香港特別行政區政府
The Government of the Hong Kong Special Administrative Region

運輸及房屋局
香港九龍何文田
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Transport and Housing Bureau
33 Fat Kwong Street, Homantin,
Kowloon, Hong Kong

本局檔號 Our Ref. HD(CEPWP)12/6/10
來函檔號 Your Ref.

31 December 2018

Clerk to Public Works Subcommittee
Legislative Council Finance Committee
Legislative Council Complex
1 Legislative Council Road
Central, Hong Kong
(Attn: Ms Doris LO)

Dear Ms LO,

Thank you for your email dated 11 December 2018. In the email, you attached a letter dated 11 December 2018 from the Hon CHU Hoi-dick (Annex 1) requesting the Government to provide supplementary information on -

(1) details of on-cost payable to the Hong Kong Housing Authority;
(2) services provided by community health centre (CHC) and the indicative list of furniture and equipment items;
(3) services provided by residential care home for the elderly (RCHE); and
(4) the project design.

2. After consolidation of information gathered from relevant bureau and departments, we provide a reply to the above issues as follows -

(1) Details of on-cost payable to the Hong Kong Housing Authority

3. The on-cost rate 12.5% of the construction cost is a standard rate set by the Government and the Hong Kong Housing Authority in March 2006. It applies to the entrustment works to building projects of the Hong Kong Housing Authority from the Government. The on-cost payable to the Hong Kong Housing Authority includes

design (4.8%), contract administration (4.8%) and administrative overhead (2.9%). We also adopted the same arrangement for 202SC – Community hall-cum-social welfare facilities at Queen's Hill, Fanling.

(2) Services provided by CHC and the indicative list of furniture and equipment items;

4. To dovetail the Government's policy initiative to enhance primary care, the Hospital Authority (HA) has set up CHCs in Tin Shui Wai North, North Lantau and Kwun Tong. The Tin Shui Wai (Tin Yip Road) CHC, the first of its kind to be designed based on the primary care development strategy and service model, commenced service in mid-2012. The CHCs in North Lantau and Kwun Tong started operation in September 2013 and March 2015 respectively.

5. The services provided by the CHCs include medical consultation, multi-disciplinary healthcare services (such as physiotherapy, occupational therapy), and patient empowerment and support services, etc. The multi-disciplinary teams provide structured risk assessment and targeted interventions for chronic disease patients with diabetes mellitus or hypertension, as well as risk assessment and management for fall prevention, smoking counselling and cessation, dietetics counselling, etc. Besides, the CHCs provide services and facilities for enhancement of patients' self-care, encouraging patients to make use of community resources for enhancing their ability in disease management. By providing comprehensive risk assessment and treat-to-target intervention, prevention of disease progression and follow-up are appropriately delivered to patients, which on the one hand reduces the patients' risk of disease complications and the need of medical consultation; while on the other hand consultation quotas can be released to patients with episodic illnesses (such as patients suffering from influenza, cold, gastroenteritis). Through a series of primary healthcare services for enhanced chronic disease management, the multi-disciplinary teams provide a more targeted care for high risk chronic disease patients, including those patients who require targeted care due to health problems or disease complications.

6. To further enhance patients' knowledge and ability in self-management of chronic diseases, the HA collaborates with non-governmental organizations to launch the Patient Empowerment Programme (PEP). The objectives of PEP are to enhance patients' knowledge and ability in self-management of chronic diseases so as to prevent possible complications; further enhance primary care and disease prevention; and enhance collaboration between the HA and partner organizations in the community on patient care. Suitable target patients (patients with Hypertension or Type 2 Diabetes

Mellitus) are invited to receive this service through various channels (General Outpatient Clinics (GOPCs) / CHCs, Family Medicine Specialist Clinics or Specialist Outpatient Clinics of HA; General Outpatient Clinic Public-Private Partnership Programme).

7. The HA has been promoting the existing three CHCs and their services through various channels. The District Councils concerned were consulted at the construction and planning stages of the CHCs to keep the community informed of the progress and collect views from community partners and local residents. When the three CHCs started operation, publicity was launched by HA at the district level, including producing pamphlets, distributing leaflets, displaying posters, notices and banners, and inviting District Councilors to conduct site inspection and share their views, so as to enable the local community to learn more about the CHCs' services.

8. For general publicity, the HA issued press releases to announce the completion and commissioning of the CHCs and invited media visits and coverage. Moreover, feature articles about the services of the three CHCs were published by the Primary Care Office in its publication Primary Care Link which is made available to primary care stakeholders and the public on the Primary Care Office's website and widely distributed to various districts.

9. Local residents have made full use of the services provided by the three CHCs since they started operation. The service attendances in the Tin Shui Wai (Tin Yip Road) CHC, North Lantau CHC and Kwun Tong CHC in the past three years is set out in the table below.

CHC	2015-16	2016-17	2017-18
Tin Shui Wai (Tin Yip Road) CHC	82 431	99 944	109 946
North Lantau CHC	64 826	68 326	66 384
Kwun Tong CHC	235 505	244 972	234 983

10. Same as the existing three CHCs, the design of the proposed CHC at Tuen Mun Area 29 West is based on the primary care development strategy and service model. The services to be provided include medical consultation, multi-disciplinary healthcare services, chronic disease management and patient education and support services (including the aforementioned PEP), so as to provide a comprehensive, coordinated and person-centred primary care services for the citizens.

11. The HA also planned to set up a Patient Resources Centre (PRCs) in the

proposed CHC, which works with the PRCs in hospitals in supporting patients and their families/carers. Currently, the existing PRCs in hospitals provide services including the facilitation of the networking between patient and patient groups for mutual support, in particular to leverage on the valuable contribution patient groups play in helping to educate and motivate their fellow patients in promoting self-care. Many patient groups are now involved in activities of the existing PRCs to show concern and care to patients, while some establish community networks and organise regularly peer sharing and workshops on self-care practices to cope with their chronic diseases. PRCs also engages volunteers to collaborate with clinical teams to strengthen the psycho-social support and empowerment to patients. The partnership with our healthcare professionals also brings about more trust between the two parties.

12. Generally speaking, the service hours of the CHCs in the HA is from 9 a.m. to 1 p.m. and from 2 p.m. to 5 p.m. from Mondays to Fridays, and from 9 a.m. to 1 p.m. on Saturdays. Upon full functioning of the CHC in Tuen Mun Area 29 West, it is estimated that there would be around 15 000 person-time per day visiting that CHC. The services received by patients also include wound dressing, injection, and various kind of assessments and examinations. Same as other districts, CHCs and GOPCs in the same district will complement each other in terms of service capacity and scope of service. The consultation quotas of GOPCs and CHCs in close proximity in the same district are pooled together to facilitate the provision of primary care services in that district.

13. Regarding the proposed development at Tuen Mun Area 29 West, which includes the public housing and the proposed CHC-cum-RCHE, the HA has been working closely with the Housing Department in consulting the Tuen Mun District Council in November 2016, its Environment, Hygiene and District Development Committee in November 2012, May 2017 and July 2018 and the Tuen Mun Northwest Area Committee in February 2014, August 2017 and June 2018. The HA will continue to closely communicate with the District Council, so as to enable the local community to understand the planning progress of the CHC and collect views from community partners and local residents. Besides, the HA will continue to consult the District Council nearer to the service commencement date, and launch publicity and promotion at the district level and for the wider population, so as to enhance the understanding of the local community of the CHC services.

14. "Intruder Detection System", a security system of higher standard, is different from the "Integrated Security Systems: Access Control System" and "Integrated Security Systems: Closed Circuit Television System". According to the HA's relevant guideline on security, Intruder Detection System is mainly installed in areas requiring

higher level security such as pharmacy with large amount of drug storage and Account Office, where cash is stored, to prevent theft. Intruder Detection System is commonly used in the facilities of HA. The Intruder Detection System would monitor the status of the doors/windows and roller shutters. If any unauthorised person breaking into the restricted area is detected, the alarm system will be triggered to make alarm onsite as well as to alert the security vendor via telephone system. Immediate actions such as reporting to the police or deploying security staff could be taken to respond to the situation.

15. Private Automatic Branch Exchange (PABX) System is an automatic telephone switching system which provides over a hundred telephone lines or fax lines for internal communication. The proposed CHC is a four-storey building with a total gross floor area of 126 000 square metres and equipped with a large number of rooms. Upon service commencement, a large number of healthcare professionals will rely on these telephone and fax lines for internal communication in order to maintain the operation. The Staff Call System is a set of direct signal devices installed in the consultation room or treatment room for calling medical staff directly to provide immediate services to patients when needed. Based on the operation experience of other HA facilities, it is necessary to install the PABX System and the Staff Calling System in this proposed CHC to enhance internal communications, particularly during emergency situations, when staff can be mobilised promptly to respond. The PABX System and the Staff Call System are installed in other HA facilities.

16. All the items listed at Enclosure 12 to PWSC(2018-19)33 have also been installed in the other facilities of HA. HA will check the relevant prices and make the quotations for the F&E items to be procured in accordance with the internal procedures.

17. Generally speaking, the facilities of the clinics will be installed in accordance with the services provided in the clinics. Since the service types and the service scales of the clinics under Department of Health and the CHCs are different, it is not appropriate to make comparison between them.

(3) Services provided by RCHE

18. As at 30 November 2018, there were 2 318 elder persons in Tuen Mun district being waitlisted for subsidised residential care places for the elderly in the Central Waiting List for subsidised long term care services.

19. Apart from the Tuen Mun Area 29 West RCHE project, there are two planned

RCHE projects in Tuen Mun district, which are the conversion of the ex-CCC Kei Leung Primary School in Leung King Estate and the private residential development project at ex-Kwong Choi Market respectively. Each of the two planned projects will provide an estimated capacity of 100 residential care places. Furthermore, Pok Oi Hospital has proposed under the Special Scheme on Privately Owned Sites for Welfare Uses for the development of an elderly home on a piece of land at Fuk Hang Tsuen Road, Lam Tei. The project will provide an estimated capacity of 1 400 residential care places.

20. Tuen Mun Area 29 West falls into Tuen Mun Outlined Zoning Plan (OZP) No. S/TM/34, Residential (Group A) 21 with maximum permissible domestic and non-domestic plot ratios of 6 and 2 respectively and the maximum building height 140 mPD. Under the current design, the proposed project at Tuen Mun Area 29 West has fully utilised the above plot ratios and building height restriction. As such and under requirement stipulated in Residential Care Homes (Eldery Persons) Regulation (Cap.459 section 23) that no parts of residential care homes shall be situated at above 24m, the RCHE could only be expanded on the same floor with slight increase in places even if the non-domestic plot ratio could be increased to 3. However, the required application to Town Planning Board for increase in plot ratio and related design change process would delay the scheduled completion date for the project (including the CHC and RCHE) and the public housing development.

(4) The project design

21. For transportation, existing Light Rail Transit Tin King station at south-east of the subject site will provide accessibility to major areas within the Tuen Mun District. Existing nearby minibus stops, bus stops and bus terminus will provide public transportation serving the subject site within and outside the district. According to the Traffic Impact Assessment (TIA) report as prepared by the consultant of the Hong Kong Housing Authority and approved by Transport Department (TD), the result shows that the current public transport provisions and existing road network will be able to cater for the demand generated by the whole development at Tuen Mun Area 29 West (including public housing development, CHC and RCHE). While a certain part of the TIA report includes third party information which the data provider does not wish to disclose, the TIA report with concerned third party information redacted is now provided for your reference (Annex 2). As per usual practice, the TIA report was prepared based on the preliminary development parameters by that time with certain degree of contingency for assessment, to allow for any necessary minor changes in the detailed design stage. Consultant of the Hong Kong Housing Authority is currently updating the TIA based on

the latest development parameters for TD's further review, and TD has indicated no adverse comment so far.

22. The proposed project at Tuen Mun 29 West has its own refuse storage and material recovery chamber and it is not necessary to use the refuse collection point in Po Tin Estate.

23. Construction waste includes inert and non-inert materials. In construction contract, the Hong Kong Housing Authority will require the contractor to submit a plan (include inert and non-inert materials) for approval. The plan shall include necessary measures including sorting methodology, estimated quantities and disposal arrangement in order to recycle, reuse and reduce the construction waste. The Hong Kong Housing Authority will monitor the contractor's daily operation in waste disposal to comply with the approved plan. The Hong Kong Housing Authority will implement a trip-ticket system to monitor the disposal of inert and non-inert construction waste in public fill reception facilities and landfills respectively.

24. The car parking provision for the public housing development and the CHC at Tuen Mun Area 29 West is proposed with reference to the "Hong Kong Planning Standards and Guidelines" and as agreed with TD. The provision of private car parking space and bicycle parking space in the public housing development and CHC at Tuen Mun Area 29 West is as follows -

	Community Health Centre	**Public Housing Development**
Private car parking Space	49 nos.	24 nos.
Bicycle parking space	N/A	66 nos.

25. For the location of private car parking space, please refer to Enclosure 2 to PWSC(2018-19)33. The location of bicycle parking space is close to the estate entrance at the roundabout (Annex 3).

Yours sincerely,

(Michael W.K. HONG)
for Secretary for Transport and Housing

c.c.

Ir Dr Hon LO Wai-kwok, SBS, MH, JP, Public Works Subcommittee of the Finance Committee of the Legislative Council

Secretary for Financial Services and the Treasury	(Attn.: Ms HSIA Mai Chi, Margaret)
Secretary for Food and Health	(Attn.: Ms AU Wan-sze, Wendy)
Director of Architectural Services	(Attn.: Mr LI Kiu-yin, Michael)
Director of Social Welfare	(Attn.: Mr TAN Tick-yee)
Director of Housing	(Attn.: Ms TAM Kwai-yee, Ann Mary)

敬啟者

關於：屯門第 29 區西社區健康中心暨安老院舍

如題，謹查詢如下：

（一）委託費用
工程費用 10.464 億中，9400 萬為給予房委會的委託費用。請告知：
（1） 委託費用訂定在 12.5%水平，是否一貫做法？有否相關指引？請提供例子，以資參考。
（2） 委託費用訂定在 12.5%水平，是由政府訂定，抑或房委會建議？
（3） 該項委託費用是支付予房委會工程計劃的「設計、行政及監督費用」。請列出分項細明。

（二）社區健康中心
（1）2017 年 1 月 11 日，陳沛然議員於立法會會議上就社區健康中心成效提出書面質詢（見超連結 https://www.info.gov.hk/gia/general/201701/11/P2017011100269.htm）。

該問題中，陳議員直指：「不少居於三間社區健康中心周邊的居民表示，不知悉區內設有社區健康中心」。

本人留意到陳肇始教授就此之詳細答覆，請告知，上述問題有否改善，或當局評估該等宣傳措施之成效如何？眼下的屯門第 29 區西社區健康中心，又將如何克服相關問題？

（2）承上，請告知該三間社區健康中心，即天水圍天業路社區健康中心，北大嶼山健康中心，觀塘社區健康中心，過去三年，診所診症的就診容量為何，就診人次為何，比例為何。

（3）承上，陳肇始教授於回覆陳議員質詢時提述到的下列各項，請告知服務成效及檢討為何：

（i）為患有糖尿病或高血壓等疾病的長期病患者進行健康風險評估及針對性護理
（ii）傷口護理
（iii）摔跌風險評估及管理
（iv）戒煙輔導
（v）營養指導

（4）據屯門區議會文件（2018-2019 年屯門區議會環境、衞生及地區發展 委員會第五次會議記錄），此一社區健康中心亦設有「病人自強計劃」服務，請簡介服務內容及對象。

（5）就是次撥款文件附件 12，請說明
（i）為何已花 4 百萬安裝綜合「保安系統：出入管制系統」及「綜合保安系統：閉路電視系統」後仍需 1 百萬安裝「侵入者偵測系統」？
（ii）請簡介何謂「專用自動電話交換系統」及「員工召喚系統」。

（iii）請說明附件 12 中的所有項目是否皆於目前衞生處診所安裝？

（6）請簡介「健康教育室」及「病人資源中心」服務內容及對象。

（7）請說明此一社區健康中心的每日就診人次容量，及一般衞生處診所的就診人次容量。

（三）安老院舍

按社會福利署地區概覽，2017 年屯門區有長者 71500 人，相信配合各項規劃，未來十年長者數目會倍增。請告知：

（1）目前屯門區輪候院舍人數為何？

（2）除此一安老院舍外，其他於屯門區已規劃的安老院舍的地點及容量為何？

（3）非住宅部分的地積比若能提高至 3，在目前建築格局下，安老院舍能否擴大至服務更多長者？

（四）交通

請說明本項目（公屋、社區健康中心、安老院舍），有否額外交通設施或配套？請提供交通影響評估文件。

（五）垃圾站

本項目落成後其垃圾處理，是否採用寶田邨垃圾站？若然，目前該設施容量是否足夠，會否不勝負荷？

（六）建築廢料

是次撥款文件第 22 段，提述到「2900 公噸(5 .8%)非惰性建築廢物於堆填區處置」。請告知，此 2900 噸廢料，會否先作分揀？目前政府及房委會工程合約中，有否就非惰性建築廢料的處理及分揀，向承建商作出要求或提引？

（七）單車停車處

請告知停車泊位數目、停車泊位佔地、單車泊位數目、單車泊位佔地分別為何。

盼覆，感謝。

此致

工務小組委員會主席盧偉國議員

運輸及房屋局總土木工程師康榮傑

食物及衞生局首席助理秘書長區蘊詩

社會福利署助理署長陳德義

立法會議員朱凱廸謹啟

2018 年 12 月 11 日

附件二 Annex 2

Hong Kong Housing Authority
Term Traffic And Environmental Consultancy Services
2012 – 2014
For New Territories West Region

Instruction No. C11

Housing Development in Tuen Mun Area 29 West

Final Traffic Impact Assessment Report

04	MCST	AA1	AA1
Issue	Prepared	Reviewed/ Checked	Approved

AECOM Asia Company Ltd.

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1. INTRODUCTION

1.1. Background

1.1.1. Hong Kong Housing Authority (HKHA) intends to develop a site at Tuen Mun into a Public Rental Housing (PRH) development, providing 825 flats which are estimated to accommodate a population of up to 2,525 persons.

1.1.2. In addition to PRH, a residential care homes for the elderly (RCHE) and a clinic/Community Health Centre would be developed according to the latest design. The whole subject development, including the domestic flats, RCHE, and clinic, is tentatively programmed for completion in phases from 2020 to 2021. For the purpose of this study, full occupation has been assumed to be 2020.

1.1.3. AECOM Asia Company Ltd. was commissioned by HKHA to carry out a Traffic Impact Assessment (TIA) to appraise the potential traffic impact generated by the subject development on the road network in vicinity of the subject site and provide mitigation measures, if necessary.

1.2. Study Objective

1.2.1. The objectives of the traffic impact study are as follows:

- To assemble available data relevant to the Subject Development and conduct necessary surveys to establish the existing traffic conditions within the area of influence (AOI) of the Subject Site.
- To forecast the traffic and transport conditions in the design year, YR2023, by taking into account general traffic growth and other planned/committed developments.
- To estimate the traffic demand generated/attracted by the Subject Developments and studies the traffic impacts of the local road network in relation to the proposed Subject Site Developments.
- To identify any inadequacies of the local road network in accommodating the additional traffic due to the proposed Subject Site Developments and recommend improvement schemes for both traffic and transportation problems encountered.
- To identify optimum transport facilities provision for the Subject Site Development, including parking and loading/unloading facilities.

2. EXISTING CONDITION

2.1. Site Description

2.1.1. The Subject Site is located within the Tuen Mun District of New Territories West, surrounded by residential including Leung King Estate, Po Tin Estate, and Tin King Estate. It is bounded by the Leung King Estate access road to the south and the Po Tin Estate access road to the north. The location of the Subject Site is presented in Figure 2.1.

2.1.2. The main access to the Subject Site Development is via Tin King Road and Leung King Estate access road.

2.2. Existing Traffic Condition

2.2.1. In order to review and assess the existing traffic condition within the AOI of the Subject Site Development, classified traffic counts were conducted at the following junctions/road link in the immediate vicinity of the Subject Site. Figure 2.1 also presents location of the surveyed junction/road link.

- J1 – Tin King Road / Leung King Estate Access Road
- J2 – Tin King Road / Ming Kum Road
- J3 – Tsing Tin Road / Ming Kum Road
- J4 – Hing Kwai Street / Tsun Wen Road

2.2.2. The Tuen Mun North West Swimming Pool has been opened in the end of 2012. This study has taken the effect of this swimming pool into account during the course of the Traffic Impact Assessment Study.

2.2.3. The traffic counts were undertaken on a typical weekday in November 2012 during the periods 0730 – 0930 and 1700 – 1900 hours. The morning and evening peak hours were found to be 0730 - 0830 and 1730 - 1830 respectively. The observed traffic flows during these peak hours are shown in Figure 2.2. It has been observed that in the morning peak hour flows are in general higher than those during the evening peak hour.

2.2.4. Junction capacity analysis have been carried out at the identified critical junctions based on the peak hours observed traffic flow. The results are presented in Table 2.1.

Table 2.1 Year 2012 Junction Performance

No.	Junction	Control	Performance(1)	
			AM	PM
J1	Tin King Road / Leung King Estate Access Road	Signal	>100%	>100%
J2	Tin King Road / Ming Kum Road	Signal	73%	>100%
J3	Tsing Tin Road / Ming Kum Road	Signal	75%	>100%
J4	Hing Kwai Street / Tsun Wen Road	Signal	>100%	>100%

Note:

(1) Figures shown represent "Reserve Capacity" (RC) for signal controlled junctions and Design Flow to Capacity" (DFC) for the priority controlled junction and roundabouts.

