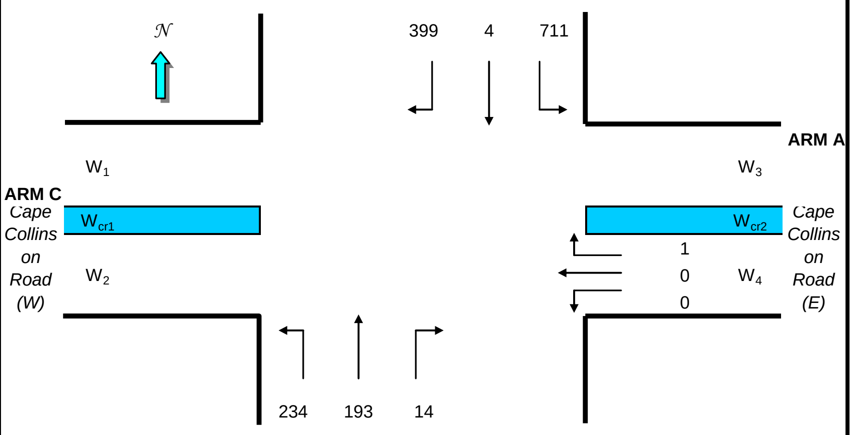
Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	114	1135		1249	0.09	6105			6105	0.205	0.205		49		0.000	82	54
LT/ST	A	3.30	2	3	12		Y	6115	176	936		1112	0.16	5996			5996	0.185			44		0.000	74	54
LT	B	3.50	3	1	9		Y	1965	41			41	1.00	1684			1684	0.024	0.024		6		0.000	6	54
LT/RT	D	3.75	4	2	10		y	4120	25		406	431	1.00	3583			3583	0.120	0.120		29		0.000	42	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2021 Level 2 - Reference Case
Time - Level 2 Peak Hour

ARM D *Lin Shing Rd (N)*



ARM B *Lin Shing Rd (S)*

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{a-d}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
W_{d-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
W_{d-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
Vr_{a-d}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
Vl_{d-c}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

W_{a-d}	=	3.00	(metres)
Vr_{a-d}	=	100	(metres)
q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	0	(pcu/hr)
q_{a-d}	=	1	(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)
q_{c-d}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	5.00	(metres)
W_{b-c}	=	5.00	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	65	(metres)
Vr_{b-c}	=	0	(metres)
q_{b-a}	=	13.959	(pcu/hr)
q_{b-c}	=	234	(pcu/hr)
q_{b-d}	=	193.45	(pcu/hr)

MINOR ROAD (ARM D)

W_{d-a}	=	3.00	(metres)
W_{d-c}	=	3.00	(metres)
Vl_{d-c}	=	50	(metres)
Vr_{d-c}	=	50	(metres)
Vr_{d-a}	=	80	(metres)
q_{d-a}	=	711	(pcu/hr)
q_{d-b}	=	4	(pcu/hr)
q_{d-c}	=	399	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

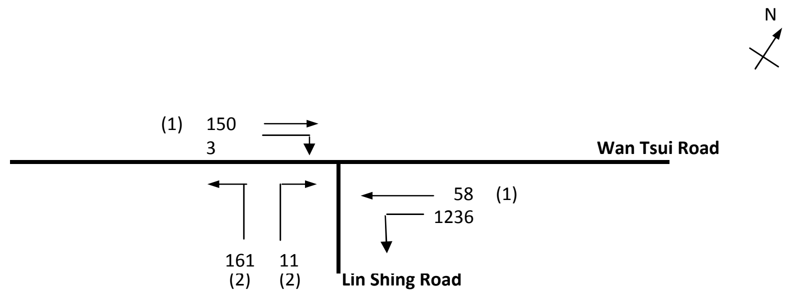
Q_{b-a}	=	377
Q_{b-c}	=	749
Q_{b-d} is nearside	=	TRUE
Q_{b-d}	=	611
Q_{d-a}	=	674
Q_{d-b} is nearside	=	TRUE
Q_{d-b}	=	533
Q_{d-c}	=	414
Q_{c-b}	=	437
Q_{a-d}	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

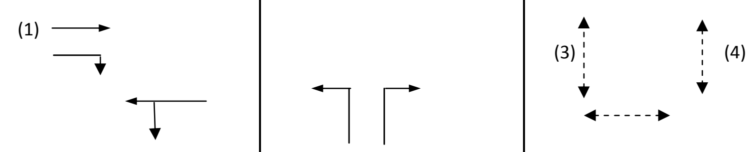
DFC_{b-a}	=	0.037
DFC_{b-c}	=	0.313
DFC_{b-d}	=	0.317
DFC_{d-a}	=	1.054
DFC_{d-b}	=	0.008
DFC_{d-c}	=	0.964
DFC_{c-b}	=	0.000
DFC_{a-d}	=	0.002

Critical DFC = 1.054

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
Junction of Lin Shing Road and Wan Tsui Road	J2LV2 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	120 sec
Sum(y)		Y =	0.735
Loss time		L =	25 sec
Total Flow		=	1444 pcu
Co	= (1.5*L+5)/(1-Y)	=	160.1 sec
Cm	= L/(1-Y)	=	94.2 sec
Yult		=	0.713
R.C.ult	= (Yult-Y)/Y*100%	=	-3.0 %
Cp	= 0.9*L/(0.9-Y)	=	136.0 sec
Ymax	= 1-L/C	=	0.792
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	-3.0 %



Stage A	I = 7	Stage B	I =	Stage C	I =

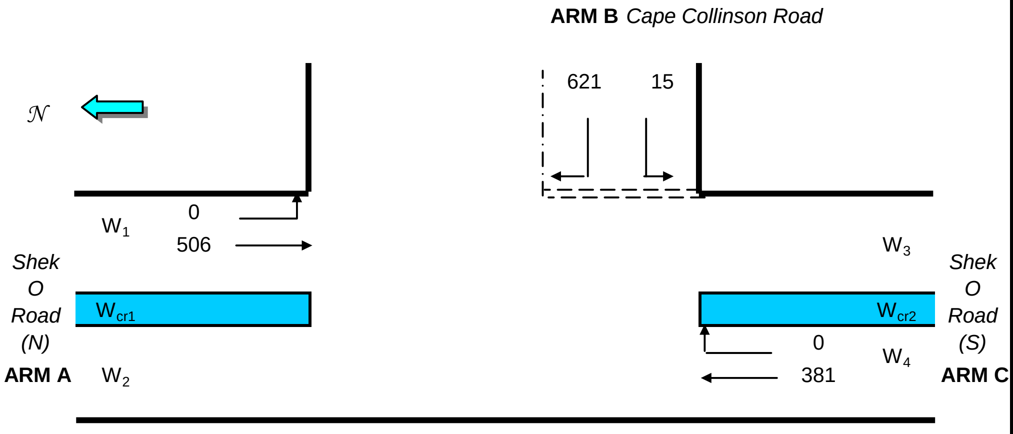
Movement	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		150		150	0.00	1915			1915	0.078			10	95	0.099	6	2
ST/LT	A	4.00	1	1	10		N	2015	1236	58		1295	0.95	1763			1763	0.735	0.735		95	95	0.928	60	4
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow **Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at** **Junction Capacity Analysis**

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - **J3: J/O Cape Collinson Road and Lin Shing Road**
Design Year - **2021 Level 2 - Reference Case**
Time - **Level 2 Peak Hour**



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	506	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	381	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	621	(pcu/hr)
q_{b-c}	=	15	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	613
Q_{c-b}	=	682
Q_{b-a}	=	273

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	2.279
DFC_{b-c}	=	0.025
DFC_{c-b}	=	0.000

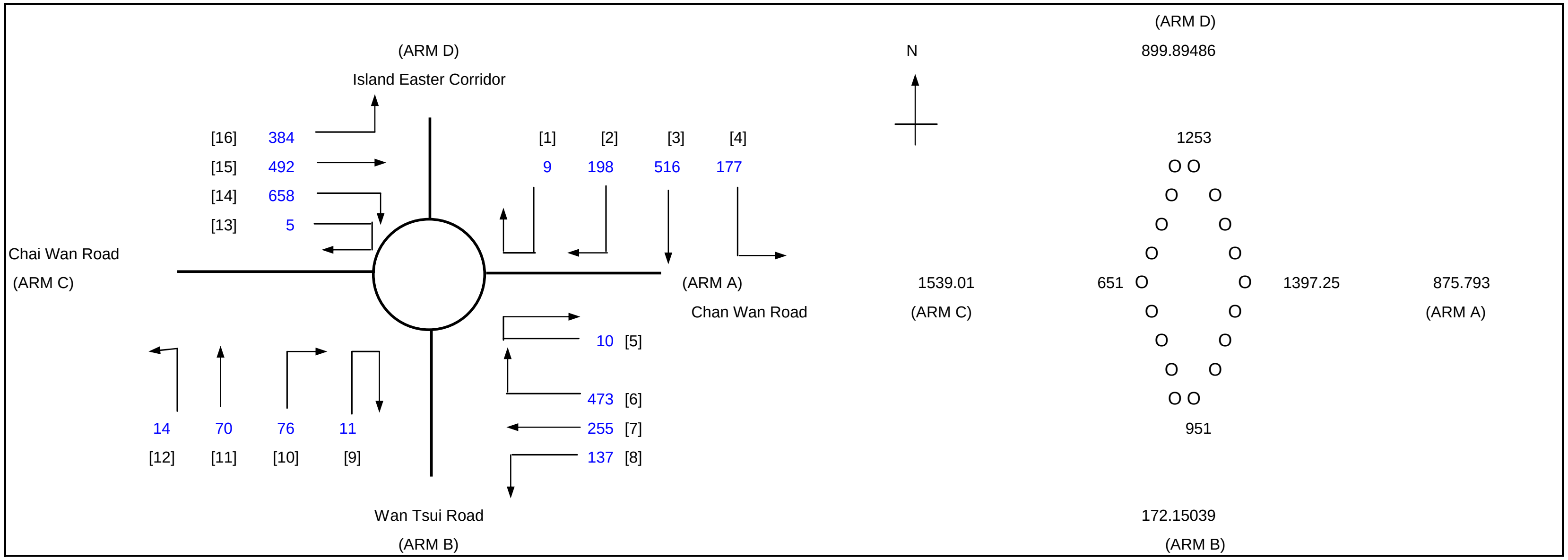
Critical DFC = 2.279

ROUNDABOUT CAPACITY ASSESSMENT

TIA Study for Columbarium Development at Cape Collinson Road	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout	FILENAME :LV2_Sen2_Ref_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV2 Peak Hour		REVIEWED BY:	OC	Sep-13

INITIALS | DATE

J4LV2 Peak Hour

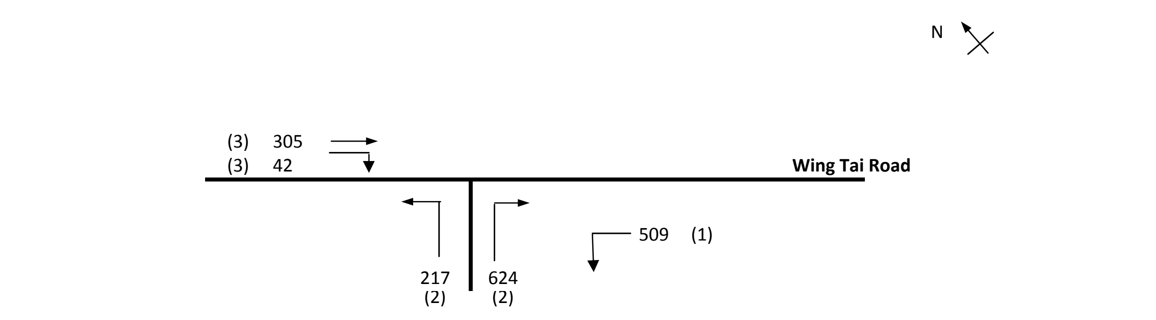


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	876	172	1539	900
Qc	=	Circulating flow across entry (pcu/h)	1397	951	651	1253
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1409	944	1987	1271
DFC	=	Design flow/Capacity = Q/Qe	0.62	0.18	0.77	0.71

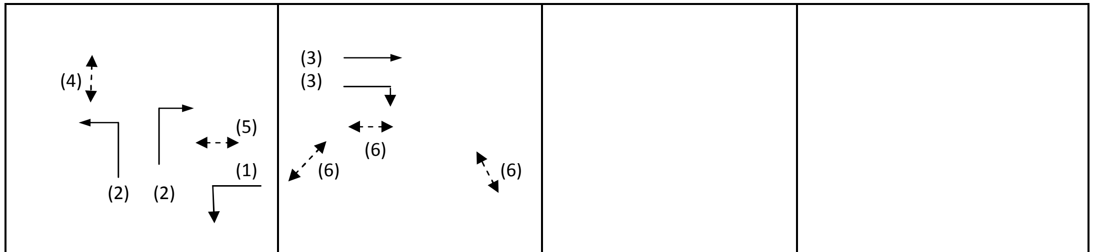
Total In Sum = 2774.98 PCU

DFC of Critical Approach = 0.77

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV2 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	100 sec
Sum(y)		Y =	0.249
Loss time		L =	10 sec
Total Flow		=	1697 pcu
Co	= (1.5*L+5)/(1-Y)	=	26.6 sec
Cm	= L/(1-Y)	=	13.3 sec
Yult		=	0.825
R.C.ult	= (Yult-Y)/Y*100%	=	231.1 %
Cp	= 0.9*L/(0.9-Y)	=	13.8 sec
Ymax	= 1-L/C	=	0.900
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	225.0 %

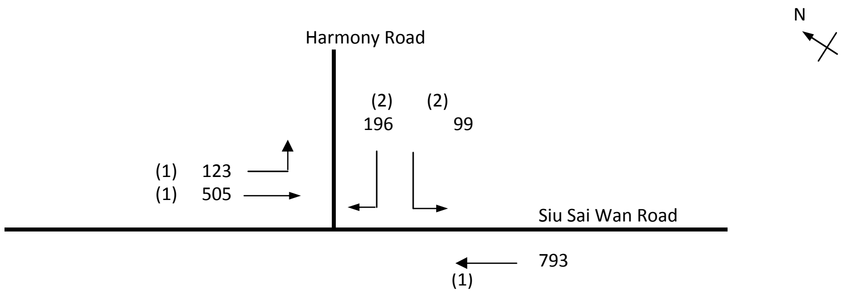


Stage A I = 7 | Stage B I = 5

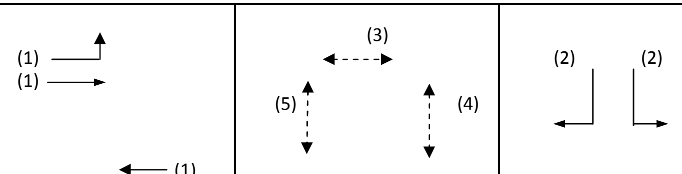
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	509			509	1.00	3857			3857	0.132			48	63	0.210	15	6
LT	A	4.00	2	2	24			4310	217			217	1.00	4056			4056	0.054			19	63	0.085	6	6
RT	A	3.50	2	2	11		y	4070			624	624	1.00	3582			3582	0.174	0.174		63	63	0.277	18	5
ST	B	3.50	3	2			y	4070		305		305	0.00	4070			4070	0.075	0.075		27	27	0.277	18	23
RT	B	4.50	3	2	13		y	4270			42	42	1.00	3828			3828	0.011			4	27	0.040	0	24
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV2 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	100 sec
Sum(y)		Y =	0.303
Loss time		L =	48 sec
Total Flow		=	1716 pcu
Co	= (1.5*L+5)/(1-Y)	=	110.5 sec
Cm	= L/(1-Y)	=	68.9 sec
Yult		=	0.540
R.C.ult	= (Yult-Y)/Y*100%	=	77.9 %
Cp	= 0.9*L/(0.9-Y)	=	72.4 sec
Ymax	= 1-L/C	=	0.520
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	54.2 %

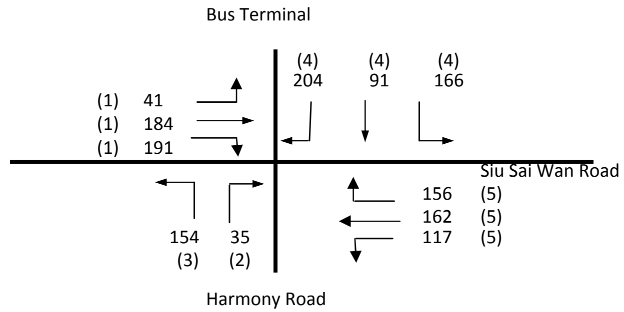


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

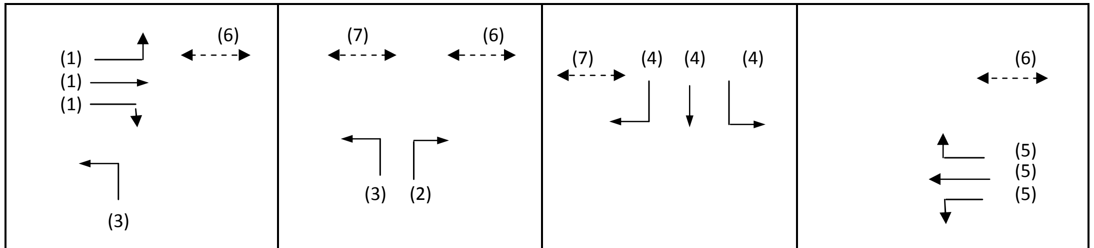
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	123	152		275	0.45	1833			1833	0.150			26	34	0.438	30	19
ST	A	3.20	1	1				2075		353		353	0.00	2075			2075	0.170			29	34	0.496	36	18
ST	A	3.00	1	2			y	3970		793		793	0.00	3970			3970	0.200	0.200		34	34	0.584	42	17
LT	C	3.75	2	1	12		y	1990	99			99	1.00	1769			1769	0.056			10	18	0.315	12	31
RT	C	3.75	2	1	12			2130			196	196	1.00	1893			1893	0.104	0.104		18	18	0.584	24	34
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV2 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.396
Loss time		L =	18 sec
Total Flow		=	1501 pcu
Co	= (1.5*L+5)/(1-Y)	=	53.0 sec
Cm	= L/(1-Y)	=	29.8 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	93.2 %
Cp	= 0.9*L/(0.9-Y)	=	32.1 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	88.4 %



Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

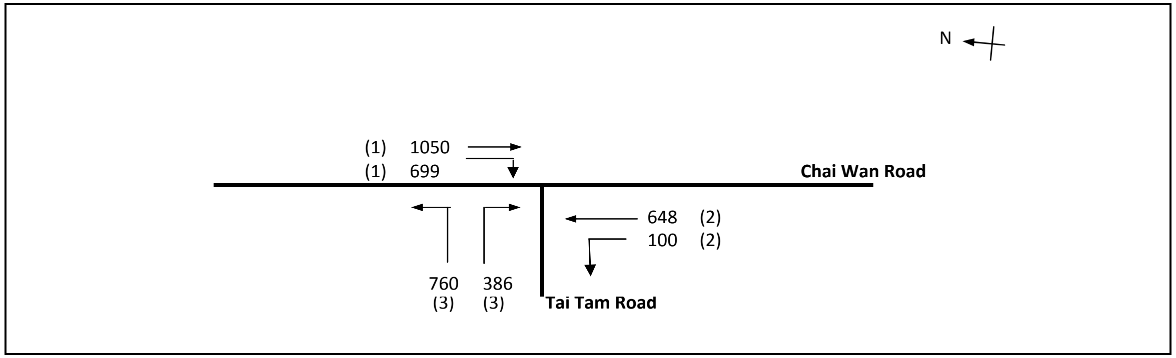
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	41	81		122	0.34	1860			1860	0.066			14	33	0.206	12	21
ST/RT	A	3.30	1	1	12			2085		103	191	294	0.65	1928			1928	0.152	0.152		33	33	0.478	30	21
RT	B	3.50	2	1	12			2105			35	35	1.00	1871			1871	0.019	0.019		4	4	0.478	6	63
LT	A,B	3.75	3	1	13		y	1990	154			154	1.00	1784			1784	0.086			19	43	0.212	12	16
RT	C	3.50	4	1	12			2105			204	204	1.00	1871			1871	0.109			24	31	0.369	24	23
LT/ST	C	3.50	4	1	12		y	1965	166	91		257	0.64	1818			1818	0.141	0.141		31	31	0.478	30	23
ST/RT	D	3.50	5	1	12			2105		0	156	156	1.00	1871			1871	0.083	0.083		18	18	0.478	18	34
LT/ST	D	3.50	5	1	11		y	1965	117	162		279	0.42	1859			1859	0.150			33	33	0.478	30	21
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

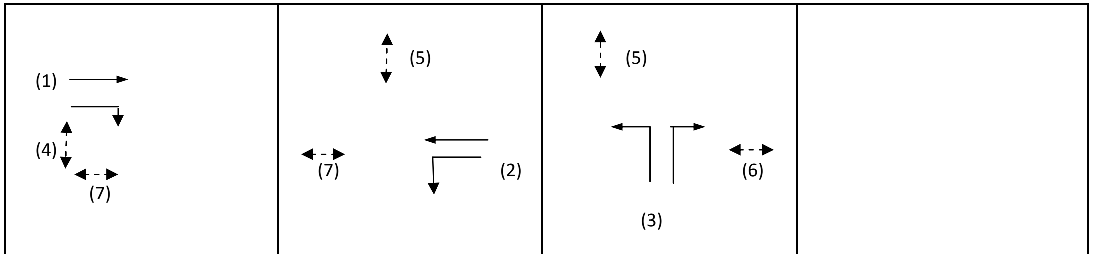
TRAFFIC SIGNAL CALCULATION

TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV2 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011

INITIALS / DATE



No. of stages per cycle		N =	3
Cycle time		C =	105 sec
Sum(y)		Y =	0.850
Loss time		L =	18 sec
Total Flow		=	3644 pcu
Co	= (1.5*L+5)/(1-Y)	=	214.0 sec
Cm	= L/(1-Y)	=	120.4 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	-10.0 %
Cp	= 0.9*L/(0.9-Y)	=	327.0 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	-12.3 %



Stage A I = 7 | Stage B I = 8 | Stage C I = 6

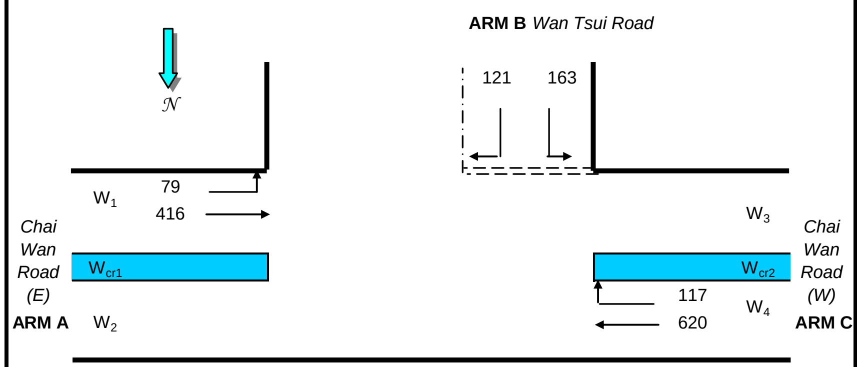
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		1050		1050	0.00	4070			4070	0.258			26	26	1.026	66	42
RT	A	3.50	1	1	13			2105			699	699	1.00	1887			1887	0.371	0.371		38	26	1.473	90	37
ST	B	3.50	2	2				4210		648		648	0.00	4210			4210	0.154	0.154		16	16	1.026	48	46
LT	B	3.10	2	1	12		y	1925	100			100	1.00	1711			1711	0.059			6	16	0.391	12	36
LT	C	4.00	3	1	15		y	2015	597			597	1.00	1832			1832	0.326	0.326		33	33	1.026	66	29
LT/RT	C	4.00	3	1	15			2155	163		386	549	1.00	1959			1959	0.280			29	33	0.883	60	29
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow | **Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at**
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road
Design Year - 2021 Level 2 - Reference Case
Time - Level 2 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	78.68	(pcu/hr)
q_{a-c}	=	416	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	620	(pcu/hr)
q_{c-b}	=	116.75	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	121	(pcu/hr)
q_{b-c}	=	163	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

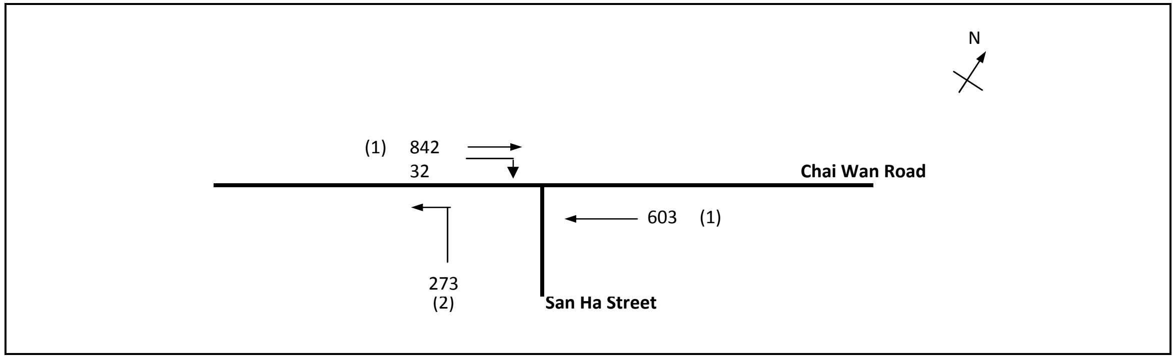
Q_{b-c}	=	768
Q_{c-b}	=	683
Q_{b-a}	=	371

COMPARISION OF DESIGN FLOW TO CAPACITY

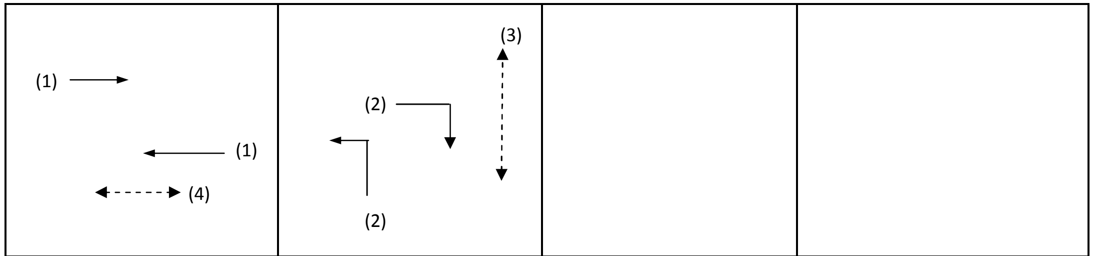
DFC_{b-a}	=	0.325
DFC_{b-c}	=	0.212
DFC_{c-b}	=	0.171

Critical DFC = 0.325

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV2 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 2 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	100 sec
Sum(y)		Y =	0.371
Loss time		L =	10 sec
Total Flow		=	1749 pcu
Co	= (1.5*L+5)/(1-Y)	=	31.8 sec
Cm	= L/(1-Y)	=	15.9 sec
Yult		=	0.825
R.C.ult	= (Yult-Y)/Y*100%	=	122.6 %
Cp	= 0.9*L/(0.9-Y)	=	17.0 sec
Ymax	= 1-L/C	=	0.900
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	118.6 %



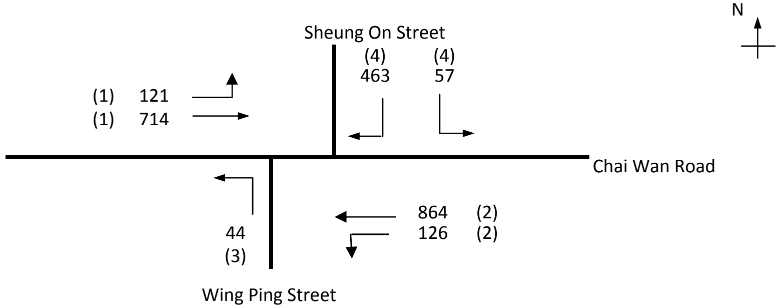
Stage A I = 6	Stage B I = 6	Stage C I =	

Movement	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		842		842	0.00	4070			4070	0.207	0.207		50	47	0.440	36	11
ST	A	3.50	1	2	10		N	4070		603		603	0.00	4070			4070	0.148			36	47	0.315	24	11
LT	B	3.00	2	1	10		N	1915	273			273	1.00	1665			1665	0.164	0.164		40	53	0.309	18	9
RT	B	3.50	2	1	12			2105			32	32	1.00	1871			1871	0.017			4	53	0.032	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

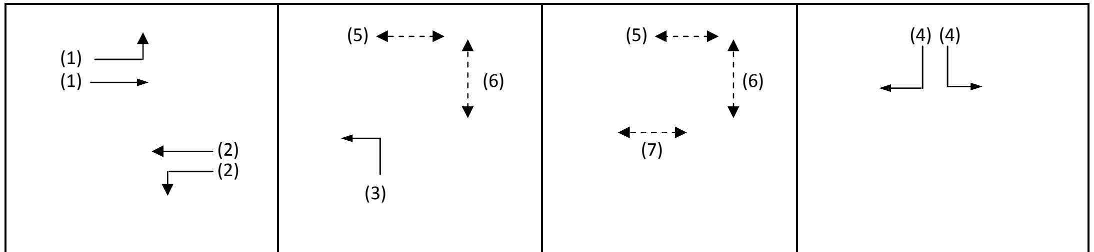
NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION

					INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.:	CTLDQS	Prepared By:	KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV2 - Peak Hour Traffic Flows	FILENAME	2_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 2 Peak Hour - Reference Case		REFERENCE NO.:		Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	120	sec
Sum(y)		Y =	0.336	
Loss time		L =	37	sec
Total Flow		=	2389	pcu
Co	= (1.5*L+5)/(1-Y)	=	91.1	sec
Cm	= L/(1-Y)	=	55.7	sec
Yult		=	0.623	
R.C.ult	= (Yult-Y)/Y*100%	=	85.2	%
Cp	= 0.9*L/(0.9-Y)	=	59.0	sec
Ymax	= 1-L/C	=	0.692	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	85.2	%

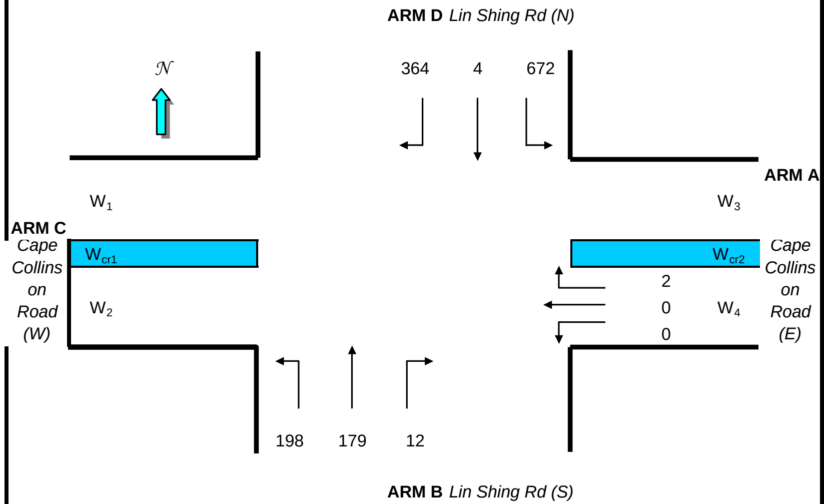


Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	121	714		835	0.14	6066			6066	0.138			34		0.000	54	54
LT/ST	A	3.30	2	3	12		Y	6115	126	864		989	0.13	6019			6019	0.164	0.164		41		0.000	64	54
LT	B	3.50	3	1	9		Y	1965	44			44	1.00	1684			1684	0.026	0.026		7		0.000	6	54
LT/RT	D	3.75	4	2	10		y	4120	57		463	521	1.00	3583			3583	0.145	0.145		36		0.000	51	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2021 Level 2 - Site 1
Time - Level 2 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{a\text{-}d}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$W_{d\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
$W_{d\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
$Vr_{a\text{-}d}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
$Vl_{d\text{-}c}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

$W_{a\text{-}d}$	=	3.00	(metres)
$Vr_{a\text{-}d}$	=	100	(metres)
$q_{a\text{-}b}$	=	0	(pcu/hr)
$q_{a\text{-}c}$	=	0	(pcu/hr)
$q_{a\text{-}d}$	=	2	(pcu/hr)

MAJOR ROAD (ARM C)

$W_{c\text{-}b}$	=		(metres)
$Vr_{c\text{-}b}$	=		(metres)
$q_{c\text{-}a}$	=	0	(pcu/hr)
$q_{c\text{-}b}$	=	0	(pcu/hr)
$q_{c\text{-}d}$	=	0	(pcu/hr)

MINOR ROAD (ARM B)

$W_{b\text{-}a}$	=	5.00	(metres)
$W_{b\text{-}c}$	=	5.00	(metres)
$Vl_{b\text{-}a}$	=	100	(metres)
$Vr_{b\text{-}a}$	=	65	(metres)
$Vr_{b\text{-}c}$	=	0	(metres)
$q_{b\text{-}a}$	=	11.633	(pcu/hr)
$q_{b\text{-}c}$	=	197.53	(pcu/hr)
$q_{b\text{-}d}$	=	178.53	(pcu/hr)

MINOR ROAD (ARM D)

$W_{d\text{-}a}$	=	3.00	(metres)
$W_{d\text{-}c}$	=	3.00	(metres)
$Vl_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}a}$	=	80	(metres)
$q_{d\text{-}a}$	=	672.35	(pcu/hr)
$q_{d\text{-}b}$	=	3.909	(pcu/hr)
$q_{d\text{-}c}$	=	363.85	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

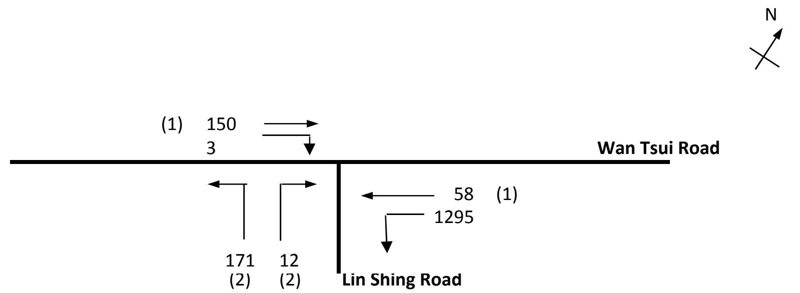
$Q_{b\text{-}a}$	=	393
$Q_{b\text{-}c}$	=	749
$Q_{b\text{-}d}$ is nearside	=	TRUE
$Q_{b\text{-}d}$	=	611
$Q_{d\text{-}a}$	=	674
$Q_{d\text{-}b}$ is nearside	=	TRUE
$Q_{d\text{-}b}$	=	532
$Q_{d\text{-}c}$	=	427
$Q_{c\text{-}b}$	=	437
$Q_{a\text{-}d}$	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

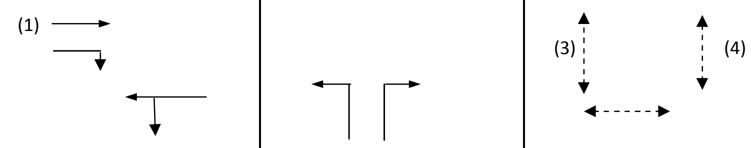
$DFC_{b\text{-}a}$	=	0.030
$DFC_{b\text{-}c}$	=	0.264
$DFC_{b\text{-}d}$	=	0.292
$DFC_{d\text{-}a}$	=	0.997
$DFC_{d\text{-}b}$	=	0.007
$DFC_{d\text{-}c}$	=	0.853
$DFC_{c\text{-}b}$	=	0.000
$DFC_{a\text{-}d}$	=	0.003

Critical DFC = 0.997

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J2: Junction of Lin Shing Road and Wan Tsui Road	J2LV2 - Peak Hour Traffic Flows	FILENAME :12_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.768	
Loss time		L =	25	sec
Total Flow		=	1503	pcu
Co	= (1.5*L+5)/(1-Y)	=	183.2	sec
Cm	= L/(1-Y)	=	107.8	sec
Yult		=	0.713	
R.C.ult	= (Yult-Y)/Y*100%	=	-7.2	%
Cp	= 0.9*L/(0.9-Y)	=	170.5	sec
Ymax	= 1-L/C	=	0.792	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	-7.2	%



Stage A I = 7	Stage B I =	Stage C I =	

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		150		150	0.00	1915			1915	0.078			10	95	0.099	6	2
ST/LT	A	4.00	1	1	10		N	2015	1295	58		1353	0.96	1762			1762	0.768	0.768		95	95	0.970	114	4
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at

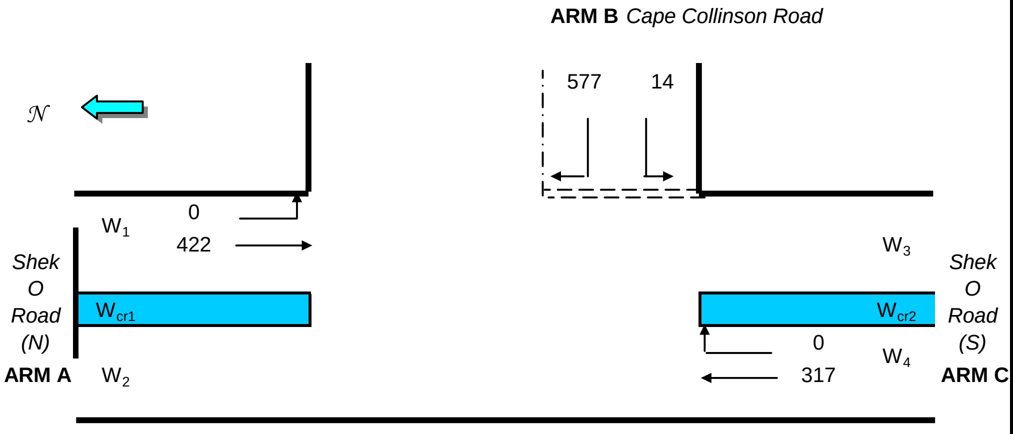
Junction Capacity Analysis

Prepared By:	KC
Checked By:	OC

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road

Design Year - 2021 Level 2 - Site 1

Time - Level 2 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	421.95	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	317.26	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	576.87	(pcu/hr)
q_{b-c}	=	14.212	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	634
Q_{c-b}	=	706
Q_{b-a}	=	293

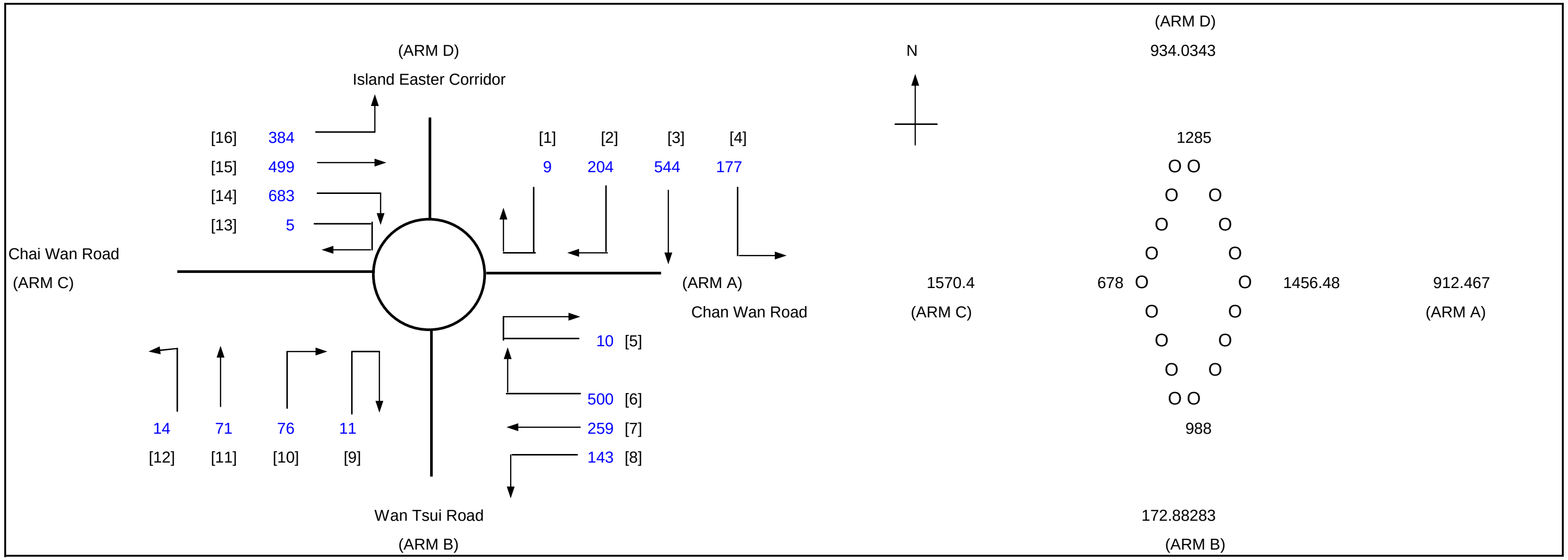
COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	1.972
DFC_{b-c}	=	0.022
DFC_{c-b}	=	0.000

Critical DFC = 1.972

ROUNDABOUT CAPACITY ASSESSMENT

				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	J4LV2 Peak Hour	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME: J_LV2_Sen2_S1_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV2 Peak Hour			REVIEWED BY:	OC	Sep-13

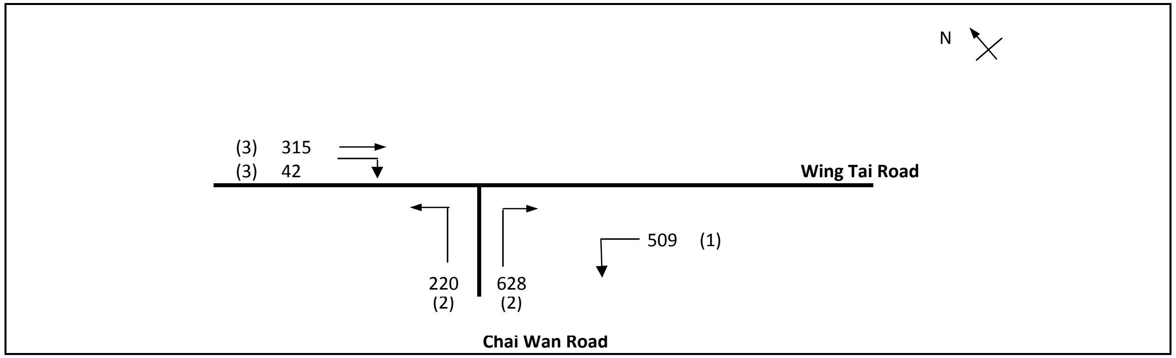


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	912	173	1570	934
Qc	=	Circulating flow across entry (pcu/h)	1456	988	678	1285
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1364	923	1966	1249
DFC	=	Design flow/Capacity = Q/Qe	0.67	0.19	0.80	0.75

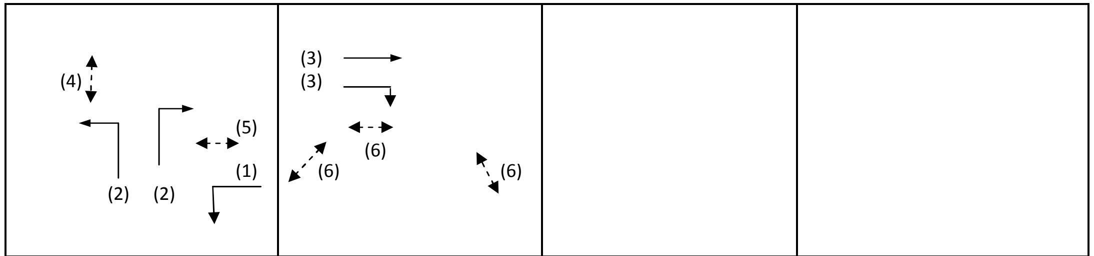
Total In Sum = 2872.18 PCU

DFC of Critical Approach = 0.80

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV2 - Peak Hour Traffic Flows	FILENAME :2_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	100 sec
Sum(y)		Y =	0.253
Loss time		L =	10 sec
Total Flow		=	1713 pcu
Co	= (1.5*L+5)/(1-Y)	=	26.8 sec
Cm	= L/(1-Y)	=	13.4 sec
Yult		=	0.825
R.C.ult	= (Yult-Y)/Y*100%	=	226.7 %
Cp	= 0.9*L/(0.9-Y)	=	13.9 sec
Ymax	= 1-L/C	=	0.900
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	220.8 %

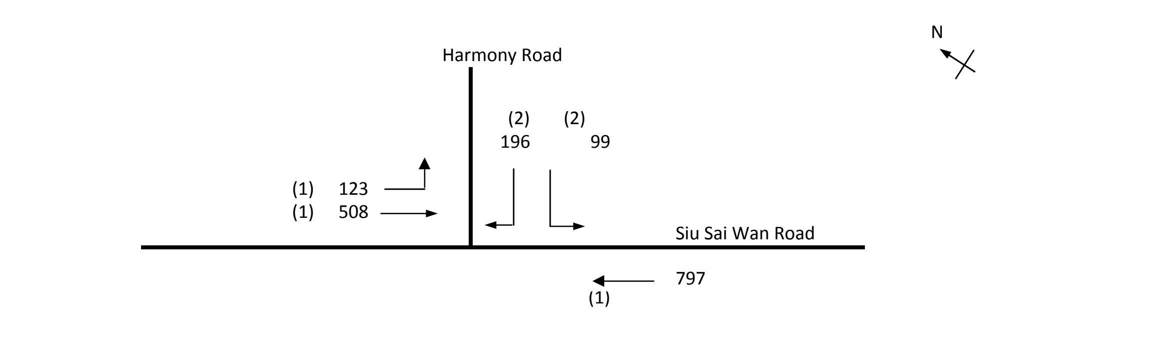


Stage A	I = 7	Stage B	I = 5		

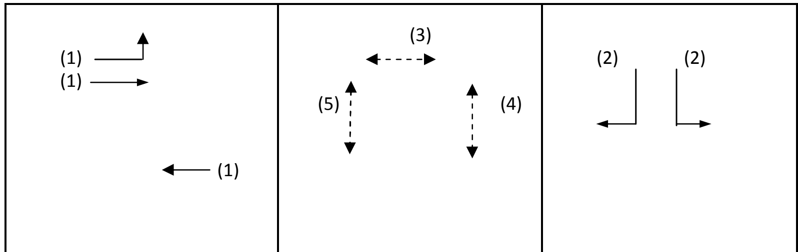
Movement	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	509			509	1.00	3857			3857	0.132			47	62	0.211	15	6
LT	A	4.00	2	2	24			4310	220			220	1.00	4056			4056	0.054			19	62	0.087	6	6
RT	A	3.50	2	2	11		y	4070			628	628	1.00	3582			3582	0.175	0.175		62	62	0.281	18	6
ST	B	3.50	3	2			y	4070		315		315	0.00	4070			4070	0.077	0.077		28	28	0.281	18	22
RT	B	4.50	3	2	13		y	4270			42	42	1.00	3828			3828	0.011			4	28	0.040	0	23
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV2 - Peak Hour Traffic Flows	FILENAME :2_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	100 sec
Sum(y)		Y =	0.305
Loss time		L =	48 sec
Total Flow		=	1723 pcu
Co	= (1.5*L+5)/(1-Y)	=	110.7 sec
Cm	= L/(1-Y)	=	69.0 sec
Yult		=	0.540
R.C.ult	= (Yult-Y)/Y*100%	=	77.3 %
Cp	= 0.9*L/(0.9-Y)	=	72.5 sec
Ymax	= 1-L/C	=	0.520
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	53.7 %



Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

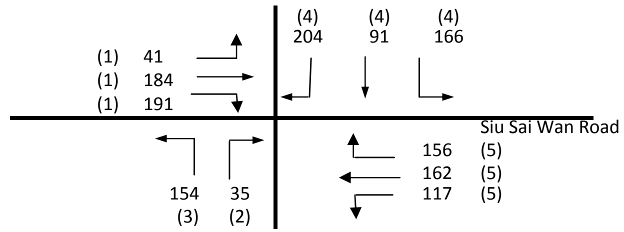
Movement	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	123	152		275	0.45	1833			1833	0.150			26	34	0.437	30	19
ST	A	3.20	1	1				2075		356		356	0.00	2075			2075	0.171			29	34	0.500	36	18
ST	A	3.00	1	2			y	3970		797		797	0.00	3970			3970	0.201	0.201		34	34	0.586	42	17
LT	C	3.75	2	1	12		y	1990	99			99	1.00	1769			1769	0.056			10	18	0.316	12	31
RT	C	3.75	2	1	12			2130			196	196	1.00	1893			1893	0.104	0.104		18	18	0.586	24	34
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

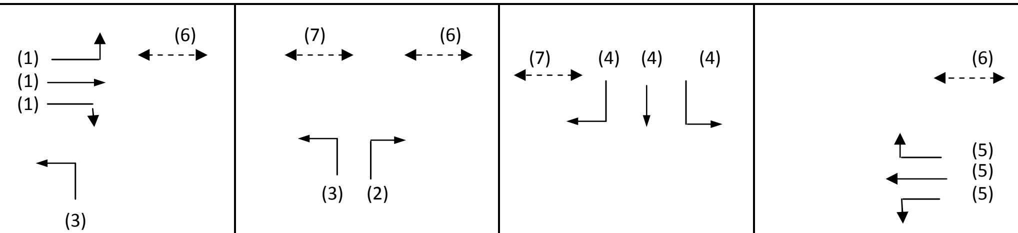
TRAFFIC SIGNAL CALCULATION

TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV2 - Peak Hour Traffic Flows	FILENAME :n2_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011

INITIALS / DATE



No. of stages per cycle	N =	4	
Cycle time	C =	105	sec
Sum(y)	Y =	0.396	
Loss time	L =	18	sec
Total Flow	=	1501	pcu
Co = (1.5*L+5)/(1-Y)	=	53.0	sec
Cm = L/(1-Y)	=	29.8	sec
Yult	=	0.765	
R.C.ult = (Yult-Y)/Y*100%	=	93.2	%
Cp = 0.9*L/(0.9-Y)	=	32.1	sec
Ymax = 1-L/C	=	0.829	
R.C.(C) = (0.9*Ymax-Y)/Y*100%	=	88.4	%

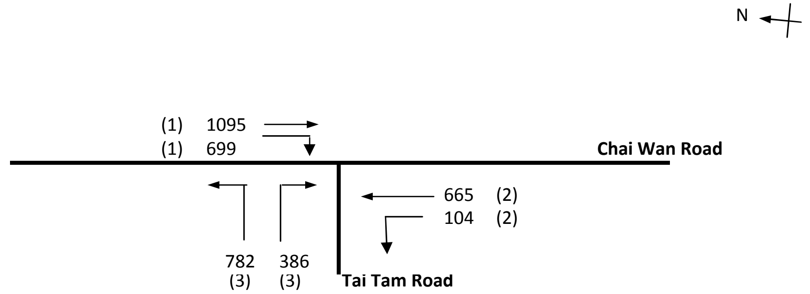


Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

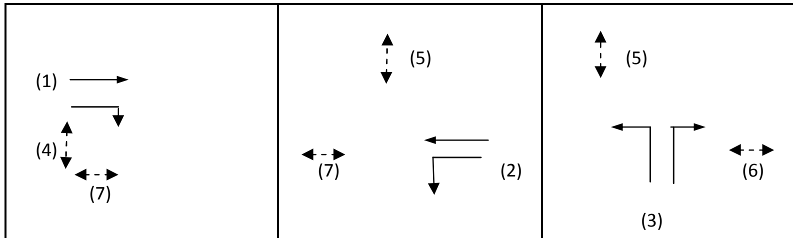
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	41	81		122	0.34	1860			1860	0.066			14	33	0.206	12	21
ST/RT	A	3.30	1	1	12			2085		103	191	294	0.65	1928			1928	0.152	0.152		33	33	0.478	30	21
RT	B	3.50	2	1	12			2105			35	35	1.00	1871			1871	0.019	0.019		4	4	0.478	6	63
LT	A,B	3.75	3	1	13		y	1990	154			154	1.00	1784			1784	0.086			19	43	0.212	12	16
RT	C	3.50	4	1	12			2105			204	204	1.00	1871			1871	0.109			24	31	0.369	24	23
LT/ST	C	3.50	4	1	12		y	1965	166	91		257	0.64	1818			1818	0.141	0.141		31	31	0.478	30	23
ST/RT	D	3.50	5	1	12			2105			156	156	1.00	1871			1871	0.083	0.083		18	18	0.478	18	34
LT/ST	D	3.50	5	1	11		y	1965	117	162		279	0.42	1859			1859	0.150			33	33	0.478	30	21
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV2 - Peak Hour Traffic Flows	FILENAME :12_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	105 sec
Sum(y)		Y =	0.807
Loss time		L =	18 sec
Total Flow		=	3732 pcu
Co	= (1.5*L+5)/(1-Y)	=	165.9 sec
Cm	= L/(1-Y)	=	93.3 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	-5.2 %
Cp	= 0.9*L/(0.9-Y)	=	174.3 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	-7.6 %

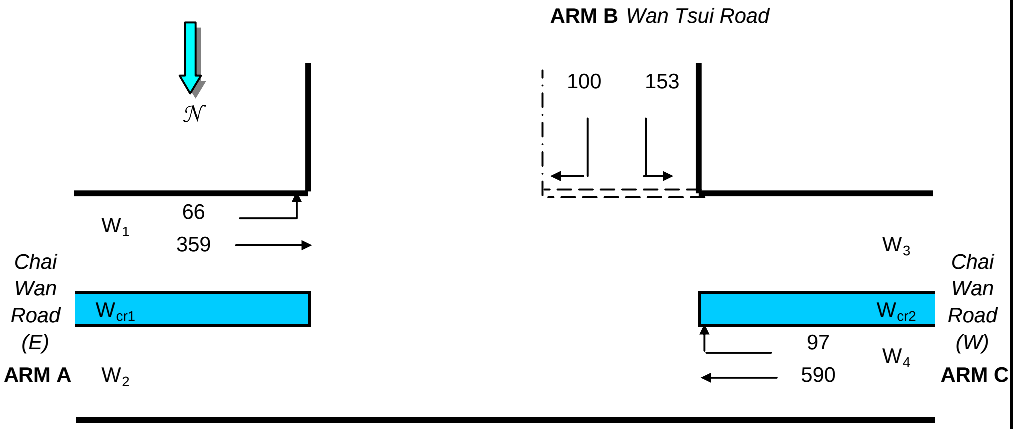


Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.75	1	2			y	4120		1095		1095	0.00	4120			4120	0.266			29	29	0.974	99	40
RT	A	3.00	1	1	13			2055			699	699	1.00	1842			1842	0.380	0.380		41	29	1.390	84	34
ST	B	3.50	2	2				4210		665		665	0.00	4210			4210	0.158	0.158		17	17	0.974	87	45
LT	B	3.10	2	1	12		y	1925	104			104	1.00	1711			1711	0.061			7	17	0.376	12	35
LT	C	4.00	3	1	15		y	2015	640			640	1.00	1832			1832	0.349			38	38	0.974	144	26
LT/RT	C	4.00	3	1	15			2155	142		386	528	1.00	1959			1959	0.270	0.270		29	38	0.752	54	21
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road
Design Year - 2021 Level 2 - Site 1
Time - Level 2 Peak Hour



GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	65.567	(pcu/hr)
q_{a-c}	=	359.46	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	590.35	(pcu/hr)
q_{c-b}	=	97.293	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	100.47	(pcu/hr)
q_{b-c}	=	153.28	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	776
Q_{c-b}	=	691
Q_{b-a}	=	380

COMPARISION OF DESIGN FLOW TO CAPACITY

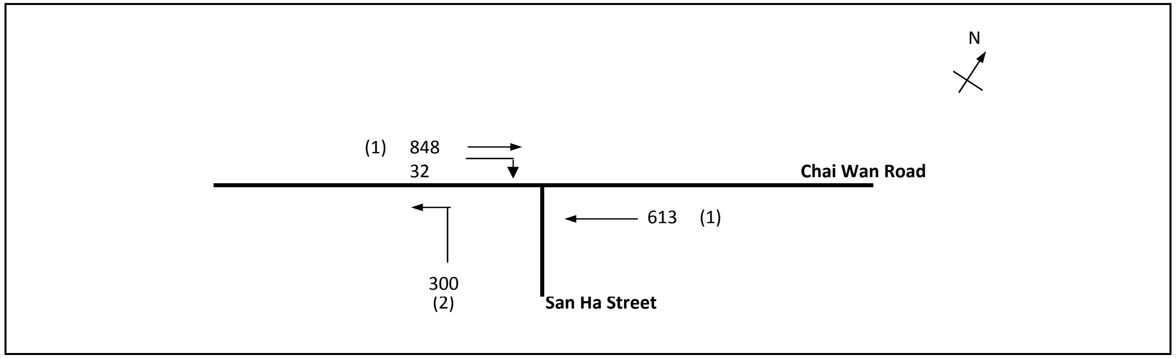
DFC_{b-a}	=	0.264
DFC_{b-c}	=	0.197
DFC_{c-b}	=	0.141

Critical DFC = 0.264

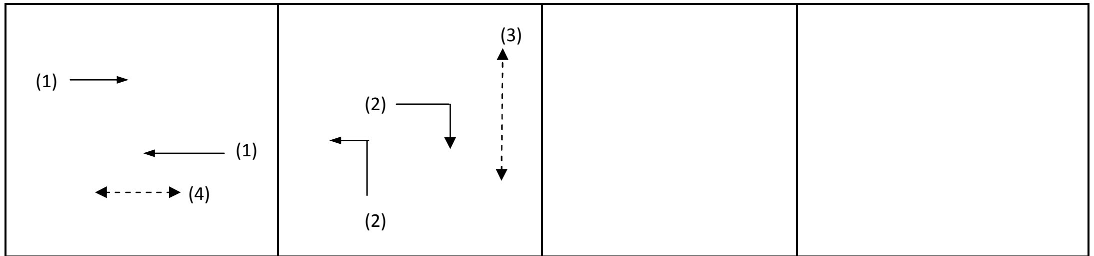
REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV2 - Peak Hour Traffic Flows	FILENAME :2_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.388	
Loss time		L =	10	sec
Total Flow		=	1792	pcu
Co	= (1.5*L+5)/(1-Y)	=	32.7	sec
Cm	= L/(1-Y)	=	16.3	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	112.5	%
Cp	= 0.9*L/(0.9-Y)	=	17.6	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	108.6	%

