

**METRO PLANNING COMMITTEE
OF THE TOWN PLANNING BOARD**

**MPC Paper No. 1/18
For Consideration by
the Metro Planning Committee on 9.2.2018**

**PROPOSED AMENDMENTS TO
THE APPROVED MA TAU KOK OUTLINE ZONING PLAN NO. S/K10/22**

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1. Introduction

This paper is to seek Members' agreement that:

- (a) the proposed amendments to the approved Ma Tau Kok Outline Zoning Plan (OZP) No. S/K10/22 (**Attachment I**) as shown on the draft Ma Tau Kok OZP No. S/K10/22A (**Attachment II**) and its Notes (**Attachment III**) are suitable for exhibition for public inspection under section 5 of the Town Planning Ordinance (the Ordinance); and
- (b) the revised Explanatory Statement (ES) (**Attachment IV**) of the draft OZP should be adopted as an expression of the planning intentions and objectives of the Town Planning Board (the Board) for various land use zonings of the OZP, and is suitable for publication together with the draft OZP and its Notes.

2. Status of the Current OZP

On 5.4.2016, the Chief Executive in Council (CE in C) approved, under section 9(1)(a) of the Ordinance, the draft Ma Tau Kok OZP which was subsequently renumbered as S/K10/22. On 7.2.2017, the CE in C referred the approved Ma Tau Kok OZP No. S/K10/22 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance.

3. Background

- 3.1 Under the 'Special Scheme on Privately Owned Sites for Welfare Uses' launched by the Labour and Welfare Bureau (LWB), the Lok Sin Tong (LST) Benevolent Society (LSTBS) has submitted a redevelopment proposal for a welfare complex at the junction of Lung Kong Road and Carpenter Road, Kowloon City. The Food and Health Bureau, LWB/Social Welfare Department (SWD) and Home Affairs Department (HAD) had given policy support to LST to pursue the proposed redevelopment (**Item A on Plans 1a and 1c**).
- 3.2 As stated in the Policy Address 2017, housing is still one of the most important livelihood issues to be addressed. The Government has been increasing land supply through a multi-pronged approach with short, medium and long-term measures to achieve the target to provide a total of 460,000 housing units, including 280,000 public housing units, in the coming decade. Amongst other measures, steps have been taken to review the possible use of "Government, Institution or Community" ("G/IC") sites without designated use. To meeting the pressing need for housing supply, a piece of Government land of about 3,000m² abutting Ko Shan Road,

Chatham Road North and Shansi Street (**Item B** on **Plans 2a** and **2c**) has been identified for public housing development by the Housing Authority (HA).

4. Proposed Amendments to the OZP (Plans 1a and 2a)

The proposed amendments to the OZP are to:

- (a) amend the building height restriction (BHR) on a “G/IC” site at 61 and 63 Lung Kong Road in Kowloon City to facilitate the LSTBS’ redevelopment (the LST site) (**Item A**);
- (b) rezone a piece of government land at Ko Shan Road mainly zoned “G/IC” to “Residential (Group A)3” (“R(A)3”) for a public housing development (subsidized sale flats) by the HA (the KSR site) (**Item B**);
- (c) to rezone Shansi Street from “G/IC” to an area shown as ‘Road’ to reflect the existing road condition (**Item C1**); and
- (d) to rezone a strip of land from an area shown as ‘Road’ to “Residential (Group A)” (“R(A)”) (**Item C2**) to reflect the existing use.

5. Item A - Relaxation of BHR at LST Site (Plans 1a to 1j)

The Site and its Surroundings

- 5.1 The LST site, about 1,830m², is currently occupied by a 5-storey LSTBS headquarters and clinic and a 3-storey Lok Sin Tong Primary School (**Plans 1b** to **1d**). LST will stop operation of the school on-site after September 2019, and the planned school closure has been approved by the Secretary for Education (SED).
- 5.2 The surroundings of the LST site are:
 - (a) within a mixed residential/commercial neighbourhood bounded by Carpenter Road, Sa Po Road, Prince Edward Road West and Junction Road. The neighbouring area is predominantly medium-rise residential developments with ground floor shops and restaurant uses. Some new residential developments are of taller building height. This area is predominantly zoned “R(A)2” that is subject to domestic and total plot ratio (PR) restrictions of 7.5 and 9 respectively as well as BHRs of 80mPD or 100mPD¹ (**Plans 1a** and **1b**);
 - (b) with some low-rise Government, institution and community (GIC) developments. Along the east side of Lung Kong Road are an education centre, a refuse collection point, a post office and a telephone exchange station (**Plans 1c** and **1e**). Further west along Nga Tsin Long Road is a street block zoned “G/IC” and occupied by the Kowloon City Municipal Services Building, a clinic and an elderly health centre (**Plans 1a** and **1b**); and

¹ “R(A)2” sites are subject to BHR of 80mPD as stipulated on the OZP, while sites with an area of 400m² or more are allowed a BHR of 100mPD as stipulated in the Notes.

- (c) to its north is the Carpenter Road Park and Kowloon Walled City Park within “Open Space” (“O”) zone (**Plans 1a and 1b**).

LST’s Redevelopment Proposal

- 5.3 LST submitted a redevelopment proposal for a welfare complex. The conceptual scheme is shown in **Plans 1f to 1h** and the main development parameters are summarised below. A full set of supporting technical assessments are deposited at the Secretariat of the Board for Members’ reference.

| | |
|----------------------------------|--|
| Site Area (about) | 1,830m ² |
| Plot Ratio (about) | 8.8 |
| Site Coverage (about) | 95% (below 15m) 69% (over 15m) |
| No. of Block | 1 |
| Building Height (mPD) | Maximum 60mPD |
| Building Height (No. of Storeys) | Northern portion: 12 above ground } (Plan 1f) Southern portion: 4 above ground } Basement: 1 |
| Main Proposed Welfare Facilities | <ul style="list-style-type: none"> - Nursing Home and Care and Attention Home for the Elderly with about 400 beds (1/F to 6/F) - Day Care Centre for the Elderly - Early Education and Training Centre - Primary Health Care Centre - Ethnic Minority Supporting Service Centre |
| Ancillary Car parking Spaces | 11 (total) <ul style="list-style-type: none"> - 5 for light buses - 2 for light goods vehicle (LGV) - 2 for ambulance - 1 for private car for people with disabilities - 1 for refuse collection vehicle |

- 5.4 LST will continue to liaise and review the scope of services and accommodations for the proposed welfare facilities with relevant government bureaux/departments. The proposed redevelopment is targeted to be completed by 2022.

Proposed Amendment to the OZP

- 5.5 The LST site is zoned “G/IC” on the OZP. To facilitate the redevelopment proposal, the BHR for the site is proposed to be amended from 5 and 8 storeys to 60mPD (**Plan 1a**).

Land Use, Development Intensity and Building Height

Land Use

- 5.6 As the LST site is located within a mixed residential/commercial neighbourhood interspersed with GIC facilities, the proposed welfare complex is considered compatible with surrounding land uses and will enhance provision of welfare services for the local community.

Development Intensity

- 5.7 There is no PR restriction under the “G/IC” zone and sites under surrounding “R(A)2” zone is subject to a total PR restriction of 9. The proposed PR of 8.8 for the redevelopment is considered compatible in the local context.

Building Height

- 5.8 The residential sites in the area are zoned “R(A)2” under the OZP and in general subject to BHR of 80mPD or 100mPD. The other “G/IC” zones in the vicinity are subject to BHRs from 1 to 8 storeys, that are relatively low-rise to provide visual relief and breathing space.
- 5.9 To support the proposed amendment to the BHR, LSTBS has conducted a Visual Appraisal (VA) to assess the possible visual impact of the proposed development (**Attachment VI**). Five viewing points at Kowloon Walled City Park and along Carpenter Road and Nam Kok Road representing key public open spaces and roads with main pedestrian flows are selected (Plan 1 of **Attachment VI**). The VA concluded that the proposed welfare complex with a BH of 60mPD is considered not visually excessive and is compatible with the surrounding area with mainly medium to high-rise residential developments (**Plans 1i** and **1j**). Measures including setback of building by 2m along Nam Kok Road as well as greening proposals will further mitigate any visual impacts.
- 5.10 The proposed BHR of 60mPD is lower than the BHR of 80mPD and 100mPD for the surrounding “R(A)2” zones and is considered acceptable for the “G/IC” zone having considered the need to optimize land resources for provision of welfare facilities, policy support for the proposed facilities, and that the VA has demonstrated that there will not be adverse visual impacts and there will be measures to enhance the visual appearance of the redevelopment. The Chief Town Planner/Urban Design and Landscape, Planning Department (CTP/UD&L, PlanD) has no adverse comment on the proposed rezoning from visual impact perspective.

Technical Aspects

Traffic Aspect

- 5.11 The Transport Impact Assessment (TIA) submitted by LSTBS in **Attachment V** shows that all critical road junctions in the surrounding areas will be operating within capacities in the design year 2025, which is three years after the completion of the welfare complex. The TIA demonstrated that the net increase in traffic trips related to the proposed welfare complex as compared to the existing uses on the site can be absorbed by the nearby road network and no significant traffic impact will be induced.
- 5.12 Ancillary parking facilities will be provided as detailed in paragraph 5.3 above. The four public metered parking spaces along Lung Kong Road that will be affected by the proposed ingress/egress will be re-provisioned on Nam Kok Road. The LST site is also well-served by public transport services of numerous bus and minibus routes. The planned subway entrance to Sung Wong Toi Station of the Shatin to Central Link (SCL) is about 160m away from the site (**Plans 1a** and **1b**). The Commissioner for Transport (C for T) has no comment on the proposed relaxation of

BHR to 60MPD and details of the TIA and the parking provision is subject to C for T's agreement at detailed design stage.

Landscape Aspect

- 5.13 There is one large and mature tree of common species (**Plans 1c and 1d**) on the LST site. The CTP/UD&L, PlanD has no adverse comment on the proposed amendment to the BHR and advised that due consideration should be given to preservation of this tree as far as possible, by integrating with the site layout for effective preservation. LSTBS considers that due to site constraints, the tree is inevitably affected by the redevelopment. Tree survey and landscape assessment will be conducted at detailed design stage and landscape mitigation measures, including greening and at-grade tree planting will be explored.

Environmental Aspect

- 5.14 The Director of Environmental Protection (DEP) has no in-principle objection to the amendment of the BHR, and considers that the proposed welfare complex would not cause insurmountable problems on environmental aspects. At the detailed design stage, LSTBS will undertake air quality impact assessment (AQIA), noise impact assessment (NIA) and sewerage impact assessment (SIA) to ascertain whether mitigation measures are required to be incorporated in the redevelopment.

Overall

- 5.15 The proposed welfare complex would not cause any insurmountable problems on environmental, traffic, sewerage, drainage and water supplies aspects and concerned Government departments have no adverse comment on the proposed amendment to the BHR of the "G/IC" zone covering the LST site.

6. Item B - Rezoning of KSR Site (Plans 2a to 2k)

The Site and its Surroundings

- 6.1 The KSR site, about 3,000m², is currently held under the Temporary Government Land Allocation by Highways Department (HyD) for a temporary works area for the SCL (**Plans 2b and 2d**). The site was previously earmarked for development of an indoor recreational centre (IRC) since the early 1980's. Based on requirements in the Hong Kong Planning Standards and Guidelines (HKPSG), as shown in **Attachment XI**, there are two existing sports centres in the planning area, which is sufficient to meet the demand in Ma Tau Kok and Kowloon City. The site was previously used for temporary public car park under short term tenancy and was temporary allocated as a works area for SCL since 2012. Director of Leisure and Cultural Services (DLCS) has no objection to rezoning the site for residential use.
- 6.2 The surroundings of the site are:
- (a) within a high-rise residential neighbourhood with a mix of public and private housing. To its north, east and south are mainly private residential buildings and the Lok Man Sun Chuen public housing estate is located to its northwest (**Plan 2a**);

- (b) to its west is the Ko Shan Road Park and the Ko Shan Theatre is located within the park (**Plans 2a** and **2b**); and
- (c) Chatham Road North and the elevated East Kowloon Corridor at a level of about 19mPD about the eastern boundary of the site.

HA’s Public Housing Proposal

6.3 A single-block public housing development for subsidized sale flats is proposed on the site. The conceptual scheme is in **Plans 2g** to **2i** and the main development parameters are summarized below. A full set of supporting technical assessments are deposited at the Secretariat of the Board for Members’ reference.

| | |
|----------------------------------|---|
| Site Area (about) | 3,000m ² |
| Maximum PR | |
| Domestic | 7.5 |
| Non-domestic | 1.5 (for ancillary and public car park) |
| Site Coverage (about) | 70% (non-domestic portion) 23% (domestic portion) |
| No. of Block | 1 |
| Building Height (mPD) | Maximum 130mPD |
| Building Height (No. of Storeys) | 35 domestic floors over 3-storey podium and 1 basement car park level |
| No. of Flats (about) | 500 |
| Car parking facilities | - 35 ancillary parking spaces for private cars - 16 public car parking spaces (11 for light buses / LGVs and 5 for private cars) |
| Tentative population in-take | 2023/24 |

Proposed Amendments to the OZP

6.4 The site is mainly zoned “G/IC” with a narrow strip of land along the northeastern boundary zoned “R(A)” and another narrow strip of land along the western boundary falling within an area shown as ‘Road’ (**Plan 2c**). The site is proposed to be rezoned to “R(A)3” (**Item B**), with the same PR restrictions as other “R(A)” zones on the OZP and a BHR of 130mPD is proposed. C for T requested for provision of public car parking spaces on the site to meet local demand. The “R(A)3” subzone is to allow for specification under the Notes that public vehicle park (excluding container vehicle) is always permitted on the site (see paragraph 9.2(b) below).

Land Use, Development Intensity and Building Height

Land Use

- 6.5 As the site is located within a high-rise residential neighbourhood, the proposed public housing development is considered compatible with surrounding land uses.

Development Intensity

- 6.6 Residential sites in the vicinity are zoned “R(A)” and subject to domestic and total PR restrictions of 7.5 and 9 respectively. The “R(A)3” zone will be subject to the same PR restrictions as other “R(A)” zones.

Building Height

- 6.7 The “R(A)” sites in the immediate vicinity to the west of Ma Tau Wai Road are mainly subject to a BHR of 120mPD. The “R(A)” zone covering Lok Man Sun Chuen to the northwest of the site is subject to a BHR of 140mPD. Other “R(A)” sites further east of To Kwa Wan Road and north of Bailey Street are subject to a BHR of 100mPD (**Plan 2f**).
- 6.8 HA proposed a BHR of 130mPD for the “R(A)3” zone. According to HA, the disposition of the residential block is highly constrained due to the need to setback 20m from Chatham Road North to meet air quality requirements; measures required to mitigate cumulative traffic noise from Chatham Road North and the elevated East Kowloon Corridor; the railway protection area; and sewage tunnel protection area within the site (**Plan 2i**). Taking into account all site constraints, HA considered that further increase in site coverage for the domestic tower may not meet the noise requirements and will reduce the open space required to meet the HKPSG requirements, and there are structural constraints for provision of any further basement level due to the SCL tunnel and the protective measures for the abutting building. HA considered that the proposed BH of 130mPD which is 10m higher than the BHR of 120mPD in the immediate vicinity is optimal for maximizing flat production on the site in accordance with the maximum PR for the “R(A)” zone.
- 6.9 HA has conducted a VA (**Attachment VIII**) to assess the possible visual impact of the proposed development. Six viewing points at key public open spaces and pedestrian nodes are selected (Plan 4 in **Attachment VIII**). The VA concluded that the proposed development will be partially blocked by existing buildings/vegetation in some viewpoints. At other viewpoints, it may reduce visual openness but will be seen as extension of existing building clusters and would generally be visually compatible with existing developments in the vicinity (**Plans 2j** and **2k**). As shown in **Plan 2g**, the podium and residential block will be setback from Chatham Road North, Shansi Street and Ko Shan Road. The VA also suggested that other visual enhancement measures such as façade treatment could be further explored at the detailed design stage.
- 6.10 The proposed BHR of 130mPD is between the BHR of 120mPD for “R(A)” zones along Ma Tau Wai Road and the BHR of 140mPD for the “R(A)” site covering Lok Man Sun Chuen to its northwest. It is considered acceptable having considered the need to optimize land resources, maximize flat production with regard to severe site constraints and that the VA has demonstrated that there will not be adverse visual

impacts and there will be measures to mitigate the visual impacts. The CTP/UD&L, PlanD has no adverse comment on the proposed rezoning from visual impact perspective.

Technical Aspects

Traffic Aspect

- 6.11 As indicated in the TIA conducted by HA (**Attachment VII**), the proposed public housing development with about 500 flats with ancillary car park and 16 public car parking spaces would not cause adverse traffic impacts to the existing road network. The public car park is required by C for T to address the local demand. Hence, it is specified in the Notes of the “R(A)3” zone that ‘Public Vehicle Park (excluding container vehicle)’ is always permitted on the site. The site is served by a number of franchised bus and minibus routes which mainly run along Chatham Road North and Ma Tau Wai Road. The planned To Kwa Wan MTR Station of the SCL is about 260m away from the site (**Plans 2a** and **2b**). C for T has no in-principle objection to the proposed development from traffic perspective.

Landscape Aspect

- 6.12 A broad brush tree survey was conducted by HA in 2015 to identify dominant tree species, maturity, rarity and any plant species of conservation interest within the site. There are about 37 trees of common species on the site. The health condition and amenity value of the trees are poor and low, and transplanting of those trees are generally not practical while the survival rates after transplanting is low. The CTP/UD&L, PlanD has no adverse comment on the rezoning and advised that due consideration should be given to preservation of the existing trees as far as possible, by integrating with the site layout for effective preservation. HA considers that due to site constraints, felling of the trees is inevitable but compensatory planting and greening proposals will be explored at detailed design stage.

Environmental Aspect

- 6.13 HA has prepared a summary on the preliminary findings of the environmental assessment study (**Attachment IX**). According to its findings, the proposed development would be subject to potential impacts of traffic noise and potential air quality impacts from vehicle emissions from nearby roads. Mitigation measures such as building setback, non-noise sensitive podium structure and acoustic windows/balconies will be incorporated into building design to alleviate the potential road traffic noise impact. Insurmountable air quality impacts are not anticipated as the buffer distance requirements for vehicular and chimney emissions (there are no chimneys identified within the buffer area) under the HKPSG are satisfied. DEP has no adverse comment from environmental perspective.

Quantitative Risk Aspect

- 6.14 A Quantitative Risk Assessment (QRA) (**Attachment X**) for a liquefied petroleum gas (LPG) compound in Lok Man Sun Chuen (**Plan 2I**) was carried out to assess the increase of risk due to a residential development at the KSR site. The risks at both the construction and operation stages were assessed. The results showed that the individual risk complied with the standard and societal risk fell in the “acceptable”

region and the Director of Electrical and Mechanical Services (DEMS) has no adverse comment on the rezoning.

Infrastructural Aspect

- 6.15 The proposed public housing development with about 500 flats would not result in any adverse impacts on infrastructural capacity in the area. Concerned Government departments including the Drainage Services Department, Water Supplies Department, Highways Department and Civil Engineering and Development Department have no comment on the rezoning.

Other Amendments Items

Item C1 - Rezoning of Shansi Street from "G/IC" zone to area shown as 'Road'

- 6.16 Shansi Street which occupies the remaining portion (about 550m²) of the "G/IC" zone covering the KSR site is proposed to be rezoned to an area shown as 'Road' to reflect its existing road condition (**Item C1** on **Plans 2a to 2c, 2d** and **2e**).

Item C2 - Rezoning of a strip of land along Ko Shan Road from an area shown as 'Road' to "R(A)" zone

- 6.17 A strip of land falling within the private lot boundary of a residential development (Faerie Court) (**Plan 2c**) is proposed to be rezoned from an area shown as 'Road' to "R(A)" zone to reflect the existing use (**Item C2** on **Plans 2a to 2c** and **2e**).

7. Provision of GIC Facilities and Open Space

- 7.1 Taking into account the LST's redevelopment and the proposed public housing development at the KSR site, the planned population of the OZP area would be about 146,350 persons. Based on requirements in HKPSG, as shown in **Attachment XI**, the planned provision for various community facilities in the area is generally sufficient except for secondary school classrooms (-64 classrooms). For secondary school classrooms, they are assessed on a wider district basis, and there is a surplus provision of 713 classrooms in Kowloon City District. The LST redevelopment will provide various community facilities to serve the local community.
- 7.2 For open space provision, there is a surplus provision of about 4 ha of district open space in Ma Tau Kok area. For local open space, while there is a shortfall (about -7 ha) in the area, there is a surplus provision of about 3.3 ha in the wider Kowloon City District. In this regard, 1m² local open space per person in accordance with HKPSG will be provided within the public housing development to meet the demand generated by the residents, and the LST site is very close to the Carpenter Road Park and Kowloon Walled City Park.

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

The proposed amendments as shown on the draft Ma Tau Kok OZP No. S/K10/22A at **Attachment II, Plan 1a** and **Plan 2a** are as follows:

(a) **Amendment Item A** (about 0.18ha)

Amendment of BHR for the “G/IC” zone covering LST site from 5 and 8 storeys to 60mPD for the proposed welfare complex in accordance with paragraph 5 above.

(b) **Amendment Item B** (about 0.3ha)

Rezoning of the KSR site from “G/IC”, “R(A)” and an area shown as ‘Road’ to “R(A)3” for public housing development with imposition of a BHR of 130mPD in accordance with paragraph 6 above.

(c) **Amendment Item C1** (about 500m²)

Rezoning the remaining portion of the “G/IC” zone in (b) above covering Shansi Street to an area shown as ‘Road’ to reflect the existing road condition.

(d) **Amendment Item C2** (about 80m²)

Rezoning a strip of land along Ko Shan Road from an area shown as ‘Road’ to “Residential (Group A)” (“R(A)”) zone to reflect the existing use.

(e) **Amendment to Names of the MTR Stations**

The alignment of the MTR SCL authorized by the Chief Executive in Council under the Railways Ordinance (Chapter 519) on 27.2.2012 is already shown on the OZP since 2015 for information. The authorized scheme is deemed to be approved under section 13A of the Ordinance. Opportunity is taken to update the name of the two MTR stations: the ‘To Kwa Wan Station’ will be amended to ‘Sung Wong Toi Station’ (**Plan 1a**) and the ‘Ma Tau Wai Station’ will be amended to ‘To Kwa Wan Station’ (**Plan 2a**).

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

Item A - “G/IC” zone

9.1 There is no need to amend the Notes of the “G/IC” zone.

Item B - “R(A)3” zone

9.2 The following amendments to the Notes of the “R(A)” zone are proposed:

- (a) incorporation of “R(A)3” zone under Remark (1) to reflect that the PR restrictions for “R(A)” zone is applicable to the new “R(A)3” zone; and
- (b) incorporation of ‘Public Vehicle Park (excluding container vehicle) (on land designated “R(A)3” only)’ as a Column 1 use and amend the corresponding Column 2 use to ‘Public Vehicle Park (excluding container vehicle) (not elsewhere specified)’.

Technical amendments

9.3 The following technical amendments will also be made to the Notes:

- (a) opportunity is taken to revise the exemption clause for PR/Gross Floor Area calculation for the “Comprehensive Development Area”, “R(A)”, “Residential (Group B)” and “Residential (Group E)” zones to clarify that exemption of caretaker’s quarters and recreational facilities are only applicable to those facilities for the use and benefit of all the owners or occupiers of the domestic building or domestic part of the building; and
- (b) incorporation of a clause in the Remarks of “R(A)” zone stating that the PRs of the existing building shall apply only if any addition, alteration and/or modification to or redevelopment of an existing building is for the same type of building as the existing building, otherwise, the OZP restrictions shall be applied.

9.4 The proposed amendments to the draft Notes of the OZP (with additions highlighted in ***bold and italics*** and deletions in ‘~~crossed-out~~’) are at **Attachment III** for Members’ consideration

10. Revision to the Explanatory Statement of the OZP

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

11. Plan Number

Upon exhibition for public inspection, the OZP will be renumbered as S/K10/23.

12. Consultation

Consultation with Kowloon City District Council (KCDC)

12.1 On 18.1.2018, the Housing and Infrastructure Committee (HIC) of the KCDC was consulted on the proposed amendments. The HIC of KCDC members generally supported LSTBS’ redevelopment proposal at LST site to increase the provision of social welfare services and the public housing development at KSR site to meet the acute public housing demand. Their main views and the responses of government departments and HA/LSTBS are summarised below:

| HIC KCDC's Views | Responses of Government departments and HA/LSTBS |
|---|---|
| LST site | |
| (a) Members raised concerns on traffic congestion in the area. | The TIA submitted by LSTBS indicated that all the road junctions under assessment will be operating within capacity and concluded that no insurmountable traffic impact is envisaged. |
| (b) Public parking spaces should be provided in the redevelopment. | <p>The site is relatively small and there is major technical and operational difficulty to provide additional basement levels for public car parking spaces. Certain types of social services (e.g. elderly, rehabilitation and child services) have to be located not more than 24m above ground level. LSTBS has fully utilized the lower level floors to accommodate the social services and it is not feasible to provide any public car parking spaces above ground.</p> <p>Public car park within the redevelopment may compromise the efficiency or effectiveness of service delivery, security and safety of service users.</p> |
| (c) A community hall and more social welfare services (e.g. childcare services) should be provided in LSTBS' redevelopment. | The proposal has already included social welfare services that are in acute demand. As LSTBS has fully utilize the capacity of the area under 24m to accommodate the elderly, rehabilitation and child services, there is no room to provide additional welfare services, e.g. child-care services in the redevelopment. No community hall can be provided as all floors have been fully utilized to provide services confirmed by SWD. But, LSTBS will further discuss with SWD for the possibility to allow public's booking of confirmed conference rooms or activity rooms in the redevelopment at the implementation stage. |
| (d) A member considered that a higher BHR (e.g. 80mPD for the surrounding "R(A)" zone) can allow the provision of more floor space. | The development is proposed at a PR of 8.8 which is similar to the PR of the surrounding "R(A)" zones. The current conceptual scheme has not fully utilized the maximum BHR of 60mPD. At the |

| HIC KCDC's Views | Responses of Government departments and HA/LSTBS |
|---|--|
| | detailed design stage, if considered feasible, LSTBS would consider providing more floor space within the BHR of 60mPD. Further increase in BHR may result in greater visual impact on the surrounding areas. |
| KSR site | |
| (a) Majority of Members suggested that the site should be used for public rental housing rather than subsidized sale flat. It can be a decanting site for the redevelopment of the existing public housing estates in the area. A member suggested that the site may be developed for subsidized sale flat. | The proposed amendment is to rezone the site for residential use, and the type of housing is not prescribed under the OZP. There is no redevelopment plan for existing HA housing estates in the area and the site is planned to be developed as subsidized sale flats by HA. |
| (b) As the site was close to Lok Man Sun Chuen, there would be synergy effect in terms of estate management if the KSR site was developed by the Hong Kong Housing Society (HKHS). It could also be a decanting site for redevelopment of Lok Man Sun Chuen. | HKHS has previously considered the site, and taking into account the then prevailing technical and other considerations, HKHS decided not to pursue the site for their housing scheme. |
| (c) Requested the provision of more public car parking spaces and some other social/community facilities within the development. | As requested by C for T, 16 public car parking spaces will be provided in the basement to meet demand. HA considered that without inducing flat loss, there is no room to accommodate other community facilities nor more public car parking spaces. |

Departmental Consultation

12.2 The proposed amendments have been circulated to relevant government bureaux/departments. They have no objection or no adverse comment on the proposed amendments, and their comments have been incorporated into the above paragraphs, where appropriate:

- (a) Secretary for Labour and Welfare;
- (b) SED;
- (c) District Lands Officer/Kowloon East, Lands Department (LandsD);
- (d) District Lands Officer/Kowloon West, LandsD;
- (e) Director of Housing;

- (f) C for T;
- (g) Chief Highway Engineer/Kowloon, HyD;
- (h) Chief Engineer/Railway Development 1-3, Railway Development Office, HyD;
- (i) DEP;
- (j) Director of Social Welfare;
- (k) Chief Engineer/Mainland South, Drainage Services Department;
- (l) Chief Engineer/Development(2), Water Supplies Department;
- (m) Chief Building Surveyor/Kowloon, Buildings Department;
- (n) DEMS;
- (o) Director of Fire Services;
- (p) DLCS;
- (q) Commissioner of Police;
- (r) District Officer (Kowloon City), HAD and
- (s) CTP/UD&L, PlanD.

Public Consultation

12.3 If the proposed amendments are agreed by the Committee, the draft OZP (to be renumbered to S/K10/23 upon exhibition) and its Notes will be exhibited under section 5 of the Ordinance for public inspection. Members of the public can submit representations on the OZP to the Board during the two-month statutory public inspection period. The KCDC will be further consulted on the amendments during the exhibition period of the amended OZP.

13. Decision Sought

Members are invited to:

- (a) agree to the proposed amendments to the approved Ma Tau Kok OZP and that the draft Ma Tau Kok OZP No. S/K10/22A at **Attachment II** (to be renumbered to S/K10/23 upon gazetting) and its Notes at **Attachment III** are suitable for public exhibition under section 5 of the Ordinance; and
- (b) adopt the revised ES at **Attachment IV** for the draft Ma Tau Kok OZP No. S/K10/22A as an expression of the planning intentions and objectives of the Board for various land use zonings of the OZP and agree that the revised ES is suitable for publication together with the OZP.

14. Attachments

| | |
|------------------------|---|
| Attachment I | Approved Ma Tau Kok OZP No. S/K10/22 (reduced to A3) |
| Attachment II | Draft Ma Tau Kok OZP No. S/K10/22A |
| Attachment III | Revised Notes of the Draft Ma Tau Kok OZP No. S/K10/22A |
| Attachment IV | Revised ES of the Draft Ma Tau Kok OZP No. S/K10/22A |
| Attachment V | TIA for Proposed Welfare Complex at LST Site (Extract) |
| Attachment VI | VA for Proposed Welfare Complex at LST Site |
| Attachment VII | TIA for Proposed Public Housing Development at KSR Site (Extract) |
| Attachment VIII | VA for Proposed Public Housing Development at KSR Site |

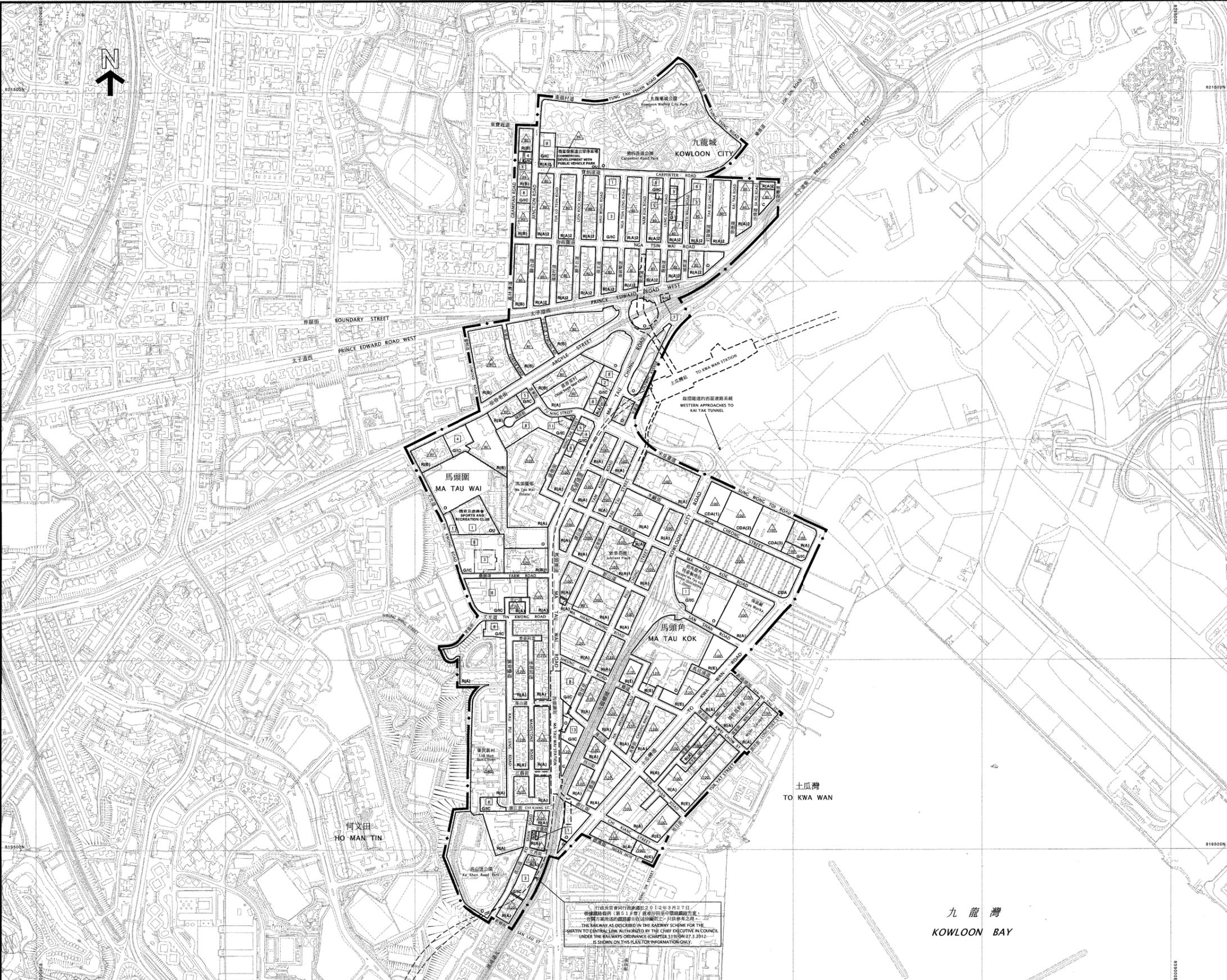
Attachment IX Summary of Preliminary Environmental Assessment Study for Proposed Public Housing at KSR Site
Attachment X QRA for Proposed Public Housing Development at KSR Site (Extract)
Attachment XI Provision of Open Space and Major Community Facilities

Amendment Item A

Plan 1a Location Plan
Plan 1b Aerial Photo
Plan 1c Site Plan
Plans 1d to 1e Site Photos
Plans 1f to 1h Conceptual Layout and Section Plans of the Proposed Welfare Complex at LST Site
Plans 1i and 1j Photomontages

Amendment Items B, C1 and C2

Plan 2a Location Plan
Plan 2b Aerial Photo
Plan 2c Site Plan
Plans 2d to 2e Site Photos
Plan 2f BHRs of Surrounding Area
Plans 2g to 2i Conceptual Layout and Section Plans of the Proposed Public Housing Development at KSR Site
Plans 2j and 2k Photomontages
Plan 2l Site Constraints of KSR Site



圖例 NOTATION

- | | | |
|---|----------|---------------------|
| ZONES | | 地帶 |
| COMMERCIAL | C | 商業 |
| COMPREHENSIVE DEVELOPMENT AREA | CDA | 綜合發展區 |
| RESIDENTIAL (GROUP A) | RIA(A) | 住宅(甲類) |
| RESIDENTIAL (GROUP B) | RIA(B) | 住宅(乙類) |
| RESIDENTIAL (GROUP E) | RIA(E) | 住宅(戊類) |
| GOVERNMENT, INSTITUTION OR COMMUNITY | GIC | 政府、機構或社區 |
| OPEN SPACE | O | 休憩用地 |
| OTHER SPECIFIED USES | OU | 其他指定用途 |
| COMMUNICATIONS | | 交通 |
| RAILWAY AND STATION (UNDERGROUND) | [Symbol] | 鐵路及車站(地下) |
| MAJOR ROAD AND JUNCTION | [Symbol] | 主要道路及路口 |
| ELEVATED ROAD | [Symbol] | 高架道路 |
| MISCELLANEOUS | | 其他 |
| BOUNDARY OF PLANNING SCHEME | [Symbol] | 規劃範圍界線 |
| BUILDING HEIGHT CONTROL ZONE BOUNDARY | [Symbol] | 建築物高度管制區界線 |
| MAXIMUM BUILDING HEIGHT (IN METRES ABOVE PRINCIPAL DATUM) | [Symbol] | 最高建築物高度(在主水平基準上若干米) |
| MAXIMUM BUILDING HEIGHT (IN NUMBER OF STOREYS) | [Symbol] | 最高建築物高度(樓層數目) |

土地用途及面積一覽表 SCHEDULE OF USES AND AREAS

| USES | 大約面積及百分比 APPROXIMATE AREA & % | | 用途 |
|--------------------------------------|-------------------------------|---------------|----------------|
| | 公頃 HECTARES | % 百分比 | |
| COMMERCIAL | 0.40 | 0.29 | 商業 |
| COMPREHENSIVE DEVELOPMENT AREA | 5.05 | 3.85 | 綜合發展區 |
| RESIDENTIAL (GROUP A) | 44.61 | 32.20 | 住宅(甲類) |
| RESIDENTIAL (GROUP B) | 8.93 | 6.45 | 住宅(乙類) |
| RESIDENTIAL (GROUP E) | 3.20 | 2.31 | 住宅(戊類) |
| GOVERNMENT, INSTITUTION OR COMMUNITY | 9.17 | 6.62 | 政府、機構或社區 |
| OPEN SPACE | 21.84 | 15.76 | 休憩用地 |
| OTHER SPECIFIED USES | 1.46 | 1.05 | 其他指定用途 |
| MAJOR ROAD ETC. | 43.88 | 31.67 | 主要道路等 |
| TOTAL PLANNING SCHEME AREA | 138.54 | 100.00 | 規劃範圍總面積 |

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

行政長官會同行政會議於2016年4月5日 根據城市規劃條例第9(1)(a)條核准的圖則
 APPROVED BY THE CHIEF EXECUTIVE IN COUNCIL UNDER SECTION 9(1)(a) OF THE TOWN PLANNING ORDINANCE ON 5 APRIL 2016

Ms Kinnie WONG 黃潔怡女士
 CLERK TO THE EXECUTIVE COUNCIL 行政會議秘書

香港城市規劃委員會依據城市規劃條例擬備的馬頭角(九龍規劃區第10區)分區計劃大綱圖
TOWN PLANNING ORDINANCE, HONG KONG TOWN PLANNING BOARD
KOWLOON PLANNING AREA No. 10 - MA TAU KOK - OUTLINE ZONING PLAN



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

圖則編號 PLAN No. **S/K10/22**

圖例
NOTATION

| ZONES | | 地帶 |
|---|------|----------------------|
| COMMERCIAL | C | 商業 |
| COMPREHENSIVE DEVELOPMENT AREA | CDA | 綜合發展區 |
| RESIDENTIAL (GROUP A) | R(A) | 住宅 (甲類) |
| RESIDENTIAL (GROUP B) | R(B) | 住宅 (乙類) |
| RESIDENTIAL (GROUP E) | R(E) | 住宅 (戊類) |
| GOVERNMENT, INSTITUTION OR COMMUNITY | GIC | 政府、機構或社區 |
| OPEN SPACE | O | 休憩用地 |
| OTHER SPECIFIED USES | OU | 其他指定用途 |
| COMMUNICATIONS | | 交通 |
| RAILWAY AND STATION (UNDERGROUND) | | 鐵路及車站 (地下) |
| MAJOR ROAD AND JUNCTION | | 主要道路及路口 |
| ELEVATED ROAD | | 高架道路 |
| MISCELLANEOUS | | 其他 |
| BOUNDARY OF PLANNING SCHEME | | 規劃範圍界線 |
| BUILDING HEIGHT CONTROL ZONE BOUNDARY | | 建築物高度管制區界線 |
| MAXIMUM BUILDING HEIGHT (IN METRES ABOVE PRINCIPAL DATUM) | | 最高建築物高度 (在主水平基準上若干米) |
| MAXIMUM BUILDING HEIGHT (IN NUMBER OF STOREYS) | | 最高建築物高度 (樓層數目) |

土地用途及面積一覽表
SCHEDULE OF USES AND AREAS

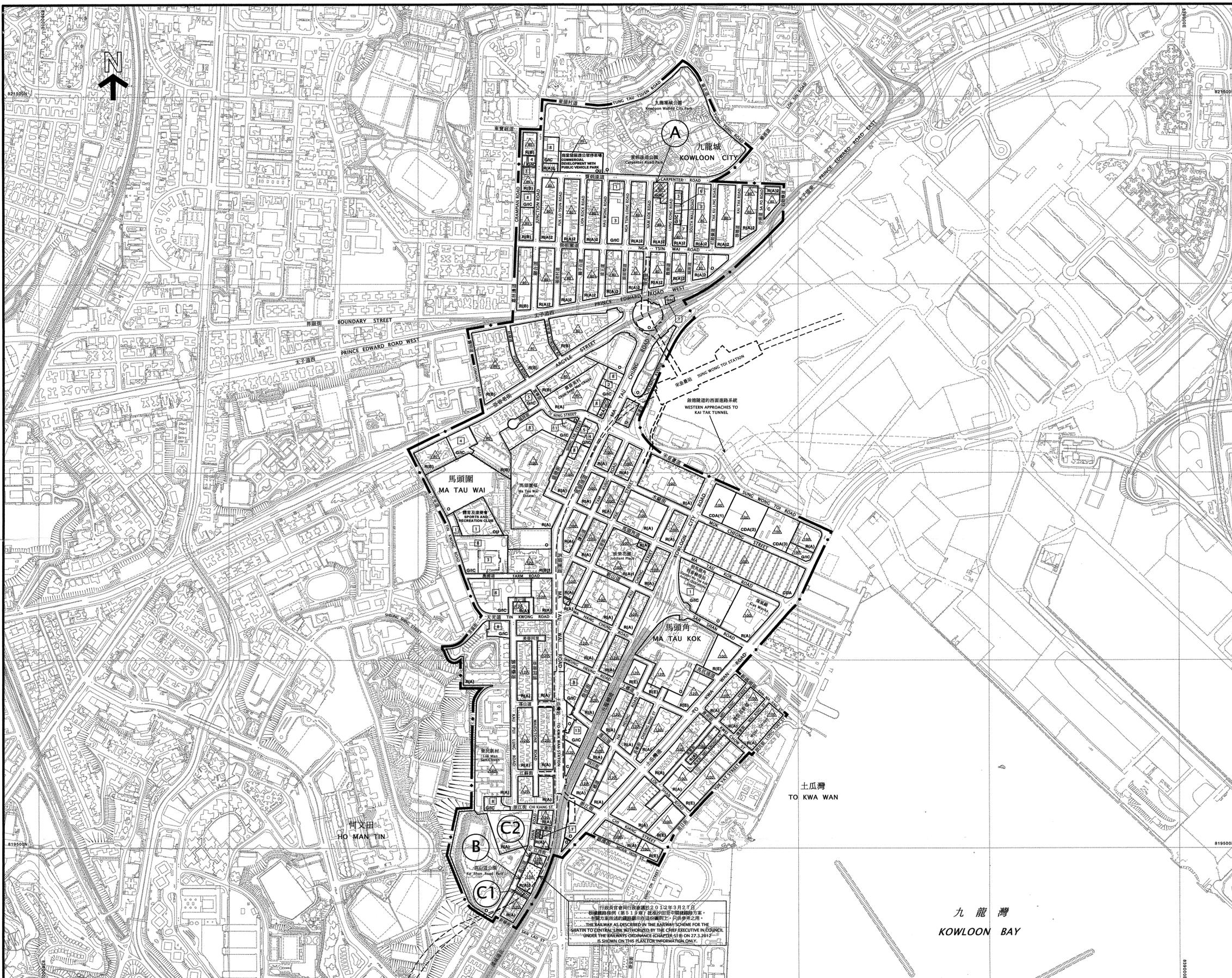
| USES | 大約面積及百分比 APPROXIMATE AREA & % | | 用途 |
|--------------------------------------|----------------------------------|----------|----------|
| | 公頃 HECTARES | 百分比 % | |
| COMMERCIAL | 0.40 | 0.29 | 商業 |
| COMPREHENSIVE DEVELOPMENT AREA | 5.05 | 3.65 | 綜合發展區 |
| RESIDENTIAL (GROUP A) | 44.92 | 32.42 | 住宅 (甲類) |
| RESIDENTIAL (GROUP B) | 8.93 | 6.45 | 住宅 (乙類) |
| RESIDENTIAL (GROUP E) | 3.20 | 2.31 | 住宅 (戊類) |
| GOVERNMENT, INSTITUTION OR COMMUNITY | 8.83 | 6.37 | 政府、機構或社區 |
| OPEN SPACE | 21.84 | 15.76 | 休憩用地 |
| OTHER SPECIFIED USES | 1.46 | 1.05 | 其他指定用途 |
| MAJOR ROAD ETC. | 43.91 | 31.70 | 主要道路等 |
| TOTAL PLANNING SCHEME AREA | 138.54 | 100.00 | 規劃範圍總面積 |

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

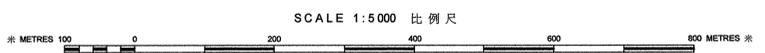
核准圖編號 S/K 10/22 的修訂
AMENDMENTS TO APPROVED PLAN No. S/K10/22

| | | |
|-------------------|--|------------|
| AMENDMENT ITEM A | | 修訂項目 A 項 |
| AMENDMENT ITEM B | | 修訂項目 B 項 |
| AMENDMENT ITEM C1 | | 修訂項目 C 1 項 |
| AMENDMENT ITEM C2 | | 修訂項目 C 2 項 |

(參看附表)
(SEE ATTACHED SCHEDULE)



香港城市規劃委員會依據城市規劃條例擬備的馬頭角 (九龍規劃區第 10 區) 分區計劃大綱圖
TOWN PLANNING ORDINANCE, HONG KONG TOWN PLANNING BOARD
KOWLOON PLANNING AREA No. 10 - MA TAU KOK - OUTLINE ZONING PLAN



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

圖則編號
PLAN No. S/K10/22A

KOWLOON PLANNING AREA NO. 10

DRAFT APPROVED MA TAU KOK OUTLINE ZONING PLAN NO. S/K10/22A

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

NOTES

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

- (1) These Notes show the uses or developments on land falling within the boundaries of the Plan which are always permitted and which may be permitted by the Town Planning Board, with or without conditions, on application. Where permission from the Town Planning Board for a use or development is required, the application for such permission should be made in a prescribed form. The application shall be addressed to the Secretary of the Town Planning Board, from whom the prescribed application form may be obtained.
- (2) Any use or development which is always permitted or may be permitted in accordance with these Notes must also conform to any other relevant legislation, the conditions of the Government lease concerned, and any other Government requirements, as may be applicable.
- (3)
 - (a) No action is required to make the existing use of any land or building conform to this Plan until there is a material change of use or the building is redeveloped.
 - (b) Any material change of use or any other development (except minor alteration and/or modification to the development of the land or building in respect of the existing use which is always permitted) or redevelopment must be always permitted in terms of the Plan or, if permission is required, in accordance with the permission granted by the Town Planning Board.
 - (c) For the purposes of subparagraph (a) above, “existing use of any land or building” means -
 - (i) before the publication in the Gazette of the notice of the first statutory plan covering the land or building (hereafter referred as ‘the first plan’),
 - a use in existence before the publication of the first plan which has continued since it came into existence; or
 - a use or a change of use approved under the Buildings Ordinance which relates to an existing building; and
 - (ii) after the publication of the first plan,

- a use permitted under a plan which was effected during the effective period of that plan and has continued since it was effected; or
 - a use or a change of use approved under the Buildings Ordinance which relates to an existing building and permitted under a plan prevailing at the time when the use or change of use was approved.
- (4) Except as otherwise specified by the Town Planning Board, when a use or material change of use is effected or a development or redevelopment is undertaken, as always permitted in terms of the Plan or in accordance with a permission granted by the Town Planning Board, all permissions granted by the Town Planning Board in respect of the site of the use or material change of use or development or redevelopment shall lapse.
- (5) Road junctions, alignments of roads and railway tracks, and boundaries between zones may be subject to minor adjustments as detailed planning proceeds.
- (6) Temporary uses (expected to be 5 years or less) of any land or building are always permitted as long as they comply with any other relevant legislation, the conditions of the Government lease concerned, and any other Government requirements, and there is no need for these to conform to the zoned use or these Notes. For temporary uses expected to be over 5 years, the uses must conform to the zoned use or these Notes.
- (7) The following uses or developments are always permitted on land falling within the boundaries of the Plan except where the uses or developments are specified in Column 2 of the Notes of individual zones:
- (a) provision, maintenance or repair of plant nursery, amenity planting, open space, rain shelter, refreshment kiosk, road, bus/public light bus stop or lay-by, cycle track, Mass Transit Railway station entrance, Mass Transit Railway structure below ground level, taxi rank, nullah, public utility pipeline, electricity mast, lamp pole, telephone booth, telecommunications radio base station, automatic teller machine and shrine;
 - (b) geotechnical works, local public works, road works, sewerage works, drainage works, environmental improvement works, marine related facilities, waterworks (excluding works on service reservoir) and such other public works co-ordinated or implemented by Government; and
 - (c) maintenance or repair of watercourse and grave.
- (8) In any area shown as 'Road', all uses or developments except those specified in paragraph (7) above and those specified below require permission from the Town Planning Board:
- on-street vehicle park and railway track.
- (9) Unless otherwise specified, all building, engineering and other operations incidental to and all uses directly related and ancillary to the permitted uses and

developments within the same zone are always permitted and no separate permission is required.

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

KOWLOON PLANNING AREA NO. 10

DRAFT APPROVED MA TAU KOK OUTLINE ZONING PLAN NO.
S/K10/22A

Schedule of Uses

| | <u>Page</u> |
|--------------------------------------|-----------------|
| COMMERCIAL | 1 |
| COMPREHENSIVE DEVELOPMENT AREA | 3 |
| RESIDENTIAL (GROUP A) | 7 |
| RESIDENTIAL (GROUP B) | 110 |
| RESIDENTIAL (GROUP E) | 132 |
| GOVERNMENT, INSTITUTION OR COMMUNITY | 187 |
| OPEN SPACE | 1920 |
| OTHER SPECIFIED USES | 210 |

COMMERCIAL

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

Planning Intention

This zone is intended primarily for commercial developments, which may include shop, services, place of entertainment and eating place, functioning mainly as local shopping centres serving the immediate neighbourhood and hotel development.