2.2.5. The results of the analysis show that all critical junctions in the vicinity of the subject development are currently operating satisfactorily, which generally agrees with our site observations.

2.3. Existing Public Transport Facilities

2.3.1. The Subject Site location would be mainly served by Light Rail, Franchised Bus, and GMB. The Leung King Light Rail Station and the Tin King Station are located at approximately 250m and 190m from the Subject Development Site, which is considered to be within acceptable walking distance. Four lines of Light rail are currently serving at Leung King Station and Tin King Station with details of each line presented in Table 2.2.

Table 2.2 Existing Light Rail Services

Route No.	Original	Destination	Peak Headway (min.)
Light Rail Service			
505	Sam Shing	Siu Hong	6 – 9
507	Tuen Mun Ferry Pier	Tin King	6 – 8
615	Tuen Mun Ferry Pier	Yuen Long	12 – 15
615P	Tuen Mun Ferry Pier	Siu Hong	10 – 12

2.3.2. There are currently 10 franchised bus routes, 4 GMB routes, and 1 MTR feeder service serving along Tin King Road which the location of all the bus stops are within 250m walking distances.

Table 2.3 Existing Light Rail, Franchised Bus and GMB Services

Route No.	Original	Destination	Peak Headway (min.)
Franchised Bus Service			
B3A	Shan King Estate	Shen Zhen Bay Point	30
58M	Leung King Estate Bus Terminus	Kwai Fong Railway Station Bus Terminus	4 – 6
58X	Leung King Estate Bus Terminus	Mong Kok East Railway Station Bus Terminus	4 – 8
258D	Po Tin	Lam Tin Railway Station Bus Terminus	6 – 7
258S	Shan King Bus Terminus	Lam Tin Railway Station Bus Terminus	n.a
260X	Po Tin	Hung Hom Railway Station Bus Terminus	7 – 10
960	Kin Sang Bus Terminus	Wan Chai Ferry Pier Bus Terminus	4 – 8
960A	Central	Hung Shui Kiu	n.a.
960B	Quarry Bay	Hung Shui Kiu	15
E33P	Siu Hong Railway Station	Airport Ground Transportation Center	15
N260	Tuen Mun Pier Bus Terminus	Mei Foo Bus Terminus	n.a.
GMB Service			
44A	Tuen Mun Station PTI	Sheung Shui Station	2 – 5
44B	Lok Ma Chau (San Tin) PTI	Tuen Mun Station PTI	15 – 20
47S	Leung King Estate	Mong Kok	15 – 20
48S	Tuen Mun Ferry Pier	Mong Kok	15 – 20
MTR Feeder Service			
K58	Fu Tai	Castle Peak Bay	8

3. FUTURE SITUATION AND SUBJECT SITE DEVELOPMENT

3.1. Subject Site Development

3.1.1. The Subject Site Development includes PRH, RCHE, and clinic/Community Health Centre. Summary of the Subject Site Development details are presented as follows:

Table 3.1 Summary of the Subject Site Development Parameters

Parameters	Proposed Submission
Housing Type	Public Rental Housing (PRH)
Population	2,525
Persons/flat	3.06
Number of Flats	825
Average Flat size	33.16 m^2
RCHE	2,505m^2 (100-place)
Clinic/Community Health Center	7,206m^2

3.1.2. The Subject Site Development is tentatively programmed for completion in 2019-2020. For purpose of the Study and future year traffic modelling, it has been assumed that full occupation of the Subject Site Development including the PRH, RCHE, and Clinic/Community Health Center, will occur in 2020 and the design year would be 3 years after full completion which is 2023.

3.1.3. Table 3.2 summarizes the schedule of the proposed redevelopment.

Table 3.2 Proposed Development Assumptions

No. of Block	Flat Type	Total No. of Flat Provided
1	1P/2P	99
	Other Flat Type	726
1	-	825

3.2. Development Vehicular Access Arrangement

3.2.1. The Subject Site Development related traffic would be mainly served by the internal road connecting with the existing Leung King Estate Access Road which would eventually lead to Tin King Road.

3.2.2. The main vehicular access will be provided for the Subject Site Development is located along the existing Leung King Estate Road, which also serves as the EVA entrance for the residential as well as the RCHE and the CHC. A supplementary vehicular access will also be provided at the existing Refuge Collection Point 1 (RCP1), connecting with Po Tin Estate. A control kiosk/gate will be in place to restrict the access for authorised user only.

4. TRAFFIC IMPACT ASSESSMENT

4.1. Site Traffic Generation

4.1.1. The likely volume of traffic generated by the Subject Site Development was estimated based on relevant trip rates provided in 'Traffic Rates for Residential Developments at 95% Confidence Level' adopted in the Transport Planning Design Manual (TPDM) and the trip rates provided in Trip Generation Survey 2006. The adopted trip rates are presented in Table 4.1.

Table 4.1 Adopted Trip Rates

Housing Type	AM Peak Hour		PM Peak Hour	
	Generation	Attraction	Generation	Attraction
PRH (pcu/hr/flat)*	0.0242	0.0226	0.0177	0.0201
RCHE**	0.0743	0.0866	0.1300	0.0990
Clinic/Community Health Centre	0.0743	0.0866	0.1300	0.0990

Note: *The trip rates of PRH with average flat size of 33.16m^2 are adopted from TPDM (Subsidized housing Public Rental with 30 m^2 average flat size)

**It has been assumed that RCHE has a similar trip generation rate with a community health centre

4.1.2. An additional 10% buffer would be applied for the trip generation/attraction. The estimated traffic generation by the site is presented in Table 4.2. It is anticipated that upon completion, the site would generate/attract a total of 30 pcu and 30 pcu during the AM Peak and PM Peak periods respectively.

Table 4.2 Estimated Site Traffic Generation (in pcus/hr)

Housing Type	AM Peak Hour		PM Peak Hour	
	Generation	Attraction	Generation	Attraction
PRH (pcu/hr/flat)	21	19	15	17
RCHE	2	2	3	2
Clinic/Community Health Centre	5	6	9	7
Total	28	27	27	26
Total including 10% buffer*	30	30	30	30

Note: *rounded to the nearest 5 and use 858 flats (previous figure is larger than the current 825 flats) with 10% buffer has been adopted for calculation purpose

4.2. Assessment Scenarios

4.2.1. In order to assess traffic impacts induced by the Subject Site Development, a "Reference Scenario" has been developed incorporating committed land uses in the vicinity. This Reference Scenario would be applied as a base for the establishment of reference traffic flows for the design years. The road network for the Reference Scenario would also include the existing road network and all committed future road improvement schemes within the Subject Site and in its close vicinity.

4.2.2. A "Design Scenario" has also been developed, incorporating the Reference Scenario as a base with the proposed housing development as an addition, assuming the subject site is to be developed into PRH with 2,525 residents together with a RCHE and a CHC.

4.3. Modelling Approach

4.3.1. The 2008-based Base District Traffic Models (BDTMs) developed by Transport Department (TD) for the New Territories West (NTW1) areas were adopted as a base for the traffic forecast with further refinements and updates of highway infrastructure to replicate the local area traffic condition in the study area and updates of the network within the study area, and taking into account the newly planned and committed developments and infrastructures for forecasting to design years.

4.4. Base Year Traffic Model Development

4.4.1. The base year traffic models were developed for this Study. The latest 2008-based NTW1 BDTMs were adopted for model development, with further refinements and updates based on the available road network and development assumptions.

4.4.2. To reflect the changes in traffic demand between 2008 and 2012, the road network has been updated according to the traffic aids, junction layouts and method of control (MOC) collected from the Transport Department (TD).

4.4.3. A traffic survey has been conducted to further refine and validate the traffic model against the observed traffic flow in order to reflect the existing traffic condition of year 2012. The committed developments between 2008 and 2012 have also been taken into account in the trip matrix in order to reflect a realistic 2012 traffic demand. The trip ends for those developments are then estimated using the obtained development schedules and by applying the trip rates which derived from trip generation/attraction survey or published sources.

4.4.4. The validation performances have been compared with the validation criteria set out for the development of the BDTMs. It has been demonstrated that the base year traffic model satisfactorily replicate the year 2012 traffic conditions and able to provide a robust basis for the development of design year traffic models to facilitate traffic forecasting and TIA purposes.

4.5. Traffic Forecast for Traffic Impact Assessment

4.5.1. Following the traffic forecast methodology discussed above, the projected traffic flows for the design year 2023 was produced for the traffic assessment.

4.5.2. Traffic forecast for both the "Reference Scenario" and "Design Scenario" have been obtained, and presented in Figure 4.1 and Figure 4.2 respectively.

4.6. Junction Capacity Assessment

4.6.1. Junction capacity assessment has been carried out at the key road junctions for the 2023 scenario. It covers a total of 4 junctions in close vicinity of the Subject Site (see Figure 2.1 for locations of these junctions). The assessment has been conducted based on existing junction layouts and methods of control.

4.6.2. The junction capacity assessment result for the Reference Scenario and the Design Scenario for year 2023 are summarised in Table 4.3.

Table 4.3 2023 AM(PM) Junction Capacity Assessment Results for Reference and Design Scenarios

No.	Junction	Control	Performance(1)			
			Reference		Design	
			AM	PM	AM	PM
J1	Tin King Road / Leung King Estate Access Road	Signal	>100%	>100%	>100%	>100%
J2	Tin King Road / Ming Kum Road	Signal	62%	98%	53%	92%
J3	Tsing Tin Road / Ming Kum Road	Signal	70%	92%	70%	92%
J4	Hing Kwai Street / Tsun Wen Road	Signal	>100%	>100%	>100%	>100%

Note:

(1) Figures shown represent "Reserve Capacity" (RC) for signal controlled junctions and Design Flow to Capacity" (DFC) for the priority controlled junction and roundabouts.

4.6.3. As shown in Table 4.3, results of the junction capacity assessment show that all critical junctions are performing well within capacity in the AM and PM peak period for both reference case (without subject site development) and the design case (with subject site development).

4.6.4. As the Leung King Estate Access road is a private road with limited accessibility, vehicular traffic generated from the Subject Site development would mainly connect to the major roads through Tin King Road and Ming Kum Road. As both road sections still have carrying capacity available, the proposed PRH development would have minimal impact on the critical junctions.

4.6.5. As a conclusion, the proposed PRH development would not induce adverse traffic impact on the adjacent road network.

5. PROVISION OF PUBLIC TRANSPORT

5.1. Overview

5.1.1. There are 4 existing GMB routes (44A, 44B, 47S, & 48S) and 10 regular franchised bus lines serving in the area of Leung King in Tuen Mun towards various MTR stations and PTIs. The nearest franchised bus stops are located along Tin King Road which are within 250m of walking distances from the Subject Site Development. The Subject Site is also located in close proximity with the Tin King and Leung King Light Rail Station. The available provision of public transport services should be able to cater for the demand by future residents of the proposed PRH development.

5.1.2. Location of the existing public transport facilities in vicinity of the Subject Site is presented in Figure 5.1.

5.2. Pedestrian Forecasts

5.2.1. A pedestrian survey trip generation survey has been conducted on December 4th, 2012 at Shan King Estate. The trip generation rate will be used to estimate level of service of pedestrian facilities as well as the future demand on public transport. An estimation of pedestrian generation for the proposed development was derived. The surveyed trip rates were applied to the proposed number of flats to derive the resident trips. These rates and the estimated pedestrian trips are presented in Table 5.1.

Table 5.1 Pedestrian Generation Rate and Estimated Trips

	AM Peak Hour		PM Peak Hour	
	Generation	Attraction	Generation	Attraction
Pedestrian Generation Rates (person/hr/flat)	0.648	0.120	0.152	0.469
Estimated Trips for 858 flats (person/hr)	555	105	130	400
Estimated Trips for RCHE*	10	10	10	10
Estimated Trips for CHC*	145	145	145	145
Total Trips for Tuen Mun Area 29 West	710	260	290	555

Note: The estimated trips are based on the populations expected to be in the RCHE and CHC which is 120 and 1,000 including staff. Conservative assumptions have been made on the generation and attraction rate, which is 0.1 person/hr and 0.1 person/hr respectively for both AM and PM peak period for RCHE. The conservative assumptions for the CHC would be 4 trips per consultation room per hour for both AM and PM peak period.

5.2.2. The site is located in close proximity from franchised bus stops, GMB stops, and Light Rail Stations, with less than 250m walking distances. All these would be considered as the main mode of public transport for the Subject Site Development.

5.2.3. Based on the Hong Kong 2011 Population Census, "Main Mode of Transport to Place of Work" and "Main Mode of Transport to Place of School", the mode split of mode of transport is summarised as follows:

Table 5.2 Mode Choice for Work and School Trips

Mode of Transport	Work Trips	School Trips	All
Bus	16.3%	8.5%	24.8%

Mass Transit Railway (Local Lines)	17.5%	11.2%	28.7%
Mass Transit Railway (Light Rail)	1.4%	3.2%	4.6%
Public Light Bus	2.9%	2.5%	5.4%

5.2.4. As a conservative assumption, it is assumed that all pedestrian trips generated are either work trips or school trips. As the MTR West Rail Line station is located beyond walking distance from the Subject Site, it is assumed that passengers would connect by using the Light Rail while the others would connect to the MTR local lines mainly by franchised bus.

5.2.5. Based on our in-house CTS model, the OD of Tuen Mun Area is presented in the table below for Year 2021. The respective route choice of public transport will be based on the presented OD distribution.

Table 5.3 Origin and Destination Area for the Tuen Mun Area

Origin/Destination Area	From Tuen Mun	To Tuen Mun
Hong Kong Island	[redacted]	[redacted]
Kowloon	[redacted]	[redacted]
Tuen Mun	[redacted]	[redacted]
Other New Territories Area	[redacted]	[redacted]

5.2.6. Assuming the travel characteristics of design year 2023 are similar with year 2021, the origin and destination of the pedestrian trips generated by the subject site development is estimated as follows:

Table 5.4 Destination Area of the Pedestrian Trips Generated by the Subject Site

Destination Area	AM Peak	PM Peak
Hong Kong Island	70	20
Kowloon	75	10
Tuen Mun	275	155
Other New Territories Area	290	105
Total:	710	290

5.3. Existing Public Transport System

5.3.1. In order to estimate the occupancy of the existing public transport, occupancy survey for franchised bus routes 58M, 58X, 258D, 258S, 260X, and 960 and GMB route 44A was conducted on a typical weekday in November 2012 during the period 0730-0930. The result is presented in Table 5.5.

Table 5.5 Table Occupancy of Public Transport (in number of passenger)

Route	Bus per hour	Average Occupancy (per bus)			Full Capacity (per bus)
		2-hour Peak	1-hour Peak	Half hour Peak	
58M	~ 12	75	82	89	124 - 133
58X	~ 12	47	67	80	124 - 133
258D	~ 10	91	95	97	124 - 133
258S	Not provided after 7:30am				
260X	~ 8	76	83	90	124 - 133
960	~11	25	27	36	124 - 133
44A	~18	16	16	16	16

5.3.2. Based on the public transport occupancy survey and the origin/destination of the public ground transportation services provided in vicinity of the subject site, the following Table 5.6 presents the current available capacity for each destination area:

Table 5.6 Existing Ground Transportation Serving HK Island and Kowloon

Route No.	Destination	Peak Headway (min.)	Available Capacity (per bus)
Public Ground Transportation Serving Subject Site and HK Island			
960	Wan Chai Ferry Pier Bus Terminus	4 – 8	125
960A	Central	N/A	N/A
960B	Quarry Bay	15	N/A
		Minimum Available Capacity (per hour):	1,000 (8 buses)
Public Ground Transportation Serving Subject Site and Kowloon			
58X	Mong Kok East Railway Station Bus Terminus	4 – 8	75
58M	Kwai Fong Railway Station Bus Terminus	4 – 6	60
N260	Mei Foo Bus Terminus	N/A	N/A
258D	Lam Tin Railway Station Bus Terminus	6 – 7	130
260X	Hung Hom Railway Station Bus Terminus	7 – 10	60
47S	Mong Kok	15 – 20	N/A
48S	Mong Kok	15 – 20	N/A
		Minimum Available Capacity (per hour):	2,480 (~30 buses)

5.3.3. The Subject Site is located within walking distances of the Light Rail stations, which provides the Subject Site accessibility within the Tuen Mun Area and other parts of the New Territories. Therefore, additional feeder services are not required for connecting with the rail system.

5.3.4. It has been estimated, based on Table 5.4, that only 65 additional passengers would be generated heading towards HK island while 70 additional passengers would be generated heading towards Kowloon area. Based on our public bus occupancy survey, it is anticipated that enough capacity is provided for additional passengers generated from the proposed development.

5.3.5. Based on the above table, all regular franchised bus services have spare capacity in handling the additional demand. Although the GMB route 44A has minimal spare capacity during the AM peak period, passenger would be able to access Tuen Mun and other New Territories area by the rail system.

5.3.6. With the available spare capacity of the franchised bus and provision of light rail services in close proximity of the Subject Site, the existing public transport provision would be sufficient to handle the additional demand.

5.4. Pedestrian Connectivity

5.4.1. Based on Table 5.1, the total AM peak pedestrian trips generation and attraction to/from the subject site are 675 and 225 respectively, creating a maximum of 880 pedestrian trips during the AM peak period. The total PM peak pedestrian trips generation and attraction to/from the subject site are 255 and 520 respectively, creating a maximum of 755 pedestrian trips during the PM peak period.

5.4.2. According to the Highway Capacity Manual, in order to maintain a pedestrian walkway level of service (LOS) of C or better, the flow rate on the walkway would need to under 33p/min/m, which m represent width of the walkway in meters. LOS C is a generally accepted level of service on public pedestrian walkway.

5.4.3. The widths of pedestrian walkways near Leung King Estate Restricted Road ranges from 2.5m to 2.65m, which allows a maximum pedestrian flow of 3,960ppl/hr to 5,247ppl/hr under LOS C.

5.4.4. Under a conservative assumption on pedestrian trip generation and attraction, the maximum pedestrian trip generation during the day is 1,000ppl/hr during the AM peak period. By comparing to the maximum allowed pedestrian flow under LOS C in the Highway Capacity Manual, which is 3,960ppl/hr for the 2m walkway, there's still enough capacity to maintain a very comfortable walking environment, where space is sufficient for normal walking speeds.

5.4.5. Based on location of the LRT station (Tin King Station) and public bus stations along Tin King Road and Ming Kum Road, majority of the pedestrian will access along pedestrian footpath on the side of the Tuen Mun Northwest swimming pool or from the pedestrian access near Po Tin Estate.

5.4.6. Due to diversified access direction, maximum pedestrian on all footpaths would be less than 1,000 ppl/hr, this would further reduce concerns on potential congestion.

5.4.7. Both main pedestrian access streams towards the residential tower and the CHC would not require crossing of the roundabout, which the major potential access routes are presented in Figure 5.2. Therefore, a signalised junction at the roundabout does not deem necessary.

5.4.8. Based on Table 4.2, the vehicular trip generation and attraction of the subject is 30pcu/hr and 30pcu/hr respectively. With a low vehicular traffic at the roundabout, it is anticipated that pedestrians would have sufficient time to cross when necessary.

5.4.9. In order to enhance pedestrian safety, railings can be provided to gently guide pedestrian accessing the subject site to avoid/minimize unsafe crossing at the roundabout.

6. PARKING PROVISIONS

6.1. Car Parking Provision Standard

6.1.1. The provision guidelines on parking, loading and unloading requirements for the subject PRH development is based on the district based parking standards of 2008, as shown in Table 6.1.

Table 6.1 Guidelines of Parking and Loading/Unloading Facilities

Use	Proposed Rate of Provision				
	Car-Parking Space	LGV Parking Space	Motorcycle Parking Space	Bicycle Parking Space	Loading/ Unloading Bay
Residential	1/33 flats (excluding 1P/2P flats)	1 bay per 300-400 flats	1/180 flats	1/15 flats	1 bay per domestic block

6.1.2. Based on the guidelines described in Table 6.1, the parking, loading and unloading requirements for the PRH development in Tuen Mun Area 29 West are shown in Table 6.2.

Table 6.2 Parking Requirements for Redevelopment

Use	Proposed Space Provision				
	Car-Parking Space	LGV Parking Space	Motorcycle Parking Space	Bicycle Parking Space	Loading/ Unloading Bay
Residential	22	3	5	55	1

Note: Assume 1P/2P Flats would not be provided the parking space.

Total no. of flats accountable for parking = 726 (excluding 99 1P/2P flats)

6.1.3. As there will be 36 consultation rooms in the CHC, an underground parking with 36 spaces will be solely provided for the CHC. Figure 6.1 presents layout of the basement carpark.

6.1.4. One parking space measuring 3.0m (W) X 7.6m (L) with minimum headroom of 2.8m for a 16-seater van will be provided for the RCHE. In addition, the RCHE will also share the loading/unloading lay-by for ambulance near the entrance with the Community Health Centre.

6.1.5. A 9m x 3m ambulance lay-by with cover adjacent to the roundabout and a MGV/HGV layby will be provided at the main entrance.

6.1.6. A taxi/private car lay-by with cover will be provided adjacent to the roundabout.

6.1.7. As the detailed design of the PRH/Clinic is still on-going, the detailed design matters of the PRH/Clinic will be addressed/ resolved at the future "planning brief" approval process stage. HD will continue to resolve/ address all the remaining outstanding issues/details to TD's satisfaction during the future planning brief exercise stage.

7. CONCLUSION

7.1. Summary of Findings

7.1.1. The Hong Kong Housing Authority (HKHA) will develop the site at Tuen Mun Area 29 West into Public Housing (PRH) which will provide 825 flats by year 2020. Traffic impact assessment has been carried out for design year 3 years after full completion which is 2023.