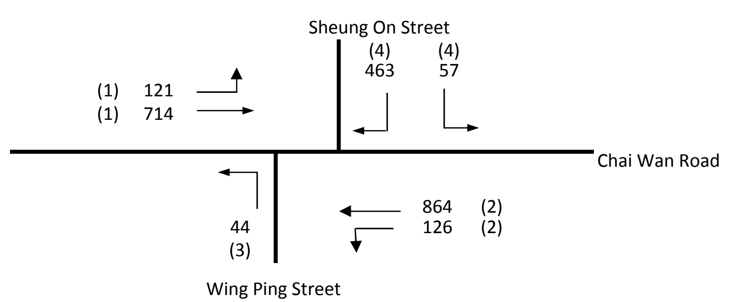


Stage A	I = 6	Stage B	I = 6	Stage C	I =

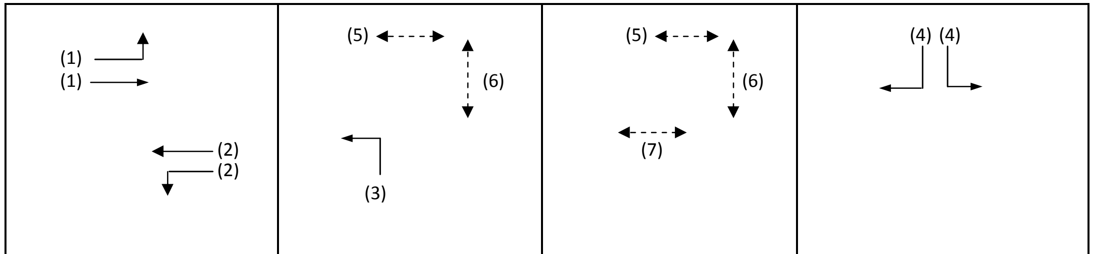
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		848		848	0.00	4070			4070	0.208	0.208		48	47	0.443	36	11
ST	A	3.50	1	2	10		N	4070		613		613	0.00	4070			4070	0.151			35	47	0.320	27	11
LT	B	3.00	2	1	10		N	1915	300			300	1.00	1665			1665	0.180	0.180		42	53	0.339	18	9
RT	B	3.50	2	1	12			2105			32	32	1.00	1871			1871	0.017			4	53	0.032	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV2 - Peak Hour Traffic Flows	FILENAME :n2_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 2 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	120 sec
Sum(y)		Y =	0.336
Loss time		L =	37 sec
Total Flow		=	2389 pcu
Co	= (1.5*L+5)/(1-Y)	=	91.1 sec
Cm	= L/(1-Y)	=	55.7 sec
Yult		=	0.623
R.C.ult	= (Yult-Y)/Y*100%	=	85.2 %
Cp	= 0.9*L/(0.9-Y)	=	59.0 sec
Ymax	= 1-L/C	=	0.692
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	85.2 %



Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	121	714		835	0.14	6066			6066	0.138			34		0.000	54	54
LT/ST	A	3.30	2	3	12		Y	6115	126	864		989	0.13	6019			6019	0.164	0.164		41		0.000	64	54
LT	B	3.50	3	1	9		Y	1965	44			44	1.00	1684			1684	0.026	0.026		7		0.000	6	54
LT/RT	D	3.75	4	2	10		y	4120	57		463	521	1.00	3583			3583	0.145	0.145		36		0.000	51	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

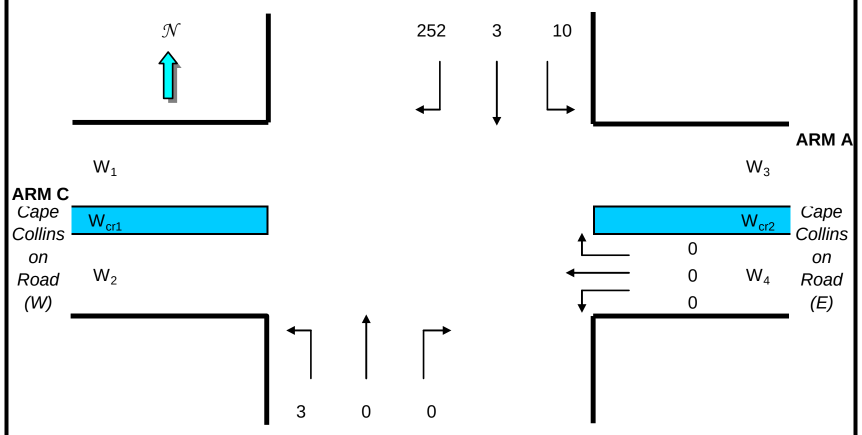
Halcrow

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at C
Junction Capacity Analysis

Prepared By:	**KC**
Checked By:	**OC**

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2021 Level 3 - Reference Case
Time - Level 3 Peak Hour

ARM D *Lin Shing Rd (N)*



ARM B *Lin Shing Rd (S)*

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
$W_{a\text{-}d}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
$W_{b\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
$W_{b\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
$W_{c\text{-}b}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
$W_{d\text{-}a}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
$W_{d\text{-}c}$	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
$Vr_{a\text{-}d}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
$Vl_{b\text{-}a}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
$Vr_{b\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
$Vr_{c\text{-}b}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
$Vl_{d\text{-}c}$	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}c}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
$Vr_{d\text{-}a}$	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)
MAJOR ROAD			**(ARM A)**
$W_{a\text{-}d}$	=	3.00	(metres)
$Vr_{a\text{-}d}$	=	100	(metres)
$q_{a\text{-}b}$	=	0	(pcu/hr)
$q_{a\text{-}c}$	=	0	(pcu/hr)
$q_{a\text{-}d}$	=	0	(pcu/hr)
MAJOR ROAD			**(ARM C)**
$W_{c\text{-}b}$	=		(metres)
$Vr_{c\text{-}b}$	=		(metres)
$q_{c\text{-}a}$	=	0	(pcu/hr)
$q_{c\text{-}b}$	=	0	(pcu/hr)
$q_{c\text{-}d}$	=	0	(pcu/hr)
MINOR ROAD			**(ARM B)**
$W_{b\text{-}a}$	=	5.00	(metres)
$W_{b\text{-}c}$	=	5.00	(metres)
$Vl_{b\text{-}a}$	=	100	(metres)
$Vr_{b\text{-}a}$	=	65	(metres)
$Vr_{b\text{-}c}$	=	0	(metres)
$q_{b\text{-}a}$	=	0	(pcu/hr)
$q_{b\text{-}c}$	=	3	(pcu/hr)
$q_{b\text{-}d}$	=	0	(pcu/hr)
MINOR ROAD			**(ARM D)**
$W_{d\text{-}a}$	=	3.00	(metres)
$W_{d\text{-}c}$	=	3.00	(metres)
$Vl_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}c}$	=	50	(metres)
$Vr_{d\text{-}a}$	=	80	(metres)
$q_{d\text{-}a}$	=	10	(pcu/hr)
$q_{d\text{-}b}$	=	3	(pcu/hr)
$q_{d\text{-}c}$	=	252	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

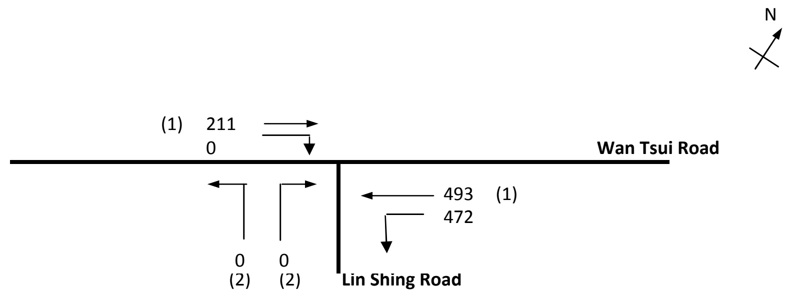
$Q_{b\text{-}a}$	=	610
$Q_{b\text{-}c}$	=	749
$Q_{b\text{-}d}$ is nearside	=	TRUE
$Q_{b\text{-}d}$	=	611
$Q_{d\text{-}a}$	=	674
$Q_{d\text{-}b}$ is nearside	=	TRUE
$Q_{d\text{-}b}$	=	533
$Q_{d\text{-}c}$	=	518
$Q_{c\text{-}b}$	=	437
$Q_{a\text{-}d}$	=	616

COMPARISION OF DESIGN FLOW TO CAPACITY

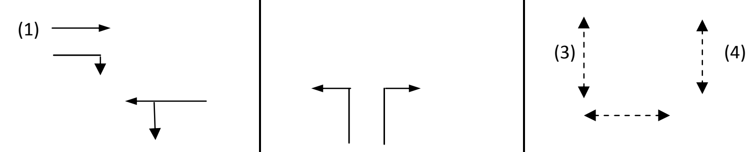
$DFC_{b\text{-}a}$	=	0.000
$DFC_{b\text{-}c}$	=	0.003
$DFC_{b\text{-}d}$	=	0.000
$DFC_{d\text{-}a}$	=	0.015
$DFC_{d\text{-}b}$	=	0.005
$DFC_{d\text{-}c}$	=	0.487
$DFC_{c\text{-}b}$	=	0.000
$DFC_{a\text{-}d}$	=	0.000

Critical DFC = 0.487

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
Junction of Lin Shing Road and Wan Tsui Road	J2LV3 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.514	
Loss time		L =	25	sec
Total Flow		=	1176	pcu
Co	= (1.5*L+5)/(1-Y)	=	87.5	sec
Cm	= L/(1-Y)	=	51.5	sec
Yult		=	0.713	
R.C.ult	= (Yult-Y)/Y*100%	=	38.5	%
Cp	= 0.9*L/(0.9-Y)	=	58.3	sec
Ymax	= 1-L/C	=	0.792	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	38.5	%



Stage A I = 7	Stage B I =	Stage C I =	

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				5					
ST	A	3.00	1	1			N	1915		211		211	0.00	1915			1915	0.110			20	95	0.139	6	2
ST/LT	A	4.00	1	1	10		N	2015	472	493		965	0.49	1877			1877	0.514	0.514		95	95	0.650	36	3
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow

Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at

Junction Capacity Analysis

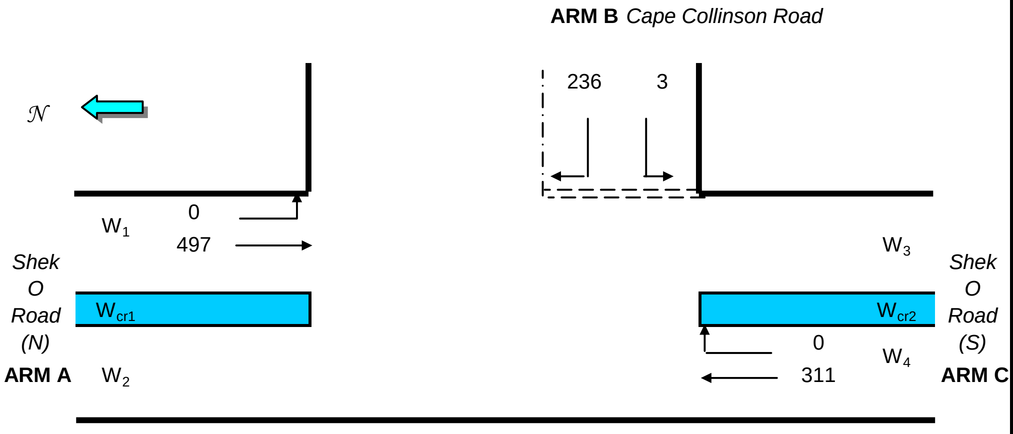
Prepared By: KC

Checked By: OC

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road

Design Year - 2021 Level 3 - Reference Case

Time - Level 3 Peak Hour



GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	497	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	311	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	236	(pcu/hr)
q_{b-c}	=	3	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	615
Q_{c-b}	=	685
Q_{b-a}	=	281

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	0.842
DFC_{b-c}	=	0.004
DFC_{c-b}	=	0.000

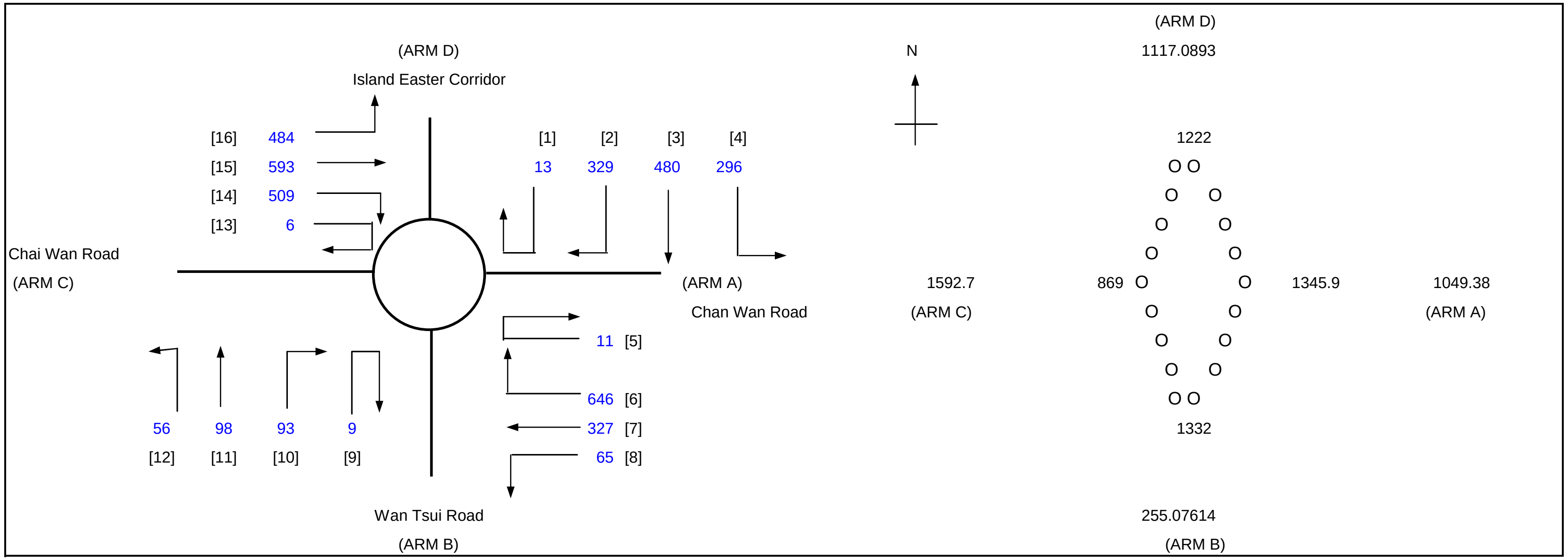
Critical DFC = 0.842

REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

ROUNDABOUT CAPACITY ASSESSMENT

				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	J4LV3 Peak Hour	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME :LV3_Sen2_Ref_J2_J5_J6_J7_J8.	CHECKED BY:	OC	Sep-13
J4LV3 Peak Hour			REVIEWED BY:	OC	Sep-13

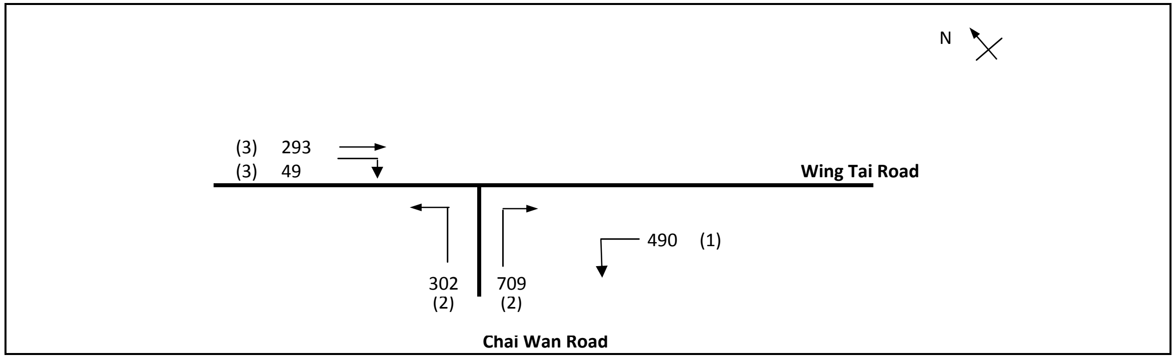


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	1049	255	1593	1117
Qc	=	Circulating flow across entry (pcu/h)	1346	1332	869	1222
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1448	732	1822	1293
DFC	=	Design flow/Capacity = Q/Qe	0.72	0.35	0.87	0.86

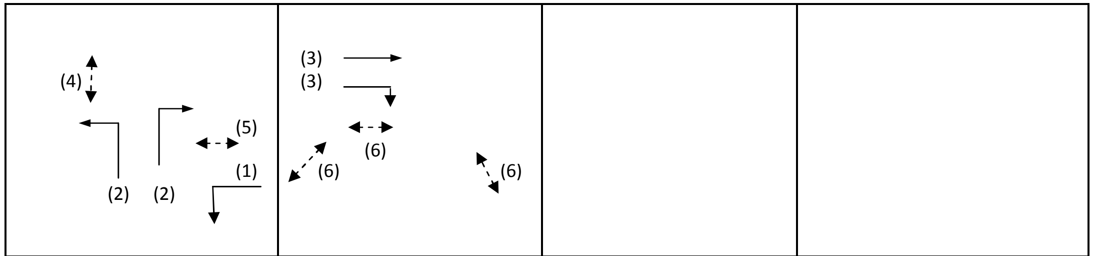
Total In Sum = 3113.64 PCU

DFC of Critical Approach = 0.87

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV3 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	100 sec
Sum(y)		Y =	0.270
Loss time		L =	10 sec
Total Flow		=	1844 pcu
Co	= (1.5*L+5)/(1-Y)	=	27.4 sec
Cm	= L/(1-Y)	=	13.7 sec
Yult		=	0.825
R.C.ult	= (Yult-Y)/Y*100%	=	205.4 %
Cp	= 0.9*L/(0.9-Y)	=	14.3 sec
Ymax	= 1-L/C	=	0.900
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	199.8 %

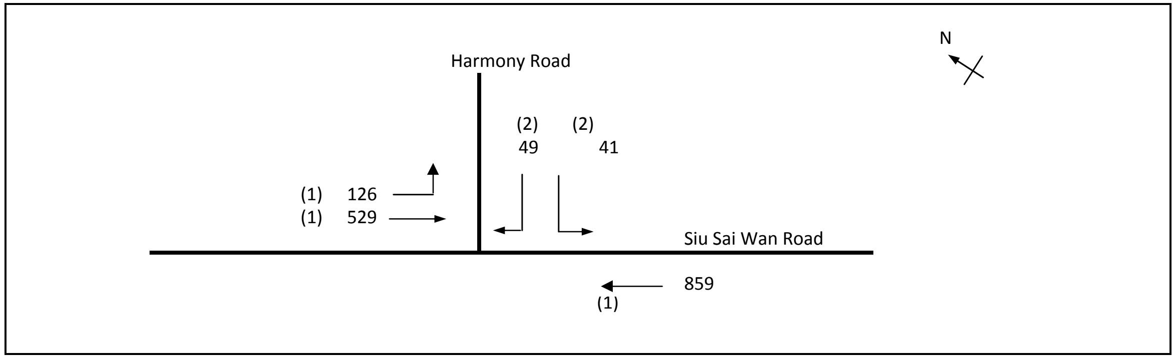


Stage A I = 7 | Stage B I = 5

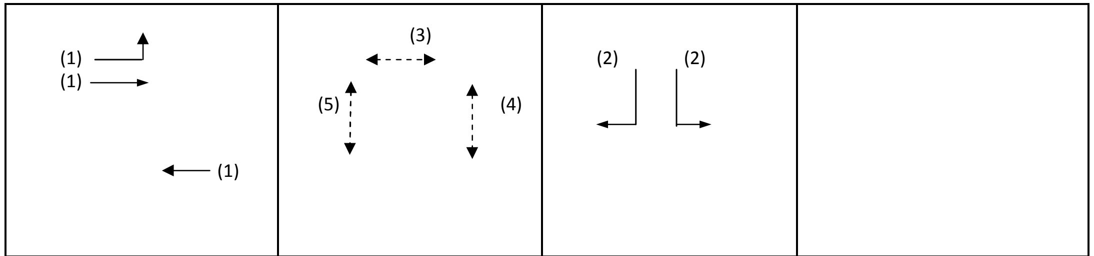
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	490			490	1.00	3857			3857	0.127			42	66	0.192	12	5
LT	A	4.00	2	2	24			4310	302			302	1.00	4056			4056	0.074			25	66	0.113	6	5
RT	A	3.50	2	2	11		y	4070			709	709	1.00	3582			3582	0.198	0.198		66	66	0.300	18	4
ST	B	3.50	3	2			y	4070		293		293	0.00	4070			4070	0.072	0.072		24	24	0.300	18	25
RT	B	4.50	3	2	13		y	4270			49	49	1.00	3828			3828	0.013			4	24	0.054	3	26
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV3 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3	
Cycle time		C =	100	sec
Sum(y)		Y =	0.243	
Loss time		L =	48	sec
Total Flow		=	1604	pcu
Co	= (1.5*L+5)/(1-Y)	=	101.7	sec
Cm	= L/(1-Y)	=	63.4	sec
Yult		=	0.540	
R.C.ult	= (Yult-Y)/Y*100%	=	122.6	%
Cp	= 0.9*L/(0.9-Y)	=	65.7	sec
Ymax	= 1-L/C	=	0.520	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	93.0	%

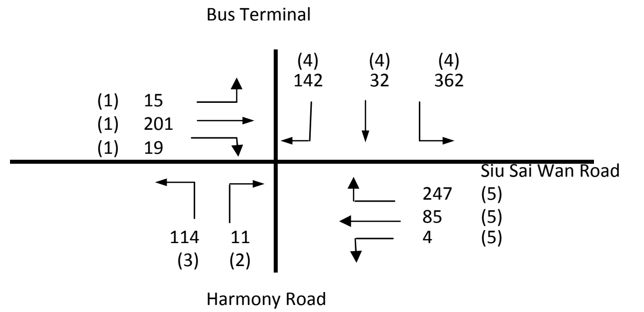


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

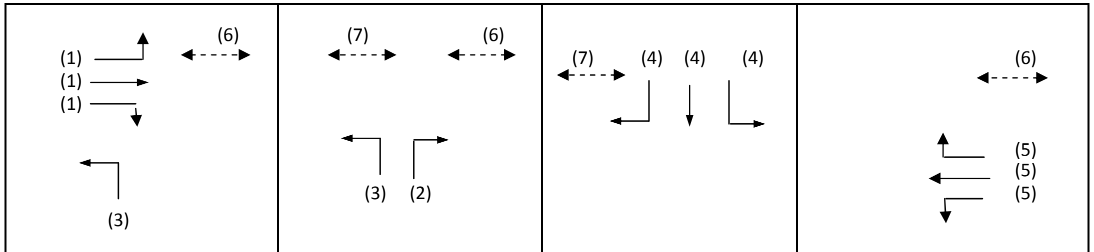
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	126	152		278	0.45	1832			1832	0.152			32	46	0.327	24	12
ST	A	3.20	1	1				2075		377		377	0.00	2075			2075	0.182			39	46	0.392	30	12
ST	A	3.00	1	2			y	3970		859		859	0.00	3970			3970	0.216	0.216		46	46	0.466	36	11
LT	C	3.75	2	1	12		y	1990	41			41	1.00	1769			1769	0.023			5	6	0.410	6	51
RT	C	3.75	2	1	12			2130			49	49	1.00	1893			1893	0.026	0.026		6	6	0.466	6	52
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV3 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	105	sec
Sum(y)		Y =	0.429	
Loss time		L =	18	sec
Total Flow		=	1232	pcu
Co	= (1.5*L+5)/(1-Y)	=	56.1	sec
Cm	= L/(1-Y)	=	31.5	sec
Yult		=	0.765	
R.C.ult	= (Yult-Y)/Y*100%	=	78.3	%
Cp	= 0.9*L/(0.9-Y)	=	34.4	sec
Ymax	= 1-L/C	=	0.829	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	73.8	%

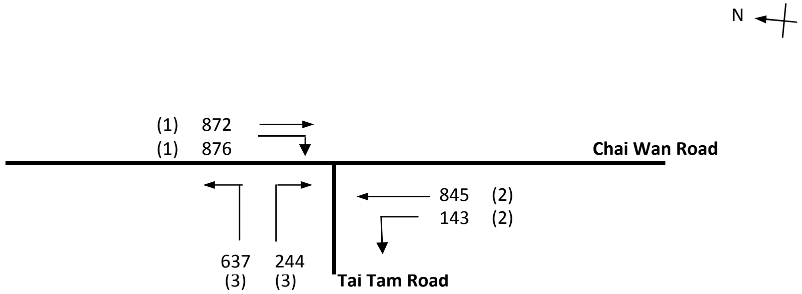


Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

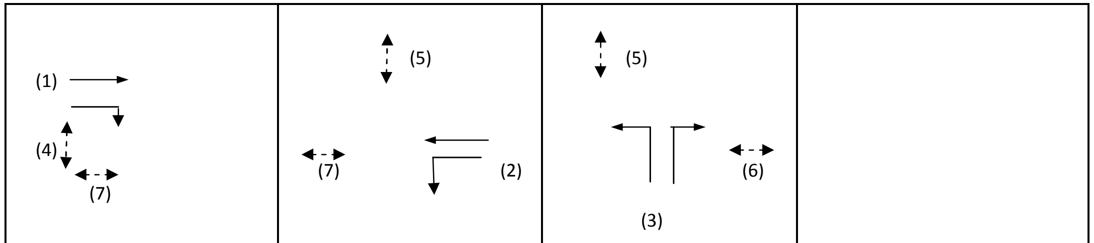
Movement	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	15	81		96	0.16	1904			1904	0.051			10	14	0.387	12	38
ST/RT	A	3.30	1	1	12			2085		120	19	139	0.14	2050			2050	0.068	0.068		14	14	0.518	18	40
RT	B	3.50	2	1	12			2105			11	11	1.00	1871			1871	0.006	0.006		1	1	0.518	0	125
LT	A,B	3.75	3	1	13		y	1990	114			114	1.00	1784			1784	0.064			13	20	0.337	12	31
RT	C	3.50	4	1	12			2105			142	142	1.00	1871			1871	0.076			15	45	0.176	12	15
LT/ST	C	3.50	4	1	12		y	1965	362	32		393	0.92	1762			1762	0.223	0.223		45	45	0.518	36	14
ST/RT	D	3.50	5	1	12			2105		0	247	247	1.00	1871			1871	0.132	0.132		27	27	0.518	30	26
LT/ST	D	3.50	5	1	11		y	1965	4	85		89	0.04	1954			1954	0.045			9	9	0.518	12	48
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV3 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	105 sec
Sum(y)		Y =	0.923
Loss time		L =	18 sec
Total Flow		=	3617 pcu
Co	= (1.5*L+5)/(1-Y)	=	417.4 sec
Cm	= L/(1-Y)	=	234.8 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	-17.1 %
Cp	= 0.9*L/(0.9-Y)	=	-694.0 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	-19.2 %



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

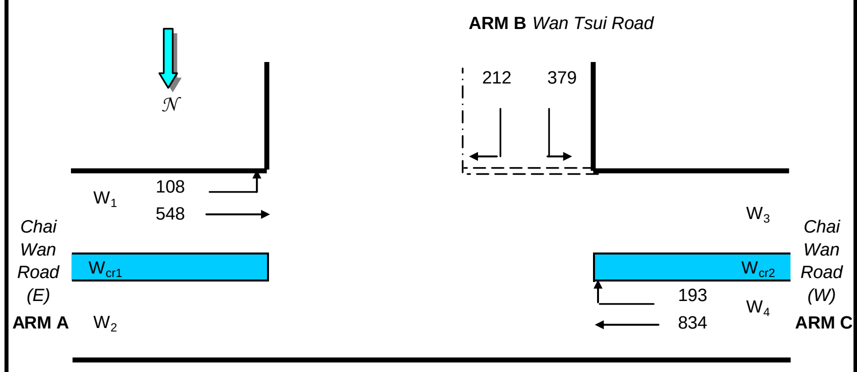
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.50	1	2			y	4070		872		872	0.00	4070			4070	0.214			20	20	1.114	60	45
RT	A	3.50	1	1	13			2105			876	876	1.00	1887			1887	0.464	0.464		44	20	2.413	120	45
ST	B	3.50	2	2				4210		845		845	0.00	4210			4210	0.201	0.201		19	19	1.114	60	46
LT	B	3.10	2	1	12		y	1925	143			143	1.00	1711			1711	0.084			8	19	0.466	18	34
LT	C	4.00	3	1	15		y	2015	474			474	1.00	1832			1832	0.259	0.259		24	24	1.114	60	36
LT/RT	C	4.00	3	1	15			2155	163		244	407	1.00	1959			1959	0.208			20	24	0.895	60	35
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Halcrow **Agreement No. CPM301_15/10 - Traffic Impact Assessment Study For Columbarium Development at**
Junction Capacity Analysis

Prepared By: KC
Checked By: OC

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road
Design Year - 2021 Level 3 - Reference Case
Time - Level 3 Peak Hour



GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	107.87	(pcu/hr)
q_{a-c}	=	548	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	834	(pcu/hr)
q_{c-b}	=	192.89	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	212	(pcu/hr)
q_{b-c}	=	379	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	750
Q_{c-b}	=	664
Q_{b-a}	=	341

COMPARISION OF DESIGN FLOW TO CAPACITY

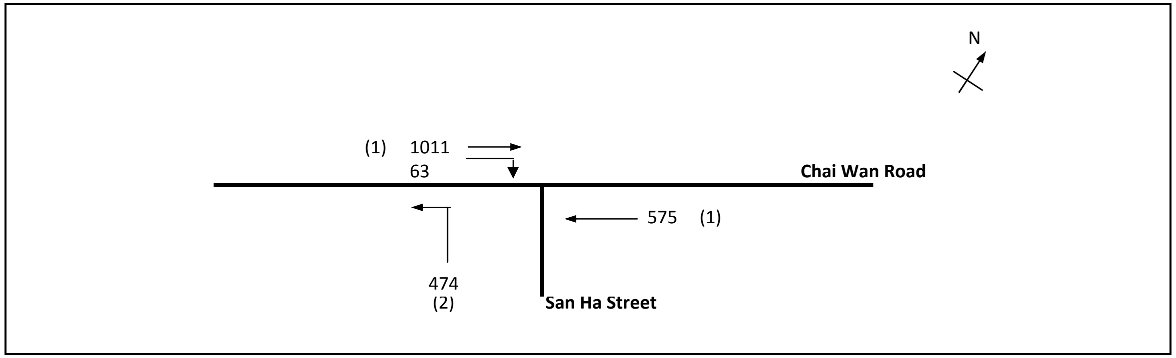
DFC_{b-a}	=	0.623
DFC_{b-c}	=	0.505
DFC_{c-b}	=	0.291

Critical DFC = 0.623

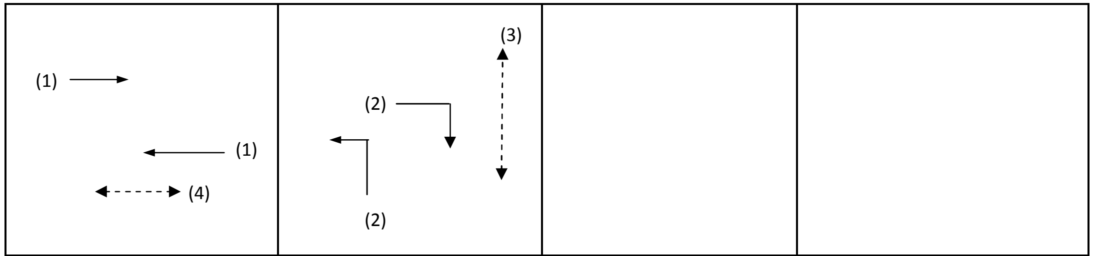
REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV3 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.533	
Loss time		L =	10	sec
Total Flow		=	2124	pcu
Co	= (1.5*L+5)/(1-Y)	=	42.8	sec
Cm	= L/(1-Y)	=	21.4	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	54.7	%
Cp	= 0.9*L/(0.9-Y)	=	24.5	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	51.9	%



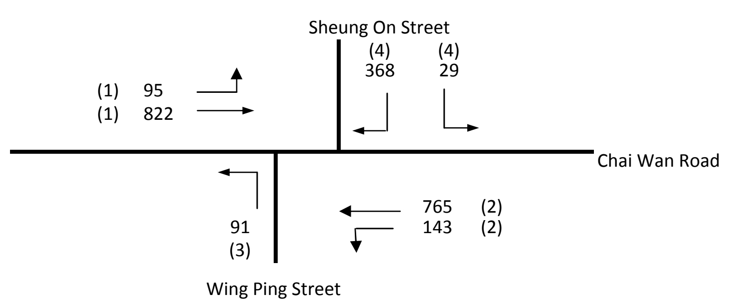
Stage A	I = 6	Stage B	I = 6	Stage C	I =	

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		1011		1011	0.00	4070			4070	0.248	0.248		42	47	0.529	42	10
ST	A	3.50	1	2	10		N	4070		575		575	0.00	4070			4070	0.141			24	47	0.301	24	11
LT	B	3.00	2	1	10		N	1915	474			474	1.00	1665			1665	0.285	0.285		48	53	0.537	36	9
RT	B	3.50	2	1	12			2105			63	63	1.00	1871			1871	0.034			6	53	0.064	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

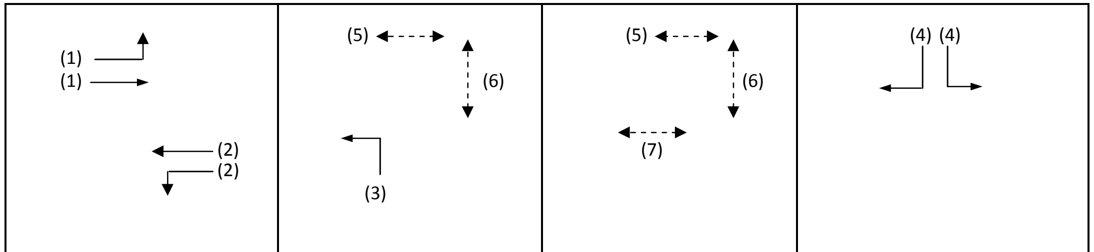
NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION

				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV3 - Peak Hour Traffic Flows	FILENAME 2_Ref_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 3 Peak Hour - Reference Case		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	120 sec
Sum(y)		Y =	0.317
Loss time		L =	37 sec
Total Flow		=	2315 pcu
Co	= (1.5*L+5)/(1-Y)	=	88.5 sec
Cm	= L/(1-Y)	=	54.1 sec
Yult		=	0.623
R.C.ult	= (Yult-Y)/Y*100%	=	96.6 %
Cp	= 0.9*L/(0.9-Y)	=	57.1 sec
Ymax	= 1-L/C	=	0.692
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	96.6 %



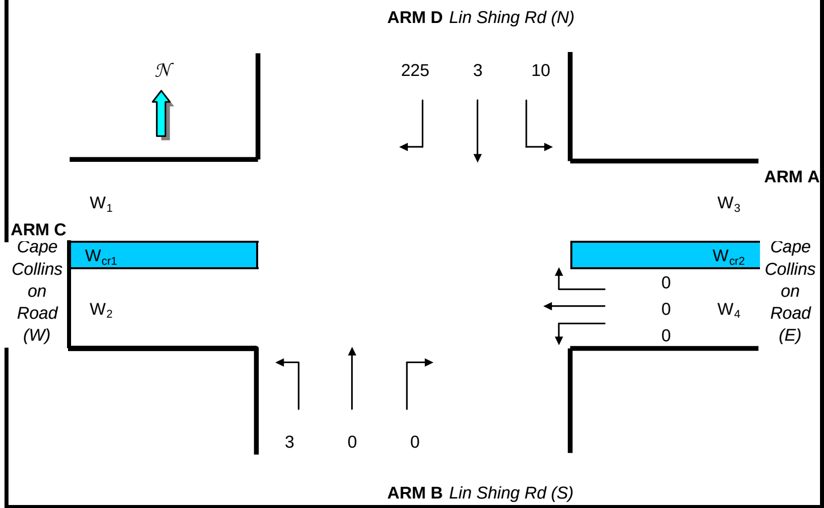
Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Straight pcu/h	Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	95	822		918	0.10	6096			6096	0.151			39		0.000	60	54
LT/ST	A	3.30	2	3	12		Y	6115	143	765		909	0.16	5997			5997	0.152	0.152		40		0.000	60	54
LT	B	3.50	3	1	9		Y	1965	91			91	1.00	1684			1684	0.054	0.054		14		0.000	18	54
LT/RT	D	3.75	4	2	10		y	4120	29		368	397	1.00	3583			3583	0.111	0.111		29		0.000	39	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Prepared By:	KC
Checked By:	OC

Junction layout sketch - J1: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2021 Level 3 - Site 1
Time - Level 3 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{a-d}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM A-D
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
W_{d-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-A
W_{d-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM D-C
Vr_{a-d}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM A-D
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
Vl_{d-c}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-C
Vr_{d-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM D-A
X_A	=	GEOMETRIC PARAMETERS FOR STREAM A-D
X_B	=	GEOMETRIC PARAMETERS FOR STREAM B-A
X_C	=	GEOMETRIC PARAMETERS FOR STREAM C-B
X_D	=	GEOMETRIC PARAMETERS FOR STREAM D-C
Z_B	=	GEOMETRIC PARAMETERS FOR STREAM B-C
Z_D	=	GEOMETRIC PARAMETERS FOR STREAM D-A
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=		(metres)
W_2	=	6.00	(metres)
W_3	=	3.00	(metres)
W_4	=	3.00	(metres)
W	=	6.00	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)
MAJOR ROAD (ARM A)			
W_{a-d}	=	3.00	(metres)
Vr_{a-d}	=	100	(metres)
q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	0	(pcu/hr)
q_{a-d}	=	0	(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)
q_{c-d}	=	0	(pcu/hr)
MINOR ROAD (ARM B)			
W_{b-a}	=	5.00	(metres)
W_{b-c}	=	5.00	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	65	(metres)
Vr_{b-c}	=	0	(metres)
q_{b-a}	=	0	(pcu/hr)
q_{b-c}	=	2.5381	(pcu/hr)
q_{b-d}	=	0	(pcu/hr)
MINOR ROAD (ARM D)			
W_{d-a}	=	3.00	(metres)
W_{d-c}	=	3.00	(metres)
Vl_{d-c}	=	50	(metres)
Vr_{d-c}	=	50	(metres)
Vr_{d-a}	=	80	(metres)
q_{d-a}	=	10.152	(pcu/hr)
q_{d-b}	=	2.5381	(pcu/hr)
q_{d-c}	=	224.69	(pcu/hr)

GEOMETRIC PARAMETERS

X_A	=	0.922
X_B	=	1.039
X_C	=	0.586
X_D	=	0.827
Y	=	0.793
Z_B	=	1.005
Z_D	=	0.905

THE CAPACITY OF MOVEMENT

Q_{b-a}	=	614
Q_{b-c}	=	749
Q_{b-d} is nearside	=	TRUE
Q_{b-d}	=	611
Q_{d-a}	=	674
Q_{d-b} is nearside	=	TRUE
Q_{d-b}	=	533
Q_{d-c}	=	518
Q_{c-b}	=	437
Q_{a-d}	=	616

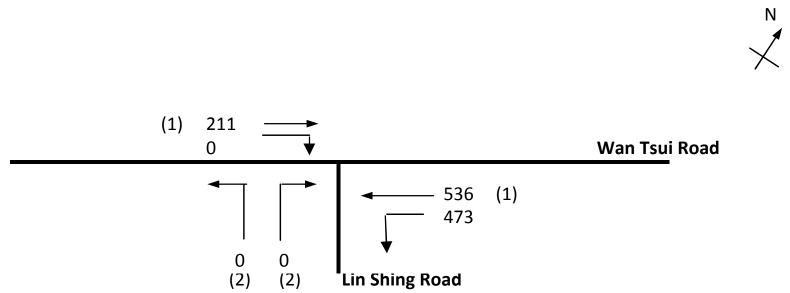
COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	0.000
DFC_{b-c}	=	0.003
DFC_{b-d}	=	0.000
DFC_{d-a}	=	0.015
DFC_{d-b}	=	0.005
DFC_{d-c}	=	0.434
DFC_{c-b}	=	0.000
DFC_{a-d}	=	0.000

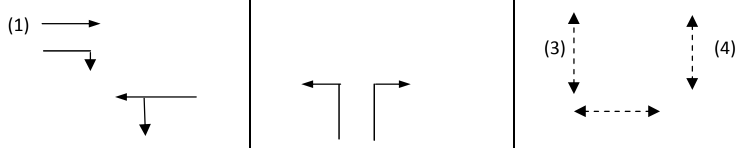
Critical DFC = 0.434

TRAFFIC SIGNAL CALCULATION

				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J2: Junction of Lin Shing Road and Wan Tsui Road	J2LV3 - Peak Hour Traffic Flows	FILENAME :12_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.536	
Loss time		L =	25	sec
Total Flow		=	1219	pcu
Co	= (1.5*L+5)/(1-Y)	=	91.5	sec
Cm	= L/(1-Y)	=	53.8	sec
Yult		=	0.713	
R.C.ult	= (Yult-Y)/Y*100%	=	33.0	%
Cp	= 0.9*L/(0.9-Y)	=	61.8	sec
Ymax	= 1-L/C	=	0.792	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	33.0	%

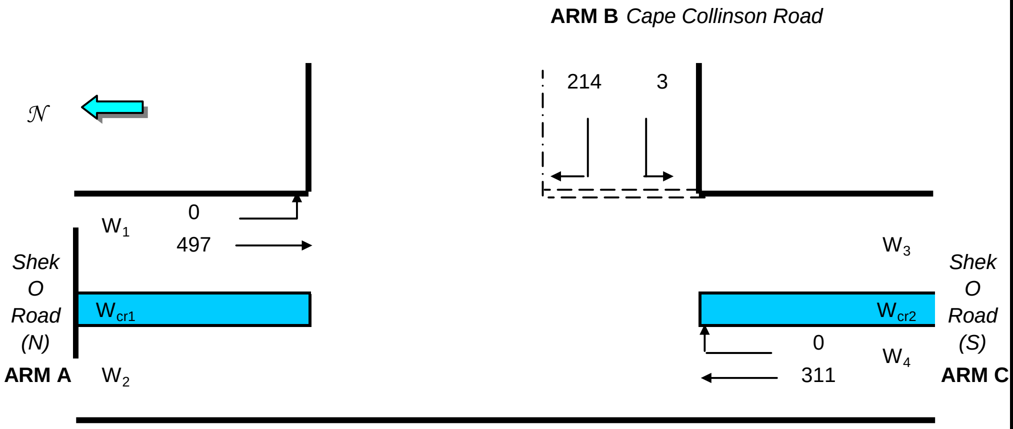


Stage A I = 7	Stage B I =	Stage C I =	

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
ST	A	3.00	1	1			N	1915		211		211	0.00	1915			1915	0.110		5	20	95	0.139	6	2
ST/LT	A	4.00	1	1	10		N	2015	473	536		1009	0.47	1883			1883	0.536	0.536		95	95	0.677	42	3
Ped	B	6.0	3																	20					

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J3: J/O Cape Collinson Road and Lin Shing Road
Design Year - 2021 Level 3 - Site 1
Time - Level 3 Peak Hour



REMARK: (GEOMETRIC INPUT DATA)

W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS

W_1	=	3.90	(metres)
W_2	=	3.90	(metres)
W_3	=	4.80	(metres)
W_4	=	4.50	(metres)
W	=	8.55	(metres)
W_{cr1}	=	0.00	(metres)
W_{cr2}	=	0.00	(metres)
W_{cr}	=	0.00	(metres)

MAJOR ROAD (ARM A)

q_{a-b}	=	0	(pcu/hr)
q_{a-c}	=	497.46	(pcu/hr)

MAJOR ROAD (ARM C)

W_{c-b}	=	4.50	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	310.91	(pcu/hr)
q_{c-b}	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W_{b-a}	=	0.00	(metres)
W_{b-c}	=	3.80	(metres)
Vl_{b-a}	=	100	(metres)
Vr_{b-a}	=	100	(metres)
Vr_{b-c}	=	100	(metres)
q_{b-a}	=	214.03	(pcu/hr)
q_{b-c}	=	2.5381	(pcu/hr)

GEOMETRIC PARAMETERS

D		0.626
E	=	0.996
F	=	1.109
Y	=	0.705

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	615
Q_{c-b}	=	685
Q_{b-a}	=	281

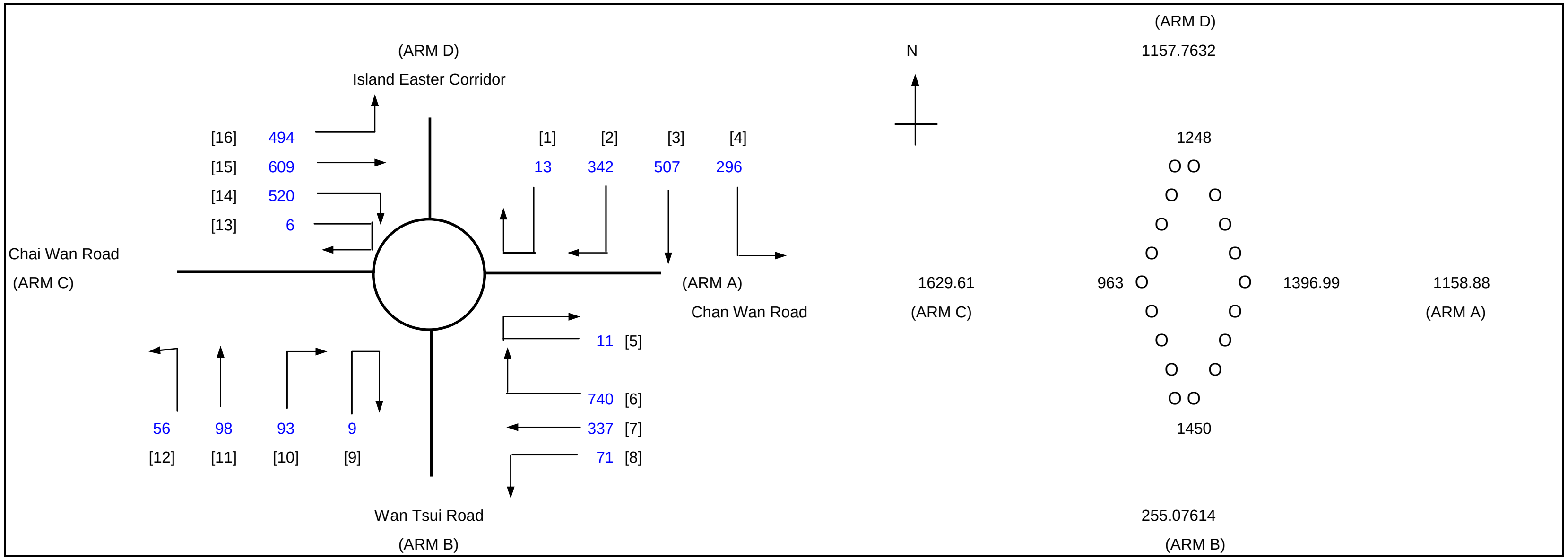
COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	0.762
DFC_{b-c}	=	0.004
DFC_{c-b}	=	0.000

Critical DFC = 0.762

ROUNDABOUT CAPACITY ASSESSMENT

				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road	J4LV3 Peak Hour	PROJECT NO.: 80510	PREPARED BY:	KC	Sep-13
Junction 4: Chai Wan Road Roundabout		FILENAME: LV3_Sen2_S1_J2_J5_J6_J7_J8.xls	CHECKED BY:	OC	Sep-13
J4LV3 Peak Hour			REVIEWED BY:	OC	Sep-13

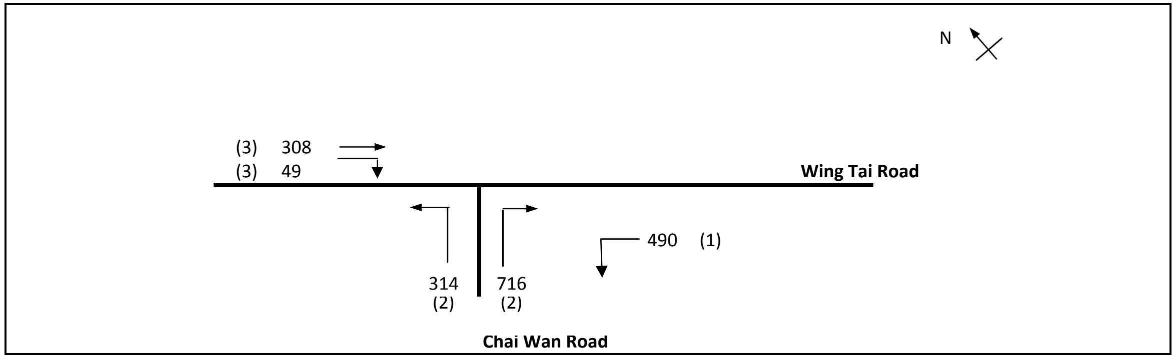


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.00	4.00	7.00	7.00
E	=	Entry width (m)	9.00	7.00	10.00	7.00
L	=	Effective length of flare (m)	6.00	5.00	6.00	6.00
R	=	Entry radius (m)	40.00	15.00	40.00	25.00
D	=	Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A	=	Entry angle (degree)	30.00	35.00	36.00	30.00
Q	=	Entry flow (pcu/h)	1159	255	1630	1158
Qc	=	Circulating flow across entry (pcu/h)	1397	1450	963	1248
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.53	0.96	0.80	0.00
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	0.97	1.00	1.01
X2	=	V + ((E-V)/(1+2S))	7.97	5.03	8.15	7.00
M	=	EXP((D-60)/10)	0.37	0.37	0.37	0.37
F	=	303*X2	2414	1523	2471	2121
Td	=	1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc	=	0.21*Td(1+0.2*X2)	0.74	0.58	0.75	0.69
Qe	=	K(F-Fc*Qc)	1409	666	1750	1274
DFC	=	Design flow/Capacity = Q/Qe	0.82	0.38	0.93	0.91

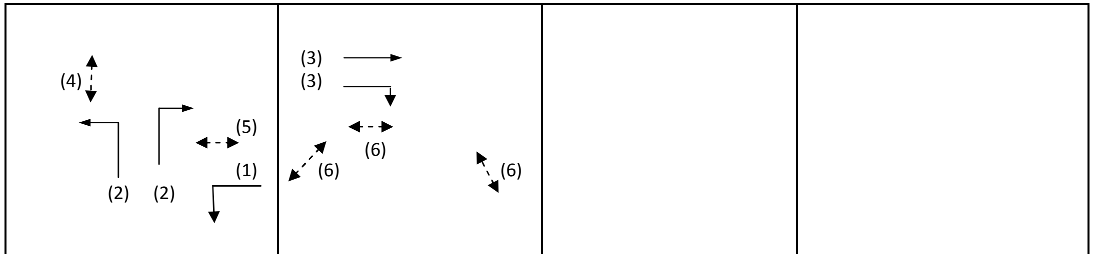
Total In Sum = 3284.74 PCU

DFC of Critical Approach = 0.93

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J5: Junction of Chai Wan Road and Wing Tai Road	J5LV3 - Peak Hour Traffic Flows	FILENAME :n2_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2
Cycle time		C =	100 sec
Sum(y)		Y =	0.276
Loss time		L =	10 sec
Total Flow		=	1878 pcu
Co	= (1.5*L+5)/(1-Y)	=	27.6 sec
Cm	= L/(1-Y)	=	13.8 sec
Yult		=	0.825
R.C.ult	= (Yult-Y)/Y*100%	=	199.2 %
Cp	= 0.9*L/(0.9-Y)	=	14.4 sec
Ymax	= 1-L/C	=	0.900
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	193.7 %

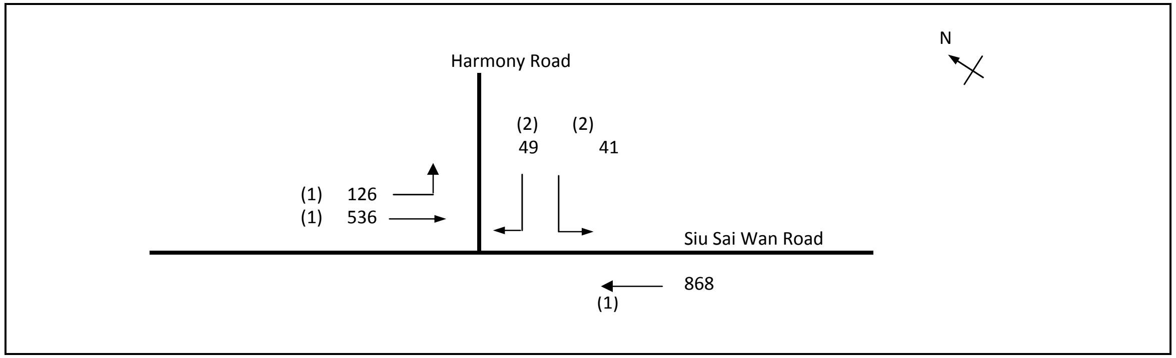


Stage A I = 7 | Stage B I = 5

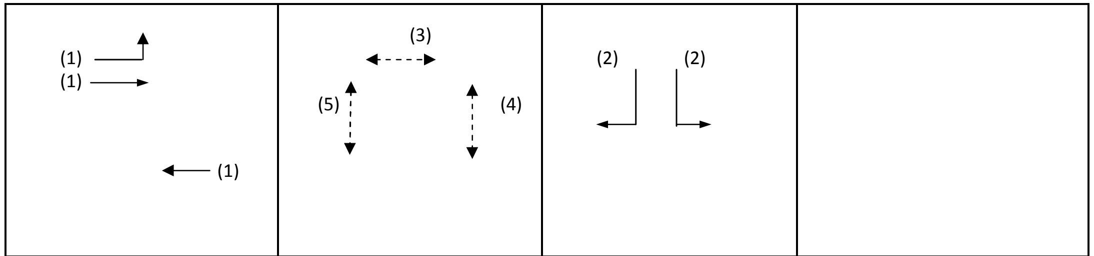
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
LT	A	3.75	1	2	22		y	4120	490			490	1.00	3857			3857	0.127			41	65	0.195	12	5
LT	A	4.00	2	2	24			4310	314			314	1.00	4056			4056	0.077			25	65	0.119	9	5
RT	A	3.50	2	2	11		y	4070			716	716	1.00	3582			3582	0.200	0.200		65	65	0.306	18	5
ST	B	3.50	3	2			y	4070		308		308	0.00	4070			4070	0.076	0.076		25	25	0.306	18	24
RT	B	4.50	3	2	13		y	4270			49	49	1.00	3828			3828	0.013			4	25	0.052	3	25
Ped	A	4.50	4																						
Ped	A	4.50	5																						
Ped	B	4.50	6																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J6: Junction of Siu Sai Wan Road and Harmony Road	J6LV3 - Peak Hour Traffic Flows	FILENAME :2_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	100 sec
Sum(y)		Y =	0.245
Loss time		L =	48 sec
Total Flow		=	1620 pcu
Co	= (1.5*L+5)/(1-Y)	=	102.0 sec
Cm	= L/(1-Y)	=	63.6 sec
Yult		=	0.540
R.C.ult	= (Yult-Y)/Y*100%	=	120.5 %
Cp	= 0.9*L/(0.9-Y)	=	65.9 sec
Ymax	= 1-L/C	=	0.520
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	91.1 %

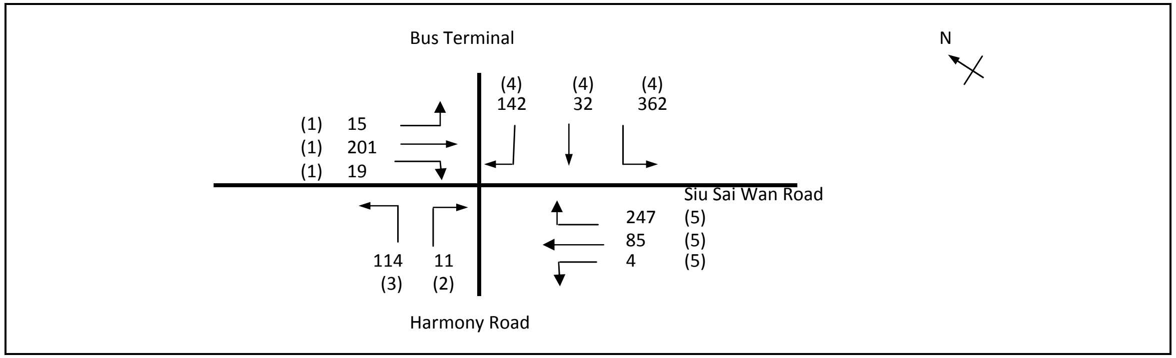


Stage A	I = 10	Stage B	I = 15	Stage C	I = 6

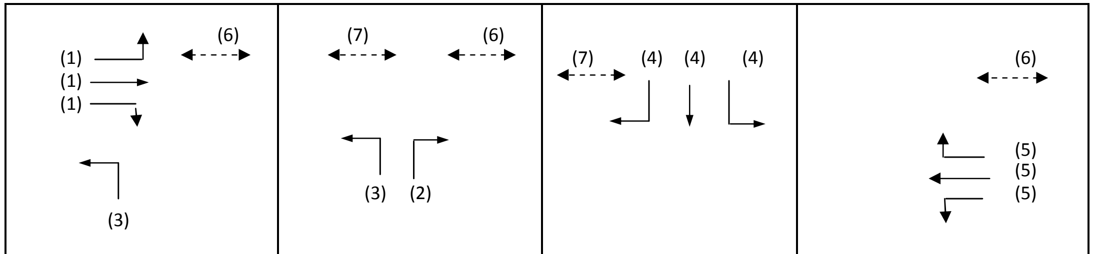
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				28					
LT/ST	A	3.30	1	1	11		y	1945	126	152		278	0.45	1832			1832	0.152			32	46	0.326	24	12
ST	A	3.20	1	1				2075		384		384	0.00	2075			2075	0.185			39	46	0.398	30	12
ST	A	3.00	1	2			y	3970		868		868	0.00	3970			3970	0.219	0.219		46	46	0.471	36	11
LT	C	3.75	2	1	12		y	1990	41			41	1.00	1769			1769	0.023			5	6	0.414	6	51
RT	C	3.75	2	1	12			2130			49	49	1.00	1893			1893	0.026	0.026		6	6	0.471	6	53
Ped	B	11.00	3																	20					
Ped	B	6.50	4																						
Ped	B	6.50	5																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J7: Junction of Siu Sai Wan Road and Harmony Road(N)	J7LV3 - Peak Hour Traffic Flows	FILENAME :2_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4
Cycle time		C =	105 sec
Sum(y)		Y =	0.429
Loss time		L =	18 sec
Total Flow		=	1232 pcu
Co	= (1.5*L+5)/(1-Y)	=	56.1 sec
Cm	= L/(1-Y)	=	31.5 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	78.3 %
Cp	= 0.9*L/(0.9-Y)	=	34.4 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	73.8 %