(Please see next page)

COMMERCIAL (Cont'd)

Remarks

- (1) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum plot ratio of 12.0, or the plot ratio of the existing building, whichever is the greater.
- (2) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the maximum building heights in terms of metres above Principal Datum as stipulated on the Plan, or the height of the existing building, whichever is the greater.
- (3) In determining the maximum plot ratio for the purposes of paragraph (1) above, any floor space that is constructed or intended for use solely as car park, loading/unloading bay, plant room and caretaker's office, provided such uses and facilities are ancillary and directly related to the development or redevelopment, may be disregarded.
- (4) Where the permitted plot ratio as defined in Building (Planning) Regulations is permitted to be exceeded in circumstances as set out in Regulation 22(1) or (2) of the said Regulations, the plot ratio for the building on land to which paragraph (1) applies may be increased by the additional plot ratio by which the permitted plot ratio is permitted to be exceeded under and in accordance with the said Regulation 22(1) or (2), notwithstanding that the relevant maximum plot ratio specified in paragraph (1) above may thereby be exceeded.
- (5) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the plot ratio/building height restrictions stated in paragraphs (1) and (2) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

COMPREHENSIVE DEVELOPMENT AREA

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

(Please see next page)

COMPREHENSIVE DEVELOPMENT AREA (Cont'd)

Planning Intention

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

Remarks

- (1) Pursuant to section 4A(2) of the Town Planning Ordinance, and except as otherwise expressly provided that it is not required by the Town Planning Board, an applicant for permission for development on land designated “Comprehensive Development Area” shall prepare a Master Layout Plan for the approval of the Town Planning Board and include therein the following information:
 - (i) the area of the proposed land uses, the nature, position, dimensions, and heights of all buildings to be erected in the area;
 - (ii) the proposed total site area and gross floor area for various uses, total number of flats and flat size, where applicable;
 - (iii) the details and extent of Government, institution or community (GIC) and recreational facilities, public transport and parking facilities, and open space to be provided within the area;
 - (iv) the alignment, widths and levels of any roads proposed to be constructed within the area;
 - (v) the landscaping and urban design proposals within the area;
 - (vi) programmes of development in detail;
 - (vii) an environmental impact assessment report, including but not limiting to a visual impact assessment, to examine any possible environmental and visual problems that may be caused to or by the proposed development during and after construction and the proposed mitigation measures to tackle them;
 - (viii) a drainage and sewerage impact assessment report to examine any possible drainage and sewerage problems that may be caused by the proposed development and the proposed mitigation measures to tackle them;
 - (ix) a traffic impact assessment report to examine any possible traffic problems that may be caused by the proposed development and the proposed mitigation measures to tackle them;

(Please see next page)

COMPREHENSIVE DEVELOPMENT AREA (Cont'd)

Remarks (Cont'd)

- (x) a quantitative air ventilation assessment study to examine the local wind environment and identify any possible opportunity/problem areas for design improvement, in particular measures to extend the wind path from Kai Tak to Ma Tau Kok area; and
- (xi) such other information as may be required by the Town Planning Board.
- (2) The Master Layout Plan should be supported by an explanatory statement which contains an adequate explanation of the development proposal, including such information as land tenure, relevant lease conditions, existing conditions of the site, the character of the site in relation to the surrounding areas, principles of layout design, major development parameters, design population, types of GIC facilities, and recreational and open space facilities.
- (3) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the maximum gross floor area (GFA) specified below:

| <u>Sub-area</u> | <u>Restriction</u> | |
|--|---|---|
| | Maximum GFA for Domestic Use <u>(m²)</u> | Maximum GFA for Non-domestic Use <u>(m²)</u> |
| CDA bounded by Sung Wong Toi Road, Mok Cheong Street and Kowloon City Road: | | |
| CDA(1) | 40,500 | 8,100 |
| CDA(2) | 63,000 | 12,600 |
| CDA(3) | 62,600 | 12,550 |
| CDA bounded by Mok Cheong Street, Ma Tau Kok Road, To Kwa Wan Road and Kowloon City Road | 213,000 | 42,600 |

(Please see next page)

COMPREHENSIVE DEVELOPMENT AREA (Cont'd)

Remarks (Cont'd)

- (4) In determining the maximum GFA for the sub-areas specified in paragraph (3) above, any floor space that is constructed or intended for use solely as car park, loading/unloading bay, plant room, **and** caretaker's office, **or** ~~and~~ caretaker's quarters; ~~or~~ **and** recreational facilities for the use and benefit of all the owners or occupiers of the domestic building or domestic part of the building, provided such uses and facilities are ancillary and directly related to the development or redevelopment, may be disregarded. Any floor space that is constructed or intended for use solely as public transport facilities, railway station development, or GIC or social welfare facilities, as required by the Government, may also be disregarded.
- (5) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the maximum building heights in terms of metres above Principal Datum as stipulated on the Plan, or the height of the existing building, whichever is the greater.
- (6) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the GFA/building height restrictions stated in paragraphs (3) and (5) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

RESIDENTIAL (GROUP A)

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

(Please see next page)

RESIDENTIAL (GROUP A) (Cont'd)

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

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

Planning Intention

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

Remarks

- (1) On land designated “Residential (Group A)”, ~~and~~ “Residential (Group A)2” **and** “**Residential (Group A)3**”, no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in the plot ratio for the building upon development and/or redevelopment in excess of 7.5 for a domestic building or 9.0 for a building that is partly domestic and partly non-domestic, or the plot ratio of the existing building, whichever is the greater. Except where the plot ratio is permitted to be exceeded under paragraphs (89) and/or (910) hereof, under no circumstances shall the plot ratio for the domestic part of any building, to which this paragraph applies, exceed 7.5.
- (2) For a non-domestic building to be erected on the site, the maximum plot ratio shall not exceed 9.0 except where the plot ratio is permitted to be exceeded under paragraphs (89) and/or (910) hereof.

(Please see next page)

RESIDENTIAL (GROUP A) (Cont'd)

Remarks (Cont'd)

- (3) *For the purposes of paragraph (1) above, on land designated “R(A)”, “R(A)2” and “R(A)3”, no addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the relevant maximum domestic and/or non-domestic plot ratio(s), or the domestic and/or non-domestic plot ratio(s) of the existing building, whichever is the greater, subject to, as applicable-*
- (i) *the plot ratio(s) of the existing building shall apply only if any addition, alteration and/or modification to or redevelopment of an existing building is for the same type of building as the existing building, i.e. domestic, non-domestic, or partly domestic and partly non-domestic building; or*
 - (ii) *the maximum domestic and/or non-domestic plot ratio(s) stated in paragraph (1) above shall apply if any addition, alteration and/or modification to or redevelopment of an existing building is not for the same type of building as the existing building, i.e. domestic, non-domestic, or partly domestic and partly non-domestic building.*
- (43) On land designated “Residential (Group A)1”, no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum domestic gross floor area of 71,800m², and a maximum non-domestic gross floor area of 7,870m² of which a gross floor area of not less than 770m² should be provided for Government, institution or community facilities. A public open space of not less than 1,800m² in size at ground level shall be provided.
- (54) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the maximum building heights in terms of metres above Principal Datum as stipulated on the Plan, or the height of the existing building, whichever is the greater.
- (65) On land designated “Residential (Group A)2”, a maximum building height of 100 metres above Principal Datum would be permitted for sites with an area of 400m² or more.
- (76) In determining the relevant maximum plot ratio for the purposes of paragraphs (1) and (2) above, area of any part of the site that is occupied or intended to be occupied by free-standing purpose-designed buildings (including both developed on ground and on podium level) solely for accommodating Government, institution or community facilities including school(s) as may be required by Government shall be deducted in calculating the relevant site area.
- (87) In determining the relevant maximum plot ratio or gross floor area for the purposes of paragraphs (1), (2) and (43) above, any floor space that is constructed or intended for use

solely as car park, loading/unloading bay, plant room; **and** caretaker's office, **or** ~~and caretaker's quarters, or~~ **and** any floor space constructed or intended to be occupied by recreational facilities for the use and benefit of all the owners or occupiers of the domestic building or domestic part of the building, provided such uses and facilities are ancillary and directly related to the development or redevelopment, may be disregarded.

- (98) Where the permitted plot ratio as defined in Building (Planning) Regulations is permitted to be exceeded in circumstances as set out in Regulation 22(1) or (2) of the said Regulations, the plot ratio/gross floor area for the building on land to which paragraph (1), (2) or (43) applies may be increased by the additional plot ratio by which the permitted plot ratio is permitted to be exceeded under and in accordance with the said Regulation 22(1) or (2), notwithstanding that the relevant maximum plot ratio/gross floor area specified in paragraphs (1), (2) and (43) above may thereby be exceeded.
- (109) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the plot ratio/gross floor area/building height restrictions stated in paragraphs (1), (2) **and** (4) to (65) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

RESIDENTIAL (GROUP B)

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

Planning Intention

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

(Please see next page)

RESIDENTIAL (GROUP B) (Cont'd)

Remarks

- (1) On land designated “Residential (Group B)”, no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum plot ratio of 5.0, or the plot ratio of the existing building, whichever is the greater.
- (2) On land designated “Residential (Group B)1”, no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum gross floor area of 37,500m². In determining the maximum gross floor area for the purpose of this paragraph, in addition to the floor spaces mentioned in paragraph (4) below, any floor space that is constructed or intended to be occupied by social welfare facilities may also be disregarded.
- (3) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the maximum building heights in terms of metres above Principal Datum as stipulated on the Plan, or the height of the existing building, whichever is the greater.
- (4) In determining the relevant maximum plot ratio/gross floor area for the purposes of paragraphs (1) and (2) above, any floor space that is constructed or intended for use solely as car park, loading/unloading bay, plant room; **and** caretaker’s office, **or** ~~and~~ caretaker’s quarters, ~~or~~ **and** any floor space constructed or intended to be occupied by recreational facilities for the use and benefit of all the owners or occupiers of the domestic building or domestic part of the building, provided such uses and facilities are ancillary and directly related to the development or redevelopment, may be disregarded.
- (5) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the plot ratio/gross floor area/building height restrictions stated in paragraphs (1) to (3) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

RESIDENTIAL (GROUP E)

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

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

| | |
|---|--|
| Ambulance Depot Government Use (not elsewhere specified) Public Transport Terminus or Station (excluding open-air terminus or station) Utility Installation for Private Project | Commercial Bathhouse/Massage Establishment Eating Place Educational Institution Exhibition or Convention Hall Flat Government Refuse Collection Point Hospital Hotel House Institutional Use (not elsewhere specified) Library Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than Entrances Market Office Petrol Filling Station Place of Entertainment Place of Recreation, Sports or Culture Private Club Public Clinic Public Convenience Public Transport Terminus or Station (not elsewhere specified) Public Utility Installation (not elsewhere specified) Public Vehicle Park (excluding container vehicle) Religious Institution Residential Institution School Shop and Services Social Welfare Facility Training Centre |
|---|--|

(Please see next page)

RESIDENTIAL (GROUP E) (Cont'd)

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

Eating Place
Educational Institution
Institutional Use (not elsewhere specified)
Library
Off-course Betting Centre
Office
Place of Entertainment
Place of Recreation, Sports or Culture
Private Club
Public Clinic
Public Convenience
Recyclable Collection Centre
School
Shop and Services
Social Welfare Facility
Training Centre

(Please see next page)

RESIDENTIAL (GROUP E) (Cont'd)

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

Schedule II: for existing industrial or industrial-office building[@]

| | |
|--|---|
| Ambulance Depot | Cargo Handling and Forwarding Facility (Container Freight Station, free-standing purpose-designed Logistics Centre only) |
| Art Studio (excluding those involving direct provision of services or goods) | Industrial Use (not elsewhere specified) |
| Cargo Handling and Forwarding Facility (not elsewhere specified) | Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than Entrances |
| Eating Place (Canteen only) | Off-course Betting Centre |
| Government Refuse Collection Point | Office (not elsewhere specified) |
| Government Use (not elsewhere specified) | Petrol Filling Station |
| Information Technology and Telecommunications Industries | Place of Recreation, Sports or Culture (not elsewhere specified) |
| Non-polluting Industrial Use (excluding industrial undertakings involving the use/storage of Dangerous Goods) | Private Club |
| Office (Audio-visual Recording Studio, Design and Media Production, Office Related to Industrial Use only) | Shop and Services (not elsewhere specified) (ground floor only except Ancillary Showroom [#] which may be permitted on any floor) |
| Public Convenience | Vehicle Repair Workshop |
| Public Transport Terminus or Station | Wholesale Trade |
| Public Utility Installation | |
| Public Vehicle Park (excluding container vehicle) | |
| Radar, Telecommunications Electronic Microwave Repeater, Television and/or Radio Transmitter Installation | |
| Recyclable Collection Centre | |
| Research, Design and Development Centre | |
| Shop and Services (Motor-vehicle Showroom on ground floor, Service Trades only) | |
| Utility Installation for Private Project | |
| Warehouse (excluding Dangerous Goods Godown) | |

(Please see next page)

RESIDENTIAL (GROUP E) (Cont'd)

In addition, the following uses are always permitted in the purpose-designed non-industrial portion on the lower floors (except basements and floors containing wholly or mainly car parking, loading/unloading bays and/or plant room) of an existing building, provided that the uses are separated from the industrial uses located above by a buffer floor or floors and no industrial uses are located within the non-industrial portion:

In addition, the following use may be permitted with or without conditions on application to the Town Planning Board in the purpose-designed non-industrial portion on the lower floors (except basements and floors containing wholly or mainly car parking, loading/unloading bays and/or plant room) of an existing building, provided that the use is separated from the industrial uses located above by a buffer floor or floors and no industrial uses are located within the non-industrial portion:

Commercial Bathhouse/
Massage Establishment
Eating Place
Educational Institution
Exhibition or Convention Hall
Institutional Use (not elsewhere specified)
Library
Off-course Betting Centre
Office
Place of Entertainment
Place of Recreation, Sports or Culture
Private Club
Public Clinic
Religious Institution
School (excluding kindergarten)
Shop and Services
Training Centre

Social Welfare Facility (excluding those involving residential care)

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

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

Planning Intention

This zone is intended primarily for phasing out of existing industrial uses through redevelopment (or conversion) for residential use on application to the Town Planning Board. Whilst existing industrial uses will be tolerated, new industrial developments are not permitted in order to avoid perpetuation of industrial/residential interface problem.

(Please see next page)

RESIDENTIAL (GROUP E) (Cont'd)

Remarks

- (1) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in the plot ratio for the building upon development and/or redevelopment in excess of 7.5 for a domestic building or 9.0 for a building that is partly domestic and partly non-domestic, or the plot ratio of the existing non-industrial building, whichever is the greater. Except where the plot ratio is permitted to be exceeded under paragraphs (6) and/or (7) hereof, under no circumstances shall the plot ratio for the domestic part of any building, to which this paragraph applies, exceed 7.5.
- (2) For a non-domestic building to be erected on the site, the maximum plot ratio shall not exceed 9.0 except where the plot ratio is permitted to be exceeded under paragraphs (6) and/or (7) hereof.
- (3) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the maximum building heights in terms of metres above Principal Datum as stipulated on the Plan, or the height of the existing building, whichever is the greater.
- (4) In determining the relevant maximum plot ratio for the purposes of paragraphs (1) and (2) above, area of any part of the site that is occupied or intended to be occupied by free-standing purpose-designed buildings (including both developed on ground and on podium level) solely for accommodating Government, institution or community facilities including school(s) as may be required by Government shall be deducted in calculating the relevant site area.
- (5) In determining the relevant maximum plot ratio for the purposes of paragraphs (1) and (2), any floor space that is constructed or intended for use solely as car park, loading/unloading bay, plant room, **and** caretaker's office, **or** ~~and~~ caretaker's quarters; ~~or~~ **and** any floor space constructed or intended to be occupied by recreational facilities for the use and benefit of all the owners or occupiers of the domestic building or domestic part of the building, provided such uses and facilities are ancillary and directly related to the development or redevelopment, may be disregarded.
- (6) Where the permitted plot ratio as defined in Building (Planning) Regulations is permitted to be exceeded in circumstances as set out in Regulation 22(1) or (2) of the said Regulations, the plot ratio for the building on land to which paragraph (1) or (2) applies may be increased by the additional plot ratio by which the permitted plot ratio is permitted to be exceeded under and in accordance with the said Regulation 22(1) or (2), notwithstanding that the relevant maximum plot ratio specified in paragraphs (1) and (2) above may thereby be exceeded.
- (7) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the plot ratio/building height restrictions stated in paragraphs (1) to (3) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

GOVERNMENT, INSTITUTION OR COMMUNITY

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

Planning Intention

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

(Please see next page)

GOVERNMENT, INSTITUTION OR COMMUNITY (Cont'd)

Remarks

- (1) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the maximum building heights, in terms of number of storeys or metres above Principal Datum, as stipulated on the Plan, or the height of the existing building, whichever is the greater.
- (2) In determining the relevant maximum number of storeys for the purposes of paragraph (1) above, any basement floor(s) may be disregarded.
- (3) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the building height restriction stated in paragraph (1) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

OPEN SPACE

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

Planning Intention

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

OTHER SPECIFIED USES

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

For “Commercial Development with Public Vehicle Park” only

| | |
|---|---|
| Ambulance Depot | Broadcasting, Television and/or Film Studio |
| Commercial Bathhouse/ Massage Establishment | Flat |
| Eating Place | Government Refuse Collection Point |
| Educational Institution | Hospital |
| Exhibition or Convention Hall | Hotel |
| Government Use (not elsewhere specified) | Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than |
| Information Technology and Telecommunications Industries | Entrances |
| Institutional Use (not elsewhere specified) | Petrol Filling Station |
| Library | Residential Institution |
| Market | |
| Off-course Betting Centre | |
| Office | |
| Place of Entertainment | |
| Place of Recreation, Sports or Culture | |
| Private Club | |
| Public Clinic | |
| Public Convenience | |
| Public Transport Terminus or Station | |
| Public Utility Installation | |
| Public Vehicle Park (excluding container vehicle) | |
| Recyclable Collection Centre | |
| Religious Institution | |
| School | |
| Shop and Services | |
| Social Welfare Facility | |
| Training Centre | |
| Utility Installation for Private Project | |

Planning Intention

This zone is intended primarily for the existing commercial development with public vehicle park, which may include shop, services, place of entertainment and eating place, functioning mainly as local shopping centre serving the immediate neighbourhood.

(Please see next page)

OTHER SPECIFIED USES (Cont'd)

Remarks

- (1) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum gross floor area of 47,858m².
- (2) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the maximum building heights, in terms of metres above Principal Datum as stipulated on the Plan, or the height of the existing building, whichever is the greater.
- (3) In determining the maximum gross floor area for the purposes of paragraph (1) above, any floor space that is constructed or intended for use solely as car park, loading/unloading bay, plant room and caretaker's office, provided such uses and facilities are ancillary and directly related to the development or redevelopment, may be disregarded.
- (4) Where the permitted plot ratio as defined in Building (Planning) Regulations is permitted to be exceeded in circumstances as set out in Regulation 22(1) or (2) of the said Regulations, the plot ratio/gross floor area for the building on land to which paragraph (1) applies may be increased by the additional plot ratio by which the permitted plot ratio is permitted to be exceeded under and in accordance with the said Regulation 22(1) or (2), notwithstanding that the relevant maximum plot ratio/gross floor area specified in paragraph (1) above may thereby be exceeded.
- (5) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the gross floor area/building height restrictions stated in paragraphs (1) and (2) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

OTHER SPECIFIED USES

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

For "Sports and Recreation Club" only

| | |
|--|---|
| Place of Recreation, Sports or Culture Private Club | Eating Place Government Refuse Collection Point Government Use (not elsewhere specified) Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than Entrances Public Vehicle Park (excluding container vehicle) Religious Institution Shop and Services (not elsewhere specified) Social Welfare Facility Utility Installation not Ancillary to the Specified Use |
|--|---|

Planning Intention

This zone is intended primarily to provide land for private club use for sporting and recreational purposes.

Remarks

- (1) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the maximum building heights, in terms of number of storeys as stipulated on the Plan, or the height of the existing building, whichever is the greater.
- (2) In determining the relevant maximum number of storeys for the purposes of paragraph (1) above, any basement floor(s) may be disregarded.
- (3) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the building height restriction stated in paragraph (1) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

KOWLOON PLANNING AREA NO. 10

DRAFT APPROVED MA TAU KOK OUTLINE ZONING PLAN NO. S/K10/22A

EXPLANATORY STATEMENT

KOWLOON PLANNING AREA NO. 10

DRAFT APPROVED MA TAU KOK OUTLINE ZONING PLAN NO. S/K10/22A

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KOWLOON PLANNING AREA NO. 10

DRAFT APPROVED MA TAU KOK OUTLINE ZONING PLAN NO. S/K10/22A

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

EXPLANATORY STATEMENT

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

1. INTRODUCTION

This Explanatory Statement is intended to assist an understanding of the *draft* ~~approved~~ Ma Tau Kok Outline Zoning Plan (OZP) No. S/K10/22A. It reflects the planning intention and objectives of the Town Planning Board (the Board) for the various land use zonings of the Plan.

2. AUTHORITY FOR THE PLAN AND PROCEDURES

- 2.1 On 9 April 1957, the draft Ma Tau Kok Outline Development Plan No. LK 10/18/4, being the first statutory plan covering the Ma Tau Kok area, was gazetted under the Town Planning Ordinance (the Ordinance). On 27 April 1973, the draft Wang Tau Hom and Tung Tau Outline Zoning Plan No. LK 8/21, being the first statutory plan covering the Kowloon City area, was gazetted under the Ordinance. On 18 December 1987, the draft Ma Tau Kok OZP No. S/K10/3, being the first statutory plan covering both Ma Tau Kok and Kowloon City areas, was gazetted under section 7 of the Ordinance. Since then, the OZP had been amended twice and exhibited for public inspection under section 6(7) and 7 of the Ordinance.
- 2.2 On 4 July 1989, the then Governor-in-Council (G in C), under section 9(1)(a) of the Ordinance, approved the draft OZP, which was subsequently renumbered as OZP No. S/K10/6. On 6 July 1993, the then G in C referred the approved OZP No. S/K10/6 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. Since then, the OZP had been amended four times and exhibited for public inspection under section 5 or 7 of the Ordinance.
- 2.3 On 23 May 2000, the Chief Executive in Council (CE in C), under section 9(1)(a) of the Ordinance, approved the draft OZP, which was subsequently renumbered as S/K10/11. On 10 October 2000, the CE in C referred the approved Ma Tau Kok OZP No. S/K10/11 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. Since then, the OZP had been amended once and exhibited for public inspection under section 5 of the Ordinance.

- 2.4 On 19 June 2001, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft OZP, which was subsequently renumbered as S/K10/13. On 25 September 2001, the CE in C referred the approved Ma Tau Kok OZP No. S/K10/13 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. Since then, the OZP had been amended twice and exhibited for public inspection under section 5 or 7 of the Ordinance.
- 2.5 On 18 February 2003, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft OZP, which was subsequently renumbered as S/K10/16. On 17 June 2003, the CE in C, under section 12(1)(b)(ii) of the Ordinance, referred the approved OZP to the Board for amendment. Since then, the OZP had been amended once under section 5 of the Ordinance.
- 2.6 On 8 June 2004, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft OZP, which was subsequently renumbered as S/K10/18. On 30 January 2007, the CE in C referred the approved Ma Tau Kok OZP No. S/K10/18 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance.
- 2.7 On 18 January 2008, the draft Ma Tau Kok OZP No. S/K10/19 incorporating amendments to impose building height restrictions for “Commercial” (“C”), “Comprehensive Development Area” (“CDA”), “Residential (Group A)” (“R(A)”), “Residential (Group B)” (“R(B)”), “Residential (Group E)” (“R(E)”), “Government, Institution or Community” (“G/IC”) and “Other Specified Uses” (“OU”) zones and technical amendments to the covering Notes of the Plan was exhibited under section 5 of the Ordinance. ~~During the two-month exhibition period, a total of 23 valid representations were received. On 28 March 2008, the Board published the representations for 3 weeks for public comments. A total of 6 valid comments were received. After giving consideration to the representations under section 6B(1) of the Ordinance on 11 July 2008, the Board decided not to uphold the adverse representations under section 6B(8) of the Ordinance.~~
- 2.8 On 4 November 2008, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft Ma Tau Kok OZP, which was subsequently renumbered as S/K10/20. ***On 16 September 2014, the CE in C referred the approved Ma Tau Kok OZP No. S/K10/20 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance.***
- ~~2.9 On 16 September 2014, the CE in C referred the approved Ma Tau Kok OZP No. S/K10/20 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. The reference back of the OZP was notified in the Gazette on 26 September 2014 under section 12(2) of the Ordinance.~~
- 2.910 On 15 May 2015, the draft Ma Tau Kok OZP No. S/K10/21 incorporating amendments including (i) the rezoning of two sites at Sung Wong Toi Road and Mok Cheong Street from "CDA(3)" to “R(A)” and “G/IC”, and a site at the junction of Ma Tau Wai Road and Ma Hang Chung Road from “G/IC” to “R(A)”; and (ii) inclusion of ‘Art Studio (excluding those involving direct provision of services or goods)’ as a Column 1 use in Schedule II of the

“R(E)” zone, and corresponding amendment to the use of ‘Place of Recreation, Sports or Culture’ in Column 2, was exhibited for public inspection under section 5 of the Ordinance. In addition, the alignment of the Mass Transit Railway (MTR) Shatin to Central Link (SCL) authorised by the CE in C under the Railways Ordinance (Chapter 519) on 27 March 2012 is shown on the draft OZP No. S/K10/21 for information.

~~2.11 During the exhibition period of the draft OZP, a total of 146 valid representations were received. On 31 March 2015, the representations were published for three weeks for public comments and one comment was received. Subsequently, the comment was treated as invalid by the Board. On 27 November 2015, after giving consideration to the representations under section 6B(1) of the Ordinance, the Board decided not to uphold the adverse representations and noted the supportive views of the remaining representations.~~

2.102 On 5 April 2016, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft OZP, which was subsequently re-numbered as S/K10/22. On 15 April 2016, the approved Ma Tau Kok OZP No. S/K10/22 (the Plan) was exhibited for public inspection under section 9(5) of the Ordinance. *On 7 February 2017, the CE in C referred the approved Ma Tau Kok OZP No. S/K10/22 to the Board for amendment under section 12(2) of the Ordinance. The reference back of the OZP was notified in the Gazette on 17 February 2017 under section 12(2) of the Ordinance.*

2.11 *On ____ 2018, the draft Ma Tau Kok OZP No. S/K10/23 (the Plan), incorporating amendments mainly (i) to amend the building height restriction for a “Government, Institution or Community” (“G/IC”) site at Lung Kong Road to facilitate a redevelopment proposal for welfare uses, and (ii) to rezone a site at Ko Shan Road mainly from “G/IC” zone to “Residential (Group A)3” (“R(A)3”) zone, was exhibited for public inspection under section 5 of the Ordinance.*

3. OBJECT OF THE PLAN

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

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

3.3 Since the Plan is to show broad land use zoning, there would be cases that small strips of land not intended for building development purposes and carry no development right under the lease, such as the areas restricted for garden, slope maintenance and access road purposes, are included in the residential zones. The general principle is that such areas should not be taken into account in plot ratio calculation. Development within residential zones should be restricted to

building lots carrying development right in order to maintain the character and amenity of the Ma Tau Kok area and not to overload the road network in this area.

4. NOTES OF THE PLAN

- 4.1 Attached to the Plan is a set of Notes which shows the types of uses or developments which are always permitted within the Area and in particular zones and which may be permitted by the Board, with and without conditions, on application. The provision for application for planning permission under section 16 of the Ordinance allows greater flexibility in land use planning and control of development to meet changing needs.
- 4.2 For the guidance of the general public, a set of definitions that explains some of the terms used in the Notes may be obtained from the Technical Services Division of the Planning Department and can be downloaded from the Board's website at <http://www.info.gov.hk/tpb>.

5. THE PLANNING SCHEME AREA

- 5.1 The Planning Scheme Area (the Area) is located in Central Kowloon within the Kowloon City Administration District. It is bounded by Tung Tau Tsuen Road and Tung Tsing Road to the north; To Kwa Wan Road and Yuk Yat Street to the east; Ngan Hon Street and San Lau Street to the south; and Tin Kwong Road to the west. The boundary of the Area is shown in a heavy broken line on the Plan. It covers about 139 hectares of land.
- 5.2 The Area is one of the earliest developed urban areas in Kowloon, which has been substantially developed for private residential, public housing and industrial uses. The medium density residential areas are mainly located along Argyle Street and Grampian Road. The major public housing estates in the Area include Chun Seen Mei Chuen, Ma Tau Wai Estate and Lok Man Sun Chuen.
- 5.3 Industrial developments, mainly in the form of factory buildings for light manufacturing industries and godowns, are concentrated in the east. The environmental problems of the Area include the concentration of dilapidated housing stock along Mok Cheong Street and the close juxtaposition of the residential and industrial uses in the east. The Plan is intended to alleviate some of the aforementioned environmental problems by putting land uses and related activities under statutory planning control, as well as to take the opportunities for urban restructuring with the closure of Kai Tak Airport.
- 5.4 The Area covers land on the waterfront of Victoria Harbour. For any development proposal affecting such land, due regard shall be given to the Vision Statement for Victoria Harbour published by the Board, the requirements under the Protection of the Harbour Ordinance (Cap. 531) and the Harbour Planning Principles published by the Harbour-front Enhancement Committee.

6. **POPULATION**

Based on ~~According to~~ the 2016 Population By-census, the population *of* ~~in~~ the area *was estimated by the Planning Department as* about 133,100 persons. If the planned uses on the OZP are developed, the planned population for the area would be about ~~144,470~~ **146,350** persons.

7. **BUILDING HEIGHT RESTRICTIONS IN THE AREA**

- 7.1 In order to provide better planning control on the development intensity and building height upon development/redevelopment and to meet public aspirations for greater certainty and transparency in the statutory planning system, the Kowloon OZPs are subject to revisions to incorporate building height restrictions to guide future development/redevelopment. Some of the high-rise redevelopments erected in the Area in the recent years following the relocation of the airport in Kai Tak and the removal of the airport height restrictions, are considered undesirable from the visual point of view, and are also incompatible and out-of-context with the local built environment. In order to prevent excessive tall or out-of-context buildings, and to instigate control on the overall building height profile of the Area, a review has been undertaken to ascertain the appropriate building height restrictions for the “C”, “CDA”, “R(A)”, “R(B)”, “R(E)”, “G/IC”, and “OU” zones on the Plan.
- 7.2 The building height restrictions are to preserve the views to the ridgelines from public view points and to maintain a stepped building height concept recommended in the Urban Design Guidelines Study with lower buildings along the waterfront, taking account of the local area context, the local wind environment, and the need to maintain visually compatible building masses in the wider setting. There are four main building height bands – 80 metres above Principal Datum (mPD), 100mPD, 120mPD and 140mPD in the Area for the “C”, “CDA”, “R(A)”, “R(B)” and “R(E)” zones – increasing progressively from the waterfront to the inland and foothill areas. The proposed building height bands help preserve views to the ridgelines, achieve a stepped height profile for visual permeability and wind penetration and circulation, and maintain a more intertwined relationship with the Victoria Harbour edge.
- 7.3 Moreover, specific building restrictions for the “G/IC” and “OU” zones in terms of mPD or number of storeys, which mainly reflect the existing and planned building heights of developments, have been incorporated into the Plan mainly to provide visual and spatial relief to the Area. The building height restrictions are specified in terms of mPD to provide certainty and clarity of planning intention. On the other hand, building height control for low-rise developments, normally with a height of not more than 13 storeys, will be subject to restrictions on the number of storeys so as to allow more design flexibility, in particular for GIC facilities with specific functional

requirements, unless such developments fall within visually more prominent locations and major breathing spaces.

- 7.4 An air ventilation assessment (AVA) by expert evaluation has been undertaken to assess the likely impact of the proposed building heights of the development sites within the Area on the pedestrian wind environment. The building height bands shown on the Plan have taken into account the findings of the AVA.
- 7.5 A minor relaxation clause in respect of building height restrictions is incorporated into the Notes of the Plan in order to provide incentive for development/redevelopments with design merits/planning gains. Each application for minor relaxation of building height restriction will be considered on its own merits and the relevant criteria for consideration of such relaxation are as follows:
- (a) amalgamating smaller sites for achieving better urban design and local area improvements;
 - (b) accommodating the bonus plot ratio granted under the Buildings Ordinance in relation to surrender/dedication of land/area for use as public passage/street widening;
 - (c) providing better streetscape/good quality street level public urban space;
 - (d) providing separation between buildings to enhance air and visual permeability;
 - (e) accommodating building design to address specific site constraints in achieving the permissible plot ratio under the Plan; and
 - (f) other factors such as site constraints, need for tree preservation, innovative building design and planning merits that would bring about improvements to townscape and amenity of the locality, provided that no adverse landscape and visual impacts would be resulted from the innovative building design.
- 7.6 However, for existing buildings where the building height already exceeded the maximum building height in terms of number of storeys or mPD as stipulated on the Plan, there is a general presumption against such application for minor relaxation unless under exceptional circumstances.

8. LAND USE ZONINGS

8.1 Commercial (“C”) - Total Area 0.40 ha

- 8.1.1 This zone is intended primarily for commercial developments, which may include shop, services, place of entertainment and eating place,

functioning mainly as local shopping centres serving the immediate neighborhood and hotel development. The sites under this zoning include an existing hotel at Sa Po Road and two existing industrial buildings at Ma Tau Wai Road.

- 8.1.2 Developments within this zone are subject to a maximum plot ratio of 12.0 in order to restrain traffic growth, which will otherwise overload the existing and planned transport network and sewerage system capacity.
- 8.1.3 In the circumstances set out in Regulation 22 of the Building (Planning) Regulations, the above specified maximum plot ratio may be increased by what is permitted to be exceeded under Regulation 22. This is to maintain flexibility for unique circumstances such as dedication of part of a site for road widening or public uses.
- 8.1.4 Development and redevelopment within the “C” sites along Prince Edward Road West and Ma Tau Wai Road are subject to maximum building height of 80mPD and 120mPD as stipulated on the Plan.
- 8.1.5 To provide design/architectural flexibility, minor relaxation of the plot ratio/building height restrictions may be considered by the Board on application under section 16 of the Ordinance taking into account its own merits.

8.2 Comprehensive Development Area (“CDA”) – Total Area 5.05 ha

- 8.2.1 This zone is intended for comprehensive development/redevelopment of the area for residential and/or commercial uses with the provision of open space and other supporting facilities. The zoning is to facilitate appropriate planning control over the development mix, scale, design and layout of development, taking account of various environmental, traffic, infrastructure and other constraints.
- 8.2.2 Sites bounded by Sung Wong Toi Road, Kowloon City Road, Ma Tau Kok Road and To Kwa Wan Road are zoned “CDA” to facilitate comprehensive redevelopment for residential uses with retail and Government, institution or community (GIC) facilities, as well as to phase out the existing industrial activities. Development restrictions in terms of maximum domestic and non-domestic gross floor areas for the “CDA” zones are stipulated in the Remarks of the Notes. Details of the proposed uses and development parameters for the “CDA” are to be stipulated in the planning briefs.
- 8.2.3 The “CDA” zone bounded by Sung Wong Toi Road, Kowloon City Road and Mok Cheong Street is sub-divided into “CDA(1)”, “CDA(2)” and “CDA(3)” to facilitate early development of the sites and to allow the Board to exercise planning control on the design and layout of redevelopment, to require provision of mitigation measures to address industrial/residential (I/R) interface problems and to ensure co-

ordinated and comprehensive redevelopment. In addition, open space and GIC facilities could also be provided within the sites.

- 8.2.4 According to the AVA by expert evaluation, the area near Mok Cheong Street is a major wind corridor. Future developments at Mok Cheong Street are therefore critical to the local ventilation environment of the Area. Upon redevelopment, a quantitative AVA Study for the CDA sites near Mok Cheong Street should be conducted so as to examine the local wind environment and identify any possible opportunity/problem areas for design improvement, in particular measures to extend the wind path from Kai Tak to Ma Tau Kok area.
- 8.2.5 In drawing up the layout of the proposed CDA developments, due consideration should be given to the findings of the AVA. In particular, there should be adequate space between buildings to enhance the air and visual permeability to the surrounding developments. Any adverse impact on the surrounding areas, particularly in terms of air ventilation, should be carefully assessed and mitigated. Moreover, diversity in building mass/form is encouraged within each CDA site to achieve a more interesting building height profile in the area.
- 8.2.6 Pursuant to section 4A(1) of the Ordinance, any development within the “CDA” zone would require approval of the Board by way of a planning application under section 16 of the Ordinance. A Master Layout Plan (MLP) should be submitted in accordance with the requirements as specified in the Notes for the approval of the Board pursuant to section 4A(2) of the Ordinance. A copy of the approved MLP would be made available for public inspection in the Land Registry pursuant to section 4A(3) of the Ordinance.
- 8.2.7 Development and redevelopment within the “CDA” sites are subject to a maximum building height of 100mPD as stipulated on the Plan.
- 8.2.8 To provide design/architectural flexibility, minor relaxation of the gross floor area/building height restrictions may be considered by the Board on application under section 16 of the Ordinance taking into account its own merits.

8.3 Residential (Group A) (“R(A)”) - Total Area ~~44.61~~ **44.92** ha

- 8.3.1 This zone is intended primarily for high-density residential developments. Commercial uses are always permitted on the lowest three floors of a building or in the purpose-designed non-residential portion of an existing building.
- 8.3.2 Most of the private and public residential developments in the Area, except those along Argyle Street, Prince Edward Road West and Grampian Road, are covered by this zoning. There are three existing public housing estates in the Area, namely, Ma Tau Wai Estate, Chun

Seen Mei Chuen and Lok Man Sun Chuen. ~~The A piece of~~ Government land at the junction of Sung Wong Toi Road and To Kwa Wan Road, **and a site at Ko Shan Road are** is planned for a public housing developments.

- 8.3.3 There are three major private residential developments in the Area, namely, the “Sky Tower” at Sung Wong Toi Road, “Jubilant Place” at Pau Chung Street and “Celestial Heights” at Kau Pui Lung Road. The Ma Tau Kok Gas Works (North Plant) site at To Kwa Wan Road and Ma Tau Kok Road is proposed for private residential use upon redevelopment.
- 8.3.4 In the consideration of the overall transport, environmental and infrastructural constraints, as well as the adequacy in the provision of community facilities envisioned in the Kowloon Density Study Review, completed in early 2002, developments or redevelopments within this zone are subject to specific control on plot ratios except otherwise specified in the Notes, i.e. a maximum plot ratio of 7.5 for a domestic building or a maximum plot ratio of 9.0 for a partly domestic and partly non-domestic building. In calculating the gross floor areas for these developments/redevelopments, the lands for free-standing purpose-designed buildings that are solely used for accommodating school or other GIC facilities, including those located on ground and on building podium, are not to be taken as parts of the site.
- 8.3.5 In the circumstances set out in Regulation 22 of the Building (Planning) Regulations, the above specified maximum plot ratios may be increased by what is permitted to be exceeded under Regulation 22. This is to maintain flexibility for unique circumstances such as dedication of part of a site for road widening or public uses.
- 8.3.6 Development and redevelopment within the “R(A)” sites are *mainly* subject to maximum building heights of 100mPD, 120mPD and 140mPD as stipulated on the Plan. ~~and that within the~~ “R(A)1” site is subject to a maximum building height of 100mPD. **The “R(A)3” site is subject to a maximum building height of 130mPD. Public vehicle park is always permitted under “R(A)3” zone.**
- 8.3.7 For sites in Kowloon City which is zoned “R(A)2”, a maximum building height of 80mPD is proposed to maintain a similar building height profile with the adjacent “R(B)” sites in Argyle Street and Prince Edward Road West area as well as to enable a smooth transition of height profile from the low-rise Kowloon Tong area to the similar height band imposed in the Kai Tak City Centre.
- 8.3.8 Nonetheless, for “R(A)2” sites, to avoid pencil-like buildings to be developed on small lots and to encourage amalgamation of sites for more comprehensive development, including the provision of parking and loading/unloading and other supporting facilities, a maximum building

height of 100mPD would be permitted for sites with an area of 400m² or more.

- 8.3.9 To provide design/architectural flexibility, minor relaxation of the plot ratio/gross floor area/building height restrictions may be considered by the Board on application under section 16 of the Ordinance taking into account its own merits.

8.4 Residential (Group B) (“R(B)”) - Total Area 8.93 ha

- 8.4.1 This zone is intended primarily for medium-density residential developments where commercial uses serving the residential neighbourhood may be permitted on application to the Town Planning Board.
- 8.4.2 Existing private residential developments under this zoning are located along Argyle Street, Prince Edward Road West and Grampian Road. In addition, the site of the Kowloon City Baptist Church at Argyle Street is zoned “R(B)” and proposed for medium-density residential use upon redevelopment.
- 8.4.3 Developments within this zone except otherwise specified are subject to specific control on plot ratio to restrain traffic growth which will otherwise overload the existing and planned transport network. A maximum plot ratio of 5.0 is imposed under the Notes for “R(B)” zone.
- 8.4.4 The site at Farm Road and Ma Tau Wai Road is zoned “R(B)1” and social welfare facilities are permitted as of right to enable early implementation of the proposed social welfare facilities. Residential development within this zone has been completed with the provision of a day nursery and a children and youth centre within the development. The development on the site is subject to the maximum gross floor area specified in the Notes.
- 8.4.5 Development and redevelopment within the “R(B)” sites are subject to a maximum building height of 80mPD as stipulated on the Plan.
- 8.4.6 To provide design/architectural flexibility, minor relaxation of the plot ratio/gross floor area/building height restrictions may be considered by the Board on application under section 16 of the Ordinance taking into account its own merits.

8.5 Residential (Group E) (“R(E)”) - Total Area 3.20 ha

- 8.5.1 This zone is intended primarily for phasing out of existing industrial uses through redevelopment (or conversion) for residential use on application to the Town Planning Board. Whilst existing industrial

uses will be tolerated, new industrial developments are not permitted in order to avoid perpetuation of I/R interface problem.

- 8.5.2 Under this zoning, existing industrial uses will be tolerated but new industrial development will not be permitted upon redevelopment of existing industrial buildings in order to avoid the perpetuation or aggravation of the I/R interface problems with the new residential development during the redevelopment process. In existing industrial buildings, new developments involving offensive trades will not be permitted. Any modification of use from non-industrial to industrial uses within existing industrial buildings will also require the permission of the Board.
- 8.5.3 Upon redevelopment of the industrial sites with potential land contamination risk, the developer will be required to prepare contamination assessment report to examine any possible ground contamination and if land contamination is confirmed, to propose remedial measures to deal with it.
- 8.5.4 Industrial sites at Yuk Yat Street, Chi Kiang Street, Sheung Heung Road and To Kwa Wan Road are zoned “R(E)” with a view to gradually phasing out the existing industrial buildings in the area.
- 8.5.5 In drawing up the development scheme for “R(E)” zone, especially along Yuk Yat Street, due consideration should be given to provide adequate space between the proposed development and the surrounding developments to enhance the air and visual permeability.
- 8.5.6 Developments within this zone are subject to specific control on plot ratios similar to that for the “R(A)” zone as stipulated in the Notes. In calculating the gross floor areas for these developments/redevelopments, the lands for free-standing purpose-designed buildings that are solely used for accommodating school or other GIC facilities, including those located on ground and on building podium, are not to be taken as parts of the site.
- 8.5.7 In the circumstances set out in Regulation 22 of the Building (Planning) Regulations, the maximum plot ratio for a development mentioned above may be increased by what is permitted to be exceeded under Regulation 22. This is to maintain flexibility for unique circumstances such as dedication of part of a site for road widening or public uses.
- 8.5.8 Development and redevelopment within the “R(E)” sites are subject to maximum building height of 100mPD and 120mPD as stipulated on the Plan.
- 8.5.9 To provide design/architectural flexibility, minor relaxation of the plot ratio/building height restrictions may be considered by the Board on

application under section 16 of the Ordinance taking into account its own merits.

8.6 Government, Institution or Community (“G/IC”) - Total Area ~~9.17~~ **8.83** ha

8.6.1 This zone is intended primarily for the provision of GIC facilities serving the needs of the local residents as well as the general public. It is also intended to provide land for uses directly related to or in support of the work of the Government, organizations providing social services to meet community needs, and other institutional establishments.

8.6.2 Major existing GIC facilities include the divisional fire station and ambulance depot at Shing Tak Street, To Kwa Wan Government Complex at Ma Tau Wai Road, the Kowloon City Municipal Services Building at Hau Wong Road and the Hong Kong Society for the Blind’s factory cum sheltered workshop and care and attention home at Mok Cheong Street. Other existing GIC uses such as schools, electricity substations, telephone exchanges are conveniently located throughout the Area. Additional GIC facilities are also provided within the public housing estates and private residential development. ***A site at Lung Kong Road will be developed as a welfare complex.***

8.6.3 Development and redevelopment within the “G/IC” sites are mainly subject to maximum building height in terms of number of storeys or ***meters above Principal Datum*** as stipulated on the Plan.

8.6.4 To provide design/architectural flexibility, minor relaxation of the building height restriction may be considered by the Board on application under section 16 of the Ordinance taking into account its own merits.

8.7 Open Space (“O”) - Total Area 21.84 ha

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

8.7.2 Existing open spaces include the Kowloon Walled City Park, Carpenter Road Park, To Kwa Wan Recreation Ground, Sung Wong Toi Garden, Ma Tau Wai Road Playground, Ko Shan Road Park and the Tin Kwong Road Recreation Ground. A special feature of Ko Shan Road Park is Ko Shan Theatre which is used for holding cultural events and performances.

8.7.3 The eastern part of the former Ma Tau Kok Animal Quarantine Depot site bounded by Ma Tau Kok Road and San Shan Road is reserved for open space use.

8.7.4 Local open spaces would be provided within the “CDA”, “R(A)” and “R(E)” zones.

8.8 Other Specified Uses (“OU”) - Total Area 1.46 ha

8.8.1 This zoning covers land allocated for specific uses.

8.8.2 The Hong Kong Softball Association Recreation Ground at Tin Kwong Road is zoned “OU” annotated “Sports and Recreation Club”. Development and/or redevelopment of this site is subject to a maximum building height of 1 storey as stipulated on the Plan.

8.8.3 The Kowloon City Plaza at Carpenter Road is zoned “OU” annotated “Commercial Development with Public Vehicle Park” to reflect the existing development. Development and/or redevelopment of this site is subject to a maximum gross floor area of 47,858m² and a building height restriction of 36mPD as stipulated on the Plan.

8.8.4 To provide design/architectural flexibility, minor relaxation of the gross floor area/building height restrictions may be considered by the Board on application under section 16 of the Ordinance taking into account its own merits.

9. COMMUNICATIONS

9.1 Roads

9.1.1 The elevated road passing through the Area above Chatham Road North and Kowloon City Road connecting to the Airport Tunnel is part of the primary distributor road network linking up Central and East Kowloon.

9.1.2 The district distributor network consists of Ma Tau Kok Road, Ma Tau Wai Road, To Kwa Wan Road, Sung Wong Toi Road and Tin Kwong Road.

9.2 Railway

On 27 March 2012, the CE in C authorised the MTR SCL under the Railways Ordinance. The authorised railway scheme shall be deemed to be approved under the Ordinance. The SCL with 10 stations including ~~Ma Tau Wai Station~~ and To Kwa Wan Station *and Sung Wong Toi Station*, connects the Ma On Shan Line with the West Rail Line. Construction works commenced in 2012 and the Tai Wai to Hung Hom section is expected to be completed by 2019. The ~~Ma Tau Wai Station and To Kwa Wan Station~~ *and Sung Wong Toi Station* will significantly improve the accessibility of the Area.

10. UTILITY SERVICES

The Area is served by piped water supply, drainage and sewerage systems, as well as gas, electricity and telephone services. There is no difficulty envisaged in meeting the future requirements for services and public utilities for the estimated population in the Area. However, upgrading of the existing fresh water and salt water supply systems will be carried out to cope with the increase of water demand for the additional population.

11. CULTURAL HERITAGE

11.1 The site of archaeological interest, declared monuments, historic buildings/structures graded by the Antiquities Advisory Board (AAB), and Government historic site identified by the Antiquities and Monuments Office (AMO) of the Leisure and Cultural Services Department (LCSD) in the Area include:

- (a) Kowloon Walled City (*Site of Archaeological Interest*);
- (b) Remnants of the South Gate of Kowloon Walled City (Declared Monument);
- (c) Former Yamen Building of Kowloon Walled City (Declared Monument);
- (d) ~~Former~~ Ma Tau Kok Animal Quarantine Depot, No. 63 Ma Tau Kok Road (Grade 2);
- (e) Sheng Kung Hui Holy Trinity Cathedral, No. 135 Ma Tau Chung Road (Grade 2);
- (f) Main Building, Heep Yunn School, No. 1 Farm Road (Grade 3);
- (g) St. Clare Chapel, Heep Yunn School, No. 1 Farm Road (Grade 3);
- (h) Tin Hau Temple, No. 49 Ha Heung Road (Grade 3);
- (i) Nos. 1 & 3 Hau Wong Road (Grade 3);
- (j) Eastern Cotton Mills Ltd., No. 7 Mok Cheong Street (Grade 3);
- (k) No. 65 Ha Heung Road (Grade 3); and
- (l) Sung Wong Toi Inscription Rock (Government historic site identified by AMO).

11.2 On 19 March 2009, the AAB released the list of 1,444 historic buildings, in which the buildings/structures within the Area have been accorded gradings. The AAB also released a number of new items in addition to the list of 1,444 historic buildings. These items are subject to the grading assessment by the AAB. Details of the list of 1,444 historic buildings and its new items have been uploaded onto the official website of the AAB at <http://www.aab.gov.hk>.

11.3 Prior consultation with the AMO of the LCSD should be made if any development, redevelopment or rezoning proposals that might affect the above site of archaeological interest, declared monuments, historic buildings/structures graded by the AAB, new items pending grading assessment by the AAB, *Government historic site identified by AMO* and their immediate environs.

12. IMPLEMENTATION

- 12.1 Although existing uses non-conforming to the statutory zonings are tolerated, any material change of use and any other development/redevelopment must be always permitted in terms of the Plan or, if permission is required, in accordance with the permission granted by the Board. The Board has published a set of guidelines for the interpretation of existing use in the urban and new town areas. Any person who intends to claim an “existing use right” should refer to the guidelines and will need to provide sufficient evidence to support his claim. The enforcement of the zonings mainly rests with the Buildings Department, the Lands Department and the various licensing authorities.
- 12.2 The Plan provides a broad land use framework within which more detailed non-statutory plans for the Area are prepared by the Planning Department. These detailed plans are used as the basis for public works planning and site reservation within Government departments. Disposal of sites is undertaken by the Lands Department. Public works projects are co-ordinated by the Civil Engineering and Development Department in conjunction with the client departments and the works departments, such as the Highways Department and the Architectural Services Department. In the course of implementation of the Plan, the Kowloon City District Council would also be consulted as and when appropriate.
- 12.3 Planning applications to the Board will be assessed on individual merits. In general, the Board, in considering the planning applications, will take into account all relevant planning considerations which may include departmental outline development plan and guidelines published by the Board. The outline development plan is available for public inspection at the Planning Department. Guidelines published by the Board are available from the Board’s website, the Secretariat of the Board and the Technical Services Division of the Planning Department. Application forms and Guidance Notes for planning applications can be downloaded from the Board’s website and are available from the Secretariat of the Board and the Technical Services Division and the relevant District Planning Office of the Planning Department. Applications should be supported by such materials as the Board thinks appropriate to enable it to consider the applications.