7.1.2. The current operational performance of the critical junctions around the Subject Site was assessed with the observed turning movements. The results revealed that the junctions are currently operating with ample capacities in the Year 2012.

7.1.3. Traffic generation and attraction for the Subject Site and other adjacent developments were estimated using trip rates provided in the Transport Planning and Design Manual and TD 05/2006 Traffic Generation Survey 2006. The 2023 background traffic flows were forecasted by traffic model.

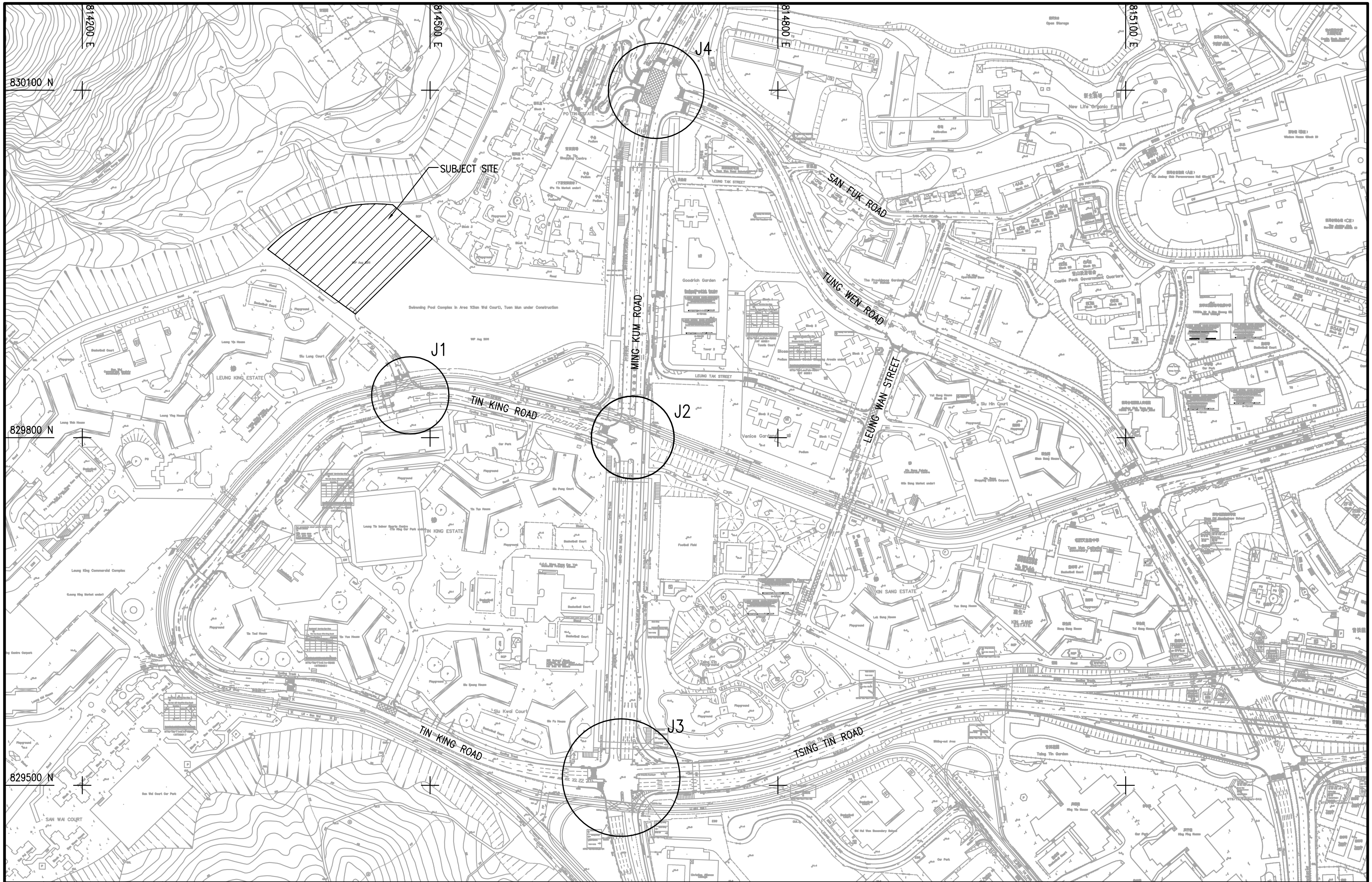
7.1.4. The assessment results indicate that with the proposed development and under the existing traffic circulation, all the critical junctions will operate with acceptable reserve capacity.

7.1.5. The current provisions of public transport are sufficient to cater for the demand generated by the Subject Site Development.

7.1.6. Car parking and loading/unloading facilities have been proposed in accordance with the Hong Kong Planning Standard and Guidelines (HKPSG).

7.1.7. In conclusion, the study has shown that the proposed development is acceptable from traffic point of view no matter under the current traffic circulation or with the proposed development scheme.

FIGURES



CONSULTANT

AECOM

TUEN MUN AREA 29 TRAFFIC IMPACT ASSESSMENT

SITE LOCATION

SCALE	A3 1 : 3000	DATE	
CHECK	–	DRAWN	HJX
JOB No.	60266561	DRAWING No. FIG 2.1	REV –

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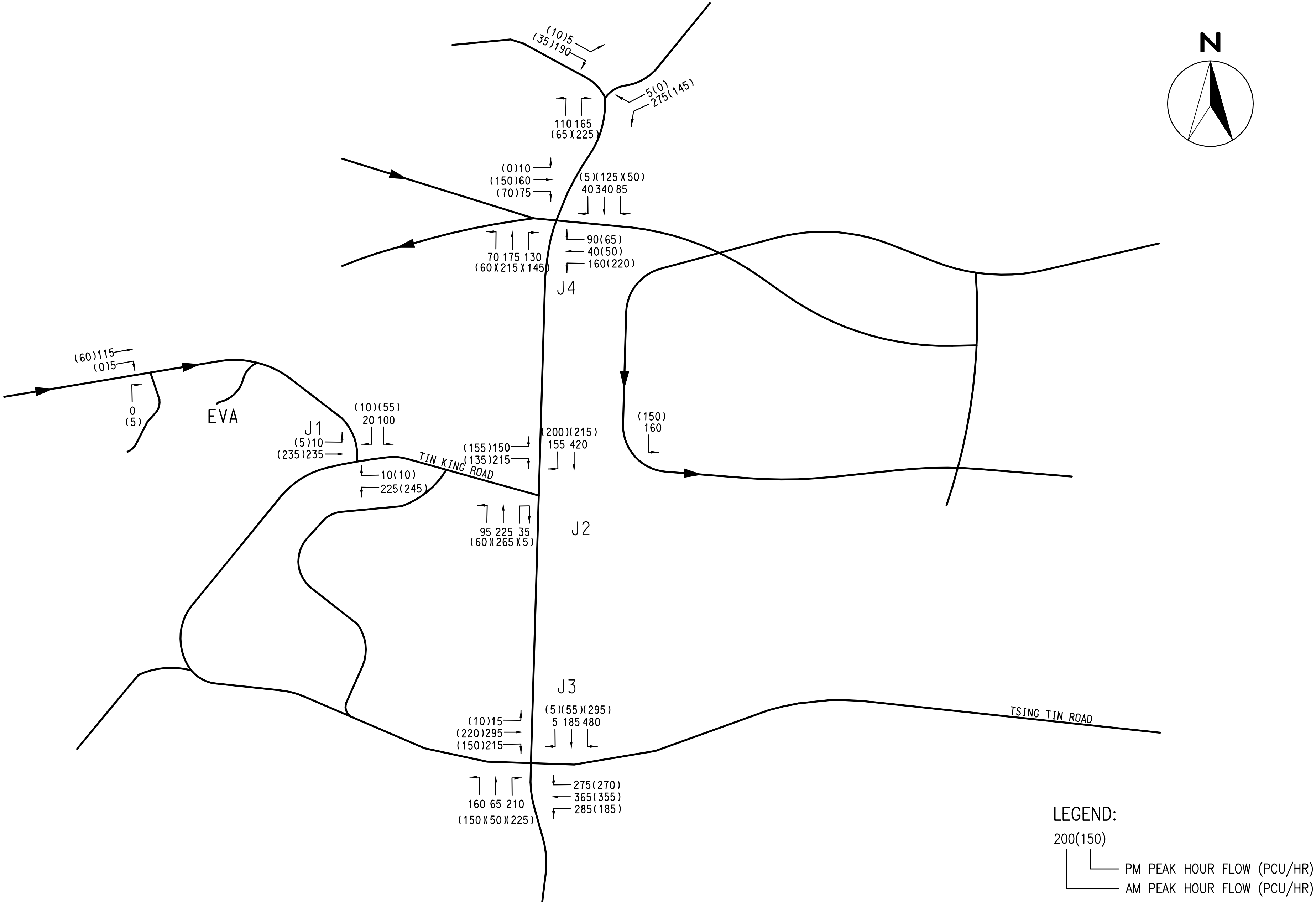

CONSULTANT	TUEN MUN AREA 29 TRAFFIC IMPACT ASSESSMENT	SCALE	N.T.S.	DATE	
AECOM	2012 EXISTING PEAK HOUR TRAFFIC FLOW	CHECK	–	DRAWN	HJX
		JOB No.	60266561	DRAWING No. FIG 2.2	REV –

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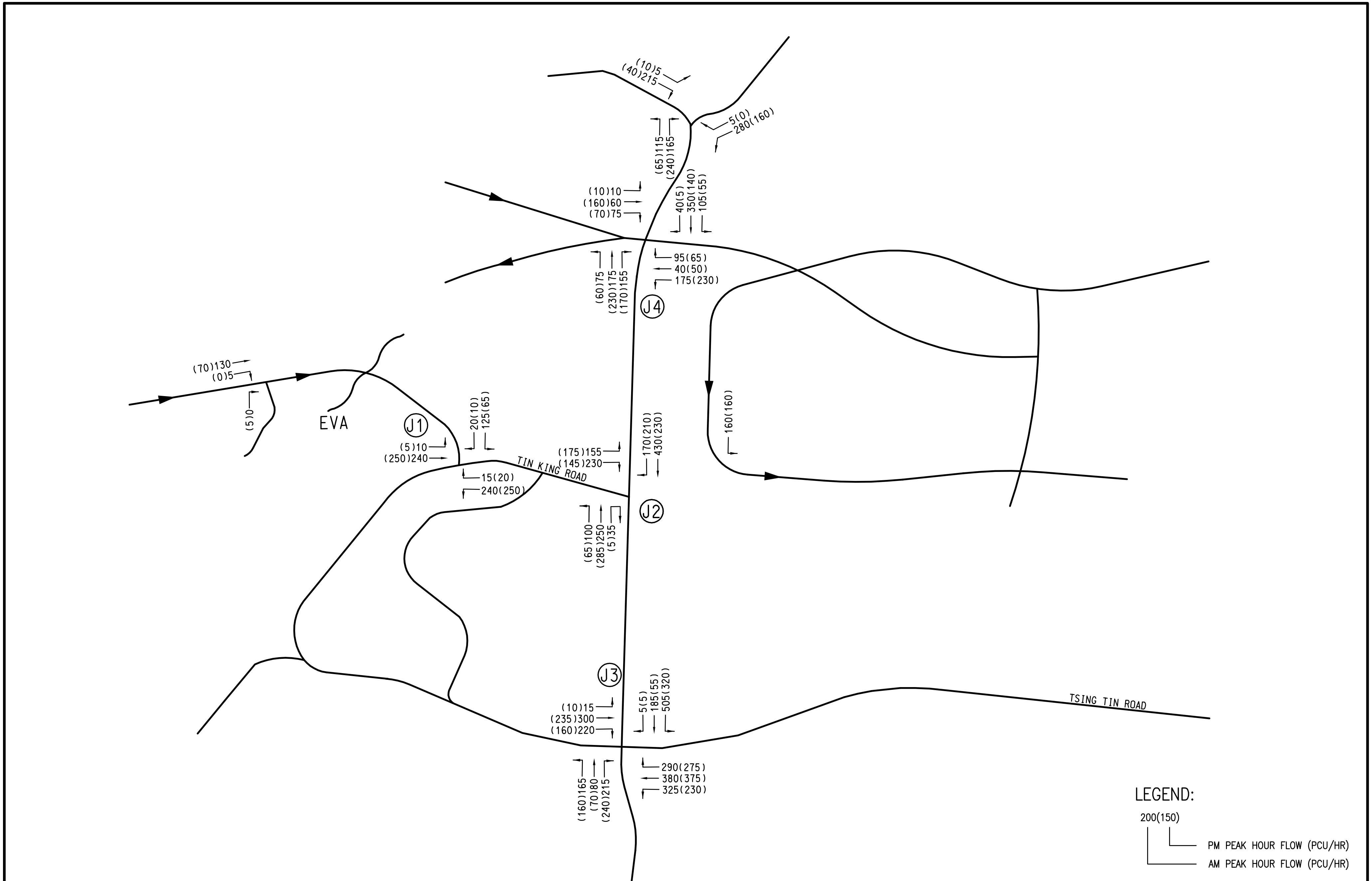

CONSULTANT		SCALE	N.T.S.	DATE		
AECOM	TUEN MUN AREA 29 TRAFFIC IMPACT ASSESSMENT	CHECK	–	DRAWN	HJX	
	PROJECTED 2023 PEAK HOUR TRAFFIC FLOWS – WITHOUT DEVELOPMENT	JOB No.	60266561	DRAWING No.	FIG 4.1	REV –

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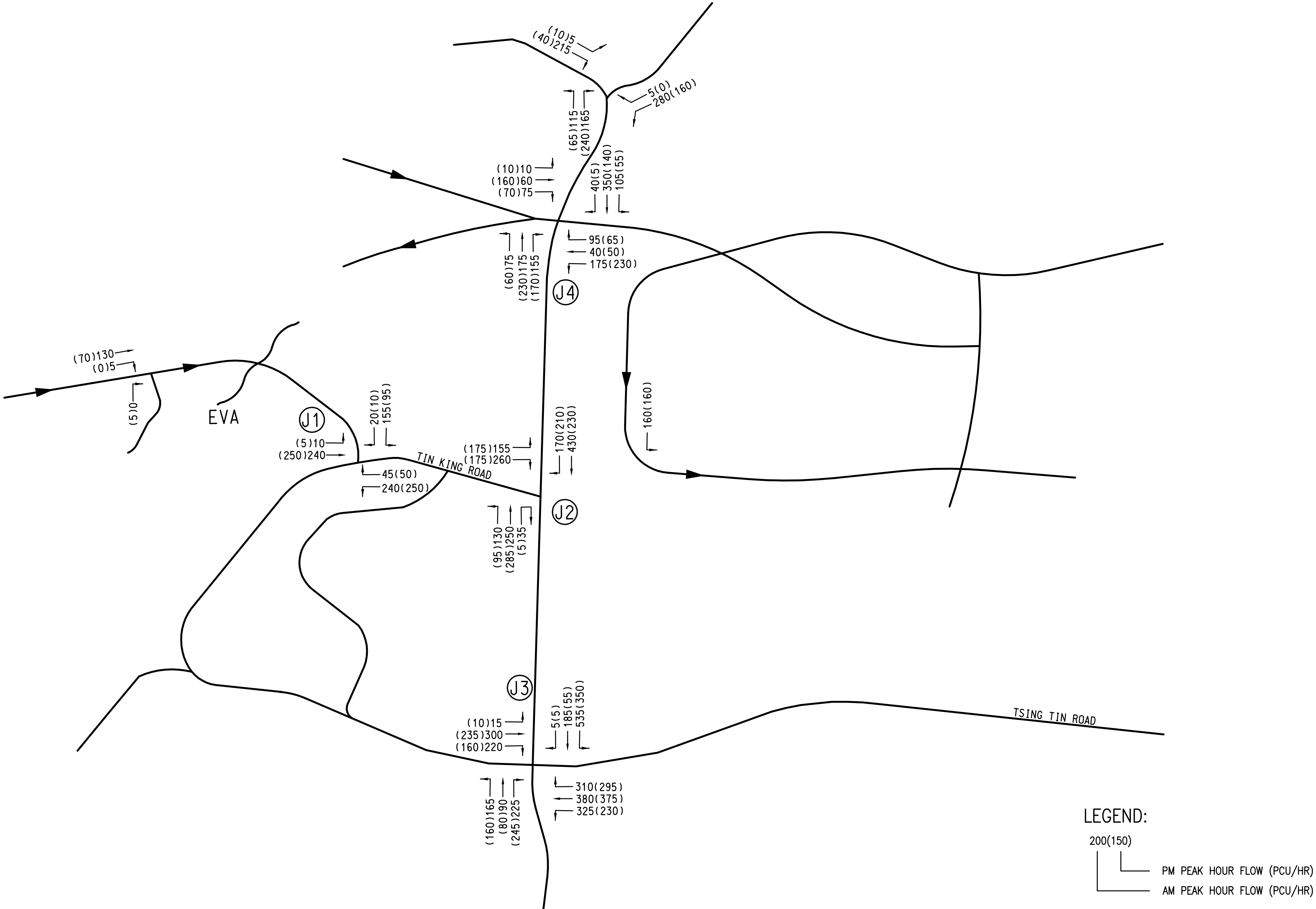

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	PROJECTED 2023 PEAK HOUR TRAFFIC FLOWS – WITH DEVELOPMENT	JOB No.	60266561	DRAWING No.	FIG 4.2	REV –

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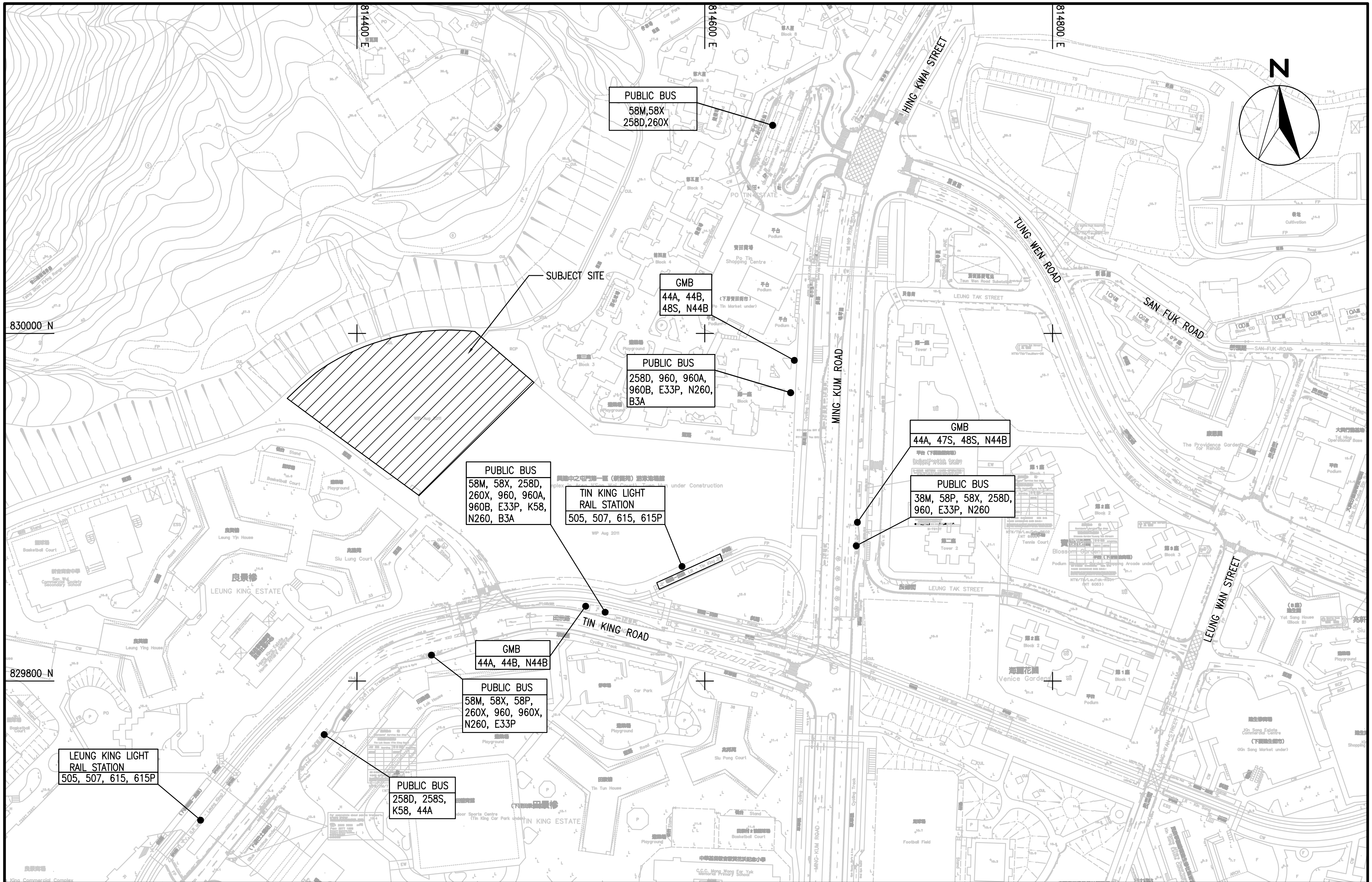

CONSULTANT	TUEN MUN AREA 29 TRAFFIC IMPACT ASSESSMENT	SCALE	A3 1 : 2000	DATE	
AECOM		CHECK	–	DRAWN	HJX
	EXISTING LOCATION OF PUBLIC TRANSPORT FACILITIES	JOB No.	60266561	DRAWING No. FIG 5.1	REV –