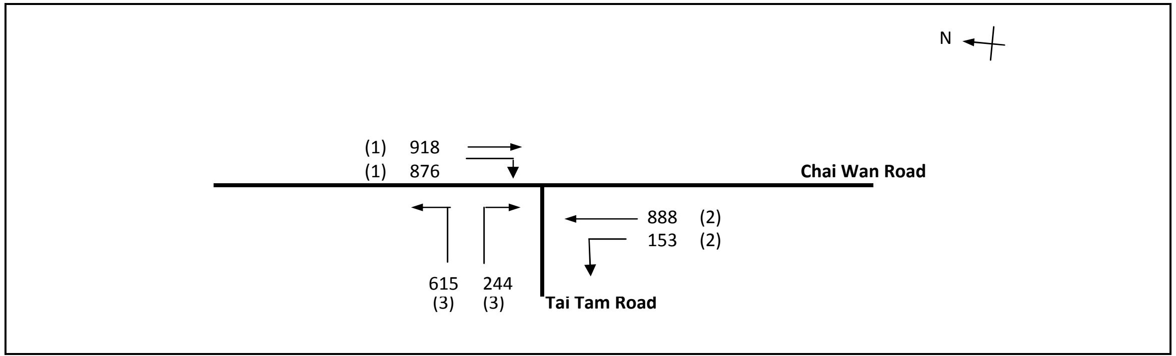


Stage A	I = 5	Stage B	I = 5	Stage C	I = 6	Stage C	I = 6

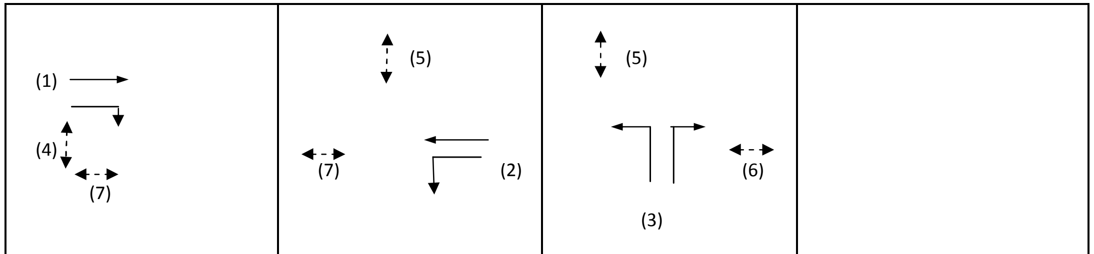
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
LT/ST	A	3.30	1	1	11		y	1945	15	81		96	0.16	1904			1904	0.051			10	14	0.387	12	38
ST/RT	A	3.30	1	1	12			2085		120	19	139	0.14	2050			2050	0.068	0.068		14	14	0.518	18	40
RT	B	3.50	2	1	12			2105			11	11	1.00	1871			1871	0.006	0.006		1	1	0.518	0	125
LT	A,B	3.75	3	1	13		y	1990	114			114	1.00	1784			1784	0.064			13	20	0.337	12	31
RT	C	3.50	4	1	12			2105			142	142	1.00	1871			1871	0.076			15	45	0.176	12	15
LT/ST	C	3.50	4	1	12		y	1965	362	32		393	0.92	1762			1762	0.223	0.223		45	45	0.518	36	14
ST/RT	D	3.50	5	1	12			2105			247	247	1.00	1871			1871	0.132	0.132		27	27	0.518	30	26
LT/ST	D	3.50	5	1	11		y	1965	4	85		89	0.04	1954			1954	0.045			9	9	0.518	12	48
Ped	D,A,B	4.00	6																						
Ped	B,C	4.00	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION				INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By:	KC	29-4-2011
J8: Junction of Chai Wan Road and Tai Tam Road	J8LV3 - Peak Hour Traffic Flows	FILENAME :12_S1_J2_J5_J6_J7_J8.xls	Checked By:	OC	29-4-2011
2021 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By:	OC	3-5-2011



No. of stages per cycle		N =	3
Cycle time		C =	105 sec
Sum(y)		Y =	0.883
Loss time		L =	18 sec
Total Flow		=	3693 pcu
Co	= (1.5*L+5)/(1-Y)	=	274.2 sec
Cm	= L/(1-Y)	=	154.2 sec
Yult		=	0.765
R.C.ult	= (Yult-Y)/Y*100%	=	-13.4 %
Cp	= 0.9*L/(0.9-Y)	=	969.5 sec
Ymax	= 1-L/C	=	0.829
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	-15.6 %



Stage A	I = 7	Stage B	I = 8	Stage C	I = 6

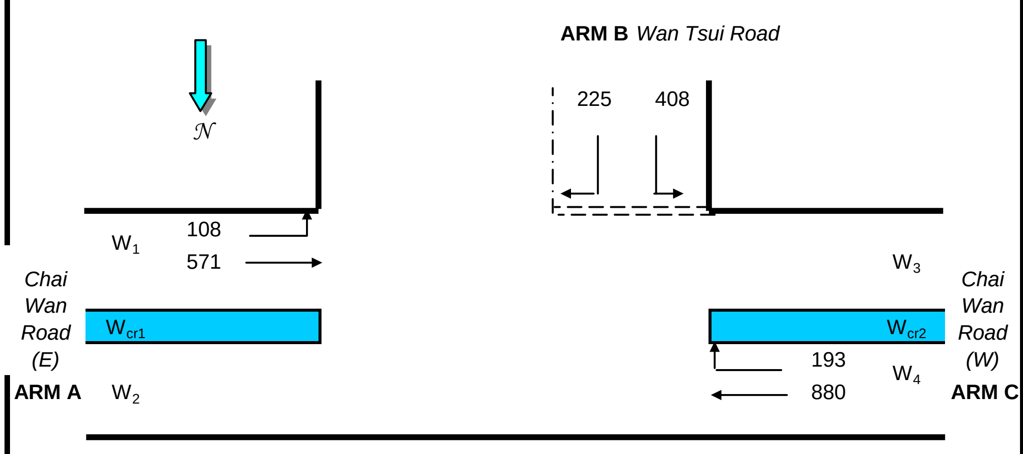
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				18					
ST	A	3.75	1	2			y	4120		918		918	0.00	4120			4120	0.223			22	22	1.066	63	44
RT	A	3.00	1	1	13			2055			876	876	1.00	1842			1842	0.475	0.475		47	22	2.273	120	43
ST	B	3.50	2	2				4210		888		888	0.00	4210			4210	0.211	0.211		21	21	1.066	60	45
LT	B	3.10	2	1	12		y	1925	153			153	1.00	1711			1711	0.089			9	21	0.451	18	32
LT	C	4.00	3	1	15		y	2015	473			473	1.00	1832			1832	0.258			25	25	1.066	60	35
LT/RT	C	4.00	3	1	15			2155	142		244	386	1.00	1959			1959	0.197	0.197		19	25	0.815	48	37
Ped	A	4.50	4																						
Ped	B,C	3.50	5																						
Ped	C	3.50	6																						
Ped	A,B	3.50	7																						

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

Junction layout sketch - J9: Junciton of Chai Wan Road and Wan Tsui Road

Design Year - 2021 Level 3 - Site 1

Time - Level 3 Peak Hour



GEOMETRIC DETAILS

W_1	=	10.90	(metres)
W_2	=	7.70	(metres)
W_3	=	10.60	(metres)
W_4	=	10.20	(metres)
W	=	19.70	(metres)
W_{cr1}	=	4.10	(metres)
W_{cr2}	=	1.70	(metres)
W_{cr}	=	2.90	(metres)

GEOMETRIC PARAMETERS

D		0.675
E	=	1.109
F	=	0.993
Y	=	0.320

MAJOR ROAD (ARM A)

q_{a-b}	=	107.87	(pcu/hr)
q_{a-c}	=	571.19	(pcu/hr)

THE CAPACITY OF MOVEMENT

Q_{b-c}	=	747
Q_{c-b}	=	661
Q_{b-a}	=	337

MAJOR ROAD (ARM C)

W_{c-b}	=	3.30	(metres)
Vr_{c-b}	=	150	(metres)
q_{c-a}	=	880.37	(pcu/hr)
q_{c-b}	=	192.89	(pcu/hr)

COMPARISION OF DESIGN FLOW TO CAPACITY

DFC_{b-a}	=	0.668
DFC_{b-c}	=	0.547
DFC_{c-b}	=	0.292

Critical DFC = 0.668

MINOR ROAD (ARM B)

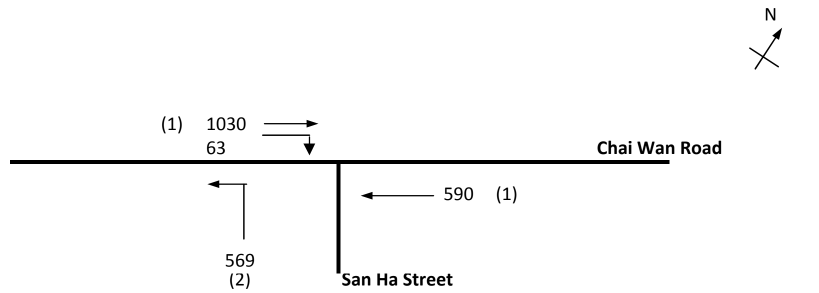
W_{b-a}	=	0.00	(metres)
W_{b-c}	=	4.50	(metres)
Vl_{b-a}	=	150	(metres)
Vr_{b-a}	=	150	(metres)
Vr_{b-c}	=	150	(metres)
q_{b-a}	=	225.08	(pcu/hr)
q_{b-c}	=	408.45	(pcu/hr)

REMARK: (GEOMETRIC INPUT DATA)

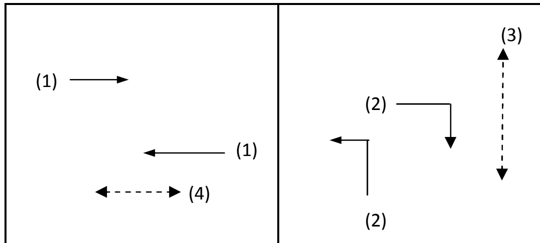
W	=	AVERAGE MAJOR ROAD WIDTH
W_{cr}	=	AVERAGE CENTRAL RESERVE WIDTH
W_{b-a}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-A
W_{b-c}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM B-C
W_{c-b}	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM C-B
Vl_{b-a}	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-a}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-A
Vr_{b-c}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM B-C
Vr_{c-b}	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM C-B
D	=	GEOMETRIC PARAMETERS FOR STREAM B-C
E	=	GEOMETRIC PARAMETERS FOR STREAM B-A
F	=	GEOMETRIC PARAMETERS FOR STREAM C-B
Y	=	(1-0.0345W)

TRAFFIC SIGNAL CALCULATION

			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J10: Junction of Chai Wan Road and San Ha Street	J10LV3 - Peak Hour Traffic Flows	FILENAME :12_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	2	
Cycle time		C =	100	sec
Sum(y)		Y =	0.595	
Loss time		L =	10	sec
Total Flow		=	2253	pcu
Co	= (1.5*L+5)/(1-Y)	=	49.3	sec
Cm	= L/(1-Y)	=	24.7	sec
Yult		=	0.825	
R.C.ult	= (Yult-Y)/Y*100%	=	38.7	%
Cp	= 0.9*L/(0.9-Y)	=	29.5	sec
Ymax	= 1-L/C	=	0.900	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	36.2	%

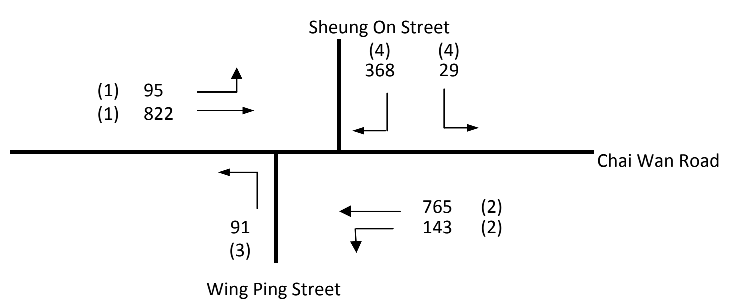


Stage A	I = 6	Stage B	I = 6	Stage C	I =

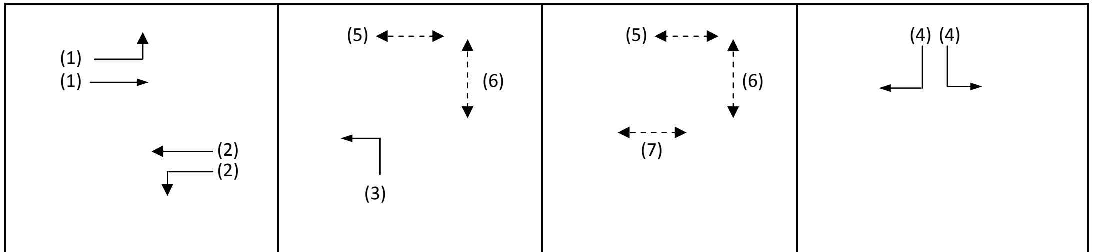
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				10					
ST	A	3.50	1	2	10		N	4070		1030		1030	0.00	4070			4070	0.253	0.253		38	47	0.539	45	10
ST	A	3.50	1	2	10		N	4070		590		590	0.00	4070			4070	0.145			22	47	0.309	24	11
LT	B	3.00	2	1	10		N	1915	569			569	1.00	1665			1665	0.342	0.342		52	53	0.644	42	10
RT	B	3.50	2	1	12			2105			63	63	1.00	1871			1871	0.034			5	53	0.064	0	10
Ped	B	19.0	3																						
Ped	A	8.0	4																						

NOTE : O - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

TRAFFIC SIGNAL CALCULATION			INITIALS	DATE
TIA Study for Columbarium Development at Cape Collinson Road, Chai Wan		PROJECT NO.: CTLDQS	Prepared By: KC	29-4-2011
J11: Junction of Chai Wan Road, Sheung On Street & Wing Ping Street	J11LV3 - Peak Hour Traffic Flows	FILENAME :2_S1_J2_J5_J6_J7_J8.xls	Checked By: OC	29-4-2011
2021 Level 3 Peak Hour - Site 1		REFERENCE NO.:	Reviewed By: OC	3-5-2011



No. of stages per cycle		N =	4	
Cycle time		C =	120	sec
Sum(y)		Y =	0.317	
Loss time		L =	37	sec
Total Flow		=	2315	pcu
Co	= (1.5*L+5)/(1-Y)	=	88.5	sec
Cm	= L/(1-Y)	=	54.1	sec
Yult		=	0.623	
R.C.ult	= (Yult-Y)/Y*100%	=	96.6	%
Cp	= 0.9*L/(0.9-Y)	=	57.1	sec
Ymax	= 1-L/C	=	0.692	
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	=	96.6	%



Stage A	I = 8	Stage B	I = 5	Stage C	I = 7	Stage C	I = 6

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	Opposing Traffic?	Near-side lane?	Straight-Ahead Sat. Flow	Movement Left pcu/h	Movement Straight pcu/h	Movement Right pcu/h	Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Flare lane Length m.	Share Effect pcu/hr	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required sec	g (input) sec	Degree of Saturation X	Queue Length (m / lane)	Average Delay (seconds)
																				22					
LT/ST	A	3.50	1	3	12		y	6175	95	822		918	0.10	6096			6096	0.151			39		0.000	60	54
LT/ST	A	3.30	2	3	12		Y	6115	143	765		909	0.16	5997			5997	0.152	0.152		40		0.000	60	54
LT	B	3.50	3	1	9		Y	1965	91			91	1.00	1684			1684	0.054	0.054		14		0.000	18	54
LT/RT	D	3.75	4	2	10		y	4120	29		368	397	1.00	3583			3583	0.111	0.111		29		0.000	39	54
Ped	B,C	4.00	5																						
Ped	B,C	5.00	6																						
Ped	C	3.00	7																	15					

NOTES : PEDESTRAIN WALKING SPEED = 1.2m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

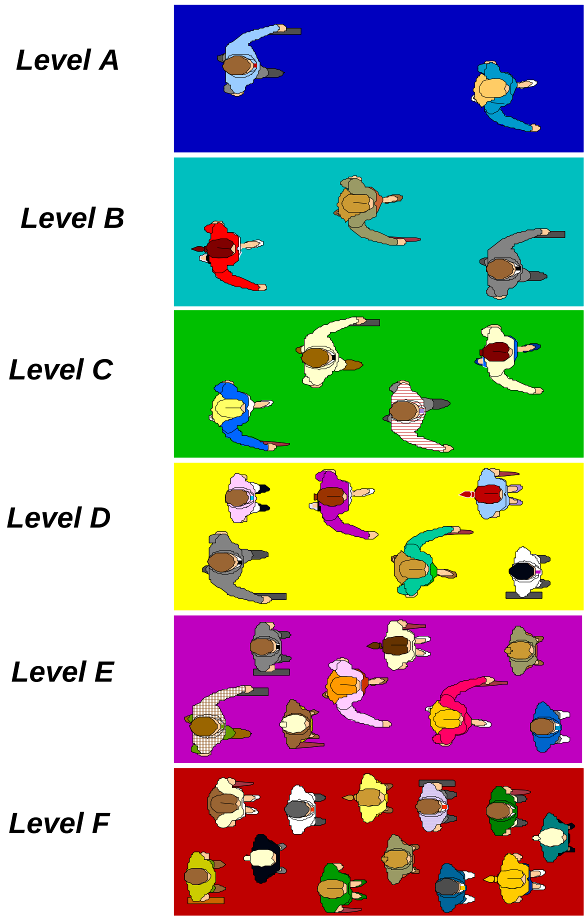
Appendix C

Level of Services Guidelines

Appendix C Description of Level-of-Service (LOS)

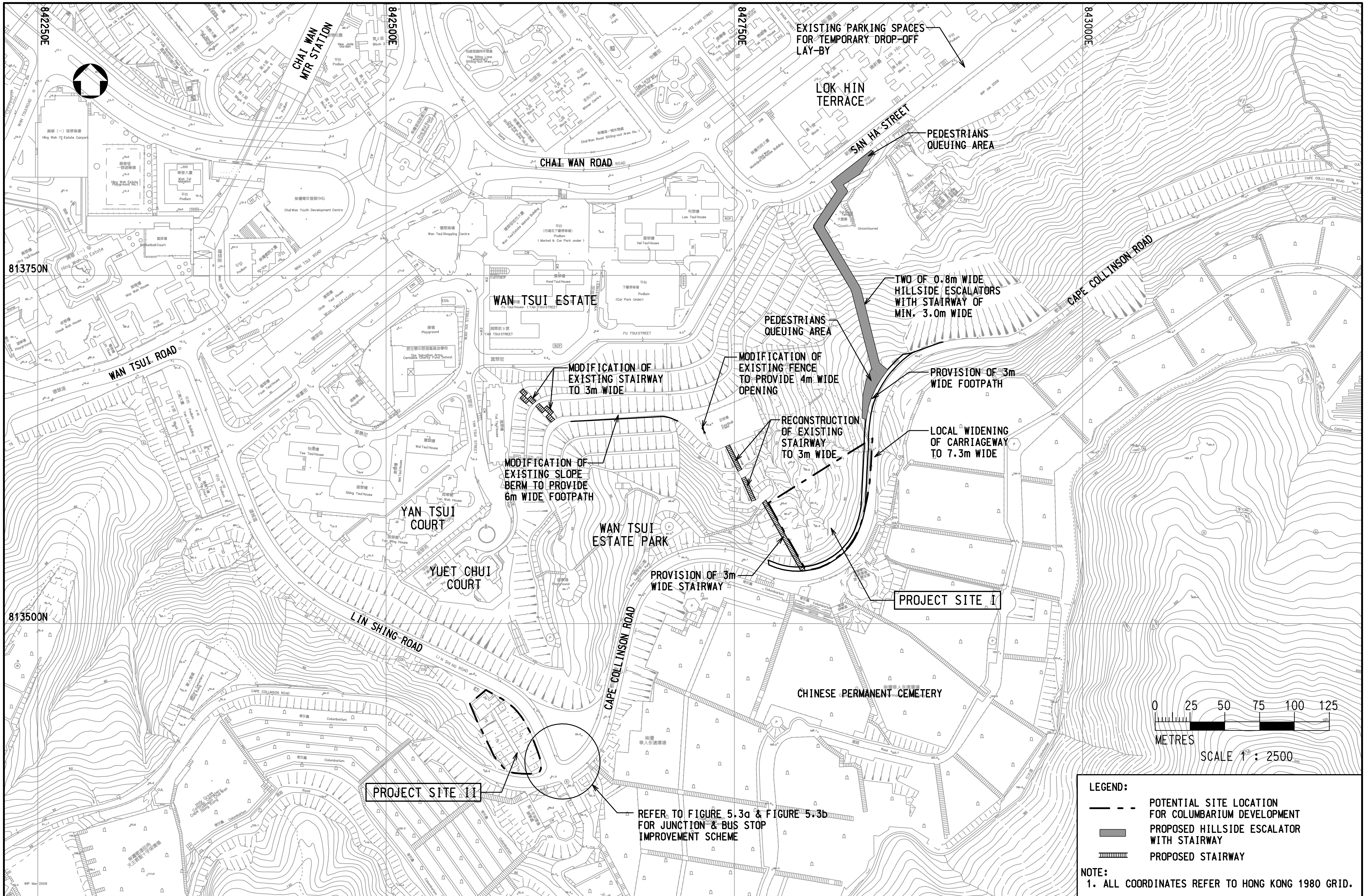
LOS	Flow Rate (ped/min/m)	Description
A	≤ 16	Pedestrians basically move in desired paths without altering their movements in response to other pedestrians. Walking speeds are freely selected, and conflicts between pedestrians are unlikely.
B	16 - 23	Sufficient space is provided for pedestrians to freely 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 exists, 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.

Graph 3-3: Graphical Presentation of LOS



Appendix D

Reference Drawings extracted from 2012 TIA Study



Client:	Consulting Engineer:	Contract No.: CPM301_15/10	TRAFFIC IMPACT ASSESSMENT REPORT	FIGURE 5.2a
ARCHITECTURAL SERVICES DEPARTMENT	Halcrow Halcrow China Ltd.	Project Title: TRAFFIC IMPACT ASSESSMENT STUDY FOR COLUMBARIUM DEVELOPMENT AT CAPE COLLINSON ROAD, CHAI WAN	Drawing Title: PROPOSED IMPROVEMENT SCHEMES FOR PEDESTRIAN FACILITIES	Checked: OC; Scale: 1:2500 @ A3; Rev.: 2 Designed: YC; Drawn: PF; Date: 16/02/2012

HN_Kam1 24/02/2012
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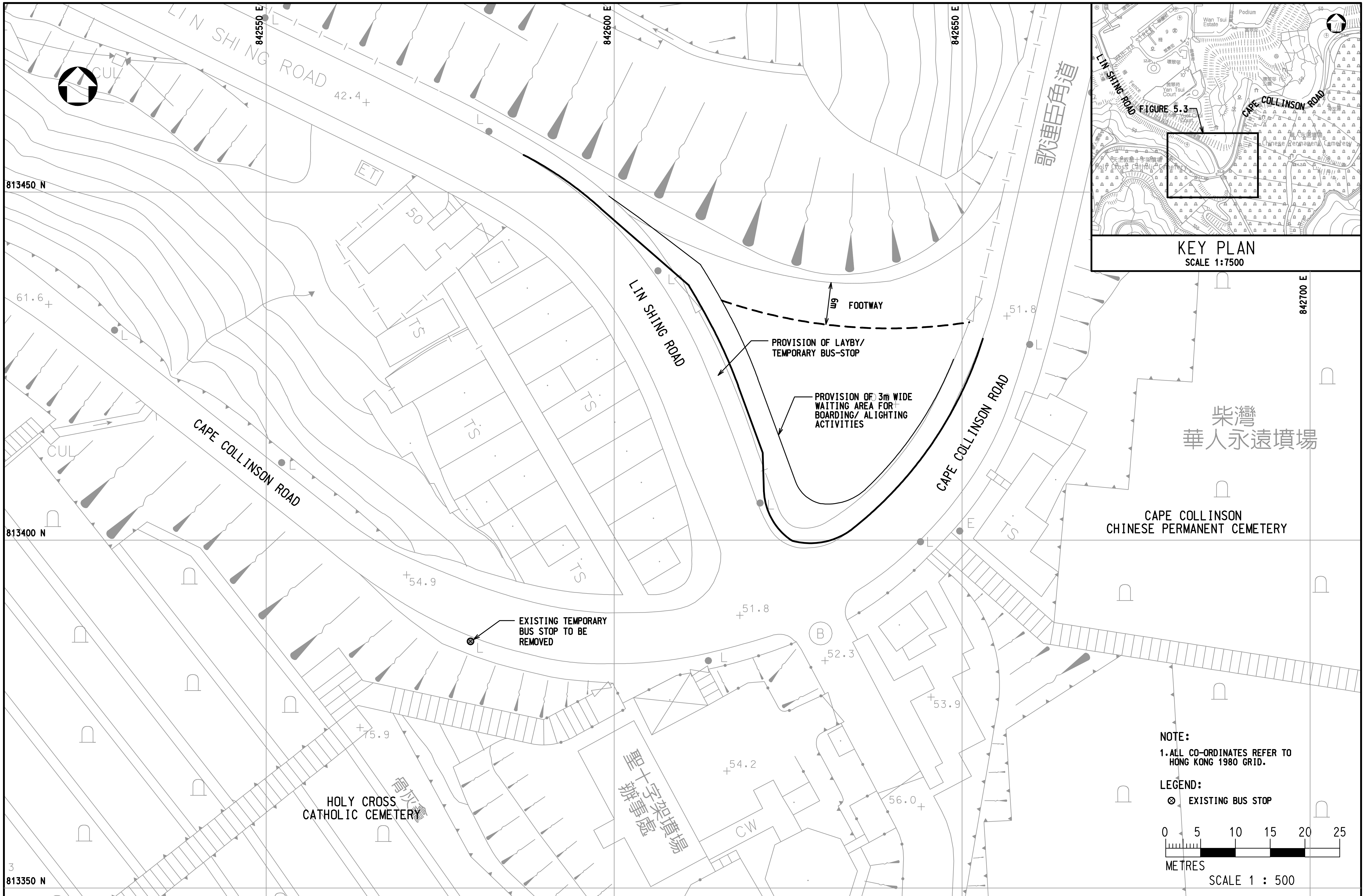

Client: ARCHITECTURAL SERVICES DEPARTMENT	Consulting Engineer: Halcrow, Halcrow China Ltd.	Contract No.: CPM301_15/10	TRAFFIC IMPACT ASSESSMENT REPORT	FIGURE 5.3a
		Project Title: TRAFFIC IMPACT ASSESSMENT STUDY FOR COLUMBARIUM DEVELOPMENT AT CAPE COLLINSON ROAD, CHAI WAN	Drawing Title: PROPOSED IMPROVEMENT SCHEME AT LIN SHING ROAD & CAPE COLLINSON ROAD JUNCTION (OPTION A)	Checked: OC; Scale: 1:500 @ A3; Rev.: 1; Designed: KC; Drawn: PF; Date: 01/06/2012

HN_Kam1 25/06/2012
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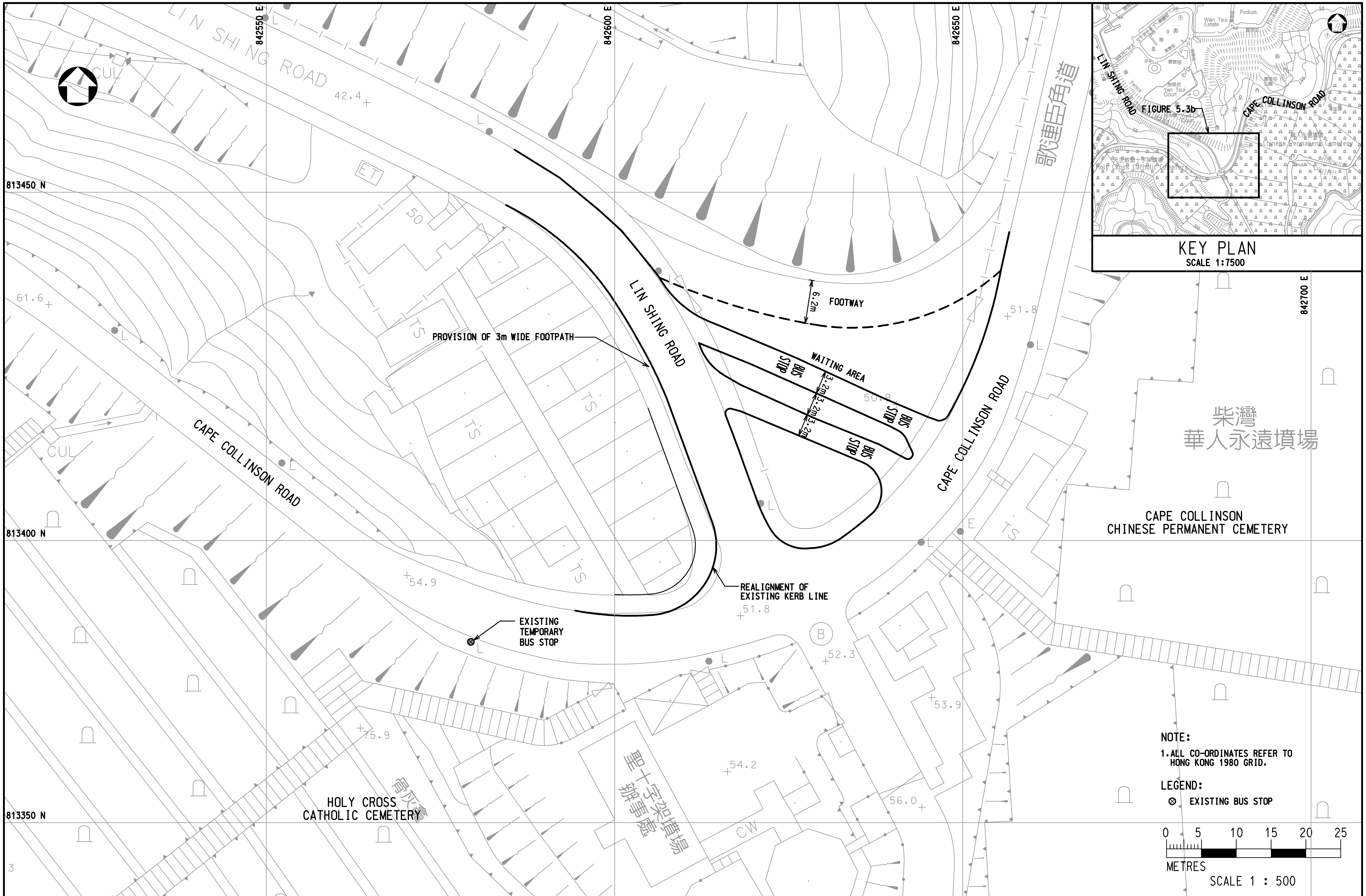

Client: ARCHITECTURAL SERVICES DEPARTMENT	Consulting Engineer: Halcrow — Halcrow China Ltd.	Contract No.: CPM301_15/10	TRAFFIC IMPACT ASSESSMENT REPORT
		Project Title: TRAFFIC IMPACT ASSESSMENT STUDY FOR COLUMBARIUM DEVELOPMENT AT CAPE COLLINSON ROAD, CHAI WAN	Drawing Title: PROPOSED IMPROVEMENT SCHEME AT LIN SHING ROAD & CAPE COLLINSON ROAD JUNCTION (OPTION B)

FIGURE 5.3b		
Checked: OC	Scale: 1:500 @ A3	Rev.: 0
Designed: KC	Drawn: PF	Date: 16/02/2012

HN_Kam1 24/02/2012
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ISSUE NO. : Issue 1
ISSUE DATE : AUG 2016
PROJECT NO. : 1336

PRELIMINARY VISUAL IMPACT ASSESSMENT

FOR

PROVISION OF COLUMBARIUM AT CAPE COLLINSON ROAD IN CHAI WAN

COMMERCIAL-IN-CONFIDENCE

Prepared By:

Allied Environmental Consultants Ltd.

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沛然環境評估工程顧問有限公司

ISSUE NO. : Issue 1
ISSUE DATE : AUG 2016
PROJECT NO. : 1336

PRELIMINARY VISUAL IMPACT ASSESSMENT

FOR

PROVISION OF COLUMBARIUM AT CAPE COLLINSON ROAD IN CHAI WAN

COMMERCIAL-IN-CONFIDENCE

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Allied Environmental Consultants Ltd.

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BEng(Hons) MHKIEIA MHKIOA
MIAIA MRAPA MISWA LEEDAP
CAP

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1. INTRODUCTION

1.1.1. The proposed site for the columbarium block is located on a sloping ground in the northern side of Cape Collinson Road opposite to an existing columbarium building of Chai Wan Chinese Permanent Cemetery (CWCPC).

1.1.2. The site is bounded by the existing Cape Collinson Road along south to east. The remaining two straight boundaries follow the alignment of the existing zoning plan and facing an open greenery area to the North-West. The site lies on a sloping hillside of unallocated Government land from 48.0mPD to 68.00mPD at Cape Collinson Road. The site is a virgin site with densely grown trees and there are three existing stream courses running across to the north-west of the site and ended with an existing open culvert. The site originally covers an area of about 3,400m^2. Notional development plan of the proposed Project is shown in ***Appendix A***. Basic parameters of the Project are summarised in ***Table 1*** below.

Table 1 Basic Development Parameter of the Project

Plot Ratio	< 2.1
Number of Storeys	Maximum 5-storey above street level
Gross Floor Area	< 7,150 m^2
Site Coverage	Approx. 60%
Floor Uses	Approx. 25,000 niches

1.1.3. The hillside slope is ascending from the residential area at San Ha Street in the north towards the proposed columbarium site at Cape Collinson Road in the south. The proposed columbarium block together with other existing columbarium of CWCPC could be seen by existing resident developments, i.e. Wan Tsui Estate, Yuet Chui Court, Yan Tsui Court and Lok Hin Terrace at San Ha Street. The visual character of the area is dominated by the concrete structures of the existing cemetery office and the cemeteries along the high portion of the mountain slope, while low portion of the slope is dominated by hillside vegetation. Appropriate architectural design and landscape proposal will be adopted to minimize visual impact of the columbarium.

1.1.4. A landscape consultant will be appointed at the detailed design stage to prepare the landscape proposal, including potential tree felling and transplanting.

1.1.5. The significance of visual impact is derived from the combined analysis of the magnitude of change and the sensitivity of the visually sensitive receivers (VSRs) at key public viewpoint (VP) to the change as shown in ***Table 2***.

Table 2 Matrix for Appraisal of Significance of Visual Impact

Magnitude of Change		Sensitivity of Resource		
		Low	**Medium**	**High**
	Large	Slight/Moderate	Moderate/Significant	Significant
	Intermediate	Slight	Slight/Moderate	Moderate/Significant
	Small	Slight	Slight	Slight/Moderate
	Negligible	Insubstantial	Insubstantial	Insubstantial

2. VISUAL SENSITIVE RECEIVERS

2.1.1. Key VSRs are identified according to the nature of settlement as follows:

- Residential VSRs that view the proposed Project from homes, including Lok Hin Terrace, Wan Tsui Estate, Yan Tsui Court and Yuet Chui Court
- Occupational VSRs that view the proposed Project from workplaces, institutional and educational buildings, including The Salvation Army Centaline Charity Fund School
- Recreational VSRs that view the proposed Project from recreational landscapes, such as Wan Tsui Estate Park; and
- Travelling VSRs that view the proposed Project from public roads during travelling on vehicles or on foot.

3. DESCRIPTION OF KEY VIEWPOINTS

3.1. VIEWPOINT A (VP A)

3.1.1. Viewpoint A (**VP A**) is at a distance of about 70m from the Cape Collinson Road from western side as indicated in ***Appendix B***. The existing visual character and visual elements of the area would be roadside vegetation along Cape Collinson Road and existing hillside cemetery view and Cape Collinson Chinese Permanent Cemetery building view. It represents the transient passers travelling along Cape Collinson Road, as it is located at prominent travel routes that are close to the Project site and have a direct view of the Project site. The potential affected population of these VSRs are expected to be low.

3.2. VIEWPOINT B (VP B)

3.2.1. Viewpoint B (**VP B**) is at a distance of about 72m from the Wan Tsui Estate Park as indicated in ***Appendix B***. It represents the transient users of the Park. The existing visual character and visual elements of the area would be densely-grown trees inside the Park and existing hillside cemetery view and existing cemetery building view.

3.3. VIEWPOINT C (VP C)

3.3.1. Viewpoint C (**VP C**) is from the pavement near Fu Tsui House at Yan Tsui Street as indicated in ***Appendix B***, which is about 230m away from the proposed site at Western side. It represents the view of the Project site from transient passers on the West. The existing visual character and visual elements of the area is dominated by hillside trees and existing hillside cemetery view.

3.4. VIEWPOINT D (VP D)

3.4.1. Viewpoint D (**VP D**) is from the playground at podium level in front of Hei Tsui House as indicated in ***Appendix B***, which is about 196m away from the Site. It represents the view of the Project site from recreational users of the Playground on the northwest. The location of viewpoint is easily accessible and frequently visited by the public for outdoor activities, recreation, rest, leisure that have relatively high viewing frequency and potential affected population as compared with transient VSRs at VP A and VP C. The existing visual character and visual elements of the area is dominated by hillside trees and small portion of existing hillside cemetery view.

4. IMPACT ON KEY VIEWPOINTS

4.1. VIEWPOINT A (VP A)

4.1.1. At VP A, the proposed development will be seen in views looking northeast from the Cape Collinson Road at a distance of about 70m. The existing view of the Project site, which is dominated by background existing cemetery view and natural hill slope, will change to a construction site during construction phase and the proposed columbarium building during operation phase that will be partially obstructed by the roadside densely-grown trees.

4.1.2. Given that the ground floor of the proposed columbarium sits at the lower level of the hill slope, large portion of the view of the Project site will be screened off by the existing roadside trees. It is anticipated that only slight visual obstruction of the existing cemetery view, which has low amenity value, will be experienced by the VSRs at VP A due to the proposed Project, and thus the visual openness experienced at VP A will not be significantly affected by the proposed Project. Although felling of a small portion of hillside vegetation would occur, the VSRs at VP A will be easily distracted by other hillside and roadside vegetation that have higher amenity value and will not be blocked by the proposed Project. In addition, the soft landscaping provided by the proposed Project will soften the concrete structure of the existing cemetery view, and blending the proposed columbarium building into the surrounding visual context that comprises of hillside vegetation and building groups as similar to the existing cemetery in order to maintain compatibility with the surrounding visual character. Hence, the magnitude of visual change during construction and operation phase is anticipated to be adversely intermediate. ***Figure 1*** illustrates the comparison by photomontage.

4.1.3. Given the transient nature of the VSRs at VP A and their views of the Project site are rare in order to focus on the travelling activity, the sensitivity to visual change is low. The resultant visual impact is considered as **slightly adverse** during both construction and operation phase.

4.2. VIEWPOINT B (VP B)

4.2.1. The proposed development will be seen in views looking northeast from VP B, which is from the sitting out area of Wan Tsui Estate Park at a distance of about 72m. The existing view of the Project site, which is dominated by background existing cemetery view and natural hill slope, will change to a construction site during construction phase and the proposed columbarium building during operation phase.

4.2.2. The impact from the loss of small portion of hillside vegetation is anticipated to be minor since the densely-grown vegetation in foreground will not be affected by the proposed Project and shall easily attracts the view of the VSRs at VP B. Given that the ground floor of the proposed columbarium sits at the lower level of the hill slope, large portion of the view of the proposed Project will be screened off by the existing hillside vegetation and the densely-grown trees inside the Park. It is anticipated that only slight visual obstruction of the existing cemetery view, which has low amenity value, will be experienced by the VSRs at VP B due to the proposed Project, and thus the visual openness experienced at VP B will not be significantly affected by the proposed Project. The view of the existing cemetery office building that has low amenity value will be substantially blocked by the proposed columbarium building, while the soft landscape design of the proposed Project allows the proposed columbarium building to blend into the surrounding visual context that comprises of hillside vegetation and building groups as similar to the existing cemetery in order to maintain compatibility with the surrounding visual character. In this connection, the magnitude of the visual change during construction and operation phase is anticipated to be adversely small. ***Figure 2*** illustrates the comparison by photomontage.

4.2.3. With consideration that the sensitivity of recreational user is medium, the resultant visual impact is therefore considered as **slightly adverse** during both construction and operation phase.

4.3. VIEWPOINT C (VP C)

4.3.1. The proposed development will be seen in views looking southeast from VP C, i.e. the pavement near Fu Tsui House at Yan Tsui Street, at a distance of about 230m. The Project site is located at the backdrop of the existing cemetery view, which has the same visual character as the Project site. The existing view of the Project site, which is dominated by the existing cemetery view and hillside vegetation, will change to a construction site during construction phase and eventually a columbarium building as similar to the existing cemetery during operation phase that remains partially blocked by the existing hillside vegetation in foreground.

4.3.2. Given that the ground floor of the proposed columbarium sits at the lower level of the hill slope, a significant portion of the view of the proposed Project will be screened off by the existing hillside vegetation. It is anticipated that only slight visual obstruction of the existing cemetery view, which has low amenity value, will be experienced by the VSRs at VP C due to the proposed Project, and thus the visual openness experienced at VP C will not be significantly affected by the proposed Project. The impact from the potential loss of small portion of hillside vegetation is anticipated to be minor since the views of the VSRs at VP C are easily distracted by the undisturbed hillside trees, which have high amenity value and will not be blocked by the proposed Project. In addition, the soft landscaping provided by the proposed Project will soften the concrete structure of the existing cemetery view, and blending the proposed columbarium building into the surrounding visual context that comprises of hillside vegetation and building groups as similar to the existing cemetery in order to maintain compatibility with the surrounding visual character. Given the long viewing distance, the magnitude of visual change during construction and operation phase is anticipated to be <u>adversely small</u>. ***Figure 3*** displays the photomontage showing the views of the proposed development.

4.3.3. Given the transient nature of the VSRs at VP C and their views of the Project site are rare in order to focus on the travelling activity, the sensitivity to visual change is <u>low</u>. Therefore, the resultant visual impact is **slightly adverse** during both construction and operation phase.

4.4. VIEWPOINT D (VP D)

4.4.1. The proposed development will be seen in views looking southeast from VP D from the podium in front of Hei Tsui House at a distance of about 196m. The Project site is located at the backdrop of the existing cemetery view, which has the same visual character as the Project site. The existing view of the Project site, which is dominated by the existing cemetery view and hillside vegetation, will change to a construction site and eventually a columbarium building as similar to the existing cemetery during operation phase that remains partially blocked by the existing hillside vegetation in foreground.

4.4.2. Given that the ground floor of the proposed columbarium sits at the lower level of the hill slope, a significant portion of the view of the proposed Project will be screened off by the existing hillside vegetation. It is anticipated that only slight visual obstruction of the existing cemetery view, which has low amenity value, will be experienced by the VSRs at VP D due to the proposed Project, and thus the visual openness experienced at VP D will not be significantly affected by the proposed Project. The impact from the potential loss of small portion of hillside vegetation is anticipated to be minor since the views of the VSRs at VP D are easily distracted by the undisturbed hillside trees, which have high amenity value and will not be blocked by the proposed Project. In addition, the soft landscaping provided by the proposed Project will soften the concrete structure of the existing cemetery view, and blending the proposed columbarium building into the surrounding visual context that comprises of hillside vegetation and building groups as similar to the existing cemetery in order to maintain compatibility with the surrounding visual character. With consideration of the combined impact of the long viewing distance and the considerable length of the façade of the proposed columbarium building fronting VP D, the magnitude of visual change during construction and operation phase is anticipated to be adversely small. ***Figure 4*** displays the photomontage showing the views of the proposed development.

4.4.3. Since the sensitivity of recreational user is medium, the resultant visual impact is **slightly adverse** during both construction and operation phase.

5. MITIGATION MEASURES DURING CONSTRUCTION

5.1. CONSTRUCTION SITE HOARDING

5.1.1. Hoardings should be provided with aesthetic treatment and designed to be subtle and camouflaged. It should be compatible with the surrounding landscape and visually "impermeable" to block the view of construction activities from VSRs. The visual quality and amenity value of the Project site would be enhanced as compared to the condition of the Project site that consists of temporary works area surrounded by grey hoarding.

5.2. TEMPORARY LANDSCAPE TREATMENT

5.2.1. Temporary landscape treatment, such as the provision of temporary planting around the Site office in ornamental pots and application of green roof for Site office, should be considered during construction phase. Landscape planting in movable planters should also be considered as a temporary greening measure for the Project area (i.e. along Site hoarding). Design of the green roof and the type of species to be used shall be reviewed and confirmed during detailed design stage. The visual quality and amenity value of the Project site is considered to be enhanced by the provision of a more greenery view to the neighbourhood as compared to the existing condition of the Project site that consists of trees.

5.3. PROPER MANAGEMENT OF CONSTRUCTION WORKS

5.3.1. Proper planning and management will be carried out before commencement of construction works. Works area should be selected only as necessary with the view to reduce visual impact and minimise potential disturbance to surrounding area during construction stage. Construction activities should be controlled and supervised to minimise potential impact on existing vegetation, particularly during any slope work if found necessary.

6. MITIGATION MEASURES DURING OPERATION

6.1. COMPENSATORY PLANTING

6.1.1. Compensatory planting should be provided in the landscape area. The planting would follow the requirements as stipulated in DEVB TC(W) No. 10/2013. The planting location and the type of compensatory plant species will be reviewed and confirmed during detailed design stage. The planting should be commenced during construction stage and be completed before the completion of construction stage to ensure the measure will be implemented on Day 1 of operation stage. Since on-site trees compensation may not be technically feasible due to the limited site area, off-site trees compensation may be considered and confirmation of available planting ground from FEHD shall be sought.

6.2. HARD LANDSCAPE FEATURE AND LIGHTING DESIGN

6.2.1. In order to blend in with the surrounding environment, the exterior of the permanent structure of the proposed Project should use non-reflective external finishes in light colour that is visually unobtrusive with surrounding context. Non-reflective paving materials should be considered to reduce potential glare from surface reflectance. The appearance should be kept sufficiently low-key so as to avoid disturbing feelings to the residents of local housing estates as well as maintaining visual compatibility with the surrounding visual character. The finishing material and colour will be reviewed and confirmed during detailed design stage.

6.2.2. Lighting should be efficiently designed so that minimum amount of lighting is required for safety and security. The design may make reference to the *Guidelines on Industry Best Practices for External Lighting Installations* by Environmental Bureau, EPD and EMSD. The mounting height and direction of exterior lighting fixtures shall be designed and arranged to point away from sensitive receivers where possible. Specification of lighting operation schedule shall be formed by the operator to impose restriction on lighting operation after business hours, such as limiting the operation of lighting except for security lighting only, and in areas with necessary night-time operation where applicable.

6.3. SOFT LANDSCAPE DESIGN

6.3.1. Landscape planting will be provided on ground floor and roof floor to improve visual quality of the development. Trees, shrub/groundcover and lawn will be provided to further enhance visual amenity. Fragrant species of soft landscaping works at suitable location shall be incorporated. The design shall integrate with the existing topography and vegetation. The construction of the new building should aim at preserving the existing vegetation and enhancing the original local landscape character as far as practicable.

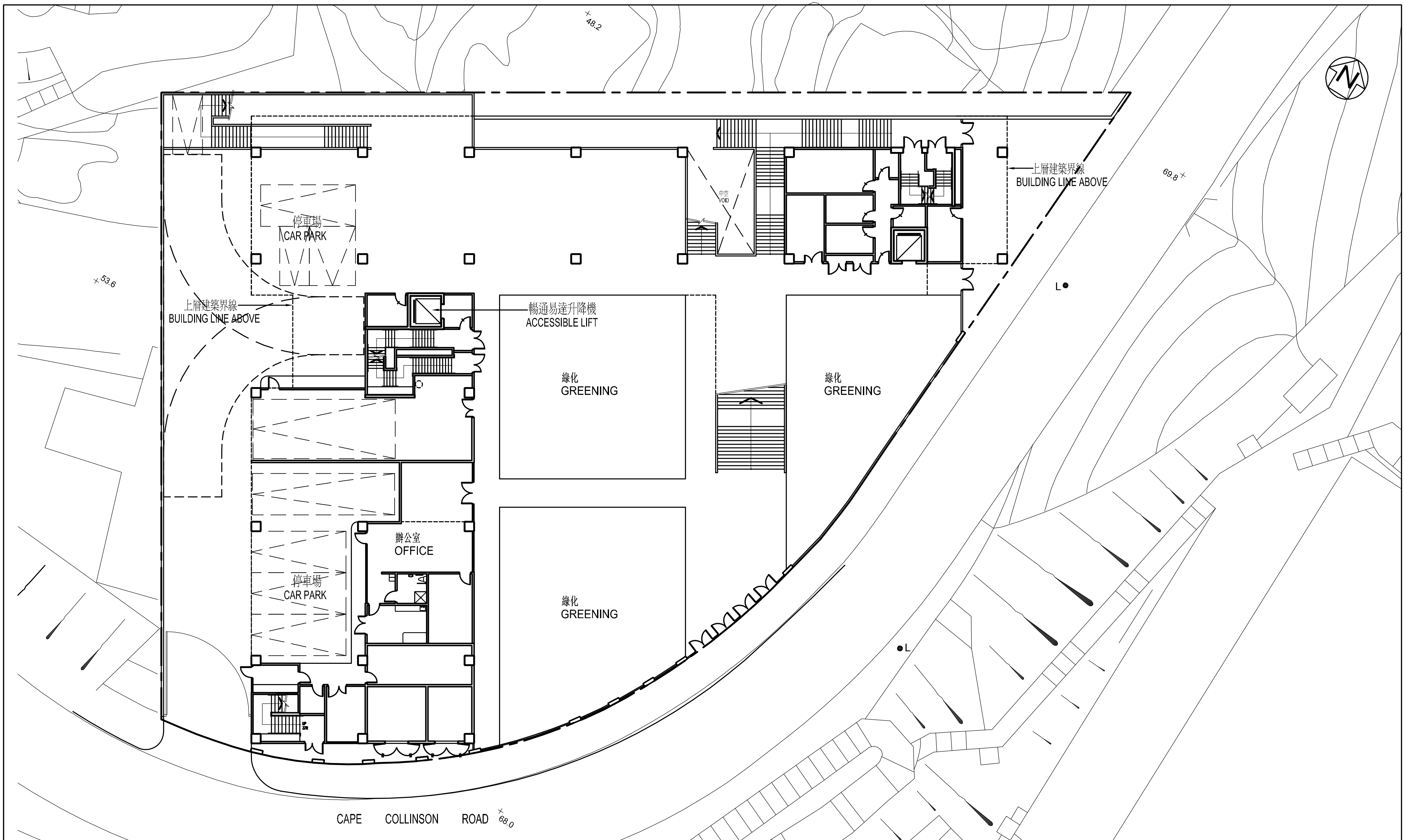
7. CONCLUSION

7.1.1. As the views of the proposed development at VP A, VP B, VP C and VP D will be screened off by the existing trees or distracted by visual resources of the same visual character and amenity value, i.e. existing cemetery and vegetation, the visual impacts experienced by the receivers at key public viewpoints are slightly adverse.

7.1.2. Although the columbarium would unavoidably result in loss of existing vegetation and natural green slopes, the proposed Project is not incompatible with the surrounding visual character in terms of nature and height. Furthermore, significant adverse visual effects to the identified key public viewing points is not anticipated with the application of the proposed mitigation measures.