Lok Sin Tong Redevelopment Project at Lung Kong Road

Traffic Impact Assessment

Revised Report

(Extract)

December 2017



CTA Consultants Limited

志達顧問有限公司

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1. INTRODUCTION

1.1 Background

- 1.1.1 The application site is an existing building of Lok Sin Tong Headquarters with clinical services provided on G/F, and Lok Sin Tong Primary School, which are respectively located at Nos. 61 & 63 Lung Kong Road in Kowloon City. The site location is shown in **Figure 1.1**.
- 1.1.2 In response to the Labour and Welfare Bureau (LWB)'s invitation to joining their Special Scheme on Privately Owned Sites for Welfare Uses, the client – Lok Sin Tong Benevolent Society, Kowloon has submitted its application for redeveloping its existing headquarters building and primary school at Nos. 61 & 63 Lung Kung Road into a welfare complex.
- 1.1.3 In support of the aforesaid application, a traffic impact assessment is required to review and appraise any possible traffic impact induced by the proposed redevelopment on the adjacent road network.
- 1.1.4 We, CTA Consultants Limited (CTA), are therefore commissioned as the traffic consultant to prepare the Traffic Impact Assessment (TIA) and provide technical justifications in supporting the application from traffic engineering point of view.



1.2 Study Objectives

1.2.1 Main objectives of this study are listed below:

- To assess the existing and proposed traffic arrangement & provision of internal transport facilities at the subject site;
- To assess the existing traffic condition in the vicinity of the proposed redevelopment;
- To estimate traffic trips related to the proposed redevelopment;
- To carry out forecasts about traffic demand of the adjacent road network in design year 2025;
- To appraise any possible traffic impact induced by the proposed redevelopment on the adjacent road network;
- To recommend traffic improvement measures to alleviate any foreseeable traffic problem to the surrounding road network, if any.



1.3 Structure of the Report

1.3.1 Following this introductory chapter, there are **FIVE** further chapters:

- **Chapter 2 – THE PROPOSED REDEVELOPMENT**, which presents the site location and operation information of the proposed welfare complex;
- **Chapter 3 – EXISTING TRAFFIC CONDITION**, which describes the existing local road network and both vehicular and pedestrian traffic conditions in the vicinity of the subject site;
- **Chapter 4 – FUTURE TRAFFIC CONDITION & TRAFFIC IMPACT ASSESSMENT**, which estimates future vehicular and pedestrian traffic on the surrounding road network, and presents findings of the traffic impact assessment for the design year 2025;
- **Chapter 5 – CONSTRUCTION TRAFFIC IMPACT ASSESSMENT**, which presents findings of the traffic impact due to construction vehicles in year 2022, which is the last year of entire construction project;
- **Chapter 6 – SUMMARY AND CONCLUSION**, which summarizes the study findings and presents the conclusion regarding the proposed welfare complex.



2. THE PROPOSED REDEVELOPMENT

2.1 Site Location

2.1.1 The proposed redevelopment is located at Nos. 61 & 63 Lung Kong Road in Kowloon City as shown in **Figure 1.1**.

2.1.2 The existing headquarters building and Lok Sin Tong Primary School are planned to be redeveloped into a welfare complex in response to LWB's policy. The proposed layout plans of its Ground Floor and car park are respectively shown in **Figure 2.1 & 2.2**.

2.1.3 As illustrated in **Figure 2.1**, the proposed run-in/out is located at the existing entrance of Lok Sin Tong's headquarters building connected to Lung Kong Road.

2.2 Development Proposal

2.2.1 Parameters of the proposed redevelopment are listed in **Table 2.1**.

Table 2.1 Parameters of the Proposed Welfare Complex

| | |
|--|---|
| Site Location | Nos. 61 & 63 Lung Kong Road in Kowloon City |
| Proposed Redevelopment | Welfare Complex |
| Site Area | 1,833 m ² |
| Nos. of Block & Storey | 1 Block with 13 Storeys |
| Total Accountable GFA (m²) | 16,077.87 m ² |

2.2.2 Details of proposed uses of the welfare complex are tabulated in **Table 2.2**.

Table 2.2 Proposed Uses of the Welfare Complex

| Proposed Uses of the Welfare Complex | | |
|--|---|--|
| Floor | Use | Accountable GFA (m²) |
| B/F | Car Park | / |
| G/F | Day Care Centre for the Elderly with ancillary services of Early Education & Training Centre & After School Service | 1,505.51 m ² |
| 1/F – 6/F | Nursing Home & Continuum of Care for the Elderly | 8,631.01 m ² |
| 7/F | Academy & Carer Support Centre for the Elderly & Parent Resource Centre | 1,203.09 m ² |
| 8/F | Self-financing Home Care Service for the Elderly | 1,203.09 m ² |
| 9/F | Primary Health Care Centre | 1,181.71 m ² |
| 10/F | Ethics Minority Supporting Service Centre | 1,181.71 m ² |
| 11/F | Central Support Units (Head Office) | 1,171.73 m ² |
| Total Accountable GFA (m²) | | 16,077.87 m² |

2.2.3 The Nursing Home & Continuum of Care for the Elderly, which occupy 1/F to 6/F of the proposed welfare complex, are the **major uses** of the complex and will offer **400 beds** for the Elderly. For uses of remaining floors as specified in **Table 2.2**, the majority is supporting service for the Nursing Home of the proposed welfare complex from operation point of view.

2.2.4 It is anticipated that the proposed welfare complex will be commissioned in year 2022. Therefore, design year 2025 (i.e. 3 years after the planned commencement year of the proposed welfare complex) is adopted for the Traffic Impact Assessment.

2.3 Provision of Internal Transport Facilities

2.3.1 Due to the fact that requirements of provision of internal transport facilities for welfare uses are not specified in the latest Hong Kong Planning Standards and Guidelines (HKPSG), the provision is determined by referring to other welfare complexes with similar nature and characteristics including uses, facilities and availability of public transport services in the vicinity.

2.3.2 Two welfare complexes are adopted as the reference for determining the provision of internal transport facilities for the proposed welfare complex. Relevant details are given in **Tables 2.3 to 2.4**:

1. Tung Wah Group of Hospitals Wong Cho Tong Social Service Building, which is located at No. 39 Sheung Shing Street in Homantin and;
2. Hong Kong Sheng Kung Hui Li Ka Shing Care & Attention Home For The Elderly

Table 2.3 Details of TWGHs Wong Cho Tong Social Service Building

| Development for reference: TWGHs Wong Cho Tong Social Service Building | |
|---|--|
| Parameters | Details |
| Site Location | No. 39 Sheung Shing Street, Homantin |
| Uses | <p style="text-align: center;">Welfare, includes:</p> <ul style="list-style-type: none"> - Nursing Home & Continuum of Care: 278 beds - Day Care Centre for the Elderly - District Elderly Community Centre - Home Care Services - Integrated Services for the disadvantaged, patients, teenagers and children - Rehabilitation Centre - Management Office |
| Site Area | ~1,353 m ² |
| Parking Provision for Light Buses & Private Cars | 8 spaces for both light buses & private cars (Ratio = 1 space : 35 beds) |

Table 2.4 Details of HKSKH Li Ka Shing Care & Attention Home For The Elderly

| Development for reference: Hong Kong Sheng Kung Hui Li Ka Shing Care and Attention Home for the Elderly | |
|--|--|
| Parameters | Details |
| Site Location | 338 Nam Cheong Street, Sham Shui Po, Kowloon |
| Uses | <p style="text-align: center;">Welfare, includes:</p> <ul style="list-style-type: none"> - Nursing Home & Continuum of Care: 257 beds - Medical & Clinical Services Centre - Rehabilitation Centre - Professional Counseling Services Centre - Day Care for the Elderly - Home Care Services - Religious Centre - Management Office |
| Site Area | ~2,800 m ² |
| Parking Provision for Light Buses & Private Cars | 7 spaces for both light buses & private cars (Ratio = 1 space : 37 beds) |

2.3.3 With reference to the parking provision of both TWGHs Wong Cho Tong Social Service Building and HKSKH Li Ka Shing Care & Attention Home For The Elderly as tabulated in **Tables 2.3 & 2.4**, it is proposed that **11 parking spaces** for both light buses and private cars should be provided for the proposed welfare complex. Calculation is listed below:

By conservative approach, the derived ratio of “TWGHs Wong Cho Tong Social Service Building - 1 space : 35 beds” should be adopted.

Required Parking Provision for light buses & private cars

= 400 beds / 35 ~ 11 parking spaces

2.3.4 Moreover, comments on the required parking provision of the proposed development were received from **Planning Division of Social Welfare Department** via its email to the client, which is also attached in **Appendix 1** for your reference. From the social welfare facilities operation point of view, **10 spaces for parking of light buses, loading/unloading and ambulance use** are required. Moreover, **1 accessible parking space** would also be provided for disable persons. It is expected that the proposed provision would thoroughly fulfill the future operational need.

2.3.5 The proposed provision of **11 spaces** is reckoned to fulfill the future operational need of the proposed welfare complex from traffic engineering point of view. Details and breakdown of the proposed provision of internal transport facilities are tabulated in **Table 2.5**.

Table 2.5 Proposed Provision of Internal Transport Facilities

| Type | Dimensions stipulated in HKPSG | Proposed Dimensions | Proposed Number of Spaces |
|-------------------------------|--------------------------------|-------------------------------|---------------------------|
| Private Cars for Disabilities | 5m(L) x 3.5m(W) x min.2.4m(H) | 5m(L) x 3.5m(W) x min.2.4m(H) | 1 |
| Light Buses | 8m(L) x 3m(W) x min.3.3m(H) | 8m(L) x 3m(W) x min.3.3m(H) | 5 |
| LGV | 7m(L) x 3.5m(W) x min.3.6m(H) | 8m(L) x 3m(W) x min.3.6m(H) | 2 |
| Ambulance | N/A | 8m(L) x 3m(W) x min.3.6m(H) | 2 |
| Refuse | N/A | 8m(L) x 3m(W) x min.3.6m(H) | 1 |
| Total Provision | | | 11 |

Notes:

1. The proposed provision is determined by complying with SWD's operational requirement and referring to other welfare complexes with similar nature and characteristics as elaborated in previous paragraphs.
2. The provision of PV parking space for disabilities is determined by referring to "Parking for persons with disabilities" stipulated in the latest HKPSG that 1 accessible parking space should be provided for 1-50 parking spaces - Proposed Dimension: 5m(L) x 3.5m(W) x min.2.4m(H)
3. As advised by Social Welfare Department, 5 spaces of light buses and 2 LGV spaces are required for daily operation of major uses (Nursing Home, Continuum of Care & Day Centre) of the proposed welfare development.

2.4 Proposed Access Arrangement

2.4.1 The proposed vehicular and pedestrian accesses are shown in **Figure 2.3**. For vehicular access, left-in-left-out arrangement at Lung Kong Road would be proposed. As advised by the AP (Spence Robinson Limited), the proposed scheme layout has been circulated to LandsD and no adverse comments on the proposed run-in/out are received. Such provision is expected to be included in the lease modification. Moreover, the 3 concerned street parking spaces which obstruct the proposed vehicular access would be relocated to Nam Kok Road as shown in **Figure 2.3**.



3 EXISTING TRAFFIC CONDITION

3.1 Existing Road Network

3.1.1 Junction Road is a district distributor which provides major access for traffic commuting to/from other areas of Kowloon. It connects to Chuk Yuen Road and Boundary Street at its both ends.

3.1.2 Carpenter Road is a local distributor which provides access for traffic commuting to/from various developments within the Area of Influence. It connects to Junction Road and Lok Sin Road at its both ends.

3.1.3 Nga Tsin Wai Road is a local distributor which also provides access for traffic commuting to/from various developments within the Area of Influence. It connects to Junction Road and Kai Tak Road at its both ends.

3.1.4 Lung Kong Road is a local road which provides access to the subject site.

3.2 Critical Junctions

3.2.1 Nine junctions are identified to be critical for the Traffic Impact Assessment due to the proposed redevelopment. Relevant details are listed in **Table 3.1** and shown in **Figure 3.1**. Existing junction layouts and corresponding method-of-control are tabulated in **Figures 3.2** to **Figure 3.10** respectively.



Table 3.1 Identified Critical Junctions

| Ref. | Junction | Type | Figure No. |
|------|---|------------|------------|
| A | Junction Road / Carpenter Road | Signalized | 3.2 |
| B | Carpenter Road / Lion Rock Road | Signalized | 3.3 |
| C | Carpenter Road / Lung Kong Road | Priority | 3.4 |
| D | Nga Tsin Wai Road / Junction Road | Signalized | 3.5 |
| E | Nga Tsin Wai Road / Lion Rock Road | Signalized | 3.6 |
| F | Nga Tsin Wai Road / Lung Kong Road | Signalized | 3.7 |
| G | Carpenter Road / Nam Kok Road | Priority | 3.8 |
| H | Nga Tsin Wai Road / Nam Kok Road | Priority | 3.9 |
| I | Prince Edward Road East / Prince Edward Road West / Argyle Street / Ma Tau Chung Road | Roundabout | 3.10 |

3.2.2 In order to study the existing traffic condition of the above critical junctions, traffic survey in the form of manual-classified count was conducted for the nine junctions during the AM and PM peak periods on a typical weekday. The survey provides most up-to-date details of the traffic condition within the study area under normal operation. The observed traffic flow are presented in **Figure 3.11**.



3.2.3 Existing operational performance of the critical junctions are listed in **Table 3.2** below.

Table 3.2 Existing Operational Performance of Critical Junctions in 2017

| Ref. | Junction | Method of Control | Year 2017 RC/DFC ⁽¹⁾ | |
|------|---|-------------------|---------------------------------|---------|
| | | | AM Peak | PM Peak |
| A | Junction Road / Carpenter Road | Signalized | 108% | 92% |
| B | Carpenter Road / Lion Rock Road | Signalized | 225% | 125% |
| C | Carpenter Road / Lung Kong Road | Priority | 0.39 | 0.47 |
| D | Nga Tsin Wai Road / Junction Road | Signalized | 142% | 75% |
| E | Nga Tsin Wai Road / Lion Rock Road | Signalized | 255% | 147% |
| F | Nga Tsin Wai Road / Lung Kong Road | Signalized | 142% | 80% |
| G | Carpenter Road / Nam Kok Road | Priority | 0.13 | 0.20 |
| H | Nga Tsin Wai Road / Nam Kok Road | Priority | 0.24 | 0.37 |
| I | Prince Edward Road East / Prince Edward Road West / Argyle Street / Ma Tau Chung Road | Roundabout | 0.70 | 0.65 |

Notes: (1) RC = Reserve Capacity for Signal Junction;

(2) DFC = Design Ratio of Flow to Capacity for Priority Junction/Roundabout

3.2.4 The assessment results in **Table 3.2** indicate that all critical junctions are at present operating with ample capacities during the peak hours.

3.3 Public Transport Services in the Vicinity

3.3.1 Numerous road-based public transport services, for instance, franchised buses and GMB are also provided in vicinity of the proposed welfare. Details of the current services of franchised buses and GMB routes within the catchment area of 500 meters are listed in **Table 3.3**.

3.3.2 Moreover, according to information published by MTRC, the Shatin-to-Central Link will be in commission in year 2021. The subject site will be conveniently accessed via the Entrance B at Nam Kok Road, which is connected to To Kwa Wan Station by the pedestrian subway across Olympic Garden and Sung Wong Toi Playground.

3.3.3 Locations of the proposed MTR station, bus stops and GMB stops are shown in **Figure 3.12**. It is considered that the proposed welfare complex will be highly accessible and well-served by comprehensive public transport services.

Table 3.3 Public Transport Services in the Vicinity of the Proposed Welfare Complex

| Service | Route | Origin - Destination | Frequency (mins) |
|----------------|---|--|------------------|
| Franchised Bus | 1 | Chuk Yuen Estate - Star Ferry | 6 -- 15 |
| | 1A | Sau Mau Ping (Central) - Star Ferry | 5 -- 10 |
| | 2A | Lok Wah - Mei Foo | 9 -- 15 |
| | 2D | Chak On Estate - Tung Tau Estate | 20 -- 30 |
| | 3B | Tsz Wah Shan (Central) - Hung Hom Ferry | 12 -- 25 |
| | 5 | Fu Shan - Star Ferry | 7 -- 15 |
| | 5C | Tsz Wah Shan (Central) - Star Ferry | 6 -- 12 |
| | 5D | Telford Gardens - Hung Hom (Circular) | 15 -- 35 |
| | 5P | Tsz Wah Shan (Central) - Star Ferry | 15 |
| | 6D | Ngau Tau Kok - Mei Foo | 12 -- 20 |
| | 6P | So Uk - Lei Yue Mun Estate | 20 |
| | 7B | Hung Hom Ferry - Lok Fu | 15 -- 30 |
| | 9 | Ping Shek - Star Ferry | 15 -- 20 |
| | 10 | Choi Wan - Tai Kok Tsui (circular) | 15 -- 25 |
| | 11 | Diamond Hill - Kowloon Station | 10 -- 20 |
| | 11B | Kwun Tong (Tsui Ping Road) - Kowloon City Ferry | 10 -- 20 |
| | 11D | Lok Fu - Kwun Tong Ferry | 20 -- 30 |
| | 11K | Chuk Yuen Estate - Hung Hom Station | 12 -- 20 |
| | 11X | Sau Mau Ping (Central) - Hung Hom Station | 10 -- 20 |
| | 12A | Whampoa Garden - Cheung Sha Wan (Sham Mong Road) | 8 -- 15 |
| 13D | Po Tat - Island Harbourview | 15 -- 25 | |
| 14 | Lei Yue Mun Estate - China ferry terminal | 12 -- 20 | |
| 15 | Ping Tin - Hung Hom Ferry | 12 -- 20 | |
| 16 | Lam Tin (Kwong Tin Estate) - Mong Kok (Park Avenue) | 8 -- 20 | |



| | | | |
|-----------------------|------|---|--------------|
| | 16X | Lam Tin (Kwong Tin Estate) - Mong Kok (Park Avenue) | Once Per Day |
| | 17 | Kwun Tong (Yue Man Square) - Oi Man | 5 -- 20 |
| | 21 | Choi Wan - Hung Hom Station | 15 -- 20 |
| | 24 | Kai Yip - Mong Kok (Circular) | 15 -- 20 |
| | 26 | Shun Tin - Tsim Sha Tsui East | 7 -- 20 |
| | 27 | Shun Tin - Mong Kok (Circular) | 6 -- 15 |
| | 28 | Lok Wah - Tsim Sha Tsui East (Mody Road) | 8 -- 15 |
| | 42 | Cheung Hong - Shun Lee | 15 -- 20 |
| | 61X | Tuen Mun Central B/T - Kowloon City | 9 -- 20 |
| | 75X | Fu Shin Estate B/T - Kowloon City Ferry | 8 -- 15 |
| | 85 | Fo Tan B/T (Shan Mei ST) - Kowloon City ferry | 13 -- 25 |
| | 85A | Kwong Yuen B/T - Kowloon City Ferry | 15 -- 25 |
| | 85B | Chun Shek B/T - Kowloon City Ferry | 20 -- 30 |
| | 85X | Ma On Shan Town B/T - Hung Hom Ferry | 10 -- 20 |
| | 93K | Po Lam - Mong Kok East Station | 15 -- 25 |
| | 95 | Tsui Lam - Jordan (To Wah Road) | 10 -- 25 |
| | 98C | Hang Hau (North) (Tseung Kwan O Hospital) - Mei Foo | 8 -- 20 |
| | 98S | Lohas Park Station - Mei Foo | 20 |
| | 101 | Kwun Tong (Yue Man Square) - Kennedy Town | 3 -- 14 |
| | 101 | Kwun Tong (Yue Man Square) - Central | 10 -- 20 |
| | 106 | Wong Tai Sin - Siu Sai Wan (Island Resort) | 4 -- 12 |
| | 106A | Wong Tai Sin - Tai Koo (Kornhill Plaza) | 10 |
| Franchised Bus | 106P | Wong Tai Sin - Siu Sai Wan (Island Resort) | 20 |
| | 107 | Kowloon Bay - Wah Kwai | 8 -- 20 |
| | 108 | Kai Yip - Braemar Hill | 10 -- 20 |
| | 111 | Ping Shek - Central (Macau Ferry) | 3 -- 12 |
| | 111P | Choi Fook - Central (Macau Ferry) | 10 -- 23 |
| | 113 | Choi Hung - Kennedy Town (Belcher Bay) | 8 -- 20 |
| | 116 | Tsz Wan Shan (Central) - Quarry Bay (Yau Man St) | 4 -- 12 |
| | 203E | Choi Hung - Kowloon Station | 10 -- 20 |
| | 213D | Sau Mau Ping (Central) - Mong Kok (Circular) | 15 -- 20 |
| | 296C | Sheung Tak - Cheung Sha Wan (Sham Mong Road) | 15 -- 25 |
| | 297 | Hang Hau (North) (Tseung Kwan O Hospital) - Hung Hom Ferry | 15 -- 25 |
| | 796C | Oscar By The Sea - So Uk Estate | 12 -- 20 |
| | 796X | Lohas Park - Tsim Sha Tsui (East) | 10 -- 20 |
| | 796X | Tseung Kwan O Station- Tsim Sha Tsui (East) | 8 -- 18 |
| | A22 | Lam Tin Station-- Airport (Ground Transportation Centre) | 15 -- 20 |
| | E23 | Tsz Wan Shan (South) - Airport (Ground Transportation Centre) | 12 -- 20 |
| | N23 | Tsz Wan Shan (North) - Tung Chung Station | 30 -- 60 |
| | N121 | Central (Macau Ferry) - Ngau Tau Kok | 15 |
| | N216 | Yau Tong - Hung Hom Station | 15 -- 20 |
| | N293 | Sheung Tak - Mong Kok East Station | 15 -- 20 |
| | N796 | Tseung Kwan O Station - Tsim Sha Tsui | 20 -- 30 |



| | | | |
|------------|------|---|----------|
| GMB | 2 | Whampoa Garden - Festival Walk | 10 -- 15 |
| | 2A | Whampoa Garden - Festival Walk | 10 -- 15 |
| | 2M | Whampoa Garden - Kowloon City (Fuk Lo Tsun Rd) | 10 -- 12 |
| | 13 | Kowloon Tong (Broadcast Dr) - Hung Hom Ferry Pier | 10 -- 15 |
| | 25M | Kowloon Tong Station - Tung Tau Estate | 6 -- 8 |
| | 39M | Lok Fu - Tung Tau Estate | 6 -- 10 |
| | 46 | Richland Gardens - Island Harbourview | 6 -- 15 |
| | 49 | Shun Tin Estate - Kowloon City Ferry Pier | 25 |
| | 61 | Siu Sai Wan (Island Resort) - Mong Kok East Station (Fife St) | 30 |
| | 66S | Fu Shan Estate - Mong Kok (Sai Yeung Choi St S) | 15 -- 20 |
| | 69 | Laguna City - Kowloon City (Lion Rock Rd) | 12 -- 20 |
| | 69A | Laguna City - Prince Edward Station | 15 |
| | 70 | Diamond Hill Station - Island Harbourview | 6 -- 8 |
| | 70A | Diamond Hill Station - Olympic Station | 9 -- 15 |
| | 88 | Kai Ching Estate - Wong Tai Sin | 15 |
| | 105 | Tseung Kwan O (Hong Sing Garden) - To Kwa Wan (Ko Shan Theatre) | 5 -- 9 |
| | 105S | Tseung Kwan O (Hong Sing Garden) - To Kwa Wan (Ko Shan Theatre) | 15 |
| | 110 | Tiu Keng Leng Station - Kowloon City | 10-20 |

3.4 Pedestrian Traffic Impact Assessment – Existing Scenario

- 3.4.1 To appraise the service level of major footpaths connected to the proposed hotel, pedestrian count survey was also conducted during the morning and evening peak periods on a typical weekday (15 November 2017). Pedestrian routing and critical sections of footpath are identified based on on-site observation and availability of public transport facilities in the vicinity (including the proposed MTR station). Relevant details are outlined in **Figure 3.13**.
- 3.4.2 The assessment is based on Level-of-Service (LOS) approach, which is stipulated in T.P.D.M. (Volume 6, Chapter 10, Section 10.4.2), defines the service level of walkway in terms of several parameters such as pedestrian flow rate, pedestrian space, walking speed, etc. The standard with relevant descriptions are summarized in **Table 3.4**.
- 3.4.3 **Table 3.4** shows how LOS A is the most comfortable while LOS F is the most crowded and unsatisfactory environment for pedestrians.

Table 3.4 Descriptions of Level-of-Service (LOS)

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

3.4.4 Existing pedestrian assessment of the above-mentioned critical sections of footpath based on LOS Criteria has been conducted and the results are summarized in **Table 3.5** below.

Table 3.5 Existing Operational Assessment of Critical Footpaths

| Critical Sections | Total Footpath Width (m) ⁽¹⁾ | Effective Width (m) ⁽²⁾ | Existing Scenario (2017) | | |
|-------------------|---|------------------------------------|----------------------------------|---|---------------------|
| | | | Two-way Pedestrian Flow (ped/hr) | Two-way Pedestrian Flow Rate (ped/min/m) ⁽³⁾ | LOS |
| | | | AM(PM) Peak Periods | AM(PM) Peak Periods | AM(PM) Peak Periods |
| A | 3.0 | 2.0 | 960(670) | 8.0(5.6) | A(A) |
| B | 3.2 | 2.2 | 480(240) | 3.6(1.8) | A(A) |
| C | 3.0 | 2.0 | 840(590) | 7.0(3.3) | A(A) |
| D | 4.6 | 3.6 | 360(215) | 1.7(1.0) | A(A) |

Notes:

(1) Total Footpath Width = Footpath Width between wall of buildings and road kerb,

(2) Effective Width = Clear Width – Death Width (0.5m from one side with railings, walls or kerb).

(3) Pedestrian Flow Rate (ped/min/m) = Peak Pedestrian Flow / 60 min / Effective Width.

3.4.5 The results indicate that the critical footpath sections are operating with adequate spare capacities to cater for the existing pedestrian demand during the identified peak periods.

3.4.6 As for pedestrian trip rates related to the proposed welfare complex, reference has been made to TWGHs Wong Cho Tong Social Service Building, details of which have already been given in **Chapter 2**. In view of highly similar characteristics such as scale, uses, availability of public transport services and facilities with the proposed welfare complex, a traffic survey was also conducted during the AM and PM peak periods for acquisition of pedestrian trip rates of the referential building. Details of the pedestrian attraction and generation rates of TWGHs Wong Cho Tong Social Service Building are tabulated in **Table 3.5**.

Table 3.6 Pedestrian Attraction & Generation Rates of TWGHs Wong Cho Tong Social Service Building

| TWGHs Wong Cho Tong Social Service Building (278 beds for the elderly) | Two-way Pedestrian Flow (Combined Attraction & Generation) |
|--|--|
| | AM(PM) Peak Periods |
| Surveyed No. of Pedestrians (Ped) | 120(70) |
| Rate (Ped / bed) | 0.43(0.25) |



4 FUTURE TRAFFIC CONDITION & TRAFFIC IMPACT ASSESSMENT

4.1 Design Year

4.1.1 It is anticipated that the proposed welfare complex will be operated in year 2022. In order to assess any related traffic impact incurred by the proposed redevelopment on the local road network, year 2025 (i.e. 3 years after the planned commencement year of the proposed welfare complex) is adopted as the design year for this study.

4.2 Traffic Forecast

4.2.1 To estimate the reference traffic flow in year 2025 (without the proposed welfare complex) in the local road network, an appropriate growth factor has to be identified for the area in the first instance. The following approaches have been adopted to derive the growth factor for the Area of Influence.

Historical Trend

4.2.2 Numerous traffic-count stations are located in the vicinity of the proposed redevelopment. The traffic counts reported in the Annual Traffic Census (ATC), which is published by Transport Department, over a period of five years, i.e. 2010 to 2015 are summarized in **Table 4.1**.



Table 4.1 Historical Traffic Data from Annual Traffic Census (ATC)

| ATC Stn | Road Name | Annual Average Daily Traffic (AADT) | | | | | | Avg. Annual Growth Rate |
|--------------|---|-------------------------------------|---------------|---------------|---------------|---------------|---------------|-------------------------|
| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | |
| 3016 | Junction Rd (From Nga Tsin Wai Rd to Tung Tau Tsuen Rd) | 16,690 | 16,680 | 16,800 | 16,670 | 17,120 | 16,900 | +0.25% |
| 3489 | Lok Sin Rd (Section between Tung Tsing Rd & Tak Ku Ling Rd) | 9,010 | 9,180 | 9,190 | 9,110 | 9,300 | 8,970 | -0.09% |
| 3494 | Tak Ku Ling Rd (Section between Nga Tsin Wai Rd & Carpenter Rd) | 7,670 | 7,810 | 7,820 | 7,750 | 8,040 | 7,480 | -0.50% |
| TOTAL | | 33,370 | 33,670 | 33,810 | 33,530 | 34,460 | 33,350 | -0.01% |

Planning Data

4.2.3 Reference has also been made to the latest 2014-Based Territorial Population Employment Data Matrices (TPEDM) planning data published by the Planning Department in March 2017 for projection of population and employment within the study district from years 2014 to 2026. The average annual growth rates in terms of population and employment from 2014 to 2021 are tabulated in **Table 4.2**.

Table 4.2 2014-Based Planning Data from 2014 to 2026

| Planning Data District | Population | | Avg. Annual Growth Rate | Employment | | Avg. Annual Growth Rate |
|------------------------|----------------|----------------|-------------------------|----------------|----------------|-------------------------|
| | 2014 | 2026 | | 2014 | 2026 | |
| Kowloon City | 414,750 | 432,550 | +0.35% | 209,100 | 237,150 | +1.05% |
| Total | 414,750 | 432,550 | +0.30% | 209,100 | 237,150 | +1.05% |



In-house Model compatible with Base District Traffic Model (BDTM)

4.2.4 **Table 4.3** summaries traffic flow of strategic roads such as primary and local distributors within the study area during peak hours from 2016 to 2021.

Table 4.3 Summary of In-house Model Traffic Flow Compatible with BDTM

| Street Name | AM Peak | | | PM Peak | | |
|-------------------|-----------------------|--------------|--------------------|-----------------------|--------------|--------------------|
| | Two-way Traffic Trips | | Annual Growth Rate | Two-way Traffic Trips | | Annual Growth Rate |
| | 2016 | 2021 | | 2016 | 2021 | |
| Junction Road | 608 | 588 | -0.67% | 666 | 630 | -1.11% |
| Carpenter Road | 237 | 224 | -1.12% | 220 | 211 | -0.83% |
| Nga Tsin Wai Road | 592 | 631 | +1.28% | 632 | 640 | +0.25% |
| Total | 1,437 | 1,443 | +0.08% | 1,518 | 1,481 | -0.49% |

Adopted Growth Rate

4.2.5 A.A.D.T. of ATC indicates that the traffic flow of the local road network has an average annual growth rate of -0.01% from year 2010 to year 2015.

4.2.6 Whilst, the planning data indicates that the population and employment of the study area are expected to grow with an average annual growth rate of +0.30% and +1.05% respectively from 2016 to 2021.

4.2.7 Taking into consideration that MTR Shatin-to-Central Link will be fully commissioned in year 2025, overall traffic flow commuting between Kowloon City and other regions are significantly affected due to the operation of To Kwa Wan Station. Therefore, the average annual growth rates identified via ATC and 2014-Based TPEDM are reckoned inadequate to reflect the future traffic pattern of the study area. Based on the in-house model compatible with BDTM, which has already taken into account potential traffic impacts incurred by Shatin-to-Central link, by conservative approach, the annual growth rate of **+1.00%** p.a. is adopted in the traffic forecast for further assessment. It is deemed sufficient to include any unexpected



4.4 Traffic Trips of the Proposed Redevelopment

4.4.1 Owing to the fact that traffic rates of both generation and attraction for welfare uses are not specified in the latest Transport Planning & Design Manual (TPDM), the traffic trips are estimated by referring to TWGHs Wong Cho Tong Social Service Building as elaborated in **Chapter 2**.

4.4.2 The estimation of traffic trips related to the proposed welfare complex is conducted with reference to the actual traffic trips of the TWGHs Wong Cho Tong Social Service Building acquired via the latest traffic survey. Adjustments based on fine scaling method have also been made to the aforesaid estimation deliberately with due consideration of differences in various factors such as scale and uses of the proposed welfare complex and the reference development.

4.4.3 Details of the surveyed traffic trips related to the reference development – TWGHs Wong Cho Tong Social Service Building are tabulated in **Table 4.4**.

Table 4.4 Surveved Traffic Trips of the Reference Development

| | Weekday AM Peak | | Weekday PM Peak | |
|---|-----------------|----------------|-----------------|----------------|
| | Gen. (pcu) | Att. (pcu) | Gen. (pcu) | Att. (pcu) |
| TWGHs Wong Cho Tong Social Service Building – IN/OUT of Building (pcu/hr) | 14 | 11 | 7 | 9 |
| TWGHs Wong Cho Tong Social Service Building – Loading/Unloading activities of Building (pcu/hr) | 10 | 8 | 5 | 7 |
| Total Trip (pcu/hr) | 24 | 19 | 12 | 16 |
| Trip Rate (pcu/hr/bed) | 0.08633 | 0.06835 | 0.04317 | 0.05755 |

- 4.4.4 Based on the adopted trip rates in **Table 4.4** and proposed development parameters (i.e. number of proposed beds for the elderly), estimation of the traffic trips of the proposed welfare complex is tabulated in **Table 4.5**:

Table 4.5 Estimated Traffic Trips of the Proposed Redevelopment

| | Weekday AM Peak | | Weekday PM Peak | |
|-------------------------------------|-----------------|------------|-----------------|------------|
| | Gen. (pcu) | Att. (pcu) | Gen. (pcu) | Att. (pcu) |
| Proposed Welfare Complex (pcu/hr) | 35 | 28 | 18 | 23 |
| Total Trip (2-ways) (pcu/hr) | 63 | | 41 | |

Note:

*Estimated Traffic Trips = Proposed number of beds for the elderly x Referential Trip Rates in **Table 4.4**

- 4.4.5 Net traffic trips of the proposed welfare complex are computed for inclusion in further Traffic Impact Assessment. Relevant results are tabulated in **Table 4.6**.

Table 4.6 Net Traffic Trips of the Proposed Welfare Complex

| | Weekday AM Peak | | Weekday PM Peak | |
|---|-----------------|------------|-----------------|------------|
| | Gen. (pcu) | Att. (pcu) | Gen. (pcu) | Att. (pcu) |
| Proposed Welfare Complex | 35 | 28 | 18 | 23 |
| MINUS | | | | |
| | Weekday AM Peak | | Weekday PM Peak | |
| | Gen. (pcu) | Att. (pcu) | Gen. (pcu) | Att. (pcu) |
| Existing Headquarters Building | 5 | 5 | 5 | 5 |
| Existing Primary School (7 classes based on Lok Sin Tong's Information) | 4 | 3 | 4 | 4 |
| Total Trips (pcu/hr) | 9 | 8 | 9 | 9 |
| Net Traffic Trips (pcu/hr) | 26 | 20 | 9 | 14 |



4.5 Traffic Forecast for Design Year 2025

4.5.1 The net traffic trips of the proposed welfare complex is then superimposed onto the year 2025 reference traffic flow (without the proposed welfare complex) as illustrated in **Figure 4.1** to derive the year 2025 design traffic flow (with the proposed welfare complex).

$$\begin{array}{l} \text{Year 2025 Design} \\ \text{Flow (with the} \\ \text{proposed welfare} \\ \text{complex)} \end{array} = \begin{array}{l} \text{Year 2025 Reference} \\ \text{Flow} \\ \text{(without the proposed} \\ \text{welfare complex)} \end{array} + \begin{array}{l} \text{Traffic Trips of the} \\ \text{Proposed} \\ \text{Welfare Complex} \end{array}$$

4.5.2 The traffic flow during AM and PM peak periods in the design year 2025 (with the proposed welfare complex) are shown in **Figure 4.2**.

4.6 Operational Assessment

4.6.1 To assess traffic impacts due to the proposed welfare complex, operational assessment of the critical junctions identified in **Chapter 3** are carried out for both reference (without the proposed welfare complex) and design (with the proposed welfare complex) scenarios in year 2025. The results are summarized in **Table 4.7**.

Table 4.7 Operational Performance of Critical Junctions in Year 2025

| Ref. | Junction | Method of Control | Year 2025 RC ⁽¹⁾ /DFC ⁽²⁾ | | | |
|------|---|-------------------|--|---------|--|---------|
| | | | Reference Scenario (Without the Proposed Welfare Complex) | | Design Scenario (With the Proposed Welfare Complex) | |
| | | | AM Peak | PM Peak | AM Peak | PM Peak |
| A | Junction Road / Carpenter Road | Signalized | 86% | 76% | 85% | 76% |
| B | Carpenter Road / Lion Rock Road | Signalized | 193% | 104% | 181% | 101% |
| C | Carpenter Road / Lung Kong Road | Priority | 0.42 | 0.52 | 0.47 | 0.54 |
| D | Nga Tsin Wai Road / Junction Road | Signalized | 113% | 54% | 110% | 53% |
| E | Nga Tsin Wai Road / Lion Rock Road | Signalized | 223% | 125% | 217% | 124% |
| F | Nga Tsin Wai Road / Lung Kong Road | Signalized | 124% | 66% | 116% | 64% |
| G | Carpenter Road / Nam Kok Road | Priority | 0.14 | 0.22 | 0.14 | 0.22 |
| H | Nga Tsin Wai Road / Nam Kok Road | Priority | 0.26 | 0.40 | 0.27 | 0.41 |
| I | Prince Edward Road East / Prince Edward Road West / Argyle Street / Ma Tau Chung Road | Roundabout | 0.81 | 0.75 | 0.82 | 0.76 |

Notes: (1) RC = Reserve Capacity;

(2) DFC = Design Ratio of Flow to Capacity for Priority Junction/Roundabout

4.6.2 **Table 4.7** reveals that all critical junctions will still operate within their capacities in design year 2025.

4.6.3 The additional traffic trips related to the proposed welfare complex are considered insignificant and can be absorbed by the road network.

4.7 Pedestrian Traffic Impact Assessment – Reference & Design Scenario

- 4.7.1 A growth factor of +1.05% p.a. from year 2014 to year 2026 is identified from 2014-Based TPEDM as tabulated in **Table 4.2** and applied to the observed pedestrian counts to forecast the background pedestrian flow in year 2025.
- 4.7.2 With the survey data presented in **Table 3.5**, LOS of critical footpath sections without the proposed welfare complex in year 2025 is calculated and summarized in **Table 4.8**.

**Table 4.8 Future Operational Assessment of Critical Footpaths in year 2025
(Without the Proposed Welfare Complex)**

| Critical Sections | Total Footpath Width (m) ⁽¹⁾ | Effective Width (m) ⁽²⁾ | Reference Scenario (2025) | | |
|-------------------|---|------------------------------------|----------------------------------|---|---------------------|
| | | | Two-way Pedestrian Flow (ped/hr) | Two-way Pedestrian Flow Rate (ped/min/m) ⁽³⁾ | LOS |
| | | | AM(PM) Peak Periods | AM(PM) Peak Periods | AM(PM) Peak Periods |
| A | 3.0 | 2.0 | 1,045(730) | 8.7(6.1) | A(A) |
| B | 3.2 | 2.2 | 520(260) | 3.9(2.0) | A(A) |
| C | 3.0 | 2.0 | 915(640) | 7.6(5.3) | A(A) |
| D | 4.6 | 3.6 | 390(235) | 1.8(1.1) | A(A) |

Notes:

- (1) Total Footpath Width = Footpath Width between wall of buildings and road kerb,
 (2) Effective Width = Clear Width – Death Width (0.5m from one side with railings, walls or kerb).
 (3) Pedestrian Flow Rate (ped/min/m) = Peak Pedestrian Flow / 60 min / Effective Width.

- 4.7.3 The results show that the critical footpath sections in the vicinity of the proposed welfare complex would operate with adequate capacities during peak periods in year 2025 for reference scenario.

4.7.4 The estimated pedestrian trips of the proposed welfare complex are calculated based on reference trip rates specified in **Table 3.6**. Details are given below:

| | |
|---|-----------------------------|
| The proposed number of beds for the elderly | =400 |
| AM(PM) Peak Trip Rates in Table 3.6 | =0.43(0.25) |
| Additional pedestrians due to the proposal | =400 x reference trip rates |

Table 4.9 Estimated Pedestrian Trips of the Proposed Welfare Complex

| Proposed Welfare Complex | Two-way pedestrian flow AM(PM) Peak Periods |
|---|--|
| Trip Rates | 0.43(0.25) |
| No. of additional pedestrians due to the proposed welfare complex (ped/hr) | 170(100) |

4.7.5 Results show that the two-way pedestrian trips related to the proposed welfare complex would be **170** and **100** pedestrians during AM and PM peak periods respectively in year 2025.

4.7.6 The additional two-way pedestrian trips of the proposed welfare complex in **Table 4.9** is superimposed onto the forecasted background pedestrian flow of reference scenario in **Table 4.8** for derivation of the design scenario. LOS assessment of the critical footpath section in year 2025 (design scenario) is also conducted and presented in **Table 4.10**.

**Table 4.10 Future Operational Assessment of Critical Footpaths in year 2025
 (With the Proposed Welfare Complex)**

| Critical Sections | Total Footpath Width (m) ⁽¹⁾ | Effective Width (m) ⁽²⁾ | Design Scenario (2025) | | |
|-------------------|---|------------------------------------|--|---|-------------------------------|
| | | | Two-way Pedestrian Flow (ped/hr) AM(PM) Peak Periods | Two-way Pedestrian Flow Rate (ped/min/m) ⁽³⁾ AM(PM) Peak Periods | LOS AM(PM) Peak Periods |
| A | 3.0 | 2.0 | 1,130(780) | 9.4(6.5) | A(A) |
| B | 3.2 | 2.2 | 605(310) | 4.6(2.3) | A(A) |
| C | 3.0 | 2.0 | 1,000(690) | 8.3(5.8) | A(A) |
| D | 4.6 | 3.6 | 475(285) | 2.2(1.3) | A(A) |

Notes:

(1) Total Footpath Width = Footpath Width between wall of buildings and road kerb,

(2) Effective Width = Clear Width – Death Width (0.5m from one side with railings, walls or kerb).

(3) Pedestrian Flow Rate (ped/min/m) = Peak Pedestrian Flow / 60 min / Effective Width.

4.7.7 Results show that the critical footpath sections in the vicinity of the proposed welfare complex would operate with adequate capacities during both AM and PM peak periods in the design year 2025.



5 CONSTRUCTION TRAFFIC IMPACT ASSESSMENT

5.1 Proposed Routing of Construction Vehicles

- 5.1.1 Two possible routes for construction vehicles commuting to the subject site for construction works have been identified in **Figure 5.1**. In view of local traffic conditions including the Kowloon City Interchange, it is proposed that the construction vehicles use the “**Alternative Route 1**” to access the subject site via Junction Road, Carpenter Road, Lion Rock Road, Nga Tsin Wai Road and Nam Kok Road so as to avoid additional traffic impact on the Interchange.
- 5.1.2 To assess underlying traffic impact due to the construction works of the proposed redevelopment, operational performance assessment of the critical junctions along the proposed “**Alternative Route 1**” is carried out for both reference (without construction vehicles) and design (with construction vehicles) scenarios in year 2022, which is the final year of the entire construction project. The results are summarized in **Table 5.1**, which shows that all junctions will operate with ample capacities in 2022.
- 5.1.3 According to the tentative construction programme of the proposed welfare complex, **20 construction vehicles per day (10 working hours)** would be required for transportation of construction waste and soil. Therefore, during the AM & PM peak periods, it is anticipated that **2 construction vehicles** would be required for in/out of the construction site for the aforesaid works.
- 5.1.4 Same growth factor (+1.00% p.a.) as specified in **Section 4.2.7** has been applied to the traffic forecast for the construction traffic impact assessment. Year 2022 reference and design traffic flows are respectively shown in **Figure 5.2 & 5.3**



Table 5.1 Operational Performance of Critical Junctions in Year 2022

| Ref. | Junction | Method of Control | Year 2022 RC ⁽¹⁾ /DFC ⁽²⁾ | | | |
|------|---|-------------------|---|---------|---|---------|
| | | | Reference Scenario (Without Construction Vehicles) | | Design Scenario (With Construction Vehicles) | |
| | | | AM Peak | PM Peak | AM Peak | PM Peak |
| A | Junction Road / Carpenter Road | Signalized | 94% | 81% | 92% | 80% |
| B | Carpenter Road / Lion Rock Road | Signalized | 203% | 111% | 196% | 107% |
| C | Carpenter Road / Lung Kong Road | Priority | 0.41 | 0.50 | 0.41 | 0.50 |
| D | Nga Tsin Wai Road / Junction Road | Signalized | 117% | 58% | 115% | 57% |
| E | Nga Tsin Wai Road / Lion Rock Road | Signalized | 235% | 132% | 233 | 131% |
| F | Nga Tsin Wai Road / Lung Kong Road | Signalized | 131% | 70% | 131% | 70% |
| G | Carpenter Road / Nam Kok Road | Priority | 0.14 | 0.22 | 0.15 | 0.23 |
| H | Nga Tsin Wai Road / Nam Kok Road | Priority | 0.25 | 0.40 | 0.25 | 0.40 |
| I | Prince Edward Road East / Prince Edward Road West / Argyle Street / Ma Tau Chung Road | Roundabout | 0.76 | 0.71 | 0.76 | 0.71 |

5.1.5 As shown in **Table 5.1**, all identified critical junctions would operate with ample capacities in year 2022 under the construction traffic impact assessment.



6 SUMMARY AND CONCLUSION

6.1 Summary

6.1.1 Lok Sin Tong intends to redevelop its existing headquarters building and primary school at Nos. 61 & 63 Lung Kong Road into a welfare complex in response to the Labour and Welfare Bureau (LWB)'s invitation to joining their Special Scheme on Privately Owned Sites for Welfare Uses..

6.1.2 CTA Consultants Limited (CTA), are therefore commissioned as the traffic consultant to prepare the Traffic Impact Assessment (TIA) and provide technical justifications in supporting the application from traffic engineering point of view.

6.1.3 To appraise the existing traffic condition, a traffic survey in the form of manual-classified count was conducted at the surrounding road network of the proposed redevelopment. Current operational performance of the critical junctions has been assessed with the observed traffic flow. The results reveal that all critical junctions are at present operating within its capacities. The key junctions include:

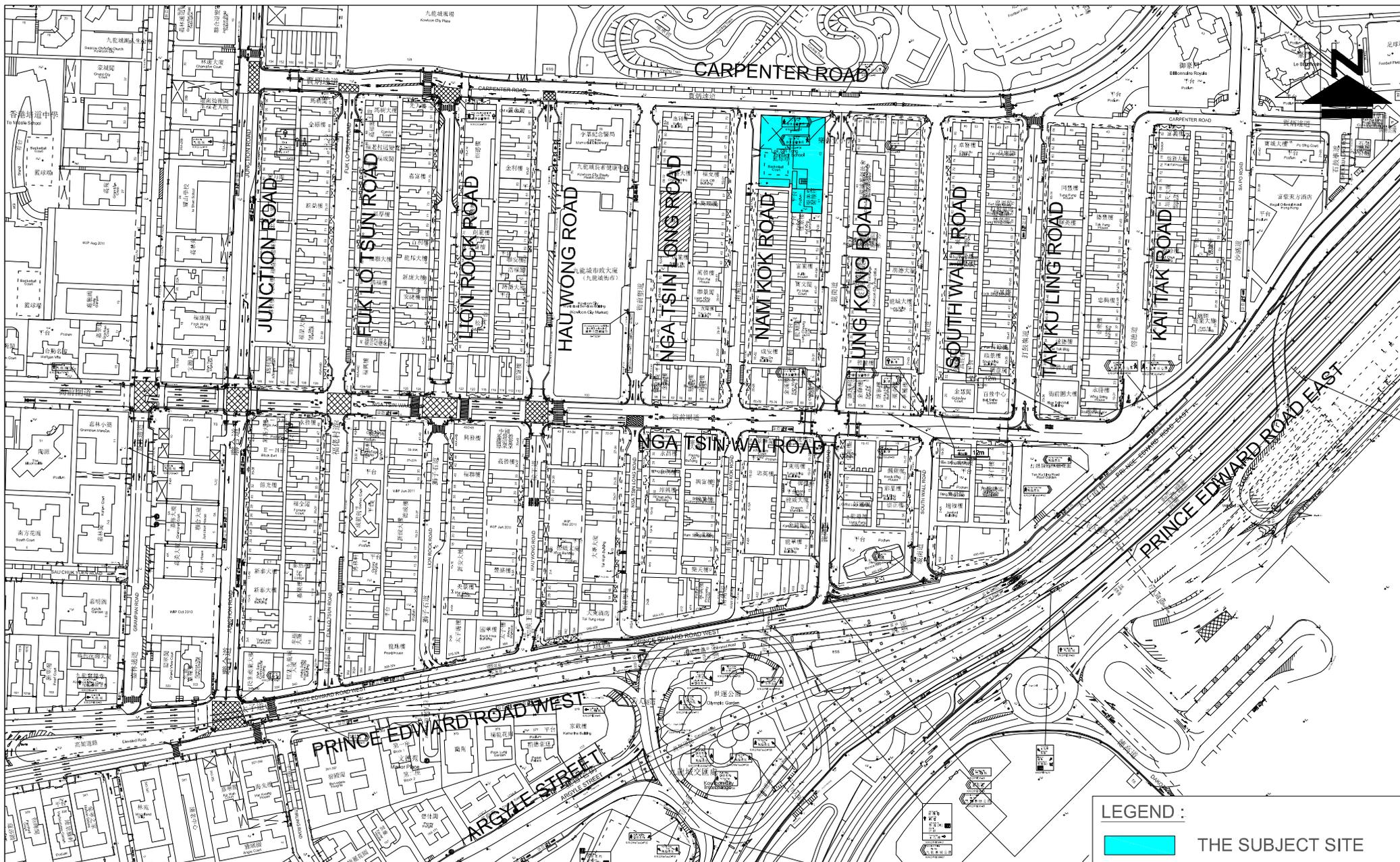
- Junction Road / Carpenter Road
- Carpenter Road / Lion Rock Road
- Carpenter Road / Lung Kong Road
- Nga Tsin Wai Road / Junction Road
- Nga Tsin Wai Road / Lion Rock Road
- Nga Tsin Wai Road / Lung Kong Road
- Carpenter Road / Nam Kok Road
- Nga Tsin Wai Road / Nam Kok Road
- Prince Edward Road East / Prince Edward Road West / Argyle Street / Ma Tau Chung Road

6.1.4 Assessment of operational performance of the critical junctions indicate that all critical junctions will still operate within their capacities in both reference and design scenarios in year 2025.