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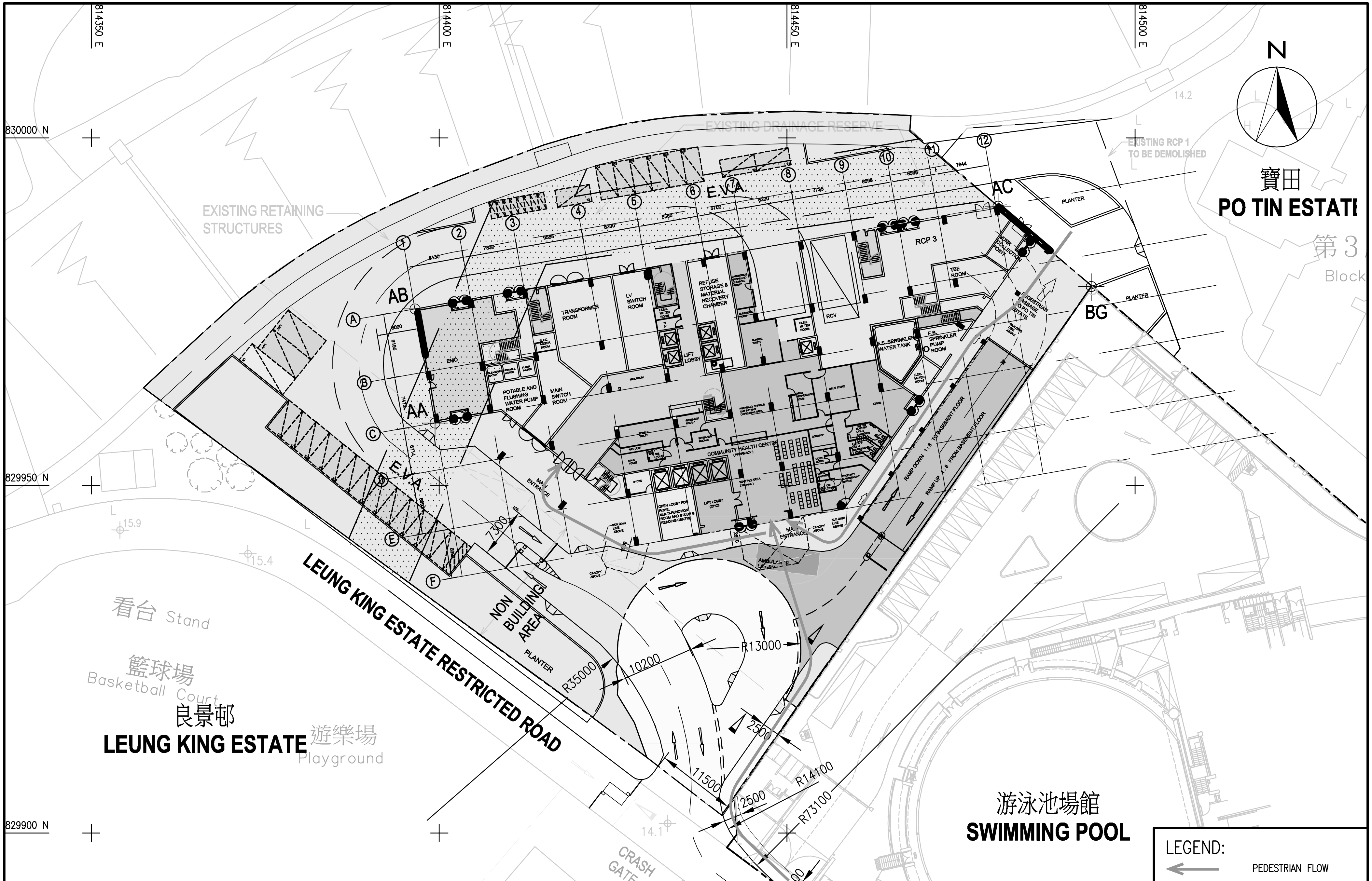

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AECOM	DIRECTIONAL FLOW OF PEDESTRIAN ACCESS	CHECK	–	DRAWN	ZY
		JOB No.	60266561	DRAWING No.	FIG 5.2
				REV	A

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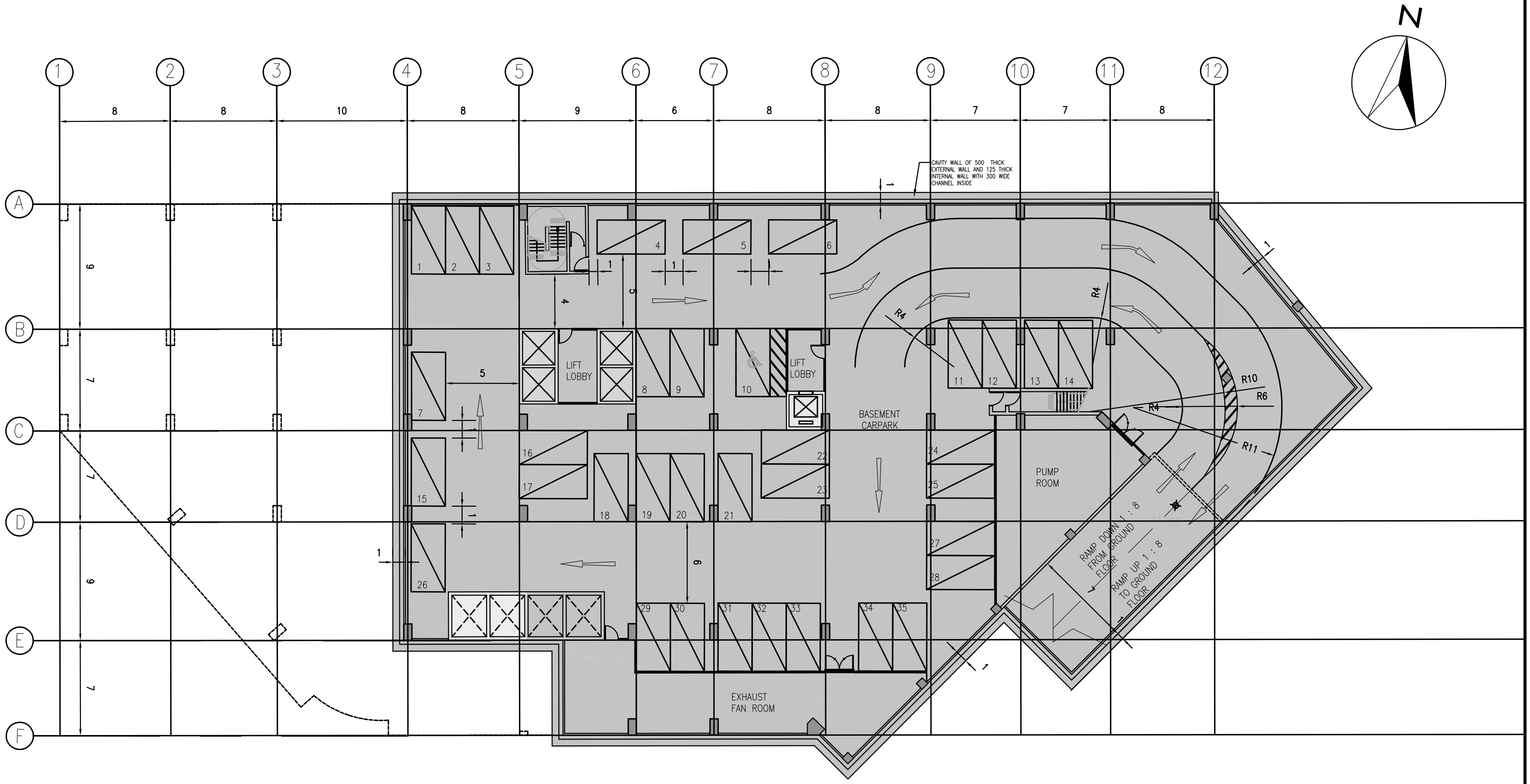

LEGEND:

- HD AREA
- SWD AREA
- FHB AREA
- AREA SHARED BY HD, SWD AND FHB

CONSULTANT					
AECOM	TUEN MUN AREA 29 TRAFFIC IMPACT ASSESSMENT	SCALE	A3 1 : 300	DATE	
		CHECK	–	DRAWN	ZY
	BASEMENT FLOOR LAYOUT PLAN	JOB No.	60266561	DRAWING No. FIG 6.1	REV –

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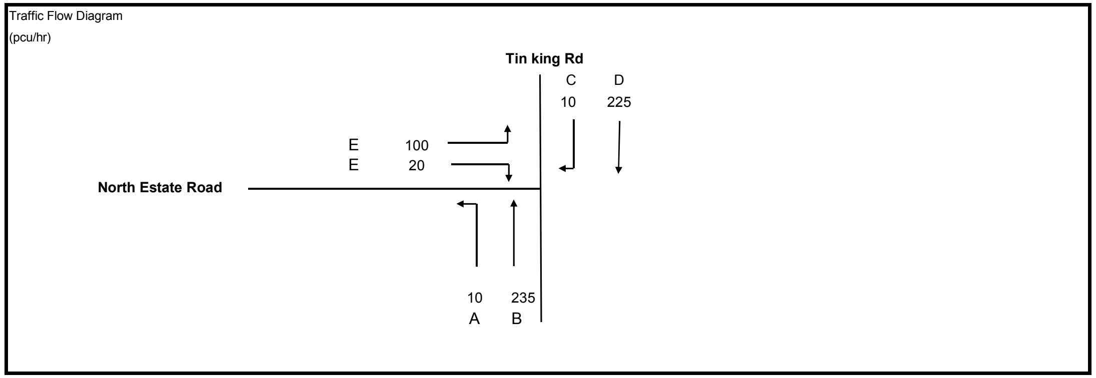
APPENDIX A

Junction Capacity Calculations for 2012

JUNCTION CAPACITY CALCULATION

Junction J1 - Tin King Rd / Leung King Estate South Estate Rd	2012 AM Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

Traffic Flow Diagram
(pcu/hr)



J1

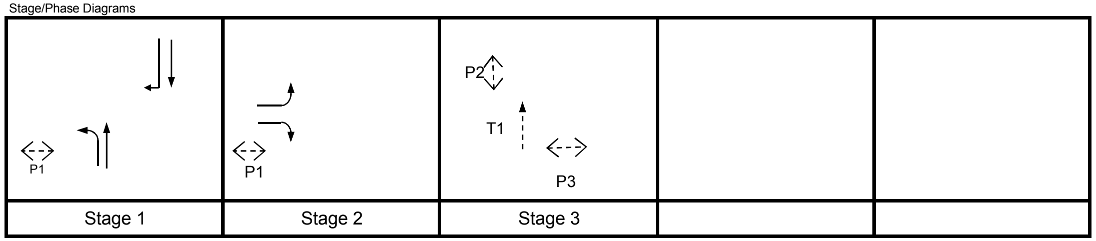
No. of stages per cycle	N =	3	
Cycle time	C =	120	sec
Sum(y)	Y =	0.172	
Lost time	L =	30	sec
Total Flow	=	11,870	pcu

Optimum Cycle C_o	= (1.5×L+5)/(1-Y) =	60	sec
Min. Cycle Time C_m	= L/(1-Y) =	36	sec
Y_{ult}	= 0.9-0.0075×L =	0.675	
$R.C._{ult}$	= (Y_{ult}-Y)/Yx100% =	292.6	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y) =	37	sec
Y_{max}	= 1-L/C =	0.750	

Critical Case : D,E,P3

R.C.(C) = (0.9xY_{max}-Y)/Yx100% = 293%

Stage/Phase Diagrams



I/G = 7 I/G = 9 G = 7 I/G = 9

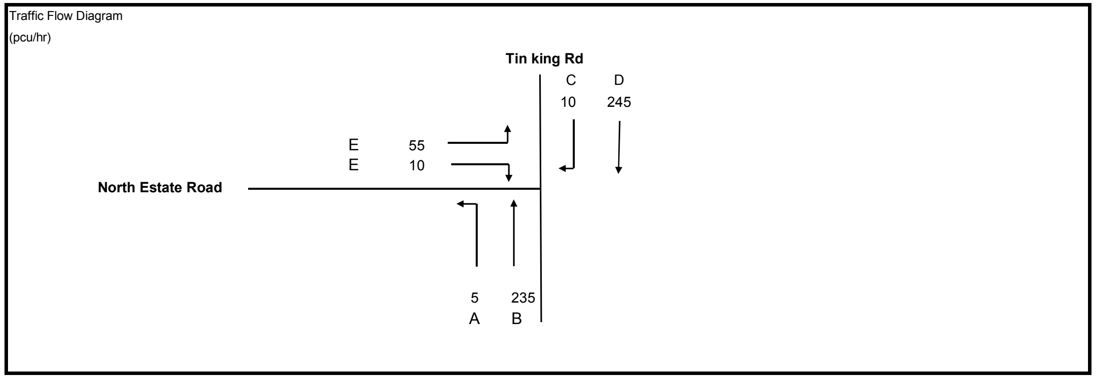
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.000	1	15			1		0		1915	10			10	100%		1741	0.006	
	B	1	3.000	1				0		0		2055		235		235			2055	0.114	
	C	1	3.500	1		20	1	1		0		1965			10	10		100%	1614	0.006	
	D	1	3.500	1				1		0		1965		225		225			1965	0.115	0.115
	E	2	3.000	1	15			1		0		1915	100			100	100%		1741	0.057	0.057
	E	2	3.000	1		25	0	0		0		2055			20	20		100%	1939	0.010	
Tram Crossing				GM		FGM															
	T1	3	min.	6	+	6	=	12	sec												
	P1	1,2	min.	5	+	8	=	13	sec												
	P2	3	min.	7	+	6	=	13	sec												
	P3	3	min.	7	+	6	=	13	sec												*

JUNCTION CAPACITY CALCULATION

Junction J1 - Tin King Rd / Leung King Estate South Estate Rd	2012 PM Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

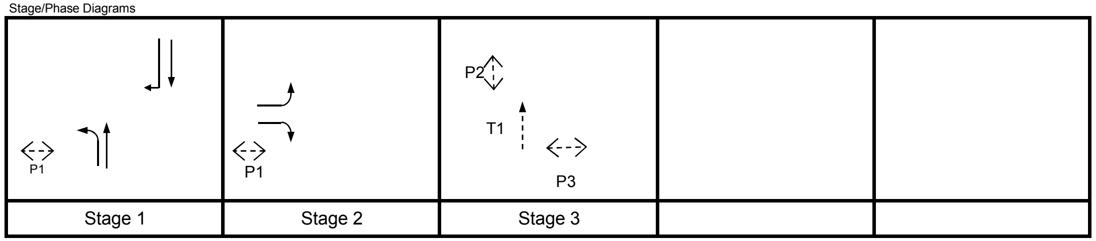
J1

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	120	sec
Sum(y)	Y =	0.156	
Lost time	L =	30	sec
Total Flow	=	11,870	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	59	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	36	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.675	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y\text{x}100\% =$	331.9	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	36	sec
Y_{max}	$= 1-L/C =$	0.750	

Stage/Phase Diagrams



I/G = 7 I/G = 9 G = 7 I/G = 9

Critical Case : D,E,P3

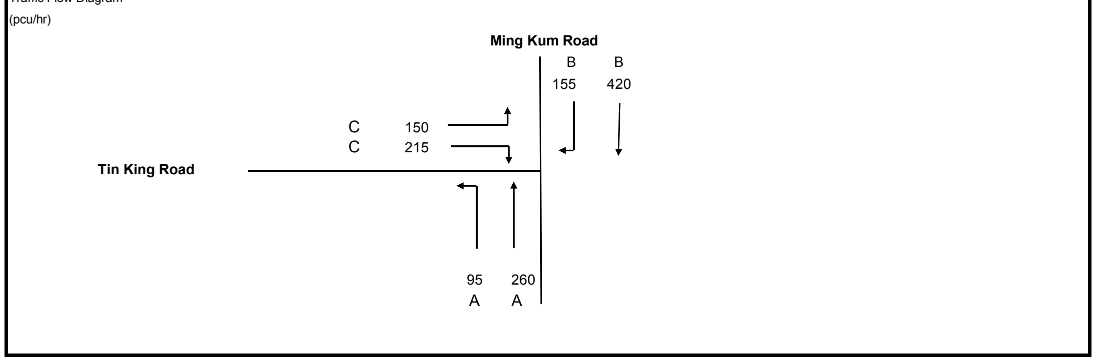
R.C.(C) $= (0.9\text{x}Y_{max}-Y)/Y\text{x}100\% =$ 332%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.000	1	15			1		0		1915	5			5	100%		1741	0.003	
	B	1	3.000	1				0		0		2055		235		235			2055	0.114	
	C	1	3.500	1		20	1	1		0		1965			10	10		100%	1614	0.006	
	D	1	3.500	1				1		0		1965		245		245			1965	0.125	0.125
	E	2	3.000	1	15			1		0		1915	55			55	100%		1741	0.032	0.032
	E	2	3.000	1		25	0	0		0		2055			10	10		100%	1939	0.005	
Tram Crossing				GM		FGM															
	T1	3	min.	6	+	6	=	12	sec												
	P1	1,2	min.	5	+	8	=	13	sec												
	P2	3	min.	7	+	6	=	13	sec												
	P3	3	min.	7	+	6	=	13	sec												*

JUNCTION CAPACITY CALCULATION

Junction J2 - Ming Kum Rd / Tin King Road	2012 AM Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

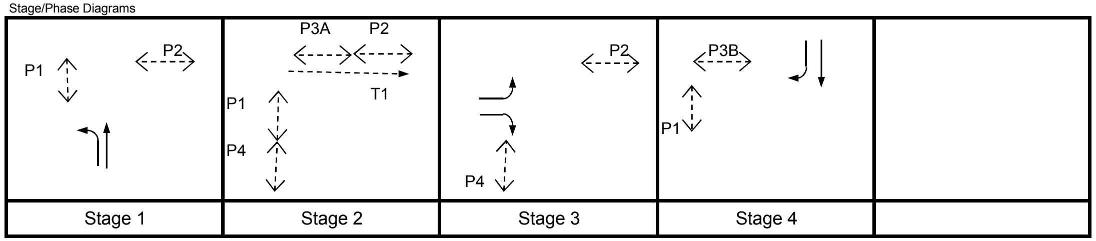
Traffic Flow Diagram
(pcu/hr)



J2

No. of stages per cycle		N =	4	
Cycle time		C =	120	sec
Sum(y)		Y =	0.343	
Lost time		L =	41	sec
Total Flow		=	12,170	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	101	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	62	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.593	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\text{x}100\%$	=	72.6	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	66	sec
Y_{max}	$= 1-L/C$	=	0.658	

Stage/Phase Diagrams



I/G = 9 G = 5 I/G = 13 I/G = 6 I/G = 11

Critical Case : A,P3A,C,B

R.C.(C) $= (0.9\text{x}Y_{max}-Y)/Y\text{x}100\%$ = 73%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.500	1	20			1		0		1965	95	73		168	57%		1885	0.089	0.089
	A	1	3.500	1				0		0		2105		187		187			2105	0.089	
	C	3	3.300	1	15			1		0		1945	150			150	100%		1768	0.085	
	C	3	3.300	1		25		0		0		2085			215	215		100%	1967	0.109	0.109
	B	4	3.500	1				1		0		1965		285		285			1965	0.145	
	B	4	3.500	1		15		0		0		2105		135	155	290		53%	1998	0.145	0.145

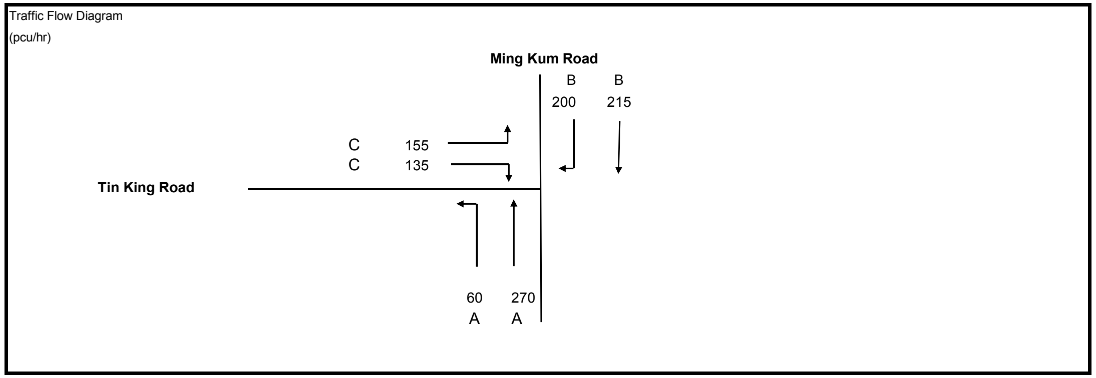
Pedestrian / Tram Crossing

Phase	Stage		GM		FGM				
T1	2	min.	5	+	5	=	10	sec	
P1	1,2,4	min.	5	+	6	=	11	sec	
P2	1,2,3	min.	5	+	6	=	11	sec	
P3A	2	min.	5	+	6	=	11	sec	*
P3B	4	min.	5	+	6	=	11	sec	
P4	2,3	min.	5	+	6	=	11	sec	

JUNCTION CAPACITY CALCULATION

Junction J2 - Ming Kum Rd / Tin King Road	2012 PM Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

Traffic Flow Diagram
(pcu/hr)