Appendix A

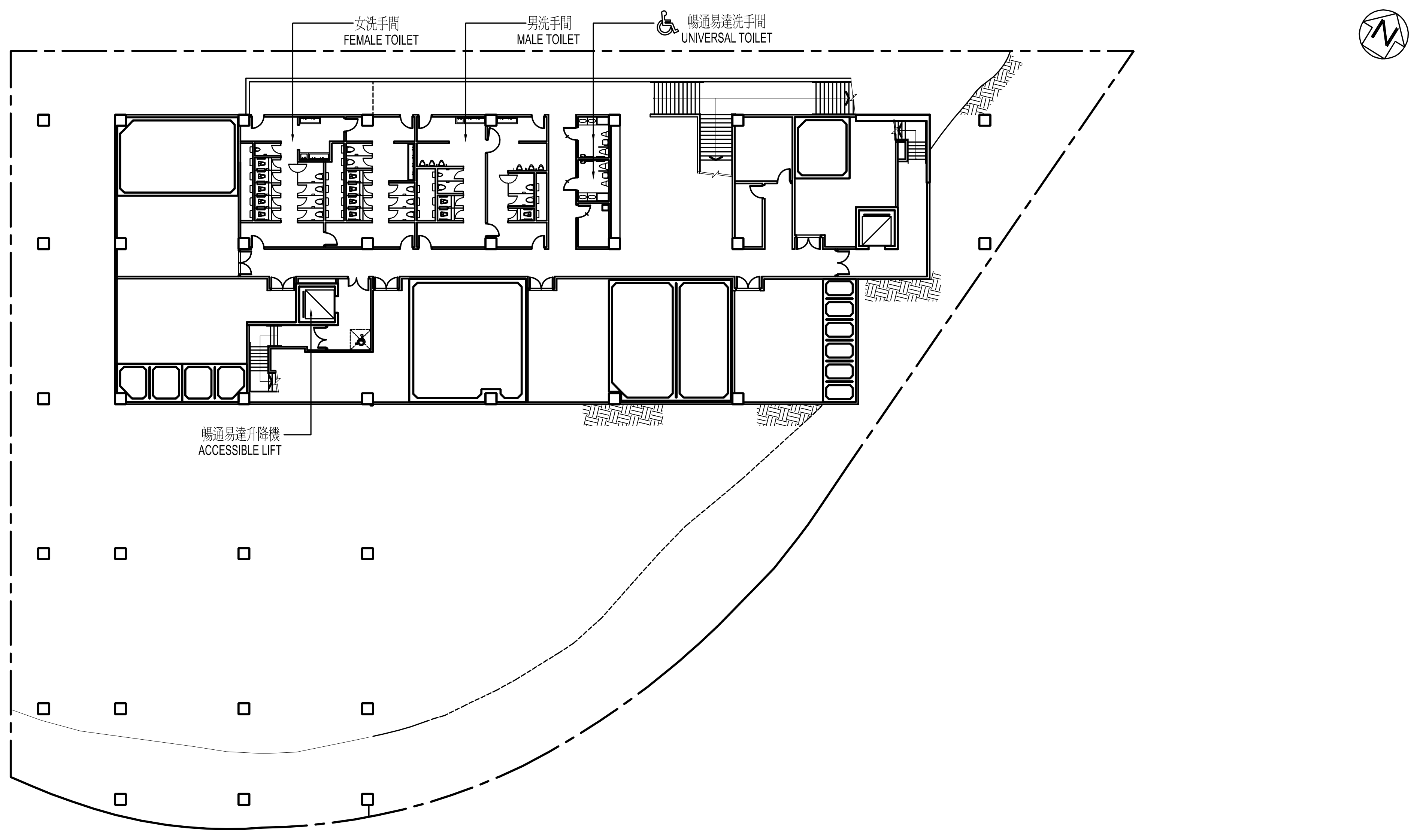
Notional Development Plan



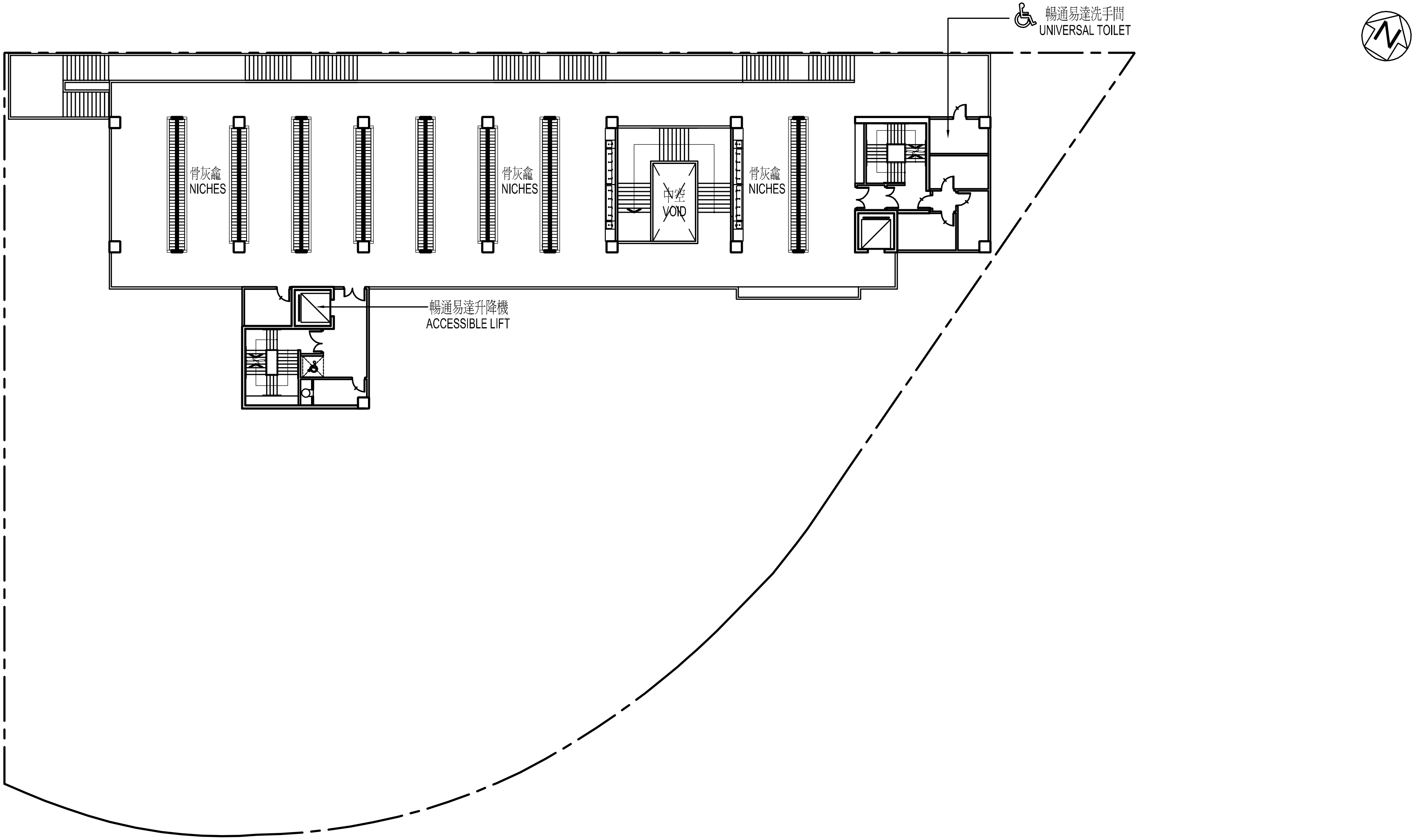
NOTIONAL GROUND FLOOR PLAN
(SUBJECT TO DETAIL DESIGN)

Project Title

PROVISION OF COLUMBARIUM AT CAPE COLLINSON ROAD IN CHAI WAN



NOTIONAL LOWER GROUND FLOOR PLAN (SUBJECT TO DETAIL DESIGN)	Project Title PROVISION OF COLUMBARIUM AT CAPE COLLINSON ROAD IN CHAI WAN

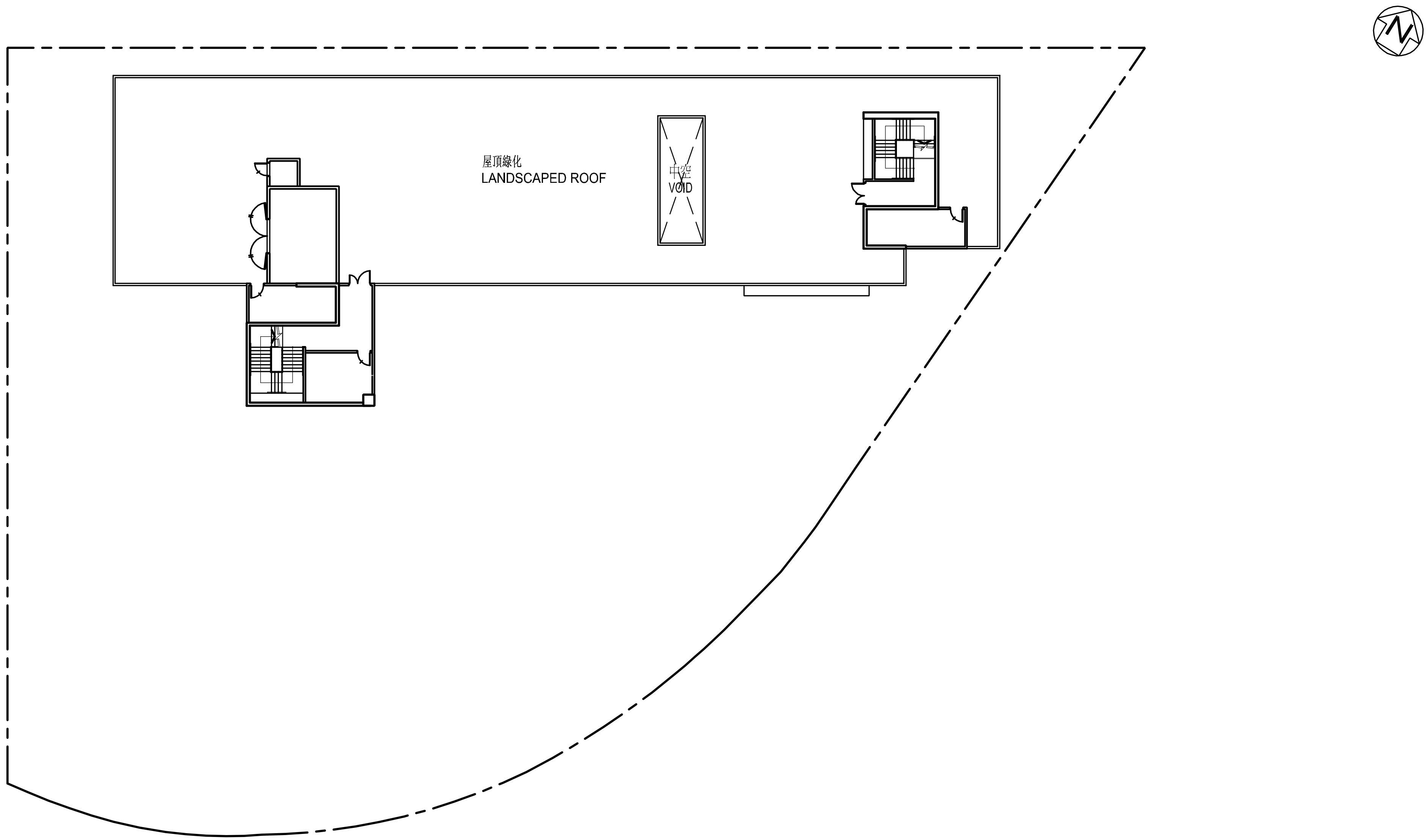


NOTIONAL TYPICAL FLOOR PLAN
(1/F - 4/F)
(SUBJECT TO DETAIL DESIGN)

Project Title

PROVISION OF COLUMBARIUM AT CAPE COLLINSON ROAD IN CHAI WAN

5M 0 5M 10M

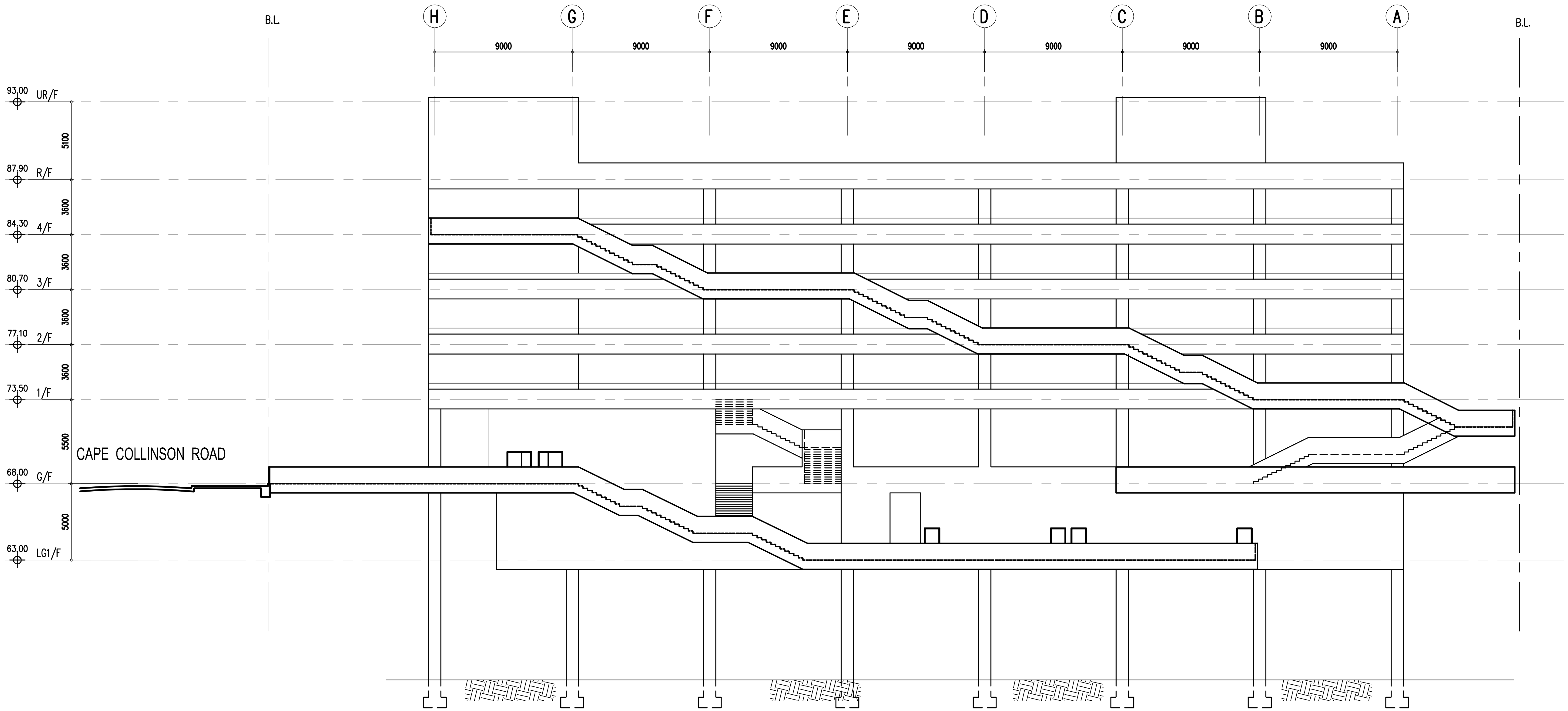


NOTIONAL ROOF FLOOR PLAN
(SUBJECT TO DETAIL DESIGN)

Project Title

PROVISION OF COLUMBARIUM AT CAPE COLLINSON ROAD IN CHAI WAN

5M 0 5M 10M



NOTIONAL ELEVATION A
(SUBJECT TO DETAIL DESIGN)

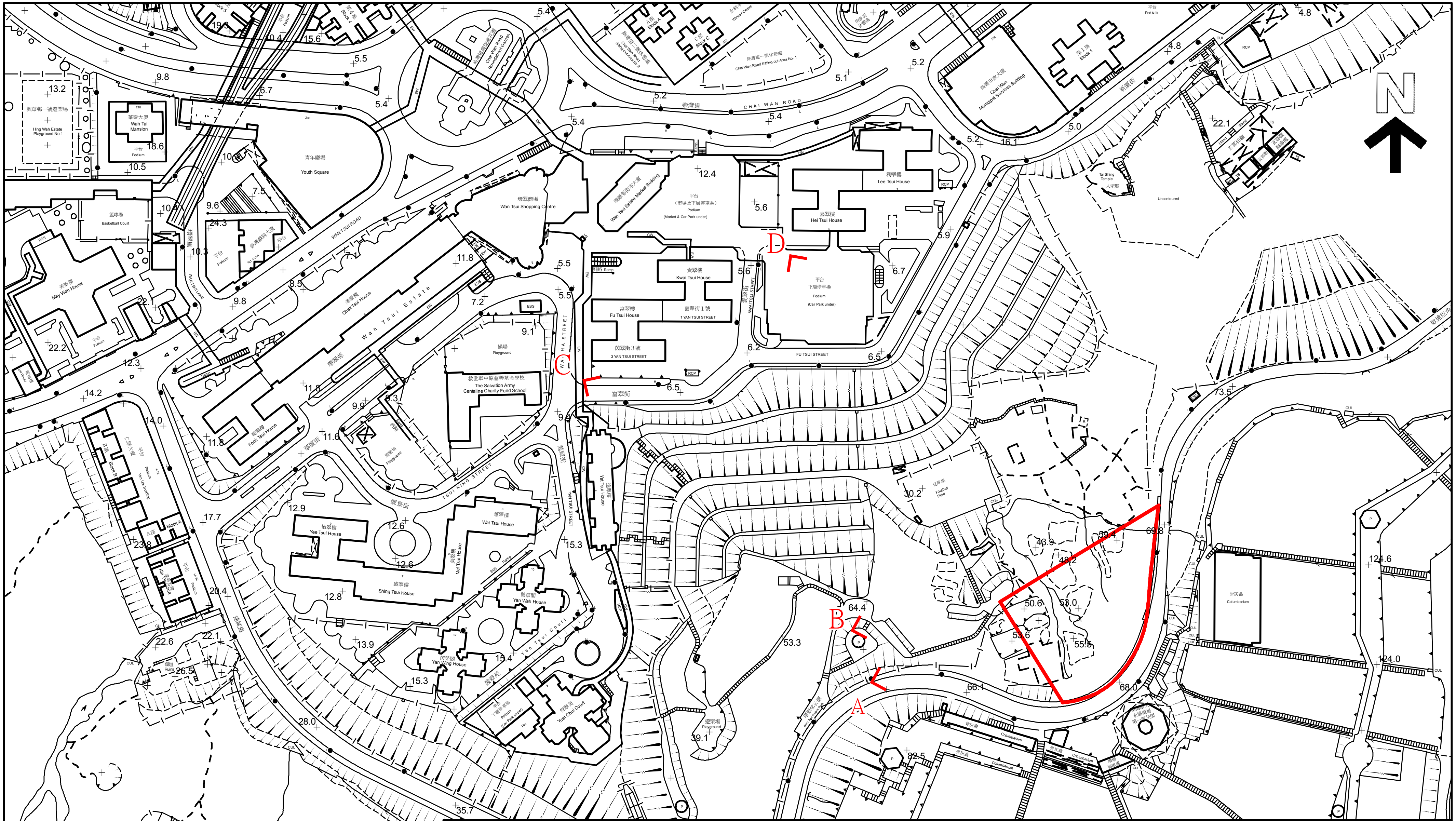
Project Title

PROVISION OF COLUMBARIUM AT CAPE COLLINSON ROAD IN CHAI WAN

5M 0 5M 10M

Appendix B

Locations of the Selected Viewpoints



Reference

Extracted from

1:1000 Survey Sheet No :
11-SE-19B 11-SE-19C
11-SE-19A 11-SE-19D

Date : 16-September-2015

Selected Vantage Points for Proposed Columbarium
Cape Collinson Road
Chai Wan

Scale 1: 2500

Site Boundary Subject to Detailed Land Survey

Hong Kong
District Planning Office
PLANNING DEPARTMENT

Figure 1 Photomontage at Viewpoint A (VP A)

Set A - 50mm focal length

Without project

With project

Figure 2 Photomontage at Viewpoint B (VP B)

Set A - 50mm focal length

Without project

With project

Figure 3 Photomontage at Viewpoint C (VP C)

Set A - 50mm focal length

Without project

With project

Figure 4 Photomontage at Viewpoint D (VP D)

Set A - 50mm focal length

Without project

With project

Provision of Columbarium at Cape Collinson Road in Chai Wan

Landscape and Tree Preservation Proposal

ADI

Project Title	Provision of Columbarium at Cape Collinson Road in Chai Wan
Report Title	Landscape and Tree Preservation Proposal
Date of Issue	8 April 2016

	Name	**Signature**	**Date**
Compiled by	C. K. Lee		8 April 2016
Checked by	Alison Lee		8 April 2016
Approved by	Christopher Chung		8 April 2016

TABLE OF CONTENT

APPENDICS

1. Introduction

This report serves to describe the tree preservation and landscaping proposal for zoning amendment application of the proposed provision of Columbarium at Cape Collinson Road in Chai Wan, Hong Kong.

The landscaping proposal is prepared based on the latest architectural scheme prepared by the Project Architect.

2. Site Context (Refer to *Appendix I - Site Location Plan*)

The Site is located at Collinson Road opposite to the existing Cape Collinson Chinese Permanent Cemetery at Chai Wan, Hong Kong. Directly facing south-west is the existing octagonal Cape Collinson columbarium with terraced cemetery and woodland peak behind. Around east, north and west of the Site are woodland natural slopes or man-made slopes with football field and Wan Tsui Park and Wan Tsui Estate beyond.

The site is currently on formed slopes with densely grown trees with site area about 3,400m^2.

3. The Development

The development involves construction of a 5 floors above Cape Collinson Road and 1 lower ground floor columbarium building for the provision of about 25,000 nos. of niches and ancillary facilities as well as landscaping area.

Footpath widening work is also required outside Site along portion of Collinson Road at north-eastern corner of the Site to accommodate the pedestrian flow at peak days.

4. Tree Preservation Proposal

4.1 Existing Trees

4.1.1 The tree survey and tree preservation proposal is prepared in accordance with DEVB TC(W) No. 10/2013 Tree Preservation. The site survey was undertaken in March 2016 and the location of trees was based on the topographic survey prepared by Chartered Land Surveyor .

4.1.2 A total of 177 trees were identified within the application boundary and in close proximity to Site within 3m from site boundary. Among which 150 nos. including 4 nos. dead trees (T190A, T198A, T210A & T214) are located within the application site and 27 nos. are outside application boundary on adjacent slopes.

4.1.3 The existing tree locations are illustrated on ***Appendix II – Tree Location Plan.*** Identification of tree species and the recommendation for these trees as a result of implementation of the current scheme are reviewed in the following paragraphs and listed in ***Appendix III - Tree Survey/Assessment Schedule*** and the photographic records of the existing trees are shown in ***Appendix IV****.*

4.1.4 A total of 26 species were identified and 11 of them are exotic species and 15 of them are native species. No protected species under the Protection of Endangered Species of Animals and Plant Ordinance (Cap. 586). No Champion Trees (identified in the book 'Champion Trees in Urban Hong Kong') or Old and Valuable Trees were found to exist within and adjacent to the site. Table 4.1 below summarises tree species on Site.

Table 4.1 Existing Tree Species Summary

Botanical Name	Chinese Name	Quantity	Native (N) or Exotic (E)
Aleurites moluccana	石栗	12	E
Artocarpus heterophyllus	菠蘿蜜	6	E
Bischofia javanica	秋楓	2	N
Bridelia tomentosa	土蜜樹	2	N
Bombax ceiba	木棉	2	E
Caryota ochlandra	魚尾葵	3	E
Celtis sinensis	朴樹	4	N
Choerospondias axillaris	南酸棗	7	N
Cinnamomum camphora	樟樹	1	N
Clausena lansium	黃皮	4	E
Delonix regia	鳳凰木	3	E
Dimocarpus longan	龍眼	48	E
Elaeocarpus decipiens	杜英	1	N
Ficus hispida	對葉榕	2	N
Liquidambar formosana	楓香	2	N
Litchi chinensis	荔枝	28	E
Litsea monopetala	假柿樹	3	N
Lophostemon confertus	紅膠木	3	E
Macaranga tanarius	血桐	10	N
Mallotus paniculatus	白楸	8	N
Mangifera indica	芒果	7	E
Microcos nervosa	布渣葉	1	N
Murraya paniculata	九里香	1	E
Pinus elliottii	濕地松	1	E
Sapindus saponaria	無患子	8	N
Sterculia lanceolata	假蘋婆	4	N
Dead Tree	死樹	4	-
	Total	177	

4.1.5 The average DBH of the surveyed trees is 0.25m with average height of 8.31m and average crown spread of 4.65 m. These sizes are indicative of a combination of a middle-aged and mature amenity trees. 4 nos. trees DBH are larger than 0.7m, including T27, T65, T103 and T134.

4.1.6 A high percentage of the trees have a fair or poor form and health condition, and exhibit low amenity value. This includes a number of trees with two dominant trunks, leaning, open cavity, decay on root or trunk, restricted crown or root.

Table 4.2 Summary of Existing Tree Condition

Assessment Criteria	Status of Trees	% Trees
Health Condition	Good	0%
	Fair	89%
	Poor	11%
Tree Form	Good	0%
	Fair	86%
	Poor	14%
Structural Condition	Good	0%
	Fair	92%
	Poor	8%
Amenity Value	High	0%
	Medium	69%
	Low	31%

4.2 Tree Retention and Felling Proposal

4.2.1 Within the sloping site and densely grown trees and site access from Collinson Road at upper level, to ensure barrier free access at site arrival and to accommodate various functional and operational requirements of the development and to minimize visual intrusion of the development by limiting the total no. of storeys, the architectural ground floor plan require full site coverage at +68.00. For security purpose, boundary fence is also required around the site boundary.

4.2.2 All of the existing trees within Site and a number of trees outside Site but in close proximity shall unavoidably be affected by the development and require removal. There are in total 166 trees including 4 nos. of dead trees (94%) being affected and to be removed and remaining 11 trees (6%) are to be retained.

4.2.3 Opportunity for transplanting of the existing trees affected by the development is critically reviewed where a number of factors are considered as follows:

- **Species:** Previous experience and arboriculture knowledge points to some species having a higher tolerance to the effects of transplantation than others. For example woodland species such as *Mallotus paniculatus* is not tolerant to the transplantation operation.

- **Condition of the tree:** Trees with balanced form, in good health and with high amenity value are considered for transplanting whereas trees with fair to poor tree condition and tree form do not make good specimens when transplanted.

- **Age of the tree:** Younger trees have a greater chance of surviving the transplantation operation than older trees. During their juvenile phase trees have their greatest vigour and so are more able to tolerate change. In addition energy reserves are available for sealing off wounds and so the tree is better able to recover from the pruning of roots and branches required during the transplanting operation. As the tree matures its ability to tolerate change decreases and so the maintenance of a stable environment around the tree is vital to its continued health.

- **Access:** Large machinery is required to lift the trees as part of the transplantation procedure and so ease of access is important. The existing trees are located on the slope that is inaccessible for the large machinery.

4.2.4 Based on the above assessment, all 166 affected trees (including 4 dead trees) specimens are not recommended for transplanting owing to the following reasons and proposed for felling:

- Trees with leaning form, twisting trunk and co-dominant trunk that may pose structural problem after transplanting;

- Trees are growing on slopes densely with others with formation of individual rootball of reasonable size not possible. Accessibility of machinery and safety during the transplanting operation is also in doubt.

- Trees densely grown have very narrow crown development or confined to the tree top with very low amenity value and crown pruning to facilitate tree transplanting may remove all the crown and adversely affecting survival rate and amenity value of the tree after transplanting.

- Trees mature in size with low survival rate after transplanting.

- No available receptor site for direct directly and transplanting off-site shall require substantial crown and root pruning and degradation in amenity value of the trees and rendered transplanting not worthy.

Details of the tree felling and retention proposal refer to ***Tree Survey/Assessment Schedule*** in ***Appendix III***, ***Photographic Record of Existing Trees*** in ***Appendix IV*** and ***Tree Recommendation Plan*** in ***Appendix V.***

4.3 Compensatory Planting Proposal

4.3.1 The Site is fully covered by densely grown existing trees. The development shall require provisions of facilities to meet the Schedule of Accommodation and statutory requirements. The landscape design will comply with the prescriptive requirements such as Site Coverage of Greenery in accordance with DEVB TC (W) No. 3/2012 . Whilst the magnitude of tree compensation would still be subject to the future detail design layout, the project team will explore different options, such as offsite compensatory planting at available land, to maximize the compensation ratio.

4.3.2 With the accommodation of various functional uses and statutory requirements and to allow adequate external areas for pedestrian circulation in peak seasons and to establish an outdoor landscape setting that is tranquil yet open to avoid too much shade that would pose a sorrow and sad atmosphere, tree planting proposed on Site shall serve mainly for peripheral buffer planting, entrance features and definition of space. Indicative tree planting proposal (location, quantity and species subject to detailed design) refers to ***Notional Compensatory Planting Plan*** (subject to detailed design) at ***Appendix VI.***

4.3.3 In order to establish the proposed compensatory planting, it is envisaged that a minimum soil depth of 1200mm will be incorporated into the design of all tree planting areas. Where possible, the trees will be planted in continuous at-grade planters to maximise the volume of soil available for their future growth. All planting areas on slab would be provided with sub-soil drainage with drainage cells and filter fabric.

4.3.5 The tree planting works shall be carried out in accordance with Section 25 of the General Specifications for Building Works by ArchSD (2012 edition). Upon practical completion of the tree planting works, a 12-months establishment works shall be undertaken by the specialist landscaping contractor, thereafter, the trees shall be handed over to the user department, FEHD for future maintenance.

5. **Notional Landscape Proposal** (subject to detailed design)

The landscape design would serve to create a pleasant outdoor environment for the visitors and staffs and general amenity to the adjoining neighborhood with the following design objectives:

a) To create tranquil outdoor rooms for visitors to awaken their memories to the departed by different spatial experience.
b) To integrate coherently with the building, create sense of arrival, amenity and identity for the development that unlike a “conventional columbarium”.
c) To maximize opportunity for greenery on various levels to create a pleasant environment.
d) To adopt environmental friendly landscape design elements including the selection of native plant species.
e) To ensure that all landscaped areas are designed and finished to minimize future maintenance requirements.
f) To ensure that all landscaped areas meet government recognized safety standards.
g) To ensure barrier free access routes to the main landscaped areas.

5.1 Landscape Concept (Refer to *Appendix VII - Notional Landscape Master Plans*)

The notional landscaping proposal involves arrival courtyard, open lawn, tree grove, peripheral planting and green roof.

5.1.1 Ground Floor Landscaped Area

Key landscaped areas are located on ground floor along Collinson Road where both the vehicular access and pedestrian entrance are located. Tree planting is proposed along the site boundary to establish a pleasant arrival experience to the visitors who would be approaching the Site. An entrance courtyard signified by two flowering feature trees and feature walls (with signage incorporated) integrated with the boundary fence is proposed to create strong sense of arrival. Open spaces beside the grand staircase connected to the niches halls possess contrasting spatial setting in the form of open lawn defined by tree row and geometric tree grove surrounded by loose pebbles, creating different emotional experience to the visitors.

Evergreen trees with dense foliage shall be proposed as peripheral tree planting and flowering trees with architectural form as feature trees. Shrubs and groundcover with blossoms, contrasting texture and forms including scented species would be proposed to provide various senses of enjoyment.

5.1.2 Inaccessible Green Roof

To maximize greenery and mitigate solar heat gain to niches hall below, extensive green roof is proposed on the main roof. Owing to the concern of high risk of suicide of the visitor, the roof area is designated as inaccessible green roof only. Hardy drought tolerant groundcover shall be proposed to minimize water consumption for irrigation and horticultural maintenance.

5.1.3 Boundary Treatment

The site boundary abutting Collinson Road would be defined by transparent metal fencing with planting areas integrated as far as spatially and technically feasible. Along the northern and western site boundary are existing slopes with level drop between the Site and the slopes. Boundary fencing along these areas would merge with existing vegetation of adjoining slopes.

5.2 Passive Recreational Facilities

Owing the nature of the development, the landscape proposal provides high quality passive recreational facilities for the use of the visitors only. Passive recreational areas shall include open lawn, seating facilities and meditation tree grove with amenity planting and shade of trees to create a comfortable landscaped environment. Seating and other site furniture will be in sufficient quantity and of high quality.

5.3 Lighting

As the columbarium would be closed in night time, all the accessible points and open space areas will be provided with sufficient illumination mainly for security purpose. The lighting proposal includes two types of lighting as follows:

(a) AREA lighting
Pole light will be proposed at main entrance and driveway to provide adequate and effective security lighting. Low level lighting like wall recessed light and bollard lighting shall be proposed at general landscaped areas.

(b) SAFETY lighting
The minimum lux level lighting for safety reasons which will be lasted between midnight until early morning.

5.4 Soil Depth for Planting

For planting areas in general, minimum 300mm, 600 mm and 1200mm clear soil depth (waterproofing, screeding and drainage layer exclusive) would be allowed for lawn/groundcover, shrub and tree planting respectively.

5.5 Irrigation

The proposed irrigation system will be manual operation. Lockable water points are provided at maximum 40m apart covering all planting areas. The proposed source of water supply is subject to final approval from the Water Supplies Department.

5.6 Material Proposal

All pavements are specifically designed to suit the functional use of the areas with the proposed finishes and materials summarized below:

- Driveway: Material that requires low maintenance such as in-situ concrete or recycled concrete pervious pavers.
- Pedestrian pavement: Non-slip materials in a combination of natural granite, artificial granite tiles, homogeneous tiles or recycled concrete pervious pavers (for on-grade paving)

5.7 Planting Scheme

The planting design aims to create a lush and naturalistic environment. Combinations of textural, foliage and flowering plants together with feature trees will be used to create a harmonic planting palette at the landscaped areas. In order to achieve an instant effect of the soft landscaping works, tree planting within the amenity areas will be specified no smaller than heavy standard size. Different tree species such as *Ilex rotunda, Schima superba* and *Liquidambar formosana*, etc. shrub and groundcover species such as *Gordonia, axillaris, Michelia figo, Rhododendron pulchrum, Liriope spicata* and *Nephrolepis acriculata* etc. and lawn species of Axonopus compressus will be included in the proposed planting palette and exact species to be further explored in detail design.

5.8 Future Maintenance

Hard Landscape Elements

Maintenance for hard landscape elements shall be carried out by management office of the development with maintenance intention as follows:

I - Routine Maintenance (Daily – Weekly)

a) Rubbish and litter removal;
b) Sweeping and cleaning; and
c) Damage inspection and repair for site furniture and light bulb replacement.

II - Annual/Long Term Maintenance

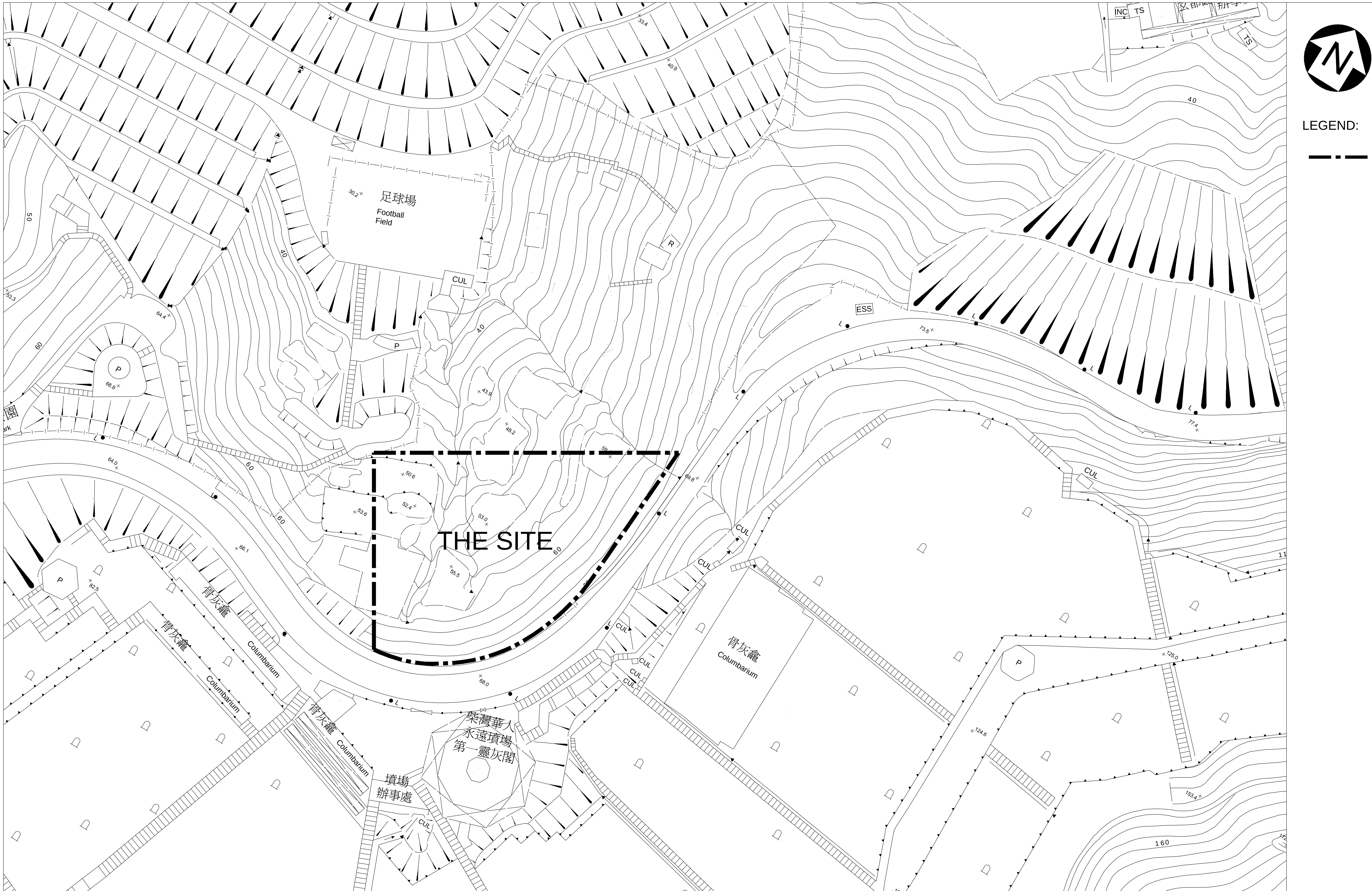
a) Repainting;
b) Resurfacing of worn pavements;
c) Replacing worn parts site furniture, lighting fixture and other facilities; and
d) Replacement of worn landscape furniture.

Soft Landscape Elements

The Softworks Sub-Contractor appointed by the Main Contractor will be responsible for a 12-month establishment period of plants after practical completion of the planting works. It allows a period of time for proper establishment of the plants. All soft landscaping works will be carried out in accordance with the General Specifications for Building Works by ArchSD (2012 edition). Upon the end of the 12-months establishment period, the Management Office of the Departmental Quarters will employ maintenance staff to take care of all landscape areas within the development.

APPENDIX I

SITE LOCATION PLAN



LEGEND:

APPLICATION BOUNDARY

REVISION 校訂	DESCRIPTION 內容摘要	DRAWN 繪圖	DATE 日期	CHECKED 審核	APPROVED 審批

DO NOT SCALE FROM THIS DRAWING 勿按圖量比例

PROJECT 工程項目: PROVISION OF COLUMBARIUM AT CAPE COLLINSON ROAD IN CHAI WAN

SCALE 比例: 1:1000 @A3

DESIGNED 設計: TEAM

DATE 日期

DRAWN 繪圖: CADD

DRAWING TITLE 圖紙名稱: SITE LOCATION PLAN

REVISION 校訂

CHECKED 審核

DRAWING NUMBER 圖號: SKAL12A–SL01

APPROVED 審批

ADI

ADI LIMITED 雅博奧頓國際設計有限公司
INTERNATIONAL SERVICES IN ENVIRONMENTAL MANAGMENT, PLANNING, URBAN DESIGN AND LANDSCAPE ARCHITECTURE 國際環境管理,城市規劃及設計,園境建築顧問服務
10/F BANGKOK BANK BUILDING, 18 BONHAM STRAND WEST, HONG KONG 香港上環文咸西街十八號盤谷銀行大廈十樓
TELEPHONE 2131 8630 FACSIMILE 2131 8609 電話: (八五二) 二一三一 八六三零 傳真: (八五二) 二一三一 八六零九

CAD FILENAME SKAL12A–SL01.dwg

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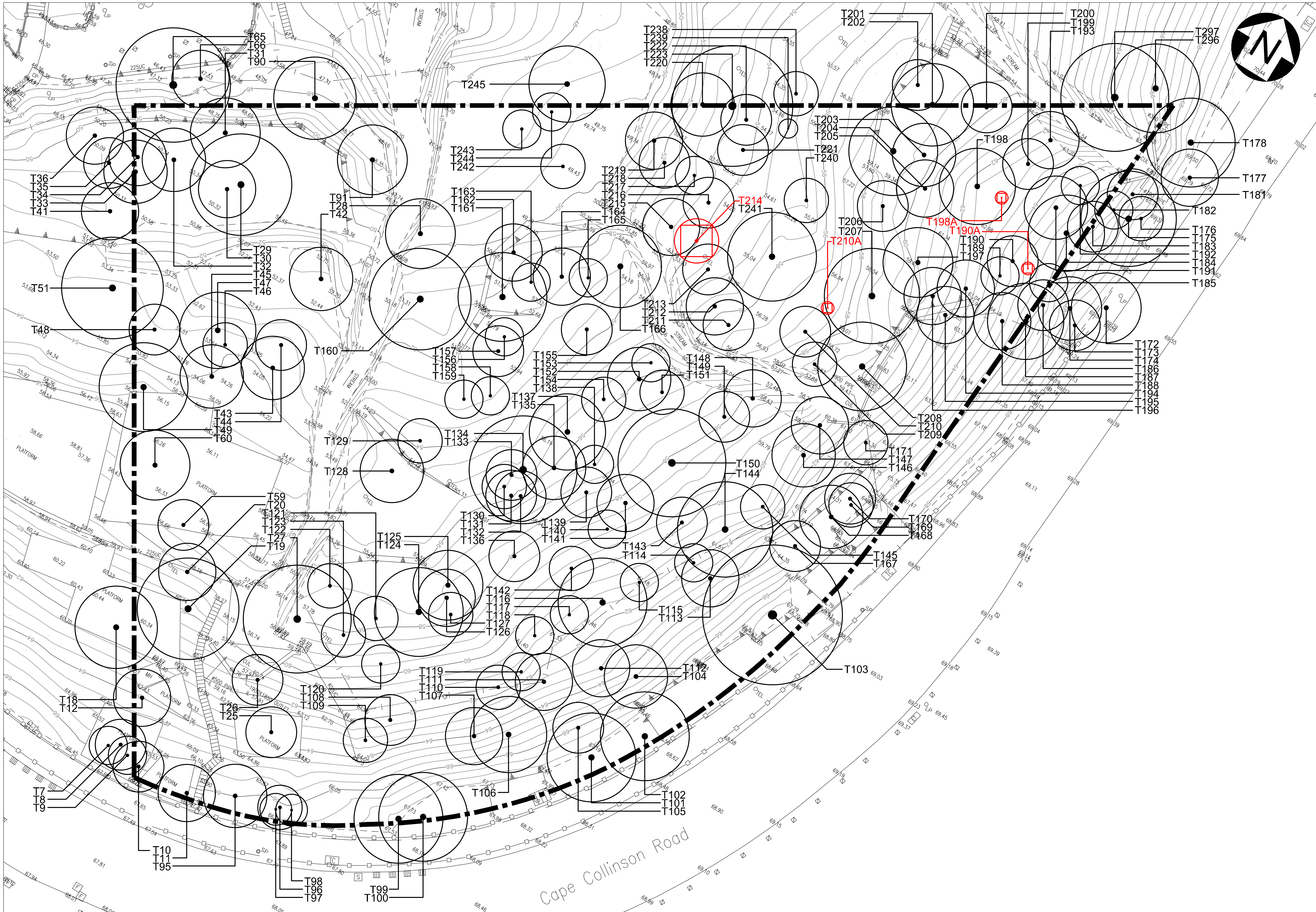
APPENDIX II

TREE LOCATION PLAN



LEGEND

APPLICATION BOUNDARY

62.98 EXISTING LEVEL

T198 EXISTING TREE

T198A EXISTING DEAD TREE

REVISION 校訂	DESCRIPTION 內容摘要	DRAWN 繪圖	DATE 日期	CHECKED 審核	APPROVED 審批

DO NOT SCALE FROM THIS DRAWING 勿按圖量比例

PROJECT 工程項目
PROVISION OF COLUMBARIUM AT CAPE COLLINSON ROAD IN CHAI WAN

SCALE 比例 1:300 @A3

DESIGNED 設計 TEAM

DATE 日期

DRAWN 繪圖 CADD

DRAWING TITLE 圖紙名稱
TREE LOCATION PLAN

REVISION 校訂

CHECKED 審核

DRAWING NUMBER 圖號 SKAL12A-TL01

APPROVED 審批

ADI

ADI LIMITED 雅博奧頓國際設計有限公司
INTERNATIONAL SERVICES IN ENVIRONMENTAL MANAGEMENT, PLANNING, URBAN DESIGN AND LANDSCAPE ARCHITECTURE 國際環境管理,城市規劃及設計,園境建築顧問服務
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CAD FILENAME SKAL12A-TL01.dwg

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APPENDIX III

TREE SURVEY/ASSESSMENT SCHEDULE

Provision of Columbarium at Cape Collinson Road in Chai Wan

Tree Survey/Assessment Schedule

Tree No.	Botanical Name	Chinese Name	Tree Size			Tree Form			Health Condition			Structural Condition			Amenity Value			Survival Rate After Transplantation			Proposed Treatment			On Slope		Ground Level (mPD)	Justification for Tree Felling	Remarks
			DBH (m)	Height (m)	Spread (m)	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor	High	Medium	Low	High	Medium	Low	Retain	Transplant	Fell	Yes	No			
T7	*Macaranga tanarius*	血桐	0.11	6.0	3.0			1		1			1				1			1	1			1		65.38		
T8	*Mallotus paniculatus*	白楸	0.12	6.0	4.0		1			1			1			1			1				1	1		65.28	b,c,g	
T9	*Mallotus paniculatus*	白楸	0.12	4.0	3.0		1			1			1			1			1				1	1		65.38	b,c,g	
T10	*Macaranga tanarius*	血桐	0.13	5.5	4.0			1			1		1				1			1			1	1		65.62	b,c,g	Dead branches
T11	*Ficus hispida*	對葉榕	0.12	5.0	4.5			1		1			1				1			1			1	1		66.45	b,c,g	Dead branches
T12	*Macaranga tanarius*	血桐	0.17	6.5	4.5		1				1		1				1			1			1	1		64.01	b,c,g	Die-back branches , Cavity
T18	*Aleurites moluccana*	石栗	0.34	15.0	6.5		1			1			1				1			1	1			1		60.70		
T19	*Lophostemon confertus*	紅膠木	0.64	11.0	8.0		1			1			1			1				1			1	1		59.84	b,c,g	Rooting area restricted
T20	*Macaranga tanarius*	血桐	0.17	7.5	4.5		1			1			1				1			1			1	1		58.59	b,c,g	Leaning
T25	*Mallotus paniculatus*	白楸	0.12	6.0	4.0		1			1			1				1			1			1	1		63.25	b,c,g	
T26	*Ficus hispida*	對葉榕	0.12	5.0	4.0			1			1		1				1			1			1	1		61.33	b,c,g	Dead branches
T27	*Aleurites moluccana*	石栗	0.70	14.0	8.5		1			1			1			1				1			1	1		58.00	b,c,g	Heavy crown weight
T28	*Mallotus paniculatus*	白楸	0.16	8.5	5.5		1			1			1			1				1			1	1		49.77	b,g	Rooting area restricted
T29	*Sapindus saponaria*	無患子	0.46	14.0	8.0		1			1			1			1			1				1		1	50.27	b	Co-dominant trunk
T30	*Litchi chinensis*	荔枝	0.30	8.0	4.5		1			1			1			1			1				1		1	50.30	b	Open Cavity
T31	*Dimocarpus longan*	龍眼	0.40	10.0	5.5		1			1			1				1			1			1		1	50.34	b.c	Open Cavity
T32	*Mangifera indica*	芒果	0.31	9.0	5.0		1			1			1			1			1				1		1	50.29	b	
T33	*Mangifera indica*	芒果	0.40	8.0	5.0			1			1		1				1			1			1		1	50.21	b.c	Decay on root, Leaning
T34	*Lophostemon confertus*	紅膠木	0.14	6.0	4.5		1			1			1			1			1				1		1	50.28	b	
T35	*Liquidambar formosana*	楓香	0.38	9.0	4.0		1			1			1			1			1		1				1	50.27		
T36	*Lophostemon confertus*	紅膠木	0.20	5.0	4.5			1		1			1			1			1		1				1	50.16		
T41	*Liquidambar formosana*	楓香	0.24	12.4	4.5		1			1			1			1			1		1				1	50.37		
T42	*Dimocarpus longan*	龍眼	0.22	7.0	5.0		1			1			1			1				1			1	1		52.37	b,c,g	
T43	*Macaranga tanarius*	血桐	0.17	6.0	5.0			1		1			1			1			1				1		1	53.88	b	
T44	*Litchi chinensis*	荔枝	0.13	7.0	4.0		1			1			1			1			1				1	1		53.79	b,g	
T45	*Aleurites moluccana*	石栗	0.39	12.0	5.0		1			1			1			1			1				1		1	54.35	b	Rooting area restricted
T46	*Litchi chinensis*	荔枝	0.13	4.5	3.5		1			1			1			1			1				1	1		53.95	b,g	
T47	*Celtis sinensis*	朴樹	0.55	10.0	6.0		1			1			1			1				1			1	1		53.60	b,g	Rooting area restricted
T48	*Aleurites moluccana*	石栗	0.13	7.0	4.0		1			1			1			1			1				1	1		53.50	b,g	
T49	*Aleurites moluccana*	石栗	0.35	14.0	7.0		1			1			1				1			1			1		1	55.26	b	Co-dominant trunk, Rooting area restricted
T51	*Dimocarpus longan*	龍眼	0.41	12.0	8.0		1			1			1			1			1		1			1		53.62		
T59	*Macaranga tanarius*	血桐	0.11	7.0	4.0			1		1			1				1			1			1	1		57.49	b,c,g	
T60	*Macaranga tanarius*	血桐	0.14	6.0	5.5			1			1			1			1			1			1		1	56.29	b.c	Die-back branches
T65	*Microcos nervosa*	布渣葉	0.70	14.0	9.0			1			1			1			1		1		1			1		47.44		Epicormics
T66	*Celtis sinensis*	朴樹	0.13	6.0	4.5		1			1			1			1			1		1			1		47.88		Co-dominant trunk
T90	*Dimocarpus longan*	龍眼	0.42	11.0	6.5		1			1			1			1				1			1	1		48.07	b,c,g	Rooting area restricted
T91	*Dimocarpus longan*	龍眼	0.51	11.0	5.5		1			1			1			1			1				1		1	48.30	b	Climber
T95	*Mallotus paniculatus*	白楸	0.16	6.5	5.0		1			1			1				1			1			1	1		65.99	b,c,g	
T96	*Delonix regia*	鳳凰木	0.12	7.0	3.5			1		1			1			1			1				1	1		66.13	b,g	
T97	*Macaranga tanarius*	血桐	0.10	4.5	2.5		1			1			1				1			1			1	1		66.19	b,c,g	
T98	*Delonix regia*	鳳凰木	0.10	6.0	2.5			1		1			1			1			1				1	1		66.12	b, g	
T99	*Aleurites moluccana*	石栗	0.56	14.0	7.0		1			1			1			1				1			1	1		67.78	b,c,g	Co-dominant trunk
T100	*Delonix regia*	鳳凰木	0.60	14.0	7.0		1				1			1			1			1			1	1		67.92	b,c,g	Open Cavity
T101	*Aleurites moluccana*	石栗	0.65	15.0	7.0		1			1			1			1				1			1	1		67.44	b,c,g	Dead branches
T102	*Aleurites moluccana*	石栗	0.60	15.0	7.0		1			1			1			1				1			1	1		67.70	b,c,g	
T103	*Aleurites moluccana*	石栗	0.80	13.0	11.0		1			1				1		1				1			1	1		67.35	b,c,g	Wire gird on trunk, Heavy crown weight
T104	*Macaranga tanarius*	血桐	0.22	7.0	5.0			1			1		1				1			1			1	1		64.49	b,c,g	Dead branches
T105	*Aleurites moluccana*	石栗	0.14	6.5	4.0		1			1			1			1			1				1	1		66.06	b, g	
T106	*Aleurites moluccana*	石栗	0.52	16.0	6.0		1			1			1			1			1				1	1		64.77	b, g	
T107	*Litchi chinensis*	荔枝	0.26	6.5	4.5		1			1			1			1			1				1	1		64.04	b, g	

Provision of Columbarium at Cape Collinson Road in Chai Wan

Tree Survey/Assessment Schedule

Tree No.	Botanical Name	Chinese Name	Tree Size			Tree Form			Health Condition			Structural Condition			Amenity Value			Survival Rate After Transplantation			Proposed Treatment			On Slope		Ground Level (mPD)	Justification for Tree Felling	Remarks
			DBH (m)	Height (m)	Spread (m)	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor	High	Medium	Low	High	Medium	Low	Retain	Transplant	Fell	Yes	No			
T108	*Caryota ochlandra*	魚尾葵	0.13	6.0	4.0		1			1			1			1			1				1	1		62.18	b, g	
T109	*Caryota ochlandra*	魚尾葵	0.12	6.0	3.5		1			1			1			1			1				1	1		63.20	b, g	
T110	*Bridelia tomentosa*	土蜜樹	0.12	6.5	3.5		1			1			1			1			1				1	1		61.57	b, g	
T111	*Litchi chinensis*	荔枝	0.27	7.5	4.5		1			1			1			1			1				1	1		62.67	b, g	
T112	*Dimocarpus longan*	龍眼	0.27	7.5	4.5		1			1			1			1			1				1	1		63.02	b, g	
T113	*Sterculia lanceolata*	假蘋婆	0.26	5.5	4.5			1		1			1			1				1			1	1		62.97	b,c,g	
T114	*Mangifera indica*	芒果	0.12	5.0	3.0		1			1			1			1				1			1	1		61.83	b,c,g	Decay on root
T115	*Litsea monopetala*	假柿樹	0.12	5.0	3.0		1			1			1			1				1			1	1		61.03	b,c,g	Decay on root
T116	*Dimocarpus longan*	龍眼	0.40	14.0	7.0		1			1				1			1			1			1	1		61.43	b,c,g	Rooting area restricted
T117	*Dimocarpus longan*	龍眼	0.10	5.0	3.0		1			1			1			1			1				1	1		61.05	b, g	
T118	*Dimocarpus longan*	龍眼	0.10	5.0	3.0		1			1			1			1			1				1	1		60.79	b, g	
T119	*Litchi chinensis*	荔枝	0.11	5.0	3.0		1			1			1			1			1				1	1		61.30	b, g	
T120	*Litchi chinensis*	荔枝	0.11	5.0	3.0		1			1			1			1			1				1	1		59.42	b, g	
T121	*Dimocarpus longan*	龍眼	0.12	6.5	3.5		1			1			1			1			1				1	1		57.67	b, g	
T122	*Mangifera indica*	芒果	0.26	6.0	3.5		1				1		1				1		1				1	1		57.51	b, g	Climber
T123	*Litchi chinensis*	荔枝	0.11	7.0	3.5		1			1			1			1			1				1	1		58.05	b, g	
T124	*Dimocarpus longan*	龍眼	0.40	14.5	7.0		1			1			1			1				1			1	1		57.43	b,c,g	
T125	*Dimocarpus longan*	龍眼	0.30	10.0	5.5		1			1			1				1			1			1	1		57.52	b,c,g	
T126	*Dimocarpus longan*	龍眼	0.23	10.0	4.5		1			1			1			1			1				1	1		57.50	b, g	
T127	*Dimocarpus longan*	龍眼	0.13	7.0	3.5		1			1			1			1			1				1	1		57.56	b, g	
T128	*Bischofia javanica*	秋楓	0.23	8.0	5.0			1		1			1				1			1			1	1		55.30	b,c,g	Decay on trunk, Climber
T129	*Bischofia javanica*	秋楓	0.15	5.0	3.5			1			1		1				1			1			1	1		53.83	b,c,g	Climber
T130	*Choerospondias axillaris*	南酸棗	0.12	6.0	3.5		1			1			1			1			1				1	1		55.40	b, g	Rooting area restricted
T131	*Choerospondias axillaris*	南酸棗	0.19	8.0	4.0		1			1			1			1			1				1	1		55.90	b, g	Rooting area restricted
T132	*Choerospondias axillaris*	南酸棗	0.18	8.5	4.0		1			1			1				1			1			1	1		56.21	b,c,g	Rooting area restricted
T133	*Choerospondias axillaris*	南酸棗	0.19	7.0	4.0		1			1			1			1			1				1	1		55.47	b, g	Climber
T134	*Dimocarpus longan*	龍眼	0.70	13.0	8.5		1			1				1			1			1			1	1		55.10	b,c,g	Open cavity, Dead branches
T135	*Dimocarpus longan*	龍眼	0.21	7.5	5.0		1			1			1			1			1				1	1		56.02	b, g	
T136	*Sapindus saponaria*	無患子	0.14	6.0	4.0		1			1			1			1			1				1	1		58.05	b, g	
T137	*Clausena lansium*	黃皮	0.24	12.0	6.0		1			1			1			1				1			1	1		55.80	b,c,g	Rooting area restricted
T138	*Dimocarpus longan*	龍眼	0.11	6.0	3.0		1			1			1			1				1			1	1		56.44	b,c,g	
T139	*Caryota ochlandra*	魚尾葵	0.11	7.0	4.0		1			1			1			1			1				1	1		57.40	b, g	
T140	*Dimocarpus longan*	龍眼	0.12	6.5	3.0		1			1			1			1			1				1	1		58.89	b, g	
T141	*Dimocarpus longan*	龍眼	0.12	8.0	4.5		1			1			1			1				1			1	1		58.26	b,c,g	Rooting area restricted
T142	*Bridelia tomentosa*	土蜜樹	0.14	8.0	3.5		1			1			1			1			1				1	1		59.71	b, g	
T143	*Mangifera indica*	芒果	0.17	8.5	4.0		1			1			1				1			1			1	1		59.78	b,c,g	Decay on trunk
T144	*Litchi chinensis*	荔枝	0.55	15.5	7.5		1			1			1				1			1			1	1		61.05	b,c,g	Decay on root
T145	*Artocarpus heterophyllus*	菠蘿蜜	0.23	7.5	3.5		1				1		1				1			1			1	1		60.44	b,c,g	Exposed root
T146	*Artocarpus heterophyllus*	菠蘿蜜	0.26	10.0	5.0		1			1			1			1			1				1	1		61.21	b, g	
T147	*Artocarpus heterophyllus*	菠蘿蜜	0.13	6.0	4.5		1			1			1			1				1			1	1		60.55	b,c,g	Dead beanches, Decay on root
T148	*Litsea monopetala*	假柿樹	0.13	6.0	4.5			1		1			1				1			1			1	1		58.27	b,c,g	Leaning
T149	*Dimocarpus longan*	龍眼	0.22	8.5	4.0		1			1			1			1			1				1	1		57.76	b, g	
T150	*Dimocarpus longan*	龍眼	0.41	16.0	8.5		1			1			1			1			1				1	1		58.18	b, g	
T151	*Artocarpus heterophyllus*	菠蘿蜜	0.19	8.0	3.5		1			1			1			1			1				1	1		56.37	b, g	
T152	*Dimocarpus longan*	龍眼	0.32	11.0	5.0		1			1			1			1				1			1	1		56.02	b,c,g	
T153	*Dimocarpus longan*	龍眼	0.12	4.5	3.0			1			1		1				1			1			1	1		55.81	b,c,g	Topped crown, Epicormics
T154	*Dimocarpus longan*	龍眼	0.12	7.5	3.5		1			1			1			1			1				1	1		55.82	b, g	
T155	*Dimocarpus longan*	龍眼	0.13	8.0	4.0		1			1			1			1			1				1	1		53.64	b, g	
T156	*Sapindus saponaria*	無患子	0.17	7.5	3.0		1			1			1				1		1				1	1		52.74	b, g	
T157	*Dimocarpus longan*	龍眼	0.18	9.5	4.0		1			1			1			1			1				1	1		52.82	b, g	
T158	*Litchi chinensis*	荔枝	0.10	6.0	3.0			1		1			1				1			1			1	1		52.90	b,c,g	
T159	*Litchi chinensis*	荔枝	0.25	5.5	3.0		1			1			1			1				1			1	1		52.72	b,c,g	Climber
T160	*Litchi chinensis*	荔枝	0.47	11.0	8.0		1			1			1			1				1			1	1		51.15	b,c,g	
T161	*Litchi chinensis*	荔枝	0.36	11.0	7.0		1			1			1			1			1				1	1		52.08	b, g	Decay on root, Dead branches
T162	*Dimocarpus longan*	龍眼	0.35	9.5	4.5		1			1			1			1			1				1	1		51.89	b, g	Decay on root, Dead branches
T163	*Choerospondias axillaris*	南酸棗	0.14	7.5	3.0		1			1			1			1			1				1	1		52.18	b, g	
T164	*Choerospondias axillaris*	南酸棗	0.17	7.5	4.5		1			1			1				1			1			1	1		52.33	b,c,g	Cavity
T165	*Dimocarpus longan*	龍眼	0.11	6.5	3.0		1			1			1				1			1			1	1		52.74	b,c,g	
T166	*Dimocarpus longan*	龍眼	0.42	13.0	6.5		1			1			1			1			1				1	1		52.94	b, g	Dead branches
T167	*Sterculia lanceolata*	假蘋婆	0.10	6.0	4.0		1			1			1			1			1				1	1		64.09	b, g	

Provision of Columbarium at Cape Collinson Road in Chai Wan

Tree Survey/Assessment Schedule

Tree No.	Botanical Name	Chinese Name	Tree Size			Tree Form			Health Condition			Structural Condition			Amenity Value			Survival Rate After Transplantation			Proposed Treatment			On Slope		Ground Level (mPD)	Justification for Tree Felling	Remarks
			DBH (m)	Height (m)	Spread (m)	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor	High	Medium	Low	High	Medium	Low	Retain	Transplant	Fell	Yes	No			
T168	*Mangifera indica*	芒果	0.17	9.0	5.0		1			1			1			1			1				1	1		64.30	b, g	
T169	*Sterculia lanceolata*	假蘋婆	0.13	5.5	3.5		1			1			1			1			1				1	1		64.42	b, g	
T170	*Mallotus paniculatus*	白楸	0.13	6.0	4.0		1			1			1			1			1				1	1		64.36	b, g	
T171	*Aleurites moluccana*	石栗	0.12	7.0	3.5		1			1			1			1			1				1	1		63.13	b, g	
T172	*Bombax ceiba*	木棉	0.47	12.0	5.5			1		1			1				1			1			1		1	69.48	b,c, g	Rooting area restricted, Co-dominant trunk
T173	*Clausena lansium*	黃皮	0.12	6.0	4.0		1			1			1			1			1				1	1		68.97	b, g	Dead branches
T174	*Dimocarpus longan*	龍眼	0.22	6.5	5.0		1			1			1			1			1				1	1		68.46	b, g	Restricted grow of crown
T175	*Pinus elliottii*	濕地松	0.42	14.0	7.5		1			1			1			1			1				1	1		68.23	b, g	Leaning
T176	*Macaranga tanarius*	血桐	0.10	5.5	3.5			1		1			1				1		1				1	1		68.80	b, g	Dead branches, Dead stub
T177	*Bombax ceiba*	木棉	0.41	12.0	4.5		1			1			1			1				1			1		1	69.62	b,c, g	Rooting area restricted
T178	*Dimocarpus longan*	龍眼	0.40	8.5	7.0		1			1			1			1			1				1	1		69.41	b, g	Crossing branche with T177
T181	*Litchi chinensis*	荔枝	0.12	6.0	4.0		1			1			1			1			1				1	1		67.16	b, g	Restricted grow of crown
T182	*Choerospondias axillaris*	南酸棗	0.11	6.5	3.0		1			1			1			1			1				1	1		66.46	b, g	
T183	*Dimocarpus longan*	龍眼	0.19	8.0	4.0		1			1			1			1			1				1	1		66.27	b, g	Decay on root
T184	*Dimocarpus longan*	龍眼	0.26	9.0	6.0		1			1			1			1			1				1	1		65.90	b, g	Decay on root
T185	*Murraya paniculata*	九里香	0.11	5.0	3.0		1			1			1				1		1				1	1		65.99	b, g	Decay on root
T186	*Artocarpus macrocarpus*	菠蘿蜜	0.17	8.0	4.0		1			1			1				1		1				1	1		66.07	b.g	Dead branches, Decay on root
T187	*Clausena lansium*	黃皮	0.30	7.0	6.0		1			1			1				1		1				1	1		65.83	b, g	Rooting area restricted
T188	*Litchi chinensis*	荔枝	0.29	9.0	4.5		1			1			1				1		1				1	1		64.82	b, g	Dead branches
T189	*Sapindus saponaria*	無患子	0.10	6.5	3.0			1		1			1				1		1				1	1		64.05	b, g	Bending trunk
T190	*Litchi chinensis*	荔枝	0.23	8.0	4.0		1			1			1			1			1				1	1		64.62	b, g	
T190A	*Dead Tree*	死樹	0.14	5.0	0.2		1				1			1			1			1			1	1			b,c,g	Dead tree
T191	*Dimocarpus longan*	龍眼	0.36	9.0	5.0		1			1			1			1			1				1	1		64.69	b, g	Epicormics
T192	*Litsea monopetala*	假柿樹	0.13	7.0	3.0		1			1			1			1			1				1	1		64.91	b, g	
T193	*Dimocarpus longan*	龍眼	0.25	11.0	4.5		1			1			1			1				1			1	1		62.47	b,c,g	Dead stub
T194	*Dimocarpus longan*	龍眼	0.29	8.5	4.5		1			1			1			1				1			1	1		62.54	b,c,g	Root flare not visible
T195	*Clausena lansium*	黃皮	0.27	8.0	4.5			1		1			1				1			1			1	1		62.31	b,c,g	on root, Open cavity
T196	*Mangifera indica*	芒果	0.27	9.0	4.5		1			1			1			1				1			1	1		61.42	b,c,g	Rooting area restricted
T197	*Dimocarpus longan*	龍眼	0.36	9.0	5.5		1			1			1			1			1				1	1		60.65	b, g	Dead branches
T198	*Dimocarpus longan*	龍眼	0.39	9.0	6.0		1			1			1			1			1				1	1		62.51	b, g	
T198A	*Dead Tree*	死樹	0.19	5.0	0.2		1				1			1			1			1			1	1			b,c,g	Dead tree
T199	*Dimocarpus longan*	龍眼	0.16	9.0	4.0			1		1				1			1			1			1	1		62.85	b,c,g	V-shaped crotch
T200	*Dimocarpus longan*	龍眼	0.14	9.0	4.0		1			1			1			1			1				1	1		59.81	b, g	Decay on trunk, cavity
T201	*Dimocarpus longan*	龍眼	0.50	10.5	6.5		1			1			1			1			1				1	1		59.37	b, g	Dead branches
T202	*Litchi chinensis*	荔枝	0.25	8.0	4.0			1		1			1				1			1	1			1		59.26		Restricted grow of crown
T203	*Litchi chinensis*	荔枝	0.37	11.0	5.0		1			1			1			1				1			1	1		59.55	b, g	Decay on root
T204	*Litchi chinensis*	荔枝	0.36	10.0	7.0		1			1			1			1			1				1	1		59.42	b, g	Girdling roots, V-shaped crotch
T205	*Artocarpus heterophyllus*	菠蘿蜜	0.25	8.5	4.5		1			1			1			1			1				1	1		60.22	b, g	Dead branches
T206	*Litchi chinensis*	荔枝	0.30	7.0	4.0		1			1			1			1			1				1	1		59.09	b, g	Dead branches
T207	*Dimocarpus longan*	龍眼	0.50	11.0	7.5		1			1			1			1			1				1	1		59.21	b, g	Decay on root
T208	*Sapindus saponaria*	無患子	0.43	10.0	7.0		1			1			1			1				1			1	1		59.48	b,c,g	Rooting area restricted
T209	*Mallotus paniculatus*	白楸	0.11	6.0	3.5		1			1			1			1				1			1	1		58.62	b,c,g	Decay on root
T210	*Sapindus saponaria*	無患子	0.16	7.5	4.0		1			1				1			1			1			1	1		57.19	b,c,g	Decay on trunk
T210A	*Dead Tree*	死樹	0.17	6.0	0.5		1				1			1			1			1			1	1			b,c,g	Dead tree
T211	*Celtis sinensis*	朴樹	0.26	8.5	4.0		1			1			1			1				1			1	1		56.38	b,c,g	Decay on trunk
T212	*Celtis sinensis*	朴樹	0.21	6.5	4.5		1			1			1			1			1				1	1		55.82	b, g	Dead branches
T213	*Litchi chinensis*	荔枝	0.17	8.5	4.0		1			1			1			1			1				1	1		54.67	b, g	
T214	*Dead Tree*	死樹	0.17	6.0	3.5		1				1			1			1			1			1	1		53.97	b,c,g	Dead Tree
T215	*Litchi chinensis*	荔枝	0.33	7.0	4.5		1				1			1			1			1			1	1		53.45	b,c,g	Decay on trunk
T216	*Dimocarpus longan*	龍眼	0.19	8.0	4.0		1			1			1			1			1				1	1		53.80	b, g	Dead branches
T217	*Sterculia lanceolata*	假蘋婆	0.10	5.5	3.0		1			1			1			1			1				1	1		52.94	b, g	
T218	*Sapindus saponaria*	無患子	0.23	6.0	4.0		1				1		1				1			1			1	1		52.08	b,c,g	Decay on trunk
T219	*Mallotus paniculatus*	白楸	0.28	7.0	4.5		1			1				1		1				1			1	1		51.50	b,c,g	
T220	*Litchi chinensis*	荔枝	0.37	8.5	5.0		1			1			1			1				1			1	1		52.62	b,c,g	Girdling roots
T221	*Litchi chinensis*	荔枝	0.19	7.0	4.0		1				1		1			1			1				1	1		53.73	b, g	Die-back beanches
T222	*Litchi chinensis*	荔枝	0.18	6.5	4.0		1			1			1				1		1				1	1		53.67	b, g	Dead branches
T223	*Litchi chinensis*	荔枝	0.37	11.0	9.5		1			1			1			1			1				1	1		53.36	b, g	
T238	*Dimocarpus longan*	龍眼	0.15	8.5	3.5		1			1			1			1			1		1			1		54.71		
T239	*Litchi chinensis*	荔枝	0.10	5.0	1.5		1			1			1			1			1				1	1		54.74	b, g	
T240	*Dimocarpus longan*	龍眼	0.17	8.5	3.5		1			1			1			1			1				1	1		54.93	b, g	Rooting area restricted

Provision of Columbarium at Cape Collinson Road in Chai Wan

Tree Survey/Assessment Schedule

Tree No.	Botanical Name	Chinese Name	Tree Size			Tree Form			Health Condition			Structural Condition			Amenity Value			Survival Rate After Transplantation			Proposed Treatment			On Slope		Ground Level (mPD)	Justification for Tree Felling	Remarks
			DBH (m)	Height (m)	Spread (m)	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor	High	Medium	Low	High	Medium	Low	Retain	Transplant	Fell	Yes	No			
T241	*Dimocarpus longan*	龍眼	0.34	11.5	7.0		1			1			1			1				1			1	1		55.81	b,c,g	Rooting area restricted
T242	*Dimocarpus longan*	龍眼	0.10	8.5	3.5		1			1			1				1		1				1	1		49.68	b, g	Dead branches
T243	*Elaeocarpus decipiens*	杜英	0.10	7.0	3.0		1			1			1			1			1				1	1		48.87	b, g	Restricted grow of crown, Leaning
T244	*Litchi chinensis*	荔枝	0.11	7.0	3.0		1			1				1			1			1			1	1		49.15	b,c,g	Decay on trunk
T245	*Sapindus saponaria*	無患子	0.32	10.5	6.0		1			1			1			1			1		1			1		49.01		
T296	*Cinnamomum camphora*	樟樹	0.32	10.0	7.0		1			1			1			1				1			1	1		66.18	b, g	Deda branches
T297	*Dimocarpus longan*	龍眼	0.48	14.0	8.5		1			1			1			1			1				1	1		64.56	b,c,g	
Statistics			44	1470	823	0	152	25	0	158	19	0	162	15	0	123	54	0	101	76	11	0	166	161	16			
						0%	86%	14%	0%	89%	11%	0%	92%	8%	0%	69%	31%	0%	57%	43%	6%	0%	94%	91%	9%			
						Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor	High	Medium	Low	High	Medium	Low	Retain	Transplant	Fell	Yes	No			

Note

Tree outside application boundary

Justification for Felling

a *Existing dead tree to be felled.*

b *Recommend to fell as the existing tree is in conflict with the proposed engineering works and architectural layout.*

c *Recommend to fell as the existing tree has an anticipated low survial rate if transplanted.*

d *Recommend to fell as the existing tree has poor tree form, broken or damaged branch and trunk or in poor health condition as being attacked by fungi/insects.*

e *Recommend to fell as the tree is growing very close to other trees and in very stressful site condition.*

f *Recommend to fell as the existing tree is undesirable species.*

g *Recommend to fell as the tree is located on sloping ground with formation of balanced rootball for transplanting technically not feasible.*

Top of Soil Level at the base of the Tree

It should be noted that this figure provides the existing soil level and that where these trees are to be retained in-situ the soil level will be maintained at the base of the tree and not cover the root collar.