6.2 Conclusion

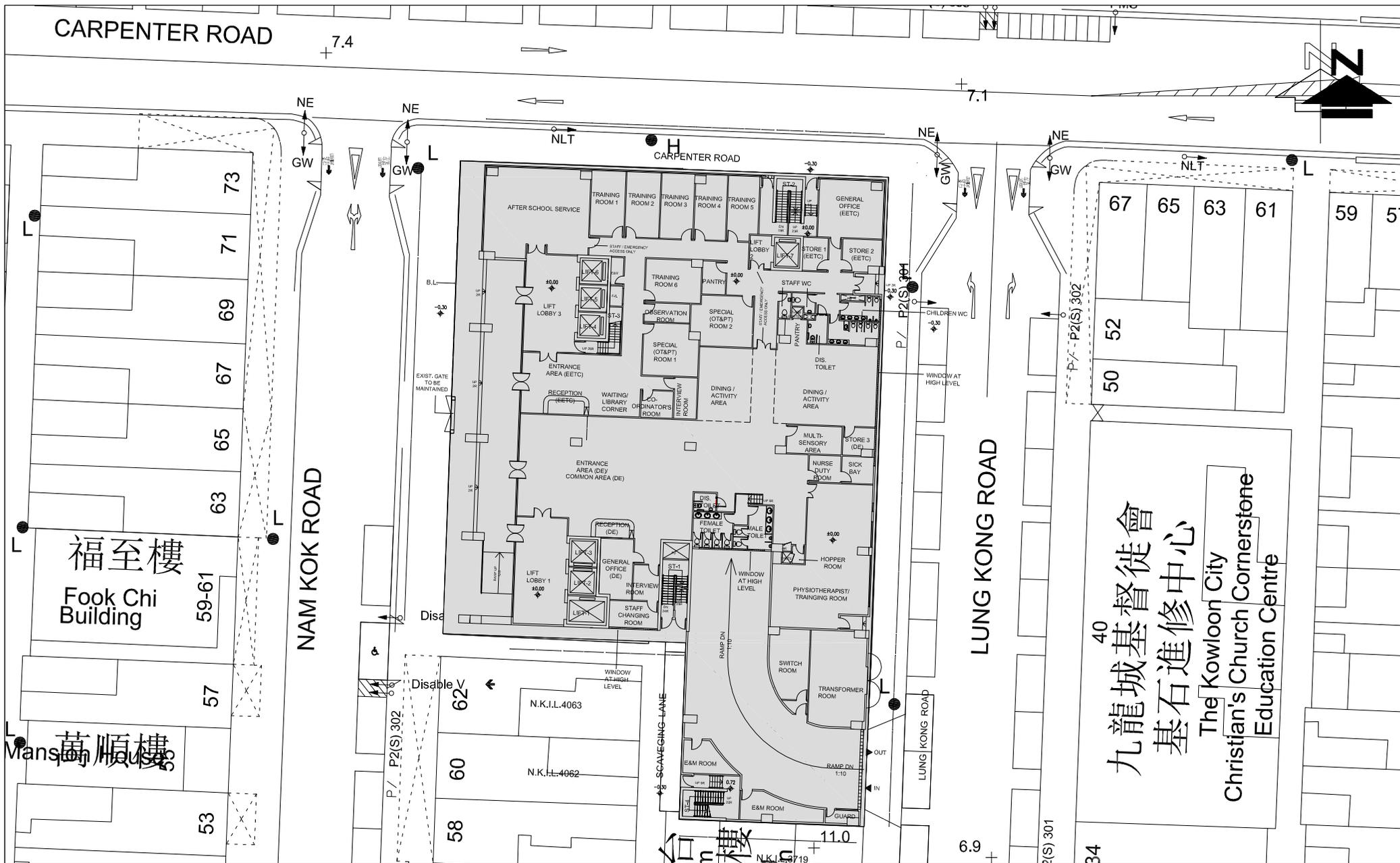
- 6.2.1 In conclusion, this Traffic Impact Assessment (TIA) study demonstrated that the related traffic trips related to the proposed welfare complex can be absorbed by the nearby road network and no significant traffic impact will be induced.
- 6.2.2 Therefore, the proposed redevelopment at Nos. 61 & 63 Lung Kong Road is reckoned feasible from traffic engineering point of view.



LEGEND :
 THE SUBJECT SITE

| | | | |
|--------------------------|-------------|--|--|
| FIGURE NO.: | | PROJECT TITLE: | |
| 1.1 | | Lok Sin Tong Redevelopment Project at Lung Kong Road | |
| PROJECT NO.: | | DRAWING TITLE: | |
| 17063HK | | SITE LOCATION PLAN | |
| SCALE: | DATE: | | |
| 1 : 3000 (IN A4 SIZE) | 22 NOV 2017 | | |

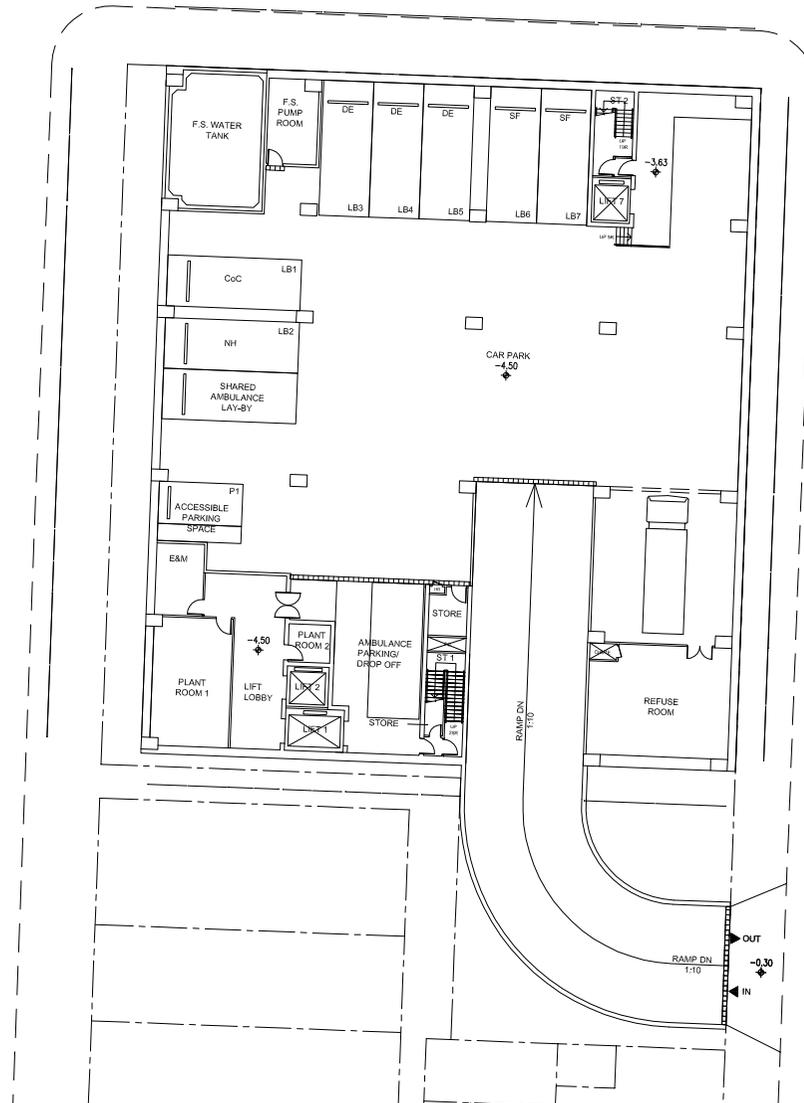
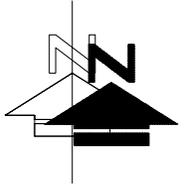




| | | | |
|--------------|-------------|--|--|
| FIGURE NO.: | | 2.1 | |
| PROJECT NO.: | | 17063HK | |
| SCALE: | DATE: | PROJECT TITLE: | |
| 1 : 450 @ A4 | 18 DEC 2017 | Lok Sin Tong Redevelopment Project at Lung Kong Road | |
| | | DRAWING TITLE: | |
| | | LAYOUT OF GROUND FLOOR | |



CTA Consultants Limited
志達顧問有限公司



| | | | |
|---------------------------|----------------------|--|---|
| FIGURE NO.: 2.2 | | PROJECT TITLE: Lok Sin Tong Redevelopment Project at Lung Kong Road |  CTA Consultants Limited 志達顧問有限公司 |
| PROJECT NO.: 17063HK | | DRAWING TITLE: LAYOUT OF CAR PARK - B/F | |
| SCALE: 1 : 450 @ A4 | DATE: 18 DEC 2017 | | |

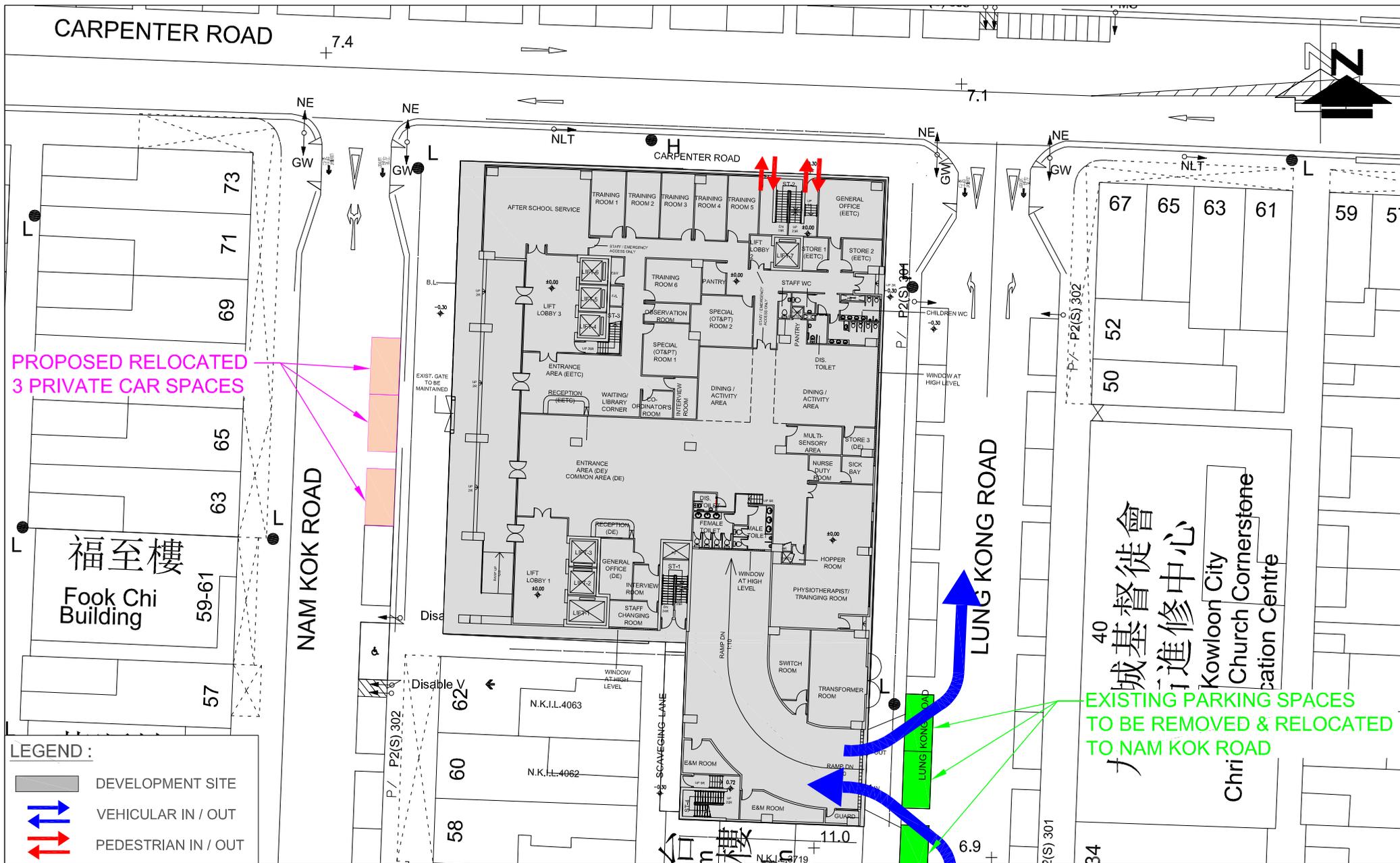


FIGURE NO.: **2.3**

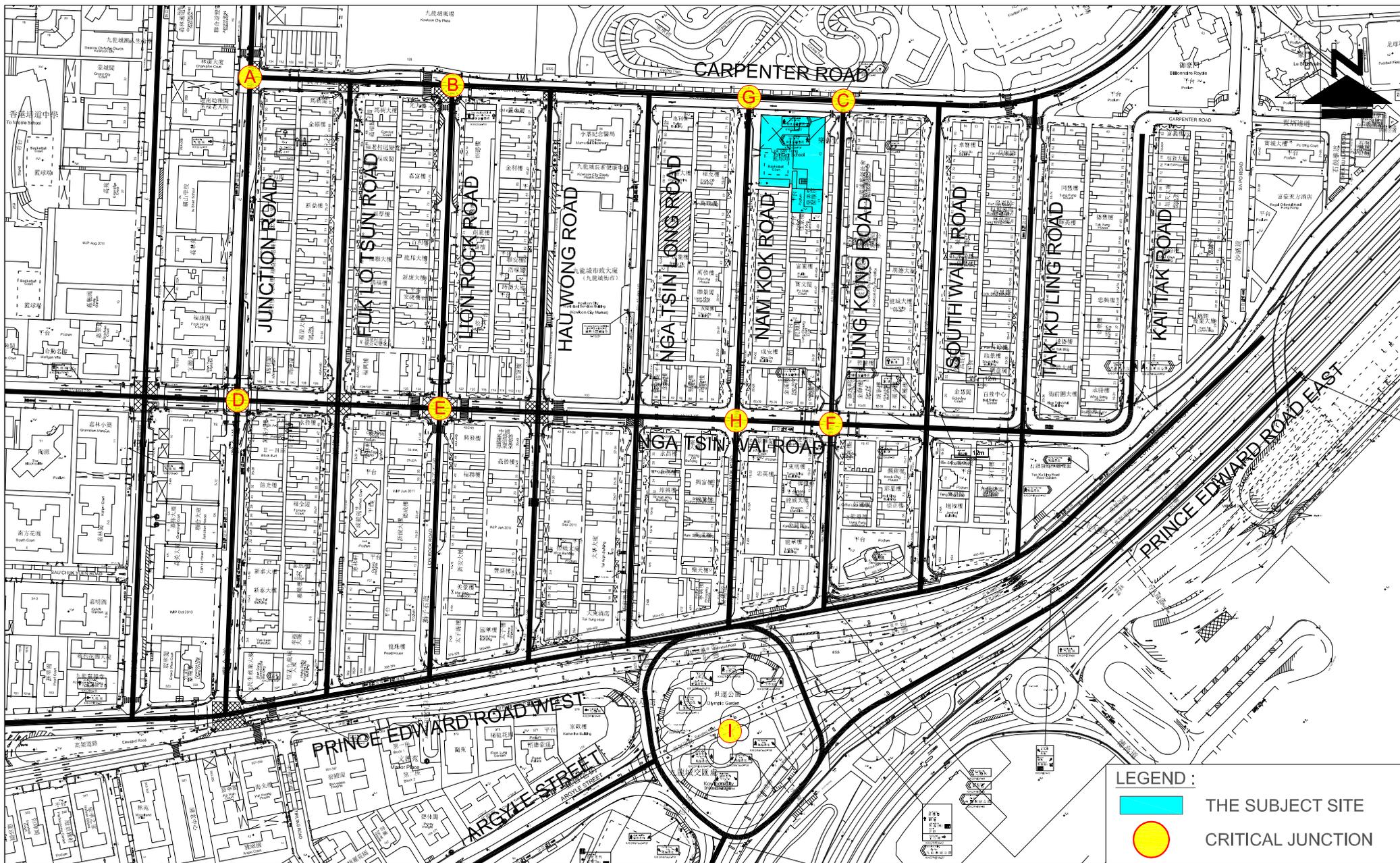
PROJECT TITLE: Lok Sin Tong Redevelopment Project at Lung Kong Road

PROJECT NO.: 17063HK

DRAWING TITLE: PROPOSED ACCESS ARRANGEMENT

SCALE: 1 : 450 @ A4
DATE: 18 DEC 2017





LEGEND :

- THE SUBJECT SITE
- CRITICAL JUNCTION

| | | |
|------------------------------------|----------------------|--|
| FIGURE NO.: | 3.1 | PROJECT TITLE: Lok Sin Tong Redevelopment Project at Lung Kong Road |
| PROJECT NO.: | 17063HK | DRAWING TITLE: KEY JUNCTION & EXISTING ROAD NETWORK |
| SCALE: 1 : 3000 (IN A4 SIZE) | DATE: 22 NOV 2017 | |



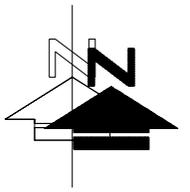
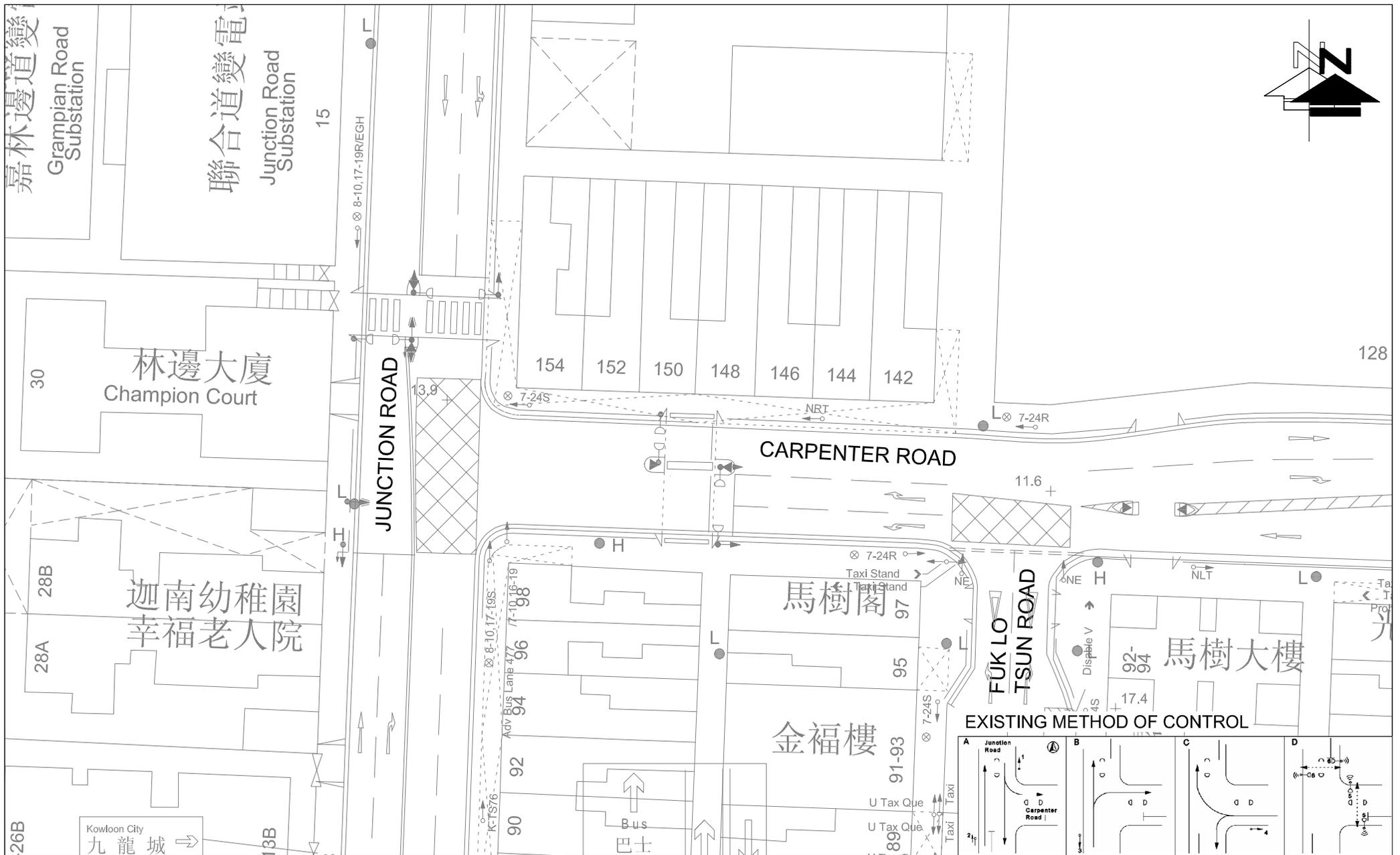


FIGURE NO.:
3.2

PROJECT TITLE:
Lok Sin Tong Redevelopment Project at Lung Kong Road

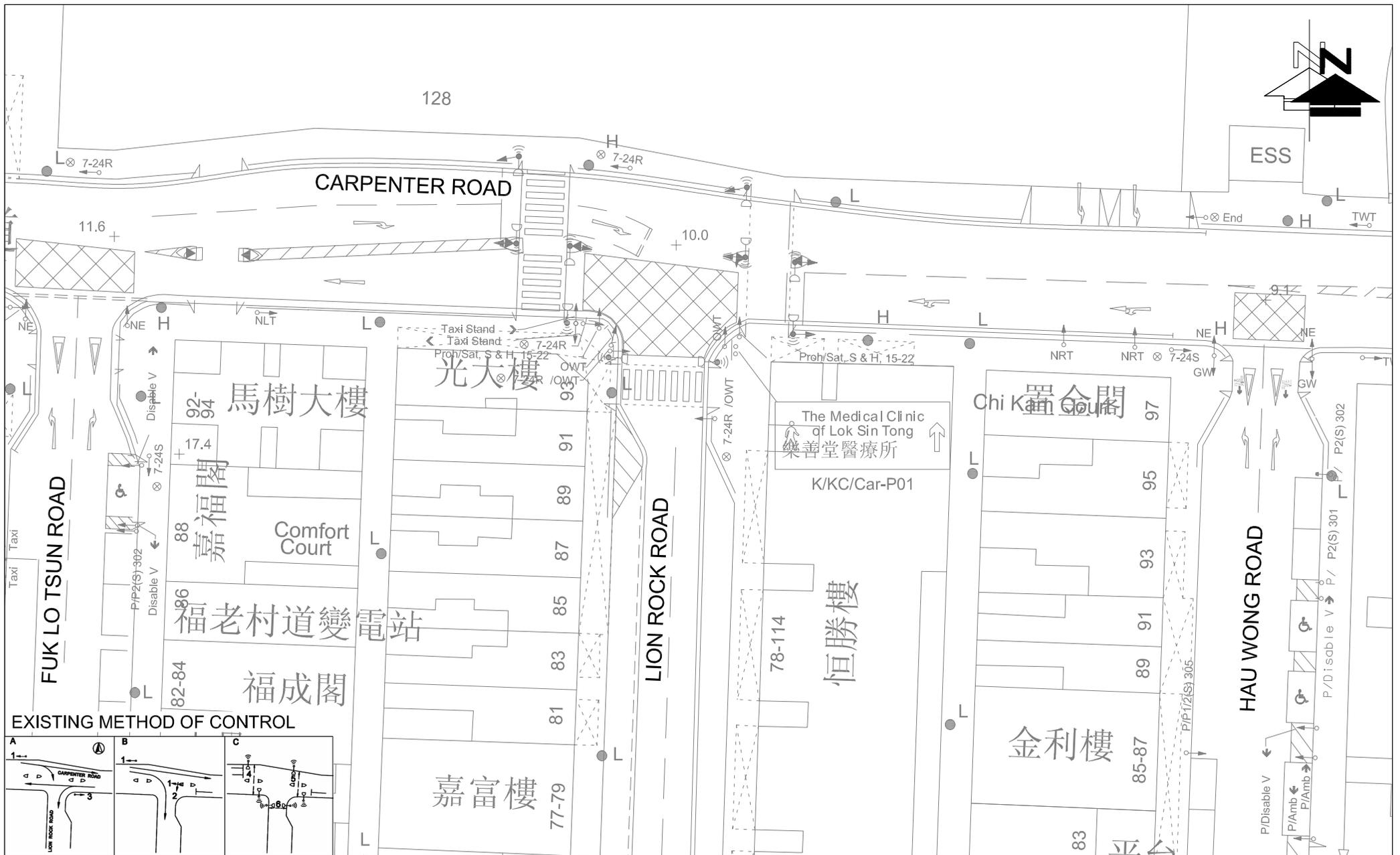
PROJECT NO.:
17063HK

DRAWING TITLE:
EXISTING JUNCTION LAYOUT OF CARPENTER ROAD / JUNCTION ROAD (A)

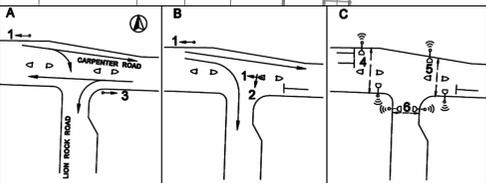
SCALE:
1 : 500
(IN A4 SIZE)

DATE:
7 AUG 2017

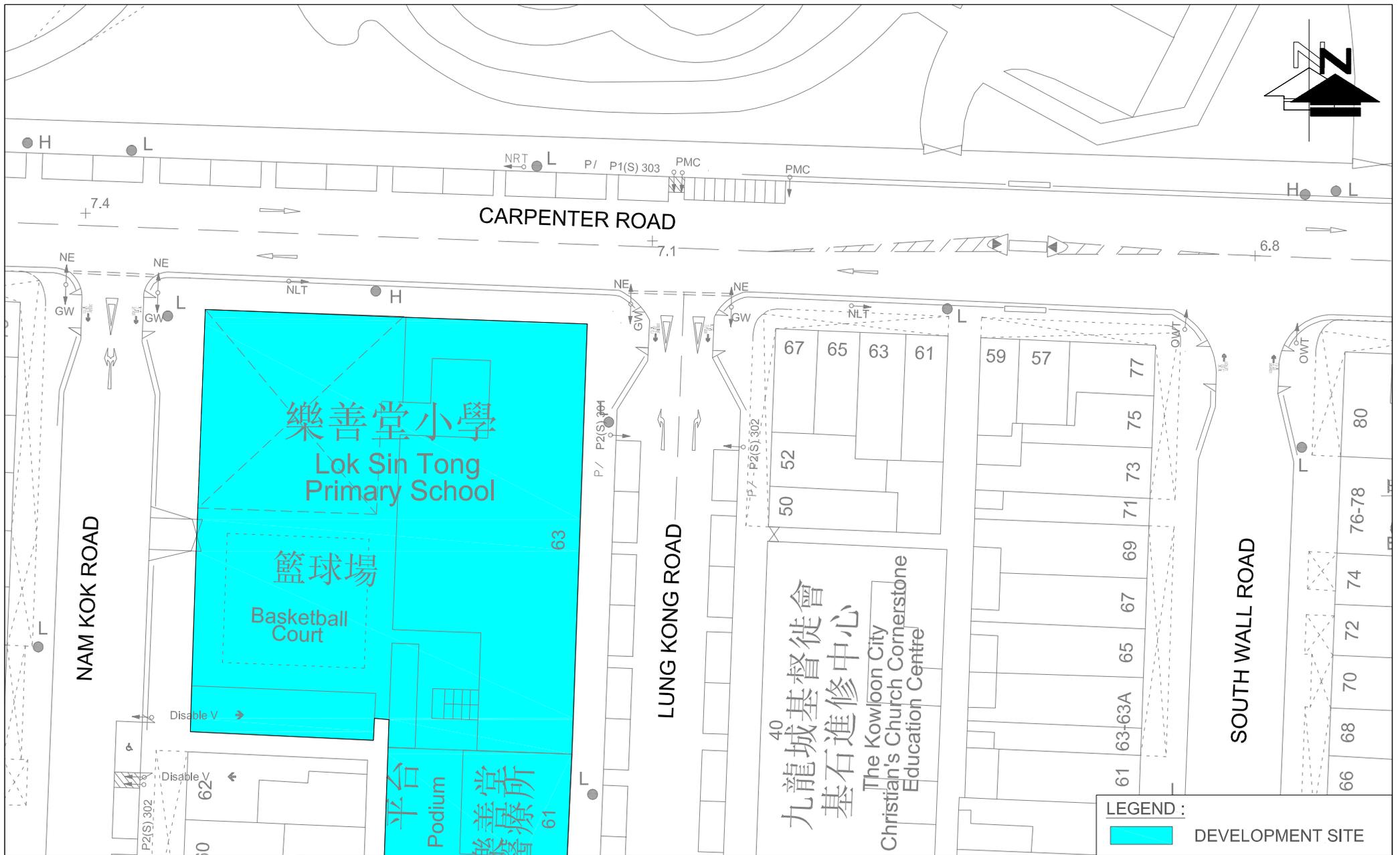




EXISTING METHOD OF CONTROL



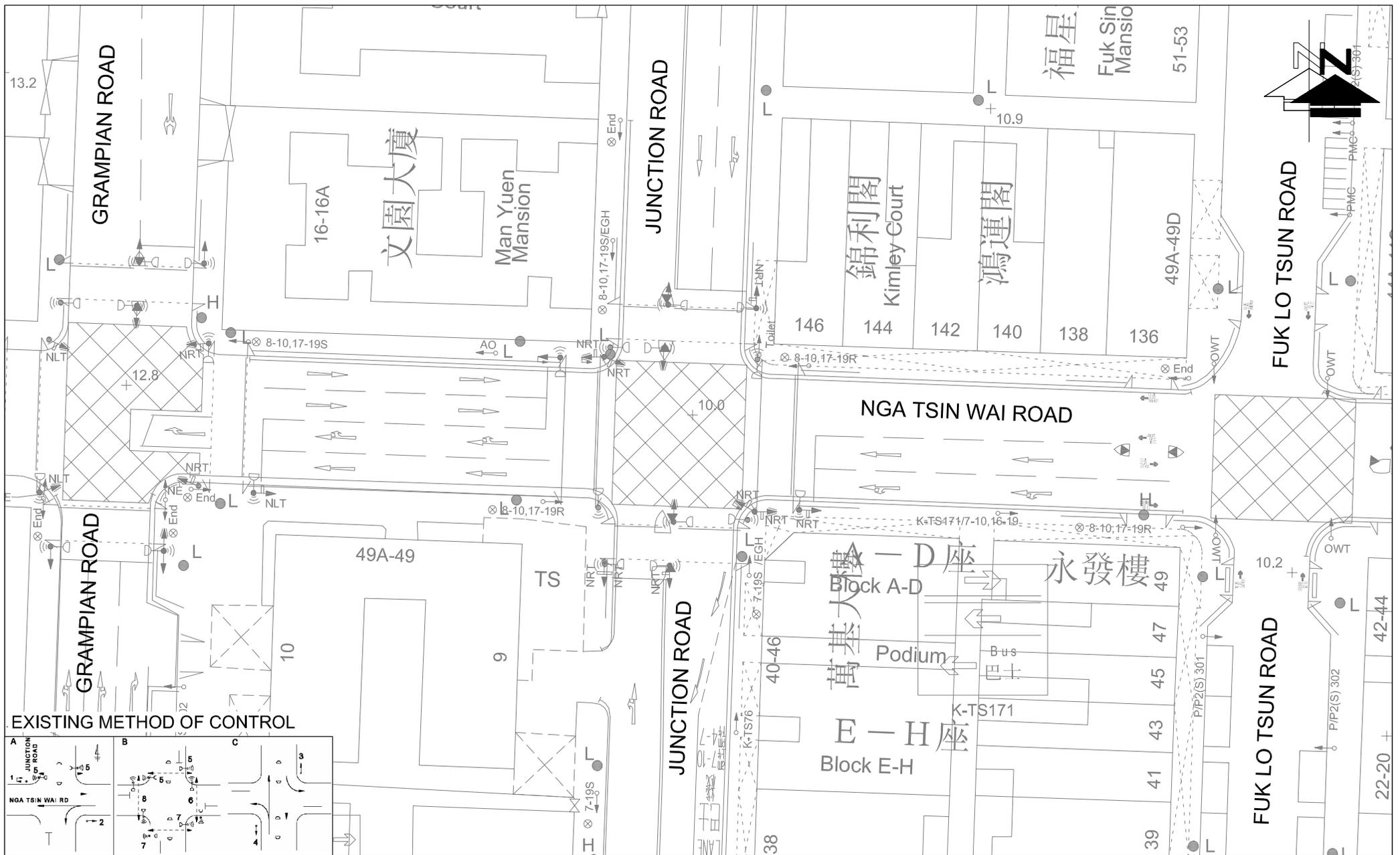
| | | | |
|-----------------------------------|---------------------|---|---|
| FIGURE NO.: 3.3 | | PROJECT TITLE: Lok Sin Tong Redevelopment Project at Lung Kong Road |  CTA Consultants Limited 志達顧問有限公司 |
| PROJECT NO.: 17063HK | | DRAWING TITLE: EXISTING JUNCTION LAYOUT OF CARPENTER ROAD / LION ROCK ROAD (B) | |
| SCALE: 1 : 500 (IN A4 SIZE) | DATE: 7 AUG 2017 | | |



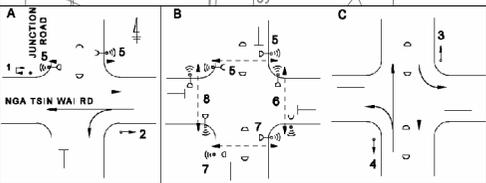
| | | |
|-----------------------------------|---------------------|--|
| FIGURE NO.: 3.4 | | PROJECT TITLE: Lok Sin Tong Redevelopment Project at Lung Kong Road |
| PROJECT NO.: 17063HK | | DRAWING TITLE: EXISTING JUNCTION LAYOUT OF CARPENTER ROAD / LUNG KONG ROAD (C) |
| SCALE: 1 : 500 (IN A4 SIZE) | DATE: 1 AUG 2017 | |

LEGEND :
 DEVELOPMENT SITE

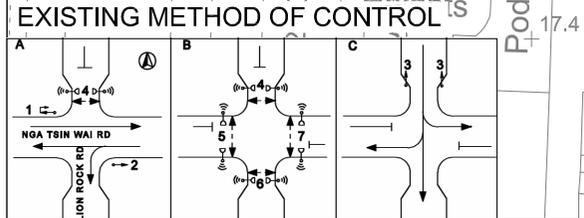




EXISTING METHOD OF CONTROL



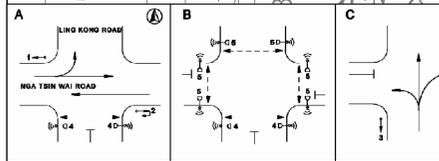
| | | | |
|-----------------------------------|---------------------|---|---|
| FIGURE NO.: 3.5 | | PROJECT TITLE: Lok Sin Tong Redevelopment Project at Lung Kong Road |  CTA Consultants Limited 志達顧問有限公司 |
| PROJECT NO.: 17063HK | | DRAWING TITLE: EXISTING JUNCTION LAYOUT OF NGA TSIN WAI ROAD / JUNCTION ROAD (D) | |
| SCALE: 1 : 500 (IN A4 SIZE) | DATE: 7 AUG 2017 | | |



| | | | |
|-----------------------------------|---------------------|---|--|
| FIGURE NO.: | 3.6 | PROJECT TITLE: | Lok Sin Tong Redevelopment Project at Lung Kong Road |
| PROJECT NO.: | 17063HK | DRAWING TITLE: | EXISTING JUNCTION LAYOUT OF NGA TSIN WAI ROAD / LION ROCK ROAD (E) |
| SCALE: 1 : 500 (IN A4 SIZE) | DATE: 7 AUG 2017 |  CTA Consultants Limited 志達顧問有限公司 | |

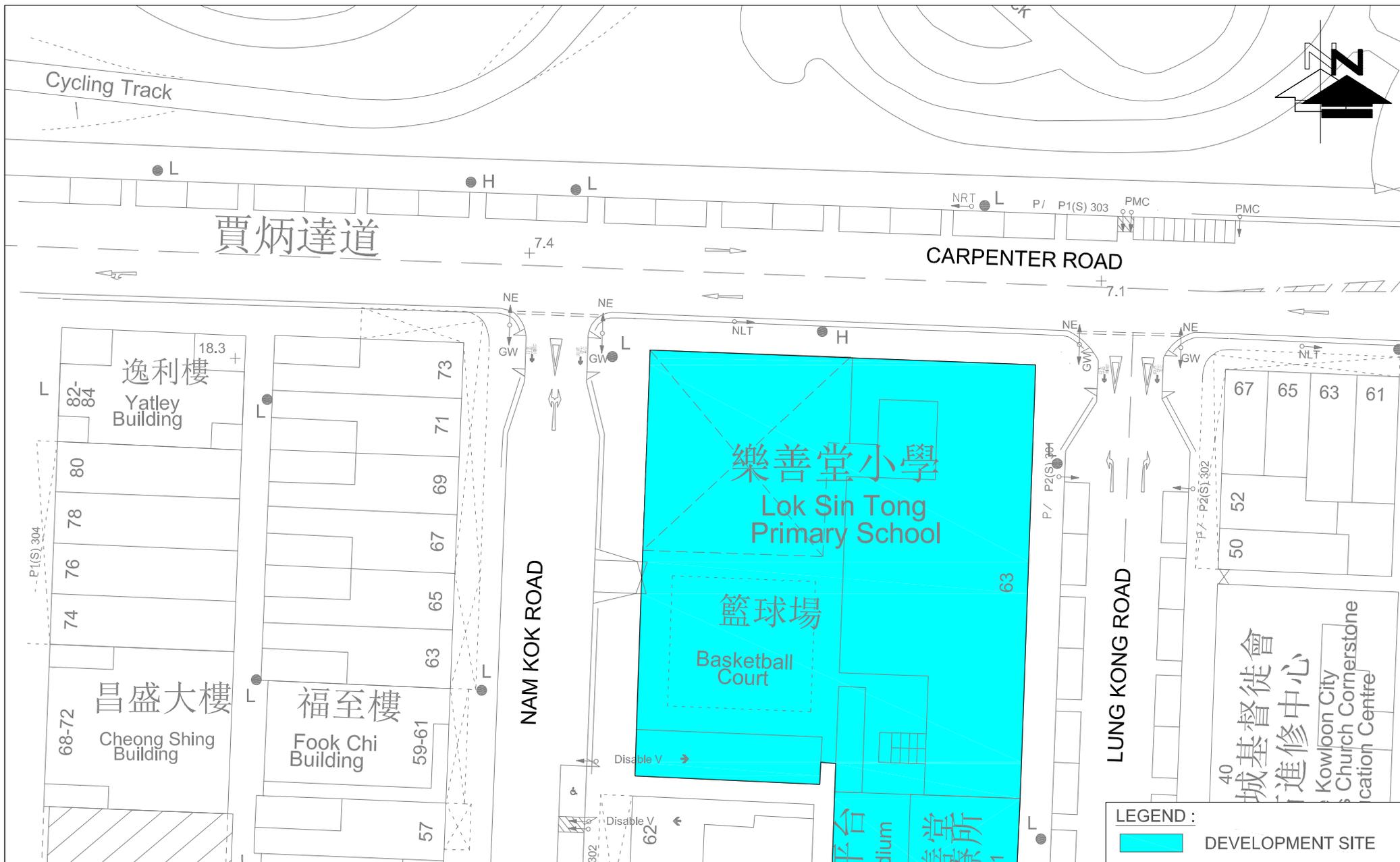


EXISTING METHOD OF CONTROL



| | | | | | | | |
|-------------------------|------------|---------|--|----------------|--|--|--|
| FIGURE NO.: | | 3.7 | | PROJECT TITLE: | | Lok Sin Tong Redevelopment Project at Lung Kong Road | |
| PROJECT NO.: | | 17063HK | | DRAWING TITLE: | | EXISTING JUNCTION LAYOUT OF NGA TSIN WAI ROAD / LUNG KONG ROAD (F) | |
| SCALE: | DATE: | | | | | | |
| 1 : 500 (IN A4 SIZE) | 7 AUG 2017 | | | | | | |



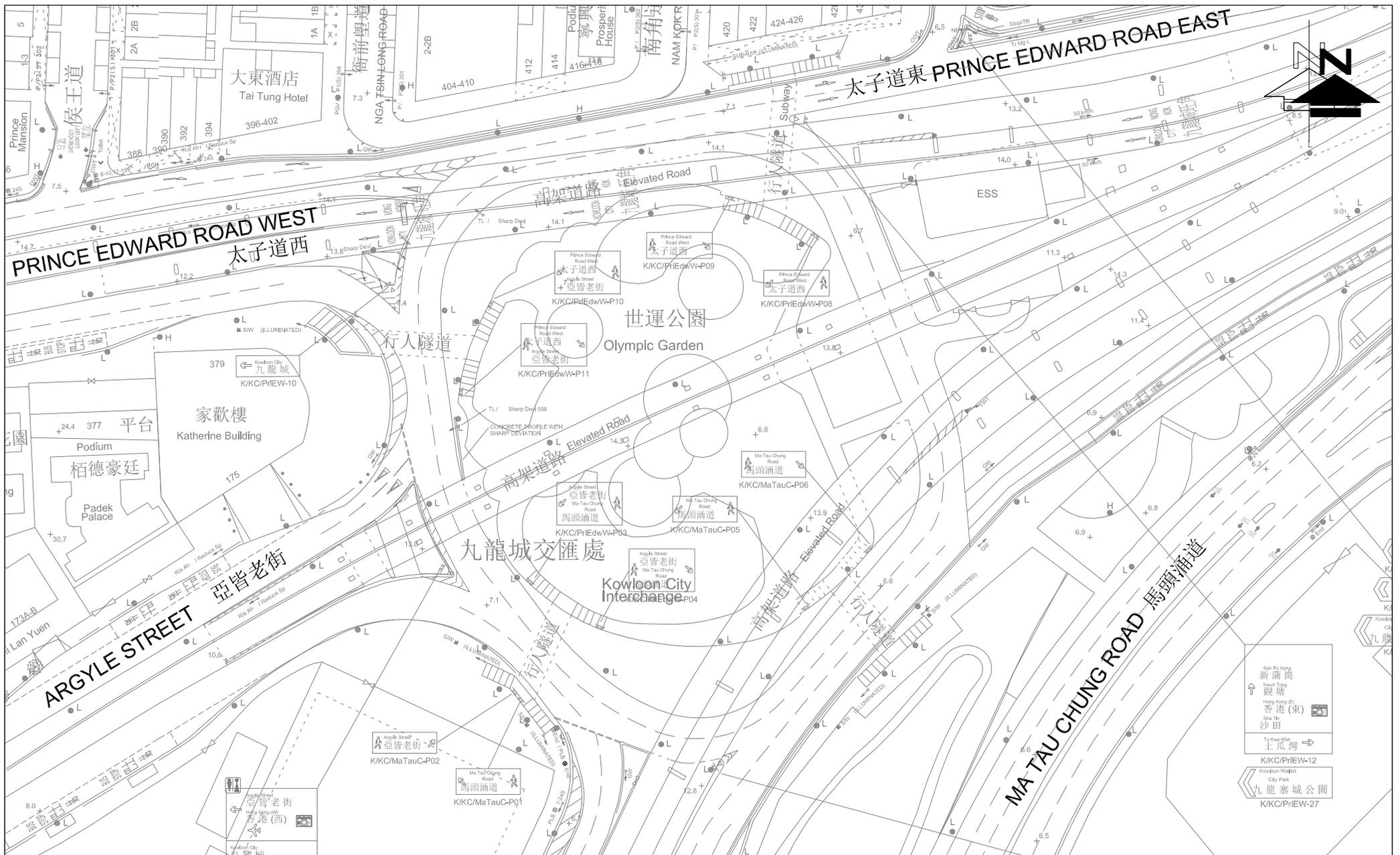


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| FIGURE NO.: | 3.8 | PROJECT TITLE: | Lok Sin Tong Redevelopment Project at Lung Kong Road |
| PROJECT NO.: | 17063HK | DRAWING TITLE: | EXISTING JUNCTION LAYOUT OF CARPENTER ROAD / NAM KOK ROAD (G) |
| SCALE: 1 : 500 (IN A4 SIZE) | DATE: 22 NOV 2017 | | |

LEGEND :
 DEVELOPMENT SITE

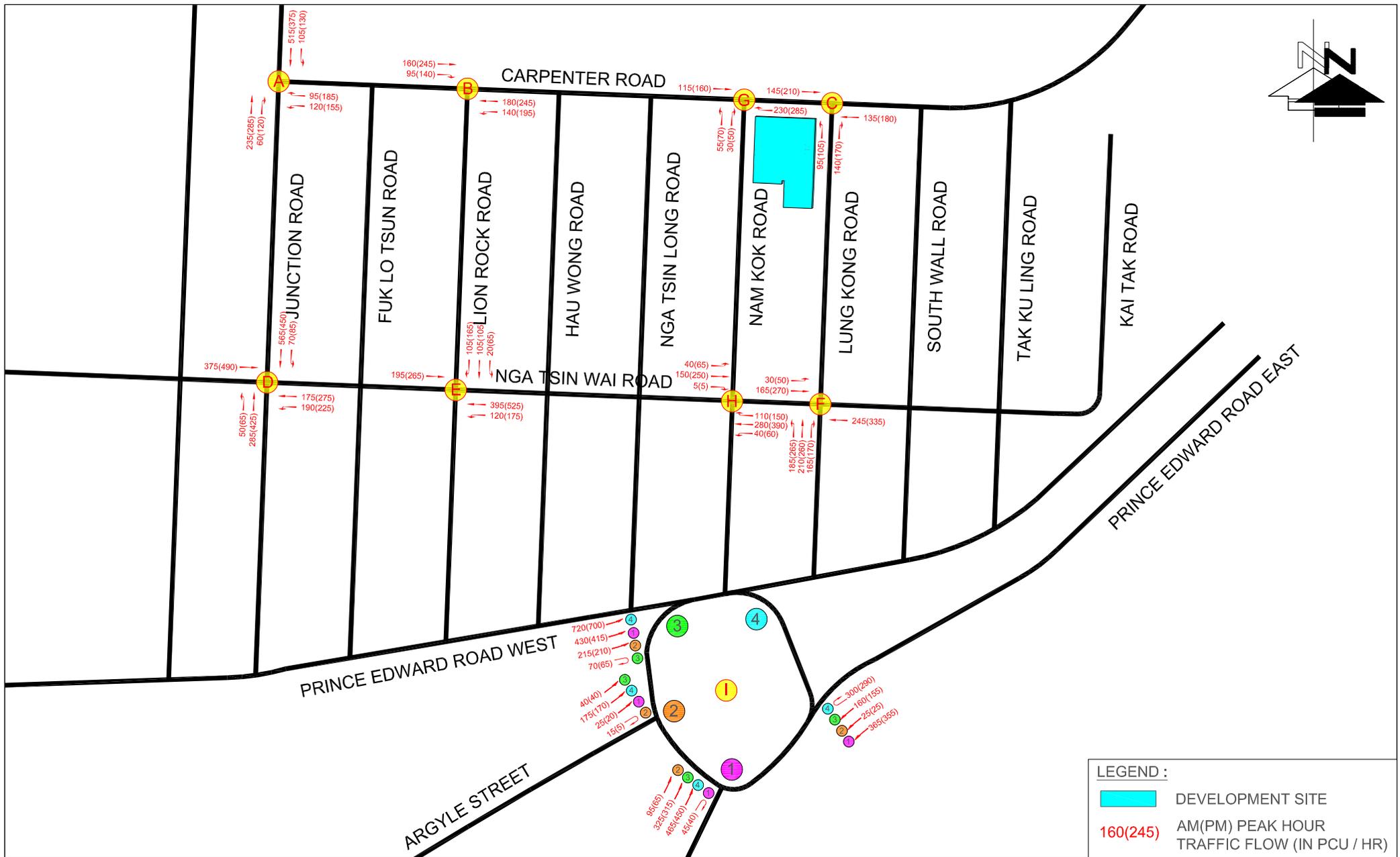
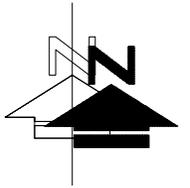