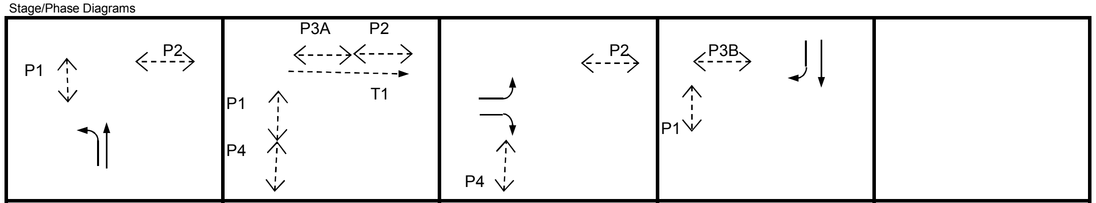


J2

No. of stages per cycle	N =	4	
Cycle time	C =	120	sec
Sum(y)	Y =	0.277	
Lost time	L =	41	sec
Total Flow	=	12,170	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y) =$	92	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	57	sec
Y_{ult}	$= 0.9-0.0075 \times L =$	0.593	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y \times 100\% =$	114.1	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y) =$	59	sec
Y_{max}	$= 1-L/C =$	0.658	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3	Stage 4	

I/G = 9 G = 5 I/G = 13 I/G = 6 I/G = 11

Critical Case : A,P3A,C,B

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 114%

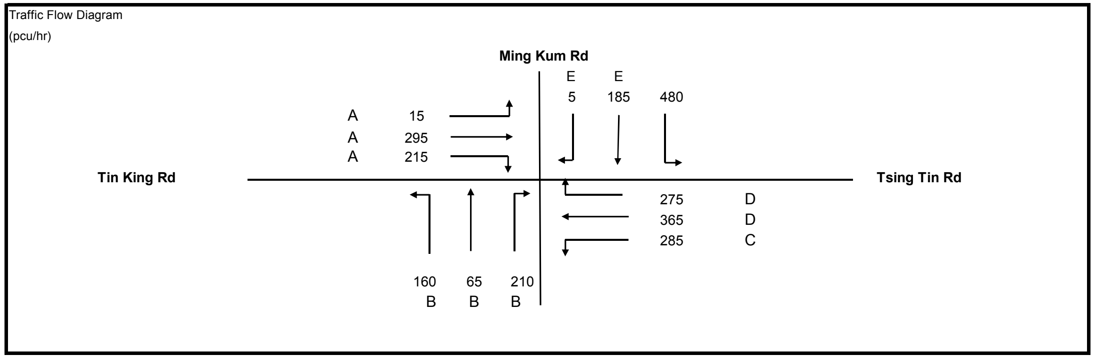
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.500	1	20			1		0		1965	60	97		157	38%		1910	0.082	
	A	1	3.500	1				0		0		2105		173		173			2105	0.082	0.082
	C	3	3.300	1	15			1		0		1945	155			155	100%		1768	0.088	0.088
	C	3	3.300	1		25		0		0		2085			135	135		100%	1967	0.069	
	B	4	3.500	1				1		0		1965		210		210			1965	0.107	0.107
	B	4	3.500	1		15		0		0		2105		5	200	205		98%	1918	0.107	
Pedestrian / Tram Crossing				GM		FGM															
	T1	2	min.	5	+	5	=	10	sec												
	P1	1,2,4	min.	5	+	6	=	11	sec												
	P2	1,2,3	min.	5	+	6	=	11	sec												
	P3A	2	min.	5	+	6	=	11	sec												*
	P3B	4	min.	5	+	6	=	11	sec												
	P4	2,3	min.	5	+	6	=	11	sec												

JUNCTION CAPACITY CALCULATION

Junction J3 - Ming Kum Rd/Tin King Rd/Tsing Tin Rd	2012 AM Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

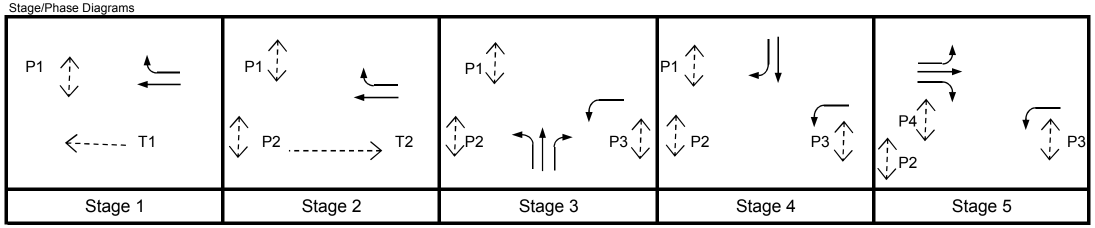
J3

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	5	
Cycle time	C =	120	sec
Sum(y)	Y =	0.412	
Lost time	L =	24	sec
Total Flow	=	28,090	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	70	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	41	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.720	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\% =$	74.6	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	44	sec
Y_{max}	$= 1-L/C =$	0.800	

Stage/Phase Diagrams



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

Critical Case : D,B,E,A

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 75%

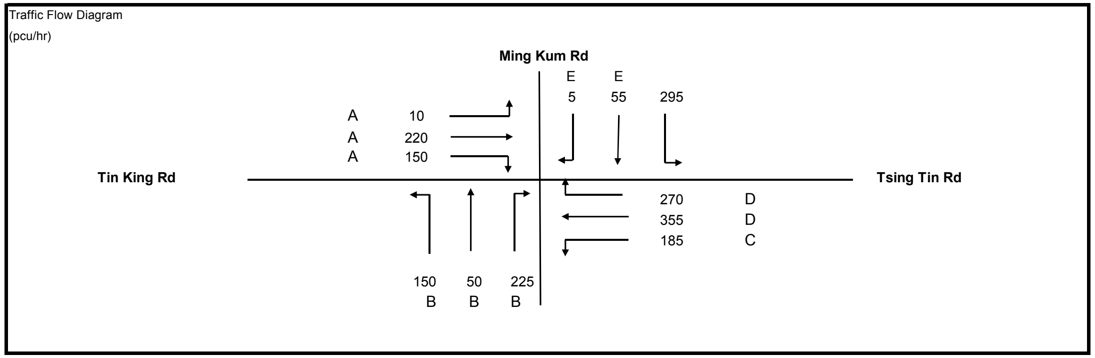
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	D	1,2	3.300	2		22.5	0	0		0		4170			275	275		100%	3909	0.070	
	D	1,2	3.300	1				1		0		1945		365		365			1945	0.188	0.188
	B	3	3.000	1	17.5			1		0		1915	160			160	100%		1764	0.091	0.091
	B	3	3.000	1				1		0		1915		65		65			1915	0.034	
	B	3	3.000	1		27.5	0			0		2055		0	106	106		100%	1949	0.054	
	B	3	3.000	1		22.5	0	0		0		2055			104	104		100%	1927	0.054	
	E	4	3.300	1		20	0	1		0		1945			5	5		100%	1809	0.003	
	E	4	3.300	2				1		0		4030		185		185			4030	0.046	0.046
	C	3,4,5	3.300	1	25			1		0		1945	285			285	100%		1835	0.155	
	A	5	3.300	1	17.5			1		0		1945	15	155		170	9%		1930	0.088	0.088
	A	5	3.300	1		30	0			0		2085		140	42	182		23%	2061	0.088	
	A	5	3.300	1		25	0	0		0		2085			173	173		100%	1967	0.088	
Pedestrian / LRT Crossing				GM		FGM															
	P1	1,2,3,4	min.	5	+	9	=	14	sec												
	P2	2,3,4,5	min.	5	+	8	=	13	sec												
	P3	3,4,5	min.	5	+	8	=	13	sec												
	P4	5	min.	5	+	5	=	10	sec												
	T1	1	min.	5	+	5	=	10	sec												
	T2	2	min.	5	+	3	=	8	sec												

JUNCTION CAPACITY CALCULATION

Junction J3 - Ming Kum Rd/Tin King Rd/Tsing Tin Rd	2012 AM Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

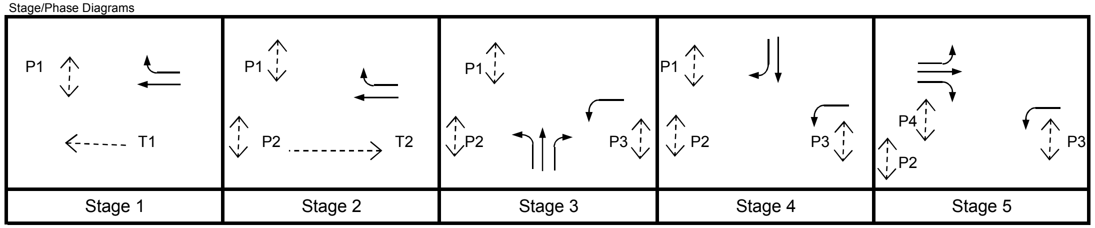
J3

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	5	
Cycle time	C =	120	sec
Sum(y)	Y =	0.331	
Lost time	L =	30	sec
Total Flow	=	28,090	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	75	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	45	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.675	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\% =$	103.8	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	47	sec
Y_{max}	$= 1-L/C =$	0.750	

Stage/Phase Diagrams



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

Critical Case : D,B,E,A

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 104%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	D	1,2	3.300	2		22.5	0	0		0		4170			270	270		100%	3909	0.069	
	D	1,2	3.300	1				1		0		1945		355		355			1945	0.183	0.183
	B	3	3.000	1	17.5			1		0		1915	150			150	100%		1764	0.085	0.085
	B	3	3.000	1				1		0		1915		50		50			1915	0.026	
	B	3	3.000	1		27.5	0			0		2055		0	113	113		100%	1949	0.058	
	B	3	3.000	1		22.5	0	0		0		2055			112	112		100%	1927	0.058	
	E	4	3.300	1		20	0	1		0		1945			5	5		100%	1809	0.003	
	E	4	3.300	2				1		0		4030		55		55			4030	0.014	
	C	3,4,5	3.300	1	25			1		0		1945	185			185	100%		1835	0.101	
	A	5	3.300	1	17.5			1		0		1945	10	113		123	8%		1932	0.064	
	A	5	3.300	1		30	0			0		2085		107	25	132		19%	2066	0.064	0.064
	A	5	3.300	1		25	0	0		0		2085			125	125		100%	1967	0.064	

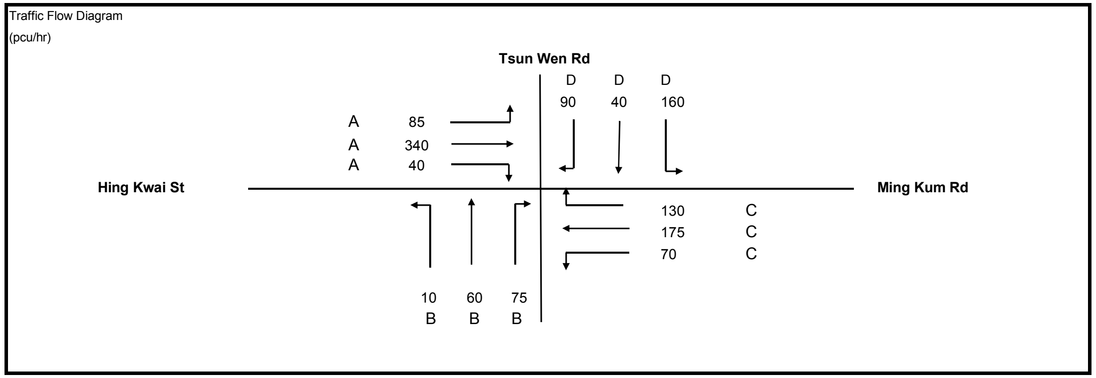
Pedestrian / LRT Crossing			GM		FGM			
P1	1,2,3,4	min.	5	+	9	=	14	sec
P2	2,3,4,5	min.	5	+	8	=	13	sec
P3	3,4,5	min.	5	+	8	=	13	sec
P4	5	min.	5	+	5	=	10	sec
T1	1	min.	5	+	5	=	10	sec
T2	2	min.	5	+	3	=	8	sec

JUNCTION CAPACITY CALCULATION

Junction J4 - Tsun Wen Rd/Ming Kum Rd/Hing Kwai St	2012 AM Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

J4

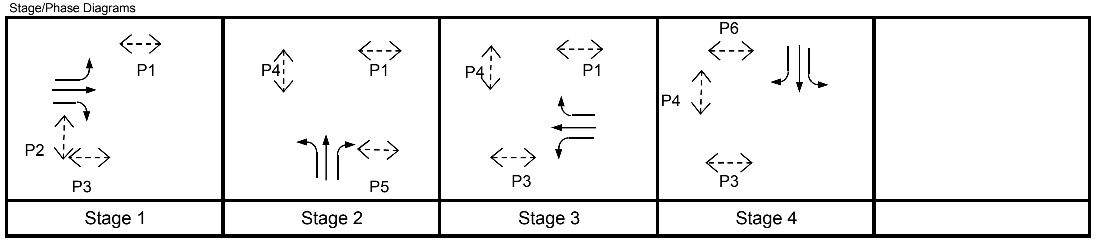
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	4	
Cycle time	C =	120	sec
Sum(y)	Y =	0.273	
Lost time	L =	39	sec
Total Flow	=	20,430	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$ =		87	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	54	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.608	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\text{x}100\%$	=	122.6	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	56	sec
Y_{max}	$= 1-L/C$	=	0.675	

Stage/Phase Diagrams



I/G = 12 G = 6 I/G = 13 I/G = 6 I/G = 5

Critical Case : A,P5,C,D

R.C.(C) $= (0.9\text{x}Y_{max}-Y)/Y\text{x}100\%$ = 123%

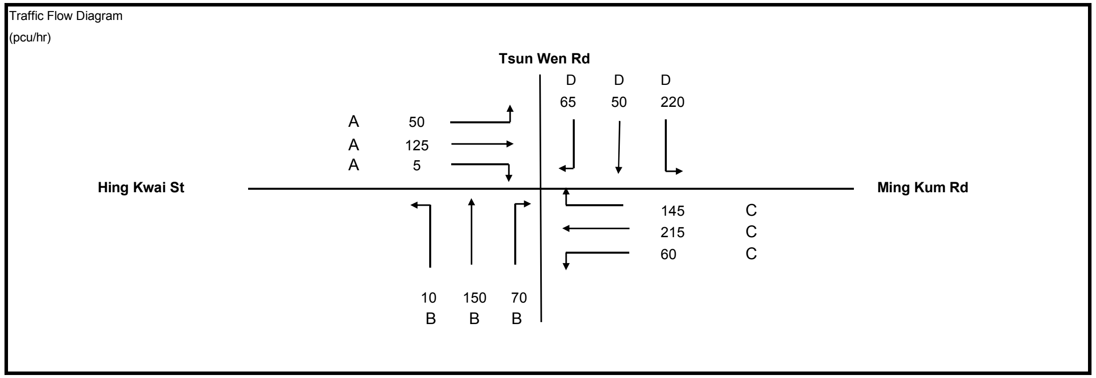
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.500	1	20			1		0		1965	85	138		223	38%		1910	0.117	0.117
	A	1	3.500	1		20	0	0		0		2105		202	40	242		17%	2079	0.117	
	B	2	4.500	1	12.5			1		0		2065	10	60		70	14%		2030	0.034	
	B	2	4.500	1		12.5	0	1		0		2065		0	75	75		100%	1844	0.041	
	C	3	3.300	1	12.5			1		0		1945	70	44		114	61%		1811	0.063	
	C	3	3.300	1				0		0		2085		131		131			2085	0.063	
	C	3	3.300	1		20	0	0		0		2085			130	130		100%	1940	0.067	0.067
	D	4	3.300	1	17.5			1		0		1945	160			160	100%		1791	0.089	0.089
	D	4	3.300	1		27.5	0	0		0		2085		40	26	66		40%	2041	0.033	
	D	4	3.300	1		22.5	0	0		0		2085			64	64		100%	1955	0.033	
Pedestrian Crossing				GM		FGM															
	P1	1,2,3	min.	9	+	9	=	18	sec												
	P2	1	min.	6	+	8	=	14	sec												
	P3	1,3,4	min.	11	+	11	=	22	sec												
	P4	2,3,4	min.	6	+	6	=	12	sec												
	P5	2	min.	6	+	10	=	16	sec												*
	P6	4	min.	5	+	7	=	12	sec												

JUNCTION CAPACITY CALCULATION

Junction J4 - Tsun Wen Rd/Ming Kum Rd/Hing Kwai St	2012 AM Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

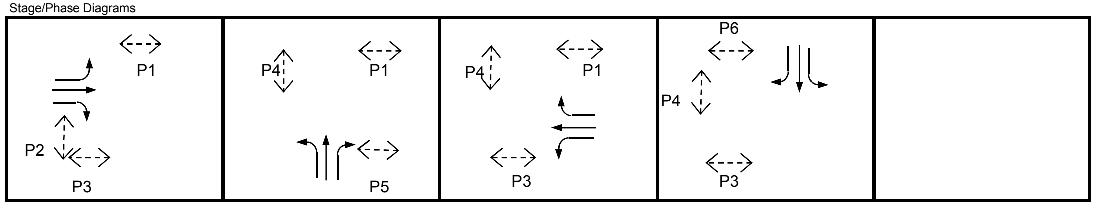
J4

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	4	
Cycle time	C =	120	sec
Sum(y)	Y =	0.256	
Lost time	L =	37	sec
Total Flow	=	20,430	pcu
Optimum Cycle C_o = $(1.5\times L+5)/(1-Y)$	=	81	sec
Min. Cycle Time C_m = $L/(1-Y)$	=	50	sec
Y_{ult} = $0.9-0.0075\times L$	=	0.623	
$R.C._{ult}$ = $(Y_{ult}-Y)/Y\times100\%$	=	143.6	%
Practical Cycle Time C_p = $0.9\times L/(0.9-Y)$	=	52	sec
Y_{max} = $1-L/C$	=	0.692	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3	Stage 4	
G = 6	I/G = 10	I/G = 6	I/G = 6	I/G = 12

Critical Case : P2,B,C,D

R.C.(C) = $(0.9xY_{max}-Y)/Yx100\%$ = 144%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.500	1	20			1		0		1965	50	35		85	59%		1882	0.045	
	A	1	3.500	1		20	0	0		0		2105		90	5	95		5%	2097	0.045	
	B	2	4.500	1	12.5			1		0		2065	10	109		119	8%		2044	0.058	0.058
	B	2	4.500	1		12.5	0	1		0		2065		41	70	111		63%	1920	0.058	
	C	3	3.300	1	12.5			1		0		1945	60	69		129	47%		1842	0.070	
	C	3	3.300	1				0		0		2085		146		146			2085	0.070	
	C	3	3.300	1		20	0	0		0		2085			145	145		100%	1940	0.075	0.075
	D	4	3.300	1	17.5			1		0		1945	220			220	100%		1791	0.123	0.123
	D	4	3.300	1		27.5	0	0		0		2085		50	9	59		15%	2068	0.029	
	D	4	3.300	1		22.5	0	0		0		2085			56	56		100%	1955	0.029	
Pedestrian Crossing				GM		FGM															
	P1	1,2,3	min.	9	+	9	=	18	sec												
	P2	1	min.	6	+	8	=	14	sec												*
	P3	1,3,4	min.	11	+	11	=	22	sec												
	P4	2,3,4	min.	6	+	6	=	12	sec												
	P5	2	min.	6	+	10	=	16	sec												
	P6	4	min.	5	+	7	=	12	sec												

APPENDIX B

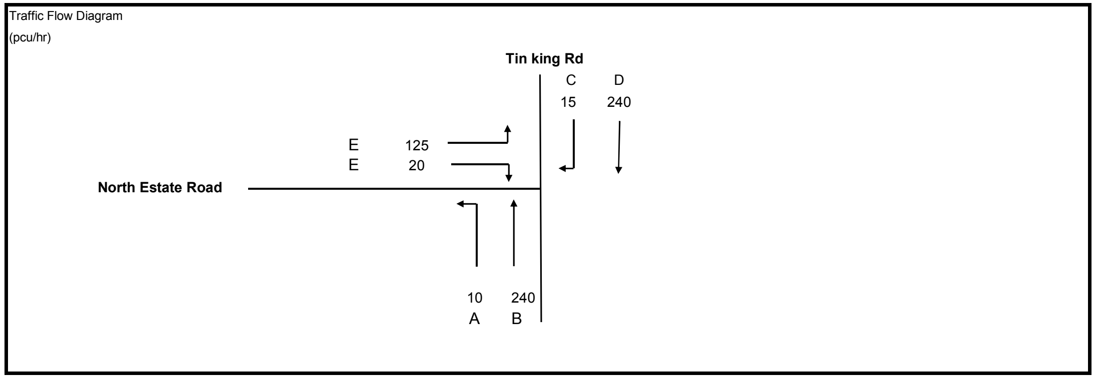
Junction Capacity Calculations for 2023

JUNCTION CAPACITY CALCULATION

Junction J1 - Tin King Rd / Leung King Estate South Estate Rd	2022_Ref AM Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

J1

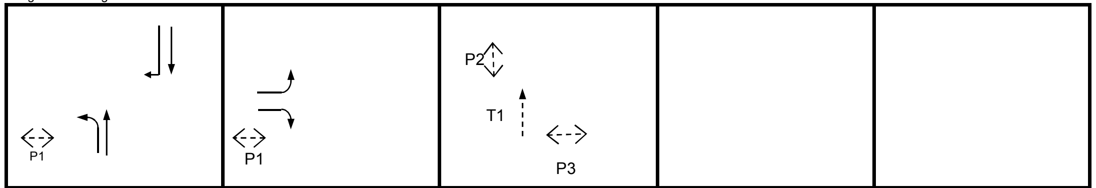
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	120	sec
Sum(y)	Y =	0.194	
Lost time	L =	30	sec
Total Flow	=	11,870	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$ =		62	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	37	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.675	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\%$ =		248.0	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	38	sec
Y_{max}	$= 1-L/C$	=	0.750	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 7 I/G = 9 G = 7 I/G = 9