Tree Diameter Breast Height (DBH)

DBH of a tree refers to its trunk diameter at breast height (i.e. measured at 1,300mm above ground level)

No. of trees to be retained: 11
No. of trees to be transplanted: 0
No. of trees to be felled: 166 (including 4 dead trees)

Tree surveyor(s): Leung Hoi Gok, Regine (ISA No. HK-0481A)
Field survey was conducted on: Mar-16
To be read in conjunction with drawings: SKAL12A-TL01 & SKAL12A-TR01

APPENDIX IV

PHOTOGRAPHIC RECORDS OF EXISTING TREES

T7 (Overall view)

29/03/2016

R

T7 (Base)

T7 (Trunk)

29/03/2016

R

T7 (Crown)

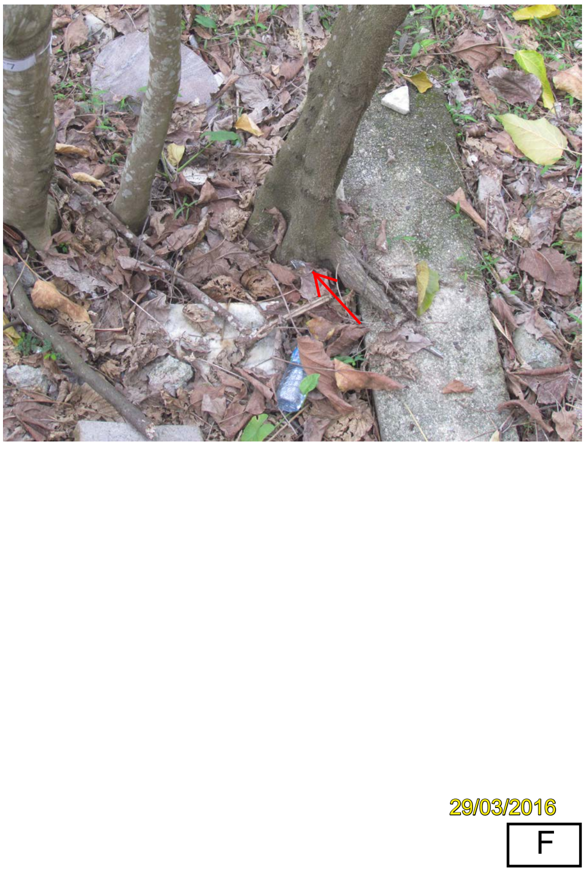
R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

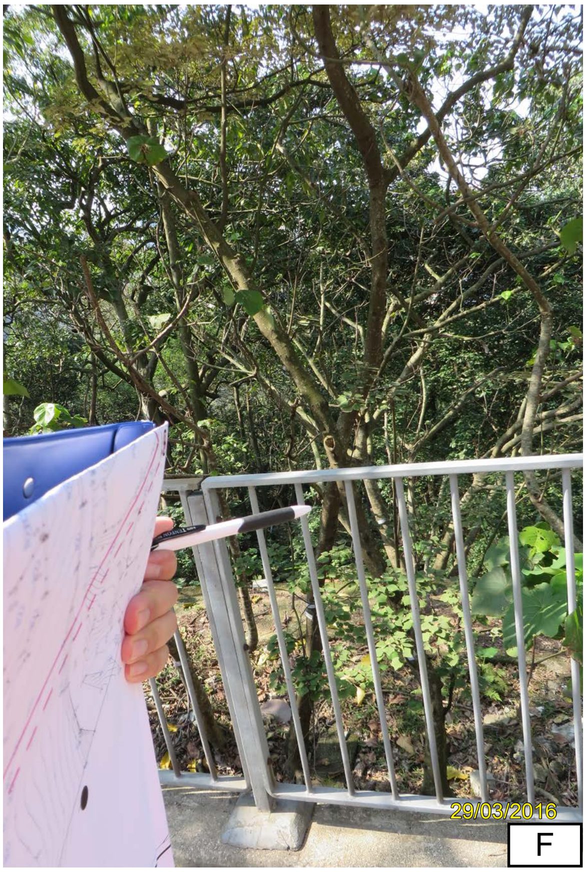
SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-1	REV	

ADI

T8 (Overall view)



T8 (Base)

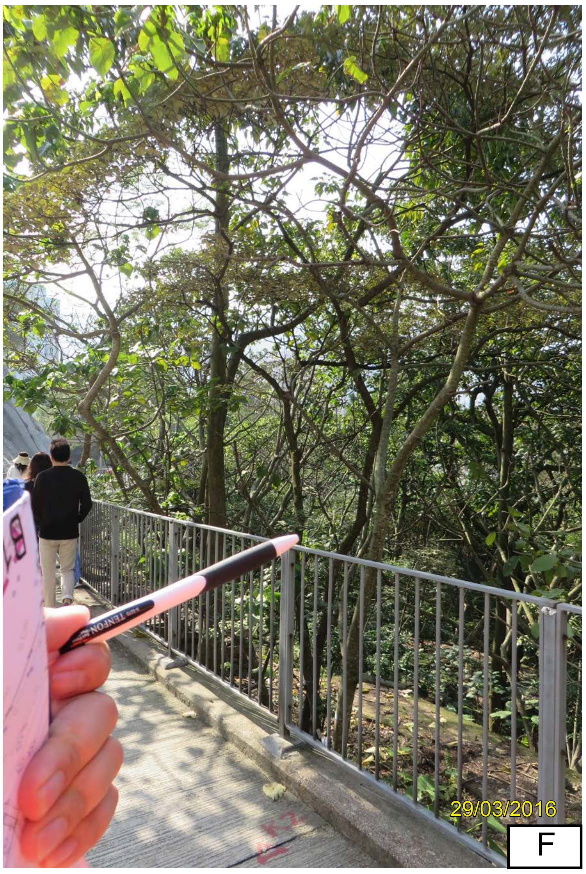


T8 (Trunk)

T8 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

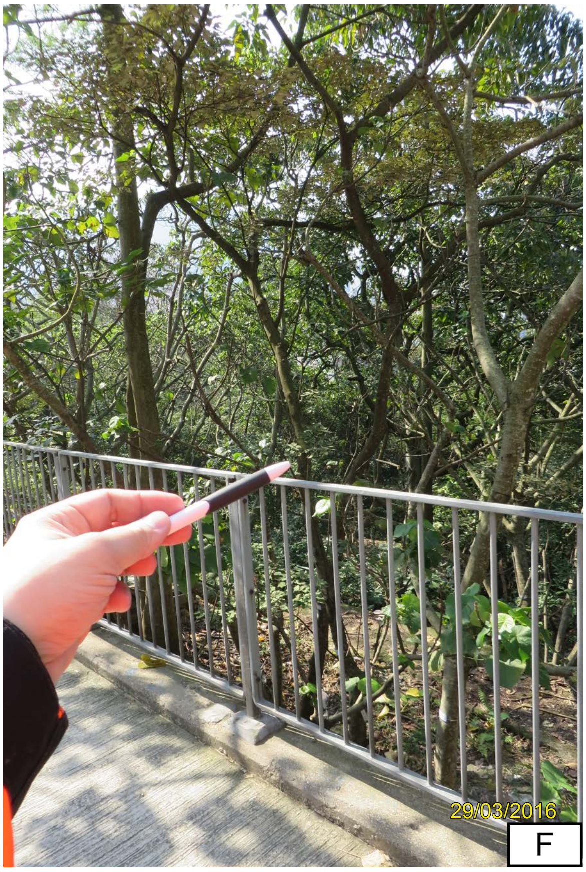
PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-2		REV	



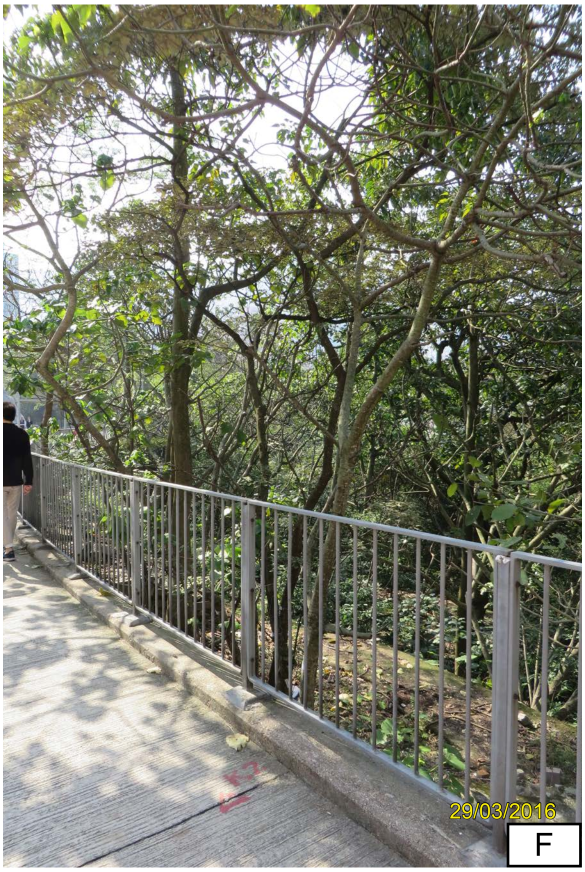
T9 (Overall view)

29/03/2016
F

T9 (Base)



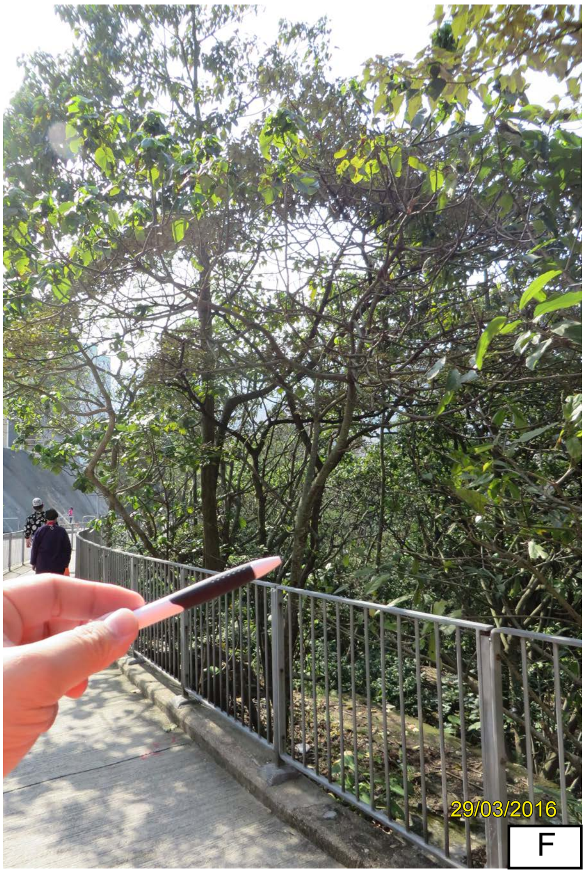
T9 (Trunk)



T9 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-3	REV		



T10 (Overall view)

29/03/2016
F

T10 (Base)

T10 (Trunk)

29/03/2016
F

T10 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-4	REV	

ADI

29/03/2016

F

T11 (Overall view)

29/03/2016

F

T11 (Base)

29/03/2016

F

T11 (Trunk)

29/03/2016

F

T11 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-5	REV	

ADI

T12 (Overall view)

T12 (Base)

T12 (Trunk)

T12 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-6		REV	

T18 (Overall view)

T18 (Base)

T18 (Trunk)

T18 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-7	REV	

ADI

T19 (Overall view)

T19 (Base)

T19 (Trunk)

T19 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-8	REV	

ADI

29/03/2016

F

T20 (Overall view)

T20 (Base)

T20 (Trunk)

T20 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-9		REV	

T25 (Overall view)

T25 (Base)

T25 (Trunk)

T25 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-10	REV	

ADI

T26 (Overall view)

T26 (Base)

T26 (Trunk)

T26 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-11	REV	

ADI

T27 (Overall view)

T27 (Base)

T27 (Trunk)

T27 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-12	REV	

ADI

T28 (Overall view)

T28 (Base)

T28 (Trunk)

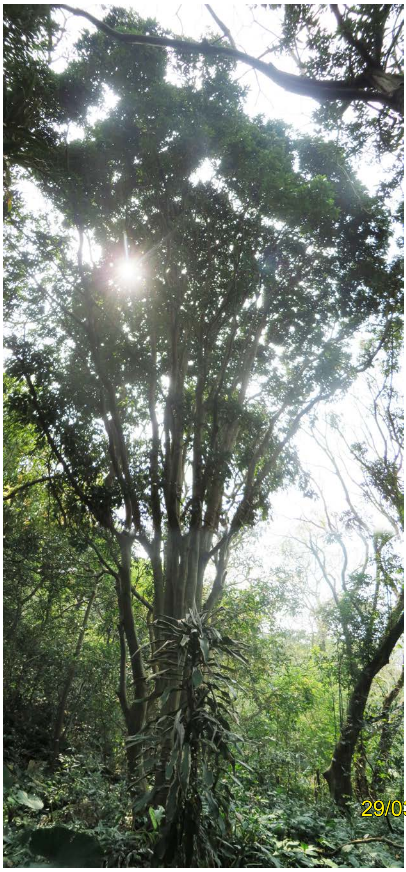
T28 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-13	REV	

ADI



F

T29 (Overall view)

F

T29 (Base)

29/03/2016

F

T29 (Trunk)

29/03/2016

F

T29 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-14	REV	

ADI

T30 (Overall view)

T30 (Base)

T30 (Trunk)

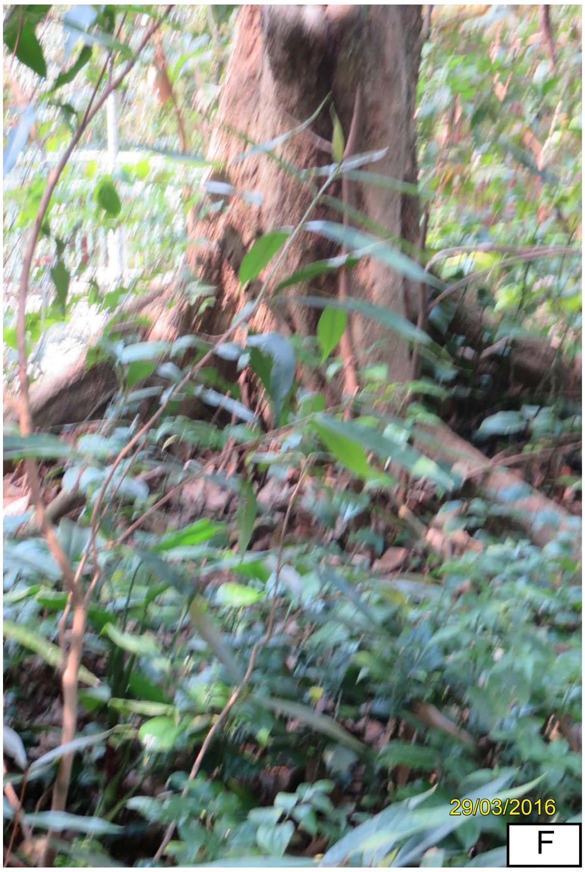
T30 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO. SKAL12A-TS-15		REV	

ADI

T31 (Overall view)



T31 (Base)

T31 (Trunk)

T31 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-16		REV	

T32 (Overall view)

T32 (Base)

T32 (Trunk)

T32 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-17	REV	

ADI

T33 (Overall view)

T33 (Base)

T33 (Trunk)

T33 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-18	REV	

ADI

T34 (Overall view)

T34 (Base)

T34 (Trunk)

T34 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

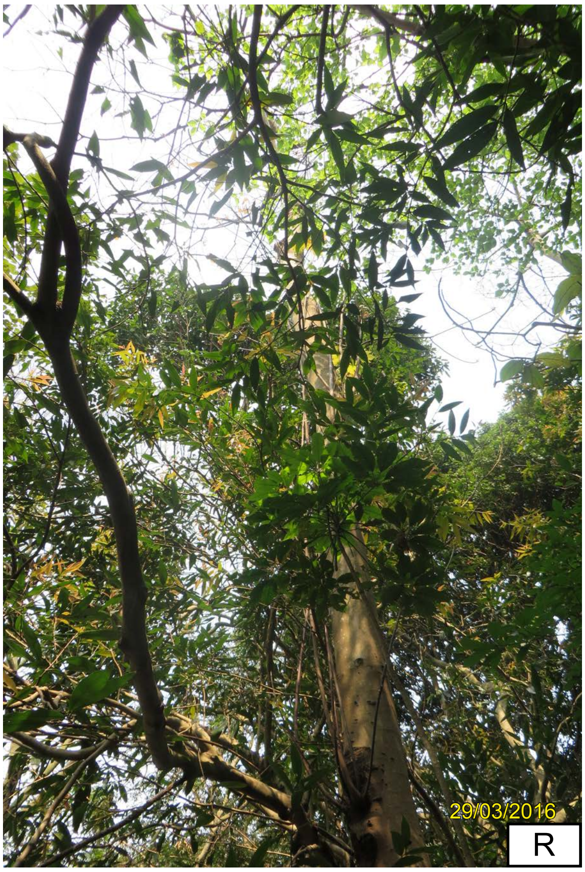
PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-19	REV	

ADI

T35 (Overall view)

T35 (Base)

T35 (Trunk)



T35 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-20	REV	

ADI

T36 (Overall view)

T36 (Base)

T36 (Trunk)

T36 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-21	REV		

T41 (Overall view)

T41 (Base)

T41 (Trunk)

T41 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-22	REV		

T42 (Overall view)

T42 (Base)

T42 (Trunk)

T42 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-23	REV	

ADI

T43 (Overall view)

T43 (Base)

T43 (Trunk)

29/03/2016

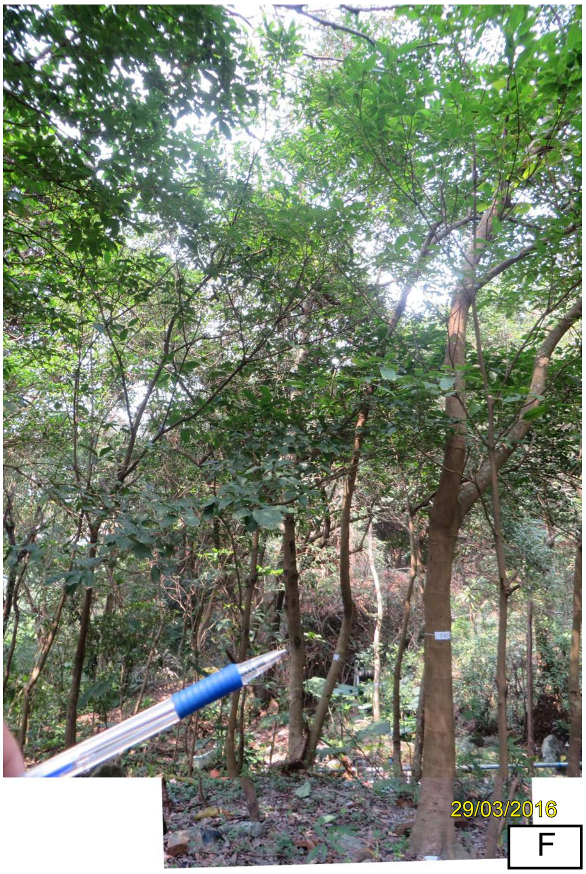
F

T43 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-24	REV	

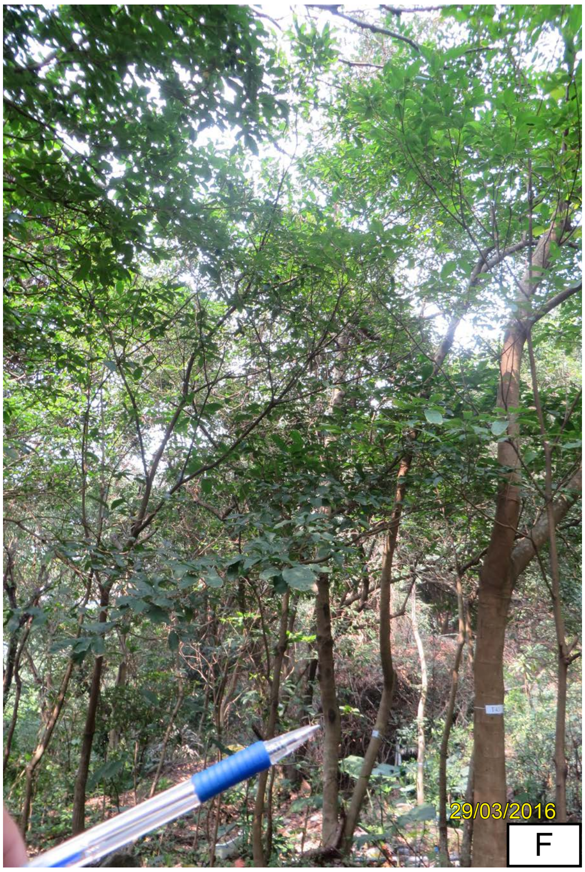
ADI



T44 (Overall view)

T44 (Base)

T44 (Trunk)



T44 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-25	REV	

ADI

T45 (Overall view)

T45 (Base)

T45 (Trunk)

T45 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-26		REV	

T46 (Overall view)

T46 (Base)

T46 (Trunk)

T46 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-27		REV	

T47 (Overall view)

T47 (Base)

T47 (Trunk)

T47 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016		ADI
	CHECKED	ALL	DRAWN	HEH		
	FIGURE NO.	SKAL12A-TS-28			REV	

T48 (Overall view)

T48 (Base)

T48 (Trunk)

T48 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-29		REV	

T49 (Overall view)

T49 (Base)

T49 (Trunk)

T49 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-30	REV	

ADI

T51 (Overall view)

T51 (Base)

T51 (Trunk)

T51 (Crown)

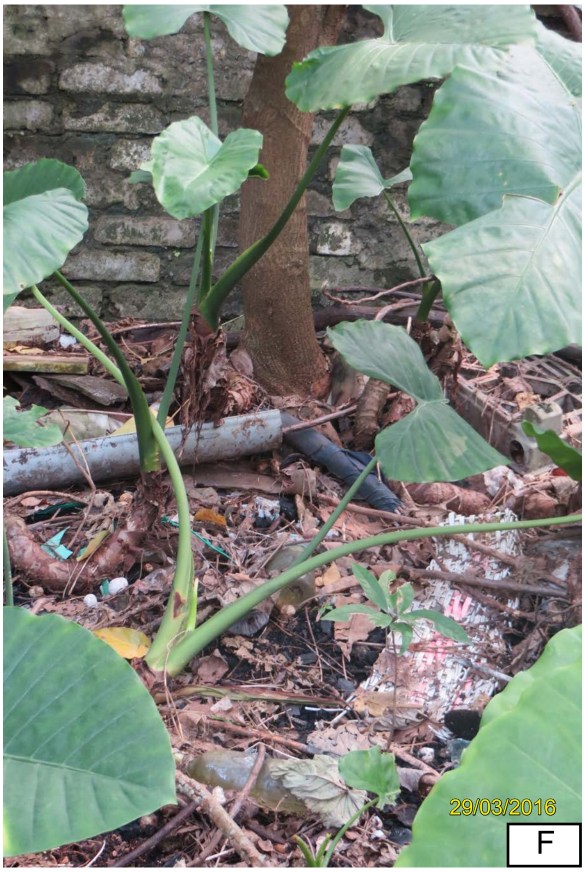
R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-31	REV	

ADI

T59 (Overall view)



T59 (Base)

T59 (Trunk)

T59 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-32	REV	

ADI

T60 (Overall view)

T60 (Base)

T60 (Trunk)

T60 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-33	REV	

ADI

T65 (Overall view)

29/03/2016

R

T65 (Base)

T65 (Trunk)

29/03/2016

R

T65 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-34		REV	

T66 (Overall view)

29/03/2016

R

T66 (Base)

T66 (Trunk)

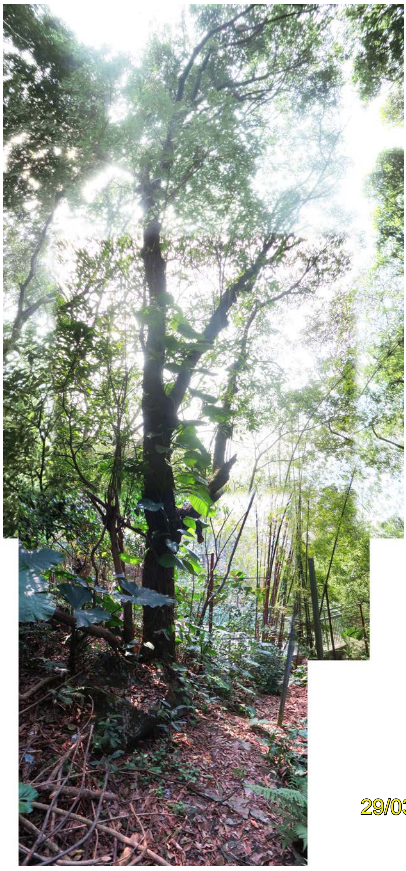
29/03/2016

R

T66 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

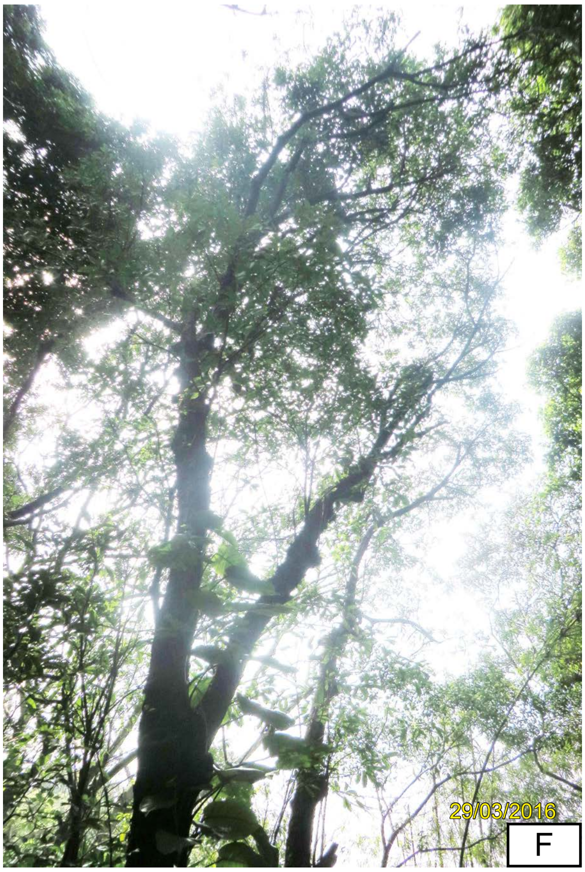
PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO. SKAL12A-TS-35			REV	



T90 (Overall view)

T90 (Base)

T90 (Trunk)



T90 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-36	REV	

ADI

T91 (Overall view)

T91 (Base)

T91 (Trunk)

T91 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-37	REV	

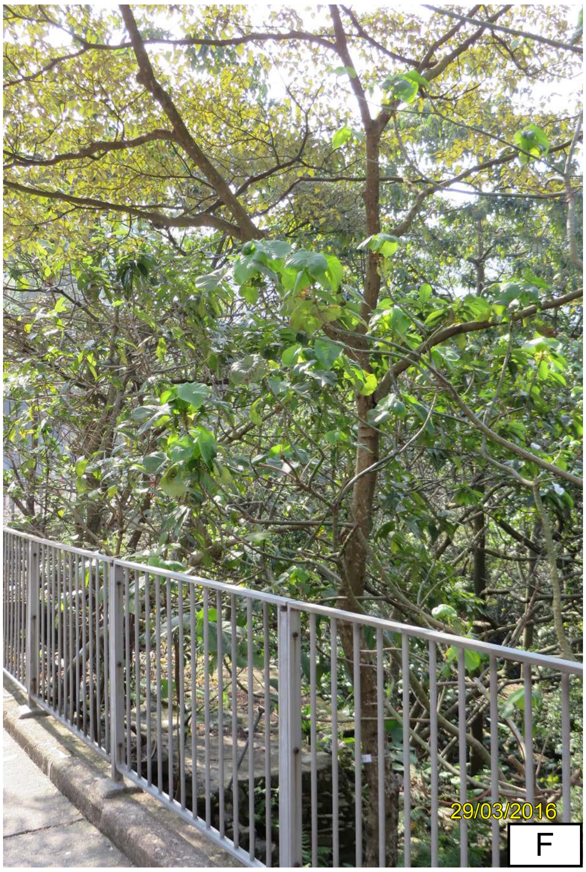
ADI

T95 (Overall view)

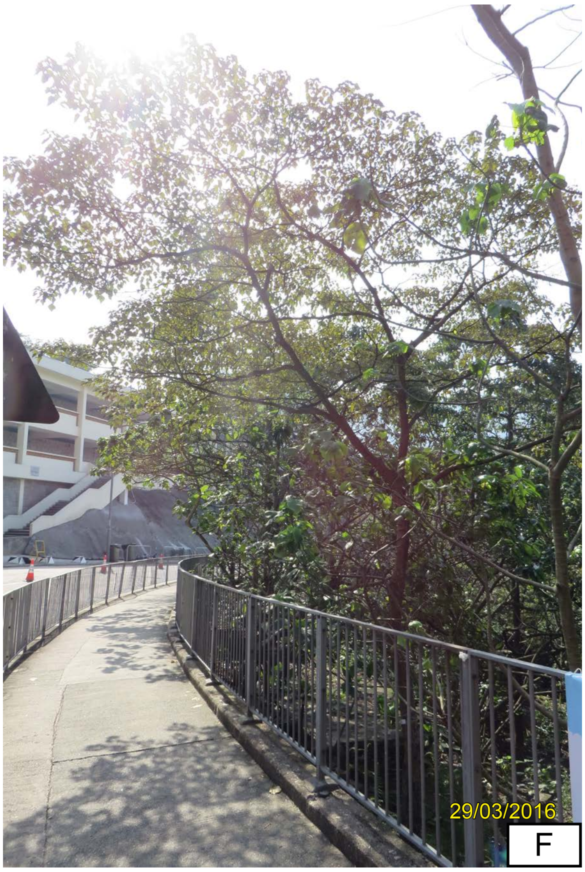
29/03/2016

F

T95 (Base)



T95 (Trunk)



T95 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-38	REV	

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

ADI

T96 (Overall view)

T96 (Base)

T96 (Trunk)

T96 (Crown)

R-Retain   T-Transplant   F-Fell   D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-39	REV	

ADI

29/03/2016

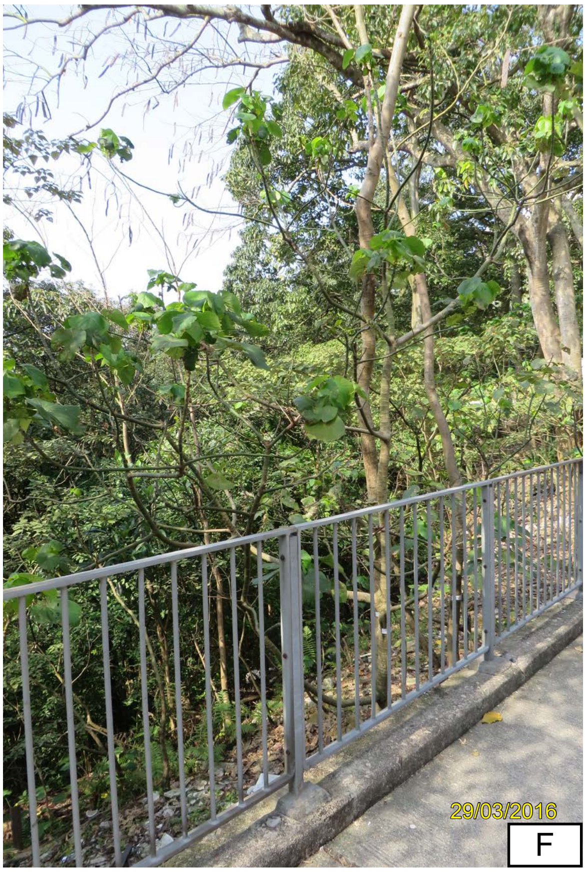
F

T97 (Overall view)

29/03/2016

F

T97 (Base)



29/03/2016

F

T97 (Trunk)

29/03/2016

F

T97 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-40	REV	

ADI

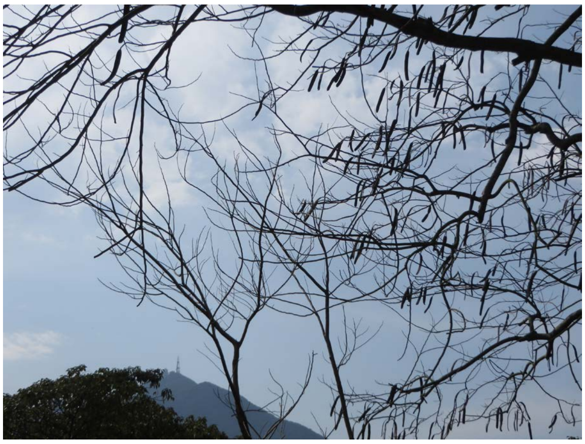
T98 (Overall view)

29/03/2016

F

T98 (Base)

T98 (Trunk)



29/03/2016

F

T98 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-41		REV	

T99 (Overall view)

T99 (Base)

T99 (Trunk)

29/03/2016

F

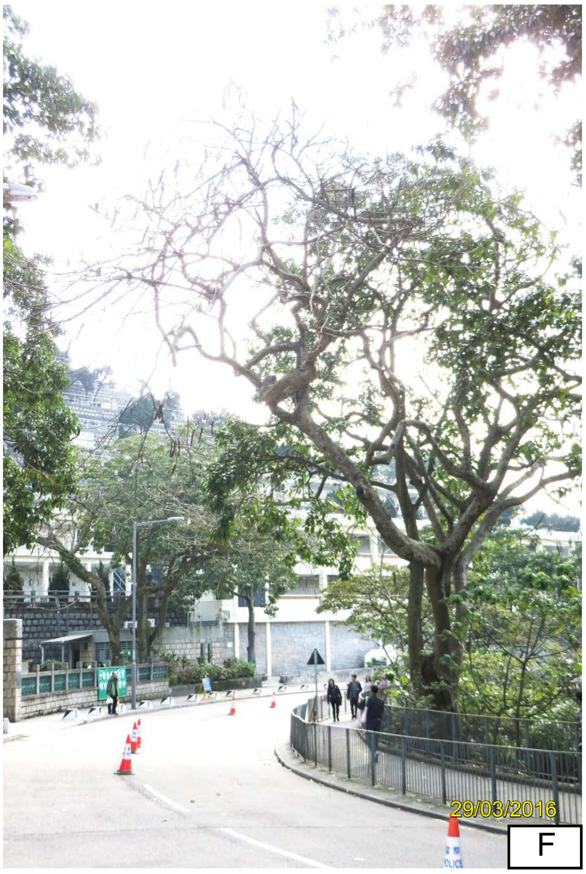
T99 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-42	REV	

ADI

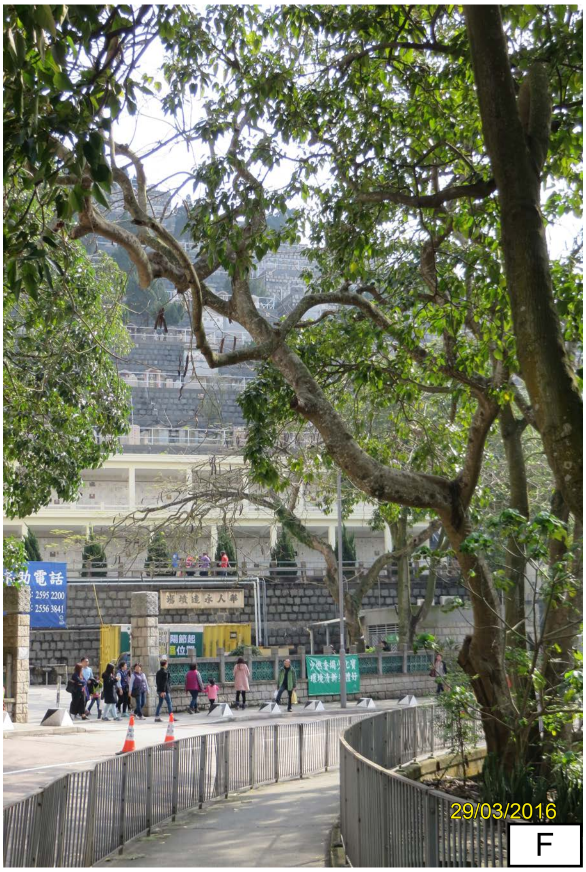


T100 (Overall view)

29/03/2016

F

T100 (Base)



T100 (Trunk)

T100 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-43	REV	

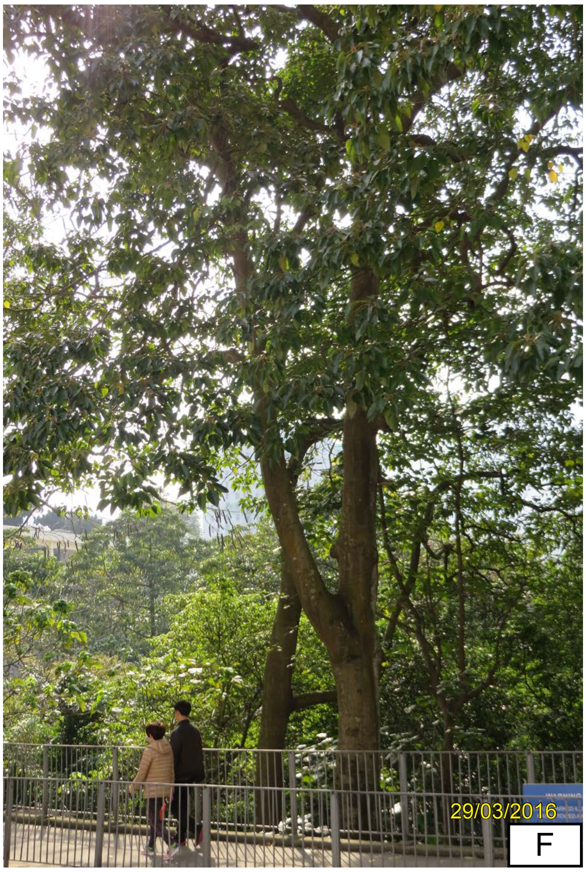
ADI

T101 (Overall view)

29/03/2016

F

T101 (Base)



T101 (Trunk)

T101 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-44		REV	

F

T102 (Overall view)

29/03/2016

F

T102 (Base)

F

T102 (Trunk)

29/03/2016

F

T102 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-45		REV	

F

T103 (Overall view)

29/03/2016

F

T103 (Base)

F

T103 (Trunk)

29/03/2016

F

T103 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-46		REV	

29/03/2016

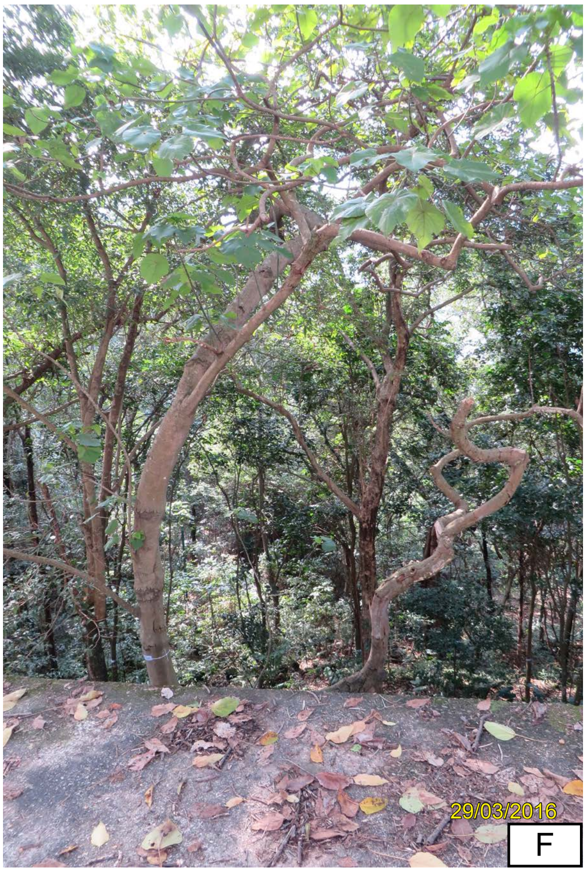
F

T104 (Overall view)

29/03/2016

F

T104 (Base)



29/03/2016

F

T104 (Trunk)

29/03/2016

F

T104 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-47		REV	

T105 (Overall view)

T105 (Base)

T105 (Trunk)

T105 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-48	REV	

ADI

T106 (Overall view)

T106 (Base)

T106 (Trunk)

T106 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-49	REV	

ADI

T107 (Overall view)

T107 (Base)

T107 (Trunk)

T107 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-50	REV		

T108 (Overall view)

T108 (Base)

T108 (Trunk)

T108 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-51	REV		

T109 (Overall view)

T109 (Base)

T109 (Trunk)

T109 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-52	REV	

ADI

T110 (Overall view)

T110 (Base)

T110 (Trunk)

T110 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO. SKAL12A-TS-53		REV	

ADI

29/03/2016

F

T111 (Overall view)

T111 (Base)

T111 (Trunk)

29/03/2016

F

T111 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-54	REV	

ADI

T112 (Overall view)

T112 (Base)

T112 (Trunk)

T112 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO. SKAL12A-TS-55			REV

ADI

T113 (Overall view)

T113 (Base)

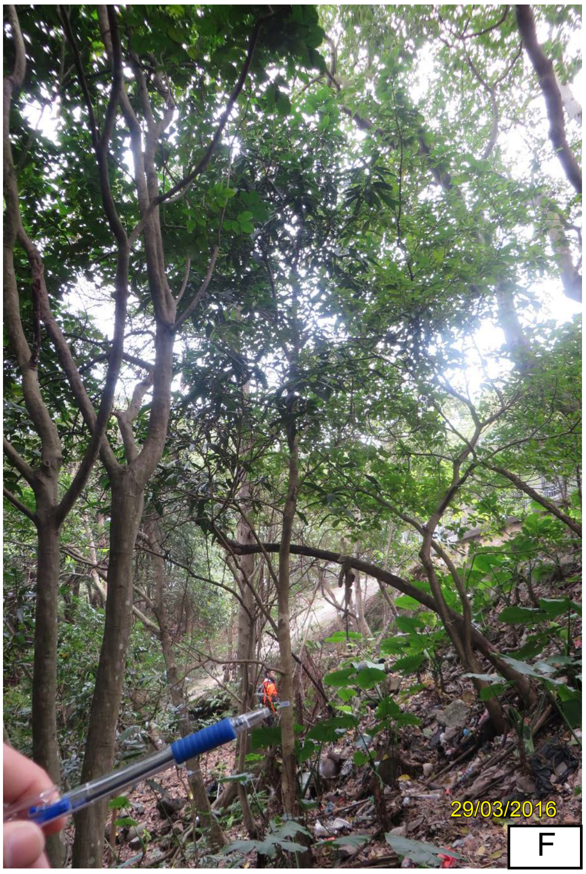
T113 (Trunk)

T113 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

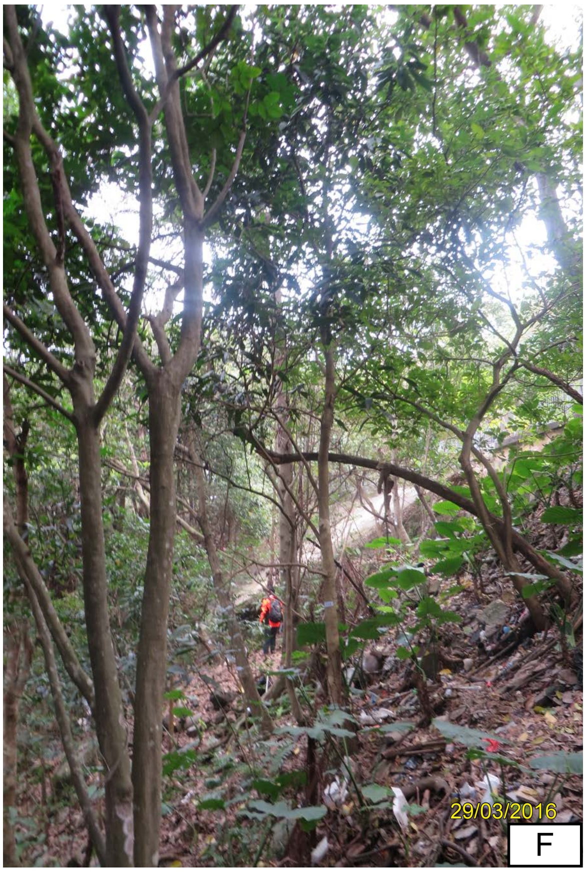
PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO. SKAL12A-TS-56		REV	

ADI



T114 (Overall view)

T114 (Base)



T114 (Trunk)

T114 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-57	REV	

ADI

T115 (Overall view)

T115 (Base)

T115 (Trunk)

T115 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-58	REV	

ADI

T116 (Overall view)

T116 (Base)

T116 (Trunk)

T116 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-59	REV	

ADI

T117 (Overall view)

T117 (Base)

T117 (Trunk)

T117 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-60	REV	

ADI

T118 (Overall view)

T118 (Base)

T118 (Trunk)

T118 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-61	REV	

ADI

T119 (Overall view)

T119 (Base)

T119 (Trunk)

29/03/2016

F

T119 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-62	REV	

ADI

T120 (Overall view)

29/03/2016

F

T120 (Base)

T120 (Trunk)

29/03/2016

F

T120 (Crown)

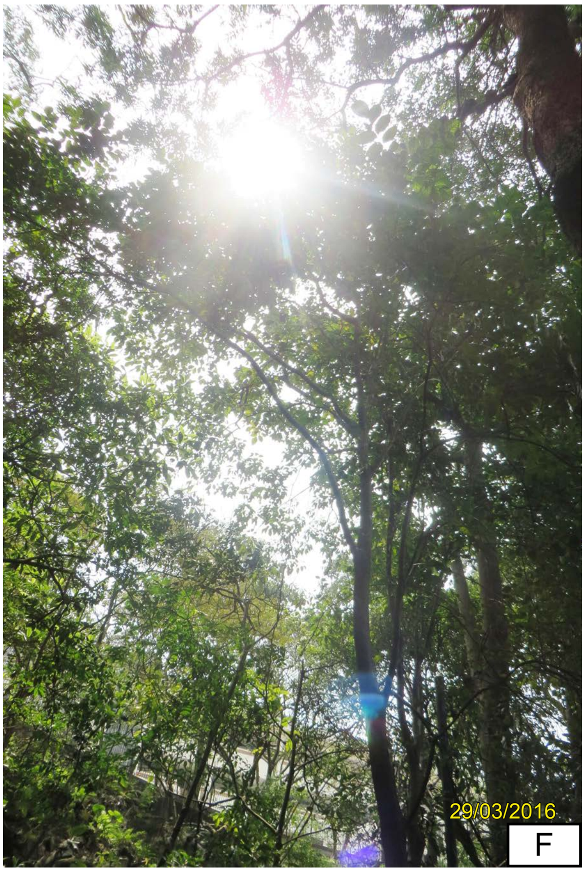
R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-63		REV	

T121 (Overall view)

T121 (Base)

T121 (Trunk)



T121 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-64	REV	

ADI

T122 (Overall view)

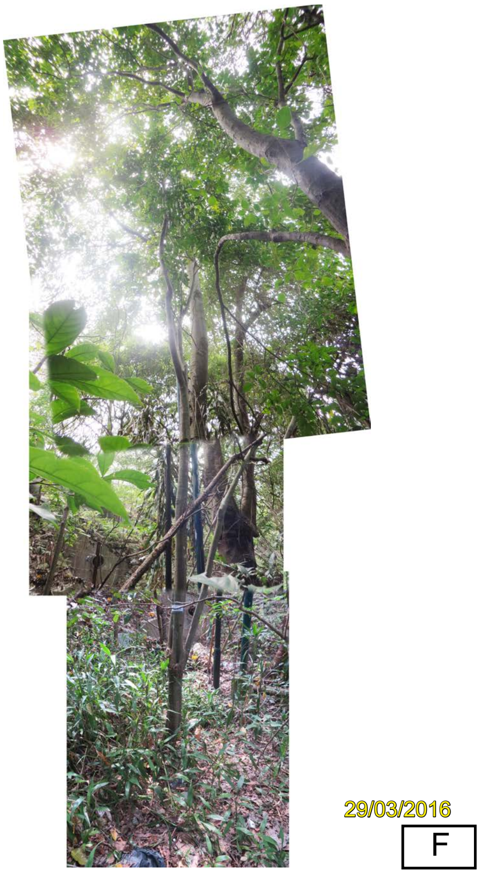
T122 (Base)

T122 (Trunk)

T122 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

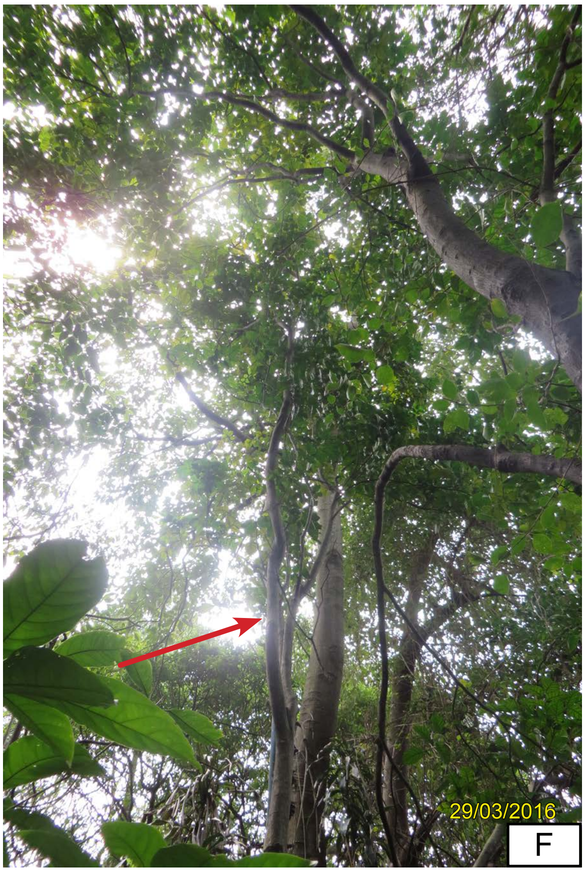
PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-65		REV	



T123 (Overall view)

T123 (Base)

T123 (Trunk)



T123 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO. SKAL12A-TS-66		REV	

ADI

T124 (Overall view)

T124 (Base)

T124 (Trunk)

T124 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-67		REV	

T125 (Overall view)

T125 (Base)

T125 (Trunk)

T125 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-68		REV	

T126 (Overall view)

T126 (Base)

T126 (Trunk)

T126 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO. SKAL12A-TS-69		REV	

ADI

T127 (Overall view)

T127 (Base)

T127 (Trunk)

T127 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO. SKAL12A-TS-70		REV	

ADI

T128 (Overall view)

T128 (Base)

T128 (Trunk)

T128 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-71	REV	

ADI

T129 (Overall view)

T129 (Base)

T129 (Trunk)

29/03/2016

F

T129 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-72	REV	

ADI

T130 (Overall view)

T130 (Base)

T130 (Trunk)

T130 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-73	REV	

ADI

T131 (Overall view)

T131 (Base)

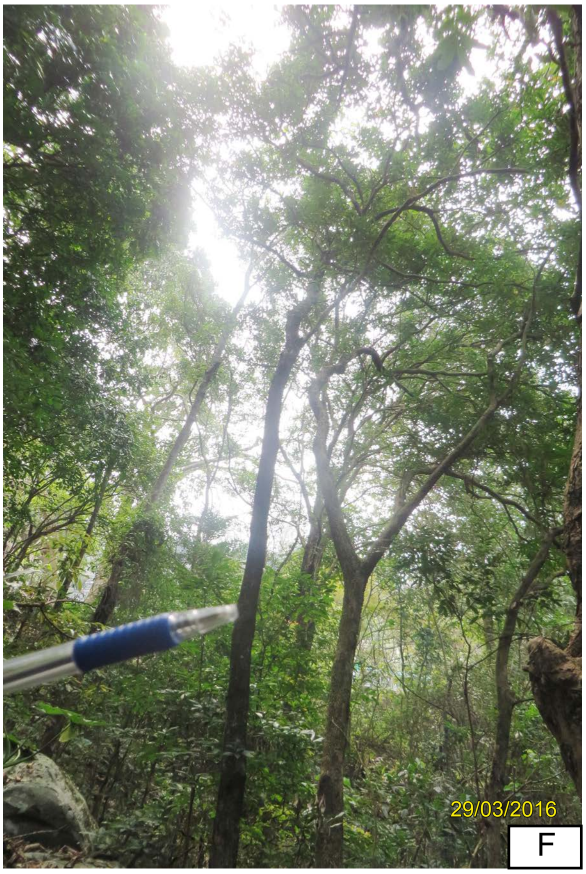
T131 (Trunk)