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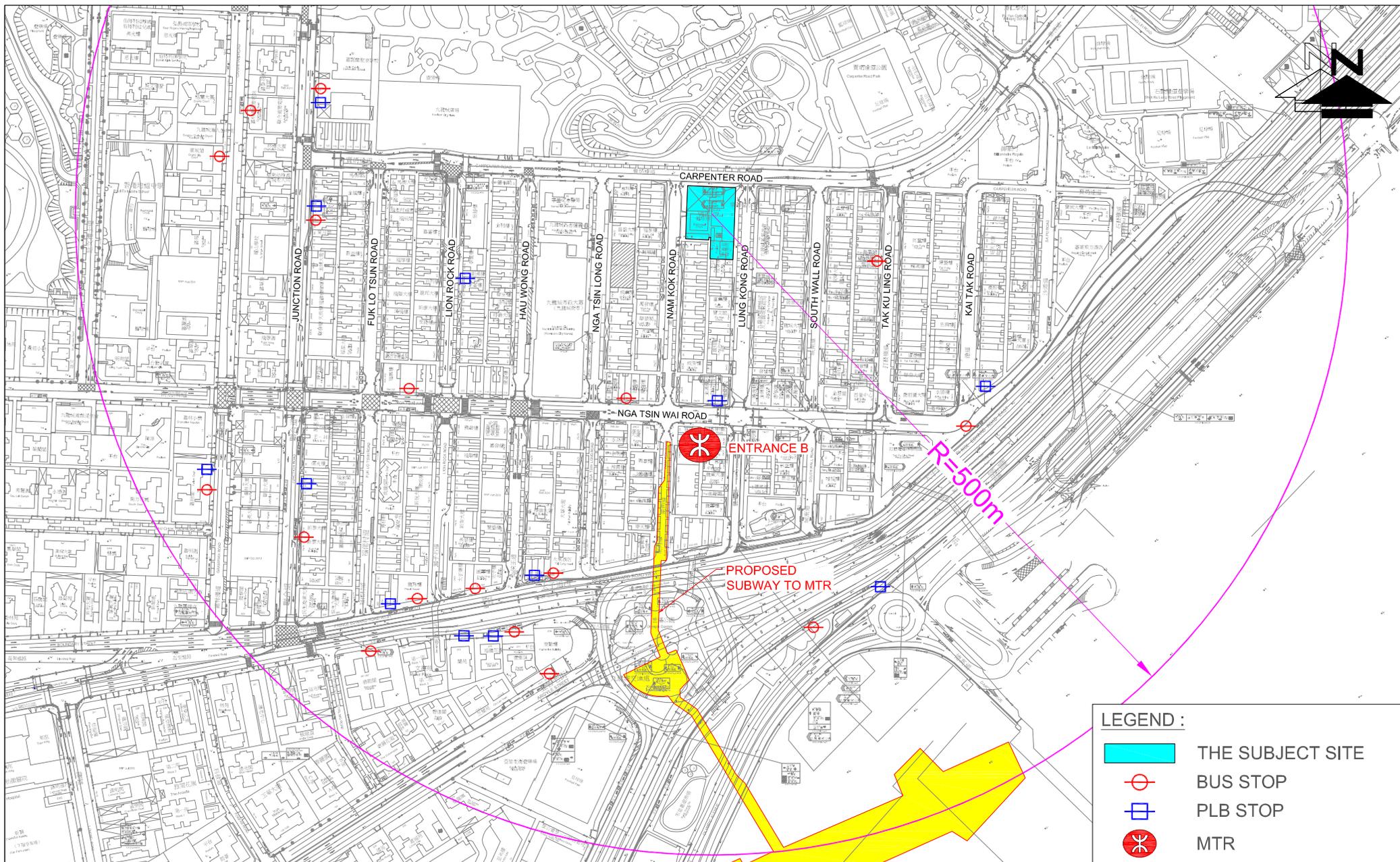
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| FIGURE NO.: | 3.10 | PROJECT TITLE: | Lok Sin Tong Redevelopment Project at Lung Kong Road |
| PROJECT NO.: | 17063HK | DRAWING TITLE: | EXISTING JUNCTION LAYOUT OF PRINCE EDWARD ROAD EAST / PRINCE EDWARD ROAD WEST / ARGYLE STREET / MA TAU CHUNG ROAD (I) |
| SCALE: 1 : 1000 (IN A4 SIZE) | DATE: 22 NOV 2017 | | |

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| | | | |
|------------------------------------|----------------------|----------------|--|
| FIGURE NO.: | 3.11 | PROJECT TITLE: | Lok Sin Tong Redevelopment Project at Lung Kong Road |
| PROJECT NO.: | 17063HK | DRAWING TITLE: | 2017 OBSERVED TRAFFIC FLOW |
| SCALE: 1 : 3200 (IN A4 SIZE) | DATE: 27 NOV 2017 | | |

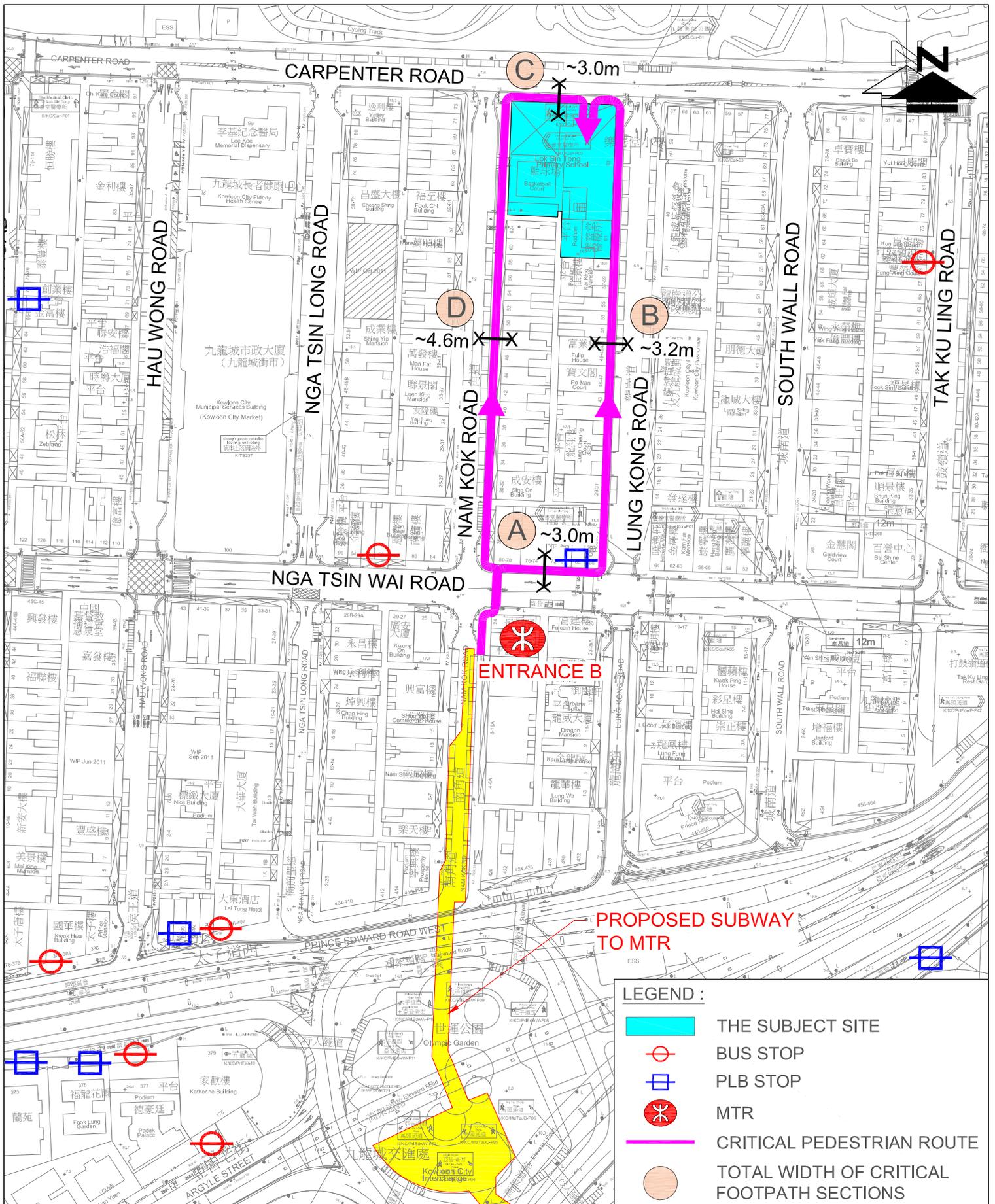
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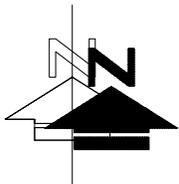
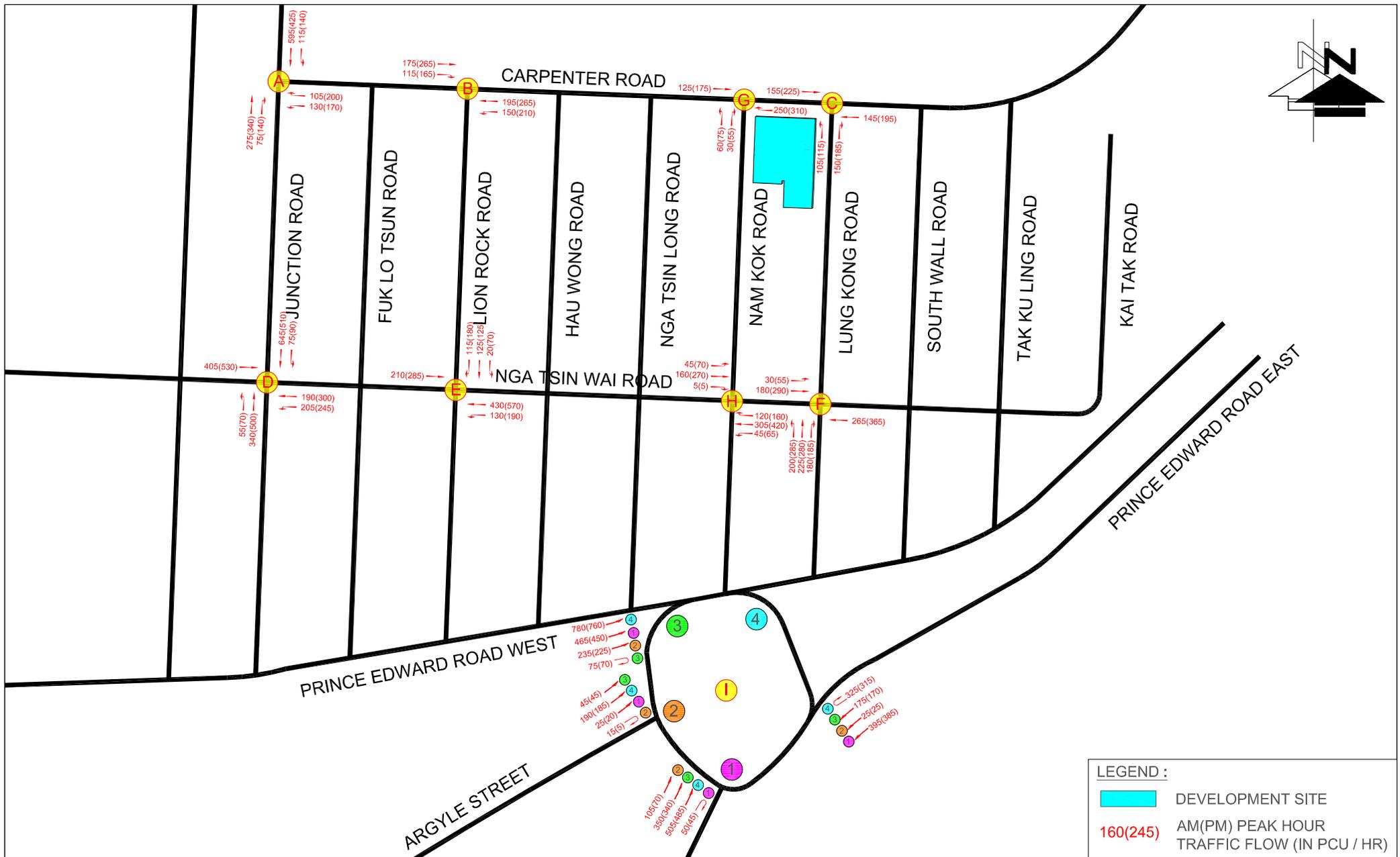
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| FIGURE NO.: | | PROJECT TITLE: | |
| 3.12 | | Lok Sin Tong Redevelopment Project at Lung Kong Road | |
| PROJECT NO.: | | DRAWING TITLE: | |
| 17063HK | | PUBLIC TRANSPORT SERVICES IN THE VICINITY | |
| SCALE: | DATE: | | |
| 1 : 4000 (IN A4 SIZE) | 27 NOV 2017 | | |

LEGEND :

- THE SUBJECT SITE
- ⊕ BUS STOP
- ⊞ PLB STOP
- ✳ MTR



| | | |
|------------------------------------|----------------------|---|
| FIGURE NO.: 3.13 | | PROJECT TITLE: Lok Sin Tong Redevelopment Project at Lung Kong Road |
| PROJECT NO.: 17063HK | | DRAWING TITLE: INDEX PLAN FOR CRITICAL FOOTPATH SECTIONS |
| SCALE: 1 : 1800 (IN A4 SIZE) | DATE: 27 NOV 2017 |  CTA Consultants Limited 志達顧問有限公司 |



| LEGEND : | |
|---|---|
|  | DEVELOPMENT SITE |
| 160(245) | AM(PM) PEAK HOUR TRAFFIC FLOW (IN PCU / HR) |

| | | | |
|------------------------------------|----------------------|----------------|--|
| FIGURE NO.: | 4.1 | PROJECT TITLE: | Lok Sin Tong Redevelopment Project at Lung Kong Road |
| PROJECT NO.: | 17063HK | DRAWING TITLE: | 2025 REFERENCE TRAFFIC FLOW |
| SCALE: 1 : 3200 (IN A4 SIZE) | DATE: 27 NOV 2017 | | |



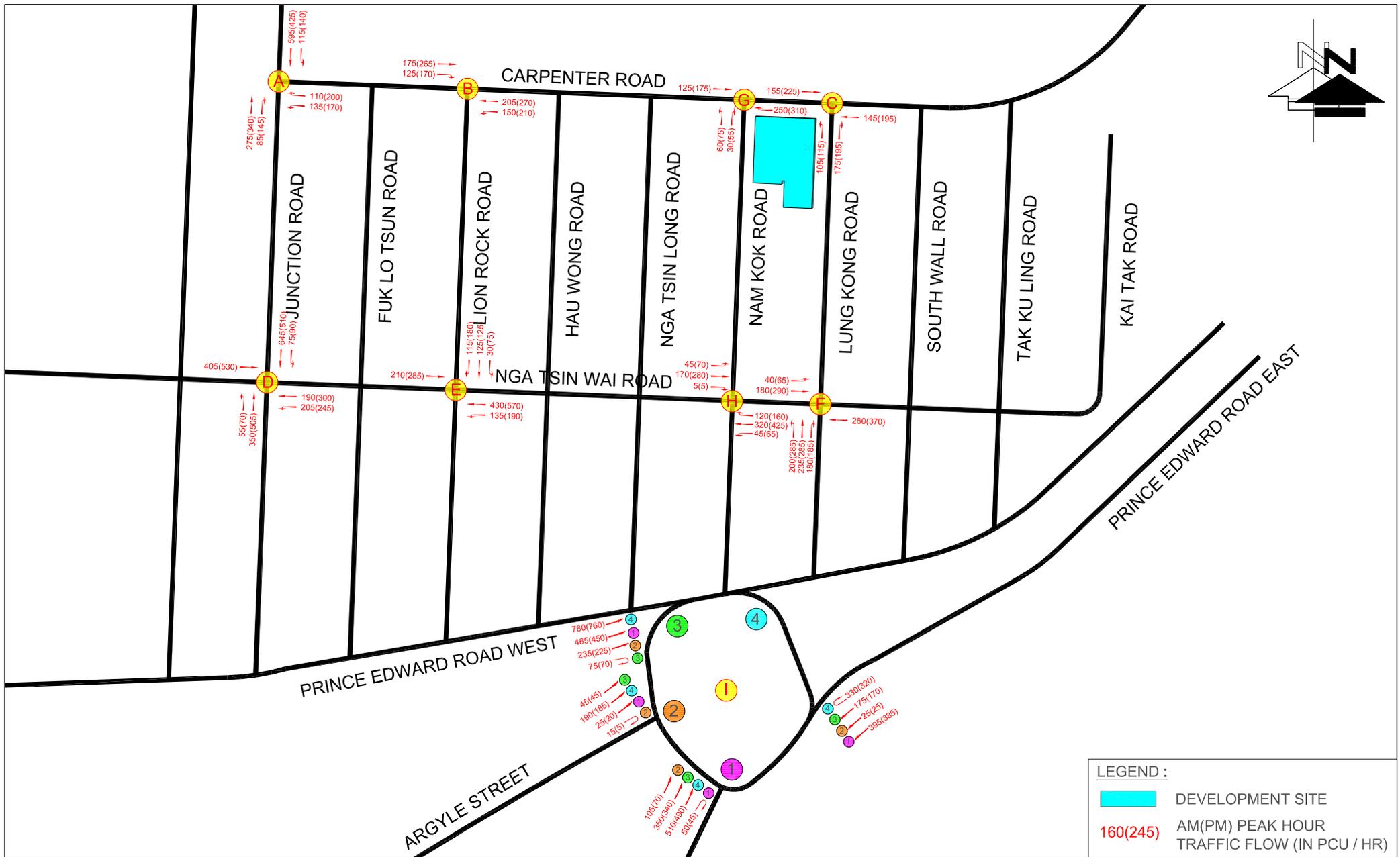
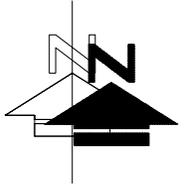


FIGURE NO.: **4.2** PROJECT TITLE: Lok Sin Tong Redevelopment Project at Lung Kong Road

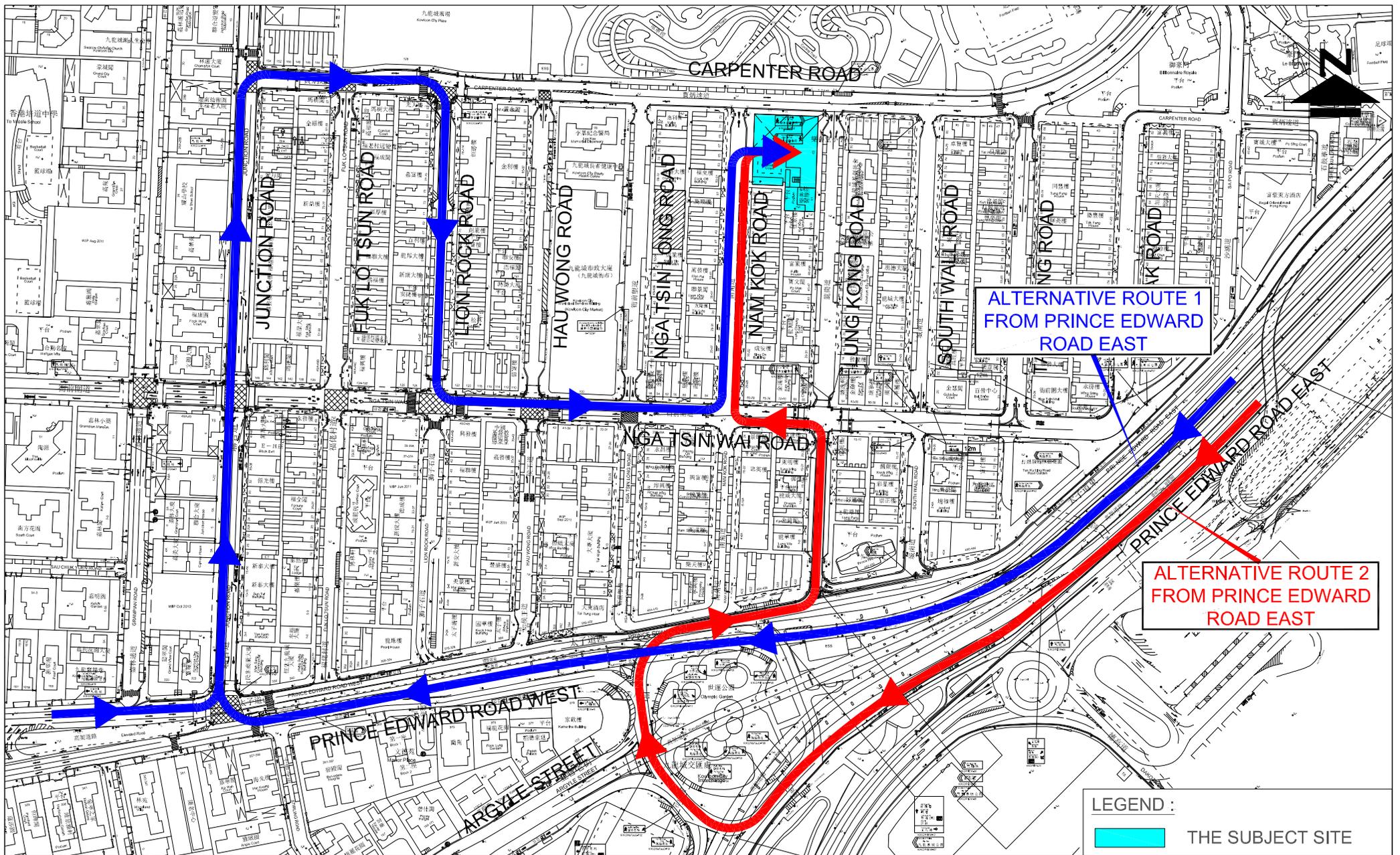
PROJECT NO.: 17063HK DRAWING TITLE: 2025 DESIGN TRAFFIC FLOW

SCALE: 1 : 3200 (IN A4 SIZE)

DATE: 27 NOV 2017

LEGEND :
 DEVELOPMENT SITE
→ 160(245) AM(PM) PEAK HOUR TRAFFIC FLOW (IN PCU / HR)





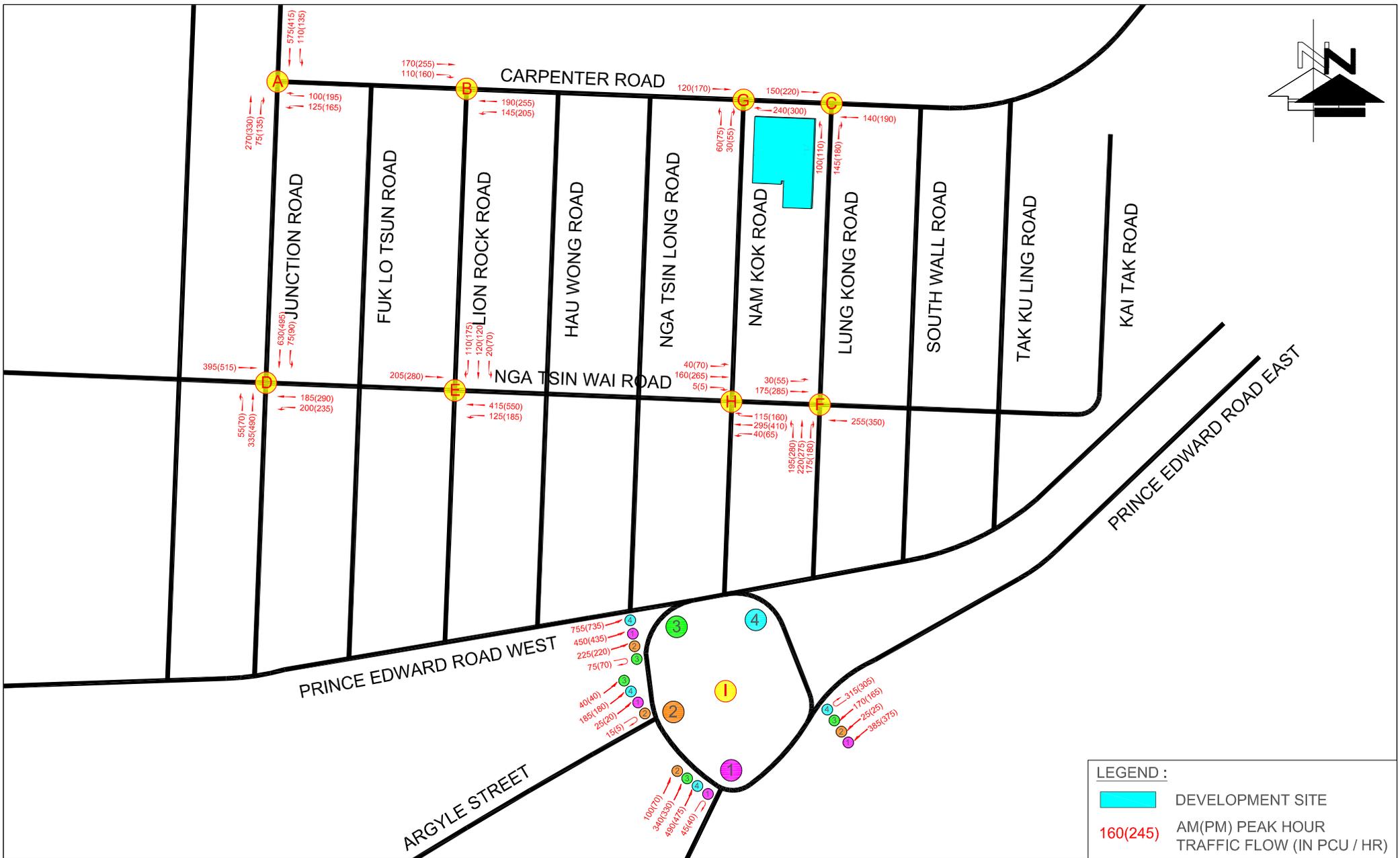
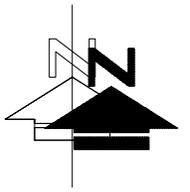
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| FIGURE NO.: 5.1 | | PROJECT TITLE: Lok Sin Tong Redevelopment Project at Lung Kong Road |
| PROJECT NO.: 17063HK | | DRAWING TITLE: ROUTING OF CONSTRUCTION VEHICLES |
| SCALE: 1 : 3000 (IN A4 SIZE) | DATE: 24 NOV 2017 | |

LEGEND :

THE SUBJECT SITE



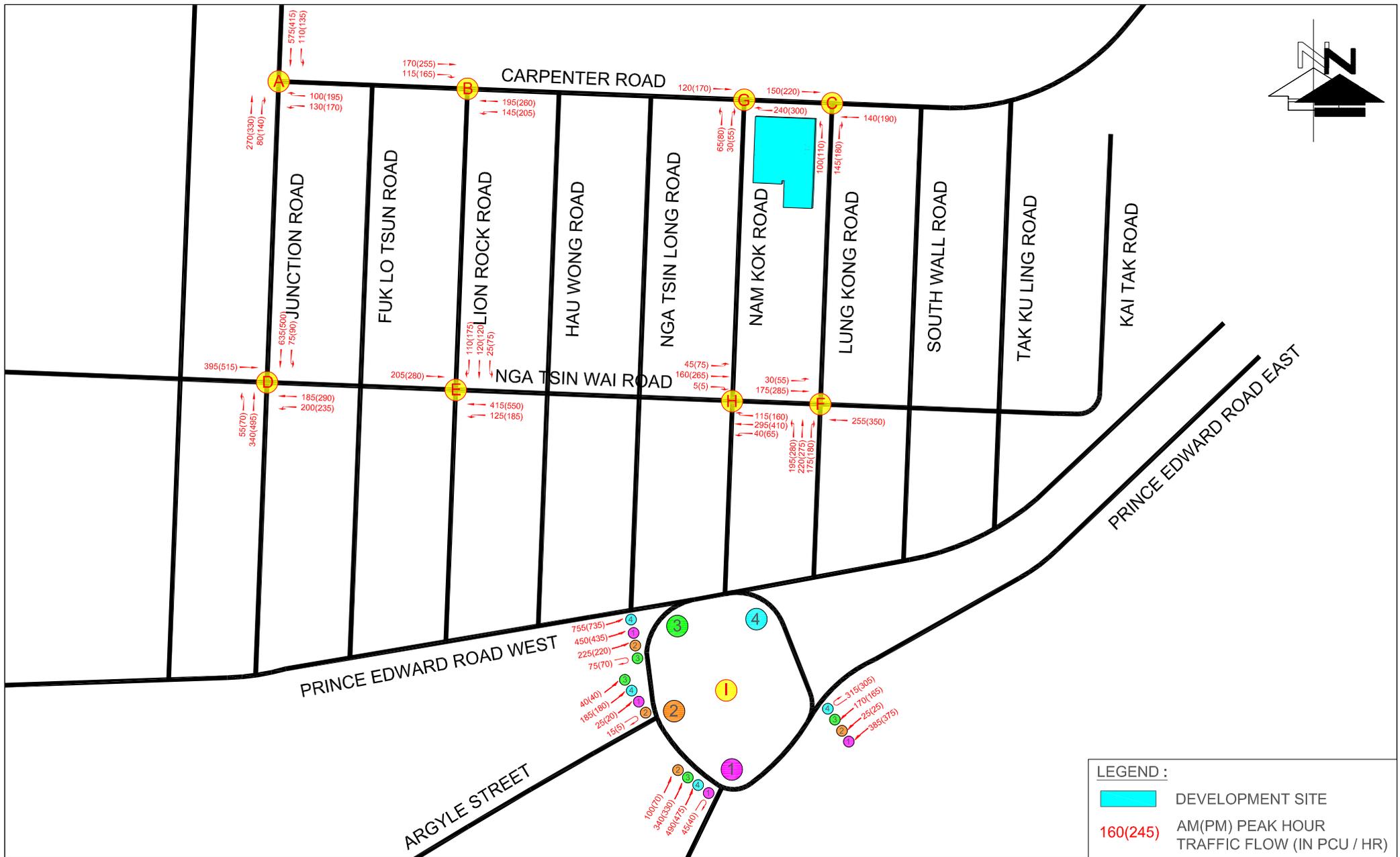
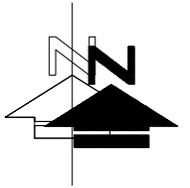
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| LEGEND : | |
|---|---|
|  | DEVELOPMENT SITE |
| 160(245) | AM(PM) PEAK HOUR TRAFFIC FLOW (IN PCU / HR) |

| | | | |
|--------------|--------------------------|----------------|--|
| FIGURE NO.: | 5.2 | PROJECT TITLE: | Lok Sin Tong Redevelopment Project at Lung Kong Road |
| PROJECT NO.: | 17063HK | DRAWING TITLE: | 2022 REFERENCE TRAFFIC FLOW - FOR CONSTRUCTION TRAFFIC IMPACT ASSESSMENT |
| SCALE: | 1 : 3200 (IN A4 SIZE) | DATE: | 27 NOV 2017 |





LEGEND :

- DEVELOPMENT SITE
- 160(245) AM(PM) PEAK HOUR TRAFFIC FLOW (IN PCU / HR)

| | | | |
|------------------------------------|----------------------|----------------|--|
| FIGURE NO.: | 5.3 | PROJECT TITLE: | Lok Sin Tong Redevelopment Project at Lung Kong Road |
| PROJECT NO.: | 17063HK | DRAWING TITLE: | 2022 DESIGN TRAFFIC FLOW - FOR CONSTRUCTION TRAFFIC IMPACT ASSESSMENT |
| SCALE: 1 : 3200 (IN A4 SIZE) | DATE: 27 NOV 2017 | | |





Appendix 1

Response-to-Comments

with

Email Reply from SWD



| TD's comments (Fax reply from TD dated 2017-11-09 - Ref: (K66AT) in TD KR146/193/L- 35) | Responses |
|---|--|
| 1. The area of inference in the assessment should be agreed by this office. It should include all road and junctions that would affect the proposed development. In addition, it should also include the interchanges with truck roads to or from which the traffic generated by the development will be directly discharged. | Having further review the local traffic network, the area of influence in the assessment has been further revised to include the Kowloon City Interchange for your further assessment. |
| 2. The propose modification to road layout and junction design should comply with the requirements of Transport Planning and Design Manual (TPDM) | Noted. |
| 3. Please provide the traffic impact assessment for construction stage as well. Please show clearly on a plan that the all routes of all construction traffic generated/ attracted by various construction works and carry our assessments on the critical junction along the routes. | Noted. The construction traffic impact assessment has been conducted and presented in Chapter 5 of the revised report. |
| 4. Please add an additional paragraph describing the access arrangement for vehicles and pedestrian to and from the development. | Noted. The access arrangement for vehicles and pedestrian to/from the development has been elaborated in Chapter 2.4 . |
| 5. Please include the planned major transport infrastructure, the planning and committed development in you assessment. | Noted. Traffic trips due to major developments in the vicinity have been presented and included for traffic impact assessment in Chapter 4.3 . |
| 6. Please provide assessment on the footpath in form of level of service (LOS) | Noted. Relevant assessment is given in Chapter 3.4 for existing scenario and Chapter 4.7 for both reference and design scenarios. |
| 7. Swept path analysis should be conducted at difficult and abrupt alignments and location of turnings. | Swept path analysis has been conducted accordingly and given in Appendix 2 – Swept Path Analysis . |
| 8. Adequate sightlines should be provided at carriageway and pedestrian crossing. | Noted. However, no modification of existing carriageway and pedestrian crossing is required. |



| | |
|--|---|
| 9. Kowloon City District Council should be consulted. | Noted. The consultation has been arranged by Planning Department and client. |
| 10. The location of the proposed vehicular access should comply with the lease condition. | As advised by AP (Spence Robinson Limited), the scheme layout has been circulated to Lands Department and no adverse comment regarding the proposed run-in/out location. Such provision is expected to be included in the Lease modification. |
| 11. The “Public Transport Services in the Vicinity” in under the subject of proposed redevelopment. Should this paragraph be put under the subject of existing traffic condition if the paragraph is describing the existing public transport service? | Noted. |
| 12. Please elaborate how do the estimated traffic trips of the proposed development in Table 4.5 obtain. | Noted. Tables 4.4 & 4.5 has been revised for better clarification of estimated traffic trips. |
| 13. Please demonstrate on plan that the maneuvering of buses or good vehicles should be within the development. No reversing movement into / from a public road will be permitted. | Noted. Swept path analysis has been conducted accordingly and given in Appendix 2 – Swept Path Analysis . |
| 14. Please provide an estimate on the visitors or residents that would use the footpaths in the vicinity to the development. Please also assess if the existing footpaths capacity or LOS is capable to cater for the additional pedestrian. | Noted. Relevant assessment is given in Chapter 3.4 for existing scenario and Chapter 4.7 for both reference and design scenarios. |
| 15. Please review the pedestrian crossing facilities in the vicinity so as to cater the increasing population of elderly. | Based on on-site observation and review of the nearby uncontrolled cautionary crossings (near Junctions C & G) and signal controlled crossing (near Junction F), the former fulfills the design requirements for the elderly as specified in TPDM Volume 2 Chapter 3.7 Section 3.7.2.2 and the latter fulfills the requirement for the elderly and disable people that “minimum period for the steady green should not be less than 6 seconds” as specified in TPDM Volume 6 Chapter 8.4 Section 8.4.3.4. Therefore, the nearby pedestrian crossings are acceptable to the elderly. |

| | |
|---|--|
| <p>16. Please elaborate the use of each floor of your Welfare Complex.</p> | <p>Specific uses of each floor of the Welfare Complex have been elaborated in Table 2.2 and Section 2.2.3 for your reference.</p> |
| <p>17. The calculation and assessment of the provision of parking spaces and loading/unloading facilities for various types of vehicles should be in accordance with the Hong Kong Planning Standards and Guidelines (HKPSG). Since your Welfare Complex comprised various types of development. Please propose the number of parking spaces for private cars, LGVs, buses, motorcycles, visitors' car park and loading and unloading spaces according to each types of development. In case the type of development is not specified in the HKPSG, please provide few more references on the parking provision of developments with the similar type of developments for our consideration. Please include the assessment in the TIA report.</p> | <p>As parking provision of such welfare development is not specified in HKPSG, several references have been identified and included in Chapter 2.3 of the revised TIA report for further determination of the proposed parking provision. Moreover, comments on the required parking provision of the proposed development were received from Planning Division of Social Welfare Department via its email to the client, which is also attached in Appendix 1 for your reference. From the social welfare facilities operation point of view, 10 spaces for parking of light buses, loading/unloading activities and ambulance use are required. Moreover, 1 accessible parking space would also be provided for disable persons. It is expected that the proposed provision would thoroughly fulfill the future operational need.</p> |
| <p>18. For disabled parking spaces, BD should be consulted.</p> | <p>Noted.</p> |
| <p>19. Please provide sufficient visitor parking spaces according to each type of developments in HKPSG.</p> | <p>According to HKPSG, no requirements of visitor parking spaces for such welfare development is specified.</p> |
| <p>20. There are some existing on-street parking spaces at the proposed vehicular access of the development if cancellation of parking spaces is required. Your development may induce an adverse effect on the number of parking spaces in the District. Although, there are on-street parking spaces along Lung Kong Road, the parking space in this District is still severely insufficient. Please propose a solution.</p> | <p>The 3 street parking spaces which obstruct the proposed vehicular access would be relocated to Nam Kok Road in view of local parking demand as shown in Figure 2.3 and elaborated in Chapters 2.3 & 2.4.</p> |



| | |
|--|---|
| <p>21. Traffic congestion in Kowloon City area caused by loading/unloading activities, boarding/alighting activities and illegal parking is serious, especially at Lung Kong Road. This is foreseeable that your development would attract people in other district to come to visit the elderly. Please propose solution on alleviate the traffic congestion problem.</p> | <p>As tabulated in Table 4.6, the maximum net increase in traffic trips due to the proposed welfare complex is only 26 pcu/hr including 13 light buses and 6 private vehicles (19 veh/hr in total), which is reckoned as insignificant to the existing road network. Therefore, it is envisaged that the proposed welfare complex would not worsen the traffic congestion in Kowloon City.</p> |
| <p>22. To better meet the demand for parking spaces from different districts, it would be more effective to incorporate public car parks into GIC facilities during planning stage. Please provide proposal on public parking spaces.</p> | <p>Due to site constraint such as close spacing between column grids, necessary provision of standard size of parking spaces and adequate space for vehicular maneuvering and parking, nil additional public parking spaces could be provided.</p> |

Dear Kalo,

I refer to our tele-conversation just now.

Please find our assessment to the (1) one parking/ loading & unloading space for goods delivery as follows -

"As there are already two shared loading/ unloading spaces (for ambulance and NH/ CoC) in addition to the one for refuse collection, we do not see strong justification for the extra loading/ unloading space for goods delivery. LST is encouraged to make flexible use of the loading/ unloading area to meet their operational need or alternatively, provide a detailed estimation with the breakdown of the logistic services including the types of goods, estimated time and frequency of use of loading/ unloading spaces by day or by week that the current provision is unable to cope with."

That said, our support level remains at 10 parking/ loading & unloading spaces/ lay-bys to meet service needs as well as the one designated for disabled parking.

Should you have further questions, please let me know.

Regards,
Tommy SETO
EO(P)WP

----- Forwarded by Tommy WY SETO/SWDNET/SWD/HKSARG on 18/12/2017 10:08 -----

Dear Kalo,

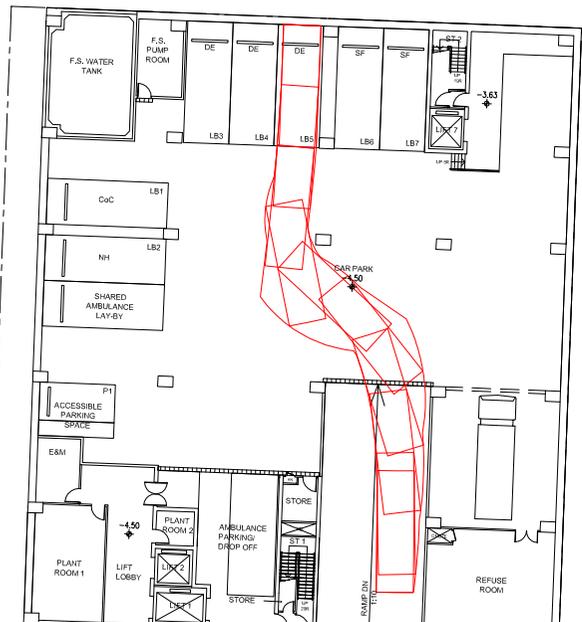
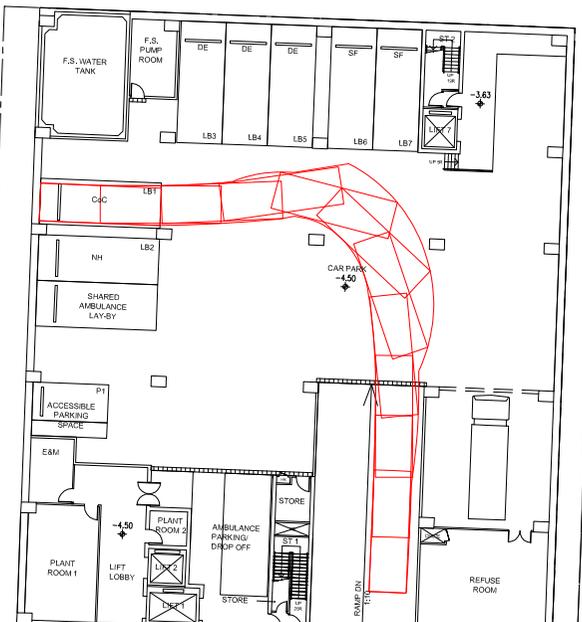
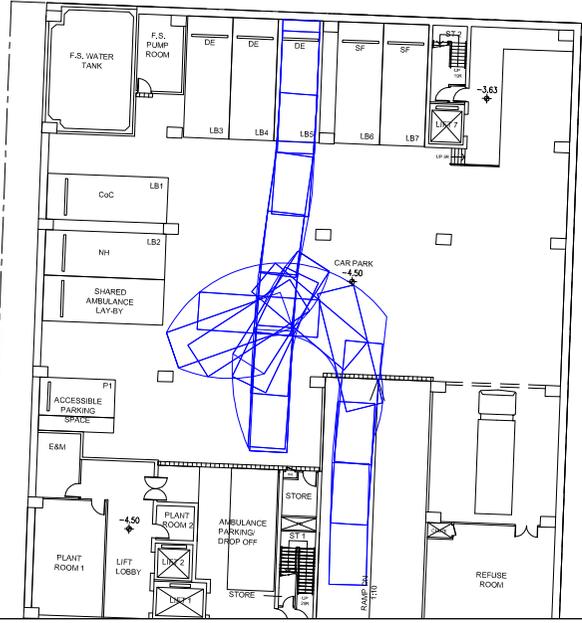
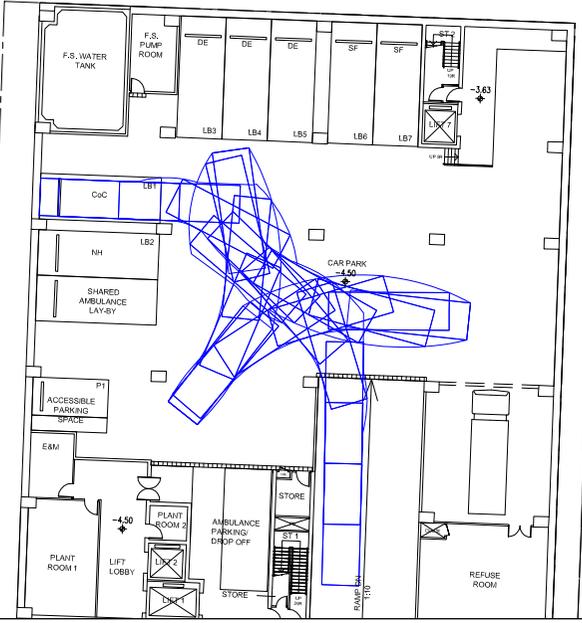
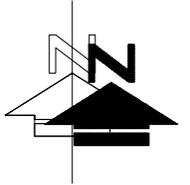
We spoke.

Upon our preliminary assessment on your parking provision proposal, we have no adverse comment at this stage, for the purpose of submitting a planning application for the proposed redevelopment, to support the following 10 parking/ loading & unloading spaces/ lay-bys from both service and operational perspectives as well as the one designated for disabled



Appendix 2

Swept Path Analysis



B/F - SWEEP PATH ANALYSIS OF 8m VEHICLE

17063HK - SCALE 1:300@A4 - 20171218

LEGEND :

-  SWEEP PATH (IN)
-  SWEEP PATH (OUT)

15. Please critically review the pedestrian crossing facilities in the vicinity so as to cater the increasing population of elderly. For example, can elderly cross the uncontrolled signalized crossing across Nga Tsin Wai Road at junction Nga Tsin Wai Road/Nam Kok Road? Any proposed measure can help elderly to cross the road safely?

Response: Refer to the enquiry 15, Elders served at Welfare Complex facilities, including Day Care Centre for the Elders, Nursing Homes and Continuum of Care for the elderly are assessed to be of moderate to severe impairment level under the Standardised Care Need Assessment Mechanism for Elderly Services, which means they are suffering from poor health or physical or mental disabilities. Concerning their health conditions, rehabilitation buses with escort services will be provided for them, our service users will not use the pedestrian crossing facilities.

16. Please elaborate the use of each floor of your Welfare Complex and please specify the traffic demand generated by the use of each floor according to the type of development as specified in Hong Kong Planning Standards and Guidelines (HKPSG).

Response: Refer to the enquiry 16, as this is a special scheme for welfare use, type of development as specified in Hong Kong Planning Standards and Guidelines (HKPSG) cannot be applied to our redevelopment project. Below are the elaborations of the use of each floor. And the traffic demand, please refer to two examples quoted in Table 2.3 and 2.4 in our TIA report.

| <i>Floor</i> | <i>Programme</i> | <i>Mode of development</i> | <i>Use</i> |
|--------------|---|----------------------------|---|
| G/F | <i>Early Education and Training Centre (EETC)</i> | <i>New development</i> | <i>It is designed mainly for disabled children from birth to the age of two, providing them with early intervention programmes with particular emphasis on the role of the disabled child's family. Disabled children aged two to under six can also receive the service if they are not concurrently receiving other pre-school rehabilitation services, which will facilitate their integration into the mainstream education system.</i> |
| | <i>Day Care Centre for the Elders (DE)</i> | <i>New development</i> | <i>Day Care Centres for the Elders is one type of community support service. It provides a range of services for the frail elderly during the day at the centre. The purpose is to enable those elderly persons, who are in need of personal care and/or limited nursing care due to weak health or functional disabilities, to remain in the community by providing nursing, rehabilitation, social and personal care services</i> |

Lok Sin Tong Redevelopment Project
R-to-C (2018-1-17)

| | | | |
|--------------|--|----------------------------|---|
| | | | <p>during the day when they lack family members or whose family members are unable to look after them.</p> <p>Shuttle bus will be used to provide pick-up service for all users. Users will usually arrive before 8:30am and leave after 4:30pm.</p> |
| Floor | Programme | Mode of development | Use |
| G/F | After School Service | New development | Offer support services for children aged between 6 and 12 for late afternoon session. Services provided include homework guidance, parent guidance and education, skill learning and other social activities. |
| 1/F | Nursing Home I, II, III | New development | <p>Nursing Homes provide residential care, meals, personal care, regular basic medical and nursing care, and social support for elders who suffer from poor health or physical/mental disabilities with deficiency in activities of daily living but are mentally suitable for communal living, and are assessed to be of severe impairment level under the Standardised Care Need Assessment Mechanism for Elderly Services.</p> <p>Elderly is not allowed to leave the premises except Out-Patient Escort Services.</p> |
| 2/F | | | |
| 3/F | | | |
| 4/F | Continuum of Care I, II, III | New development | <p>Continuum of Care for the elderly provide residential care, meals, personal care and limited nursing care for elders who suffer from poor health or physical/mild mental disabilities with deficiency in activities of daily living but are mentally suitable for communal living, and are assessed to be of moderate impairment level under the Standardised Care Need Assessment Mechanism for Elderly Services.</p> |
| 5/F | | | |
| 6/F | | | |
| 7/F | Elderly Academy / Carer Support Centre | New development | <p>The primary objective of Elderly Academy is to offer opportunities for elders to pursue studies and participate in activities that foster their general well-being, both physically and mentally.</p> <p>Carer Support Service aims at facilitating and supporting carers to take care of elders, mainly for those in the Day Care Centre for the Elders on G/F.</p> <p>Elderly and carers will come 1-2 times per week</p> |
| | Parents Resource Centre | New development | Parents Resource Centre serves as a focal point where |

Lok Sin Tong Redevelopment Project
R-to-C (2018-1-17)

| | | | |
|--------------|---|------------------------------------|--|
| | | | <p>parents and relatives of persons users of EETC on G/F with similar problems can share experience and seek mutual support with assistance from staff.</p> <p>Visitors will come 1-2 times per week</p> |
| Floor | Programme | Mode of development | Use |
| 8/F | Home Care Service | Redevelopment of existing premises | Provide a package of home-based support services at elderly premises to meet elderly's personal care, nursing care and rehabilitation training needs. |
| 9/F | Primary Health Care Centre | Extension | <p>Provide grass-root citizens in Kowloon City with quality, affordable and diversified medical services which include the following:-</p> <ol style="list-style-type: none"> 1. Out-patient services for general medicine; 2. Chinese medicine services including outpatient service, acupuncture and cupping treatments; 3. Dental services; 4. Specialist services including ophthalmology and dermatology. |
| 10/F | Ethnic Minority Supporting Service Centre | Redevelopment of existing premises | <p>To foster the integration of ethnic minorities into Hong Kong society by organizing Integration Programmes, Language Programmes, Child and Youth Assistance Programmes, etc. The Centre will 10,000 ethnic minorities annually.</p> <p>Each service user will visit 2-3 times per week. Expected peak hour for Women is from 10am to 12nn daily. Expected peak hour for family is from 6 to 9pm.</p> |
| 11/F | Central Support Units | Redevelopment of existing premises | Provide back-end administrative, financial and general support to the social services, medical, social enterprise and educational subsidiaries in order to ensure the service quality. |

Lok Sin Tong Redevelopment Project
R-to-C (2018-1-17)

- | | |
|-----|---|
| 17. | <p>Since your Welfare Complex comprises various types of development. Please propose the number of parking spaces for private cars, LGVs, buses, motorcycles, visitors' car parks and loading and unloading spaces according to each type of development.</p> <p>In case the type of development is not specified in the HKPSG, please provide few more references on the parking provision of developments with the similar type of developments for our consideration. Please include the assessment in the TIA report.</p> |
|-----|---|

Response: All service users, excluding those of Nursing Homes and Continuum of Care, are low-income families living in Kowloon City District. They are expected to visit the Complex on foot or by public transport.

Only relatives and friends of elders living in Nursing Homes and Continuum of Care will visit the Complex from other districts. In general, all Nursing Homes and Continuum of Care under the subvention of Social Welfare Department provide no parking spaces for visitors/ relatives.

With reference to the daily operation for over 200 elderly in Lok Sin Tong Chu Ting Cheong Home for the Aged in Tai Po, no parking space is provided for visitors in the Home since the operation from 1983. Visitors are also officially informed of such arrangement, no complaint has been received regarding the parking arrangement. No severe traffic congestion is caused in the district due to the increase of visitors.

Lok Sin Tong has reflected the needs of provision of loading and unloading spaces for visitors during peak Hour to Social Welfare Department (SWD). SWD will consider such operation positively.