Critical Case : D,E,P3

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 248%

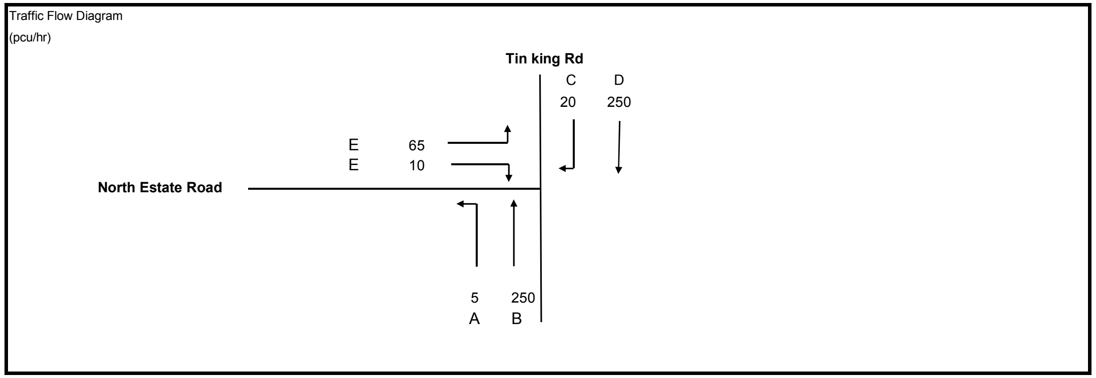
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.000	1	15			1		0		1915	10			10	100%		1741	0.006	
	B	1	3.000	1				0		0		2055		240		240			2055	0.117	
	C	1	3.500	1		20	1	1		0		1965			15	15		100%	1614	0.009	
	D	1	3.500	1				1		0		1965		240		240			1965	0.122	0.122
	E	2	3.000	1	15			1		0		1915	125			125	100%		1741	0.072	0.072
	E	2	3.000	1		25	0	0		0		2055			20	20		100%	1939	0.010	
Tram Crossing				GM		FGM															
	T1	3	min.	6	+	6	=	12	sec												
	P1	1,2	min.	5	+	8	=	13	sec												
	P2	3	min.	7	+	6	=	13	sec												
	P3	3	min.	7	+	6	=	13	sec												*

JUNCTION CAPACITY CALCULATION

Junction J1 - Tin King Rd / Leung King Estate South Estate Rd	2022_Ref PM Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

J1

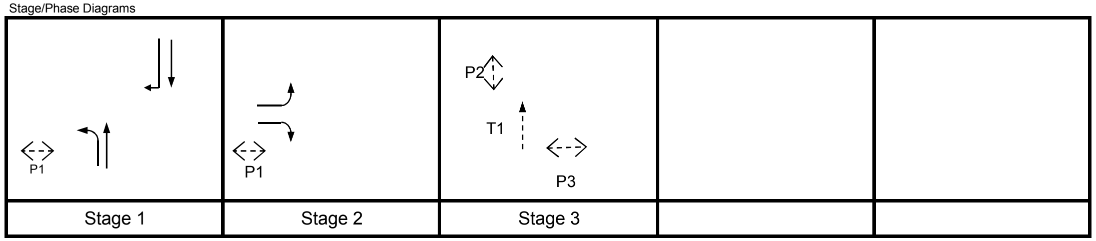
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	120	sec
Sum(y)	Y =	0.165	
Lost time	L =	30	sec
Total Flow	=	11,870	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	60	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	36	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.675	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\% =$	310.2	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	37	sec
Y_{max}	$= 1-L/C =$	0.750	

Stage/Phase Diagrams



I/G = 7 I/G = 9 G = 7 I/G = 9

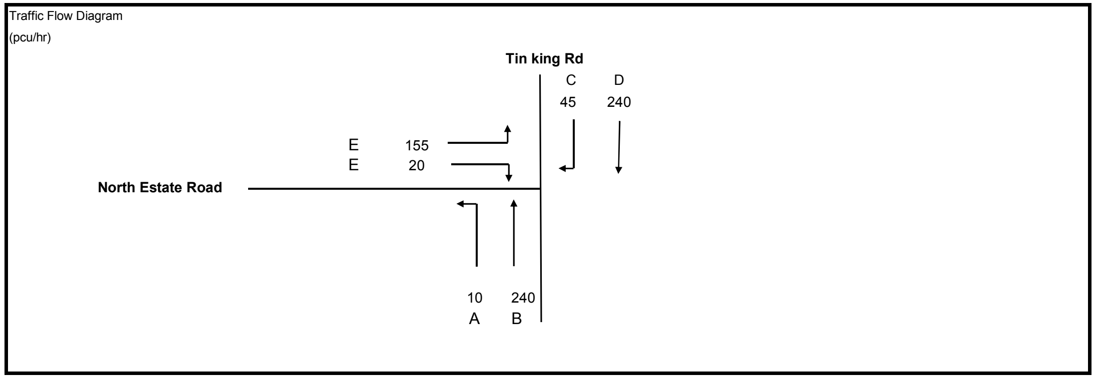
Critical Case : D,E,P3

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 310%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m)		OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr)			TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%)		REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
					LEFT	RIGHT							LEFT	STRAIGHT AHEAD	RIGHT		LEFT	RIGHT			
	A	1	3.000	1	15			1		0		1915	5			5	100%		1741	0.003	
	B	1	3.000	1				0		0		2055		250		250			2055	0.122	
	C	1	3.500	1		20	1	1		0		1965			20	20		100%	1614	0.012	
	D	1	3.500	1				1		0		1965		250		250			1965	0.127	0.127
	E	2	3.000	1	15			1		0		1915	65			65	100%		1741	0.037	0.037
	E	2	3.000	1		25	0	0		0		2055			10	10		100%	1939	0.005	
Tram Crossing				GM		FGM															
	T1	3	min.	6	+	6	=	12	sec												
	P1	1,2	min.	5	+	8	=	13	sec												
	P2	3	min.	7	+	6	=	13	sec												
	P3	3	min.	7	+	6	=	13	sec												*

JUNCTION CAPACITY CALCULATION

Junction J1 - Tin King Rd / Leung King Estate South Estate Rd	2022_Proj AM Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

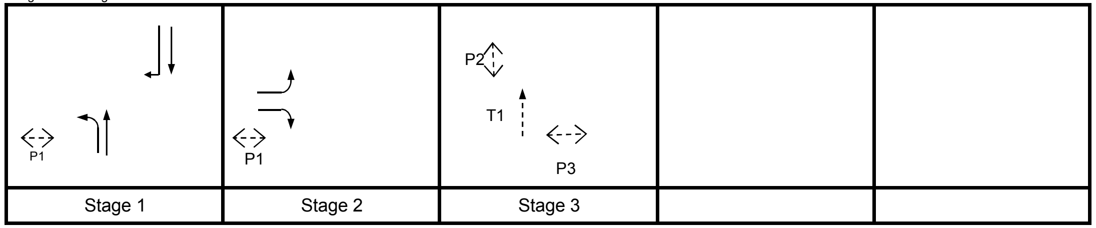


J1

No. of stages per cycle	N =	3	
Cycle time	C =	120	sec
Sum(y)	Y =	0.211	
Lost time	L =	30	sec
Total Flow	=	11,870	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$		63	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	38	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.675	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\%$	=	219.6	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	39	sec
Y_{max}	$= 1-L/C$	=	0.750	

Stage/Phase Diagrams



I/G = 7 I/G = 9 G = 7 I/G = 9

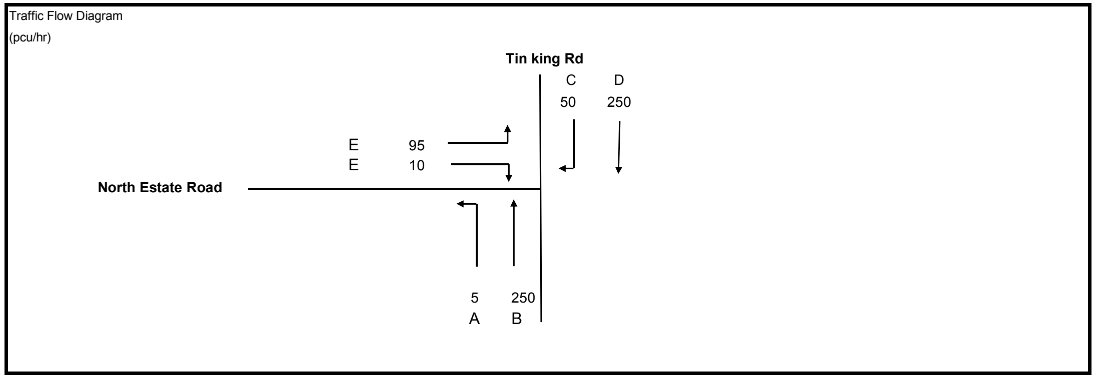
Critical Case : D,E,P3

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 220%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.000	1	15			1		0		1915	10			10	100%		1741	0.006	
	B	1	3.000	1				0		0		2055		240		240			2055	0.117	
	C	1	3.500	1		20	1	1		0		1965			45	45		100%	1614	0.028	
	D	1	3.500	1				1		0		1965		240		240			1965	0.122	0.122
	E	2	3.000	1	15			1		0		1915	155			155	100%		1741	0.089	0.089
	E	2	3.000	1		25	0	0		0		2055			20	20		100%	1939	0.010	
Tram Crossing				GM		FGM															
	T1	3	min.	6	+	6	=	12	sec												
	P1	1,2	min.	5	+	8	=	13	sec												
	P2	3	min.	7	+	6	=	13	sec												
	P3	3	min.	7	+	6	=	13	sec												*

JUNCTION CAPACITY CALCULATION

Junction J1 - Tin King Rd / Leung King Estate South Estate Rd	2022_Proj PM Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

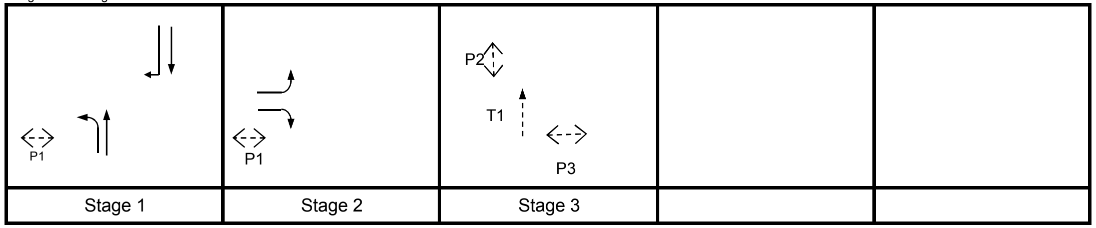


J1

No. of stages per cycle	N =	3	
Cycle time	C =	120	sec
Sum(y)	Y =	0.182	
Lost time	L =	30	sec
Total Flow	=	11,870	pcu

Optimum Cycle C_o	= (1.5×L+5)/(1-Y) =		61	sec
Min. Cycle Time C_m	= L/(1-Y)	=	37	sec
Y_{ult}	= 0.9-0.0075×L	=	0.675	
$R.C._{ult}$	= $(Y_{ult}$-Y)/Yx100%	=	271.3	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y)	=	38	sec
Y_{max}	= 1-L/C	=	0.750	

Stage/Phase Diagrams



I/G = 7 I/G = 9 G = 7 I/G = 9

Critical Case : D,E,P3

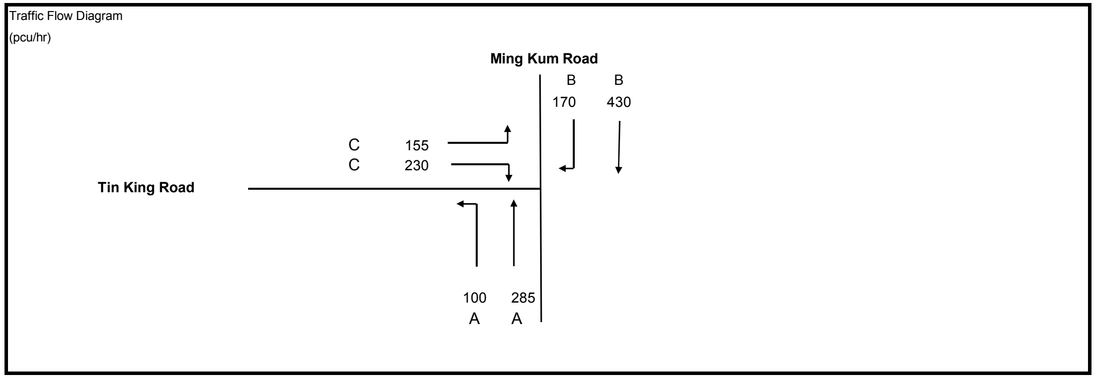
R.C.(C) = $(0.9xY_{max}$-Y)/Yx100% = 271%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.000	1	15			1		0		1915	5			5	100%		1741	0.003	
	B	1	3.000	1				0		0		2055		250		250			2055	0.122	
	C	1	3.500	1		20	1	1		0		1965			50	50		100%	1614	0.031	
	D	1	3.500	1				1		0		1965		250		250			1965	0.127	0.127
	E	2	3.000	1	15			1		0		1915	95			95	100%		1741	0.055	0.055
	E	2	3.000	1		25	0	0		0		2055			10	10		100%	1939	0.005	

Tram Crossing			GM		FGM				
T1	3	min.	6	+	6	=	12	sec	
P1	1,2	min.	5	+	8	=	13	sec	
P2	3	min.	7	+	6	=	13	sec	
P3	3	min.	7	+	6	=	13	sec	*

JUNCTION CAPACITY CALCULATION

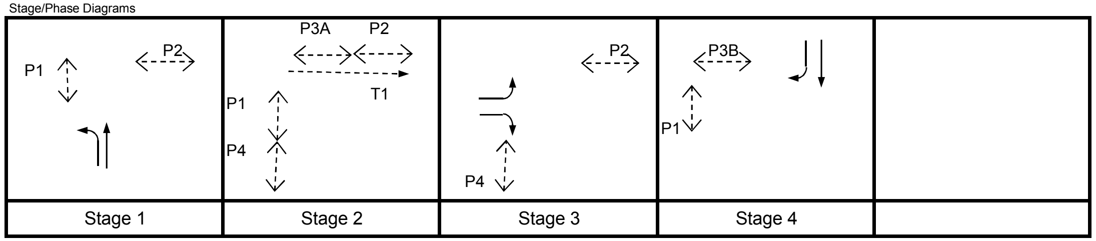
Junction J2 - Ming Kum Rd / Tin King Road	2023 AM Reference Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561



J2

No. of stages per cycle		N =	4	
Cycle time		C =	120	sec
Sum(y)		Y =	0.365	
Lost time		L =	41	sec
Total Flow		=	12,170	pcu
Optimum Cycle C_o	= (1.5×L+5)/(1-Y)	=	105	sec
Min. Cycle Time C_m	= L/(1-Y)	=	65	sec
Y_{ult}	= 0.9-0.0075×L	=	0.593	
$R.C._{ult}$	= (Y_{ult}-Y)/Yx100%	=	62.3	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y)	=	69	sec
Y_{max}	= 1-L/C	=	0.658	

Stage/Phase Diagrams



I/G = 9 G = 5 I/G = 13 I/G = 6 I/G = 11

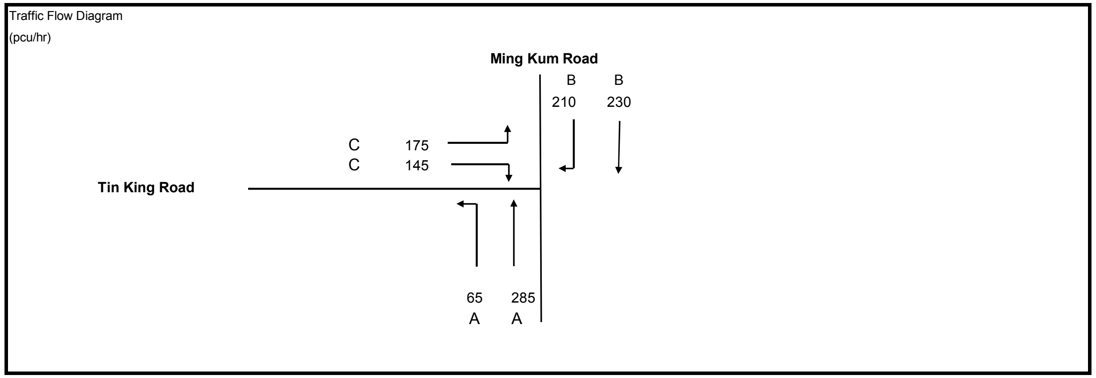
Critical Case : A,P3A,C,B

R.C.(C) = (0.9xY_{max}-Y)/Yx100% = 62%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.500	1	20			1		0		1965	100	82		182	55%		1887	0.096	
	A	1	3.500	1				0		0		2105		203		203			2105	0.096	0.096
	C	3	3.300	1	15			1		0		1945	155			155	100%		1768	0.088	
	C	3	3.300	1		25		0		0		2085			230	230		100%	1967	0.117	0.117
	B	4	3.500	1				1		0		1965		298		298			1965	0.152	0.152
	B	4	3.500	1		15		0		0		2105		132	170	302		56%	1993	0.152	
Pedestrian / Tram Crossing				GM		FGM															
	T1	2	min.	5	+	5	=	10	sec												
	P1	1,2,4	min.	5	+	6	=	11	sec												
	P2	1,2,3	min.	5	+	6	=	11	sec												
	P3A	2	min.	5	+	6	=	11	sec												*
	P3B	4	min.	5	+	6	=	11	sec												
	P4	2,3	min.	5	+	6	=	11	sec												

JUNCTION CAPACITY CALCULATION

Junction J2 - Ming Kum Rd / Tin King Road	2023 AM Reference Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561



J2

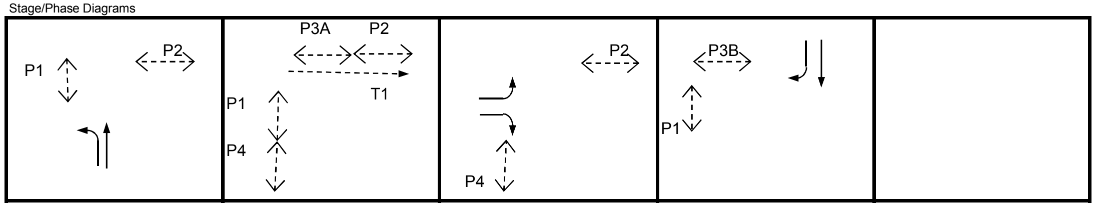
No. of stages per cycle	N =	4	
Cycle time	C =	120	sec
Sum(y)	Y =	0.299	
Lost time	L =	41	sec
Total Flow	=	12,170	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	95	sec
Min. Cycle Time C_m	$= L/(1-Y)$ =	59	sec
Y_{ult}	$= 0.9-0.0075\times L$ =	0.593	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\text{x}100\%$ =	97.9	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$ =	61	sec
Y_{max}	= 1-L/C =	0.658	

Critical Case : A,P3A,C,B

R.C.(C) $= (0.9\text{x}Y_{max}-Y)/Y\text{x}100\%$ = 98%

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3	Stage 4	

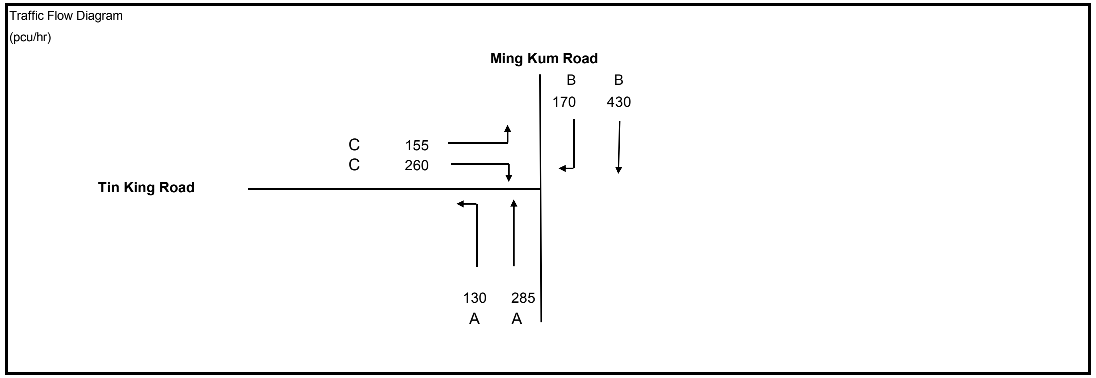
I/G = 9 G = 5 I/G = 13 I/G = 6 I/G = 11

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.500	1	20			1		0		1965	65	101		166	39%		1909	0.087	0.087
	A	1	3.500	1				0		0		2105		184		184			2105	0.087	
	C	3	3.300	1	15			1		0		1945	175			175	100%		1768	0.099	0.099
	C	3	3.300	1		25		0		0		2085			145	145		100%	1967	0.074	
	B	4	3.500	1				1		0		1965		223		223			1965	0.113	0.113
	B	4	3.500	1		15		0		0		2105		7	210	217		97%	1920	0.113	
Pedestrian / Tram Crossing				GM		FGM															
	T1	2	min.	5	+	5	=	10	sec												
	P1	1,2,4	min.	5	+	6	=	11	sec												
	P2	1,2,3	min.	5	+	6	=	11	sec												
	P3A	2	min.	5	+	6	=	11	sec												*
	P3B	4	min.	5	+	6	=	11	sec												
	P4	2,3	min.	5	+	6	=	11	sec												

JUNCTION CAPACITY CALCULATION

Junction J2 - Ming Kum Rd / Tin King Road	2023 AM Design Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