T131 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-74	REV	

ADI



T132 (Overall view)

T132 (Base)

T132 (Trunk)

T132 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

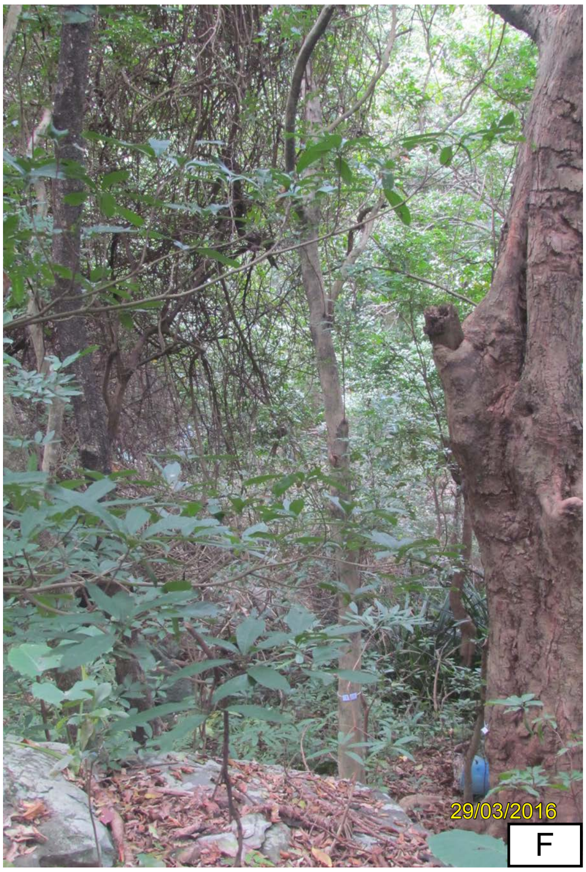
PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-75	REV	

ADI

T133 (Overall view)


29/03/2016
F

T133 (Base)



T133 (Trunk)


29/03/2016
F

T133 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-76		REV	

T134 (Overall view)

T134 (Base)

T134 (Trunk)

29/03/2016
F

T134 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-77		REV	

T135 (Overall view)

T135 (Base)

T135 (Trunk)

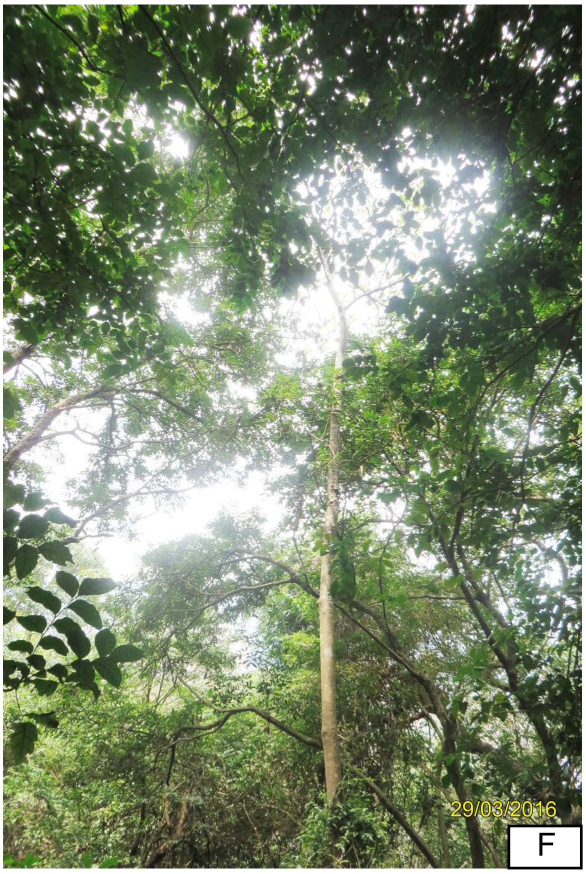
29/03/2016

F

T135 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-78		REV	



T136 (Overall view)

T136 (Base)

T136 (Trunk)

T136 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-79	REV	

ADI

T137 (Overall view)

T137 (Base)

T137 (Trunk)

T137 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-80	REV	

ADI

T138 (Overall view)

T138 (Base)

T138 (Trunk)

T138 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-81	REV	

ADI

T139 (Overall view)

T139 (Base)

T139 (Trunk)

T139 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-82	REV	

ADI

T140 (Overall view)

T140 (Base)

T140 (Trunk)

T140 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-83	REV	

ADI

T141 (Overall view)

T141 (Base)

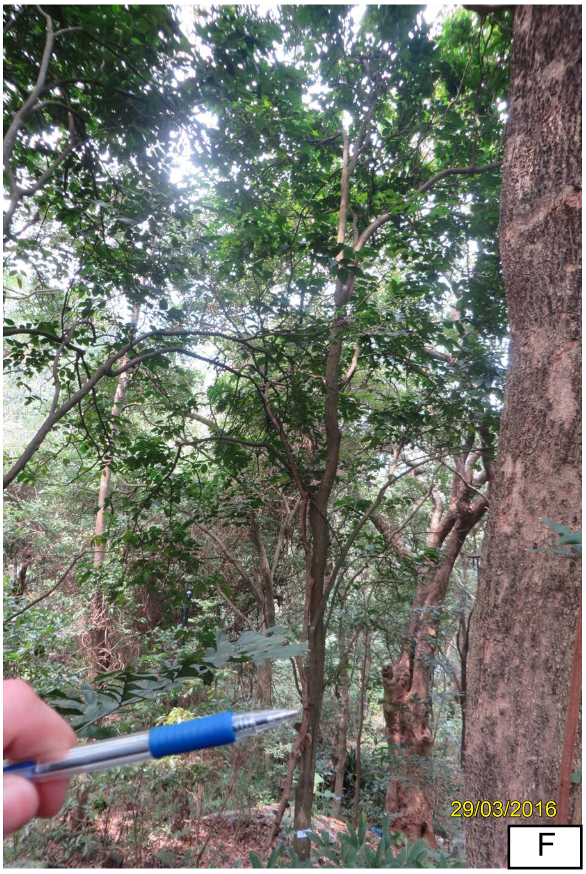
T141 (Trunk)

T141 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-84	REV	

ADI



T142 (Overall view)

T142 (Base)

T142 (Trunk)

T142 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-85		REV	

T143 (Overall view)

T143 (Base)

T143 (Trunk)

29/03/2016
F

T143 (Crown)

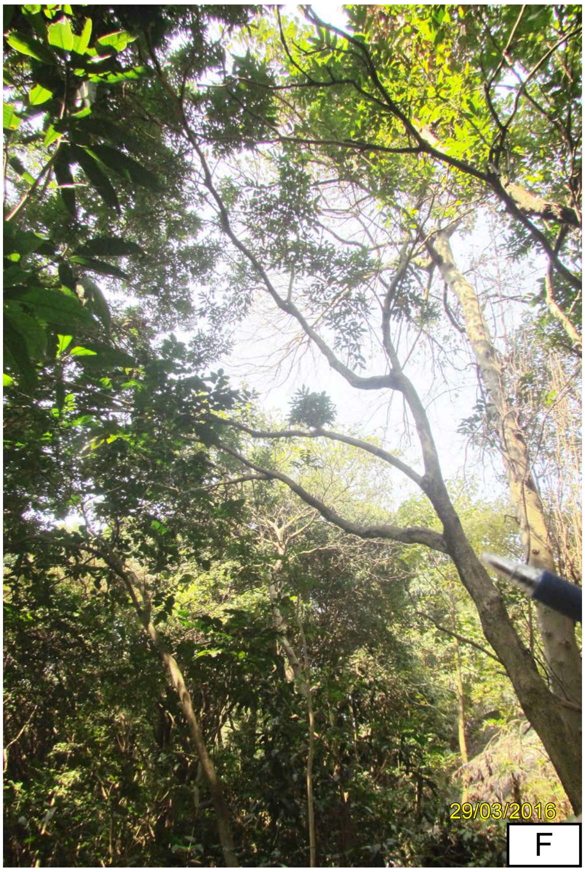
R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO. SKAL12A-TS-86			REV	

T144 (Overall view)

T144 (Base)

T144 (Trunk)



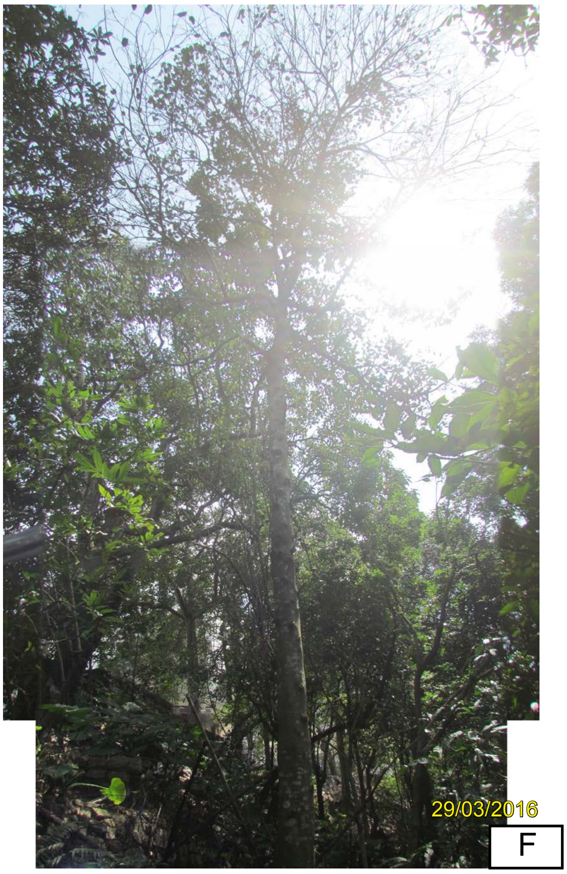
T144 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-87	REV	

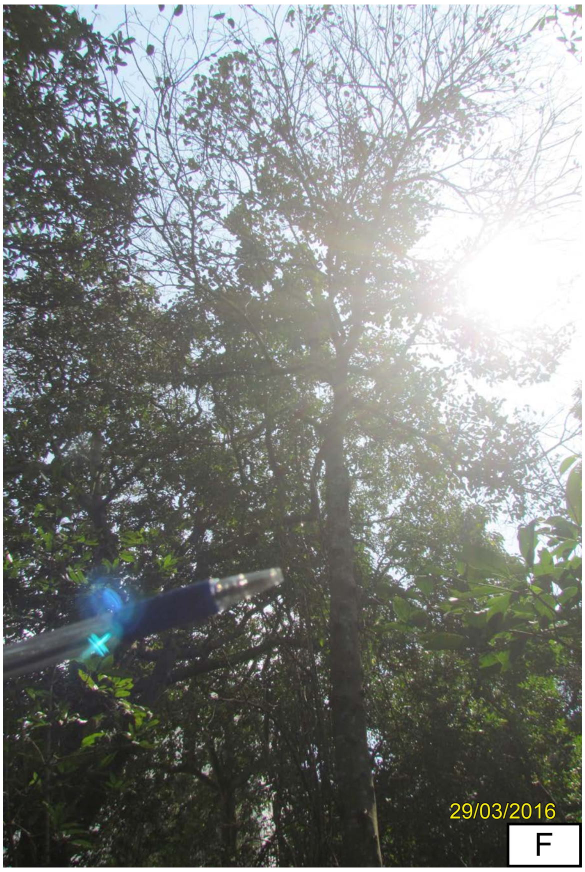
ADI



T145 (Overall view)

T145 (Base)

T145 (Trunk)



T145 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-88	REV	

ADI

T146 (Overall view)

T146 (Base)

T146 (Trunk)

T146 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-89		REV	

T147 (Overall view)

T147 (Base)

T147 (Trunk)

T147 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-90	REV	

ADI

29/03/2016

F

T148 (Overall view)

29/03/2016

F

T148 (Base)

29/03/2016

F

T148 (Trunk)

29/03/2016

F

T148 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-91	REV	

ADI

T149 (Overall view)

T149 (Base)

T149 (Trunk)

T149 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-92		REV	

T150 (Overall view)

T150 (Base)

T150 (Trunk)

T150 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-93	REV	

ADI

T151 (Overall view)

T151 (Base)

T151 (Trunk)

T151 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-94		REV	

T152 (Overall view)

T152 (Base)

T152 (Trunk)

T152 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-95	REV	

ADI

T153 (Overall view)

T153 (Base)

T153 (Trunk)

29/03/2016
F

T153 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-96		REV	

T154 (Overall view)

T154 (Base)

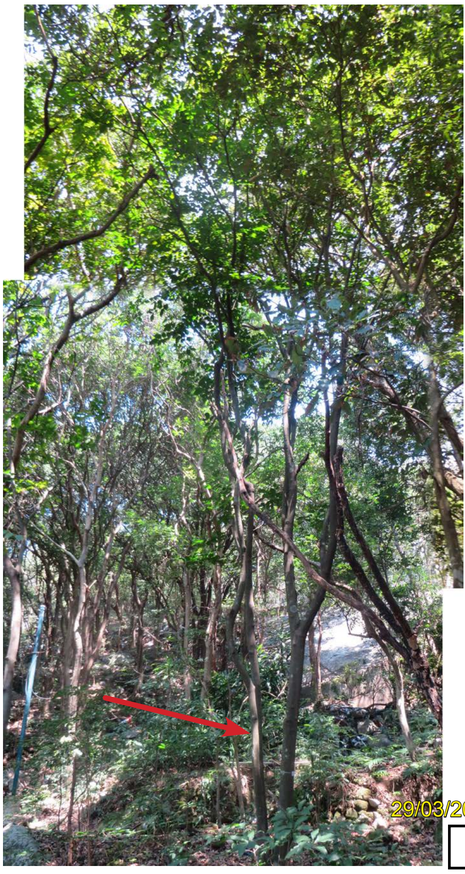
T154 (Trunk)

T154 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-97	REV	

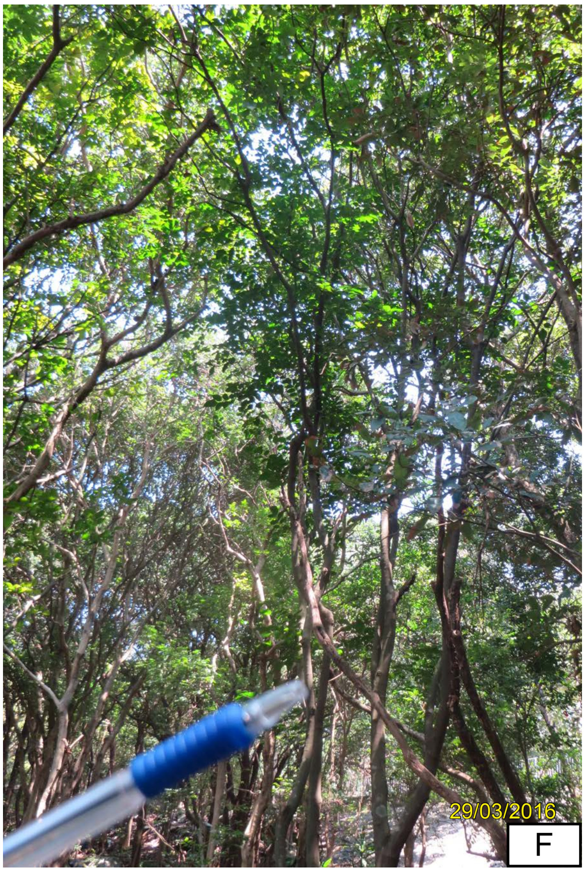
ADI



T155 (Overall view)

T155 (Base)

T155 (Trunk)



T155 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-98	REV	

ADI

T156 (Overall view)

T156 (Base)

T156 (Trunk)

T156 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-99	REV	

ADI

T157 (Overall view)

T157 (Base)

T157 (Trunk)

T157 (Crown)

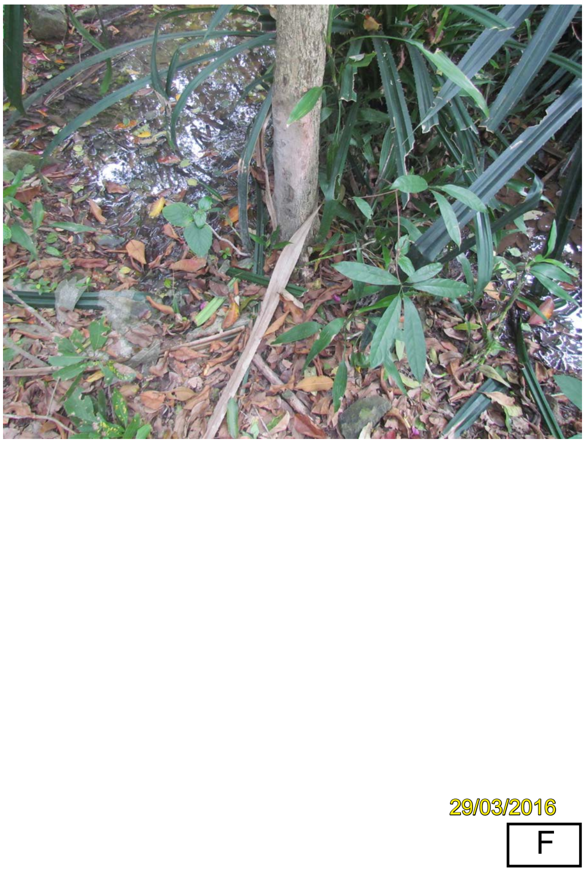
R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-100	REV	

ADI

T158 (Overall view)



T158 (Base)

T158 (Trunk)

T158 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-101	REV	

ADI

T159 (Overall view)

T159 (Base)

T159 (Trunk)

T159 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-102	REV	

ADI

29/03/2016

F

T160 (Overall view)

T160 (Base)

T160 (Trunk)

29/03/2016

F

T160 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-103	REV	

ADI

29/03/2016

F

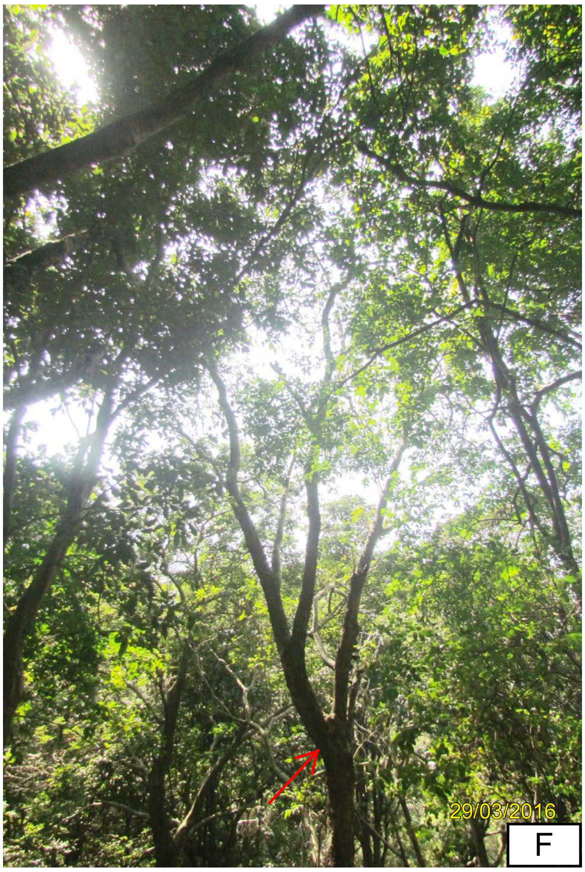
T161 (Overall view)

F

T161 (Base)

F

T161 (Trunk)



F

T161 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-104		REV	

T162 (Overall view)

T162 (Base)

T162 (Trunk)

T162 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-105	REV	

ADI

T163 (Overall view)

T163 (Base)

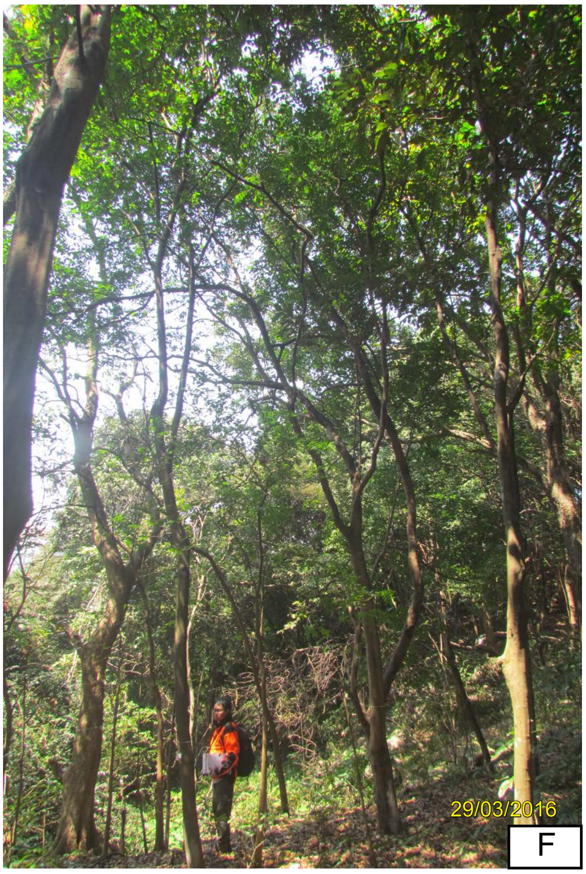
T163 (Trunk)

T163 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-106	REV	

ADI



T164 (Overall view)

T164 (Base)

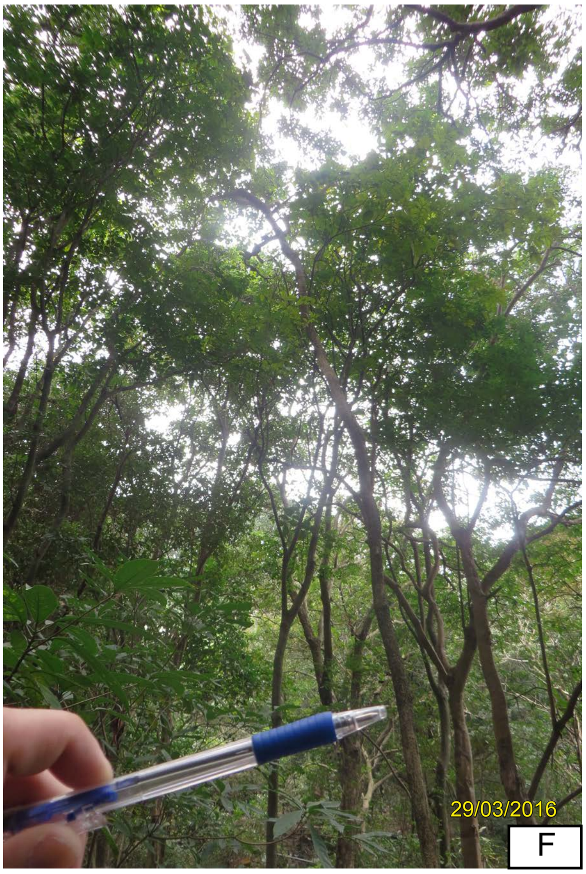
T164 (Trunk)

T164 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-107	REV	

ADI



T165 (Overall view)

T165 (Base)

T165 (Trunk)

T165 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-108	REV	

ADI

T166 (Overall view)

T166 (Base)

T166 (Trunk)

T166 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-109	REV	

ADI

T167 (Overall view)

T167 (Base)

T167 (Trunk)

T167 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-110	REV	

ADI

T168 (Overall view)

T168 (Base)

T168 (Trunk)

T168 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-111	REV	

ADI

T169 (Overall view)

T169 (Base)

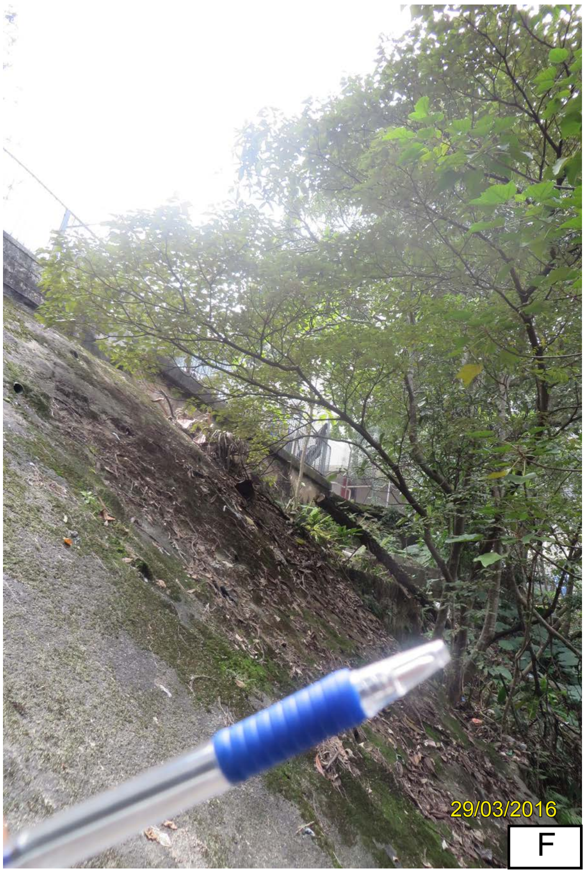
T169 (Trunk)

T169 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-112	REV	

ADI



T170 (Overall view)

T170 (Base)

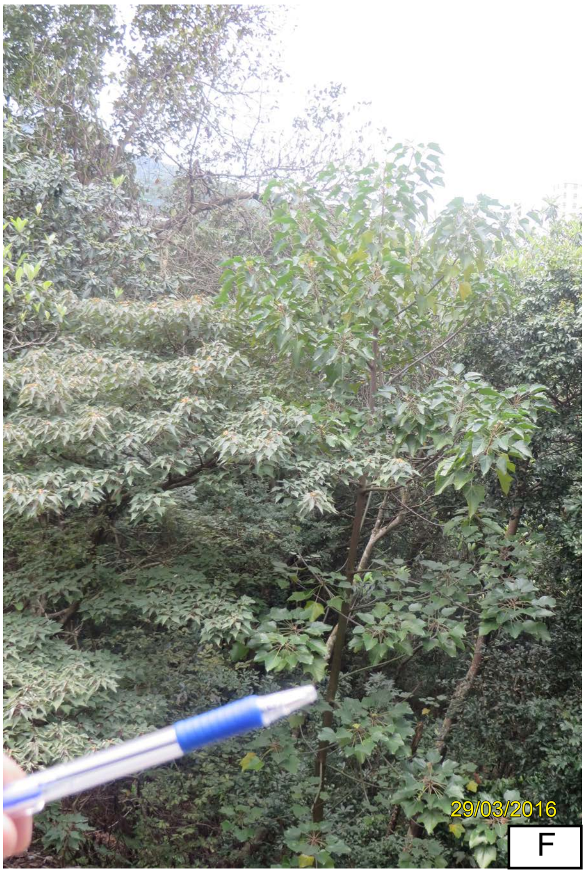
T170 (Trunk)

T170 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-113	REV	

ADI



T171 (Overall view)

T171 (Base)

T171 (Trunk)

T171 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-114	REV	

ADI

T172 (Overall view)

T172 (Base)

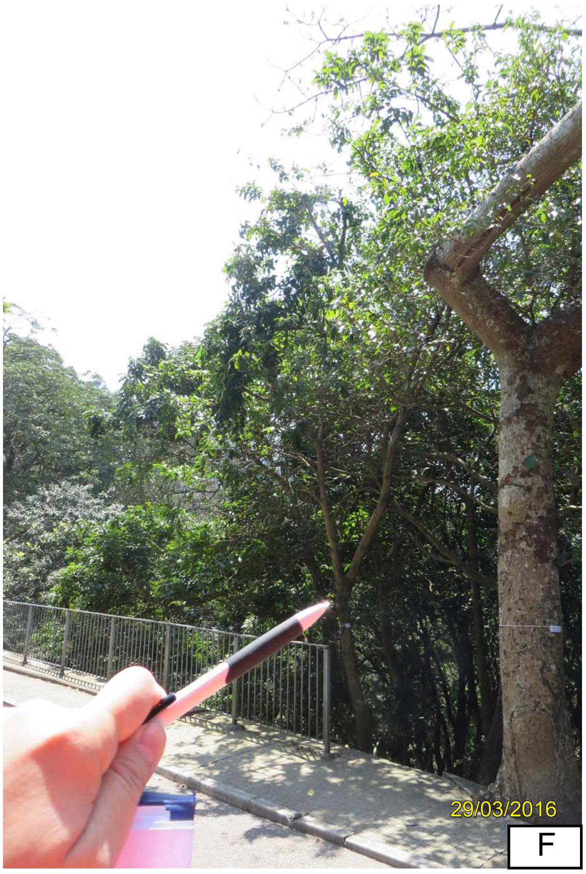
T172 (Trunk)

T172 (Trunk)

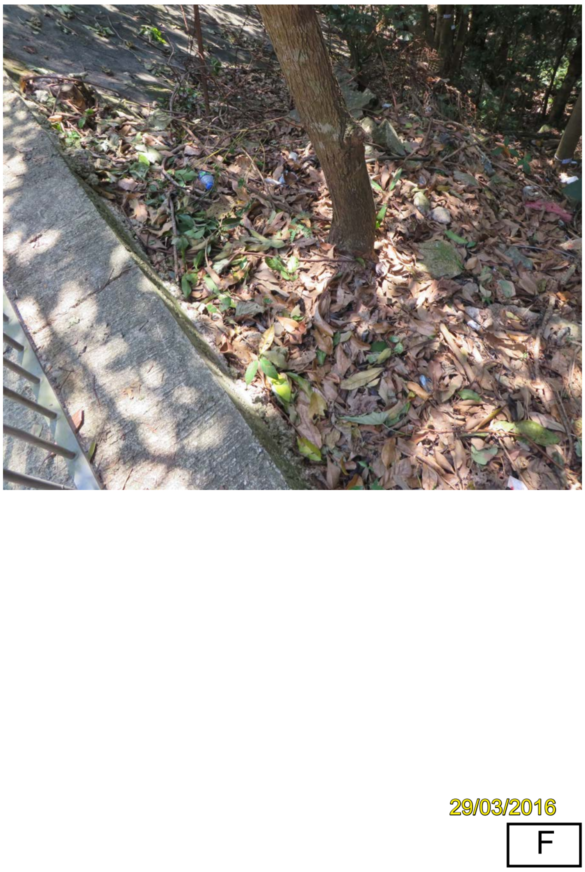
T172 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-115		REV	



T173 (Overall view)



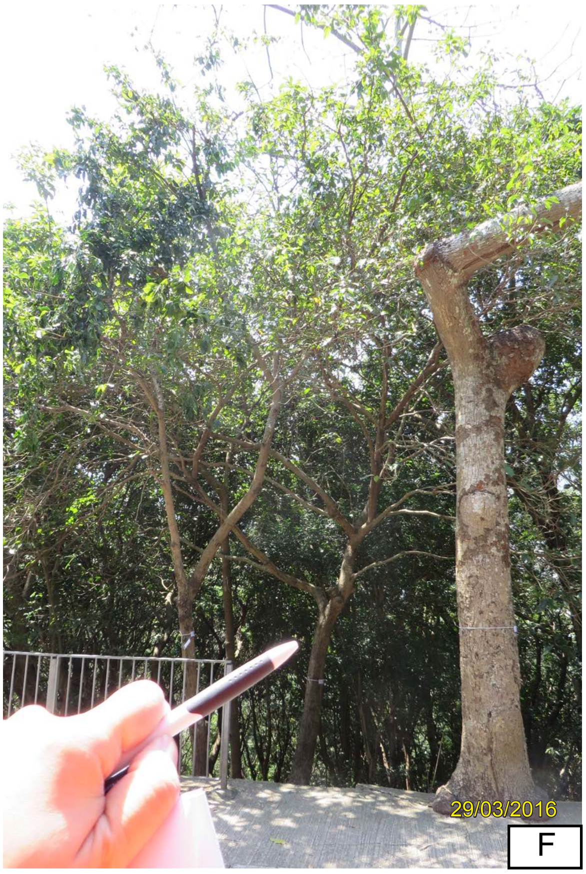
T173 (Base)

T173 (Trunk)

T173 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016		ADI
	CHECKED	ALL	DRAWN	HEH		
	FIGURE NO.	SKAL12A-TS-116			REV	



T174 (Overall view)

T174 (Base)

T174 (Trunk)

T174 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-117	REV	

ADI

T175 (Overall view)

T175 (Base)

T175 (Trunk)

T175 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-118		REV	

T176 (Overall view)

T176 (Base)

T176 (Trunk)

T176 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-119		REV	

T177 (Overall view)

29/03/2016
F

T177 (Base)

T177 (Trunk)

T177 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-120	REV	

ADI

T178 (Overall view)

T178 (Base)

T178 (Trunk)

T178 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-121	REV	

ADI

T181 (Overall view)


29/03/2016

F

T181 (Base)

T181 (Trunk)


29/03/2016

F

T181 (Crown)

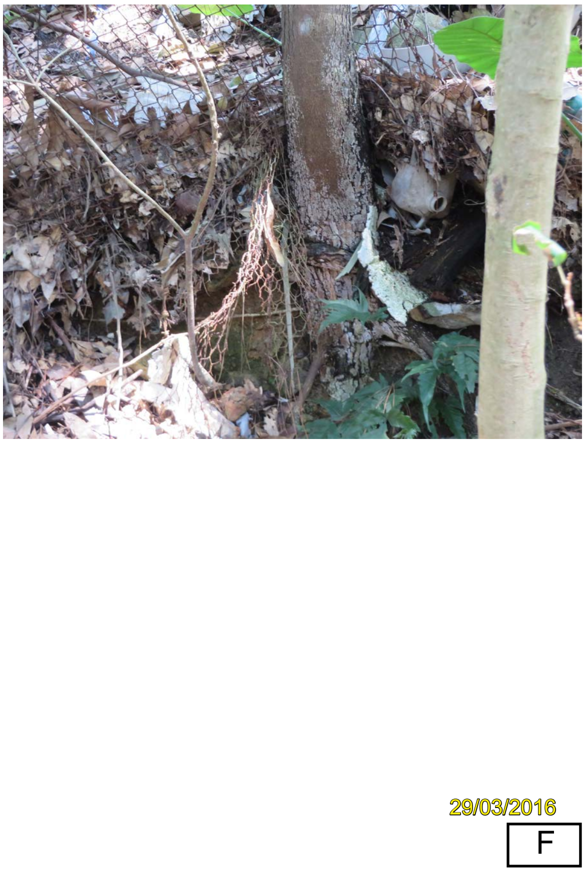
R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-122	REV	

ADI

T182 (Overall view)



T182 (Base)

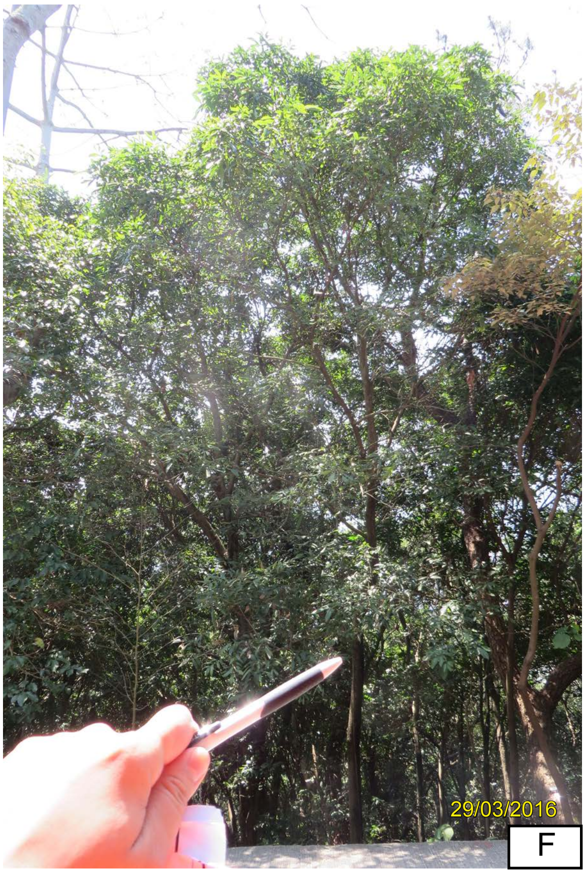
T182 (Trunk)

T182 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-123	REV	

ADI



T183 (Overall view)

T183 (Base)

T183 (Trunk)

29/03/2016

F

T183 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO. SKAL12A-TS-124		REV	

ADI

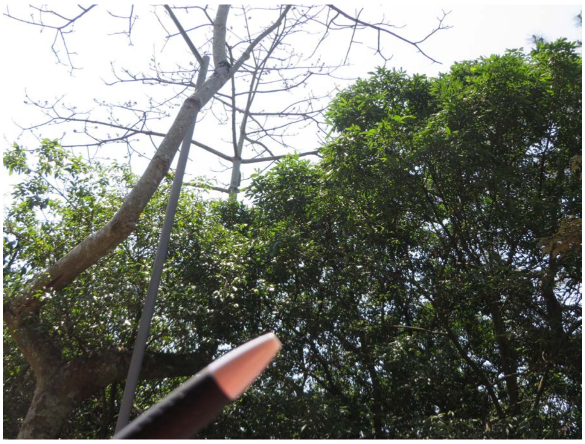
T184 (Overall view)

29/03/2016

F

T184 (Base)

T184 (Trunk)



29/03/2016

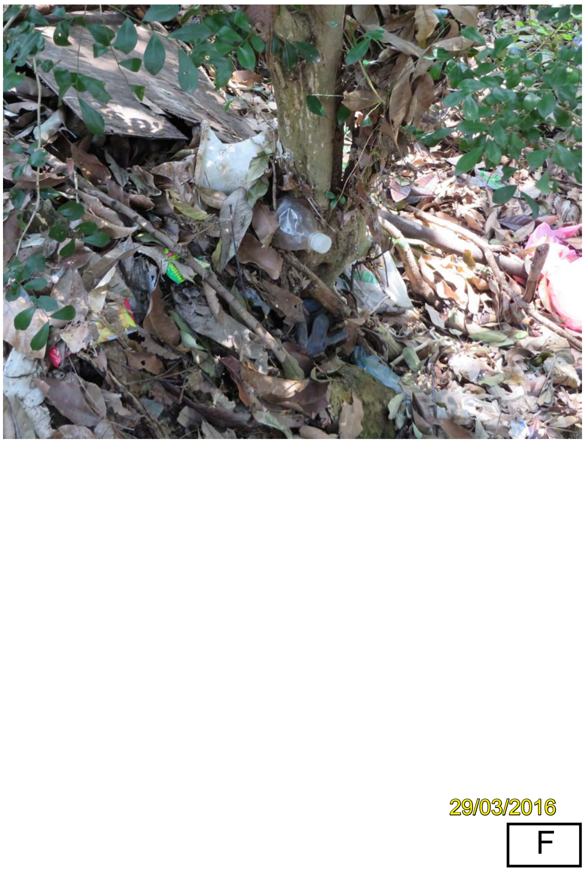
F

T184 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-125	REV		

T185 (Overall view)



T185 (Base)

T185 (Trunk)

T185 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-126	REV	

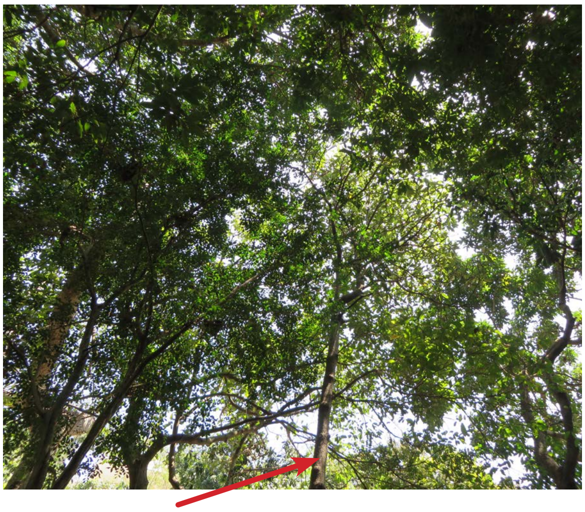
ADI

T186 (Overall view)


29/03/2016
F

T186 (Base)

T186 (Trunk)


29/03/2016
F

T186 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-127		REV	

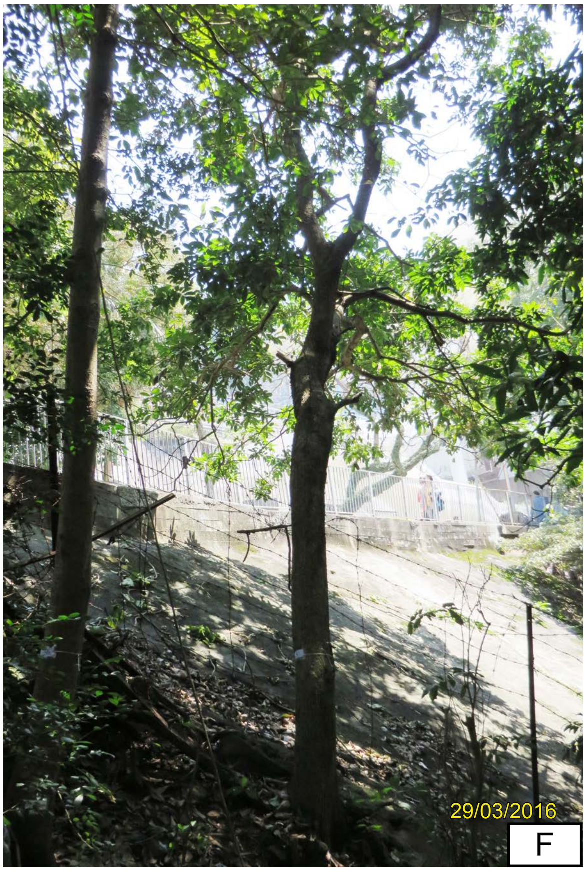
F

T187 (Overall view)

29/03/2016

F

T187 (Base)



F

T187 (Trunk)

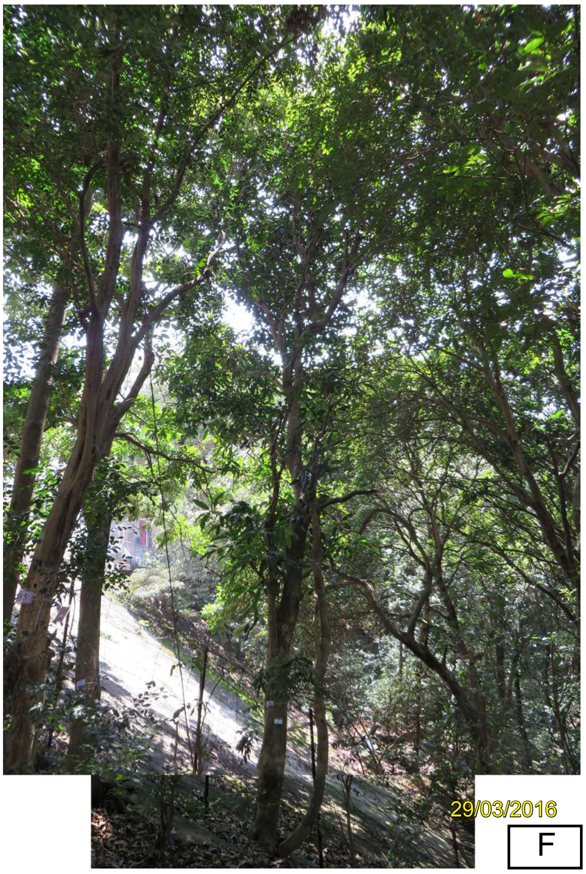
29/03/2016

F

T187 (Crown)

R-Retain   T-Transplant   F-Fell   D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-128		REV	



29/03/2016

F

T188 (Overall view)

29/03/2016

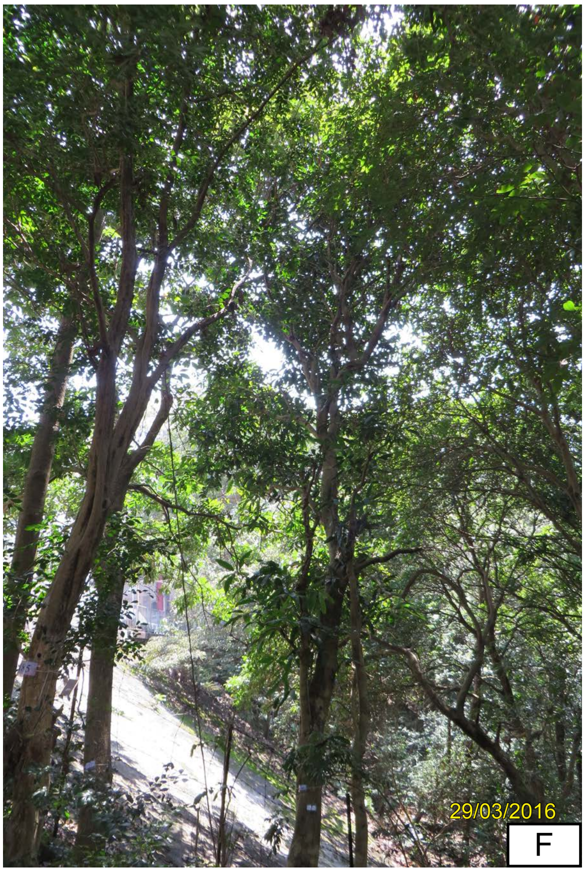
F

T188 (Base)

29/03/2016

F

T188 (Trunk)



29/03/2016

F

T188 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-129	REV	

ADI

F

T189 (Overall view)

29/03/2016

F

T189 (Base)

F

T189 (Trunk)

29/03/2016

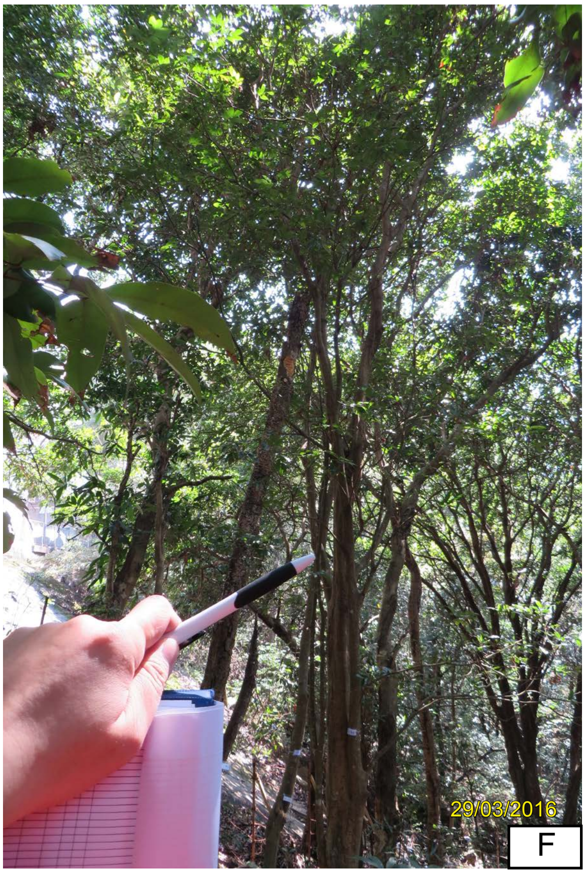
F

T189 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-130	REV	

ADI



F

T190 (Overall view)

29/03/2016

F

T190 (Base)

F

T190 (Trunk)

29/03/2016

F

T190 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

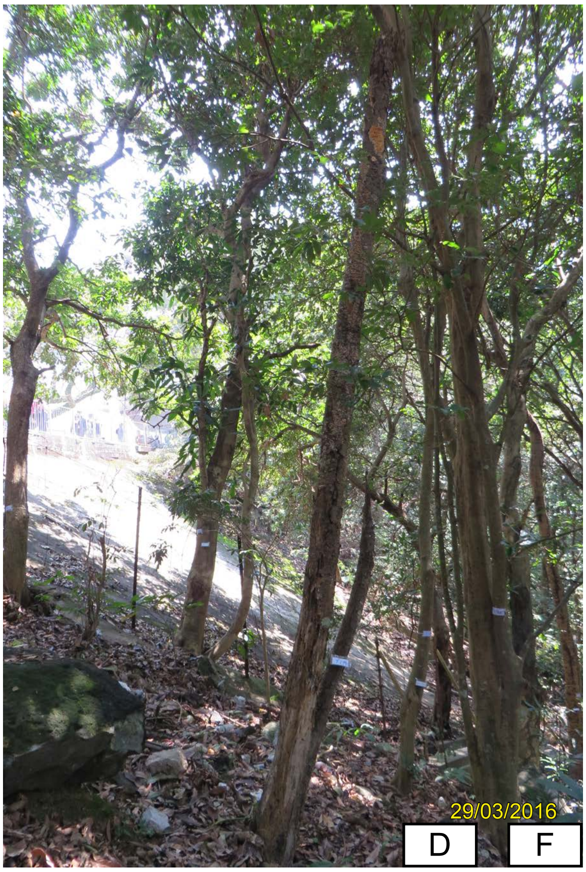
PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-131	REV	

ADI

T190A (Overall view)

T190A (Base)



T190A (Trunk)

29/03/2016

D F

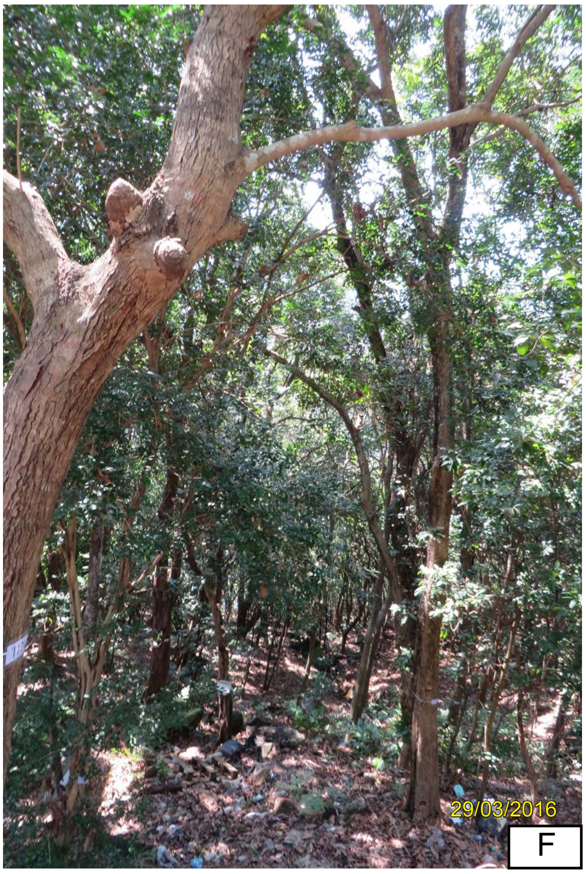
T190A (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-132	REV	

ADI



T191 (Overall view)

29/03/2016

F

T191 (Base)

T191 (Trunk)

T191 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-133	REV	

ADI

T192 (Overall view)

T192 (Base)

T192 (Trunk)

T192 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

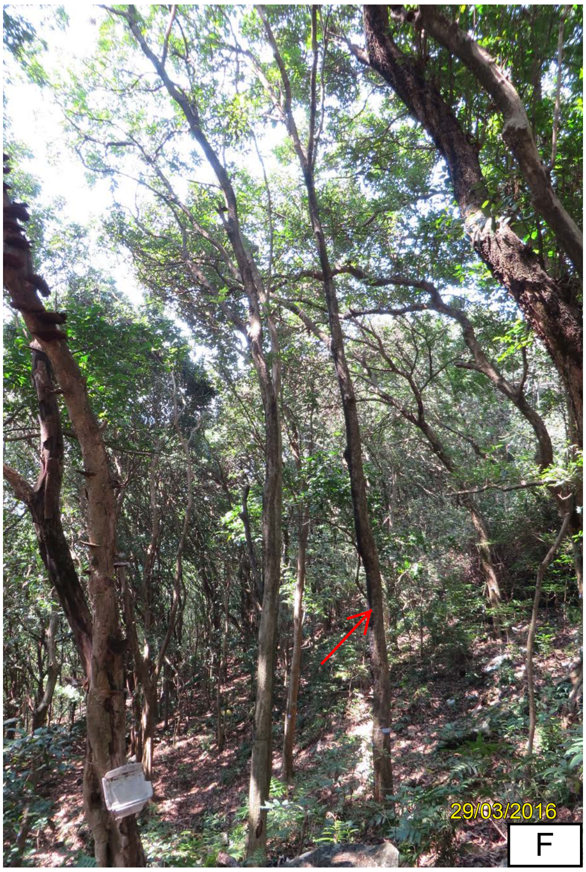
PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-134	REV	

ADI

T193 (Overall view)

29/03/2016
F

T193 (Base)



T193 (Trunk)

29/03/2016
F

T193 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

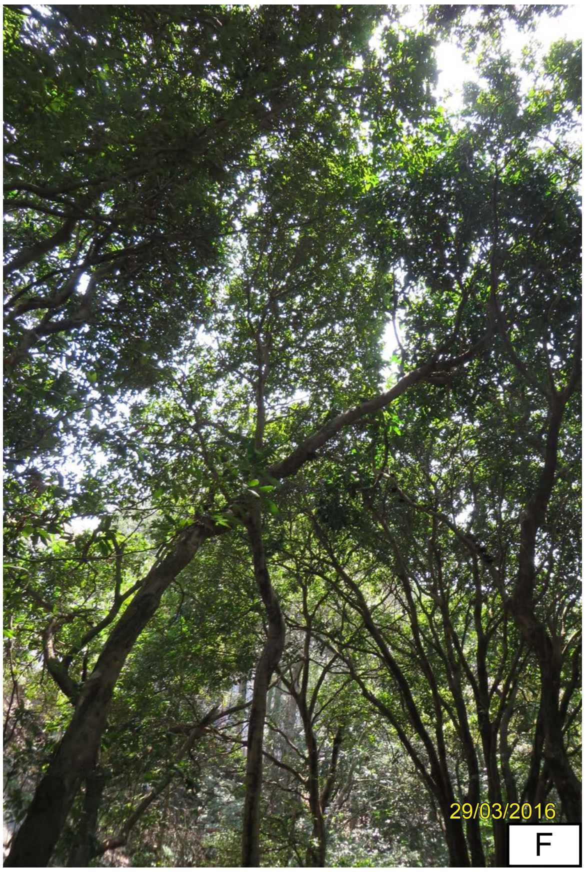
SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-135	REV	

ADI

T194 (Overall view)

T194 (Base)

T194 (Trunk)

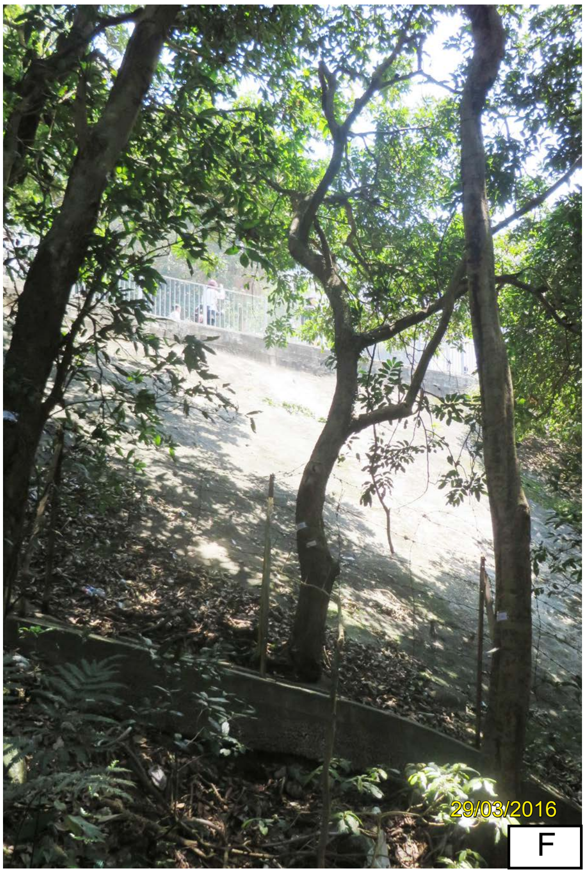


T194 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

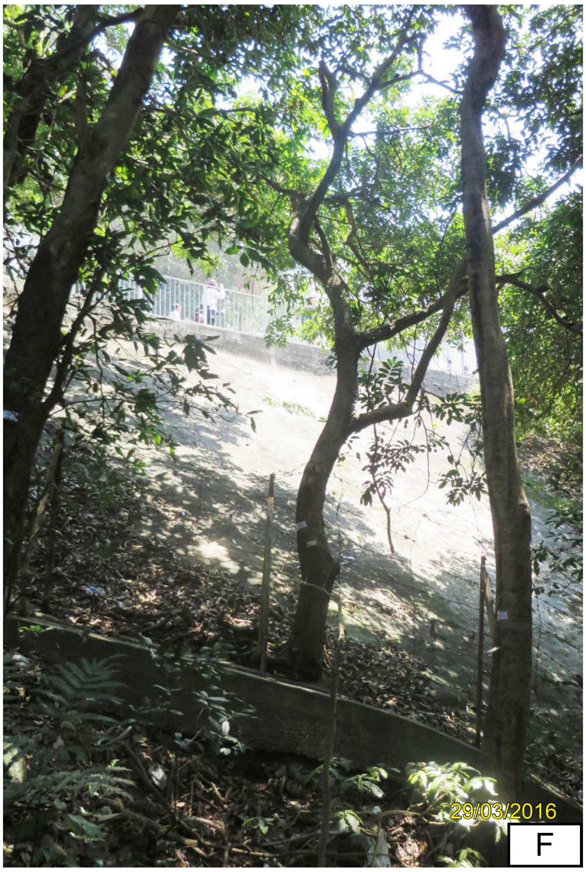
PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-136	REV	

ADI



T195 (Overall view)

T195 (Base)



T195 (Trunk)

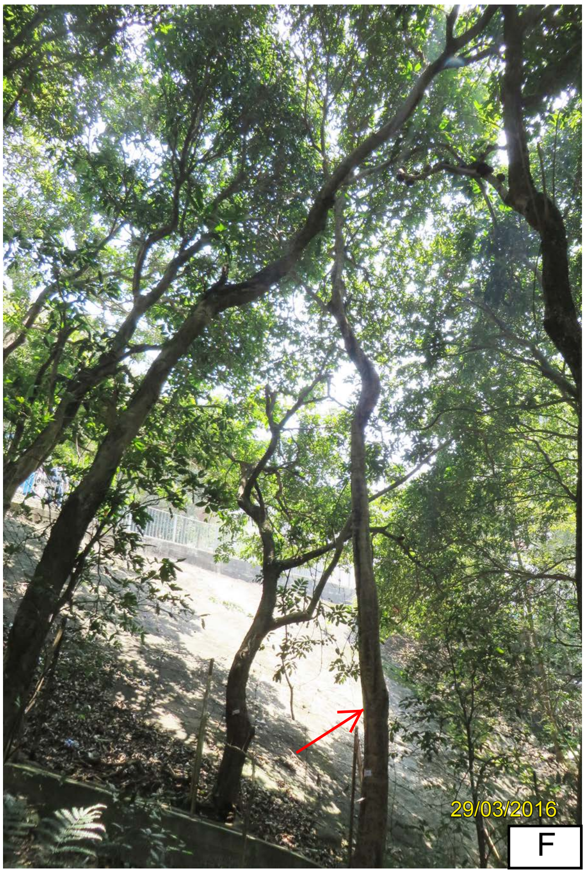
T195 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