- | | |
|-----|--|
| 20. | <p>According to Transport Planning and Design Manual (TPDM), Volume 7, Clause 4.6.8, please review the number of on-street parking spaces needed to be re-located. In addition, please obtain agreements from relevant stakeholders such as relevant District Council Members, nearby building owners, shop owners/operators, and nearby institutions, etc. if proposing relocation of the parking spaces.</p> <p>Cancellation of parking spaces may induce an adverse effect on the number of parking spaces in the District. The parking space in this District is still severely insufficient. Please propose a solution.</p> |
|-----|--|

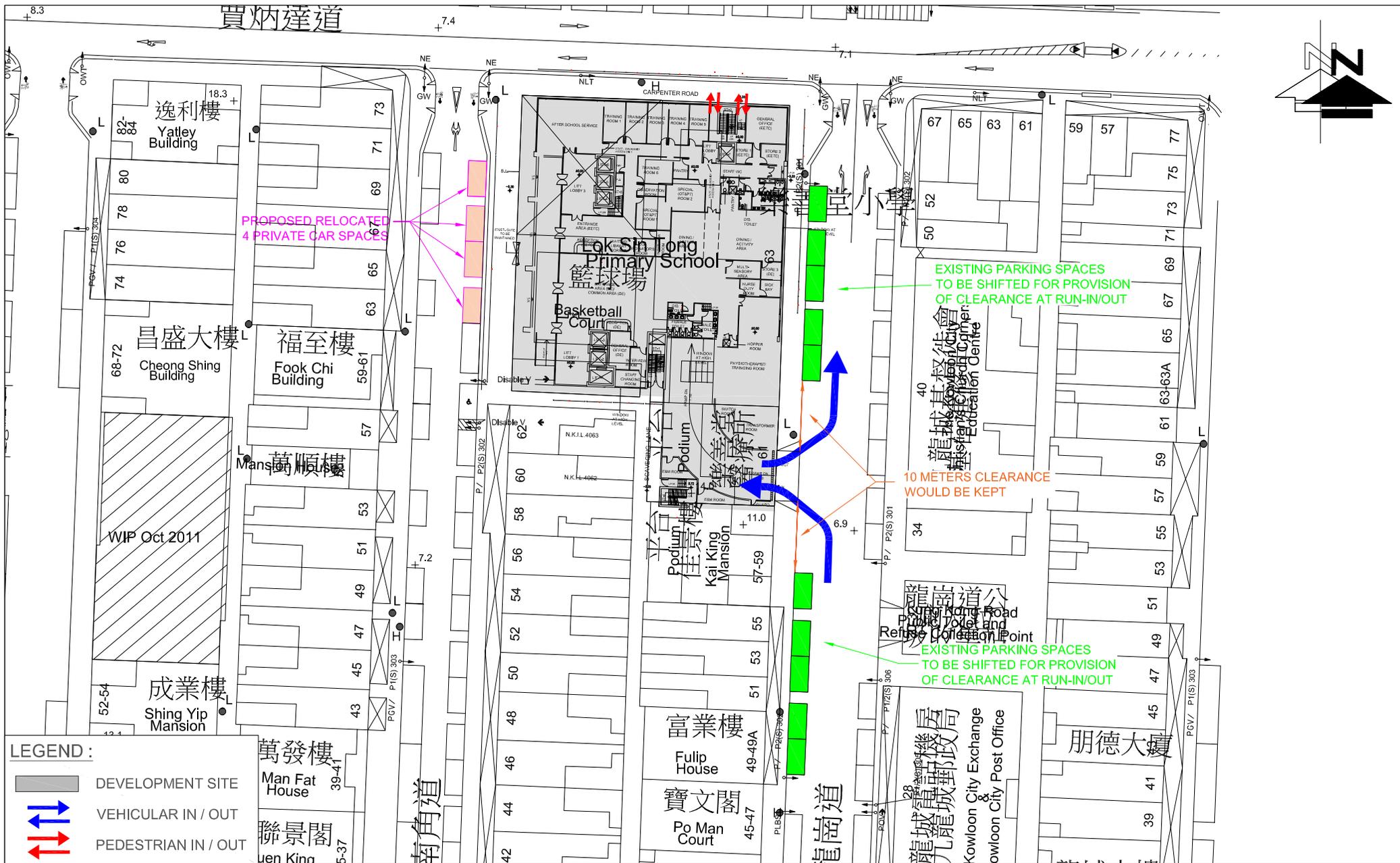
Response: As shown in the revised **Figures 2.1 & 2.3**, 4 street parking spaces are required to be relocated to Nam Kok Road for placement of the proposed run-in/out. Moreover, it is proposed to slightly shift the existing street parking spaces near the proposed run-in/out for provision of adequate clearances in accordance with TPDM Volume 7 Section 4.6.8.

- | | |
|-----|---|
| 21. | Traffic congestion in Kowloon City area caused by loading/unloading activities, boarding/alighting activities and illegal parking is serious, especially at Lung Kong Road. This is foreseeable that your development would attract people in other district to come to visit the elderly. Please propose solution on alleviate the traffic congestion problem. |
|-----|---|

Response: Lok Sin Tong has reflected the needs of provision 2 waiting spaces for pick-up/drop-off activities and short halt of private cars on a need basis to Social Welfare Department (SWD). SWD will consider such operation positively.



| | | |
|---------------------------|----------------------|---|
| FIGURE NO.: 2.1 | | PROJECT TITLE: Lok Sin Tong Redevelopment Project at Lung Kong Road |
| PROJECT NO.: 17063HK | | DRAWING TITLE: LAYOUT OF GROUND FLOOR |
| SCALE: 1 : 720 @ A4 | DATE: 17 JAN 2018 |  CTA Consultants Limited 志達顧問有限公司 |



LEGEND :

- DEVELOPMENT SITE
- VEHICULAR IN / OUT
- PEDESTRIAN IN / OUT

| | | | | |
|------------------------|----------------------|----------------|--|---|
| FIGURE NO.: | 2.3 | PROJECT TITLE: | Lok Sin Tong Redevelopment Project at Lung Kong Road | CTA Consultants Limited 志達顧問有限公司 |
| PROJECT NO.: | 17063HK | DRAWING TITLE: | PROPOSED ACCESS ARRANGEMENT | |
| SCALE: 1 : 720 @ A4 | DATE: 17 JAN 2018 | | | |

**Visual Appraisal for Proposed Lok Sin Tong Welfare Complex
at 61-63 Lung Kong Road**

Background

1. Under the Special Scheme on Privately Owned Sites for Welfare uses (the Special Scheme) steered by the Labour and Welfare Bureau (LWB), Lok Sin Tong Benevolent Society, Kowloon (the Applicant), has submitted its application and a preliminary proposal for redeveloping its two adjoining sites located at Nos. 61 and 63 Lung Kong Road, Kowloon City.

Currently, the two adjoining sites (the subject site) are occupied by Lok Sin Tong Benevolent Society, Kowloon's Headquarter and Clinic (No. 61 Lung Kong Road), and Lok Sin Tong Primary School (No. 63 Lung Kong Road). They are zoned 'Government, Institution or Community' (G/IC) on the approved Ma Tau Kok Outline Zoning Plan (OZP) No. S/K10/20, subject to a maximum height of 5 storeys and 8 storeys respectively.

2. Located in midst of a primarily residential area and highly accessible by public transport, the site is a supreme spot for social services and networking. Upon redevelopment, the Applicant plans to substantially expand its existing services, as well as providing more community and welfare services and social engagement programmes.

The combined site will have an area of 1833m². The proposed development seeks a relaxation of building height restriction from 5 and 8 storeys to 13 storeys, i.e. about 60.0mPD (to the main roof level) and the proposed plot ratio is about 8.77.

3. This Visual Appraisal (VA) is to examine the possible visual impact of the proposed development for social welfare complex at the subject site.

Visual Character of the Site and its Surroundings

4. The subject site abuts Lung Kong Road, Carpenter Road and Nam Kok Road on three sides. The surroundings are mainly old multi-storey houses, with a number of relatively new high-rise residential developments located at south and south-east of the site. Just on the opposite side of Carpenter Road is the vast open space and greenery of Carpenter Road Park and Kowloon Walled City Park.
5. The topography of the subject site and its vicinity is relatively flat. The ground elevation increases across the Kowloon Walled City Park toward the north (Tung Tau Tsuen Road).

The Redevelopment Proposal and its Design Features

6. The proposed development is a 13-storeyed building for social welfare use. 'Green boxes' is one of the key concepts of the design. The landscape deck and scattered green areas at different levels soften the streetscape and enhance quality of living space, both interior and exterior of the building. The glazed elevation along Carpenter Road provides a lightweight visual composition. Moreover, the building is 2m set back from the boundary along Nam Kok Road to in order to open up the space for public and street planting.

Viewpoints

7. For the VA, the following four viewpoints from different directions and distance are selected (Plan 1),

View point 1: North-West corner of Kowloon Walled City Park
View point 2: Junction of Carpenter Road and Hau Wong Road
View point 3: Junction of Carpenter Road and South Wall Road
View point 4: Nam Kok Road between Carpenter Road and Nga Tsin Wai Road
View point 5: Junction of Carpenter Road and Nam Kok Road

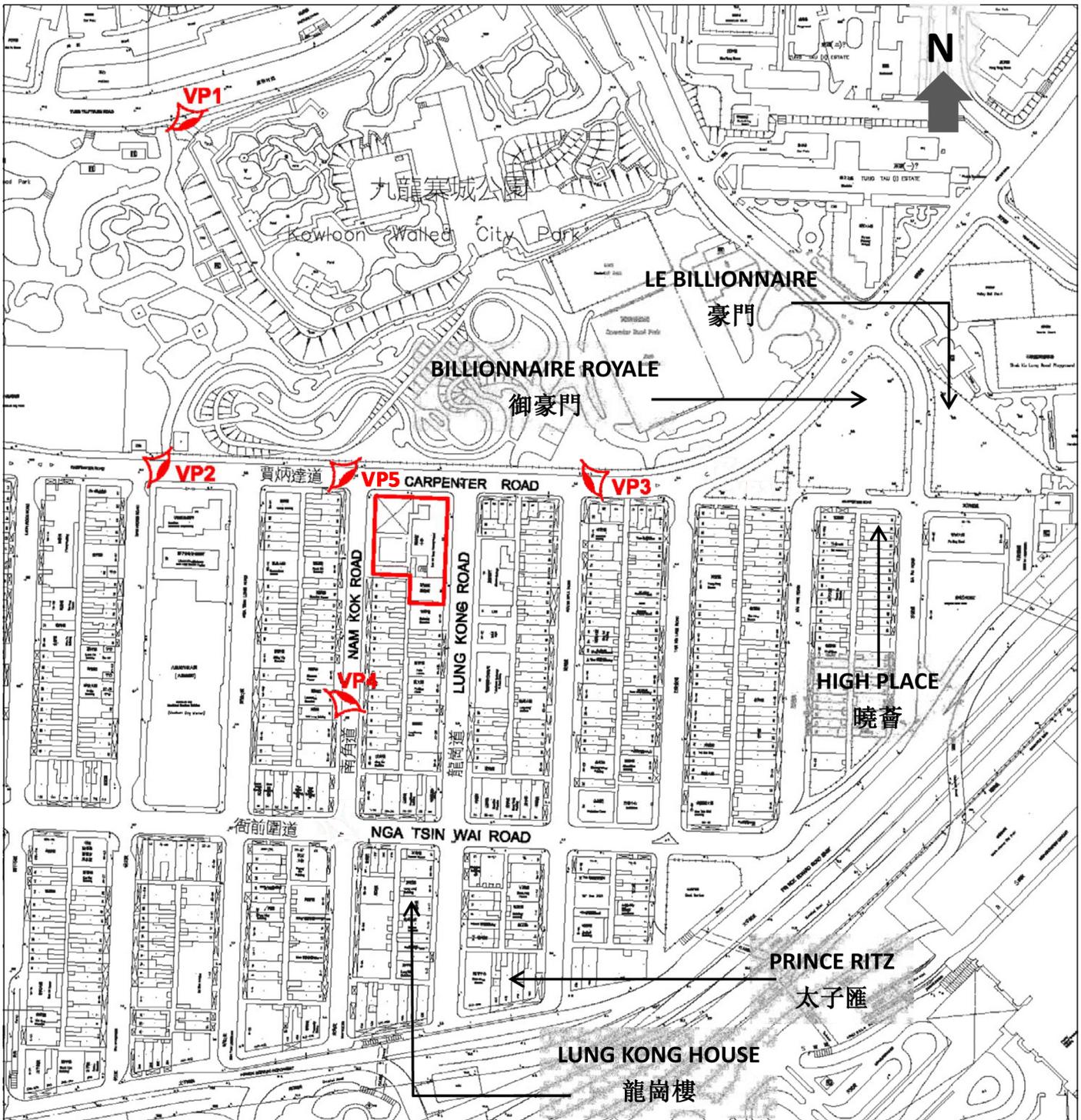
View point 1 is selected for its relatively high level and being the key open space in the neighbourhood. View points 2, 3, 4, 5 are located on the main pedestrian flow from the East, South, West and North respectively.

Visual Appraisal

8. Four sets of photomontage (Plans 2 to 5) have been prepared to demonstrate the visual image of the proposed development and how it would fit into the surrounding area.
9. View point 1 (Plan 2): Viewing from the north-west at Kowloon Walled City Park, the proposed building is considered not excessive comparing with the new high-rise residential developments such as Prince Ritz and Urbana Lofts. The proposed building as viewed beyond the greenery from the Kowloon Walled City Park is visually acceptable.
10. View point 2 (Plan 3): Viewing from the west at the junction of Carpenter Road and Hau Wong Road, the proposed development is considered visually compatible with the surrounding. The façade treatment of layers and porosity reduces the scale of the building mass which is more contextual. The landscape deck at mid-level of the building also creates visual interest to the pedestrian.
11. View point 3 (Plan 4): Viewing from the east at the junction of Carpenter Road and South Wall Road, the façade would create visual interest to the current streetscape. The elevation interplays with solid and void, with highlights of green pockets. Nonetheless, the layers and rhythm of the elevation respects its neighbours and is considered visually compatible with the surrounding. Roadside planting will also be provided to enhance visual amenity at pedestrian level.
12. View point 4 (Plan 5): From the south at Nam Kok Road, the viewing angle is comparatively narrow. The building is set back 2m from the site boundary along Nam Kok Road, with further voids and landscape pockets at ground and mid-levels. The pockets provide breathing space for the narrow street. As shown in the montage, the segregated façade provides an overall visual composition which is considered compatible with the surrounding. Roadside planting will also be provided to enhance visual amenity at pedestrian level.
13. View point 5 (Plan 6): Viewing from the north at the junction of Carpenter Road and Nam Kok Road, a collective view of landscape pockets and green features at multiple levels on different facades creates visual interest to the pedestrian. The layers and rhythm of the façade extend across different elevations to reduce the scale of the building mass. Roadside planting near the main entrance provides a welcoming gesture to the pedestrians.

Conclusion

14. Based on the above, the proposed development is considered not visually excessive and is compatible with the surrounding area. The mitigation measures including building line set back and roadside planting would certainly improve the streetscape and provide quality public space. The design of the 'green boxes', rhythm of solid and void, layering of massing also present the building as an interesting feature in the neighbourhood.
15. The relaxation in building height is aimed to optimize the development potential and ensure a diversified mix of social welfare facilities for the neighbourhood. Various visual features demonstrated including landscape pockets, interplay of solid and void, segregated facade treatment, etc. will reduce the visual mass and maximize the visual compatibility with the surroundings. It is noted that the maximum building height for the adjacent Residential (Group A)2 zones are 80mPD. The proposed building height profile will also be compatible with the long term urban development.



SITE BOUNDARY FOR PROPOSED LOK SIN TONG WELFARE COMPLEX



VIEW POINT

VP1-KOWLOON WALL CITY PARK

VP2-CARPENTER ROAD WEST

VP3-CARPENTER ROAD EAST

VP4- NAM KOK ROAD

VP5-CARPENTER ROAD WEST

SCALE: 1: 3000

| | | | |
|------------------------|--|---|--------------------|
| Reference 參考資料: | VISUAL APPRAISAL FOR PROPOSED LOK SIN TONG WELFARE COMPLEX 61-63 LUNG KONG ROAD | Spence Robinson Ltd Architects • Project Managers • Interior Designers 馬海(建築顧問)有限公司 | Plan 圖 1 |
| Date 日期: 01/02/2018 | | | |



EXISTING VIEW 現有景觀

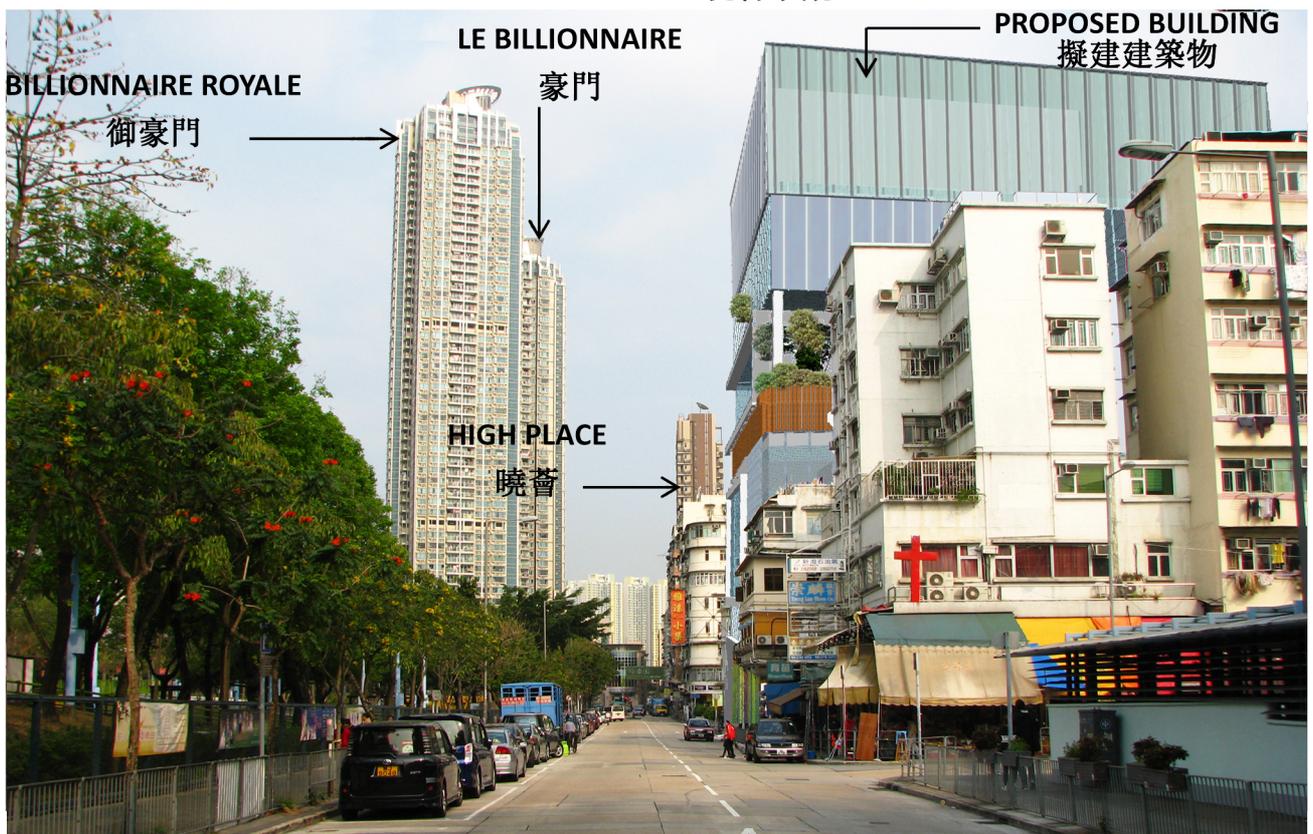


PHOTOMONTAGE 合成照片

| | | | | |
|------------------------|--|--|--|---------------------------|
| Reference 參考資料: | 合成照片 PHOTOMONTAGE | | | |
| Date 日期: 01/02/2018 | VISUAL APPRAISAL FOR PROPOSED LOK SIN TONG WELFARE COMPLEX 61-63 LUNG KONG ROAD- VIEW POINT 1 | | Spence Robinson Ltd <small>Architects • Project Managers • Interior Designers</small> 馬海(建築顧問)有限公司 | Plan 圖 2 |



EXISTING VIEW 現有景觀



PHOTOMONTAGE 合成照片

Reference 參考資料:

Date 日期:
01/02/2018

合成照片 PHOTOMONTAGE

VISUAL APPRAISAL FOR
PROPOSED LOK SIN TONG WELFARE COMPLEX
61-63 LUNG KONG ROAD- VIEW POINT 2

Spence Robinson Ltd
Architects • Project Managers • Interior Designers
馬海(建築顧問)有限公司

Plan 圖
3



EXISTING VIEW 現有景觀



PROPOSED BUILDING
← 擬建建築物

PHOTOMONTAGE 合成照片

| | | | |
|------------------------|---|---|------------------------|
| Reference 參考資料: | <p>合成照片 PHOTOMONTAGE</p> <p>VISUAL APPRAISAL FOR</p> <p>PROPOSED LOK SIN TONG WELFARE COMPLEX</p> <p>61-63 LUNG KONG ROAD- VIEW POINT 3</p> | <p>Spence Robinson Ltd</p> <p>Architects • Project Managers • Interior Designers</p> <p>馬海(建築顧問)有限公司</p> | <p>Plan 圖</p> <p>4</p> |
| Date 日期: 01/02/2018 | | | |



MEI TUNG ESTATE
美東邨



EXISTING VIEW 現有景觀



PROPOSED BUILDING
擬建建築物 →

MEI TUNG ESTATE
美東邨



PHOTOMONTAGE 合成照片

Reference 參考資料:

Date 日期:
01/02/2018

合成照片 PHOTOMONTAGE
VISUAL APPRAISAL FOR
PROPOSED LOK SIN TONG WELFARE COMPLEX
61-63 LUNG KONG ROAD- VIEW POINT 4

Spence Robinson Ltd
Architects • Project Managers • Interior Designers
馬海(建築顧問)有限公司

Plan 圖
5



EXISTING VIEW 現有景觀

PROPOSED BUILDING
擬建建築物 →



PHOTOMONTAGE 合成照片

| | | | |
|------------------------|--|---|---------------------|
| Reference 參考資料: | <p>合成照片 PHOTOMONTAGE VISUAL APPRAISAL FOR PROPOSED LOK SIN TONG WELFARE COMPLEX 61-63 LUNG KONG ROAD- VIEW POINT 5</p> | <p>Spence Robinson Ltd Architects • Project Managers • Interior Designers 馬海(建築顧問)有限公司</p> | <p>Plan 圖 6</p> |
| Date 日期: 01/02/2018 | | | |

Hong Kong Housing Authority

Agreement No. CB20150689

HKHA Term Engineering Consultancy Services 2016-2018

For Kowloon Central & West and Islands Region

Proposed Subsidised Sale Flats (SSF) Development at Ko Shan Road

Traffic Impact Assessment (Final) (Extract)



Document No. L1070/T001/001

Issue 4

December 2017

L1070/T001/001

Issue 4

December 2017

Agreement No. CB20150689

Proposed Subsidised Sale Flats Development at Ko Shan Road

Traffic Impact Assessment (Final)

| | |
|--|-----------------|
| Approved for Issue by: | |
|  | |
| ----- | |
| | William So |
| Position: | Project Manager |
| | ----- |
| Date: | December 2017 |
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L1070/T001/001
Issue 4
December 2017

Agreement No. CB20150689

Proposed Subsidised Sale Flats Development at Ko Shan Road

Traffic Impact Assessment (Final)

| Issue | Prepared by | Reviewed by | Date |
|--------------|--------------------|--------------------|-------------|
| 1 | KNC | BF | MAR 2017 |
| 2 | KNC | BF | JUN 2017 |
| 3 | KNC | BF | SEPT 2017 |
| 4 | KNC | BF | DEC 2017 |
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APPENDIX A FIGURES**APPENDIX B TRAFFIC ANALYSIS****APPENDIX C YEAR 2012 SURVEYED TRAFFIC
(EXTRACTED FROM CTIA REPORT BY MTR PROJECT)**



Executive Summary

This summary presents the collected data, design criteria, assumptions and findings in the Traffic Impact Assessment (TIA) for proposed SSF development at Ko Shan Road.

The subject site is bounded by Ko Shan Road, Shansi Street and Chatham Road North, and opposite to the Ko Shan Road Park. The Eastern Kowloon Corridor runs in parallel with Chatham Road North adjacent to the subject development.

The proposed development consists of 483 flats (Being conservative, 500 flats are assumed with 10% allowance) together with an ancillary vehicle park serving the residents. A separate public vehicle park at lower ground level serving commercial vehicles with 11 parking spaces for light buses/light goods vehicles and 5 parking spaces for private cars is proposed although the conservative assumption with parking spaces of 15 light buses/light goods vehicles and 5 private cars in total was adopted for the technical assessment. The proposed SSF development will be completed in 2023/2024 tentatively.

The proposed development is served by a number of franchised bus and GMB routes which are mainly running along Chatham Road North and nearby Ma Tau Wai Road. The proposed Ma Tau Wai Station under the MTR Shatin Central Link which is under construction is expected to be available at Ma Tau Kok Road/To Kwa Wan Road Garden which is about 260m away from the subject site.

Pedestrian traffic impact assessment has been carried out for the existing and future traffic condition in the design year of 2028 under both scenarios with and without the proposed development. The analyses for the Level of Service (LOS) of the footpath and volume to Capacity (V/C) ratio of the pedestrian crossing have been carried out to identify the impact due to the proposed development. The results of LOS and V/C ratio indicate that the footpaths and pedestrian crossing will operate at a satisfactory level with the proposed development.

The traffic flow generated by the proposed development is estimated by trip generation with reference to Transport Planning and Design Manual by Transport Department. Traffic flow of the existing road network adopted for the traffic impact assessment are based on the existing traffic counts collected in 2017 and the growth rate determined from 2014-based Territorial Population and Employment Data Matrix published by Planning Department for Kowloon City is applied to these counts to forecast the traffic flow in 2023 and 2028. The road junction capacity assessment reveals that the proposed housing development will result in



insignificant differences in terms of road junction capacities before and after including the traffic flow generated from the development.

It is concluded that the proposed development will not result in adverse traffic impact to the existing road network.



1.0 Introduction

1.1 The Hong Kong Housing Authority (HKHA) intends to develop the site at Ko Shan Road into Subsidised Sale Flats (SSF). Mannings (Asia) Consultants Ltd has been commissioned by HKHA under the Agreement No. CB20150689 to undertake the Traffic Impact Assessment (TIA) for the proposed development of Subsidised Sale Flats (SSF) at Ko Shan Road, Kowloon.

2.0 Background

2.1 The subject site is being considered in the location of existing MTR Shatin Central Line Construction Site Office in Ko Shan Road for the proposed Subsidised Sale Flats development to accommodate a total of about 483 flats (Being conservative, 500 flats are assumed with 10% allowance) and a public vehicle park at lower ground level serving commercial vehicles with 11 parking spaces for light buses/light goods vehicles (Being conservative, 15 parking spaces for light buses/light goods vehicles to be adopted for assessment) and 5 parking spaces for private cars. The proposed SSF development would be completed in 2023 tentatively. Therefore 2028 would be the proposed design year for this traffic impact assessment.

3.0 Study Objective

3.1.1 The objective of the study is to identify the potential traffic impact to the surrounding road network due to the proposed SSF development. Subsequently proposed mitigation measures would be made to alleviate any adverse traffic impact due to the proposed development, if any.

3.1.2 The major tasks to achieve this objective include:

- Assess the existing and future traffic conditions within the area of influence;
- Forecast the future year traffic flows;
- Estimate the volume of traffic likely to be generated by the proposed SSF development;
- Assess the traffic impact of the proposed development on the adjacent road network using the forecast background flows and the traffic generated by the proposed development; and
- Propose traffic improvement or traffic management measure as necessary.



4.0 Existing Site Description and Traffic Condition

4.1.1 Site Description

4.1.2 The subject site is in the peripheral with Chatham Road North to the east, Shan Si Street to the south and Ko Shan Road to the west. A viaduct The Eastern Kowloon Corridor runs in parallel with Chatham Road North adjacent to the subject development. The location plan is shown in **FIGURE 1** of **Appendix A**.

4.1.3 The road network in the vicinity of the site, as shown in **FIGURE 1** comprising the following:

- Chatham Road North
- Ma Tau Wai Road
- East Kowloon Corridor
- Ko Shan Road
- Bailey Street
- Chi Kiang Street
- Pak Kung Street
- San Lau Street
- Shan Si Street
- Kiang Hsi Street
- Tin Kwong Road

4.1.4 Chatham Road North and Ma Tau Wai Road are the major carriageways running north and south of the study area providing traffic commuting between Hung Ham and Ma Tau Chung in east Kowloon. Chatham Road North is a continuous section of Chatham Road South linking Tsim Sha Tsui and Hung Hom in Kowloon. Chatham Road North runs from the interchange with Hong Chong Road and Chatham Road South in Lo Lung Hang to the junction with Ma Tau Wai Road near To Kwa Wan. It feeds into the East Kowloon Corridor at its northern end, forming a section of Hong Kong's Route 5.

4.1.5 Ma Tau Wai Road is the extension of Chatham Road North runs in between To Kwa Wan and Ma Tau Chung in Kowloon. Ko Shan Road is a continuous carriageway from Shun Yung Street that runs in parallel to Chatham Road North providing the local access road to the west.

4.1.6 Bailey Street and Chi Kiang Street are the main streets running east and west in the vicinity of study area. These two streets enable local traffic commuting between Ko Shan Road and southern end of To Kwa Wan.

- 4.1.7 Similarly, Chi Kiang Street is located to the north of To Kwa Wan. It is separated into two sections by Ma Tau Wai Road. It connects Ko Shan Road to the west and To Kwa Wan Road to the east.
- 4.1.8 Other local streets intercepting with Chatham Road North include Pak Kung Street, San Lau Street, Shan Si Street providing local accesses to the south of study area. Similarly, Kiang Hsi Street, Chi Kiang Street, Lok Shan Road, Tin Kwong Road intercepting with Ma Tau Wai Road provides traffic commuting between the local areas to other districts in the north.
- 4.1.9 The traffic routings in and out of the study area among Kwun Tong, New Territories via Lion Rock Tunnel, New Territories via Tate's Cairn Tunnel, West Kowloon and Hong Kong are illustrated in **Figure 1 of Appendix A**.
- 4.1.10 The proposed sites are also well served by a number of franchised bus and GMB routes which are mainly running along Chatham Road North, Ma Tau Wai Road. The bus and GMB services are summarised in the following **Tables 4.1 and 4.2**.

Table 4.1: Franchised Bus Services along Chatham Road North and Ma Tau Wai Road

| Operator | Route No. | Origin | Destination |
|----------|-----------|--------------------------|------------------------------|
| KMB | 5 | Star Ferry | Fu Shan |
| KMB | 5A | Star Ferry | Kowloon City (Shing Tak St.) |
| KMB | 5P | Star Ferry | Tsz Wan Shan (Central) |
| KMB | 11 | Kowloon Station | Diamond Hill Railway Station |
| KMB | 26 | Tsim Sha Tsui East | Shun Tin |
| KMB | 101 | Kennedy Town | Kwun Tong (Yue Man Square) |
| KMB | 107 | Wah Kwai | Kowloon Bay |
| KMB | 108 | Braemar Hill | Kai Yip |
| KMB | 111 | Central (Macau Ferry) | Ping Shek |
| KMB | 116 | Quarry St (Yau Man St) | Tsz Wan Shan (Central) |
| KMB | 101R | Happy Valley Racecourse | Kwun Tong (Yue Man Square) |
| KMB | N121 | Central (Macau Ferry) | Ngau Tau Kok |
| KMB | 93K | Mong Kok East Station | Po Lam |
| CTB | A22 | Airport | Lam tin Station |
| LWB | E23 | Airport | Tsz Wan Shan |
| CTB | N23 | Tung Chung Station | Tsz Wan Shan(North) |
| KMB | 14 | China Ferry Terminal | Lei Yue Mun Estate |
| KMB | 28 | Tsim Sha Tsui(Mody Road) | Lok Wah |
| KMB | 3B | Hung Hom Ferry Pier | Tsz Wan Shan (Central) |
| KMB | 2E | Pak Tin | Kowloon City Ferry Pier |

| | | | |
|-----|------|----------------------------|---|
| KMB | 5C | Star Ferry | Tsz Wan Shan (Central) |
| KMB | 5D | Telford Garden | Hung Hom |
| KMB | 6C | Mei Foo | Kowloon City Ferry Pier |
| KMB | 6F | Mei Foo | Ngau Tau Kok |
| KMB | 11K | Hung Hom Station | Chuk Yuen Station |
| KMB | 12A | Whampoa Garden | Cheung Sha Wan(Sham Mong Rd) |
| KMB | 15 | Hung Hom Ferry Pier | Ping Tin |
| KMB | 21 | Hung Hom Station | Choi Wan |
| KMB | 85X | Hung Hom Ferry Pier | MA On Shan Town B/T |
| KMB | 85 | Fo Tan(Shan Mei St) | Kowloon City Ferry Pier |
| KMB | 85B | Chun Shek B/T | Kowloon City Ferry Pier |
| KMB | 297 | Hung Hom Ferry Pier | Hang Hau (North) (Tseung Kwan O Hospital) |
| CTB | 796X | Tsim Sha Tsui East | Lohas Park |
| KMB | 41 | Cheung Ching | Kowloon City Ferry Pier |
| KMB | 45 | Lai Yiu | Kowloon City Ferry Pier |
| KMB | 106 | Siu Sai Wan(Island Resort) | Wong Tai sin |
| KMB | 106A | Wong Tai Sin | Tai Ko |
| KMB | 106P | Siu Sai Wan(Island Resort) | Wong Tai sin |
| KMB | 115 | Central (Macau Ferry) | Kowloon City Ferry Pier |
| KMB | 75X | Fu Shin Estate | Kowloon City Ferry Pier |

Table 4.2: GMB Services along Chatham Road North and Ma Tau Wai Road

| Route No | Origin | Destination |
|----------|--------------------------|----------------------------|
| 27M | Mong Kok Station | Lok Man Sun Chuen |
| 2 | Whampoa Garden | Festival Walk |
| 2A | Whampoa Garden | Festival Walk |
| 26 | To Kwa Wan(Chi Kiang St) | Kowloon Station |
| 13 | Hung Hom Ferry Pier | Kowloon Tong(Broadcast Dr) |

4.1.11 In addition, the proposed MTR Shatin Central Line Ma Tau Wai Station would have an exit at Ma Tau Kok Road/To Kwa Wan Road Garden which is about 260m away from the subject site.

4.2 Existing Traffic Condition

4.2.1 In order to collect the updated traffic flow information of the concerned road junctions close to the subject site, manual classified traffic count surveys were conducted in February 2017 between the hours 0700 and 1900 of among the

critical road junctions. The locations of these critical junctions are shown in **Table 4.3** and these junctions are illustrated in **Figure 1** of **Appendix A**.

Table 4.3 List of Critical Junctions

| Junction | Location |
|----------|---|
| A | Sheung Shing street /Tin Kwong Road |
| B | Tin Kwong Road /Kau Pui Lung Road/ |
| C | Tin Kwong Road /Ma Tau Wai Road/Ma Hang Chung Road |
| D | Lok shan Road / Ma Tau Wai Road |
| E | Ko Shan Road / Chi Kiang Street |
| F | Chi Kiang Street/Ma Tau Wai Road (South of Kowloon City Road) |
| G | Chi Kiang Street / To Kwa Wan Road |
| H | Ko Shan Road / Kiang Hsi Street |
| I | San Lau Street / Chatham Road North |
| J | San Lau Street / Ma Tau Wai Road / Bailey Street |
| K | Shun Yung Street / Pak Kung Street |
| L | Pak Kung Street / Chatham Road North |
| M | Kiang Hsi Street / Chatham Road North |
| N | Shan Si Street / Chatham Road North |
| O | Ko Shan Road / Shan Si Street |
| P | Fat Kwong Street / Shun Yung Street / Yan Fung Street |

- 4.2.2 Based on the surveyed data, it was observed that the peak hours in the study area mainly fall within the time period 7:30 – 8:30 in the morning and 17:30 – 18:30 in the afternoon. The peak hour traffic flow for the concerned road junctions of Year 2017 are shown in **FIGURE 2** of **Appendix A**.
- 4.2.3 The reserved capacity (RC) of the signalized junctions and design flow to capacity ratio (DFC) of priority junctions has been carried out in accordance with Transport Planning and Design Manual Volume 4 (TPDM Vol. 4) and Volume 2 (TPDM Vol. 2) respectively.
- 4.2.4 Results of the junction capacity analysis of the concerned road junctions in the morning and evening peak hours under the existing traffic condition are shown in the **Table 4.4** below. Details of the junction capacity analysis are shown in **Appendix B**.

Table 4.4: Results of junction capacity analysis of concerned junction in Year 2017

| | | | RC(%) / DFC | |
|--------------|---|---------------|-------------|------|
| Junction No. | Junction | Junction Type | AM | PM |
| A | Sheung Shing Street /Tin Kwong Road | Signalised | 53% | 77% |
| B | Kau Pui Lung Road/Tin Kwong Road | Signalised* | 56% | 60% |
| C | Ma Tau Wai Road/Ma Hang Chung Road /Tin Kwong Road | Signalised | 18% | 20% |
| D | Lok shan Road / Ma Tau Wai Road | Signalised | 125% | 138% |
| E | Chi Kiang Street / Ko Shan Road | Priority | 0.55 | 0.47 |
| F | Ma Tau Wai Road / Chi Kiang Street | Signalised | 44% | 30% |
| G | Chi Kiang Street / To Kwa Wan Road | Signalised | 42% | 49% |
| H | Kiang His Street / Ko Shan Road | Signalised | 94% | 90% |
| I | Chatham Road North / San Lau Street | Signalised | 94% | 74% |
| J | Bailey Street / Ma Tau Wai Road | Signalised | 17% | 20% |
| K | Ko Shan Road / Pak Kung Street | Priority | 0.17 | 0.19 |
| L | Chatham Road North / Pak Kung Street | Signalised | 135% | 117% |
| M | Kiang His Street / Chatham Road North | Priority | 0.43 | 0.50 |
| N | Shan Si Street / Chatham Road North | Priority | 0.07 | 0.08 |
| O | Ko Shan Road / Shan Si Street | Priority | 0.06 | 0.05 |
| P | Fat Kwong Street / Shun Yung Street / Yan Fung Street | Signalised | 24% | 28% |

*Junction B is currently a temporary signalized junction modified under the MTR project during construction and this would be reverted to the original priority junction after the completion of the MTR project before 2023.

4.2.5 The results of the junction capacity analysis indicate that the concerned road junctions are operating in a satisfactory level. In details, the Reserve Capacity (RC) for critical signalised junctions in the vicinity of study area is ranging between 17% and 138% under the considerations of AM and PM Peaks in existing 2017. Similarly, the Demand Flow Capacity (DFC) for priority junctions in the study area is ranging between 0.05 to 0.55 under the considerations of AM and PM Peaks in existing 2017.

5.0 Future Traffic Condition and Traffic Forecast

5.1 Trip Generation by Proposed Subsidised Sale Flats (SSF) Development

5.1.1 The traffic generated by the proposed development is estimated by trip generation reference from Tables 1 & 2 of TPDM Vol. 1 Chapter 3 Appendix & Table 1 of Data Record No. 439, Review of DR431 Traffic Generation Characteristics. The Traffic Generation Rates are shown in **Table 5.1**.

Table 5.1: Traffic Generation Rates

| | AM Peak | | PM Peak | |
|-----------------------------|------------|------------|------------|------------|
| | Generation | Attraction | Generation | Attraction |
| Subsidised Housing: HOS/SSF | 0.0761 | 0.0573 | 0.0350 | 0.0451 |

5.1.2 Based on the above trip rates, the vehicle trip rated to the proposed development are shown in **Table 5.4** below.

5.1.3 A public vehicle park (PVP) at lower ground level is also proposed for the development. This PVP will serve commercial vehicles with 11 parking spaces for light buses/light goods vehicles (Being conservative, 15 parking spaces for light buses/light goods vehicles to be adopted) and 5 parking spaces for private cars.

5.1.4 In order to determine the trip generation/attraction rate during AM and PM Peaks for the proposed public vehicle park (PVP), a local car park survey was carried out at Lok Man Sun Chuen Car Park on 14 September 2017. This particular car park is located in Ko Shan Road near Anhui Street and comprising a total of 69 parking spaces, of which 57 private car parking spaces are under monthly parking spaces, 10 private car parking spaces and 2 Light Goods Vehicle parking spaces are hourly parking spaces. The results of peak hour survey are shown in **Table 5.2**.

Table 5.2 Results of traffic in/out of Existing Lok Man Sun Chuen Car Park during AM and PM Peaks

| | In (no. of veh.) | | Out (no. of veh.) | |
|---------|------------------|---------------------|-------------------|---------------------|
| | Private Car | Light Goods Vehicle | Private Car | Light Goods Vehicle |
| AM Peak | 6 | 2 | 16 | 2 |
| PM Peak | 10 | 2 | 4 | 2 |

5.1.5 During the survey, it was unable to identify the private car driving in / out the car park are hourly parked or monthly parked. Therefore, it is assumed that 50% of the surveyed vehicles were under 50%/50% split between hourly parking and monthly parking. The estimation trip generation/attraction rate for the proposed public vehicle park during AM and PM Peaks are shown **Table 5.3**

Table 5.3 Estimation of trip generation/attraction rate for the proposed public vehicle park (PVP), during AM and PM Peaks

| Vehicle Type | Peak | Lok Man Sun Chuen Car Park | | | | Proposed PVP | | |
|---------------|------|-----------------------------|------------------------------|------------------------------------|-----------------------------------|------------------------------------|---|--|
| | | No. of vehicle(s) In (a) | No. of vehicle(s) Out (b) | No. of hourly parking space (c) | Assumed % of hourly parked (d) | No. of hourly parking space (e) | Estimated no. of vehicle(s) In $(f)=(e)/(c) \times (a) \times (d)$ | Estimated no. of vehicle(s) Out $(g)=(e)/(c) \times (b) \times (d)$ |
| Private Car | AM | 6 | 16 | 10 | 50% | 5 | 2 | 4 |
| | PM | 10 | 4 | | | | 3 | 1 |
| Goods Vehicle | AM | 2 | 2 | 2 | 100% | 15 | 15 | 15 |
| | PM | 2 | 2 | | | | 15 | 15 |

5.1.6 The conversion of in/out of vehicle for the proposed PVP into PCU is simply by amalgamation of PCU factors with the estimated number of vehicle using 1.5 for LGV and 1.0 for private car. The resultant of estimated trip related for the public vehicle park along with estimated trips for the subject development are summarised in **Table 5.4**.

Table 5.4: Estimated Overall Trip Related to the Proposed SSF Development and Public Vehicle Park

| Development Phase | | AM Peak | | PM Peak | |
|-----------------------------------|---|--------------------|--------------------|--------------------|--------------------|
| | | Generation (pcu/h) | Attraction (pcu/h) | Generation (pcu/h) | Attraction (pcu/h) |
| Residential (approx. no. of flat) | 550 | 42 | 32 | 20 | 24 |
| Public vehicle park | 5 private cars | 4 | 2 | 1 | 3 |
| Public vehicle park | 15 light buses/light goods vehicles(for assessment) | 23 | 23 | 23 | 23 |

- 5.1.7 Furthermore, the traffic routings in and out of the study area among Eastern district, Western & Northern District of Kowloon and Hong Kong Island are illustrated in **Figure 1** of **Appendix A**.

5.2 Traffic Forecast

- 5.2.1 The proposed development would be completed by 2023, and thus the Year 2028 will be adopted as the design year. The methodology to be adopted for traffic forecast will be presented in the following paragraphs.
- 5.2.2 Traffic flow adopted for the traffic impact assessment are based on the existing traffic counts collected in the year of Year 2017 and growth factor is applied to these counts to forecast the based traffic flow in the year of completion of the development and 5 years after the completion of the development. Three different methods had been adopted to determine the growth factor. One is based on the 2014-based Territorial Population and Employment Data Matrix published by Planning Department. The others are based on the latest BDTM Traffic Flow and the past years record of the Annual Average Daily Traffic (AADT) value from the Annual Traffic Census (ATC) to determine the growth data for traffic forecast.
- 5.2.3 The data that based on 2014-based Territorial Population and Employment Data Matrix published by Planning Department for Kowloon City are summarised in the following **Table 5.5** and **Table 5.6** respectively. The corresponding growth factors between years are presented in **Table 5.7**.

Table 5.5: 2014-based Territorial Population and Employment Data Matrix for the period from Year 2014 to 2026

| Zone | Population | | |
|--------------|------------|--------|--------|
| | 2014 | 2021 | 2026 |
| Kowloon City | 414750 | 440200 | 432550 |

Table 5.6: 2014-based Territorial Population and Employment Data Matrix for the period from Year 2014 to 2026

| Zone | Employment | | |
|--------------|------------|--------|--------|
| | 2014 | 2021 | 2026 |
| Kowloon City | 209100 | 234200 | 237150 |

Table 5.7: Growth Factor derived from 2014-based Territorial Population and Employment Data Matrix for the period from Year 2014 to 2026

| Zone | Annual Growth Rate 2014/2026 | | |
|--------------|------------------------------|------------|----------|
| | Population | Employment | Weighted |
| Kowloon City | 0.4% | 1.1% | 0.6% |

5.2.4 Traffic flow data for the Year 2008, 2016 and 2021 of the main roads within the study area were extracted from the 2008 based BDTM for derivation of growth factors for future years. The corresponding traffic flow data among the main roads in the vicinity of study area are summarized in **Table 5.8** as shown below.

Table 5.8: Growth Factors deriving from 2008 BDTM flow Data between Year 2008 and 2021

| Location | 2008 | | 2016 | | 2021 | | 2008/2016 | | 2016/2021 | |
|--|------|------|------|------|------|------|-----------|-------|-----------|-------|
| | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM |
| Chatham Road North (Between San Lau Street & Chi Kiang Street) | 1490 | 1600 | 1394 | 1563 | 1395 | 1597 | -0.8% | -0.3% | 0.0% | 0.4% |
| | 1507 | 976 | 1112 | 996 | 1114 | 1001 | -3.7% | 0.3% | 0.0% | 0.1% |
| Ma Tau Wai Road (Between Hok Yuen Street & Bailey Street) | 842 | 721 | 886 | 798 | 903 | 814 | 0.6% | 1.3% | 0.4% | 0.4% |
| | 909 | 733 | 847 | 801 | 856 | 805 | -0.9% | 1.1% | 0.2% | 0.1% |
| To Kwa Wan Road(Between Bailey Street & Kai Ming Street) | 600 | 568 | 716 | 757 | 743 | 778 | 2.2% | 3.7% | 0.7% | 0.5% |
| | 1491 | 1223 | 1399 | 1357 | 1420 | 1348 | -0.8% | 1.3% | 0.3% | -0.1% |
| East Kowloon Corridor (Between Bailey Street & Kai Ming Street) | 2952 | 3092 | 2712 | 2649 | 3201 | 2621 | -1.1% | -1.9% | 3.4% | -0.2% |
| | 2450 | 1670 | 1802 | 1569 | 1962 | 1880 | -3.8% | -0.8% | 1.7% | 3.7% |
| Bailey Street(Between Ma Tau Wai Road & Sung On Street) | 378 | 384 | 396 | 420 | 405 | 437 | 0.6% | 1.1% | 0.5% | 0.8% |
| | 599 | 917 | 441 | 697 | 445 | 737 | -3.8% | -3.4% | 0.2% | -3.4% |
| Hok Yuen Street (Between Ma Tau Wai Road & Sung On Street) | 231 | 277 | 258 | 376 | 271 | 398 | 1.4% | 3.9% | 1.0% | 1.1% |
| Ko Shan Road(Between San Lau Street & Chi Kiang Street) | 275 | 289 | 274 | 288 | 274 | 288 | 0.0% | 0.0% | 0.0% | 0.0% |
| | 215 | 216 | 209 | 212 | 205 | 210 | -0.4% | -0.2% | -0.4% | -0.2% |
| Overall Average | | | | | | | -0.2% | | 0.4% | |

5.2.5 The AADT data for Year 2005 to 2015 of the main roads within the study area have been extracted from ATC and the data are summarized in **Table 5.9**. The corresponding average annual growth factors between 2005 and 2015 are shown in **Table 5.10**.