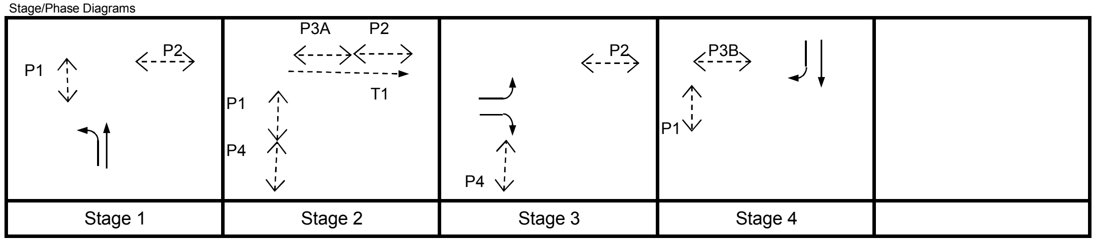
J2



No. of stages per cycle	N =	4	
Cycle time	C =	120	sec
Sum(y)	Y =	0.388	
Lost time	L =	41	sec
Total Flow	=	12,170	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$ =		109	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	67	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.593	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$ =		52.7	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	72	sec
Y_{max}	= 1-L/C	=	0.658	

Stage/Phase Diagrams



I/G = 9 G = 5 I/G = 13 I/G = 6 I/G = 11

Critical Case : A,P3A,C,B

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 53%

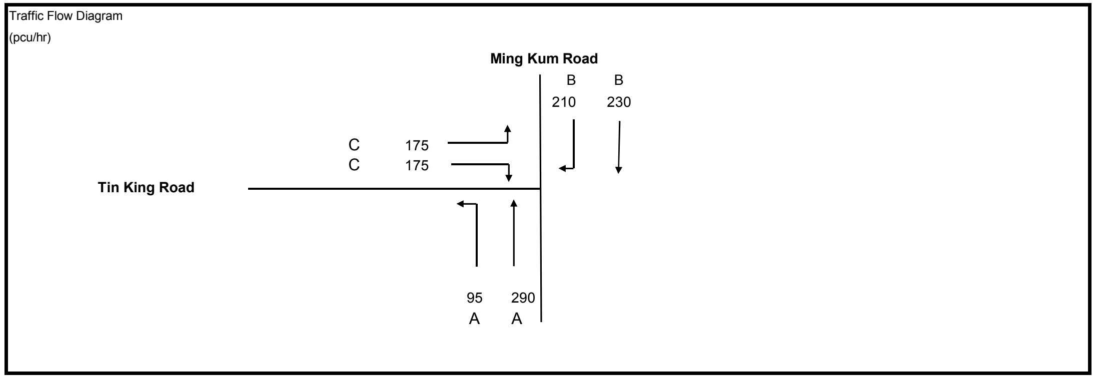
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.500	1	20			1		0		1965	130	65		195	67%		1872	0.104	0.104
	A	1	3.500	1				0		0		2105		220		220			2105	0.104	
	C	3	3.300	1	15			1		0		1945	155			155	100%		1768	0.088	
	C	3	3.300	1		25		0		0		2085			260	260		100%	1967	0.132	0.132
	B	4	3.500	1				1		0		1965		298		298			1965	0.152	0.152
	B	4	3.500	1		15		0		0		2105		132	170	302		56%	1993	0.152	

Pedestrian / Tram Crossing			GM		FGM				
T1	2	min.	5	+	5	=	10	sec	
P1	1,2,4	min.	5	+	6	=	11	sec	
P2	1,2,3	min.	5	+	6	=	11	sec	
P3A	2	min.	5	+	6	=	11	sec	*
P3B	4	min.	5	+	6	=	11	sec	
P4	2,3	min.	5	+	6	=	11	sec	

JUNCTION CAPACITY CALCULATION

Junction J2 - Ming Kum Rd / Tin King Road	2023 PM Design Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

Traffic Flow Diagram
(pcu/hr)

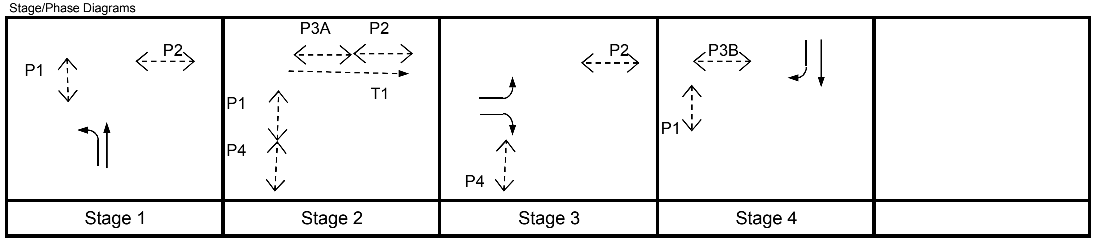


J2

No. of stages per cycle	N =	4	
Cycle time	C =	120	sec
Sum(y)	Y =	0.309	
Lost time	L =	41	sec
Total Flow	=	12,170	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$		96	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	59	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.593	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$	=	92.0	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	62	sec
Y_{max}	$= 1-L/C$	=	0.658	

Stage/Phase Diagrams



I/G = 9 G = 5 I/G = 13 I/G = 6 I/G = 11

Critical Case : A,P3A,C,B

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 92%

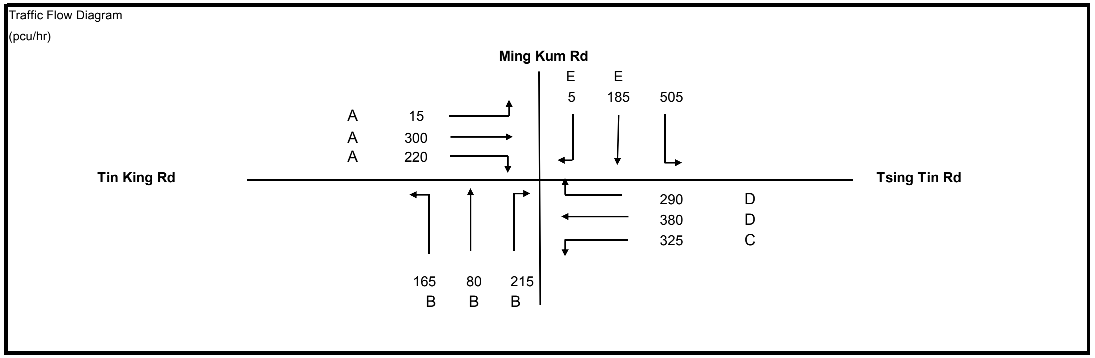
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.500	1	20			1		0		1965	95	87		182	52%		1891	0.096	0.096
	A	1	3.500	1				0		0		2105		203		203			2105	0.096	
	C	3	3.300	1	15			1		0		1945	175			175	100%		1768	0.099	0.099
	C	3	3.300	1		25		0		0		2085			175	175		100%	1967	0.089	
	B	4	3.500	1				1		0		1965		223		223			1965	0.113	0.113
	B	4	3.500	1		15		0		0		2105		7	210	217		97%	1920	0.113	
Pedestrian / Tram Crossing				GM		FGM															
	T1	2	min.	5	+	5	=	10	sec												
	P1	1,2,4	min.	5	+	6	=	11	sec												
	P2	1,2,3	min.	5	+	6	=	11	sec												
	P3A	2	min.	5	+	6	=	11	sec												*
	P3B	4	min.	5	+	6	=	11	sec												
	P4	2,3	min.	5	+	6	=	11	sec												

JUNCTION CAPACITY CALCULATION

Junction J3 - Ming Kum Rd/Tin King Rd/Tsing Tin Rd	2023 AM Reference Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

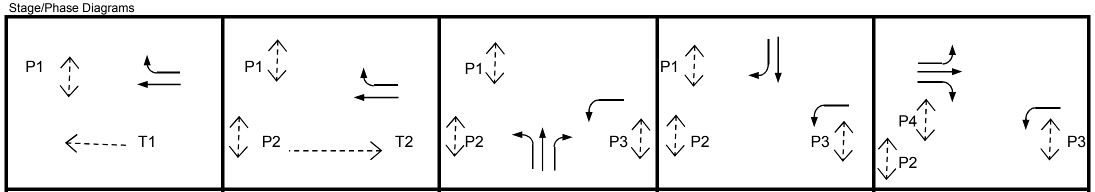
J3

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	5	
Cycle time	C =	120	sec
Sum(y)	Y =	0.425	
Lost time	L =	24	sec
Total Flow	=	28,090	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	71	sec
Min. Cycle Time C_m	$= L/(1-Y)$ =	42	sec
Y_{ult}	$= 0.9-0.0075\times L$ =	0.720	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$ =	69.6	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$ =	45	sec
Y_{max}	= 1-L/C =	0.800	

Stage/Phase Diagrams



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

Critical Case : D,B,E,A

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 70%

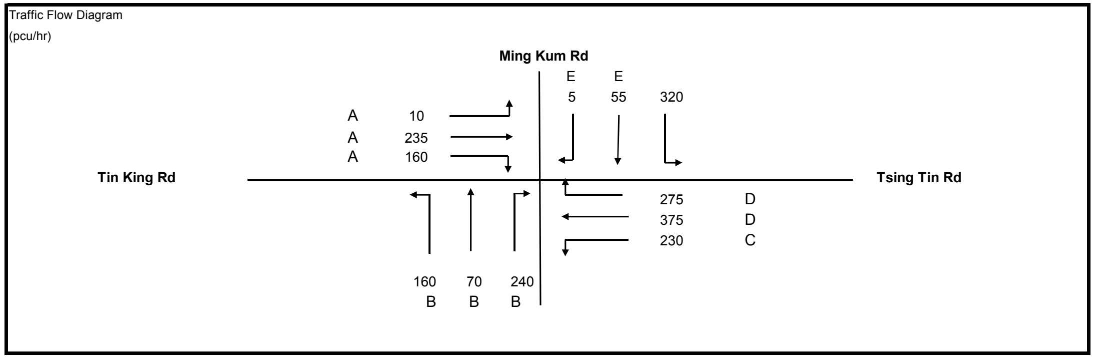
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	D	1,2	3.300	2		22.5	0	0		0		4170			290	290		100%	3909	0.074	
	D	1,2	3.300	1				1		0		1945		380		380			1945	0.195	0.195
	B	3	3.000	1	17.5			1		0		1915	165			165	100%		1764	0.094	0.094
	B	3	3.000	1				1		0		1915		80		80			1915	0.042	
	B	3	3.000	1		27.5	0			0		2055		0	108	108		100%	1949	0.055	
	B	3	3.000	1		22.5	0	0		0		2055			107	107		100%	1927	0.055	
	E	4	3.300	1		20	0	1		0		1945			5	5		100%	1809	0.003	
	E	4	3.300	2				1		0		4030		185		185			4030	0.046	0.046
	C	3,4,5	3.300	1	25			1		0		1945	325			325	100%		1835	0.177	
	A	5	3.300	1	17.5			1		0		1945	15	158		173	9%		1931	0.090	
	A	5	3.300	1		30	0			0		2085		142	43	185		23%	2061	0.090	0.090
	A	5	3.300	1		25	0	0		0		2085			177	177		100%	1967	0.090	
Pedestrian / LRT Crossing				GM		FGM															
	P1	1,2,3,4	min.	5	+	9	=	14	sec												
	P2	2,3,4,5	min.	5	+	8	=	13	sec												
	P3	3,4,5	min.	5	+	8	=	13	sec												
	P4	5	min.	5	+	5	=	10	sec												
	T1	1	min.	5	+	5	=	10	sec												
	T2	2	min.	5	+	3	=	8	sec												

JUNCTION CAPACITY CALCULATION

Junction J3 - Ming Kum Rd/Tin King Rd/Tsing Tin Rd	2023 PM Reference Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

J3

Traffic Flow Diagram
(pcu/hr)

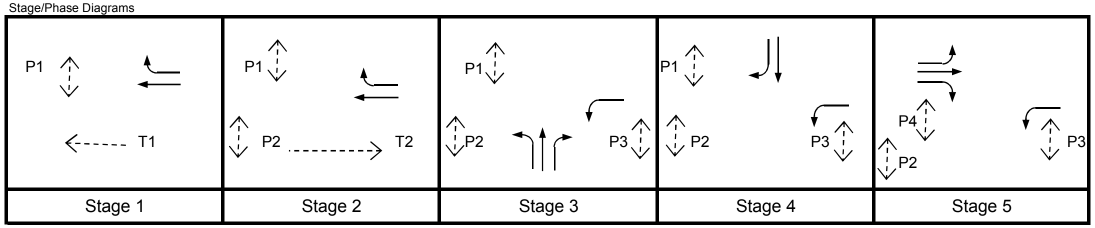


No. of stages per cycle	N =	5	
Cycle time	C =	120	sec
Sum(y)	Y =	0.351	
Lost time	L =	30	sec
Total Flow	=	28,090	pcu
Optimum Cycle C_o	= (1.5×L+5)/(1-Y) =	77	sec
Min. Cycle Time C_m	= L/(1-Y) =	46	sec
Y_{ult}	= 0.9-0.0075×L =	0.675	
$R.C._{ult}$	= $(Y_{ult}$-Y)/Yx100% =	92.1	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y) =	49	sec
Y_{max}	= 1-L/C =	0.750	

Critical Case : D,B,E,A

R.C.(C) = (0.9xY_{max}-Y)/Yx100% = 92%

Stage/Phase Diagrams



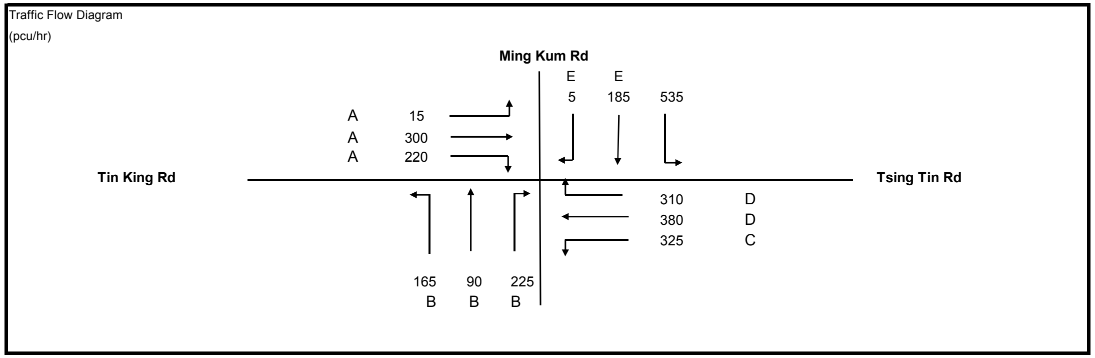
I/G = 5 I/G = I/G = 12 G = 5 I/G = 6 I/G = 5

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	D	1,2	3.300	2		22.5	0	0		0		4170			275	275		100%	3909	0.070	
	D	1,2	3.300	1				1		0		1945		375		375			1945	0.193	0.193
	B	3	3.000	1	17.5			1		0		1915	160			160	100%		1764	0.091	0.091
	B	3	3.000	1				1		0		1915		70		70			1915	0.037	
	B	3	3.000	1		27.5	0			0		2055		0	121	121		100%	1949	0.062	
	B	3	3.000	1		22.5	0	0		0		2055			119	119		100%	1927	0.062	
	E	4	3.300	1		20	0	1		0		1945			5	5		100%	1809	0.003	
	E	4	3.300	2				1		0		4030		55		55			4030	0.014	
	C	3,4,5	3.300	1	25			1		0		1945	230			230	100%		1835	0.125	
	A	5	3.300	1	17.5			1		0		1945	10	121		131	8%		1932	0.068	0.068
	A	5	3.300	1		30	0			0		2085		114	26	140		19%	2066	0.068	
	A	5	3.300	1		25	0	0		0		2085			134	134		100%	1967	0.068	
Pedestrian / LRT Crossing				GM		FGM															
	P1	1,2,3,4	min.	5	+	9	=	14	sec												
	P2	2,3,4,5	min.	5	+	8	=	13	sec												
	P3	3,4,5	min.	5	+	8	=	13	sec												
	P4	5	min.	5	+	5	=	10	sec												
	T1	1	min.	5	+	5	=	10	sec												
	T2	2	min.	5	+	3	=	8	sec												

JUNCTION CAPACITY CALCULATION

Junction J3 - Ming Kum Rd/Tin King Rd/Tsing Tin Rd	2023 AM Design Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

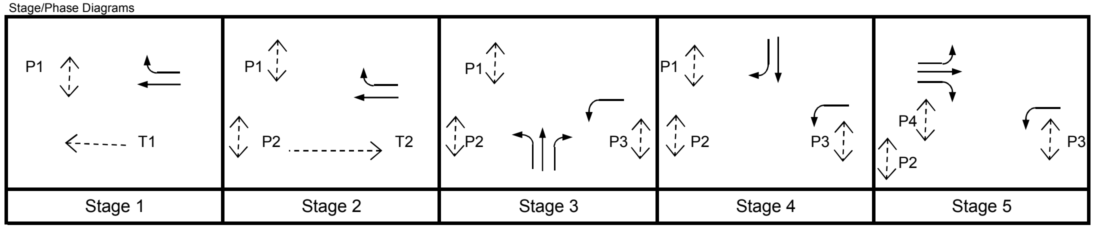
Traffic Flow Diagram
(pcu/hr)



J3

No. of stages per cycle	N =	5	
Cycle time	C =	120	sec
Sum(y)	Y =	0.425	
Lost time	L =	24	sec
Total Flow	=	28,090	pcu
Optimum Cycle C_o = $(1.5\times L+5)/(1-Y)$	=	71	sec
Min. Cycle Time C_m = $L/(1-Y)$	=	42	sec
Y_{ult} = $0.9-0.0075\times L$	=	0.720	
$R.C._{ult}$ = $(Y_{ult}-Y)/Y\times100\%$	=	69.6	%
Practical Cycle Time C_p = $0.9\times L/(0.9-Y)$	=	45	sec
Y_{max} = $1-L/C$	=	0.800	

Stage/Phase Diagrams



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

Critical Case : D,B,E,A

R.C.(C) = $(0.9xY_{max}-Y)/Yx100\%$ = 70%

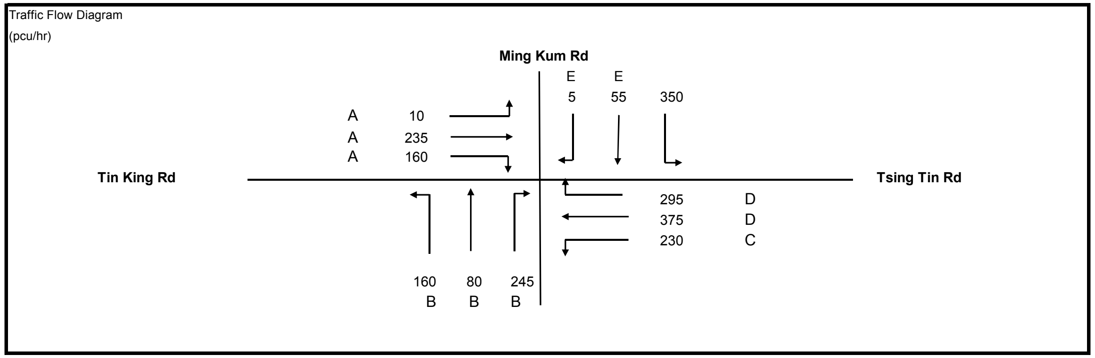
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	D	1,2	3.300	2		22.5	0	0		0		4170			310	310		100%	3909	0.079	
	D	1,2	3.300	1				1		0		1945		380		380			1945	0.195	0.195
	B	3	3.000	1	17.5			1		0		1915	165			165	100%		1764	0.094	0.094
	B	3	3.000	1				1		0		1915		90		90			1915	0.047	
	B	3	3.000	1		27.5	0			0		2055		0	113	113		100%	1949	0.058	
	B	3	3.000	1		22.5	0	0		0		2055			112	112		100%	1927	0.058	
	E	4	3.300	1		20	0	1		0		1945			5	5		100%	1809	0.003	
	E	4	3.300	2				1		0		4030		185		185			4030	0.046	0.046
	C	3,4,5	3.300	1	25			1		0		1945	325			325	100%		1835	0.177	
	A	5	3.300	1	17.5			1		0		1945	15	158		173	9%		1931	0.090	
	A	5	3.300	1		30	0			0		2085		142	43	185		23%	2061	0.090	0.090
	A	5	3.300	1		25	0	0		0		2085			177	177		100%	1967	0.090	
Pedestrian / LRT Crossing				GM		FGM															
	P1	1,2,3,4	min.	5	+	9	=	14	sec												
	P2	2,3,4,5	min.	5	+	8	=	13	sec												
	P3	3,4,5	min.	5	+	8	=	13	sec												
	P4	5	min.	5	+	5	=	10	sec												
	T1	1	min.	5	+	5	=	10	sec												
	T2	2	min.	5	+	3	=	8	sec												

JUNCTION CAPACITY CALCULATION

Junction J3 - Ming Kum Rd/Tin King Rd/Tsing Tin Rd	2023 PM Design Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

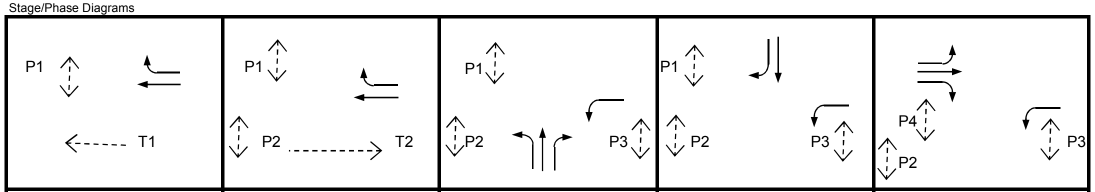
J3

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	5	
Cycle time	C =	120	sec
Sum(y)	Y =	0.351	
Lost time	L =	30	sec
Total Flow	=	28,090	pcu
Optimum Cycle C_o = $(1.5\times L+5)/(1-Y)$	=	77	sec
Min. Cycle Time C_m = $L/(1-Y)$	=	46	sec
Y_{ult} = $0.9-0.0075\times L$	=	0.675	
$R.C._{ult}$ = $(Y_{ult}-Y)/Y\times100\%$	=	92.1	%
Practical Cycle Time C_p = $0.9\times L/(0.9-Y)$	=	49	sec
Y_{max} = $1-L/C$	=	0.750	