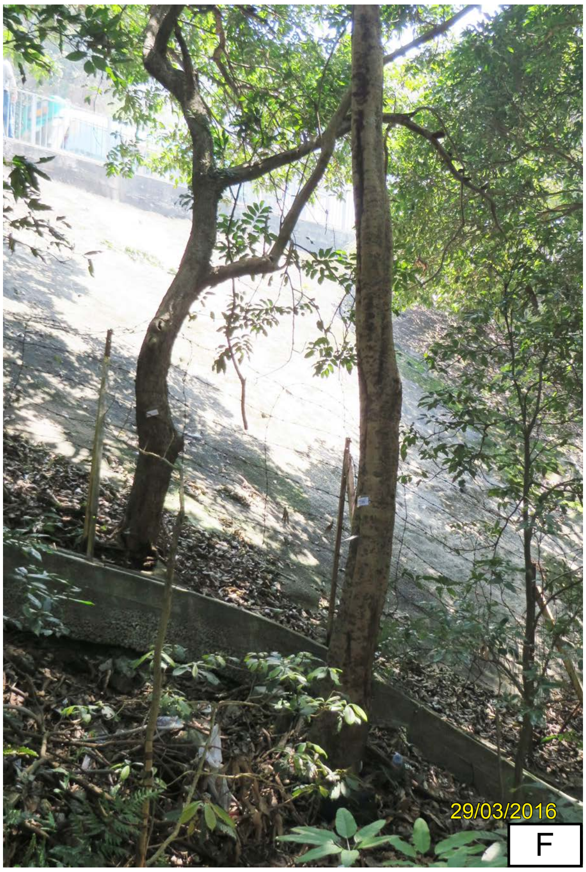
SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-137	REV	

ADI

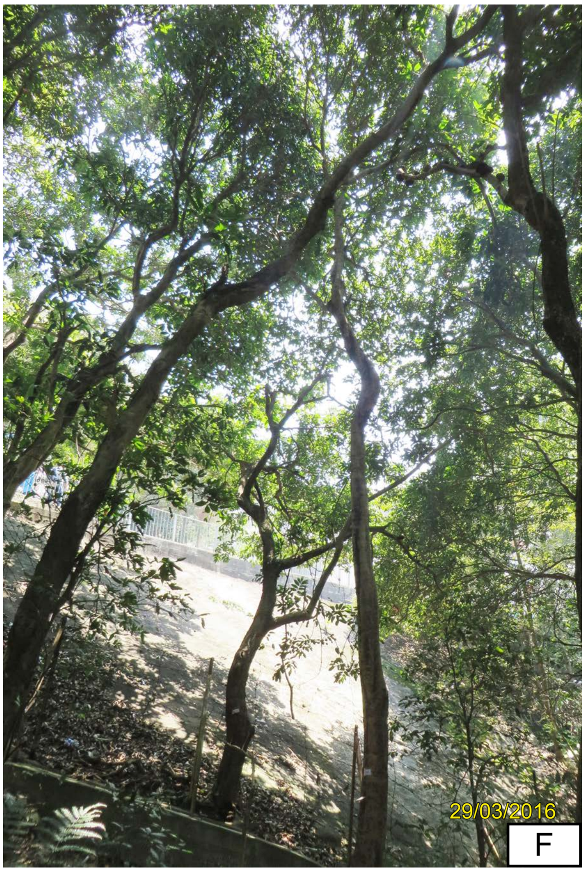


T196 (Overall view)

T196 (Base)



T196 (Trunk)



T196 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-138	REV	

ADI

T197 (Overall view)

T197 (Base)

T197 (Trunk)

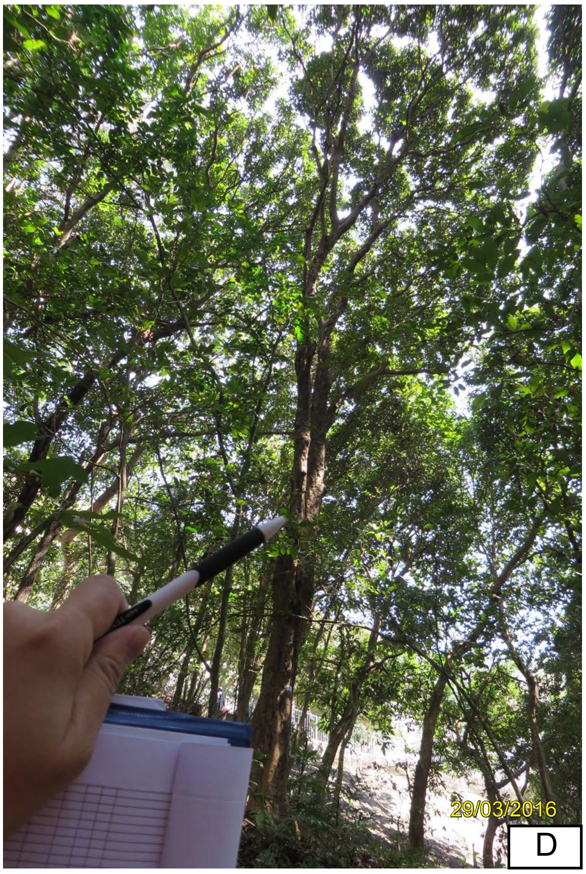
T197 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-139	REV	

ADI



D

T198 (Overall view)

29/03/2016

D

T198 (Base)

D

T198 (Trunk)

29/03/2016

D

T198 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO. SKAL12A-TS-140		REV	

ADI

T198A (Overall view)

T198A (Base)

T198A (Trunk)

29/03/2016

D F

T198A (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-141	REV	

ADI

T199 (Overall view)

T199 (Base)

T199 (Trunk)

T199 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-142		REV	

T200 (Overall view)

T200 (Base)

T200 (Trunk)

T200 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-143		REV	

T201 (Overall view)

T201 (Base)

T201 (Trunk)

T201 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-144	REV	

ADI

T202 (Overall view)

T202 (Base)

T202 (Trunk)

T202 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-145	REV	

ADI

T203 (Overall view)

T203 (Base)

T203 (Trunk)

T203 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-146	REV	

ADI

T204 (Overall view)

T204 (Base)

T204 (Trunk)

T204 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-147	REV	

ADI

T205 (Overall view)

T205 (Base)

T205 (Trunk)

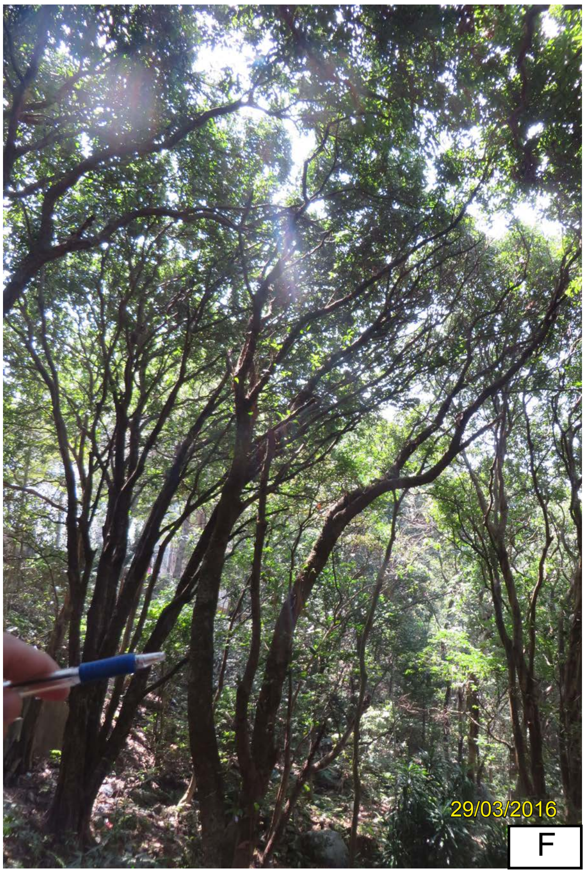
T205 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-148	REV	

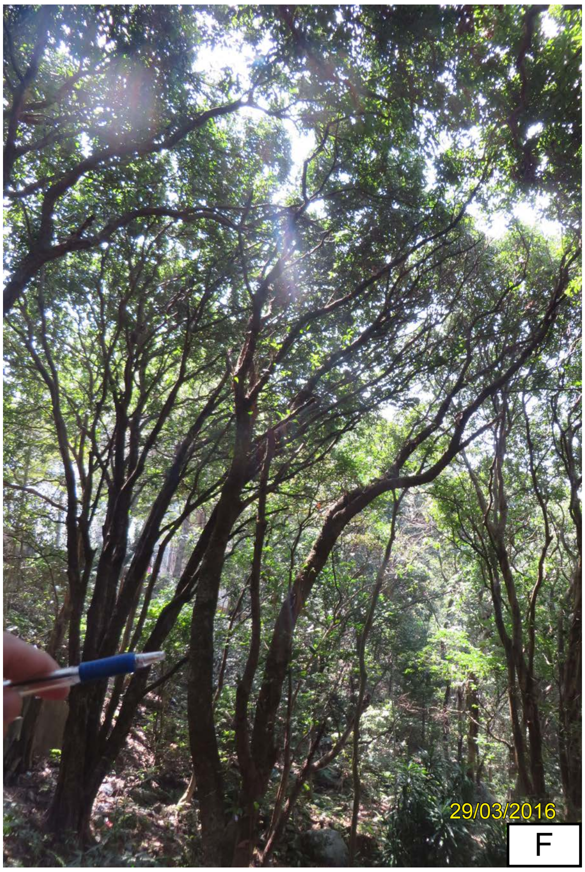
ADI



T206 (Overall view)

T206 (Base)

T206 (Trunk)



T206 (Crown)

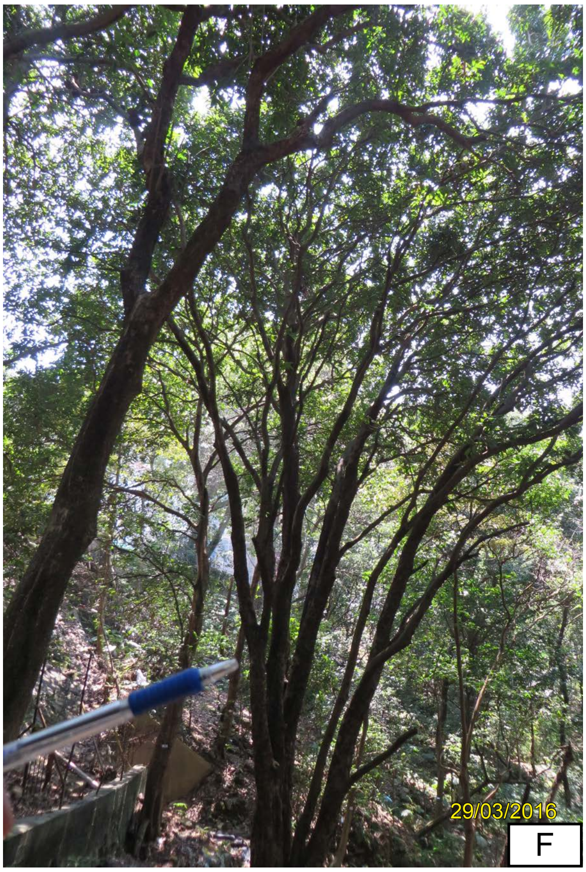
R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-149	REV	

ADI

T207 (Overall view)

T207 (Base)



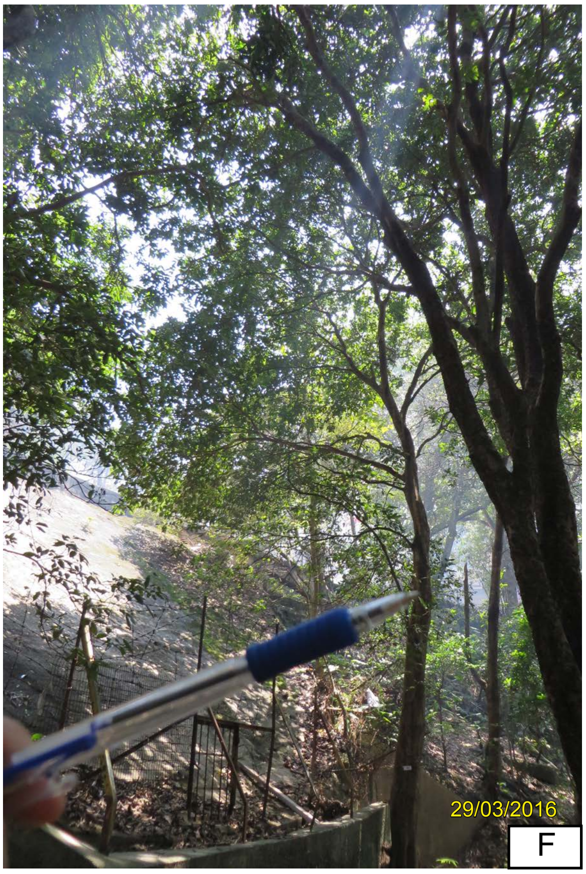
T207 (Trunk)

T207 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-150	REV	

ADI



T208 (Overall view)

T208 (Base)

T208 (Trunk)

T208 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-151	REV	

ADI

29/03/2016

F

T209 (Overall view)

T209 (Base)

T209 (Trunk)

T209 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-152	REV	

ADI

T210 (Overall view)

T210 (Base)

T210 (Trunk)

T210 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-153	REV	

ADI

T210A (Overall view)


29/03/2016
D F

T210A (Base)

T210A (Trunk)


29/03/2016
D F

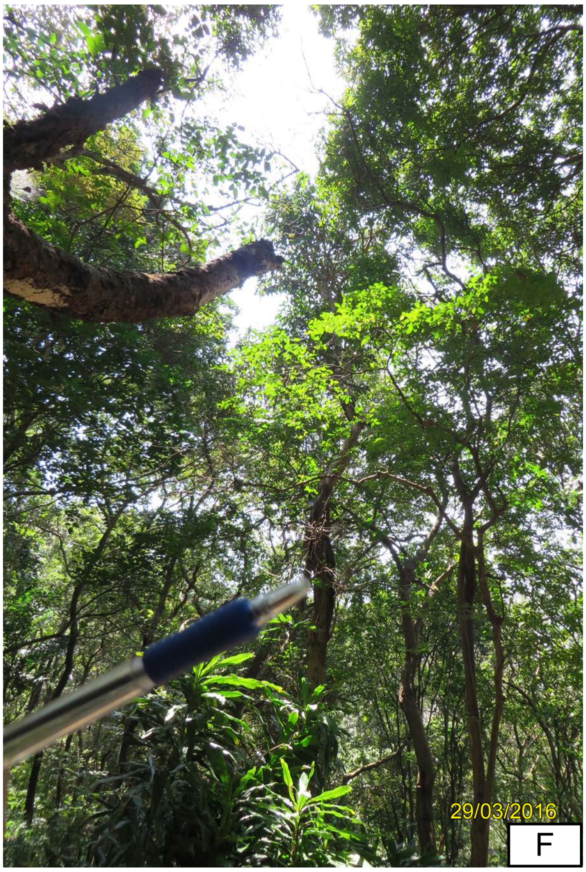
T210A (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO. SKAL12A-TS-154		REV		

T211 (Overall view)

T211 (Base)

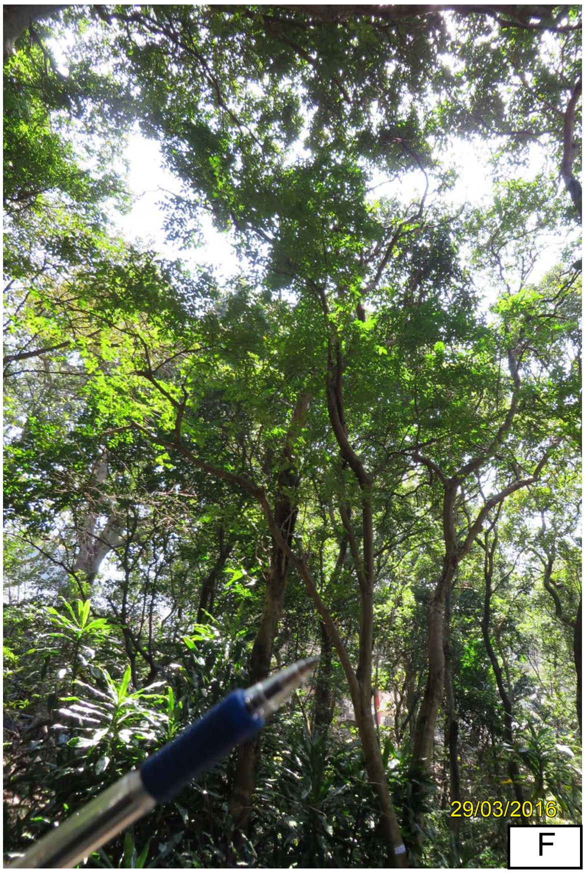


T211 (Trunk)

T211 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

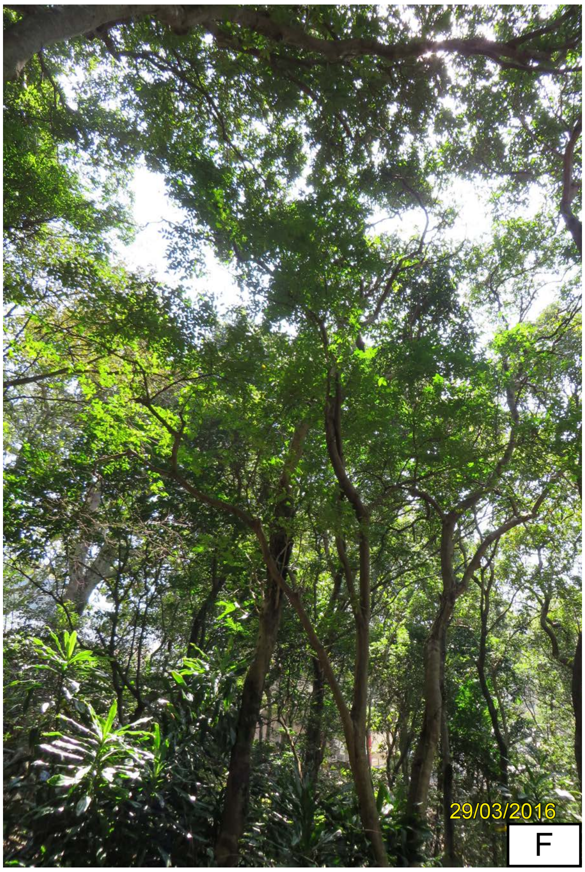
PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-155		REV	



T212 (Overall view)

T212 (Base)

T212 (Trunk)

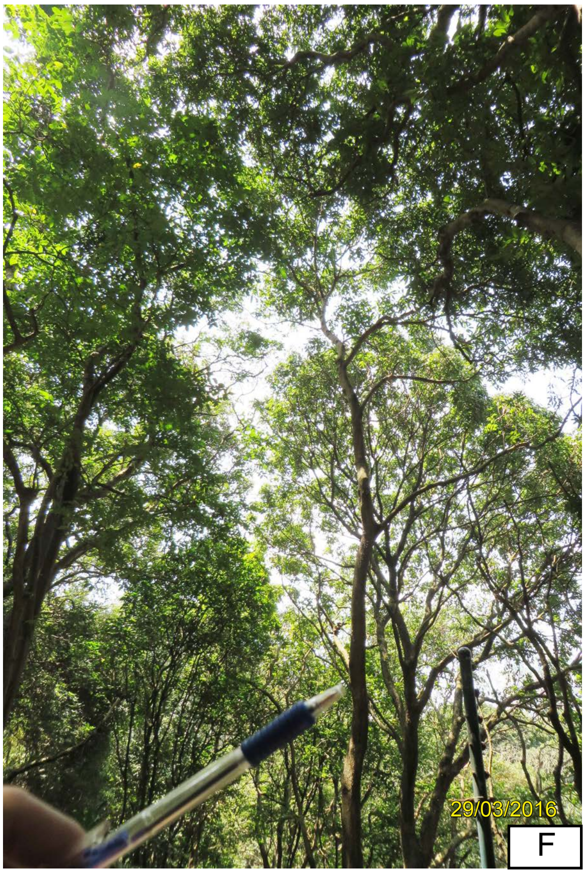


T212 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-156	REV	

ADI



T213 (Overall view)

T213 (Base)

T213 (Trunk)

T213 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO. SKAL12A-TS-157			REV	

T214 (Overall view)

T214 (Base)

T214 (Trunk)

T214 (Crown)

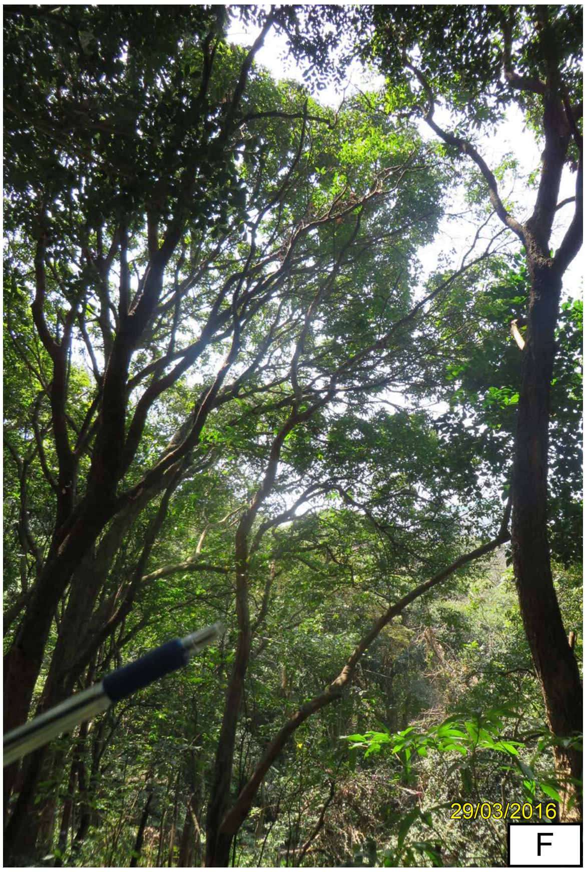
R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-158	REV	

ADI

T215 (Overall view)

T215 (Base)



T215 (Trunk)

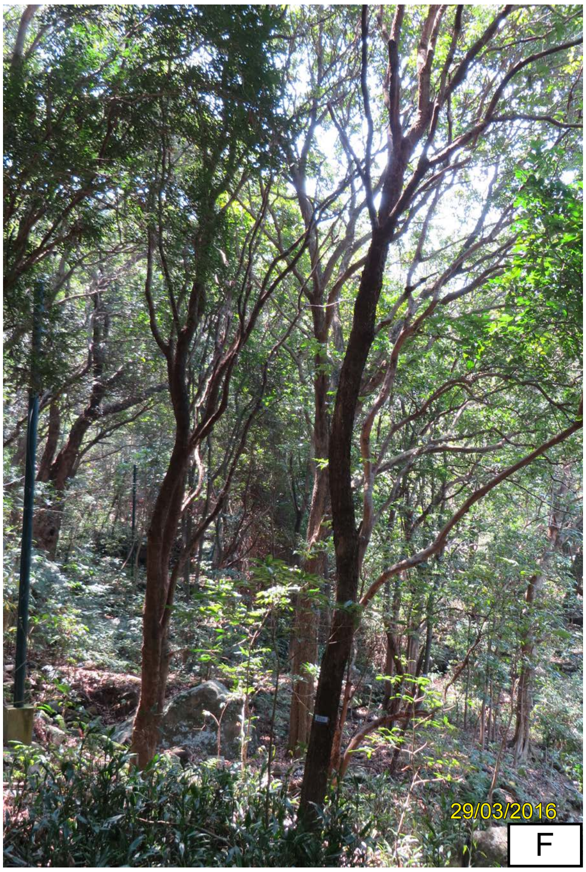
T215 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-159	REV		

T216 (Overall view)

T216 (Base)



T216 (Trunk)

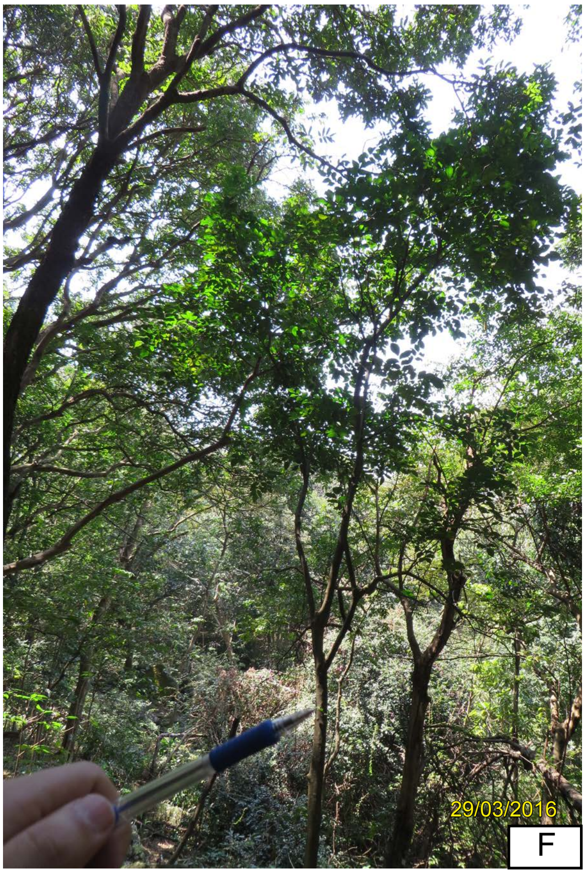
T216 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-160	REV	

ADI



T217 (Overall view)

T217 (Base)

T217 (Trunk)

T217 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-161		REV	

T218 (Overall view)

T218 (Base)

T218 (Trunk)

T218 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-162	REV	

ADI

T219 (Overall view)

T219 (Base)

T219 (Trunk)

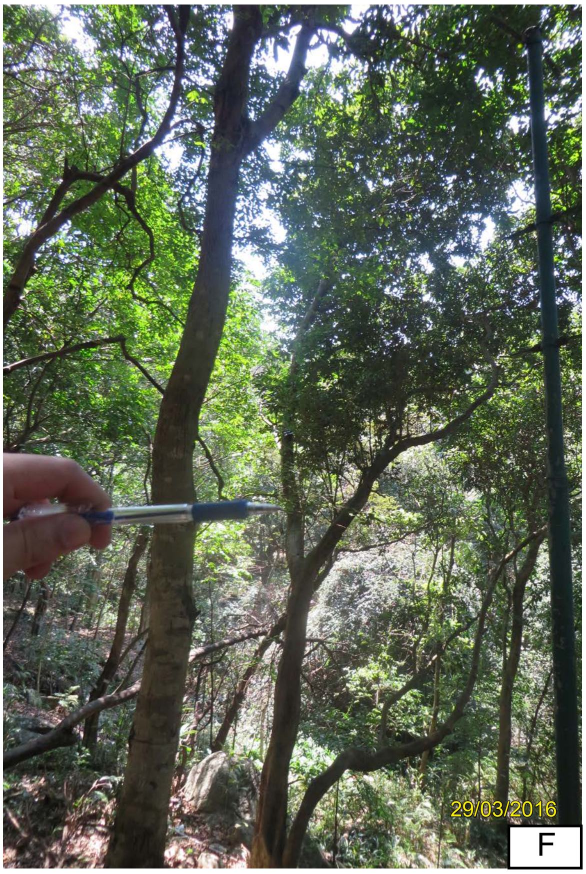
T219 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-163	REV	

ADI



T220 (Overall view)

T220 (Base)

T220 (Trunk)

T220 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

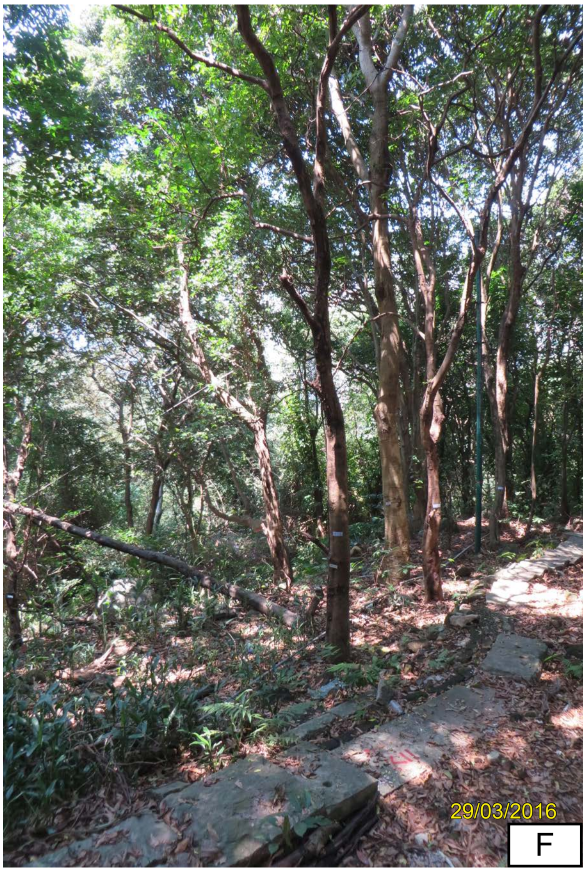
PROPOSED RESIDENTIAL DEVELOPMENT
AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG
Tree Photographic Records

SCALE	N.T.S	DATE	29 March 2016
CHECKED	ALL	DRAWN	HEH
FIGURE NO.	SKAL12A-TS-164	REV	

ADI

T221 (Overall view)

T221 (Base)

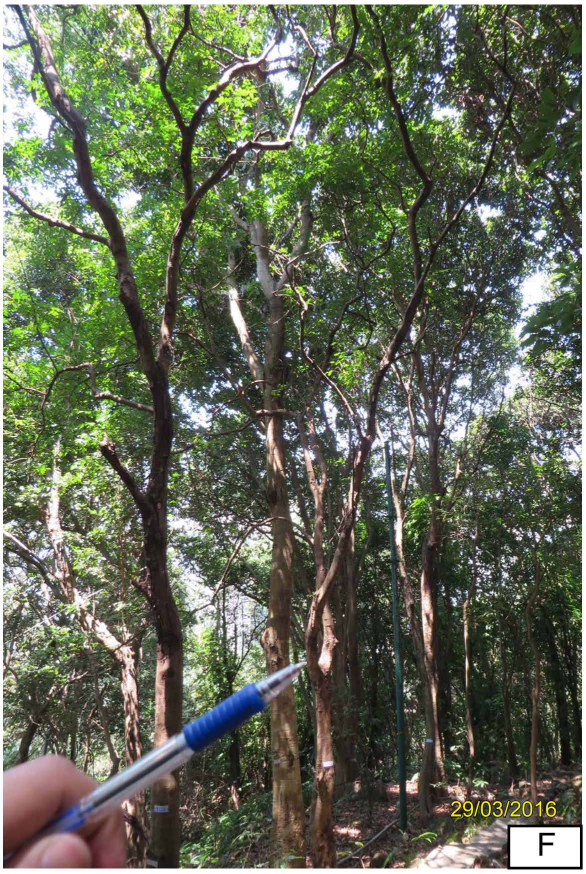


T221 (Trunk)

T221 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-165	REV		



T222 (Overall view)

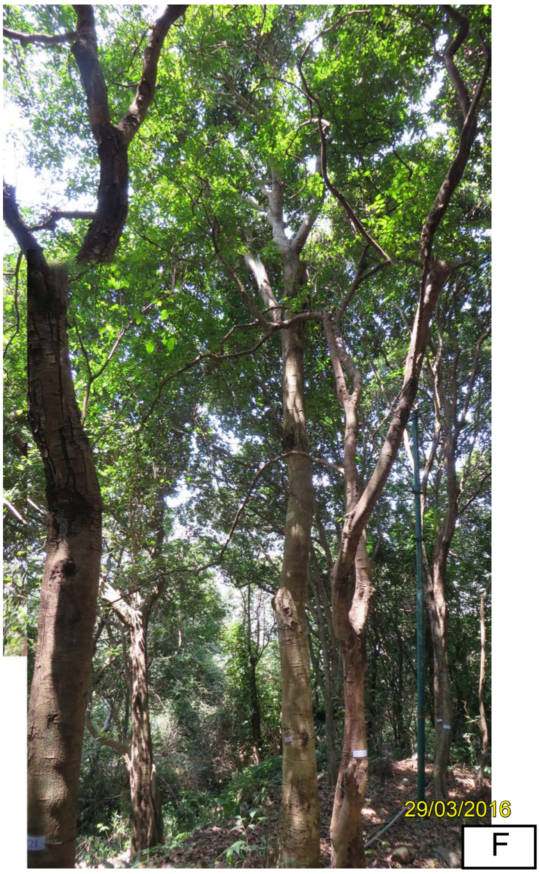
T222 (Base)

T222 (Trunk)

T222 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO. SKAL12A-TS-166			REV	



T223 (Overall view)

T223 (Base)

T223 (Trunk)

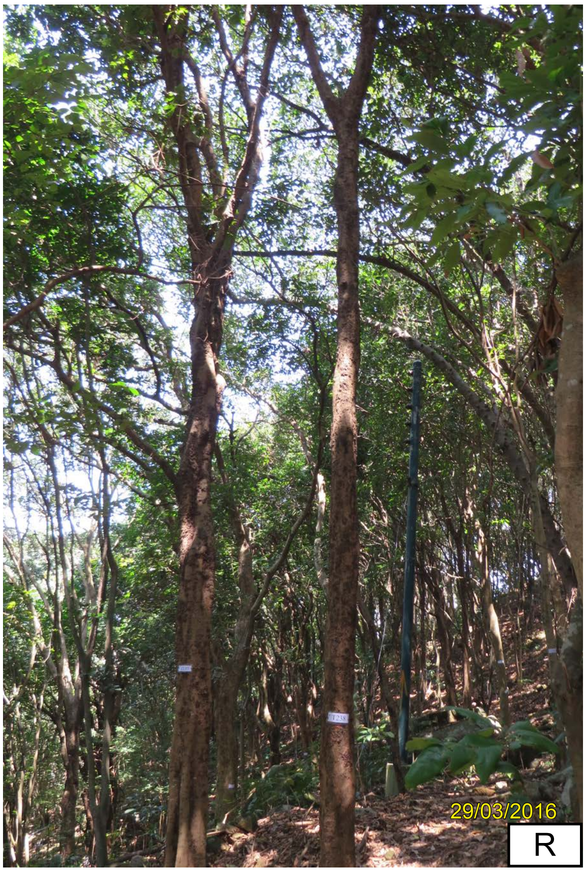
T223 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-167	REV		

T238 (Overall view)

T238 (Base)



T238 (Trunk)

T238 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-168	REV	

ADI

T239 (Overall view)

T239 (Base)

T239 (Trunk)

T239 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO. SKAL12A-TS-169		REV	

ADI

T240 (Overall view)

T240 (Base)

T240 (Trunk)

T240 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-170	REV		

T241 (Overall view)

29/03/2016

F

T241 (Base)

T241 (Trunk)

T241 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-171	REV	

ADI

F

T242 (Overall view)

29/03/2016

F

T242 (Base)

F

T242 (Trunk)

29/03/2016

F

T242 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-172	REV	

ADI

T243 (Overall view)

29/03/2016
F

T243 (Base)

T243 (Trunk)

T243 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016
	CHECKED	ALL	DRAWN	HEH
	FIGURE NO.	SKAL12A-TS-173	REV	

ADI

T244 (Overall view)

29/03/2016
F

T244 (Base)

T244 (Trunk)

29/03/2016
F

T244 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-174		REV	

T245 (Overall view)

29/03/2016
R

T245 (Base)

T245 (Trunk)

T245 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-175		REV	

T296 (Overall view)

29/03/2016

F

T296 (Base)

T296 (Trunk)

T296 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-176	REV		

T297 (Overall view)

T297 (Base)

T297 (Trunk)

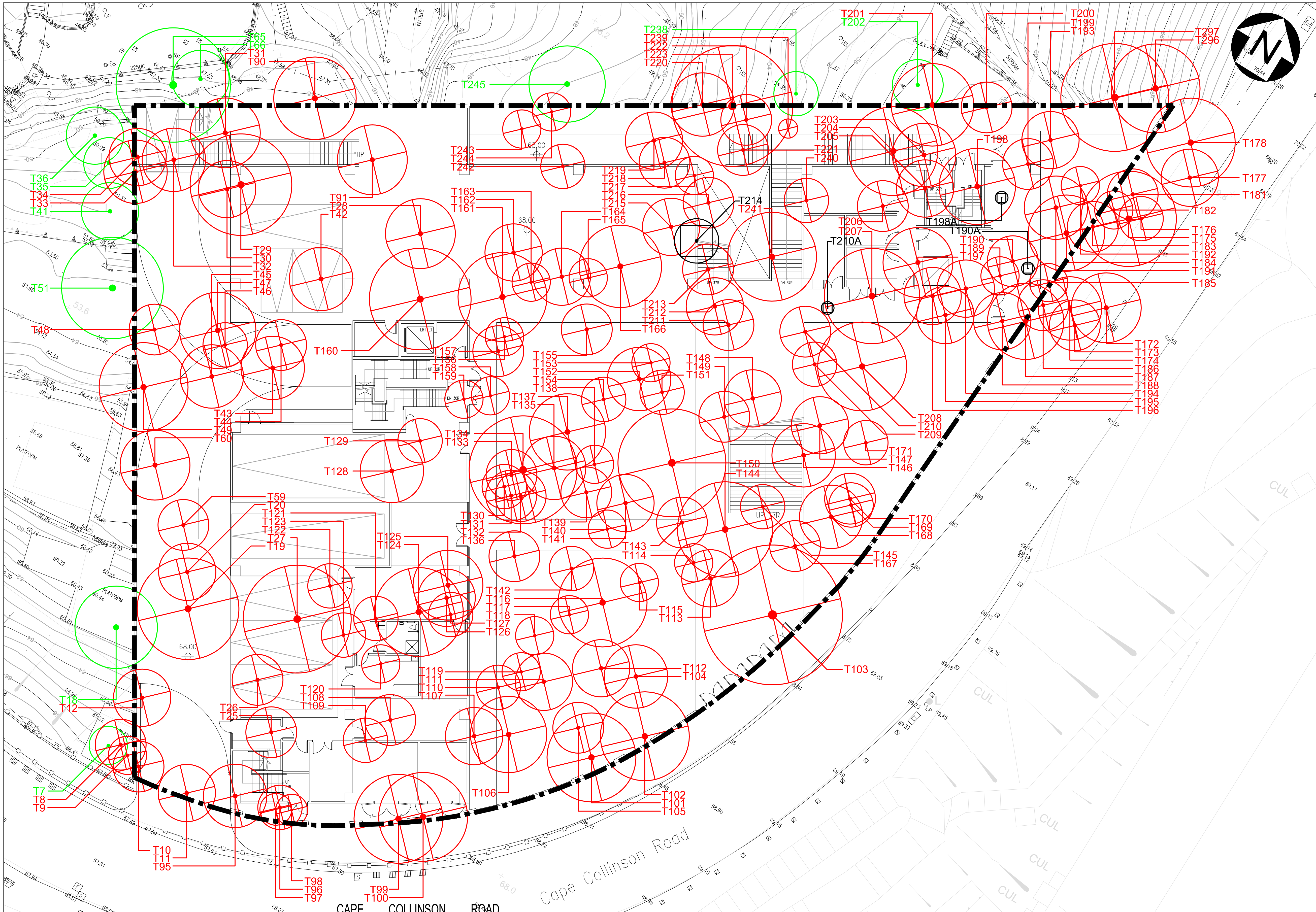
T297 (Crown)

R-Retain T-Transplant F-Fell D-Dead Tree

PROPOSED RESIDENTIAL DEVELOPMENT AT RBL NO. 1019, 35 BARKER ROAD, HONG KONG Tree Photographic Records	SCALE	N.T.S	DATE	29 March 2016	ADI
	CHECKED	ALL	DRAWN	HEH	
	FIGURE NO.	SKAL12A-TS-177	REV		

APPENDIX V

TREE RECOMMENDATION PLAN



LEGEND

APPLICATION BOUNDARY

62.98 EXISTING LEVEL

T198 TREES TO BE FELLED

T202 TREES TO BE RETAINED

T198A DEAD TREE

REVISION 校訂	DESCRIPTION 內容摘要	DRAWN 繪圖	DATE 日期	CHECKED 審核	APPROVED 審批

DO NOT SCALE FROM THIS DRAWING 勿按圖量比例

PROJECT 工程項目: PROVISION OF COLUMBARIUM AT CAPE COLLINSON ROAD IN CHAI WAN

SCALE 比例: 1:300 @A3

DESIGNED 設計: TEAM

DATE 日期:

DRAWN 繪圖: CADD

DRAWING TITLE 圖紙名稱: TREE RECOMMENDATION PLAN

REVISION 校訂:

CHECKED 審核:

DRAWING NUMBER 圖號: SKAL12A-TR01

APPROVED 審批:

ADI

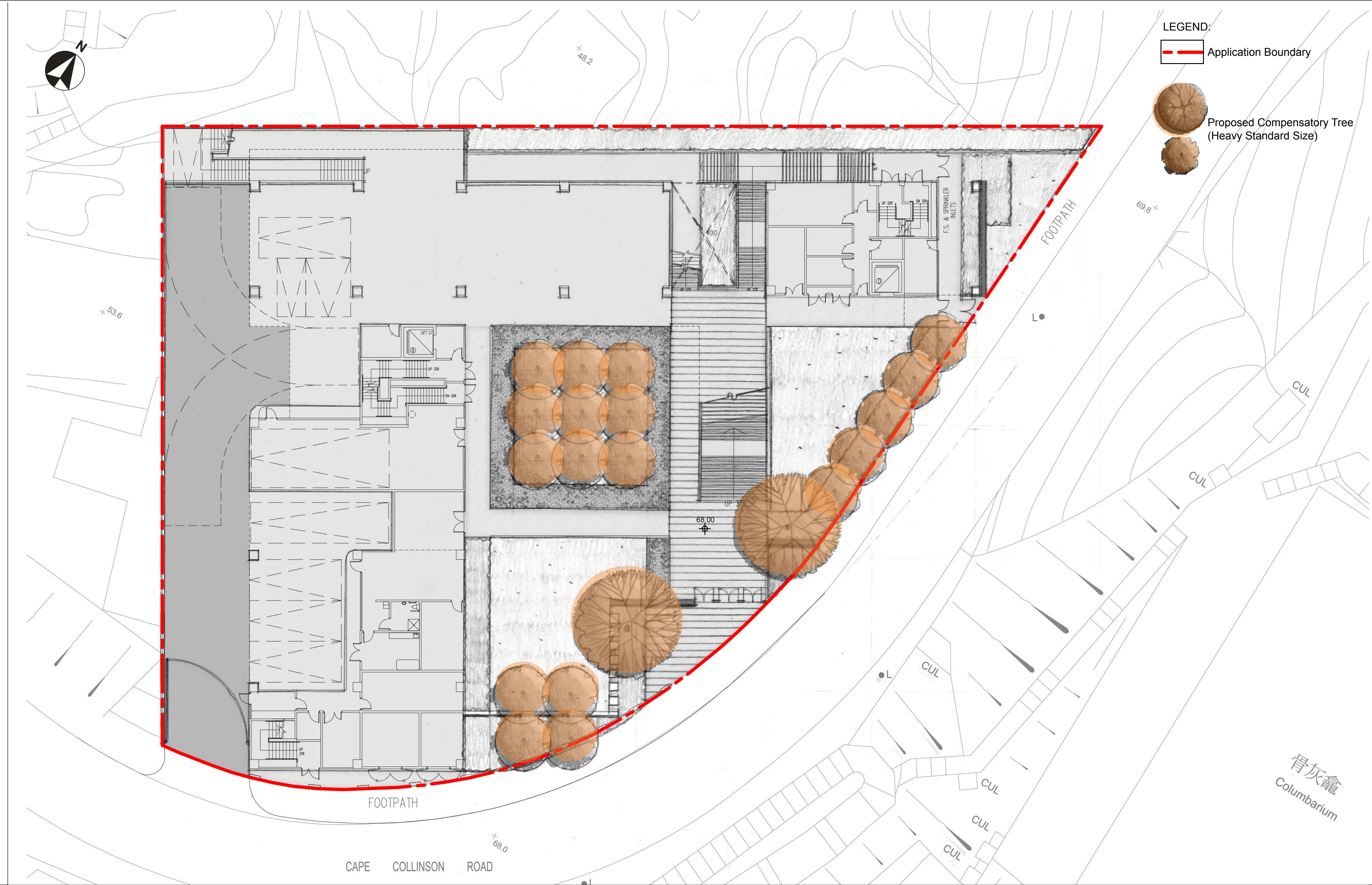
ADI LIMITED 雅博奧頓國際設計有限公司
INTERNATIONAL SERVICES IN ENVIRONMENTAL MANAGEMENT, PLANNING, URBAN DESIGN AND LANDSCAPE ARCHITECTURE 國際環境管理,城市規劃及設計,園境建築顧問服務
10/F BANGKOK BANK BUILDING, 18 BONHAM STRAND WEST, HONG KONG 香港上環文咸西街十八號盤谷銀行大廈十樓
TELEPHONE 2131 8630 FACSIMILE 2131 8609 電話: (八五二) 二一三一 八六三零 傳真: (八五二) 二一三一 八六零九

CAD FILENAME SKAL12A-TR01.dwg

K:\Projects\SKAL12A=P126\Tree survey\SKAL12A-TR01.dwg, ISO full bleed A3 (420.00 x 297.00 MM), 1:1

APPENDIX VI

NOTIONAL COMPENSATORY PLANTING PLAN
(subject to detailed design)



Provision of Columbarium at Cape Collinson Road in Chai Wan

Notional Compensatory Planting Plan (Subject to Detailed Design)

SCALE	1:300 (A3)	DATE	JUL 2016
CHECKED	ALL	DRAWN	TEAM
FIGURE NO.	SKAL12A /CP-01	REV	A

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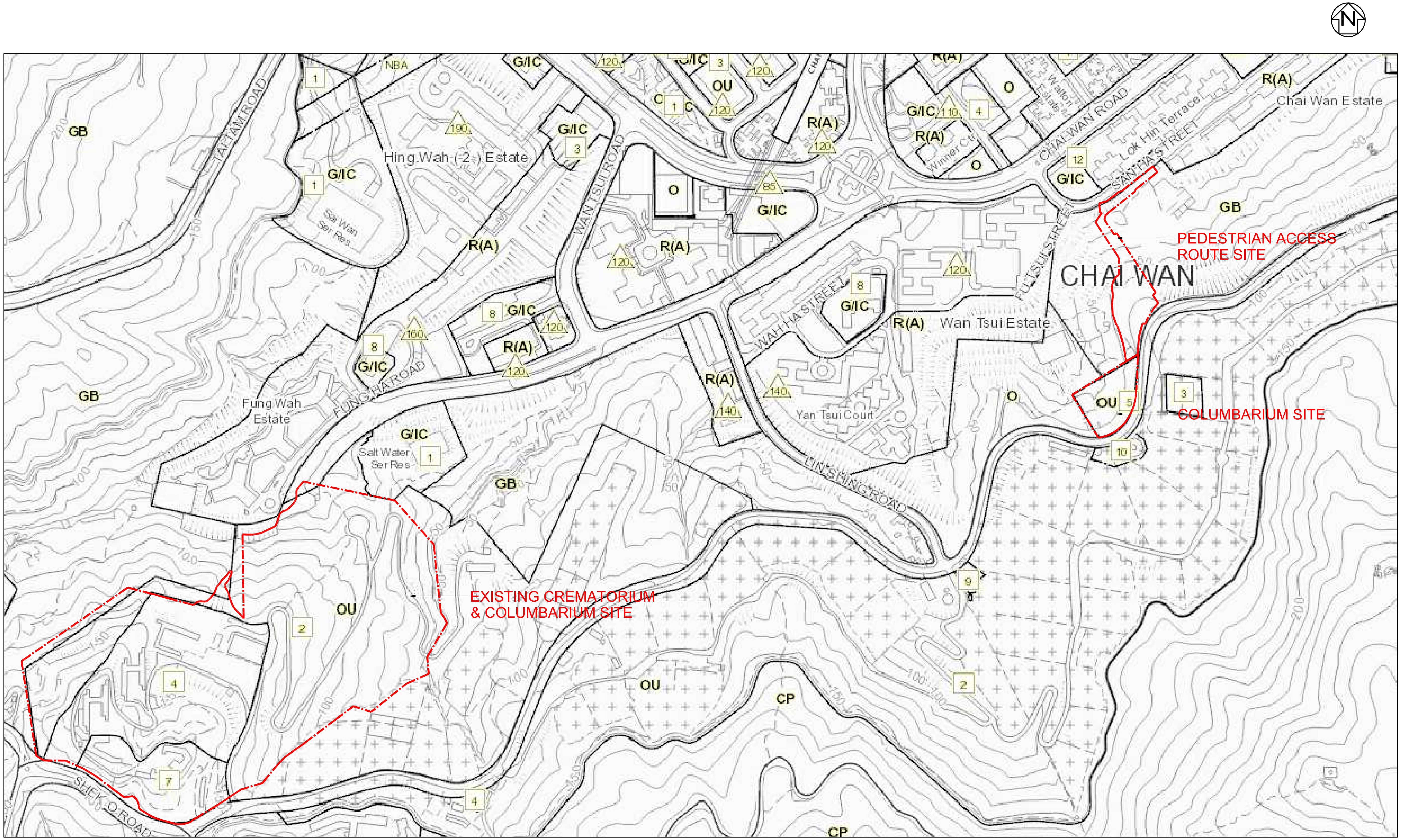
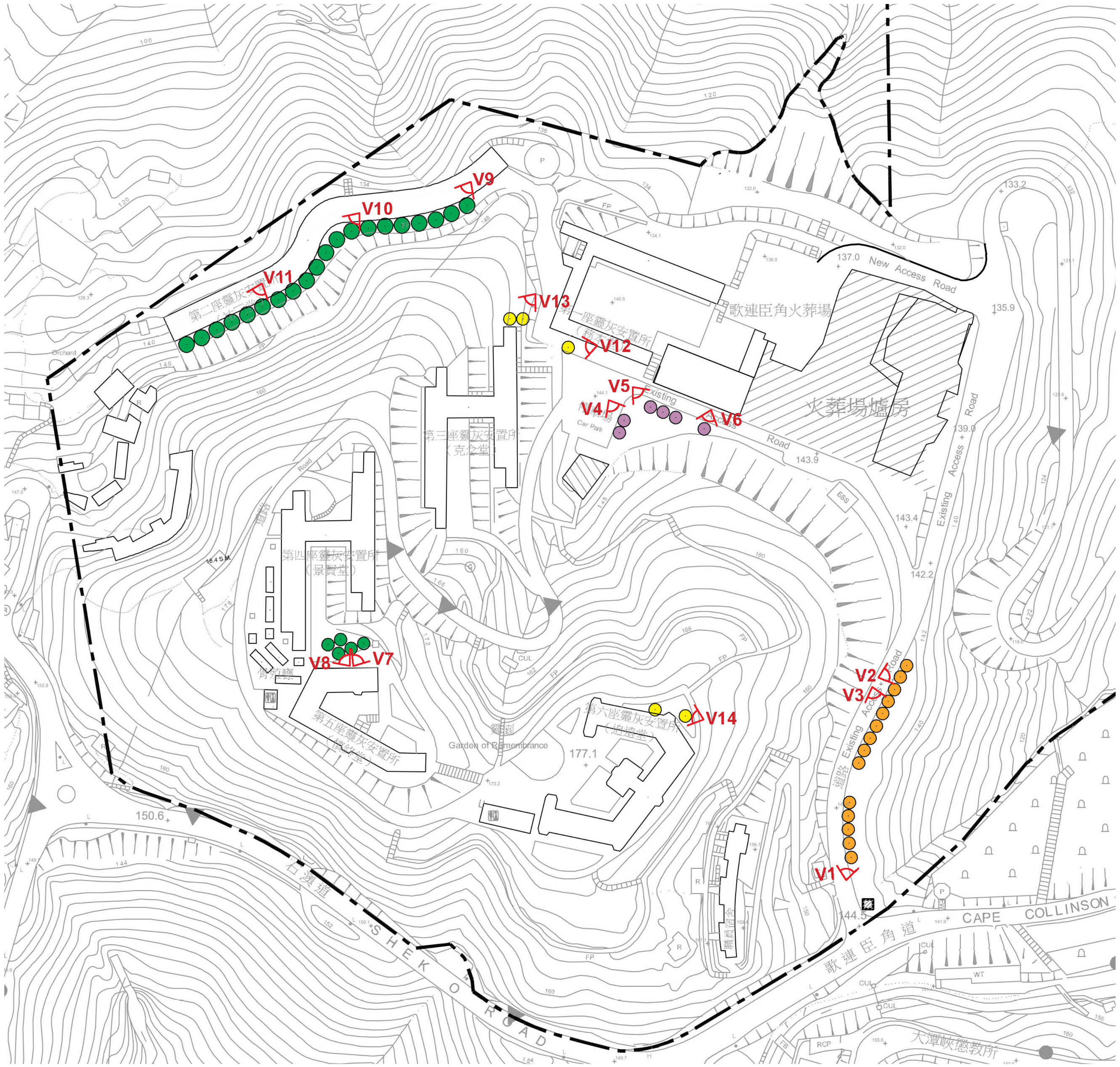


DRAFT

PROVISION OF COLUMBARIUM AT CAPE COLLINSON ROAD IN CHAI WAN

LOCATION PLAN OF THE PROPOSED COLUMBARIUM & PEDESTRIAN ACCESS ROUTE (SUBJECT TO DETAIL DESIGN) AND EXISTING CREMATORIUM & COLUMBARIUM AT CAPE COLLINSON

Dwg.no. J505 / 20160810 / SL / SK03
Scale : N.T.S.



KEY PLAN

LEGEND:

Boundary of Cape Collinson Crematorium & Columbarium

Proposed Compensatory Tree

Note: The proposed locations of compensatory trees are indicative only. Exact Location shall subject to site verification.