Table 5.9: AADT Data Extracted from ATC for Year 2005 to 2015

| Location | Station No. | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Ma Tau Wai Rd & To Kwa Wan Rd (San Lau St & Bailey St & Chi Kiang St) | 3014 | 24440 | 24080 | 23750 | 22630 | 21580 | 22740 | 23830 | 24320 | 23420 | 26640 | 23980 |
| Chatham Rd N (Between San Lau St & Wo Chung St) | 3412 | 38510 | 38450 | 38390 | 37550 | 36820 | 36730 | 37040 | 36500 | 36410 | 31600 | 30950 |
| Wuhu St (between Gillies St & Chatham Rd N) | 3448 | 14290 | 14270 | 14240 | 13930 | 13720 | 14730 | 14850 | 15120 | 14740 | 14160 | 12180 |
| Shung Yung St & Pak Kung St (between Fat Kwong St & Chatham Rd N) | 3449 | 12480 | 12460 | 12440 | 12170 | 13090 | 12580 | 12820 | 12820 | 12710 | 11430 | 12720 |
| Fat Kwong St (between Sheung Shing St & Chung Hau St) | 3649 | 16970 | 16950 | 16930 | 16550 | 16250 | 16430 | 16050 | 16060 | 15920 | 15620 | 16400 |
| Chi Kiang St (To Kwa St to Ma Tau Wai Rd) | 3654 | 10570 | 10360 | 10340 | 10120 | 9930 | 9980 | 8920 | 9080 | 8850 | 8960 | 8880 |
| Chatham Rd N (Wuhu St to Hong Chong Rd) | 4208 | 131610 | 130470 | 134340 | 118420 | 120080 | 116300 | 120490 | 113000 | 116410 | 113010 | 113540 |
| Fat Kwong St (Chung Hau St to Yan Fung St) | 4211 | 22480 | 22010 | 21700 | 21380 | 20980 | 20970 | 21610 | 20600 | 20610 | 20640 | 20740 |
| Chatham Rd N & Ma Tau Wai Rd (Between San Lau St to Chi Kiang St) | 4212 | 36160 | 36190 | 37390 | 35410 | 33990 | 34960 | 34180 | 34730 | 34060 | 34900 | 35130 |
| East Kowloon Corridor <FO> (Ma Tau Kok Rd to Chatham Rd N) | 4213 | 75280 | 74000 | 74450 | 72810 | 72170 | 74710 | 76090 | 76880 | 76930 | 77910 | 74070 |
| Total | | 382790 | 379240 | 383970 | 360970 | 358610 | 360130 | 365880 | 359110 | 360060 | 354870 | 348590 |

Table 5.10: Growth Factor from ATC between Year 2005 and 2015

| Location | Station No. | 2005/2006 | 2006/2007 | 2007/2008 | 2008/2009 | 2009/2010 | 2010/2011 | 2011/2012 | 2012/2013 | 2013/2014 | 2014/2015 |
|---|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Ma Tau Wai Rd & To Kwa Wan Rd (San Lau St & Bailey St & Chi Kiang St) | 3014 | -1.5% | -1.4% | -4.7% | -4.6% | 5.4% | 4.8% | 2.1% | -3.7% | 13.7% | 10.0% |
| Chatham Rd N (Between San Lau St & Wo Chung St) | 3412 | -0.2% | -0.2% | -2.2% | -1.9% | -0.2% | 0.8% | -1.5% | -0.2% | 13.2% | -2.1% |
| Wuhu St (between Gillies St & Chatham Rd N) | 3448 | -0.1% | -0.2% | -2.2% | -1.5% | 7.4% | 0.8% | 1.8% | -2.5% | -3.9% | 14.0% |
| Shung Yung St & Pak Kung St (between Fat Kwong St & Chatham Rd N) | 3449 | -0.2% | -0.2% | -2.2% | 7.6% | -3.9% | 1.9% | 0.0% | -0.9% | 10.1% | 11.3% |
| Fat Kwong St (between Sheung Shing St & Chung Hau St) | 3649 | -0.1% | -0.1% | -2.2% | -1.8% | 1.1% | -2.3% | 0.1% | -0.9% | -1.9% | 5.0% |
| Chi Kiang St (To Kwa Street to Ma Tau Wai Road) | 3654 | -2.0% | -0.2% | -2.1% | -1.9% | 0.5% | 10.6% | 1.8% | -2.5% | 1.2% | -0.9% |
| Chatham Rd N (Wuhu St to Hong Chong Rd) | 4208 | -0.9% | 3.0% | 11.9% | 1.4% | -3.1% | 3.6% | -6.2% | 3.0% | -2.9% | 0.5% |
| Fat Kwong St (Chung Hau St to Yan Fung St) | 4211 | -2.1% | -1.4% | -1.5% | -1.9% | 0.0% | 3.1% | -4.7% | 0.0% | 0.1% | 0.5% |
| Chatham Rd N & Ma Tau Wai Rd (San Lau St to Chi Kiang St) | 4212 | 0.1% | 3.3% | -5.3% | -4.0% | 2.9% | -2.2% | 1.6% | -1.9% | 2.5% | 0.7% |
| East Kowloon Corridor <FO> (Ma Tau Kok Rd to Chatham Rd N) | 4213 | -1.7% | 0.6% | -2.2% | -0.9% | 3.5% | 1.8% | 1.0% | 0.1% | 1.3% | -4.9% |
| Total | | -0.9% | 1.2% | -6.0% | -0.7% | 0.4% | 1.6% | -1.9% | 0.3% | -1.4% | -1.8% |

5.2.6 **Table 5.10** has shown the growth rates deriving from ATC Data in the vicinity of study area in between 2005 and 2015. The overall average growth rate would be -0.85% per annum. **Table 5.7** has illustrated growth rate based on the 2014 Based TPEDM data in between 2014 and 2026. **Table 5.8** has illustrated growth rate based on the BDTM traffic flows in between 2016 and 2021. These results

have revealed that growth rate of 0.6% deriving from TPEDM traffic flows is greater than growth rate 0.4 % deriving from BDTM. It is therefore decided to adopt a growth factor of 0.6% as a conservative approach for future traffic forecasting. Therefore, the growth factors for 2023 and 2028 years are 1.037 and 1.068 respectively.

6.0 Traffic Impact Assessment

- 6.1.1 There is currently MTR project under construction within the vicinity and temporary traffic arrangement of temporary traffic diversion of Ma Tau Wai Road and Chatham Road North had been implemented on site now. The traffic pattern of the nearby road network would be different to the traffic pattern without the temporary traffic arrangement implemented by the MTR project. In order to forecast the traffic flow of year 2023 and 2028 without the temporary traffic diversion scheme implemented by the MTR project, the surveyed traffic flow on year 2017 along Ko Shan Road, Kau Pui Lung Road, Chatham Road North and Ma Tau Wai Road had been redistributed based on the surveyed traffic flow of year 2012 before commencement of the MTR project provided by MTR. The modified traffic flow of year 2017 is shown on **FIGURE 2-1** in **Appendix A**. The traffic flow of the nearby road network of year 2012 before commencement of the MTR project extracted from the CTIA report of MTR project was shown on **Appendix C**. By incorporating the traffic growth rate with the modified traffic flow of year 2017, the based traffic flow for the year of 2023 and 2028 are determined and are shown in **FIGURES 3 & 4** in **Appendix A** respectively.
- 6.1.2 The junction capacity of the concerned road junctions for year 2023 and 2028 without development are listed on **Tables 6.1** below. Details of the junction capacity analysis are shown in **Appendix B**.

Table 6.1 Summary of junction capacity of concerned junction without the Proposed Development (Year 2023 & 2028)

| Year | | | 2023 RC / DFC | | 2028 RC / DFC | |
|--------------|---|---------------|------------------|------|------------------|------|
| Junction No. | Junction | Junction Type | AM | PM | AM | PM |
| A | Sheung Shing Street /Tin Kwong Road | Signalised | 48% | 71% | 44% | 66% |
| B | Kau Pui Lung Road/Tin Kwong Road | Priority* | 0.48 | 0.37 | 0.50 | 0.39 |
| C | Ma Tau Wai Road/Ma Hang Chung Road /Tin Kwong Road | Signalised | 9% | 10% | 6% | 7% |
| D | Lok Shan Road / Ma Tau Wai Road | Signalised | 117% | 130% | 111% | 123% |
| E | Chi Kiang Street / Ko Shan Road | Priority | 0.36 | 0.32 | 0.37 | 0.33 |
| F | Ma Tau Wai Road / Chi Kiang Street | Signalised | 38% | 25% | 34% | 21% |
| G | Chi Kiang Street / To Kwa Wan Road | Signalised | 36% | 44% | 33% | 40% |
| H | Kiang Hsi Street / Ko Shan Road | Signalised | 97% | 93% | 91% | 87% |
| I | Chatham Road North / San Lau Street | Signalised | 87% | 68% | 82% | 63% |
| J | Bailey Street / Ma Tau Wai Road | Signalised | 13% | 16% | 9% | 13% |
| K | Ko Shan Road / Pak Kung Street | Priority | 0.12 | 0.15 | 0.13 | 0.15 |
| L | Chatham Road North / Pak Kung St | Signalised | 122% | 109% | 116% | 103% |
| M | Kiang Hsi Street / Chatham Road North | Priority | 0.47 | 0.55 | 0.50 | 0.59 |
| N | Shan Si Street / Chatham Road North | Priority | 0.08 | 0.08 | 0.09 | 0.09 |
| O | Ko Shan Road / Shan Si Street | Priority | 0.06 | 0.05 | 0.06 | 0.06 |
| P | Fat Kwong Street / Shun Yung Street / Yan Fung Street | Signalised | 19% | 27% | 16% | 23% |

*Junction B is currently a temporary signalized junction modified under the MTR project during construction and this would be reverted to the original priority junction after the completion of the MTR project before 2023.

6.1.3 The results of the junction capacity analysis for the concerned junctions without the Proposed Development under the considerations of AM and PM Peaks have shown that most of the concerned junctions would be operating at a satisfactory level in Years of 2023 and 2028 except for the junction of Ma Tau Wai Road/Ma Hang Chung Road /Tin Kwong Road. The RCs of this particular junction are 9% and 11% in AM and PM Peaks respectively in year 2023. Similarly, the junction analysis reveals that the RCs of this particular junction are 7% and 8% in AM and PM Peaks respectively in year 2028. These RCs indicates that the junction would experience some delays during peak hours even if there would be no development in the future.

- 6.1.4 Furthermore, Junction of Kau Pui Lung Road/Tin Kwong Road is currently a signalised junction under the construction of Shatin Central Railway in the vicinity of study. The setting up of the traffic signal of the captioned junction on site now is a temporary signal arrangement. Based on the information on the previous SLG meeting of the MTR project, the captioned signalised junction arrangement is a temporary traffic arrangement for diversion of the traffic on Ma Tau Wai Road during the construction. This particular would be resumed to priority junction after the completion of the MTR project before 2023 and it is therefore reasonable to assess this particular junction as a priority junction for years of 2023 and 2028.
- 6.1.5 The traffic flow generated from the proposed Development were incorporated into the road network for the year of 2023 and 2028 which are shown in **FIGURES 5 and 6** of **Appendix A** respectively.
- 6.1.6 The junction capacity of the concerned junctions with development for year 2023 and 2028 are shown in the **Table 6.2** below. Details of the junction capacity analysis are shown in **Appendix B**.

Table 6.2: Summary of junction capacity of concerned junction with the proposed development (Year 2023 & 2028)

| Year | | | 2023 | | 2028 | |
|--------------|---|---------------|------|------|------|------|
| Junction No. | Junction | Junction Type | AM | PM | AM | PM |
| A | Sheung Shing St /Tin Kwong Road | Signalised | 47% | 70% | 43% | 65% |
| B | Kau Pui Lung Rd/Tin Kwong Road | Priority | 0.49 | 0.38 | 0.50 | 0.40 |
| C | Ma Tau Wai Road/Ma Hang Chung Road /Tin Kwong Road | Signalised | 8% | 10% | 6% | 8% |
| D | Lok shan Road / Ma Tau Wai Road | Signalised | 116% | 129% | 110% | 122% |
| E | Chi Kiang Street / Ko Shan Road | Priority | 0.37 | 0.33 | 0.38 | 0.34 |
| F | Ma Tau Wai Road / Chi Kiang St | Signalised | 37% | 25% | 33% | 21% |
| G | Chi Kiang St / To Kwa Wan Road | Signalised | 35% | 44% | 31% | 39% |
| H | Kiang Hsi Street / Ko Shan Road | Signalised | 91% | 88% | 85% | 83% |
| I | Chatham Rd North / San Lau St | Signalised | 86% | 66% | 80% | 61% |
| J | Bailey Street / Ma Tau Wai Road | Signalised | 12% | 15% | 9% | 12% |
| K | Ko Shan Road / Pak Kung Street | Priority | 0.15 | 0.18 | 0.15 | 0.18 |
| L | Chatham Rd North / Pak Kung St | Signalised | 119% | 109% | 113% | 103% |
| M | Kiang Hsi Street / Chatham Road North | Priority | 0.48 | 0.56 | 0.51 | 0.60 |
| N | Shan Si Street / Chatham Road North | Priority | 0.17 | 0.15 | 0.18 | 0.16 |
| O | Ko Shan Road / Shan Si Street | Priority | 0.08 | 0.09 | 0.08 | 0.09 |
| P | Fat Kwong Street / Shun Yung Street / Yan Fung Street | Signalised | 17% | 26% | 14% | 22% |

*Junction B is currently a temporary signalized junction modified under the MTR project during construction and this would be reverted to the original priority junction after the completion of the MTR project before 2023.

6.1.7 The results of the junction capacity analysis with the proposed development have shown that most of the concerned junctions would be operating within capacity during AM and PM Peaks in 2023 and 2028. However, the junction of Ma Tau Wai Road/Ma Hang Chung Road /Tin Kwong Road would be operating with slight delays during peak hours for the years 2023 and 2028.

6.1.8 Noticeably, the results of the junction capacity analysis among all concerned junctions reveal that there would be insignificant differences in terms of junction



capacities under the considerations with and without development in the tentative completion year of 2023 and the design year of 2028. These junctions assessment may conclude that the proposed development would not inflict adverse traffic impact to the existing road network in the study area.

6.1.9 Part of the traffic flow along Ma Tau Wai Road and Chatham Road North had been diverted to Ko Shan Road and Kau Pui lung Road during implementation of the temporary traffic diversion scheme by the MTR project in year 2017. The traffic flow pattern will be reverted to the original pattern so the overall traffic flow along Ko Shan Road and Kau Pui Lung Road in years 2023 and 2028 had been dropped for both with and without the proposed development and the junction capacity of the junctions E, F and K is therefore improved. For Junction O, the critical traffic flow of the right turning from Ko Shan Road northbound onto Shan Si Street did not affected by the temporary traffic diversion scheme implemented by MTR project. Therefore, no improvement will be resulted at the junction capacity in years 2023 and 2028 for both with and without the proposed development.

6.1.10 There is a driving test centre at Tin Kwong Road. The nearby road network of Tin Kwong Road, Sheung Shing Street, Ma Tau Wai Road and Farm Road are the examination routes for learner drivers. Based on the results of the traffic forecast and junction capacity analysis presented in the previous sections, there is no significant increase in the traffic flow of the nearby road network and no significant difference in terms of the junction capacities for the nearby road junctions before and after the proposed development. Therefore, no adverse impact will be imposed to the safety of the learner drivers after the completion of the proposed development.

7.0 Pedestrian Traffic Impact Assessment

7.1 Existing Pedestrian Condition

7.1.1 In order to assess the condition of the footpaths and pedestrian crossings, it is essential to collect the latest pedestrian flow information in the vicinity of the study area for before and after the completion of the proposed development. The pedestrian surveys have been conducted between the hours 0700 and 1900 within the period from 28 February to 3 March 2017 for the concerned signalised pedestrian crossing and the footpath close to the subject site. The locations of pedestrian surveys are shown in **Figure 7** of **Appendix A**. Based on the surveyed data, it was observed that the peak hour of the pedestrian fall within 07:30 and 08:30 in the morning.

7.1.2 The level of service (LOS) analysis of the footpath close to the subject sites are carried out in accordance with TPDM Volume 6 Clauses 10.4.2.3. In general, LOS C is desirable for most design at streets with dominant 'living' pedestrian activities. For LOS D, the freedom to select individual walking speeds and bypass other pedestrians will be restricted. For the purpose of the pedestrian assessment of this TIA report, LOS of C or above would be adopted as the acceptable level and mitigation measure would be proposed for LOS D or below. Summary of the LOS of the footpath close to the subject sites are shown in **Table 7.1** below.

Table 7.1: Summary of LOS of footpath close to the subject sites in 2017

| Footpath | Peak 5 min Pedestrian Flow (no. of ped.) | Clear Width (m) | Flow Rate (ped/m/min) | LOS |
|----------|--|-----------------|-----------------------|-----|
| 1 | 30 | 2.0 | 3.0 | A |
| 2 | 40 | 1.5 | 5.3 | A |
| 3 | 33 | 1.2 | 5.5 | A |
| 4 | 55 | 0.9 | 12.2 | A |
| 5 | 62 | 1.5 | 8.3 | A |
| 6 | 58 | 2.0 | 5.8 | A |
| 7 | 41 | 2.7 | 3.0 | A |
| 8 | 56 | 2.8 | 4.0 | A |
| 9 | 73 | 2.5 | 5.8 | A |
| 10 | 70 | 2.3 | 6.1 | A |
| 11 | 48 | 1.9 | 5.1 | A |
| 12 | 114 | 2.3 | 9.9 | A |
| 13 | 156 | 2.0 | 15.6 | A |
| 14 | 212 | 1.7 | 24.9 | C |
| 15 | 162 | 2.9 | 11.2 | A |
| 16 | 141 | 2.8 | 10.1 | A |
| 17 | 173 | 3.1 | 11.2 | A |

- 7.1.3 The results of the LOS indicate that the footpaths close to the subject sites are generally operated with a satisfactory of LOS.
- 7.1.4 For the signalised pedestrian crossing, the analysis of the volume to capacity (V/C) ratio has been carried out in accordance to the capacities as defined in TPDM Volume 4. Summary of the VC ratios of the concerned pedestrian crossings are shown in **Table 7.2** below.

Table 7.2: Summary of V/C Ratio of Signalised Pedestrian Crossing of the concerned junctions in 2017

| Pedestrian Crossing | Peak 5 min Pedestrian Flow (no. of ped.) | Cycle Time (sec) | Pedestrian Green Time (sec) | Clear Width (m) | Pedestrian Capacity (ped/h) | V/C Ratio |
|---------------------|--|------------------|-----------------------------|-----------------|-----------------------------|-----------|
| 18 | 122 | 130 | 30 | 5.0 | 2192 | 0.67 |
| 19 | 92 | 130 | 30 | 4.0 | 1754 | 0.63 |

- 7.1.5 The results of the LOS indicate that the footpaths close to the subject sites are operating with a satisfactory of LOS.

7.2 Future Pedestrian Condition

- 7.2.1 The pedestrian generated by the proposed public housing development is estimated by the pedestrian trip rate from the pedestrian count of the similar type of public housing of the existing Block 2 of Jubilant Place. The estimate pedestrian flow generated by the development is shown on **Table 7.3** below.

Table 7.3: Pedestrian Flow Generated from the Proposed Development During Morning Peak

| Development Type | Unit | Generation | Attraction |
|------------------|---------------|------------|------------|
| Residential | Person/h/flat | 0.708 | 0.222 |
| Total | | 354 | 111 |

*Remark: the figure shown on Table 7.3 above was based on 500 no. of flats and allowance of additional 10% increase in development scale was incorporated in the analysis in the following section.

- 7.2.2 The movement of the pedestrian generated by the proposed public housing development is estimated by on site observation. Also, Shatin Central Link will be operated before the completion of the proposed public housing development. One of the EXIT of the proposed Ma Tau Wai MTR Station will be located at Ma Tau Wai Road southbound near Chi Kiang Street. Most of the pedestrian would likely to walk towards Ma Tau Wai Station during the peak hours. It is therefore reasonable to assume that 60% of the subject site residents would likely to walk

to/from the MTR Station and the other 40% would likely to use franchised bus services along Chatham Road North and Ma Tau Wai Road. The pedestrian routing due to the proposed public housing development is shown in **Figure 7 of Appendix A**.

7.2.3 In order to assess the pedestrian condition in the design year of 2028, a nominal growth rate of 1% per annual will be applied to the pedestrian flow. The surrounding area of the subject sites are relatively well developed, 1% growth rate is considered appropriate in traffic view point. Based on these forecast flow, the LOS of the footpath nearby and the VC ratio of the pedestrian crossing are summarized in Tables 6.4 and 6.5 respectively. According to the requirement of Hong Kong Housing Authority, allowance of additional 10% increase in development scale was incorporated for design flexibility and as shown in **Tables 7.4 and 7.5**.

Table 7.4: Summary of LOS of footpath close to the subject site of Year 2028

| Footpath | Peak 5 min Pedestrian Flow (no. of ped.) | Clear Width (m) | Flow Rate (ped/m/min) | LOS |
|----------|--|-----------------|-----------------------|-----|
| 1 | 34 | 2.0 | 3.4 | A |
| 2 | 83 | 1.5 | 11.1 | A |
| 3 | 37 | 1.2 | 6.2 | A |
| 4 | 63 | 0.9 | 13.9 | A |
| 5 | 70 | 1.5 | 9.3 | A |
| 6 | 87 | 2.0 | 8.7 | A |
| 7 | 48 | 2.7 | 3.5 | A |
| 8 | 64 | 2.8 | 4.6 | A |
| 9 | 80 | 2.5 | 6.4 | A |
| 10 | 76 | 2.3 | 6.6 | A |
| 11 | 55 | 1.9 | 5.8 | A |
| 12 | 130 | 2.3 | 11.3 | A |
| 13 | 170 | 2.0 | 17.0 | B |
| 14 | 242 | 1.7 | 28.5 | C |
| 15 | 176 | 2.9 | 12.2 | A |
| 16 | 152 | 2.8 | 10.8 | A |
| 17 | 190 | 3.1 | 12.3 | A |

**Table 7.5:** Summary of V/C Ratio of Signalised Pedestrian Crossing of the concerned junctions of Year 2028

| Pedestrian Crossing | Peak 5 min Pedestrian Flow (no. of ped.) | Cycle Time (sec) | Pedestrian Green Time (sec) | Clear Width (m) | Pedestrian Capacity (ped/h) | V/C Ratio |
|---------------------|--|------------------|-----------------------------|-----------------|-----------------------------|-----------|
| 18 | 151 | 130 | 30 | 5.0 | 2192 | 0.83 |
| 19 | 106 | 130 | 30 | 4.0 | 1754 | 0.73 |

7.2.4 The results of the LOS as shown in Table 6.5 for pedestrian crossings 18 and 19 showing that those crossings would be operating at a satisfactory level even with the additional pedestrian generated from the proposed development. This analysis may conclude that the additional pedestrian traffic would not exert adverse traffic impact onto the vicinity of study road network in Year 2028.

8.0 Provision of Parking Facilities and Site Access

8.1.1 Table 8.1 shows the proposed parking and loading/ unloading requirements and for the proposed development with reference to DCMBI No. P13/12 under the Interim Parking Standards for the New Home Ownership Scheme (HOS) Projects by Hong Kong Housing Authority which is equivalent to TD's Departmental Circular No. 2/2012 under the same title. The higher end of the provision for parking and loading/unloading are adopted for the subject development.

Table 8.1: Parking and Loading / Unloading Provision

| Parking and Servicing Facilities | Provision in accordance to HKHA DCMBI No. P13/12 (nos.) | Required numbers of facilities based on DCMBI No. P13/12 | Proposal based on upper bound (nos.) |
|---|---|--|--|
| Private Car Parking | <ul style="list-style-type: none"> - 1 private car parking space per 15 (for worst case scenario) to 22 flats for New HOS within 500m radius of rail station; - 2 to 3 (worst case scenario) visitor parking spaces per residential block - 1 assessable car parking spaces per 1 to 50 car parking space in the lot | Min = 24 Max = 35 including one disabled parking | 35 (including 32 parking spaces for residents and 3 for visitors in which one of the parking spaces for residents shall be an accessible parking space) |
| Motorcycle Parking | 1 space per 110 flats | 4 | 4 |
| Loading / unloading bay (Complying the heavy goods vehicle standard i.e. size of 11m x 3.5m x 4.7m headroom) | 1 bay per residential block | 1 | 1 |

* Above calculation is based on current proposed 483 flat number. Exact number of provision to be confirmed upon the flat number is finalized.

8.1.2 In addition, a public vehicle park (PVP) is proposed for Ko Shan Road Development. The proposed PVP would provide parking spaces for 11 LGVs and

5 private cars although the conservative assumption with parking spaces of 15 LGVs and 5 private cars in total was adopted for the technical assessment.

- 8.1.3 Two separate run in-outs are proposed for vehicular flow of the subject site. The proposed run in-out at Ko Shan Road will serve residents whereas another proposed run in-out at Shan Si Street will be used for the separate public vehicle park. The "left in - left out" traffic management measure is proposed at the vehicular access for residents at Ko Shan Road to stop the vehicular flow crossing the lanes outside the access. A "Turn Left" road signage facing the vehicular access at Ko Shan Road is proposed to allow outgoing vehicular flow along the southbound only. Traffic cylinders along the center line between the two way lanes outside the vehicular access of Ko Shan Road are proposed to avoid the vehicles turning right from northbound of Ko Shan Road to the proposed development. These proposed site accesses and traffic management measures are shown in **FIGURE 8** of **Appendix A**.



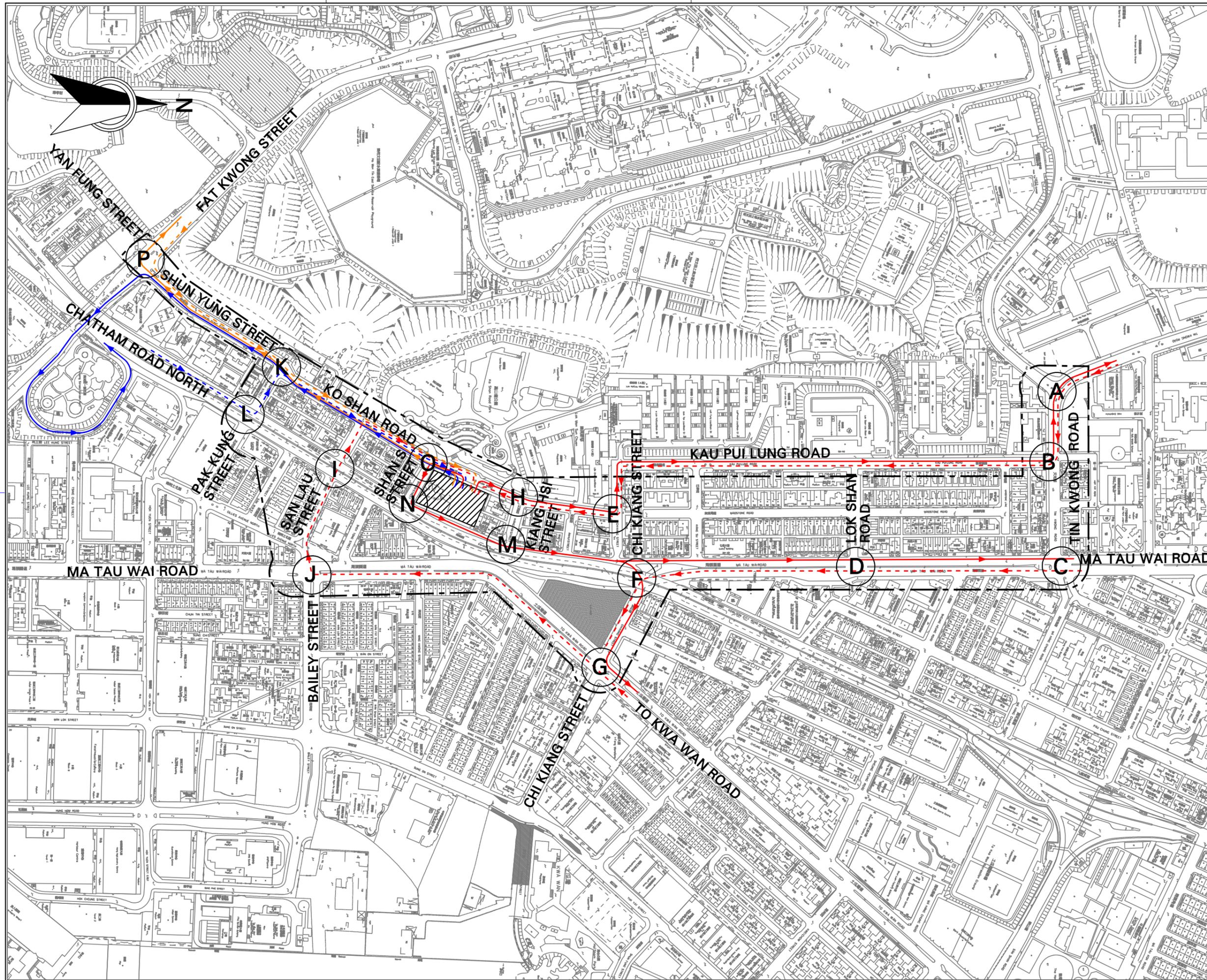
9.0 Summary & Conclusion

- 9.1.1 The Hong Kong Housing Authority (HKHA) intends to develop the site at Ko Shan Road into Subsidised Sale Flats (SSF) Development. Mannings (Asia) Consultants Ltd has been commissioned by HKHA under the Agreement No. CB20150689 to undertake the Traffic Impact Assessment (TIA) for the proposed development of Subsidised Sale Flats.
- 9.1.2 The main objective of this TIA study is to demonstrate that the proposed development would not generate adverse impact to the existing road networks. Mitigation measure would be proposed in order to alleviate any potential impact arise from the proposed development in the vicinity of road networks.
- 9.1.3 The results of the junction capacity analysis indicate that most of the concerned junctions would be operating at a satisfactory level with additional traffic generated from the development in the vicinity of study area.
- 9.1.4 The nearby road network of the proposed development is one of the examination routes for the learner drivers. With reference to the junction capacity assessment, there is no significant increase in traffic flow for the nearby road network due to the proposed development. Therefore, the proposed development will not impose any adverse impact to the safety for the learner drivers due to the proposed development.
- 9.1.5 Pedestrian traffic impact assessment has also been carried out for the existing traffic condition and future traffic condition for the design year of 2028 under both scenarios with and without the proposed development. The LOS and V/C ratio of the footpath and pedestrian crossing have been carried out to identify any adverse impact due to the proposed development.
- 9.1.6 The results of LOS and V/C ratio indicate that the footpaths and pedestrian crossing can operate at a satisfactory level with the proposed development.
- 9.1.7 The provision of car parking and loading/unloading bay with reference to DCMBI No. P13/12 Interim Parking Standards for the New Home Ownership Scheme (HOS) Projects by Hong Kong Housing Authority which is equivalent to TD's Departmental Circular No. 2/2012 under the same title is proposed and detailed in Section 8. In addition, a public vehicle park (PVP) is proposed for Ko Shan Road Development. The proposed PVP would provide parking spaces for 11 LGVs and 5 private cars although the conservative assumption with parking spaces of 15 LGVs and 5 private cars in total was adopted for the technical assessment.

- 9.1.8 Consequently, two separate run in-outs are proposed for the subject site. One run in-out located in Ko Shan Road is for residents and the other proposed run in-out in Shan Si Street is for public vehicle park. These run in-outs are shown in **FIGURE 8** of **Appendix A**
- 9.1.9 This Traffic Impact Assessment may conclude that the proposed Subsidised Sale Flats (SSF) would not inflict adverse traffic impact in both road network and pedestrian facilities in the vicinity of study area.

APPENDIX A

FIGURES



- LEGENDS :**
-  PROPOSED SITE
 -  CRITICAL JUNCTION
 -  STUDY BOUNDARY
 -  TRAFFIC ROUTING FROM EASTERN DISTRICT
 -  TRAFFIC ROUTING TOWARDS EASTERN DISTRICT
 -  TRAFFIC ROUTING FROM WESTERN & NORTHERN DISTRICT
 -  TRAFFIC ROUTING TOWARDS WESTERN & NORTHERN DISTRICT
 -  TRAFFIC ROUTING FROM WESTERN DISTRICT & HK
 -  TRAFFIC ROUTING TOWARDS WESTERN DISTRICT & HK

| | | | | |
|------|---|---|--------|------|
| Rev. | A | Additional junctions and routing showed | JUN 17 | BF |
| | | Description of Revision | Date | Ckd. |

Client
 HONG KONG HOUSING AUTHORITY

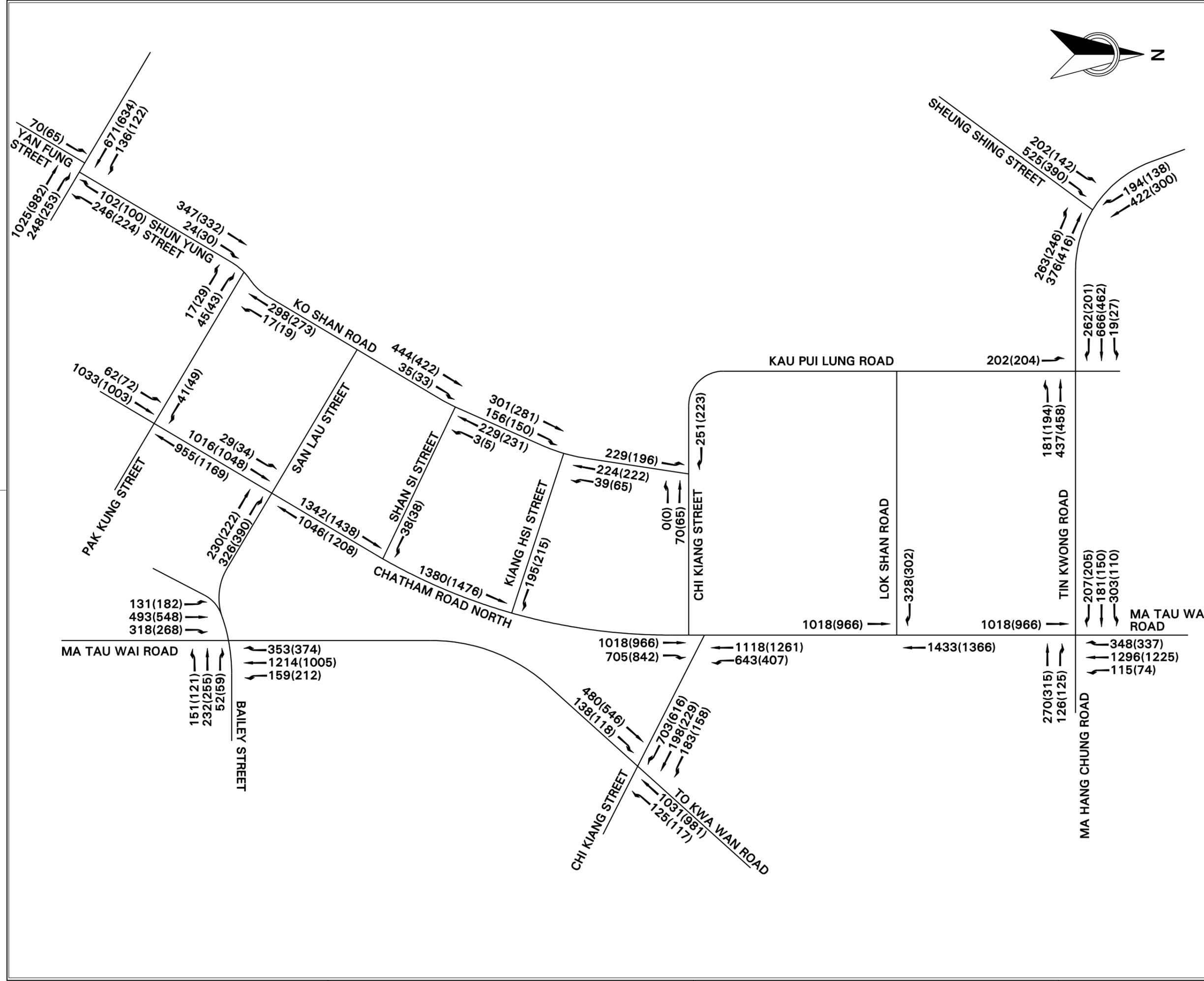
Consultants
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| Scale in A3 | 1:4000 | Date | FEB 2017 |
| Designed | LC | Drawn | ACS |
| Design Team Leader | WS | Checked | BF |
| Approved | KTC | Date | FEB 2017 |

Project
 HKHA TERM ENGINEERING CONSULTANCY SERVICES 2016-2018 FOR KOWLOON CENTRAL & WEST AND ISLANDS REGION

Title
 SITE LOCATION AND CRITICAL JUNCTION PLAN

| | | | | | |
|-------------|----------|-------|---|------|---|
| Drawing No. | FIGURE 1 | Stage | P | Rev. | A |
|-------------|----------|-------|---|------|---|



LEGENDS :
 123(456) — Traffic Flow of PM Peak
 ——— Traffic Flow of AM Peak

| Rev. | Description of Revision | Date | Ckd. |
|------|-------------------------|------|------|
| | | | |

Client
 HONG KONG HOUSING AUTHORITY

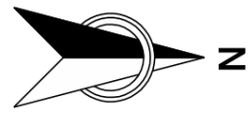
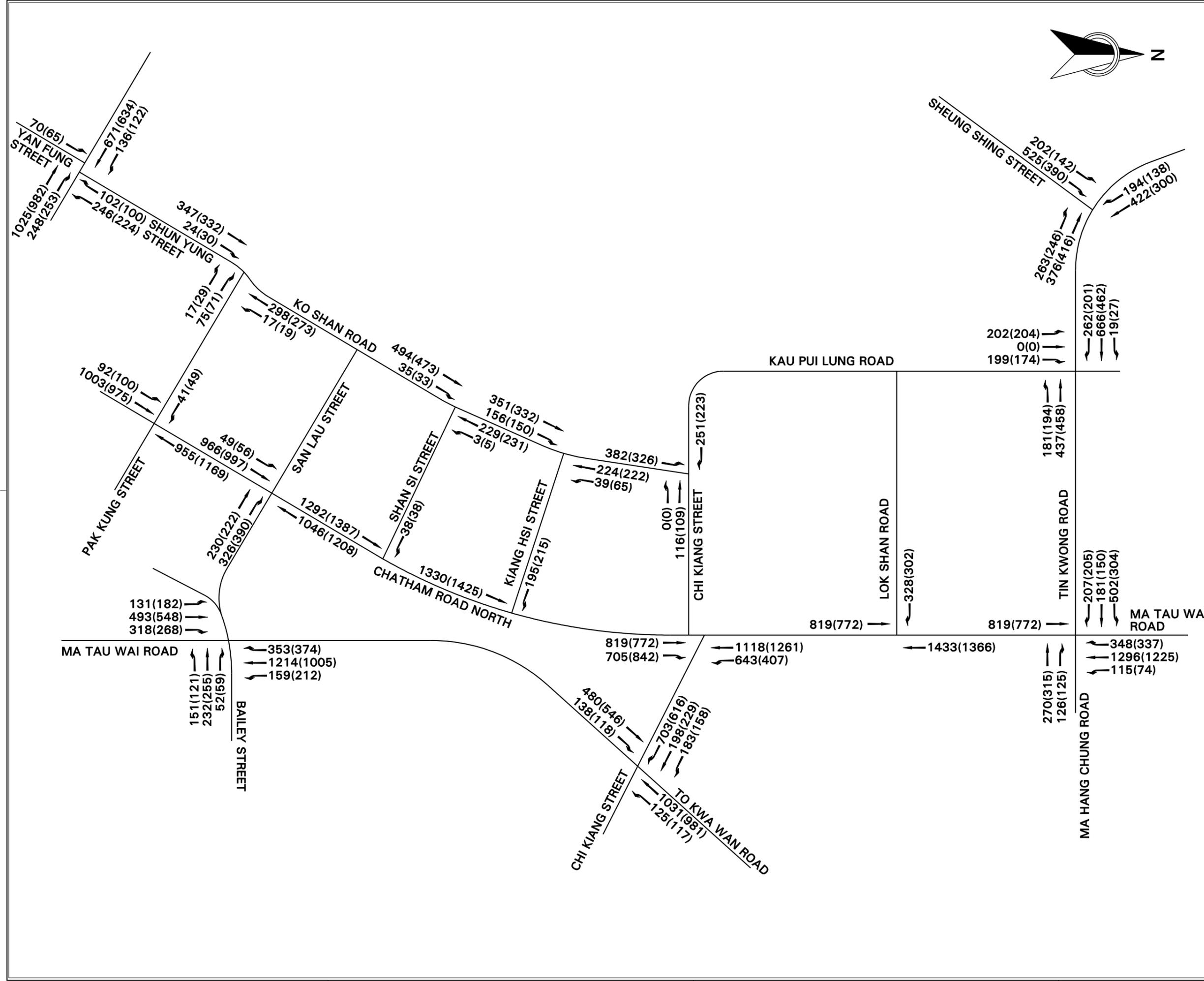
Consultants
 MANNINGS (Asia) Consultants Limited

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|--------------------------|------------------|---------------|
| Scale in A3 N.T.S. | Date FEB 2017 | |
| Designed LC | Drawn ACS | Checked BF |
| Design Team Leader WS | Date FEB 2017 | |
| Approved KTC | Date FEB 2017 | |

Project
 HKHA TERM ENGINEERING CONSULTANCY SERVICES 2016-2018 FOR KOWLOON CENTRAL & WEST AND ISLANDS REGION

Title
 MODIFIED TRAFFIC FLOW OF YEAR 2017

| | | |
|---------------------------|------------|----------|
| Drawing No. FIGURE 2-1 | Stage P | Rev. |
|---------------------------|------------|----------|



LEGENDS :
 123(456) — Traffic Flow of PM Peak
 ——— Traffic Flow of AM Peak

| Rev. | Description of Revision | Date | Ckd. |
|------|-----------------------------|--------|------|
| A | Additional junctions showed | JUN 17 | BF |

Client
 HONG KONG HOUSING AUTHORITY

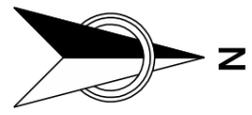
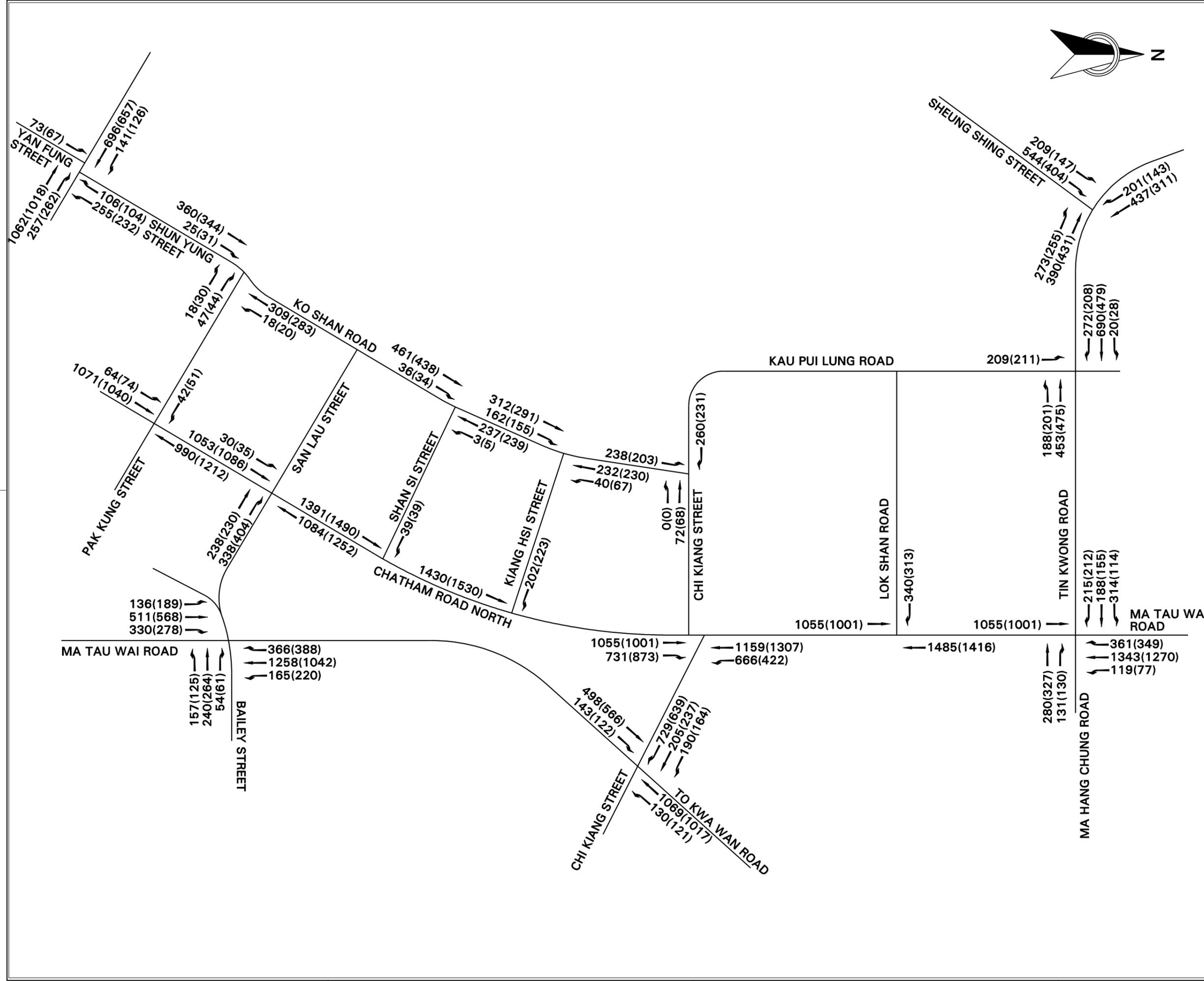
Consultants
 MANNINGS (Asia) Consultants Limited

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| N.T.S. | | FEB 2017 | |
| Designed | Drawn | Checked | |
| LC | ACS | BF | |
| Design Team Leader | | Date | |
| WS | | FEB 2017 | |
| Approved | | Date | |
| KTC | | FEB 2017 | |

Project
 HKHA TERM ENGINEERING CONSULTANCY SERVICES 2016-2018 FOR KOWLOON CENTRAL & WEST AND ISLANDS REGION

Title
 EXISTING TRAFFIC FLOW OF YEAR 2017

| Drawing No. | Stage | Rev. |
|-------------|-------|------|
| FIGURE 2 | P | A |



LEGENDS :
 123(456) — Traffic Flow of PM Peak
 ——— Traffic Flow of AM Peak

| | | | |
|------|-----------------------------|--------|------|
| B | Revised traffic flow | SEP 17 | BF |
| A | Additional junctions showed | JUN 17 | BF |
| Rev. | Description of Revision | Date | Ckd. |

Client
 HONG KONG HOUSING AUTHORITY

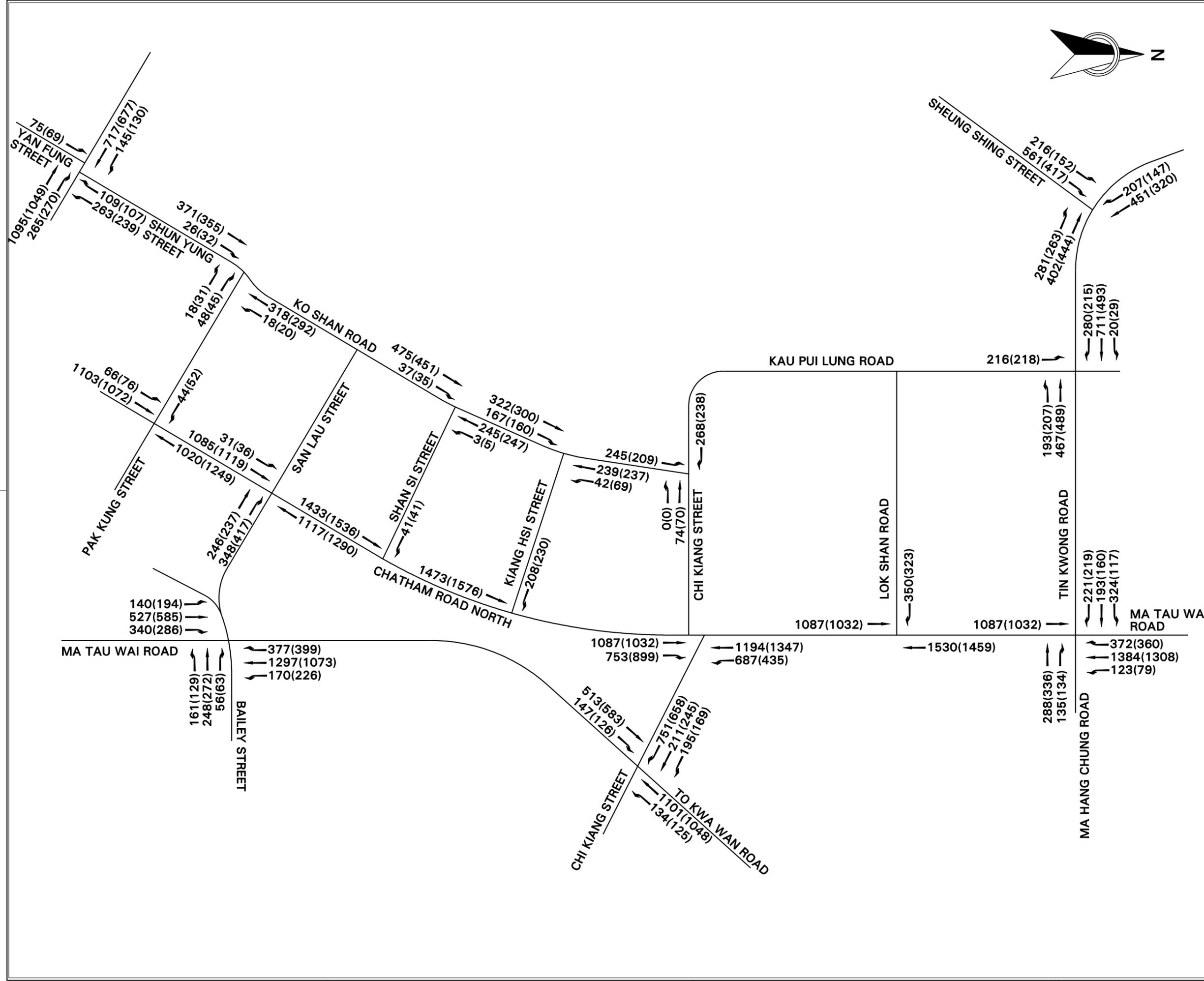
Consultants
 MANNINGS (Asia) Consultants Limited

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| N.T.S. | FEB 2017 | |
| Designed | Drawn | Checked |
| LC | ACS | BF |
| Design Team Leader | Date | |
| WS | FEB 2017 | |
| Approved | Date | |
| KTC | FEB 2017 | |

Project
 HKHA TERM ENGINEERING CONSULTANCY SERVICES 2016-2018 FOR KOWLOON CENTRAL & WEST AND ISLANDS REGION

Title
 FORECASTED TRAFFIC FLOW OF YEAR 2023 WITHOUT PROPOSED DEVELOPMENT

| | | |
|-------------|-------|------|
| Drawing No. | Stage | Rev. |
| FIGURE 3 | P | B |



LEGENDS :
 123(456) — Traffic Flow of PM Peak
 ——— Traffic Flow of AM Peak

| | | | |
|------|-----------------------------|--------|------|
| B | Revised traffic flow | SEP 17 | BF |
| A | Additional junctions showed | JUN 17 | BF |
| Rev. | Description of Revision | Date | Ckd. |