Stage/Phase Diagrams



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

Critical Case : D,B,E,A

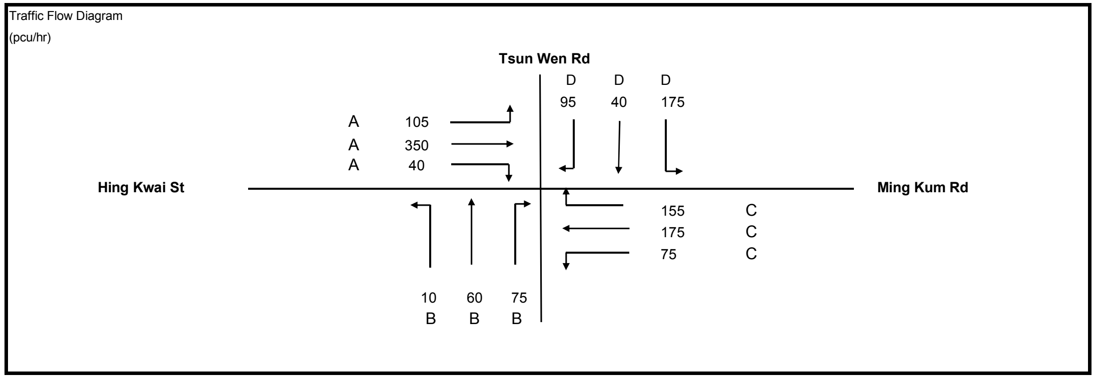
R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 92%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	D	1,2	3.300	2		22.5	0	0		0		4170			295	295		100%	3909	0.075	
	D	1,2	3.300	1				1		0		1945		375		375			1945	0.193	0.193
	B	3	3.000	1	17.5			1		0		1915	160			160	100%		1764	0.091	0.091
	B	3	3.000	1				1		0		1915		80		80			1915	0.042	
	B	3	3.000	1		27.5	0			0		2055		0	123	123		100%	1949	0.063	
	B	3	3.000	1		22.5	0	0		0		2055			122	122		100%	1927	0.063	
	E	4	3.300	1		20	0	1		0		1945			5	5		100%	1809	0.003	
	E	4	3.300	2				1		0		4030		55		55			4030	0.014	
	C	3,4,5	3.300	1	25			1		0		1945	230			230	100%		1835	0.125	
	A	5	3.300	1	17.5			1		0		1945	10	121		131	8%		1932	0.068	0.068
	A	5	3.300	1		30	0			0		2085		114	26	140		19%	2066	0.068	
	A	5	3.300	1		25	0	0		0		2085			134	134		100%	1967	0.068	
Pedestrian / LRT Crossing				GM		FGM															
	P1	1,2,3,4	min.	5	+	9	=	14	sec												
	P2	2,3,4,5	min.	5	+	8	=	13	sec												
	P3	3,4,5	min.	5	+	8	=	13	sec												
	P4	5	min.	5	+	5	=	10	sec												
	T1	1	min.	5	+	5	=	10	sec												
	T2	2	min.	5	+	3	=	8	sec												

JUNCTION CAPACITY CALCULATION

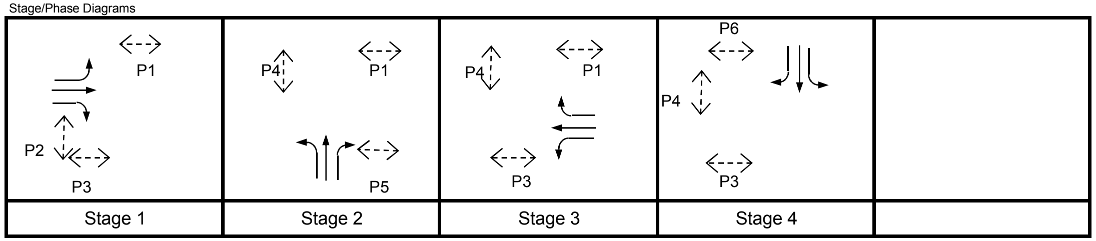
Junction J4 - Tsun Wen Rd/Ming Kum Rd/Hing Kwai St	2023 AM Reference Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

J4



No. of stages per cycle	N =	4	
Cycle time	C =	120	sec
Sum(y)	Y =	0.302	
Lost time	L =	39	sec
Total Flow	=	20,430	pcu
Optimum Cycle C_o = $(1.5\times L+5)/(1-Y)$	=	91	sec
Min. Cycle Time C_m = $L/(1-Y)$	=	56	sec
Y_{ult} = $0.9-0.0075\times L$	=	0.608	
$R.C._{ult}$ = $(Y_{ult}-Y)/Y\times100\%$	=	101.2	%
Practical Cycle Time C_p = $0.9\times L/(0.9-Y)$	=	59	sec
Y_{max} = $1-L/C$	=	0.675	

Stage/Phase Diagrams



I/G = 12 G = 6 I/G = 13 I/G = 6 I/G = 5

Critical Case : A,P5,C,D

R.C.(C) = $(0.9xY_{max}-Y)/Yx100\%$ = 101%

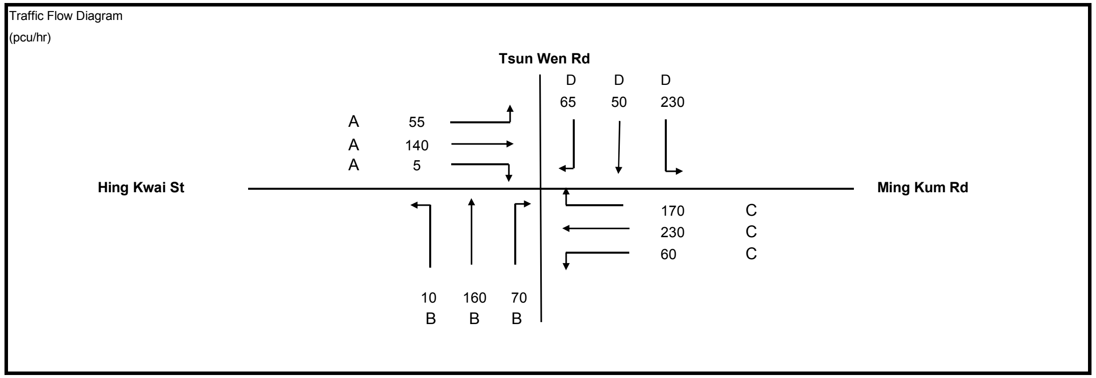
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.500	1	20			1		0		1965	105	131		236	44%		1902	0.124	
	A	1	3.500	1		20	0	0		0		2105		219	40	259		15%	2081	0.124	0.124
	B	2	4.500	1	12.5			1		0		2065	10	60		70	14%		2030	0.034	
	B	2	4.500	1		12.5	0	1		0		2065		0	75	75		100%	1844	0.041	
	C	3	3.300	1	12.5			1		0		1945	75	41		116	65%		1805	0.064	
	C	3	3.300	1				0		0		2085		134		134			2085	0.064	
	C	3	3.300	1		20	0	0		0		2085			155	155		100%	1940	0.080	0.080
	D	4	3.300	1	17.5			1		0		1945	175			175	100%		1791	0.098	0.098
	D	4	3.300	1		27.5	0	0		0		2085		40	29	69		42%	2038	0.034	
	D	4	3.300	1		22.5	0	0		0		2085			66	66		100%	1955	0.034	
Pedestrian Crossing				GM		FGM															
	P1	1,2,3	min.	9	+	9	=	18	sec												
	P2	1	min.	6	+	8	=	14	sec												
	P3	1,3,4	min.	11	+	11	=	22	sec												
	P4	2,3,4	min.	6	+	6	=	12	sec												
	P5	2	min.	6	+	10	=	16	sec												*
	P6	4	min.	5	+	7	=	12	sec												

JUNCTION CAPACITY CALCULATION

Junction J4 - Tsun Wen Rd/Ming Kum Rd/Hing Kwai St	2023 PM Reference Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

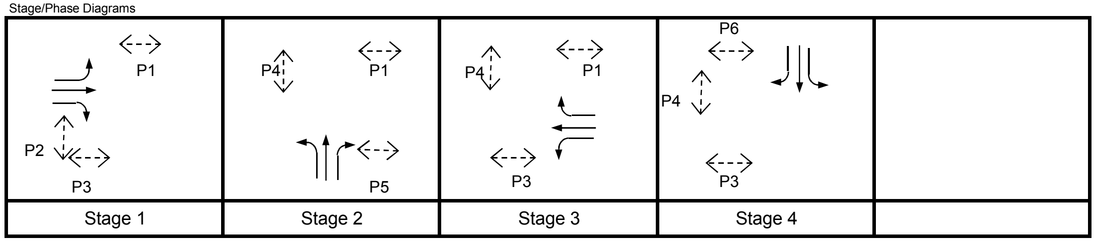
J4

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	4	
Cycle time	C =	120	sec
Sum(y)	Y =	0.276	
Lost time	L =	37	sec
Total Flow	=	20,430	pcu
Optimum Cycle C_o = $(1.5\times L+5)/(1-Y)$	=	84	sec
Min. Cycle Time C_m = $L/(1-Y)$	=	51	sec
Y_{ult} = $0.9-0.0075\times L$	=	0.623	
$R.C._{ult}$ = $(Y_{ult}-Y)/Y\times100\%$	=	125.2	%
Practical Cycle Time C_p = $0.9\times L/(0.9-Y)$	=	53	sec
Y_{max} = 1-L/C	=	0.692	

Stage/Phase Diagrams



G = 6 I/G = 10 I/G = 6 I/G = 6 I/G = 12

Critical Case : P2,B,C,D

R.C.(C) = $(0.9xY_{max}-Y)/Yx100\%$ = 125%

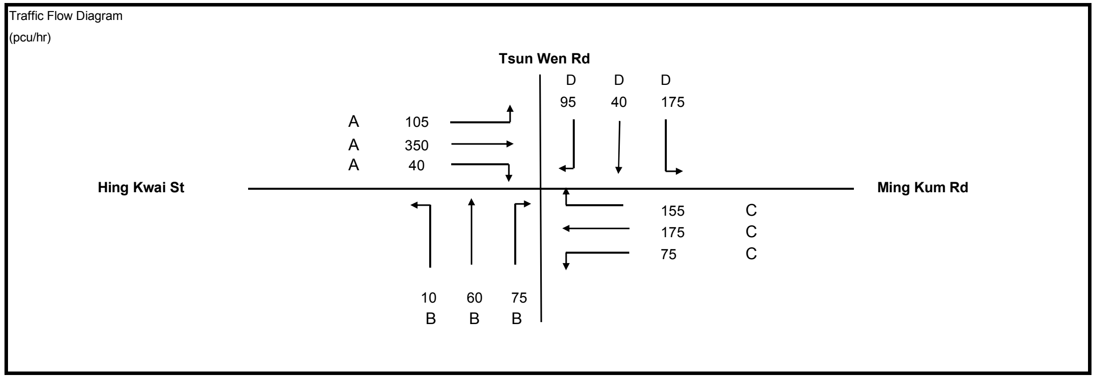
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.500	1	20			1		0		1965	55	40		95	58%		1883	0.050	
	A	1	3.500	1		20	0	0		0		2105		100	5	105		5%	2098	0.050	
	B	2	4.500	1	12.5			1		0		2065	10	114		124	8%		2045	0.060	0.060
	B	2	4.500	1		12.5	0	1		0		2065		46	70	116		60%	1926	0.060	
	C	3	3.300	1	12.5			1		0		1945	60	76		136	44%		1847	0.074	
	C	3	3.300	1				0		0		2085		154		154			2085	0.074	
	C	3	3.300	1		20	0	0		0		2085			170	170		100%	1940	0.088	0.088
	D	4	3.300	1	17.5			1		0		1945	230			230	100%		1791	0.128	0.128
	D	4	3.300	1		27.5	0	0		0		2085		50	9	59		15%	2068	0.029	
	D	4	3.300	1		22.5	0	0		0		2085			56	56		100%	1955	0.029	
Pedestrian Crossing				GM		FGM															
	P1	1,2,3	min.	9	+	9	=	18	sec												
	P2	1	min.	6	+	8	=	14	sec												*
	P3	1,3,4	min.	11	+	11	=	22	sec												
	P4	2,3,4	min.	6	+	6	=	12	sec												
	P5	2	min.	6	+	10	=	16	sec												
	P6	4	min.	5	+	7	=	12	sec												

JUNCTION CAPACITY CALCULATION

Junction J4 - Tsun Wen Rd/Ming Kum Rd/Hing Kwai St	2023 AM Design Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

J4

Traffic Flow Diagram
(pcu/hr)



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Total Flow	=	20,430	pcu

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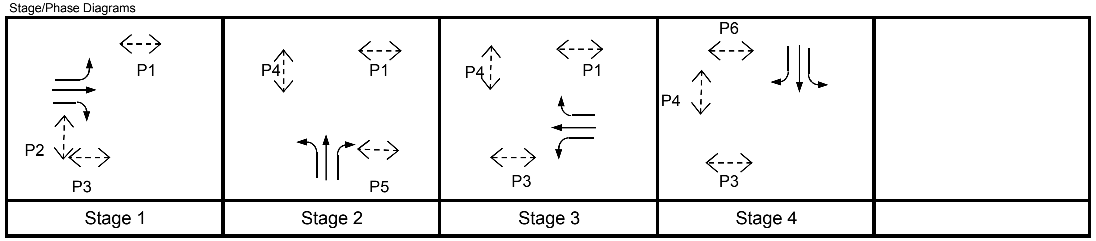
Min. Cycle Time C_m	$= L/(1-Y)$	=	56	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.608	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y \times 100\%$	=	101.2	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	59	sec
Y_{max}	$= 1-L/C$	=	0.675	

Stage/Phase Diagrams



I/G = 12 G = 6 I/G = 13 I/G = 6 I/G = 5

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MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m)		OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr)			TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%)		REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
					LEFT	RIGHT							LEFT	STRAIGHT AHEAD	RIGHT		LEFT	RIGHT			
	A	1	3.500	1	20			1		0		1965	105	131		236	44%		1902	0.124	
	A	1	3.500	1		20	0	0		0		2105		219	40	259		15%	2081	0.124	0.124
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	D	4	3.300	1		27.5	0	0		0		2085		40	29	69		42%	2038	0.034	
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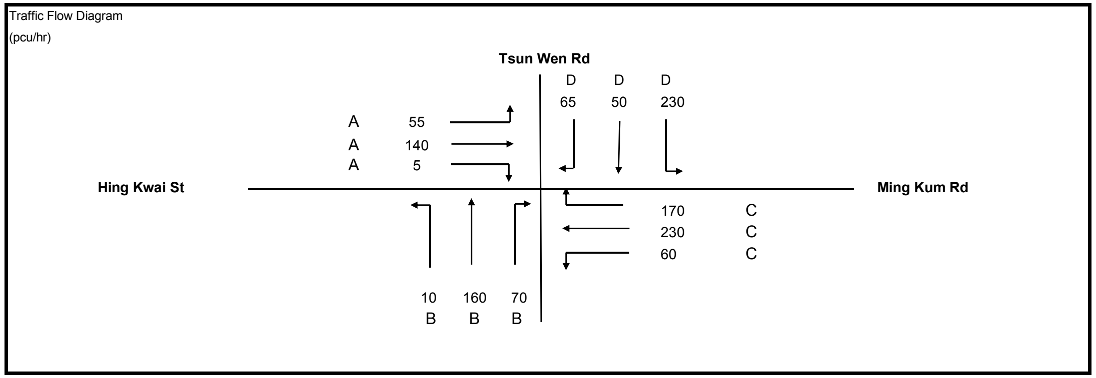
JUNCTION CAPACITY CALCULATION

Junction J4 - Tsun Wen Rd/Ming Kum Rd/Hing Kwai St	2023 PM Design Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60266561

Traffic Flow Diagram
(pcu/hr)



J4

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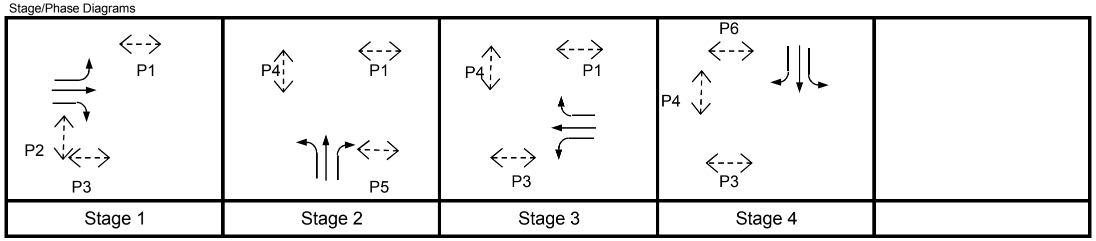
Stage/Phase Diagrams



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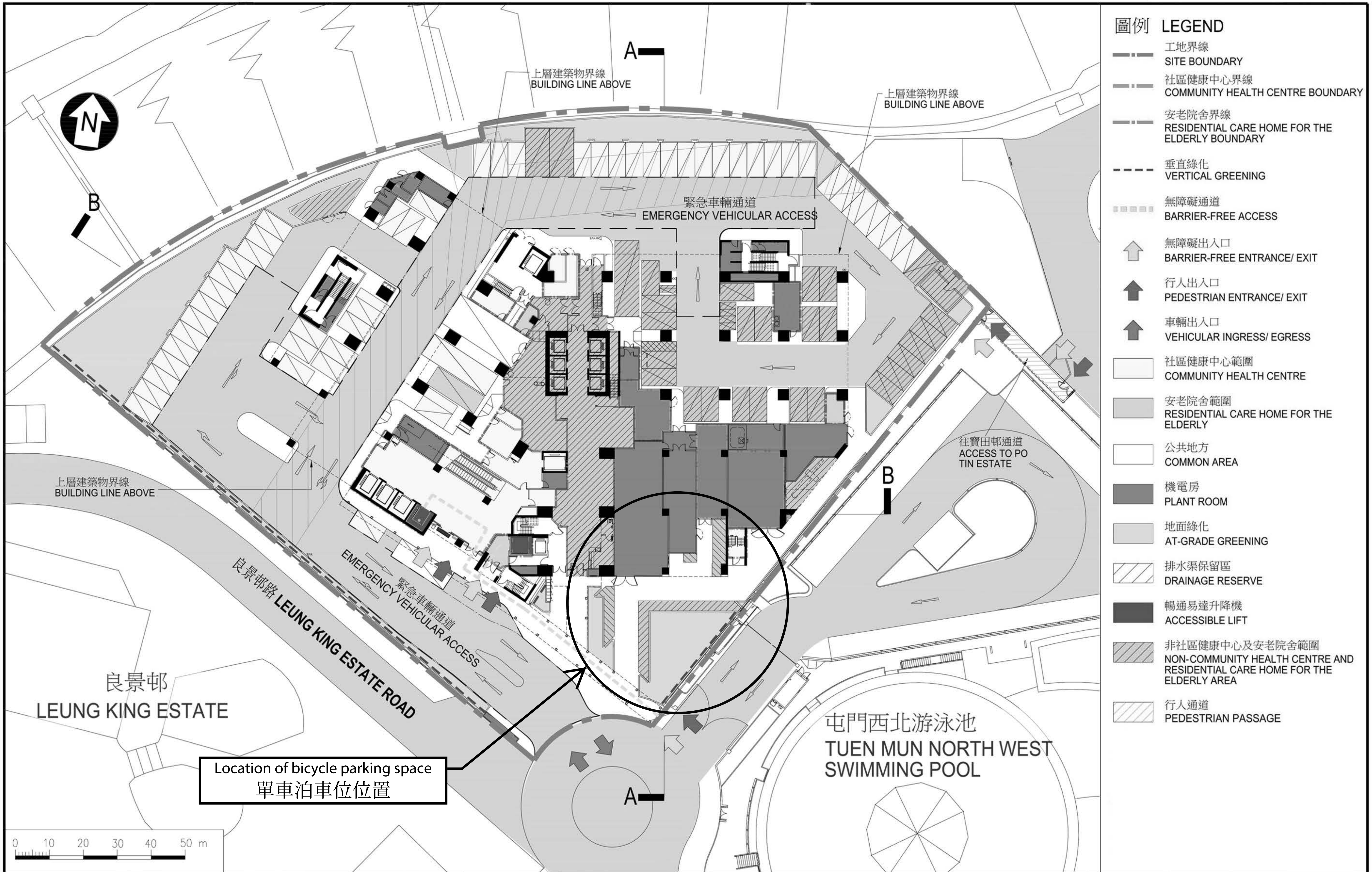
	P3	1,3,4	min.	11	+	11	=	22	sec												
	P4	2,3,4	min.	6	+	6	=	12	sec												
	P5	2	min.	6	+	10	=	16	sec												
	P6	4	min.	5	+	7	=	12	sec												



地下平面圖
GROUND FLOOR PLAN

75MC
屯門第29區西社區健康中心暨安老院舍
COMMUNITY HEALTH CENTRE CUM RESIDENTIAL CARE HOME FOR THE ELDERLY AT TUEN MUN AREA 29 WEST

ARCHITECTURAL SERVICES DEPARTMENT 建築署