Proposed Compensatory Trees Schedule				
Scientific Name	Chinense Name	Size	Plant No.	Spacing
Senna surattensis	黃槐	Heavy standard	5	as shown
Lagerstroemia speciosa	大花紫薇	Heavy standard	6	as shown
Sterculia lanceolata	假蘋婆	Heavy standard	25	as shown
Xanthostemon chrysanthus	金蒲桃	Heavy standard	14	as shown
		Total	50	

0 20 40 100M

Provision of Columbarium at Cape Collinson Road in Chai Wan

Compensatory Planting Plan (Cape Collinson Crematorium & Columbarium)

SCALE	1:1500(A3)	DATE	AUG 2016
CHECKED	ALL	DRAWN	TEAM
FIGURE NO.	SKAL12A /CC/CP01	REV	A

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香港上環文咸西街十八號盤谷銀行大廈十樓
電話：(八五二) 二一三一 八六三零 傳真：(八五二) 二一三一 八六零九

VIEW POINT (V1)

VIEW POINT (V2)

VIEW POINT (V3)

Note: View Points refer to figure No. SKAL12A/CC/CP01

LEGEND:

Proposed compensatory tree location

Provision of Columbarium at Cape Collinson Road in Chai Wan

Compensatory Planting Plan (Cape Collinson Crematorium & Columbarium)

SCALE	-	DATE	JUNE 2016
CHECKED	ALL	DRAWN	TEAM
FIGURE NO.	SKAL12A /CC/CP02	REV	-

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雅博奧頓國際設計有限公司

VIEW POINT (V4)

VIEW POINT (V6)

VIEW POINT (V5)

VIEW POINT (V7)

Note: View Points refer to figure No. SKAL12A/CC/CP01

LEGEND:

Proposed compensatory tree location

Provision of Columbarium at Cape Collinson Road in Chai Wan

Compensatory Planting Plan (Cape Collinson Crematorium & Columbarium)

SCALE	-	DATE	JUNE 2016
CHECKED	ALL	DRAWN	TEAM
FIGURE NO.	SKAL12A /CC/CP03	REV	-

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VIEW POINT (V8)

VIEW POINT (V10)

VIEW POINT (V9)

VIEW POINT (V11)

Note: View Points refer to figure No. SKAL12A/CC/CP01

LEGEND:

Proposed compensatory tree location

Provision of Columbarium at Cape Collinson Road in Chai Wan

Compensatory Planting Plan (Cape Collinson Crematorium & Columbarium)

SCALE	-	DATE	JUNE 2016
CHECKED	ALL	DRAWN	TEAM
FIGURE NO.	SKAL12A /CC/CP04	REV	-

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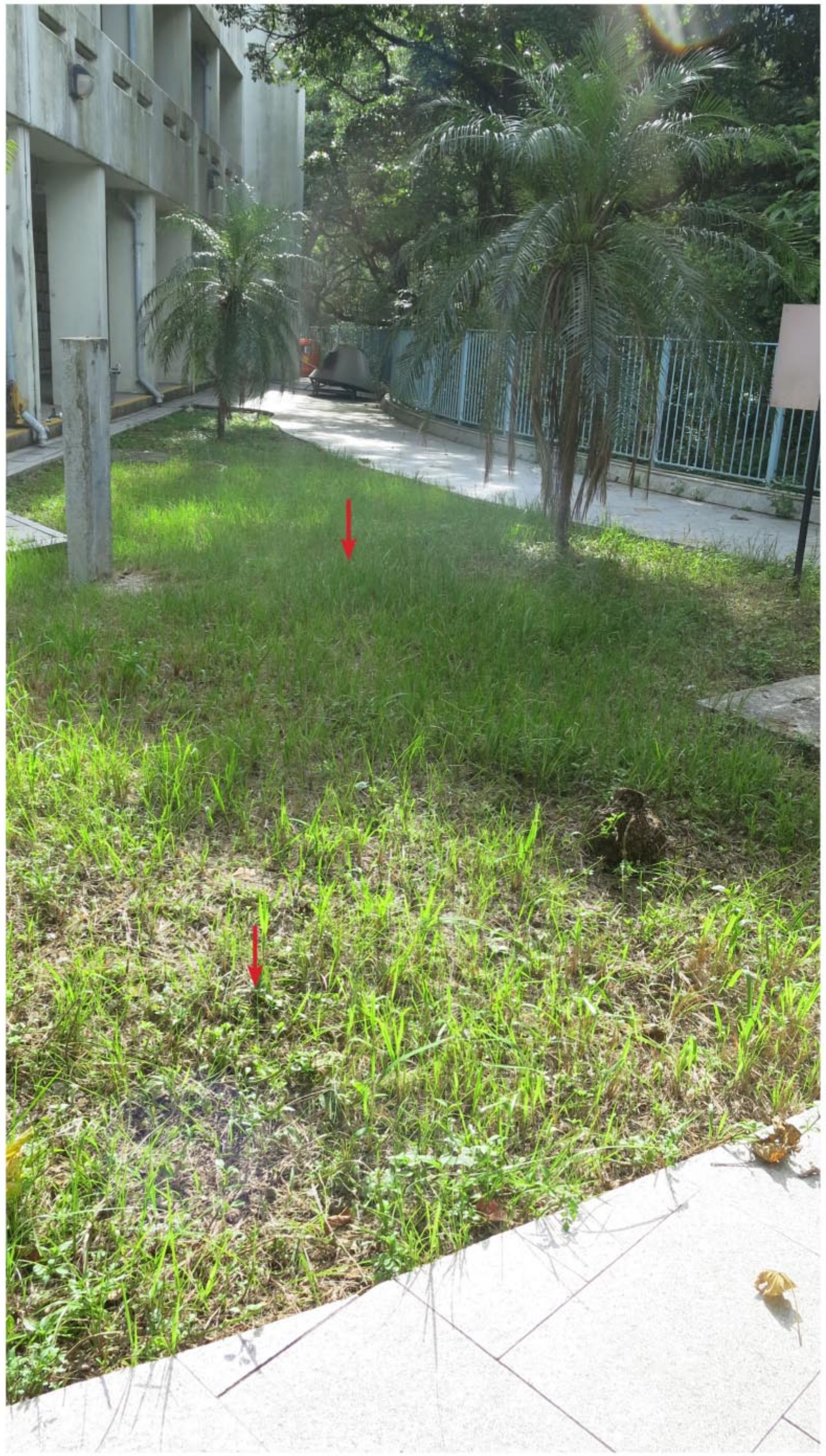
VIEW POINT (V12)

VIEW POINT (V13)



VIEW POINT (V14)

Note: View Points refer to figure No. SKAL12A/CC/CP01

LEGEND:

Proposed compensatory tree location

Provision of Columbarium at Cape Collinson Road in Chai Wan

Compensatory Planting Plan (Cape Collinson Crematorium & Columbarium)

SCALE	-	DATE	JUNE 2016
CHECKED	ALL	DRAWN	TEAM
FIGURE NO.	SKAL12A /CC/CP05	REV	-

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APPENDIX VII

NOTIONAL LANDSCAPE MASTER PLANS
(subject to detailed design)

Provision of Columbarium at Cape Collinson Road in Chai Wan

Notional Landscape Master Plan - Combined (Subject to Detailed Design)

SCALE	1:300 (A3)	DATE	JUL 2016
CHECKED	ALL	DRAWN	TEAM
FIGURE NO.	SKAL12A /LMP-01	REV	A

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Provision of Columbarium at Cape Collinson Road in Chai Wan

Notional Landscape Plan - G/F (Subject to Detailed Design)

SCALE	1:300 (A3)	DATE	JUL 2016
CHECKED	ALL	DRAWN	TEAM
FIGURE NO.	SKAL12A /LMP-02	REV	A

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Provision of Columbarium at Cape Collinson Road in Chai Wan

Notional Landscape Plan - R/F (Subject to Detailed Design)

SCALE	1:300 (A3)	DATE	MAR 2016
CHECKED	ALL	DRAWN	TEAM
FIGURE NO.	SKAL12A /LMP-03	REV	-

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Provision of Major Community Facilities in Chai Wan Area

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	
District Open Space	10 ha per 100,000 persons	17.08ha	14.34	15.52	-1.56ha
Local Open Space	10 ha per 100,000 persons	17.08ha	23.20	25.31	+8.23ha
Secondary School	1 whole-day classroom for 40 persons aged 12-17	189 classrooms	418	418	+229 classrooms
Primary School	1 whole-day classroom for 25.5 persons aged 6-11	261 classrooms	210	210	-51 classrooms
Kindergarten/ Nursery	26 classrooms for 1,000 children aged 3 to 6	69 classrooms	127	127	+58 classrooms
District Police Station	1 per 200,000 to 500,000 persons	0	0	0	0
Divisional Police Station	1 per 100,000 to 200,000 persons	1	1	1	0
Clinic/Health Centre	1 per 100,000 persons	2	3	4	+2
Post Office	No set standard	NA	3	3	NA
Magistracy (with 8 courtrooms)	1 per 660,000 persons	0	0	0	0
Integrated Children and Youth Services Centre	1 for 12,000 persons aged 6-24	2	4	4	+2
Integrated Family Services Centre	1 for 100,000 to 150,000 persons	1	2	2	+1
Library	1 district library for every 200,000 persons	1	2	2	+1

Sport Centre	1 per 50,000 to 65,000 persons	2	2	2	0
Sports Ground/ Sport Complex	1 per 200,000 to 250,000 persons	1	1	1	0
Swimming Pool Complex - standard	1 complex per 287,000 persons	1	1	1	0

Note:

The planned population for the area is 178,509 (usual residents, mobile residents and transients).

東區區議會文件第 50/16 號

東區區議會轄下
規劃、工程及房屋委員會
第四次委員會會議紀要

上述會議已於 2016 年 6 月 27 日舉行，討論的事項摘錄如下：

I. 灣仔北及北角海濱城市設計研究 － 第二階段公眾參與
(規劃、工程及房屋委員會文件第 22/16 號)

委員樂見部門制定優化海濱建議。有委員希望部門避免採用過分花巧的設計，盡快建設務實及完善的海濱，並加強海濱的行人連接，以及研究增設連貫單車徑的可行性，以增加海濱的連貫性，為市民增加休憩空間。

II. 柴灣道公共房屋發展計劃
(規劃、工程及房屋委員會文件第 25/16 號)

III. 擬議修訂《柴灣分區計劃大綱核准圖編號S/H20/21》
(規劃、工程及房屋委員會文件第 26/16 號)

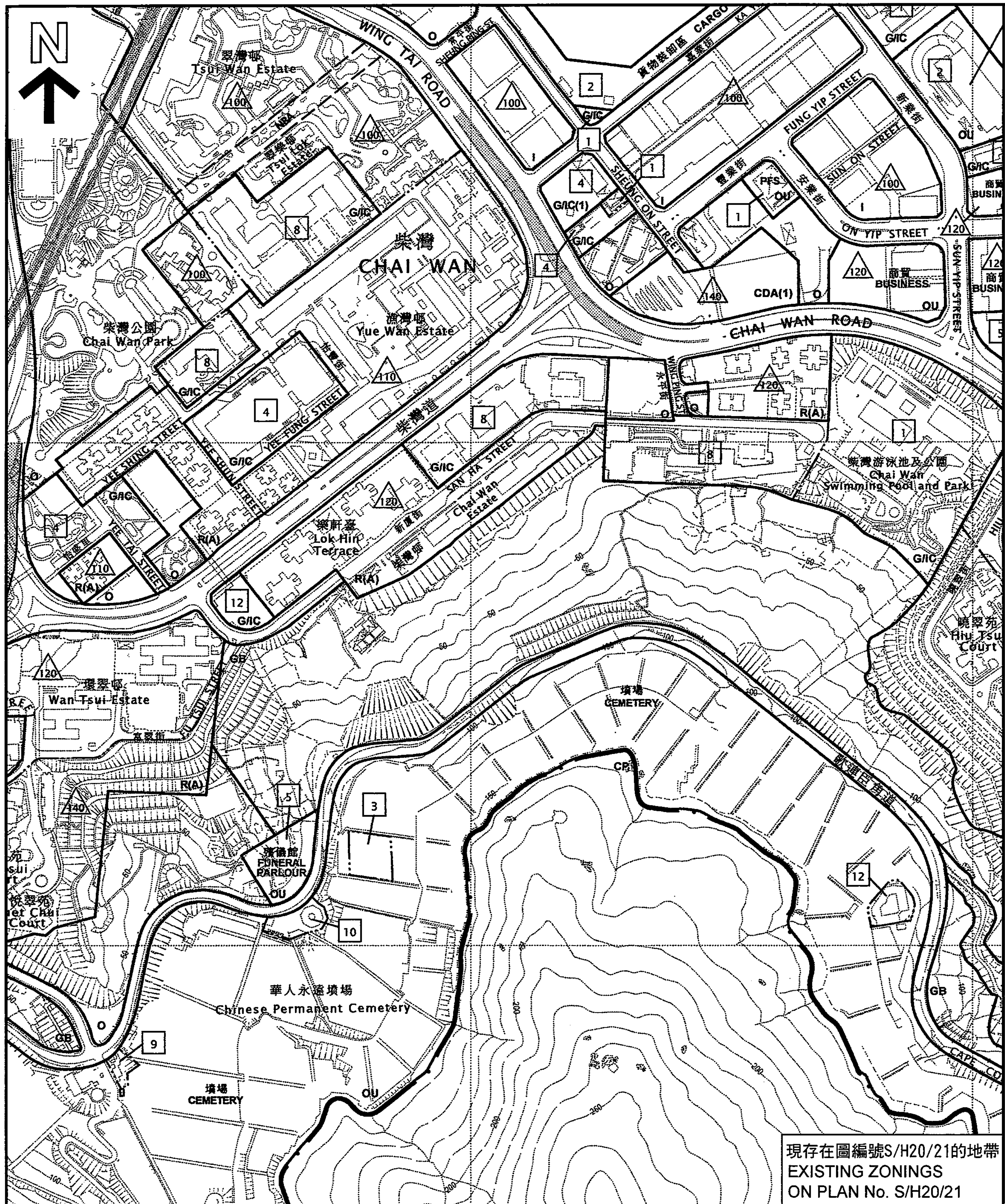
委員普遍同意將柴灣道的用地撥作公共房屋發展，以善用土地資源及應付社會對公共房屋的殷切需求。有委員希望政府補償休憩用地的損失、加強交通配套措施、提供足夠停車位，以及設法減低鄰近高速公路的噪音滋擾等。此外，委員亦同意《柴灣分區計劃大綱核准圖編號 S/H20/21》的擬議修訂。

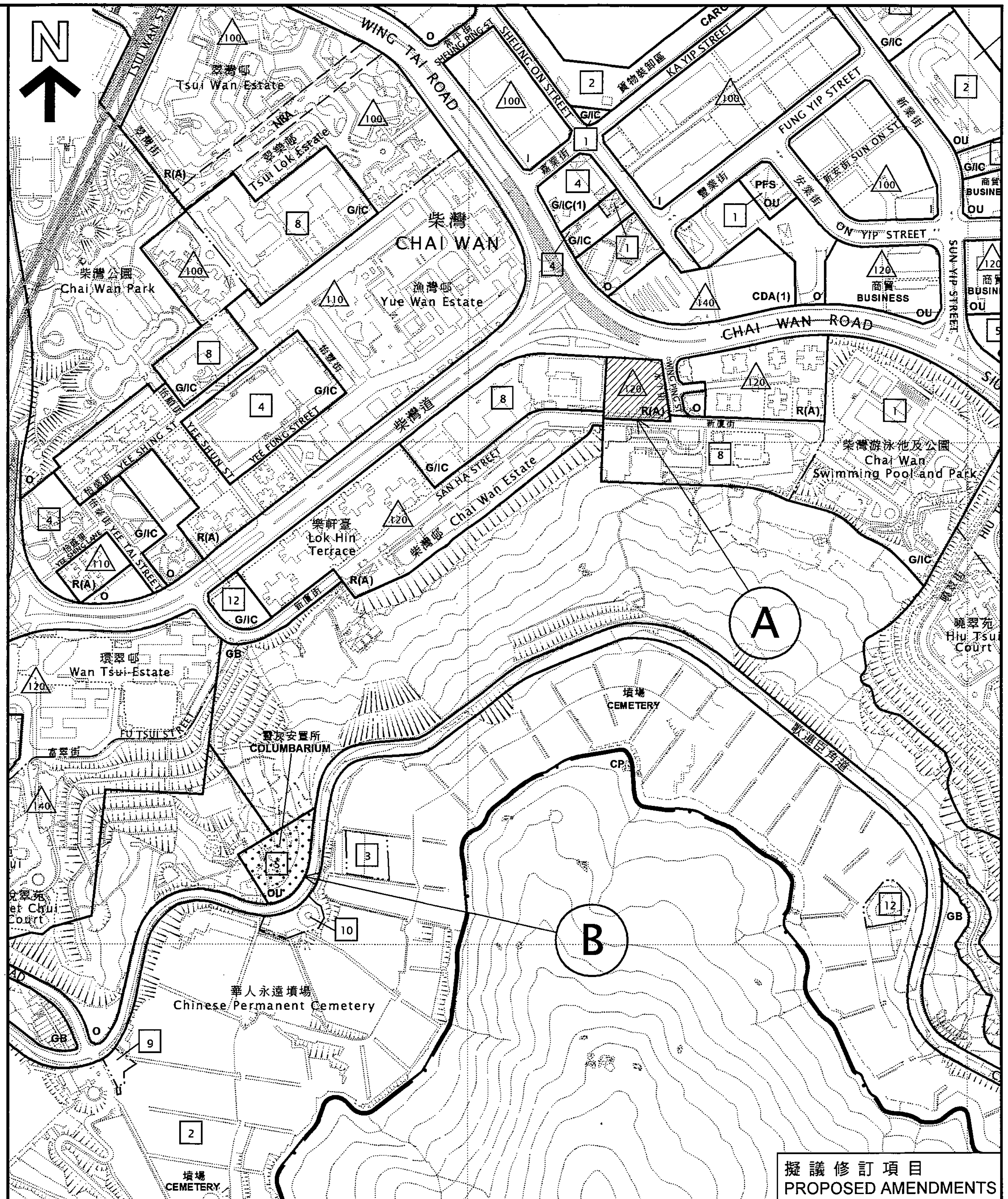
IV. 要求鰂魚涌公園二期旁空地興建綜合體育館
(規劃、工程及房屋委員會文件第 23/16 號)

有委員認為區內的體育場館不足，建議政府於題述用地增設綜合體育館，並設置標準室內游泳池，供市民享用。相反，有委員擔心多層體育館會影響地基結構及附近景觀，認為政府應先諮詢區內持份者的意見。經討論後，委員會通過以下修訂動議，亦同意將議題列入跟進事項：

「東區區議會轄下規劃、工程及房屋委員會要求政府在鰂魚涌公園二期旁邊的休憩用地探討研究興建一個三至四層的綜合體育館，內設標準室內公共泳池供市民使用，以改善區內市民的生活環境。」

東區區議會秘書處
2016 年 6 月





本摘要圖於2016年7月7日擬備，
所根據的資料為於2013年2月5日
核准的分區計劃大綱圖編號S/H20/21

EXTRACT PLAN PREPARED ON 7.7.2016
BASED ON OUTLINE ZONING PLAN No. S/H20/21
APPROVED ON 5.2.2013

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

柴灣分區計劃大綱核准圖編號S/H20/21的擬議修訂項目

PROPOSED AMENDMENTS TO APPROVED CHAI WAN OZP No. S/H20/21

修訂項目A和B

AMENDMENT ITEMS A & B

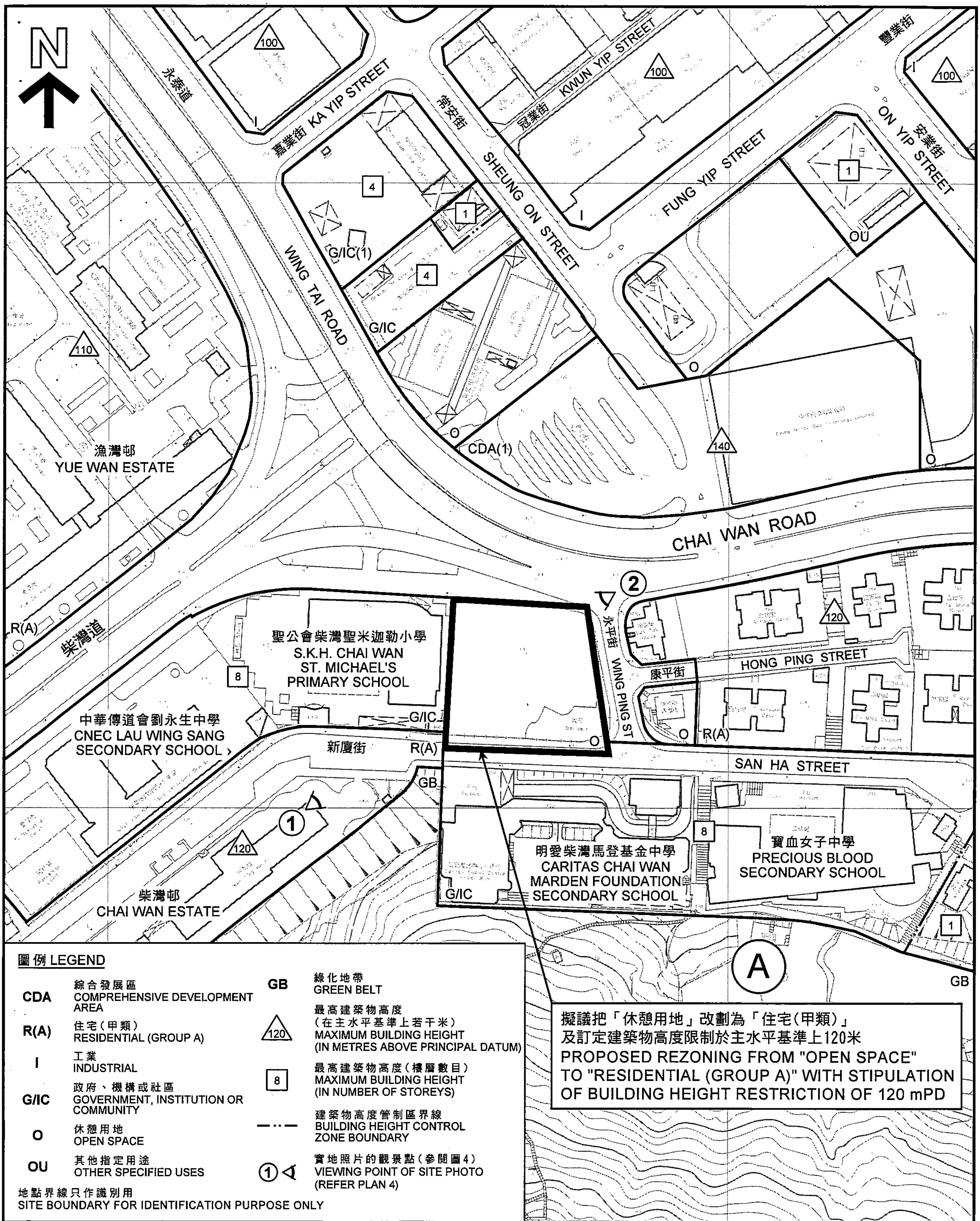
SCALE 1 : 5 000 比例尺

米 METRES 100 0 100 200 300 400 米 METRES

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/H20/16/1

圖 PLAN
1



本摘要圖於2016年8月17日擬備，所根據的資料為測量圖編號11-SE-19B

EXTRACT PLAN PREPARED ON 17.8.2016 BASED ON SURVEY SHEET No. 11-SE-19B

平面圖 SITE PLAN

柴灣分區計劃大綱核准圖編號S/H20/21的擬議修訂項目

PROPOSED AMENDMENTS TO APPROVED CHAI WAN OZP No. S/H20/21

修訂項目A

AMENDMENT ITEM A

SCALE 1 : 2 000 比例尺

米 METRES 40 0 40 80 米 METRES

規劃署 PLANNING DEPARTMENT

參考編號 REFERENCE No. M/H20/16/1

圖 PLAN 2

本摘要圖於2016年7月7日擬備，所根據的資料為地政總署於2016年1月1日拍得的航攝照片編號CS62497

EXTRACT PLAN PREPARED ON 7.7.2016 BASED ON AERIAL PHOTO No.CS62497 TAKEN ON 1.1.2016 BY LANDS DEPARTMENT

航攝照片 AERIAL PHOTO

柴灣分區計劃大綱核准圖編號S/H20/21的擬議修訂項目

PROPOSED AMENDMENTS TO APPROVED CHAI WAN OZP No. S/H20/21

修訂項目A

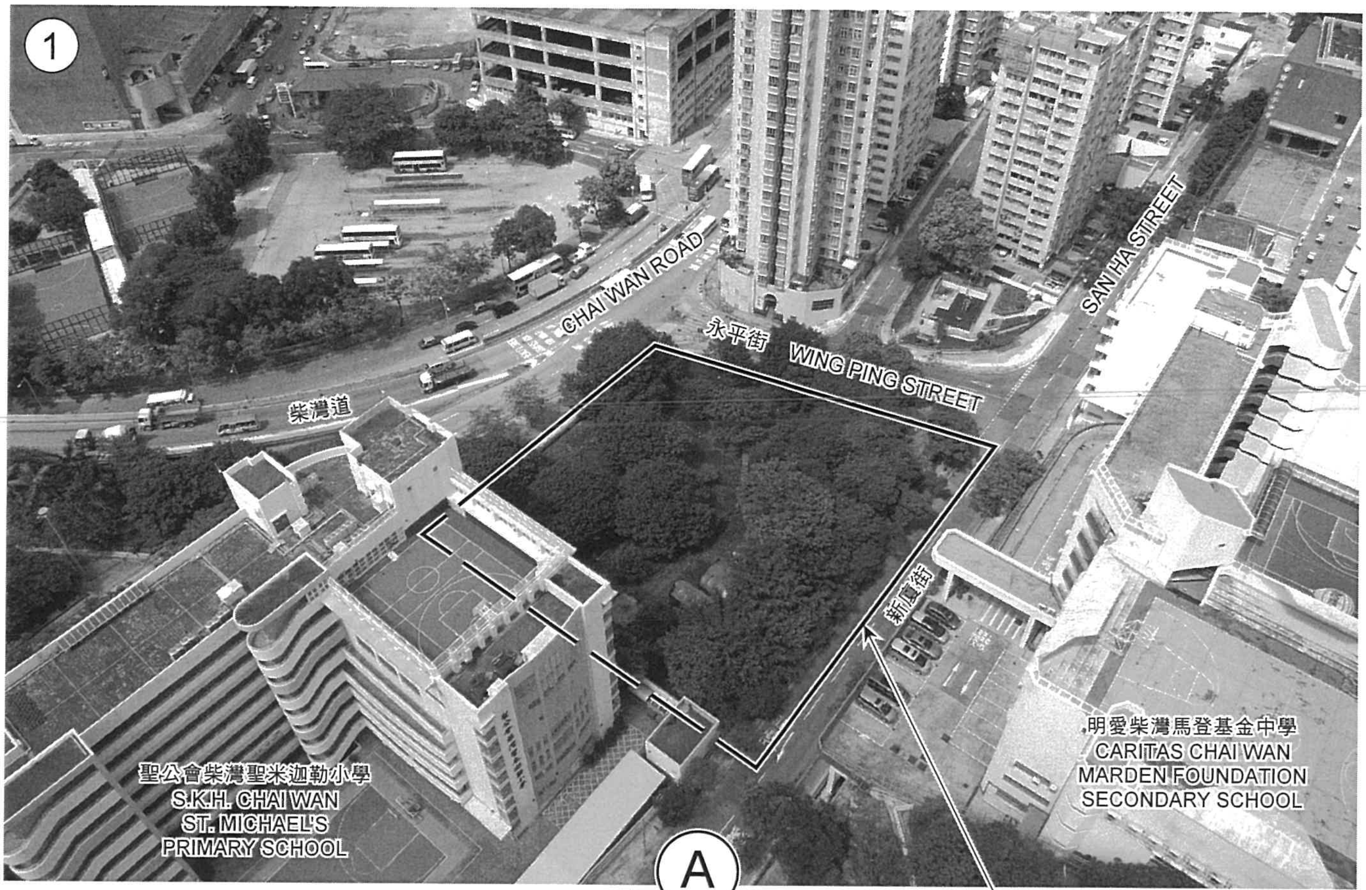
AMENDMENT ITEM A

規劃署

PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/H20/16/1

圖 PLAN
3

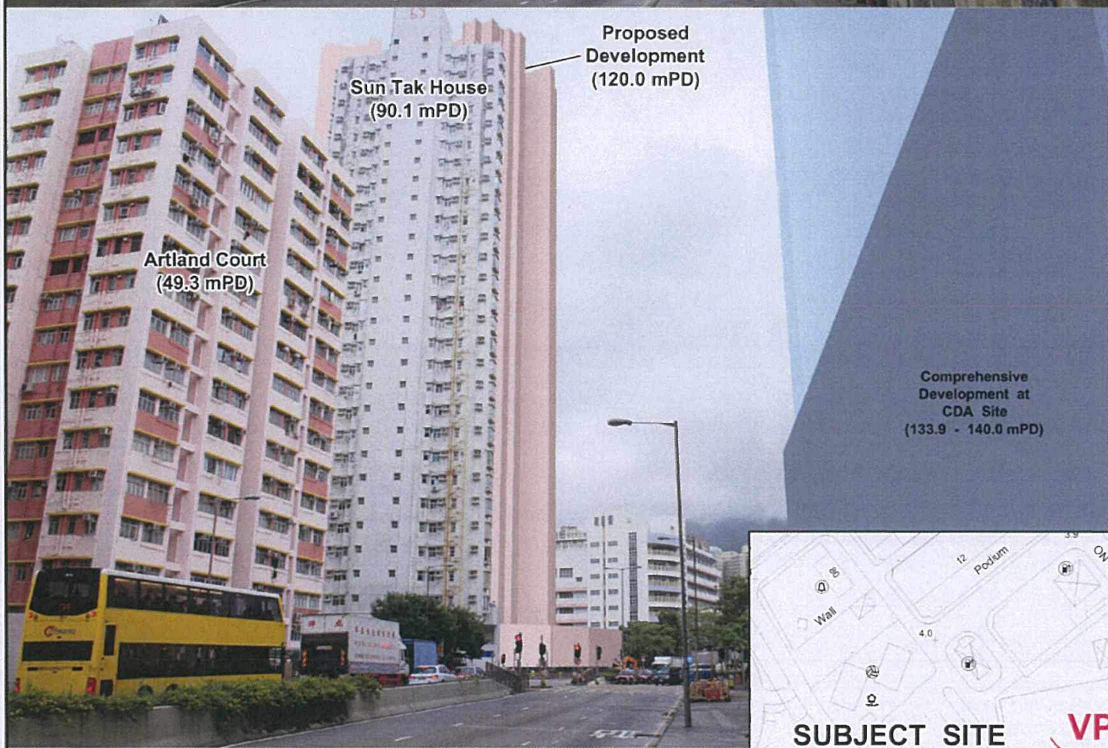


擬議把「休憩用地」改劃為「住宅(甲類)」
及訂定建築物高度限制於主水平基準上120米
PROPOSED REZONING FROM "OPEN SPACE"
TO "RESIDENTIAL (GROUP A)" WTH STIPULATION
OF BUILDING HEIGHT RESTRICTION OF 120 mPD

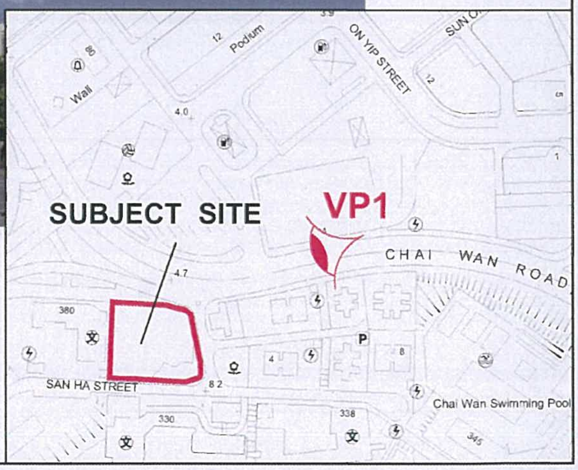
地點界線只作識別用
SITE BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

本圖於2016年7月8日擬備，所根據的資料為攝於2016年7月5日的實地照片 EXTRACT PLAN PREPARED ON 8.7.2016 BASED ON SITE PHOTOS TAKEN ON 5.7.2016	**實地照片 SITE PHOTOS** 柴灣分區計劃大綱核准圖編號S/H20/21的擬議修訂項目 PROPOSED AMENDMENTS TO APPROVED CHAI WAN OZP No. S/H20/21 修訂項目A AMENDMENT ITEM A	規劃署 PLANNING DEPARTMENT 參考編號 REFERENCE No. M/H20/16/1	圖 PLAN 4

With Existing View



With Proposed Development



本圖於2016年7月22日擬備，
所根據的資料由房屋署規劃組提供

PLAN PREPARED ON 22.7.2016
BASED ON PLAN PROVIDED BY
PLANNING SECTION OF
HOUSING DEPARTMENT

合成照片 PHOTOMONTAGE

觀景點1 - 前中華汽車巴士廠外
VP1 - OUTSIDE FORMER
CHINA MOTOR BUS DEPOT

柴灣分區計劃大綱核准圖編號S/H20/21的擬議修訂項目
PROPOSED AMENDMENTS TO
APPROVED CHAI WAN OZP No. S/H20/21

修訂項目A
AMENDMENT ITEM A

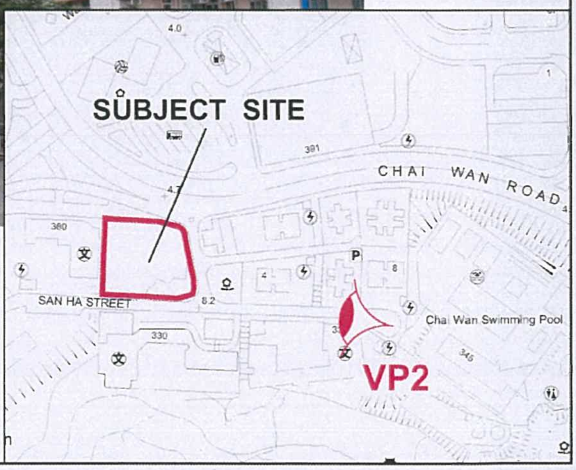
規劃署
PLANNING
DEPARTMENT

參考編號
REFERENCE No.
M/H20/16/1

圖 PLAN
5

With Existing View

With Proposed Development



本圖於2016年7月22日擬備，
所根據的資料由房屋署規劃組提供
PLAN PREPARED ON 22.7.2016
BASED ON PLAN PROVIDED BY
PLANNING SECTION OF
HOUSING DEPARTMENT

合成照片 PHOTOMONTAGE

觀景點2 － 柴灣游泳池外
VP2 - OUTSIDE CHAI WAN SWIMMING POOL
柴灣分區計劃大綱核准圖編號S/H20/21的擬議修訂項目
PROPOSED AMENDMENTS TO
APPROVED CHAI WAN OZP No. S/H20/21
修訂項目A
AMENDMENT ITEM A

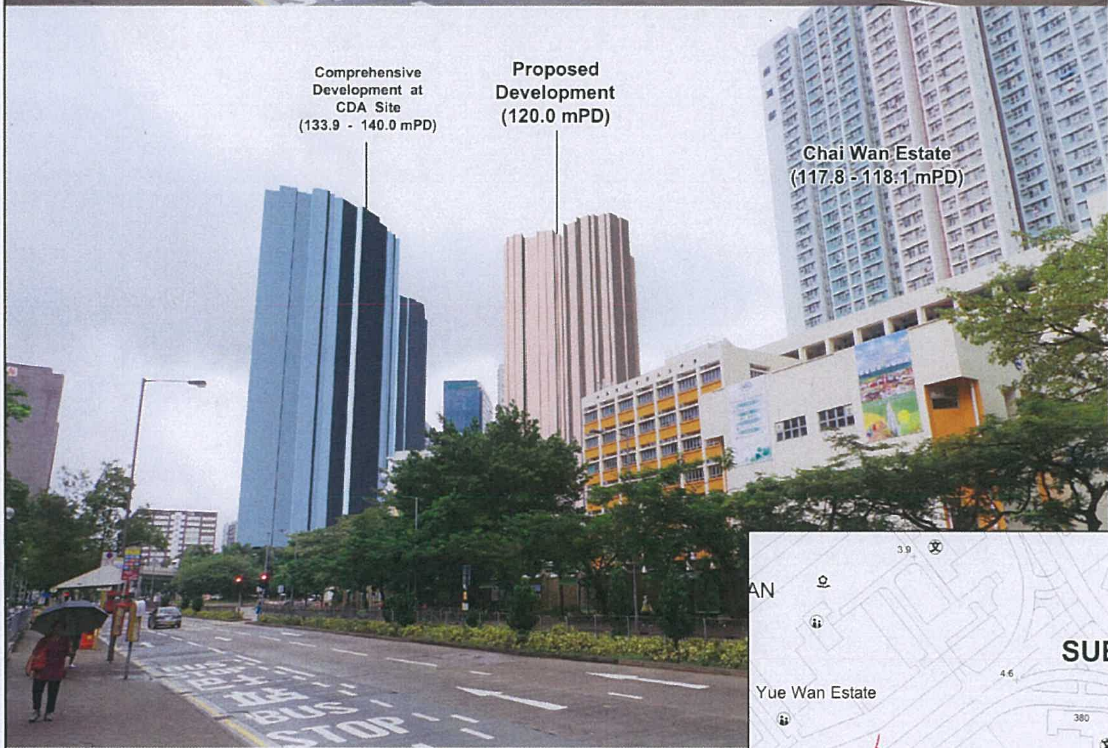
規劃署
PLANNING
DEPARTMENT

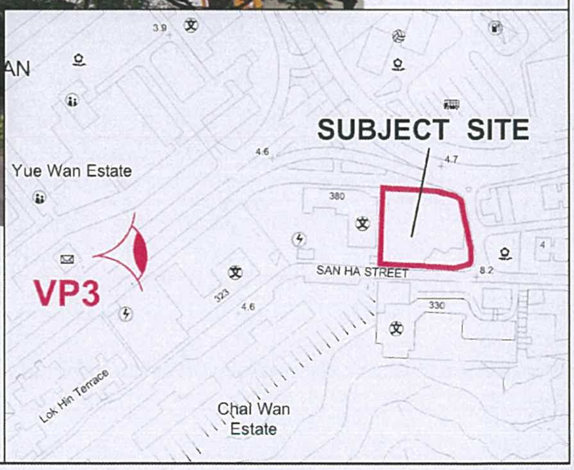
參考編號
REFERENCE No.
M/H20/16/1

圖 PLAN
6

With Existing View

With Proposed Development





本圖於2016年7月22日擬備，
所根據的資料由房屋署規劃組提供
PLAN PREPARED ON 22.7.2016
BASED ON PLAN PROVIDED BY
PLANNING SECTION OF
HOUSING DEPARTMENT

合成照片 PHOTOMONTAGE

觀景點3 － 漁灣邨漁安樓外
VP3 - OUTSIDE YUE ON HOUSE
OF YUE WAN ESTATE

柴灣分區計劃大綱核准圖編號S/H20/21的擬議修訂項目
PROPOSED AMENDMENTS TO
APPROVED CHAI WAN OZP No. S/H20/21

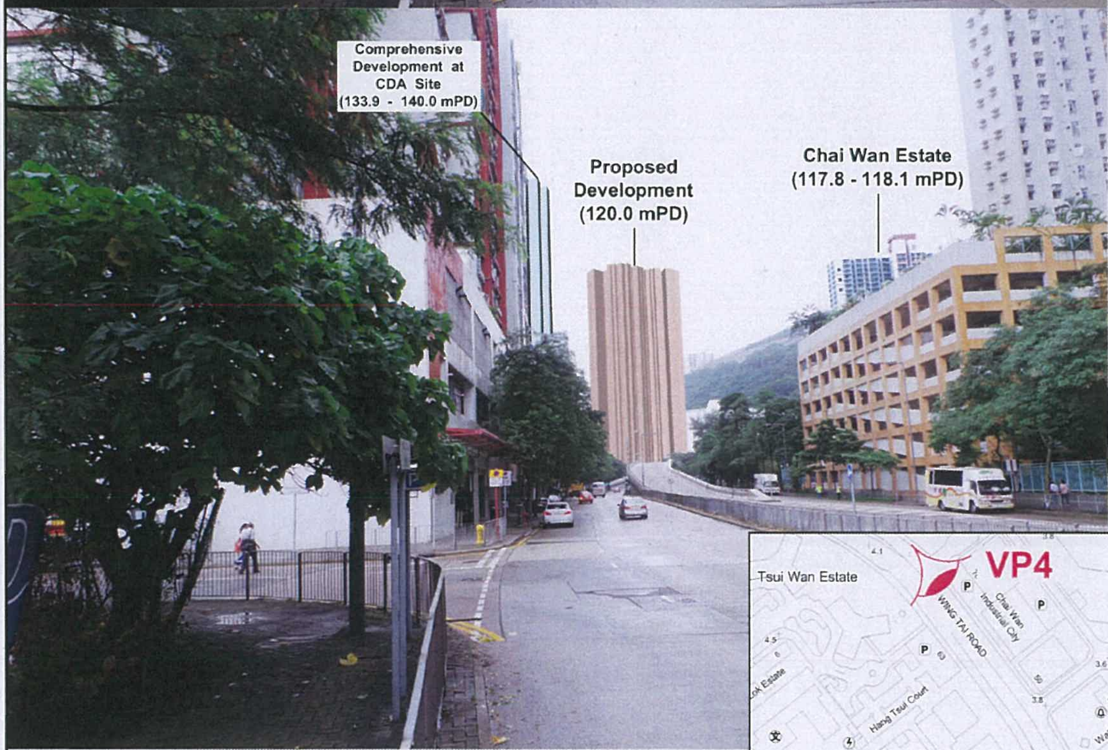
修訂項目A
AMENDMENT ITEM A

規劃署
PLANNING
DEPARTMENT

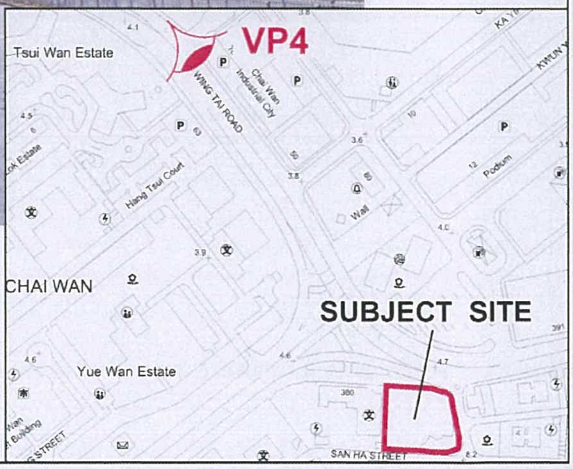
參考編號
REFERENCE No.
M/H20/16/1

圖 PLAN
7

With Existing View



With Proposed Development



本圖於2016年7月22日擬備，
所根據的資料由房屋署規劃組提供
PLAN PREPARED ON 22.7.2016
BASED ON PLAN PROVIDED BY
PLANNING SECTION OF
HOUSING DEPARTMENT

合成照片 PHOTOMONTAGE

觀景點4 － 永泰道與常平街交接處
VP4 - JUNCTION OF WING TAI ROAD AND SHEUNG PING STREET

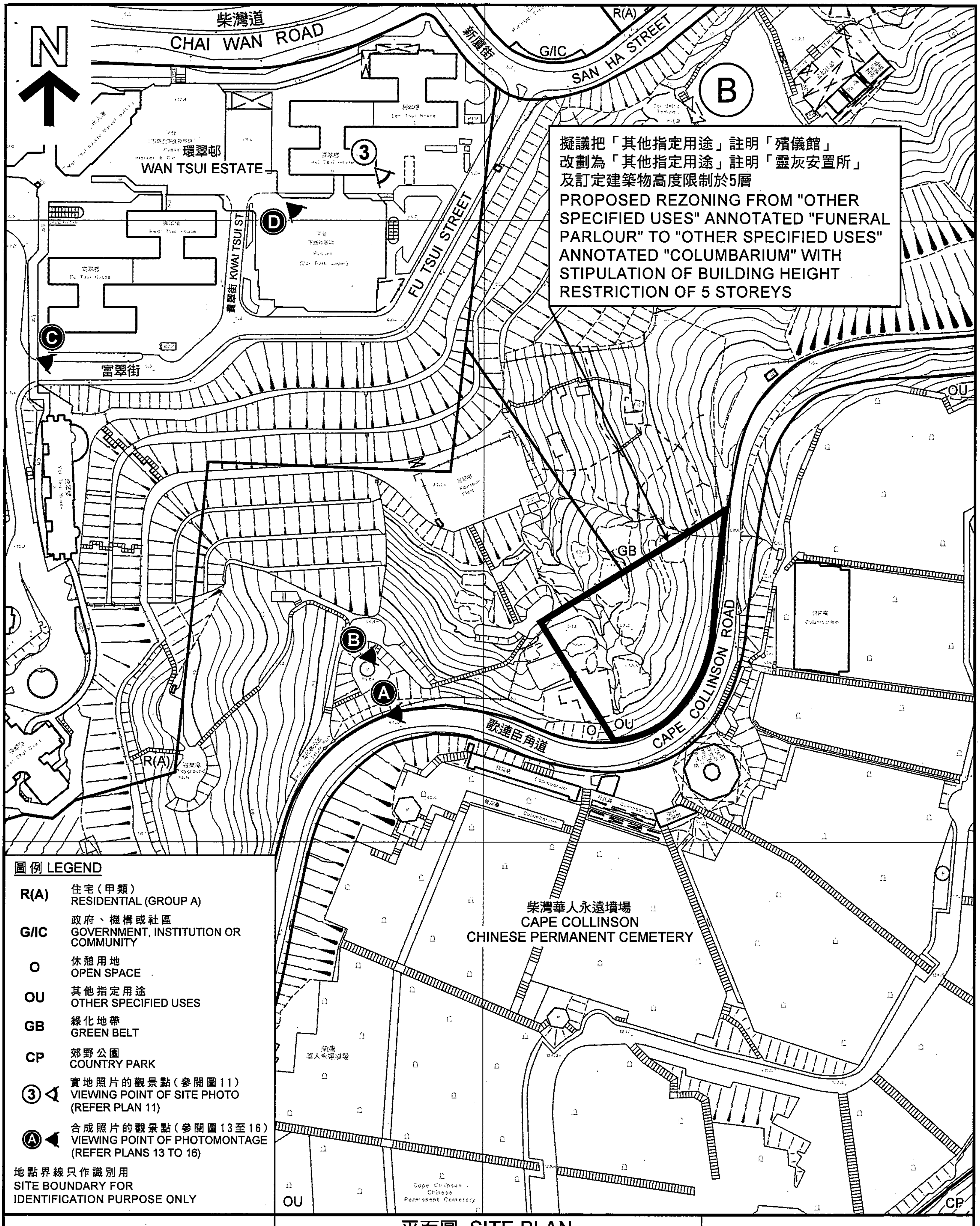
柴灣分區計劃大綱核准圖編號S/H20/21的擬議修訂項目
PROPOSED AMENDMENTS TO APPROVED CHAI WAN OZP No. S/H20/21

修訂項目A
AMENDMENT ITEM A

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/H20/16/1

圖 PLAN
8



本摘要圖於2016年8月19日擬備，所根據的資料為測量圖編號 11-SE-19A、B、C及D

EXTRACT PLAN PREPARED ON 19.8.2016 BASED ON SURVEY SHEETS No. 11-SE-19A, B, C & D

平面圖 SITE PLAN

柴灣分區計劃大綱核准圖編號S/H20/21的擬議修訂項目

PROPOSED AMENDMENTS TO APPROVED CHAI WAN OZP No. S/H20/21

修訂項目B

AMENDMENT ITEM B

SCALE 1 : 2 000 比例尺

米 METRES 40 0 40 80 米 METRES

規劃署 PLANNING DEPARTMENT

參考編號 REFERENCE No. M/H20/16/1

圖 PLAN 9

地點界線只作識別用
SITE BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

本摘要圖於2016年7月22日擬備，所根據的資料為地政總署於2016年1月1日拍得的航攝照片編號CS62497

EXTRACT PLAN PREPARED ON 22.7.2016 BASED ON AERIAL PHOTO No.CS62497 TAKEN ON 1.1.2016 BY LANDS DEPARTMENT

航攝照片 AERIAL PHOTO

柴灣分區計劃大綱核准圖編號S/H20/21的擬議修訂項目

PROPOSED AMENDMENTS TO APPROVED CHAI WAN OZP No. S/H20/21

修訂項目B

AMENDMENT ITEM B

規劃署

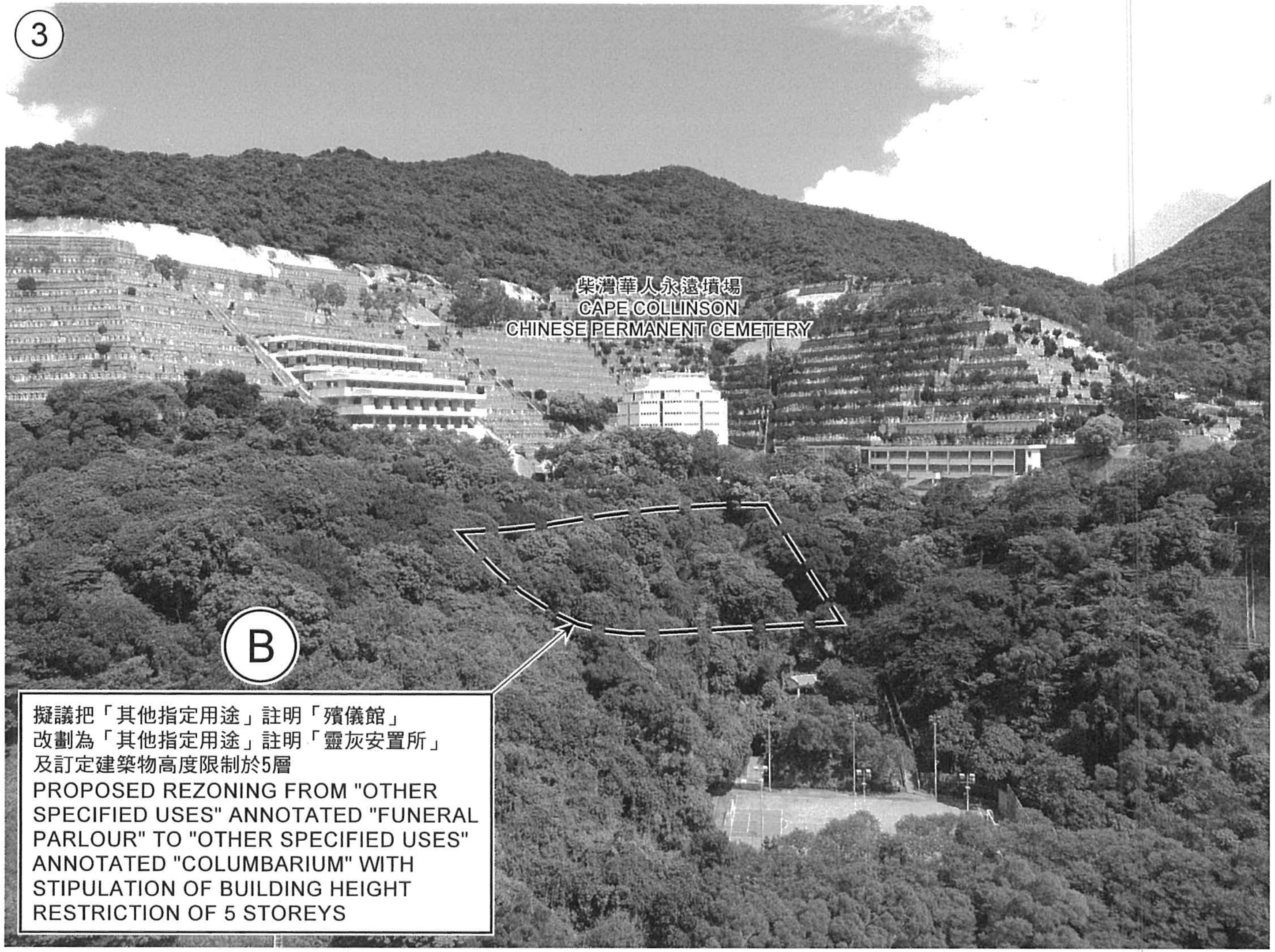
PLANNING DEPARTMENT

參考編號 REFERENCE No.

M/H20/16/1

圖 PLAN

10



地點界線只作識別用
SITE BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

本圖於2016年7月22日擬備，所根據的資料為攝於2016年7月5日的實地照片
EXTRACT PLAN PREPARED ON 22.7.2016
BASED ON SITE PHOTO TAKEN ON 5.7.2016

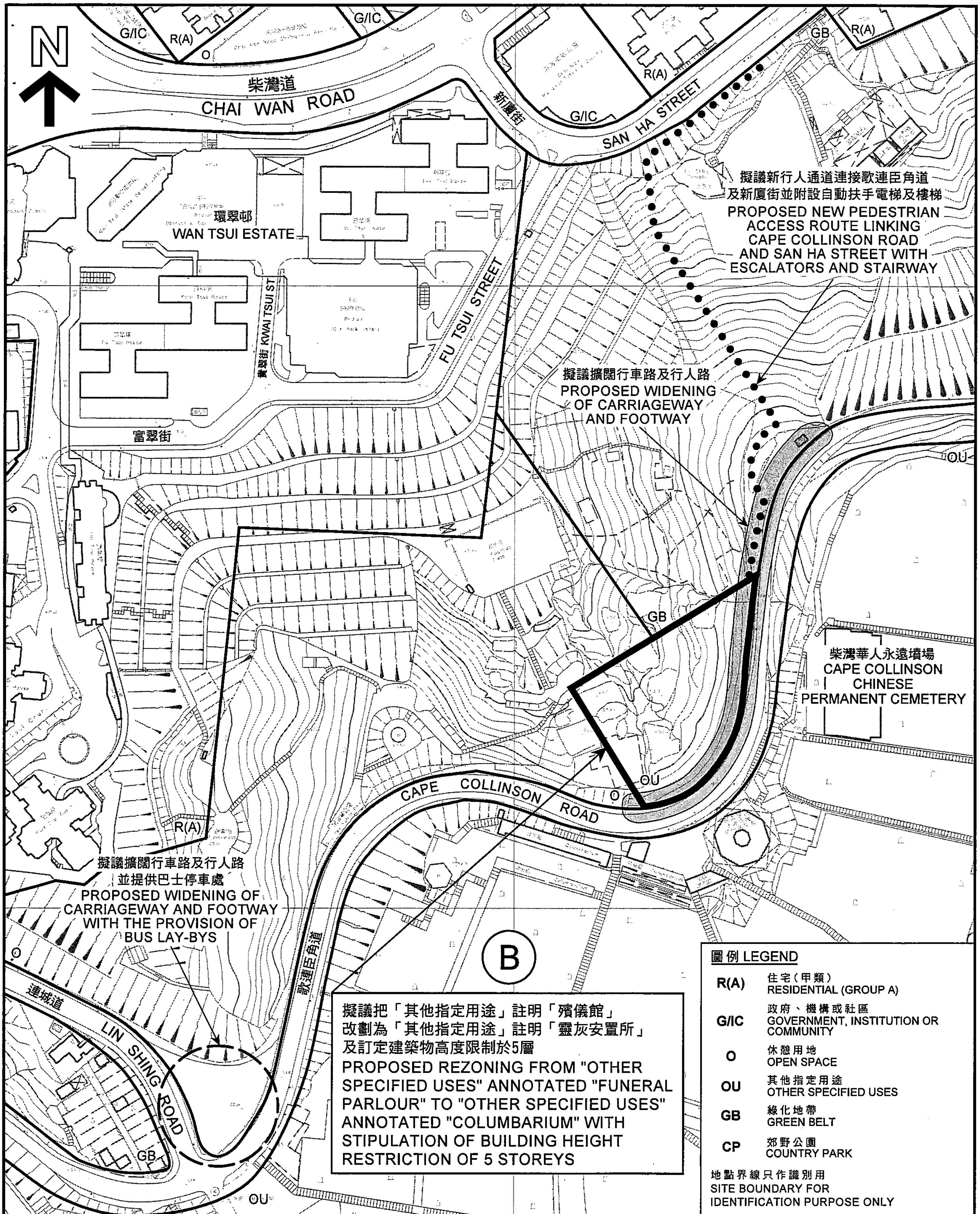
實地照片 SITE PHOTO

柴灣分區計劃大綱核准圖編號S/H20/21的擬議修訂項目
PROPOSED AMENDMENTS TO
APPROVED CHAI WAN OZP No. S/H20/21
修訂項目B
AMENDMENT ITEM B

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/H20/16/1

圖 PLAN
11



本摘要圖於2016年8月18日擬備，所根據的資料為測量圖編號 11-SE-19A、B、C及D

EXTRACT PLAN PREPARED ON 18.8.2016 BASED ON SURVEY SHEETS No. 11-SE-19A, B, C & D

擬議交通紓緩措施
PROPOSED TRAFFIC MITIGATION MEASURES

柴灣分區計劃大綱核准圖編號S/H20/21的擬議修訂項目

PROPOSED AMENDMENTS TO APPROVED CHAI WAN OZP No. S/H20/21

修訂項目B

AMENDMENT ITEM B

SCALE 1 : 2 000 比例尺

米 METRES 40 0 40 80 米 METRES

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/H20/16/1

圖 PLAN
12

現有景觀
EXISTING VIEW

擬議發展
PROPOSED DEVELOPMENT

本圖於2016年8月19日擬備，所根據的資料由建築署提供
PLAN PREPARED ON 19.8.2016 BASED ON PLAN PROVIDED BY ARCHITECTURAL SERVICES DEPARTMENT

合成照片 PHOTOMONTAGE

觀景點A － 歌連臣角道
VP A - CAPE COLLINSON ROAD
柴灣分區計劃大綱核准圖編號S/H20/21的擬議修訂項目
PROPOSED AMENDMENTS TO APPROVED CHAI WAN OZP No. S/H20/21
修訂項目B
AMENDMENT ITEM B

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/H20/16/1

圖 PLAN
13

現有景觀
EXISTING VIEW

擬議發展
PROPOSED DEVELOPMENT

本圖於2016年8月19日擬備，
所根據的資料由建築署提供
PLAN PREPARED ON 19.8.2016
BASED ON PLAN PROVIDED BY
ARCHITECTURAL SERVICES
DEPARTMENT

合成照片 PHOTOMONTAGE

觀景點B － 環翠邨公園
VP B - WAN TSUI ESTATE PARK
柴灣分區計劃大綱核准圖編號S/H20/21的擬議修訂項目
PROPOSED AMENDMENTS TO
APPROVED CHAI WAN OZP No. S/H20/21
修訂項目B
AMENDMENT ITEM B

規劃署
PLANNING
DEPARTMENT

參考編號
REFERENCE No.
M/H20/16/1

圖 PLAN
14

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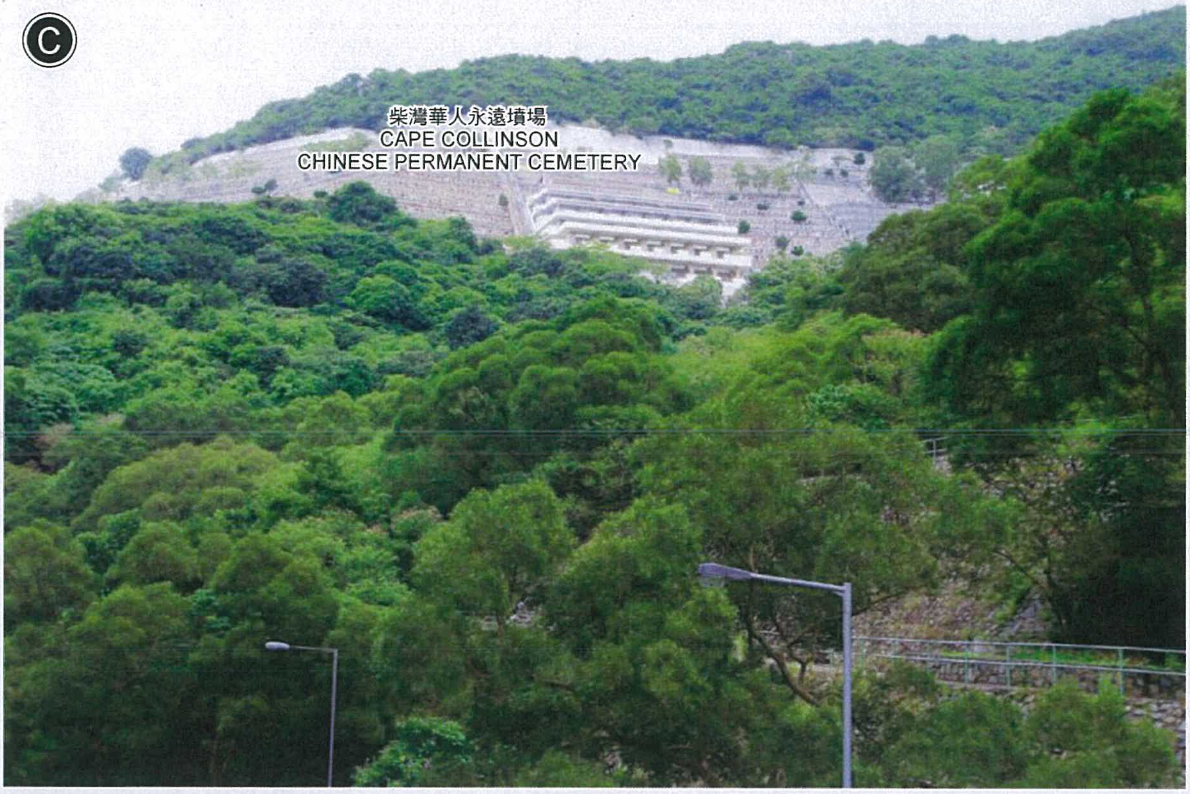

現有景觀
EXISTING VIEW

擬議發展
PROPOSED DEVELOPMENT

本圖於2016年8月19日擬備，
所根據的資料由建築署提供
PLAN PREPARED ON 19.8.2016
BASED ON PLAN PROVIDED BY
ARCHITECTURAL SERVICES
DEPARTMENT

合成照片 PHOTOMONTAGE

觀景點C － 富翠樓旁行人路
VP C - PAVEMENT NEAR FU TSUI HOUSE
柴灣分區計劃大綱核准圖編號S/H20/21的擬議修訂項目
PROPOSED AMENDMENTS TO
APPROVED CHAI WAN OZP No. S/H20/21
修訂項目B
AMENDMENT ITEM B

規劃署
PLANNING
DEPARTMENT

參考編號
REFERENCE No.
M/H20/16/1

圖 PLAN
15

現有景觀
EXISTING VIEW

擬議發展
PROPOSED DEVELOPMENT

本圖於2016年8月19日擬備，所根據的資料由建築署提供 PLAN PREPARED ON 19.8.2016 BASED ON PLAN PROVIDED BY ARCHITECTURAL SERVICES DEPARTMENT	**合成照片 PHOTOMONTAGE** 觀景點D － 環翠邨平台遊樂場 VP D - WAN TSUI ESTATE PODIUM PLAYGROUND 柴灣分區計劃大綱核准圖編號S/H20/21的擬議修訂項目 PROPOSED AMENDMENTS TO APPROVED CHAI WAN OZP No. S/H20/21 修訂項目B AMENDMENT ITEM B	規劃署 PLANNING DEPARTMENT 參考編號 REFERENCE No. M/H20/16/1	圖 PLAN 16