Client
 HONG KONG HOUSING AUTHORITY

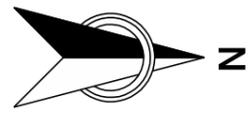
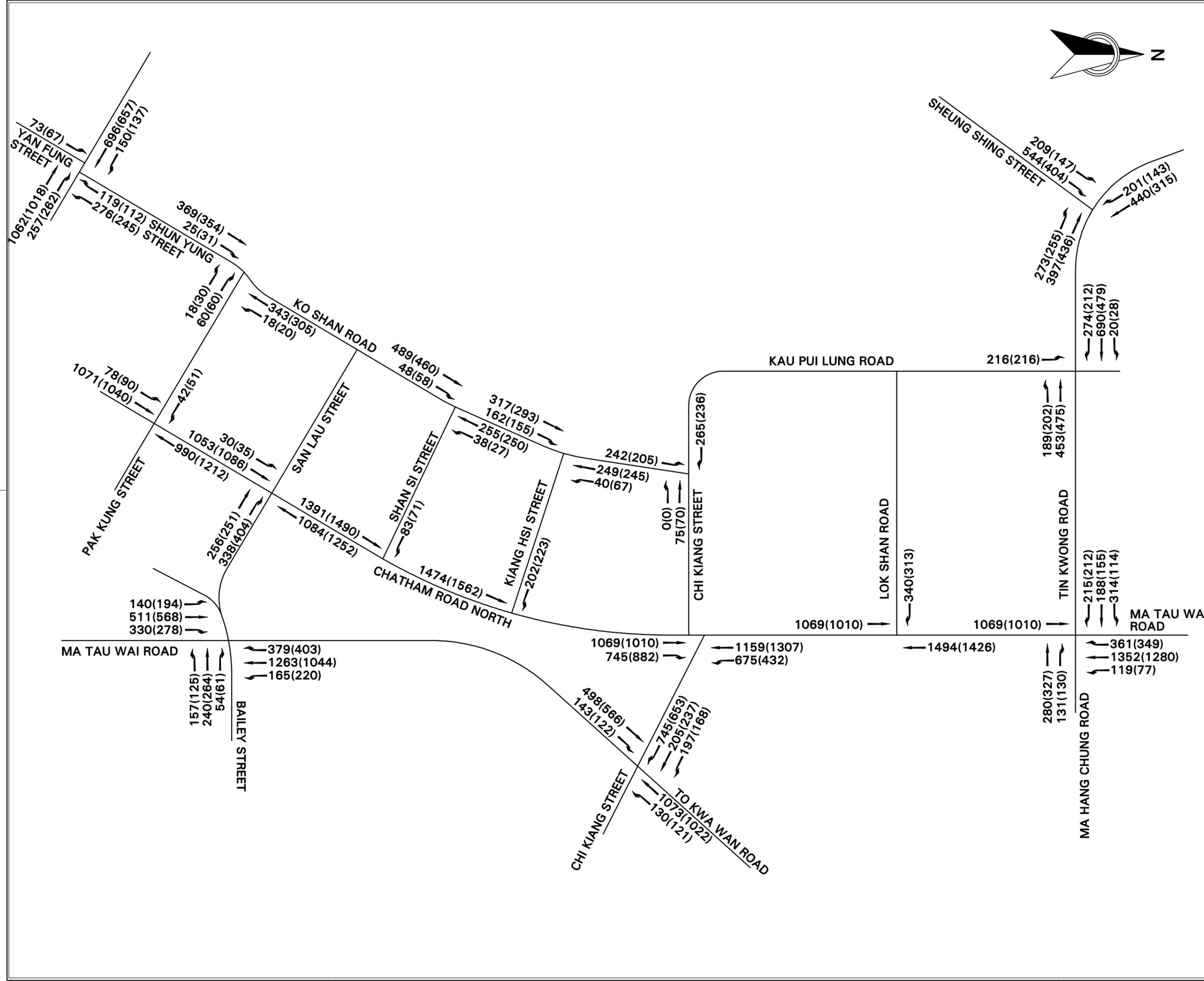
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| Designed | Drawn | Checked |
| LC | ACS | BF |
| Design Team Leader | Date | |
| WS | FEB 2017 | |
| Approved | Date | |
| KTC | FEB 2017 | |

Project
 HKHA TERM ENGINEERING CONSULTANCY SERVICES 2016-2018 FOR KOWLOON CENTRAL & WEST AND ISLANDS REGION

Title
 FORECASTED TRAFFIC FLOW OF YEAR 2028 WITHOUT PROPOSED DEVELOPMENT

| | | |
|-------------|-------|------|
| Drawing No. | Stage | Rev. |
| FIGURE 4 | P | B |



LEGENDS :
 123(456) — Traffic Flow of PM Peak
 ——— Traffic Flow of AM Peak

| | | | |
|------|-----------------------------|--------|------|
| B | Revised traffic flow | SEP 17 | BF |
| A | Additional junctions showed | JUN 17 | BF |
| Rev. | Description of Revision | Date | Ckd. |

Client
 HONG KONG HOUSING AUTHORITY

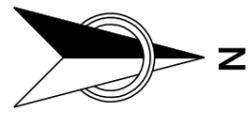
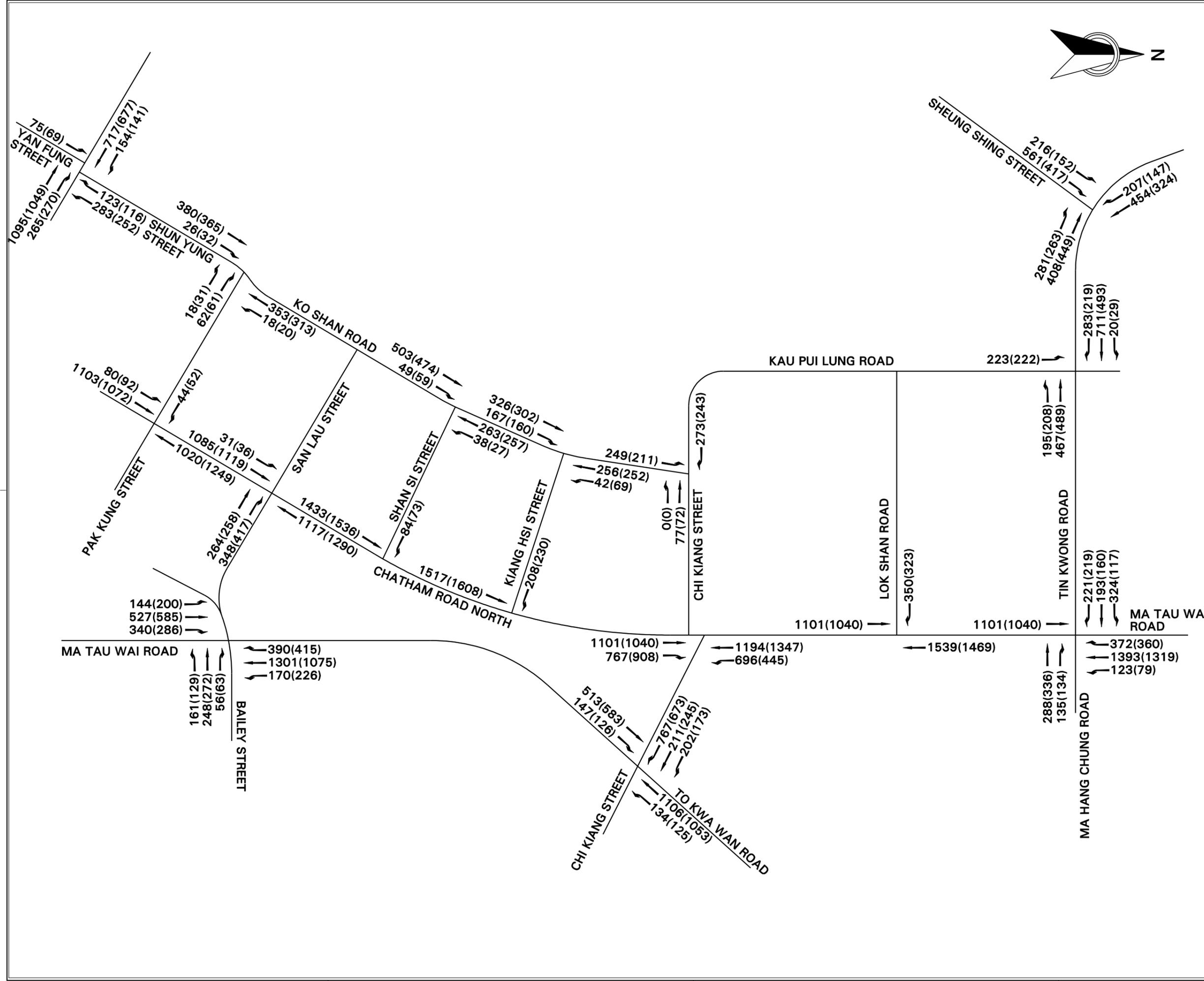
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 MANNINGS (Asia) Consultants Limited

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| Designed | Drawn | Checked |
| LC | ACS | BF |
| Design Team Leader | Date | |
| WS | FEB 2017 | |
| Approved | Date | |
| KTC | FEB 2017 | |

Project
 HKHA TERM ENGINEERING CONSULTANCY SERVICES 2016-2018 FOR KOWLOON CENTRAL & WEST AND ISLANDS REGION

Title
 FORECASTED TRAFFIC FLOW OF YEAR 2023 WITH PROPOSED DEVELOPMENT

| | | |
|-------------|-------|------|
| Drawing No. | Stage | Rev. |
| FIGURE 5 | P | B |



LEGENDS :
 123(456) — Traffic Flow of PM Peak
 ——— Traffic Flow of AM Peak

| | | | |
|------|-----------------------------|--------|------|
| B | Revised traffic flow | SEP 17 | BF |
| A | Additional junctions showed | JUN 17 | BF |
| Rev. | Description of Revision | Date | Ckd. |

Client
 HONG KONG HOUSING AUTHORITY

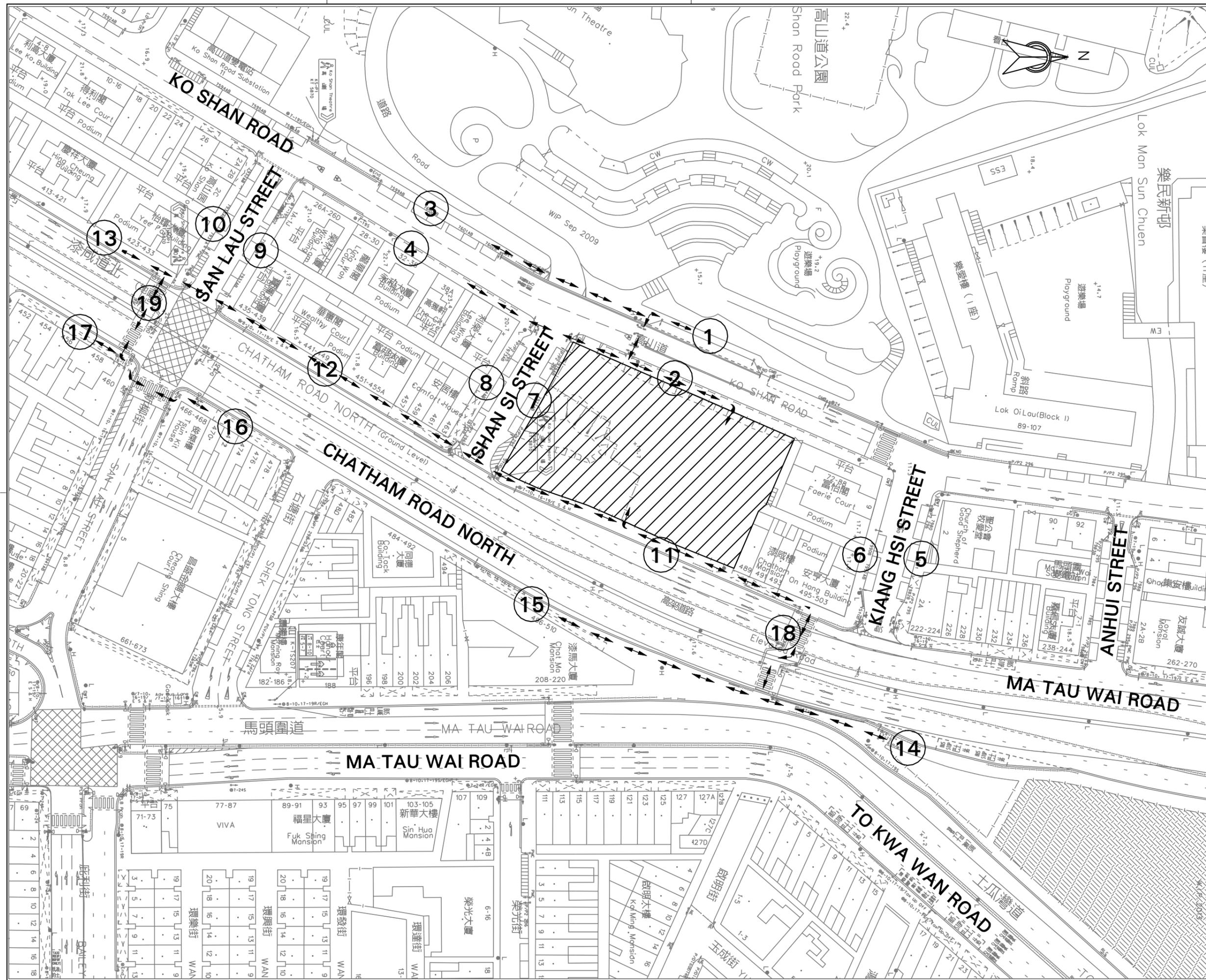
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| Designed | Drawn | Checked |
| LC | ACS | BF |
| Design Team Leader | Date | |
| WS | FEB 2017 | |
| Approved | Date | |
| KTC | FEB 2017 | |

Project
 HKHA TERM ENGINEERING CONSULTANCY SERVICES 2016-2018 FOR KOWLOON CENTRAL & WEST AND ISLANDS REGION

Title
 FORECASTED TRAFFIC FLOW OF YEAR 2028 WITH PROPOSED DEVELOPMENT

| | | |
|-------------|-------|------|
| Drawing No. | Stage | Rev. |
| FIGURE 6 | P | B |



- LEGENDS :**
- 1 Surveyed Footpath / Pedestrian Crossing
 - \longleftrightarrow Pedestrian Movement

| | | | |
|------|-------------------------|--------|------|
| A | Routing added | JUN 17 | BF |
| Rev. | Description of Revision | Date | Ckd. |

Client
HONG KONG HOUSING AUTHORITY

Consultants
MANNINGS (Asia) Consultants Limited

| | | |
|--------------------------|------------------|---------------|
| Scale in A3 N.T.S. | Date FEB 2017 | |
| Designed LC | Drawn ACS | Checked BF |
| Design Team Leader WS | Date FEB 2017 | |
| Approved KTC | Date FEB 2017 | |

Project
HKHA TERM ENGINEERING CONSULTANCY SERVICES 2016-2018 FOR KOWLOON CENTRAL & WEST AND ISLANDS REGION

Title
Location of Pedestrian Survey

| | | |
|--------------------------------|-------------------|------------------|
| Drawing No. FIGURE 7 | Stage P | Rev. A |
|--------------------------------|-------------------|------------------|

Visual Appraisal for SSF Housing Development at Ko Shan Road

1 Purpose

- 1.1 To facilitate the rezoning amendment to the approved Ma Tau Kok Outline Zoning Plan (OZP) No. S/K10/22, with an increase in the plot ratio (PR) and the building height for the proposed public housing development at Ko Shan Road (**Plans 1 – 3**).
- 1.2 To assess the potential visual impact in terms of the development scale, form, massing, and spatial relationship with the overall townscape or surrounding landscape for the Metro Planning Committee (MPC) of the Town Planning Board (TPB) to visualise the three-dimensional relationship of the proposed housing development with the surrounding context.

2 Methodology

- 2.1 The methodology of the visual impact assessment is set out below.
 - (a) Identification of the visual context and character within the wider contexts of the Kowloon City District.
 - (b) Illustration of the visual impact of the proposed housing site in the respective areas by using computer-generated photomontages with the indicative layout of the development in the proposed housing site.
 - (c) Identification and selection of the vantage points to facilitate assessing the visual impact locally for the housing site. The vantage points should be easily accessible and popular to the public and/or tourists and be able to demonstrate the visual impact of the proposed housing site on the adjacent neighbourhood areas. Important views from special landmarks, valued landscape features, ridgelines, etc should be assessed where possible.
 - (d) Identification of the scale of the development in the proposed housing site. Using computer-generated photomontages to illustrate the visual impact and their significance from the vantage points. Providing visual appraisal by evaluating the overall visual impact of the proposed housing development.

3 The Proposed Development

- 3.1 The proposed housing site at Ko Shan Road (**Plans 1 to 3**) is currently zoned Government, Institution or Community” (“G/IC”). The site is proposed for Subsidized Sale Flats (SSF) housing development. The north of the proposed housing site is

occupied by the existing public housing estate, Lok Man Sun Chuen, with building heights ranging from 59 to 81mPD. The northeast of the subject site is mainly private housing developments including the Faerie Court, Chatham Mansion and On Hang Building, with building heights ranging from about 15 to 91mPD.

- 3.2 The site is located on a flat land, bounded by Ko Shan Road, Shansi Street and Chatham Road North, opposite to the Ko Shan Road Park. It is proposed to rezone the site from “G/IC” to “R(A)1”. The proposed development parameters are summarized as follows:

| | |
|--------------------------|---------------------------------|
| Zoning Area: | About 0.3ha |
| Development Site Area: | About 0.3ha |
| Maximum PR: | 7.5/1.5 (domestic/non-domestic) |
| Maximum Building Height: | 130mPD |

- 3.3 The site is currently occupied as the temporary MTRCL Works Area for the Shatin to Central Link (SCL) project.

4 **Visual Appraisal**

- 4.1 Six vantage points (**VP**) have been selected from the north, northeast, southwest and northwest of the subject site (**Plan 4**) with a distance ranging from about 170m to 670m. They represent the views from key public open spaces in the vicinity or from pedestrian nodes accessible by the public.

(a) **VP1** is at King’s Park High Level Service Reservoir playground which is located in a densely populated area surrounded by several public and private residential developments as well as primary and secondary schools. The playground is a large open space with 7-a-side soccer pitch and basketball court and is easily accessible.

(b) **VP2** is at one of the entrances of Fat Kwong Street Garden No.1. This garden is easily accessible and popular with the locals. The garden provides a toilet block, landscaped and sitting-out areas.

(c) **VP3** is at the road junction of To Kwa Wan Road and Chi Kiang Street which is easily accessible and a major pedestrian crossing in the area used by the locals.

(d) **VP4** is at Homantin East Service Reservoir Playground which is easily accessible and popular with the locals. The playground provides two 11-a-side soccer pitches with natural turf and ancillary facilities of toilets and changing rooms with lockers.

(e) **VP5** is at Sheung Lok Street Garden which is easily accessible and popular with the local residents. It is close to the Homantin Estate and a proposed HOS development at Sheung Lok Street currently under construction. The garden provides pavilion with landscaped and sitting-out areas.

(f) **VP6** is at Lok Man Sun Chuen which is a public housing development under the Hong Kong Housing Society. It is easily accessible and adjacent to the entrance of a supermarket in the area with frequent pedestrian flow.

4.2 Six photomontages have been prepared to illustrate the visual effect of the proposed SSF development (**Plans 5.1 – 5.6**) from the above VPs as below:

(a) VP1 – King’s Park High Level Service Reservoir Playground

From **VP1 (Plan 5.1)**, the King’s Park High Level Service Reservoir Playground (from the SW of the site in a distance of about 665m), the proposed SSF development would be partially screened off by the existing vegetation and fence. While it would slightly reduce the visual openness, the visual impact is not significant. It would not cause any visual incompatibility with the surroundings.

(b) VP2 – Fat Kwong Street Garden No.1

From **VP2 (Plan 5.2)**, the entrance of the Fat Kwong Street Garden No. 1 (from the SW of the site in a distance of about 390m), the proposed SSF development would be largely screened off by the existing buildings along Chatham Road North. It has an insignificant visual impact when compared with the existing developments nearby. It would not cause any visual incompatibility with the surroundings.

(c) VP3 – Road Junction of To Kwa Wan Road and Chi Kiang Street

From **VP3 (Plan 5.3)**, the road junction of To Kwa Wan Road and Chi Kiang Street (from the NE of the site in a distance of about 265m), the proposed SSF development would be partially screened off by the existing trees and buildings nearby. Although there is a slight reduction in visual openness, the proposed development would be viewed as an extension of the existing developments. It would not cause any significant visual incompatibility with the surroundings.

(d) VP4 – Homantin East Service Reservoir Playground

From **VP4 (Plan 5.4)**, Homantin East Service Reservoir Playground (from the SW

towards of site in a distance of about 355m), the proposed SSF development would be partially screened off by existing vegetation. It has relatively small visual impact when compared with the existing developments nearby. Although the proposed development would slightly block the view of the ridgeline of Kowloon Peak (Fei Ngo Shan), it would not cause any significant visual incompatibility with the surroundings.

(e) VP5 – Sheung Lok Street Garden

From **VP5 (Plan 5.5)**, the pavilion of the Sheung Lok Street Garden (from the NW of the site in a distance of about 300m), the proposed SSF development would be partially screened off by the existing railing and vegetation. Although it inevitably adds more visual bulk to the locality and results in a reduction of visual openness, the building gaps between the proposed domestic building and adjacent buildings could still allow visual penetration with open sky view. Design measures would be explored at detailed design stage to soften the building mass, such as facade treatment. The proposed development will not induce significant visual impact from this VP and only moderately increase the visual obstruction to the skyline.

(f) VP6 – Lok Man Sun Chuen

From **VP6 (Pan 5.6)**, Lok Man Sun Chuen (from the N of the site in a distance of about 170m), the proposed SSF development would be partially screened off by existing buildings. It has relatively small visual impact when compared with the existing developments nearby. Although there is a reduction in visual openness when compared with the existing developments nearby, the proposed development would blend into the overall environment and would not cause significant visual incompatibility with the surroundings.

- 4.3 The proposed development would reduce visual openness with blockage to the view at some viewpoints. However, the overall development would not create significant visual incompatibility with the surrounding buildings. Visual enhancement measures to minimize the residual visual impact, such as set-back and facade treatment etc., should be explored at the detailed design stage.

5 Conclusion

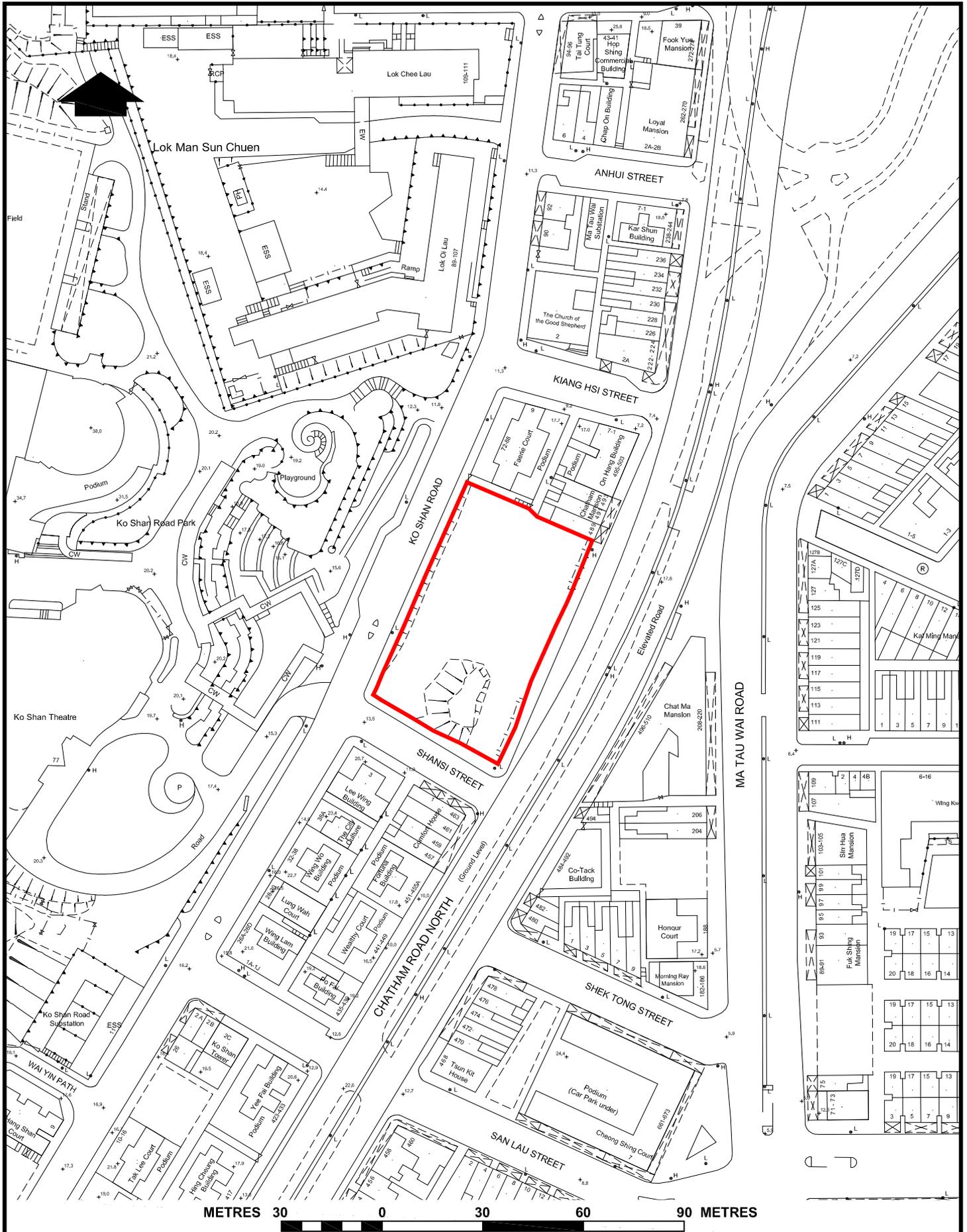
- 5.1 Photomontages to illustrate the possible visual impact of the proposed SSF development are shown in **Plan 5.1 to Plan 5.6**. The proposed maximum building height of the site is about 130mPD. When viewed from the selected viewpoints, part of the proposed development at the subject site would be screened off and some may be seen as an

extension of the existing buildings with similar development intensity in the district. The proposed housing block in the site would be seen as part of the building group and would generally be compatible with the existing developments in the vicinity.

- 5.2 Based on the visual appraisal, **VP 3 to VP 6**, the visual openness would be partially reduced with visual blockage. However, the proposed development would be viewed as an extension of the existing developments and the proposed SSF development would not cause any significant visual incompatibility with the surroundings.
- 5.3 In order to optimize the development intensity, high-rise housing block in this small site is inevitably necessary. The scope for rearranging the disposition of the residential blocks is also relatively limited due to site constraints, such as 20m setback from Chatham Road North to meet Air Quality Requirement. In order to enhance the visual amenity of the proposed SSF development, HD would explore various design measures, such as façade treatment, in the detailed design stage. In short, visual interest will be considered to be incorporated into the new building outlook to enhance the visual quality of the proposed SSF development as far as practicable.

Attachments

| | |
|-------------------------|---|
| Plan 1 | Location Plan |
| Plan 2 | Site Plan |
| Plan 3 | Aerial Photo |
| Plan 4 | Location Plan of Selected Viewpoints |
| Plans 5.1 to 5.6 | Photomontages |

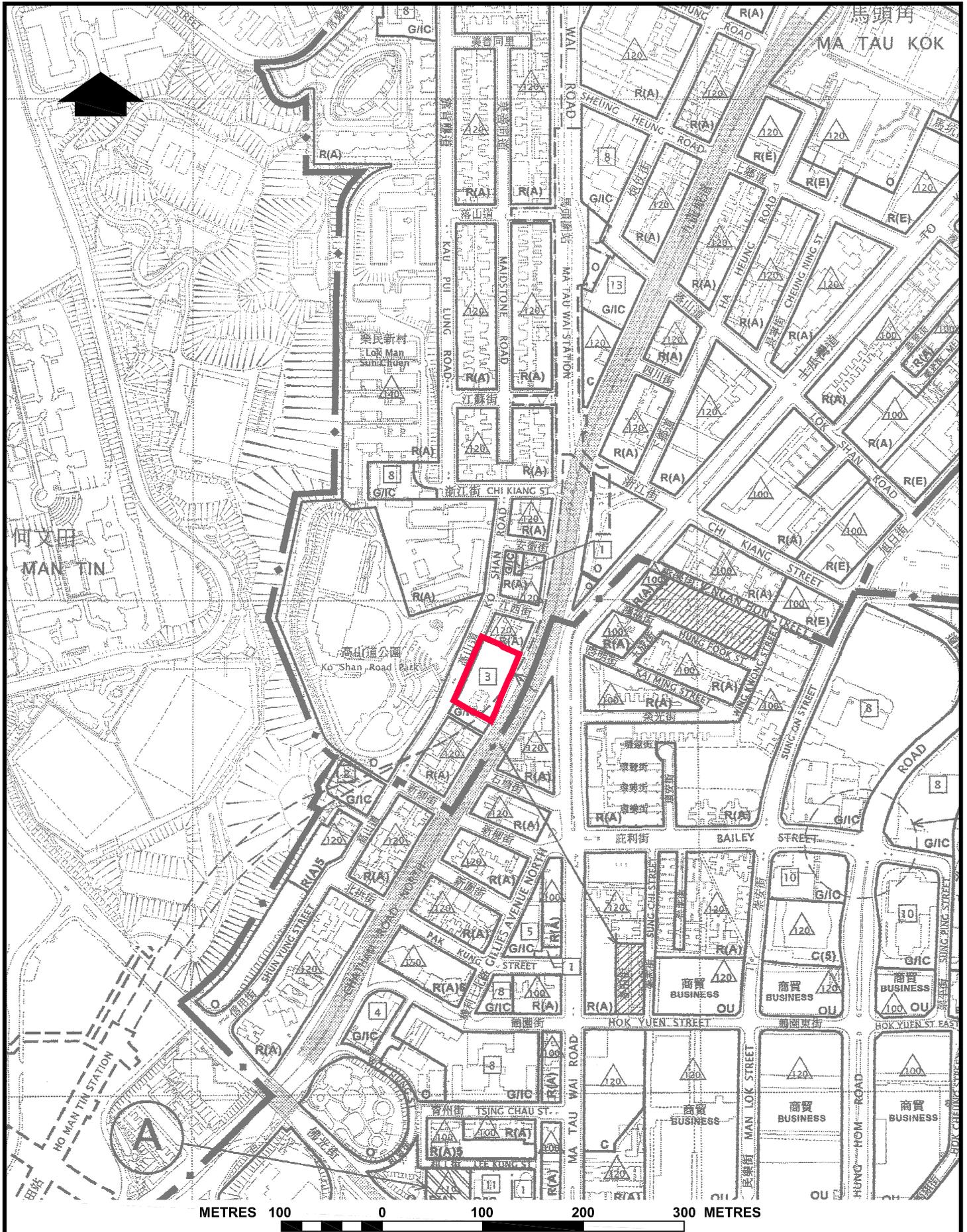


KO SHAN ROAD

**HOUSING DEPARTMENT
PLANNING SECTION**

PLAN 1

**DATE :
11. 4. 2017**



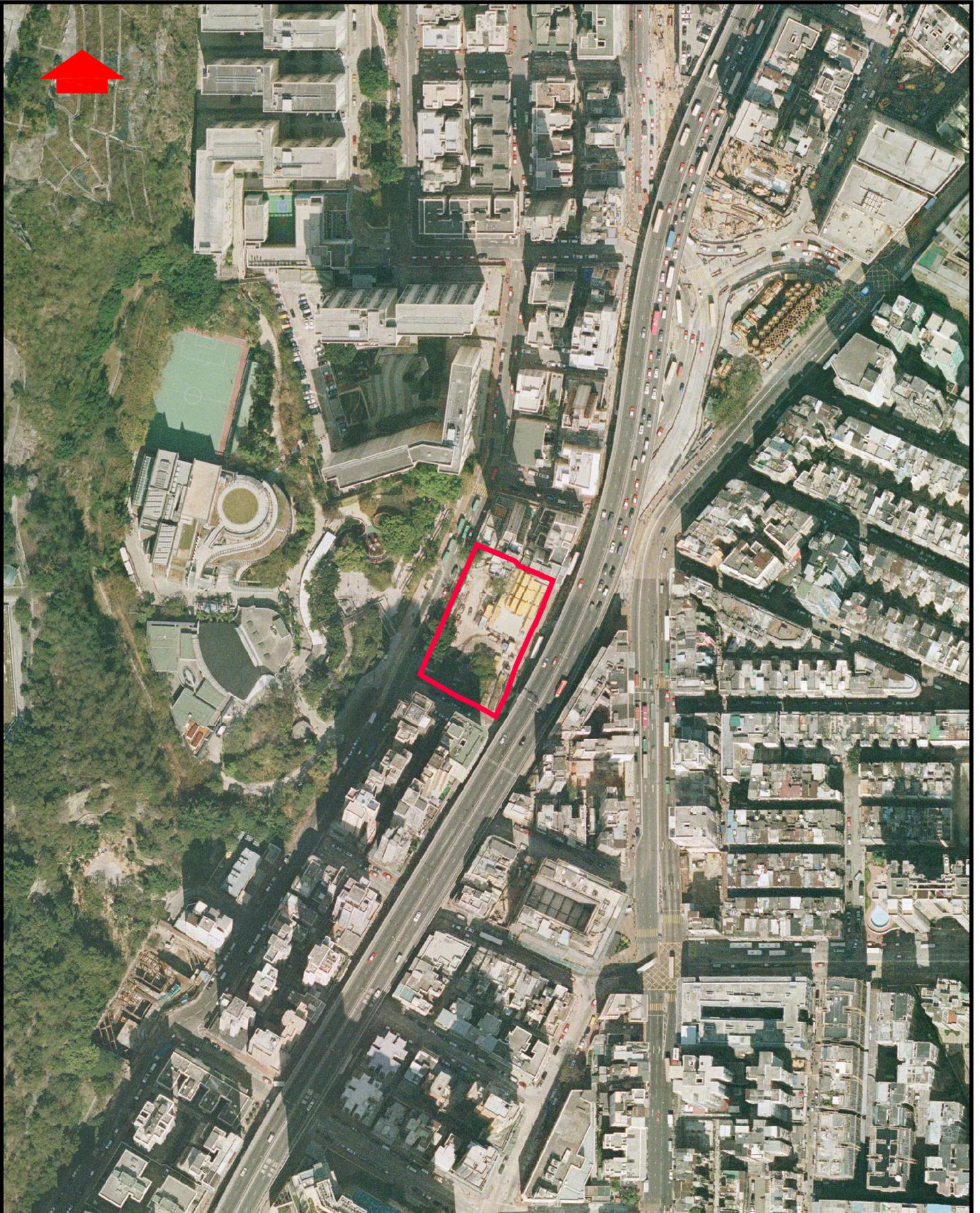
KO SHAN ROAD



HOUSING DEPARTMENT
PLANNING SECTION

PLAN 2

DATE:
11. 4. 2017



METRES 50 0 50 100 150 METRES

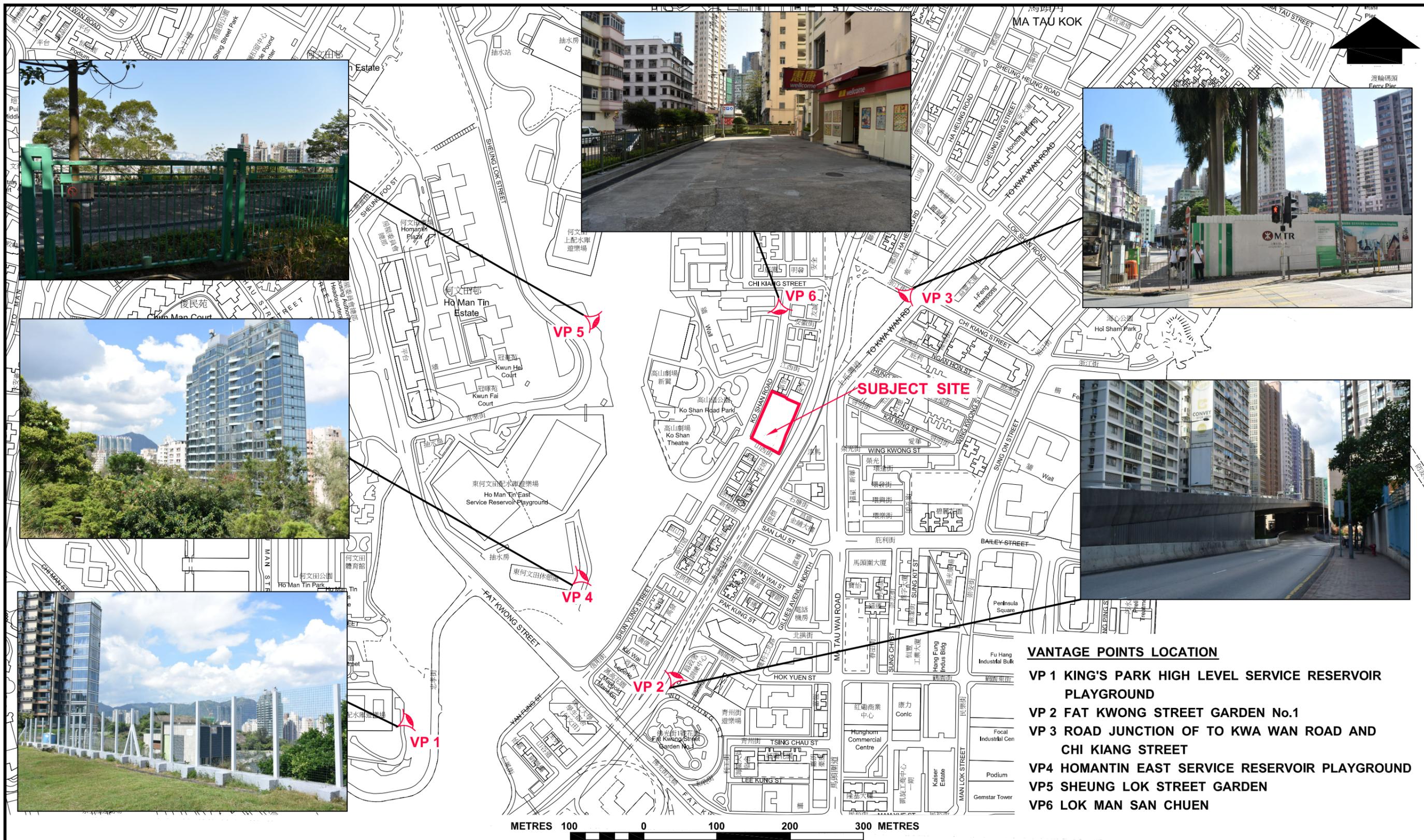
KO SHAN ROAD



HOUSING DEPARTMENT
PLANNING SECTION

PLAN 3

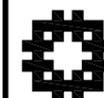
DATE :
11. 4. 2017



VANTAGE POINTS LOCATION

- VP 1 KING'S PARK HIGH LEVEL SERVICE RESERVOIR PLAYGROUND
- VP 2 FAT KWONG STREET GARDEN No.1
- VP 3 ROAD JUNCTION OF TO KWA WAN ROAD AND CHI KIANG STREET
- VP 4 HOMANTIN EAST SERVICE RESERVOIR PLAYGROUND
- VP 5 SHEUNG LOK STREET GARDEN
- VP 6 LOK MAN SAN CHUEN

**SUBSIDIZED SALE FLATS AT KO SHAN ROAD -
LOCATION PLAN OF VANTAGE POINTS**

 **HOUSING DEPARTMENT
PLANNING SECTION**

PLAN 4

**DATE :
11. 4. 2017**



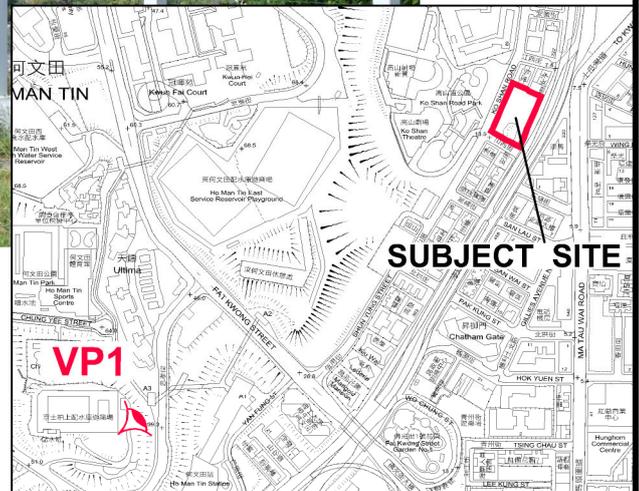
With
Proposed
GIC
Development

Proposed
GIC
Development
(3 Storeys)



With
Proposed
Development

Proposed
Development
(130mPD)



LEGEND:



Behind Existing Structure

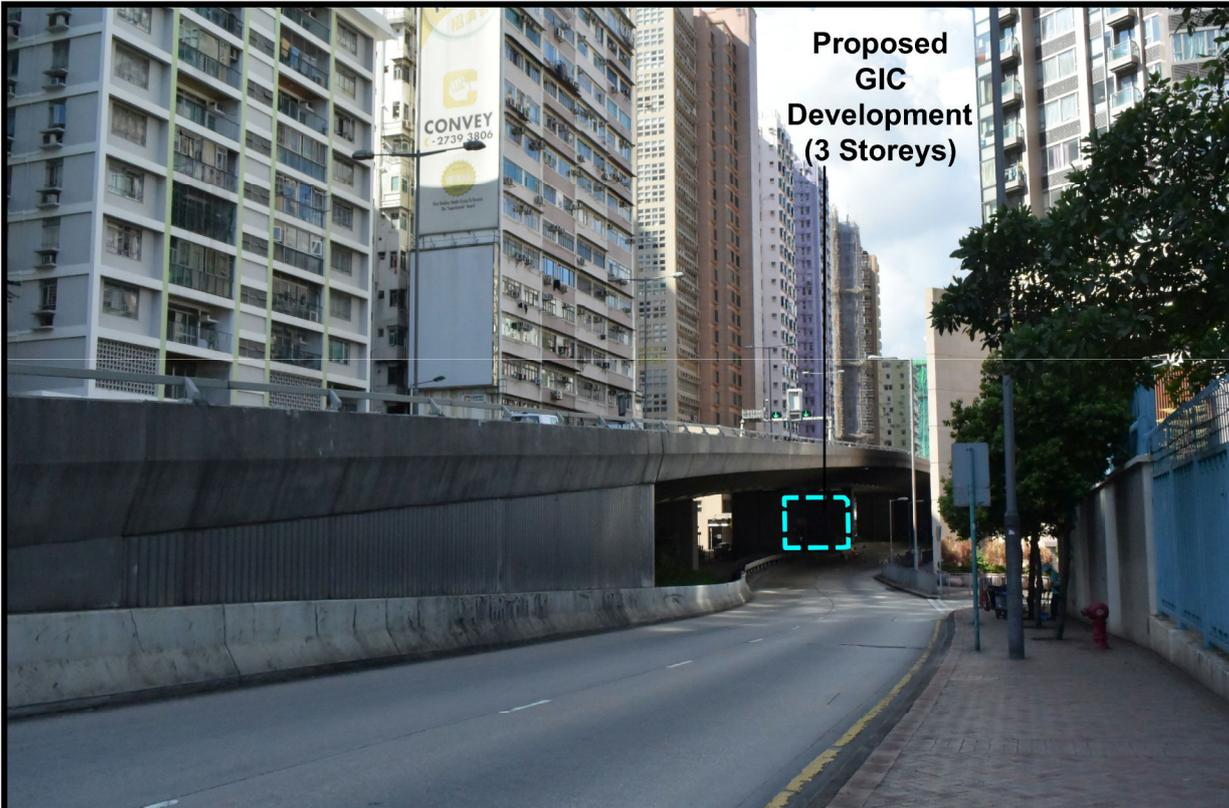
**PHOTOMONTAGE AT VIEWPOINT 1
(VIEW FROM KING'S PARK HIGH LEVEL
SERVICE RESERVOIR PLAYGROUND)**



**HOUSING DEPARTMENT
PLANNING SECTION**

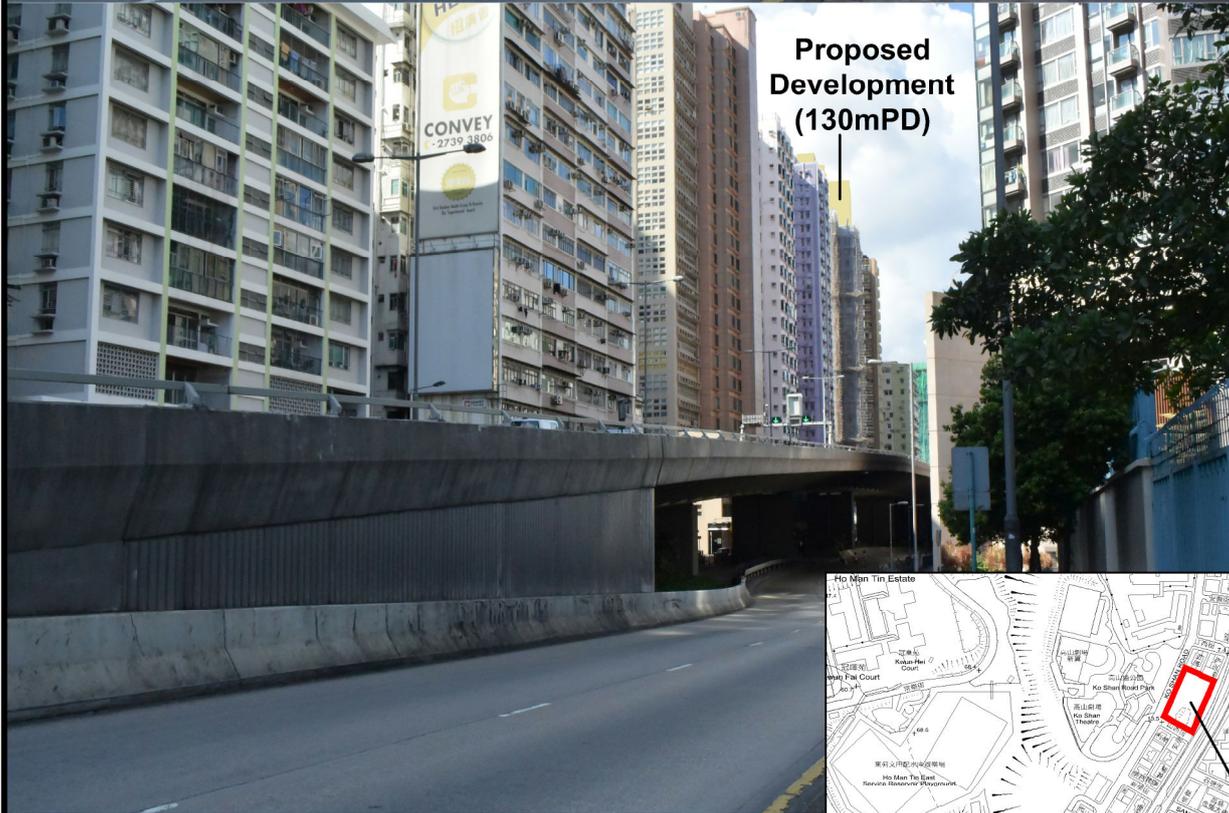
PLAN 5.1

**DATE:
22. 1. 2018**



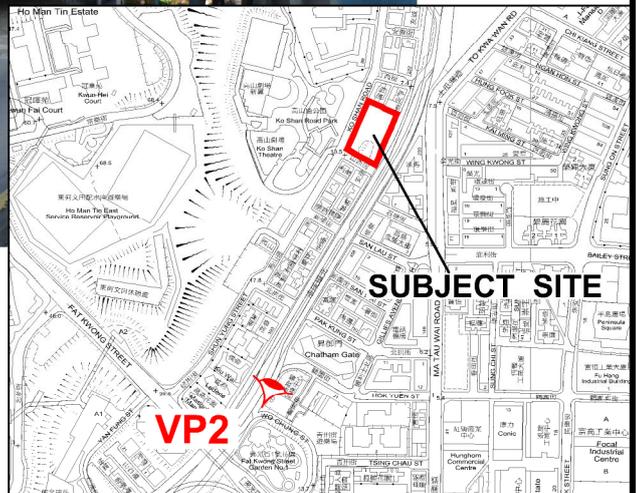
Proposed
GIC
Development
(3 Storeys)

With
Proposed
GIC
Development



Proposed
Development
(130mPD)

With
Proposed
Development



SUBJECT SITE

VP2

LEGEND:



Behind Existing Structure

**PHOTOMONTAGE AT VIEWPOINT 2
(VIEW FROM FAT KWONG STREET
GARDEN No.1)**



**HOUSING DEPARTMENT
PLANNING SECTION**

PLAN 5.2

**DATE :
22. 1. 2018**



Proposed
GIC
Development
(3 Storeys)

With
Proposed
GIC
Development



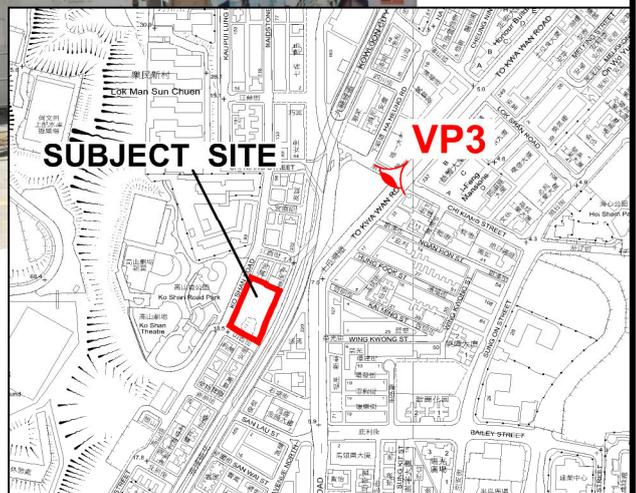
Proposed
Development
(130mPD)

With
Proposed
Development

LEGEND:



Behind Existing Structure



**PHOTOMONTAGE AT VIEWPOINT 3
(VIEW FROM ROAD JUNCTION OF TO KWA
WAN ROAD AND CHI KIANG STREET)**



**HOUSING DEPARTMENT
PLANNING SECTION**

PLAN 5.3

**DATE :
22. 1. 2018**



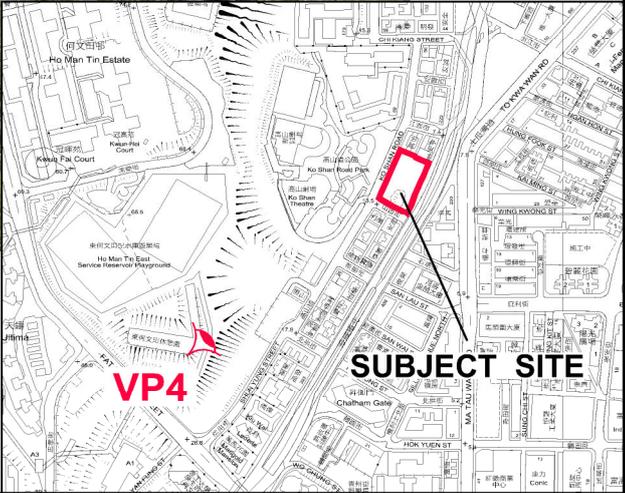
Proposed
GIC
Development
(3 Storeys)

With
Proposed
GIC
Development



Proposed
Development
(130mPD)

With
Proposed
Development



LEGEND:

 Behind Existing Structure

**PHOTOMONTAGE AT VIEWPOINT 4
(VIEW FROM HOMANTIN EAST SERVICE
RESERVOIR PLAYGROUND)**

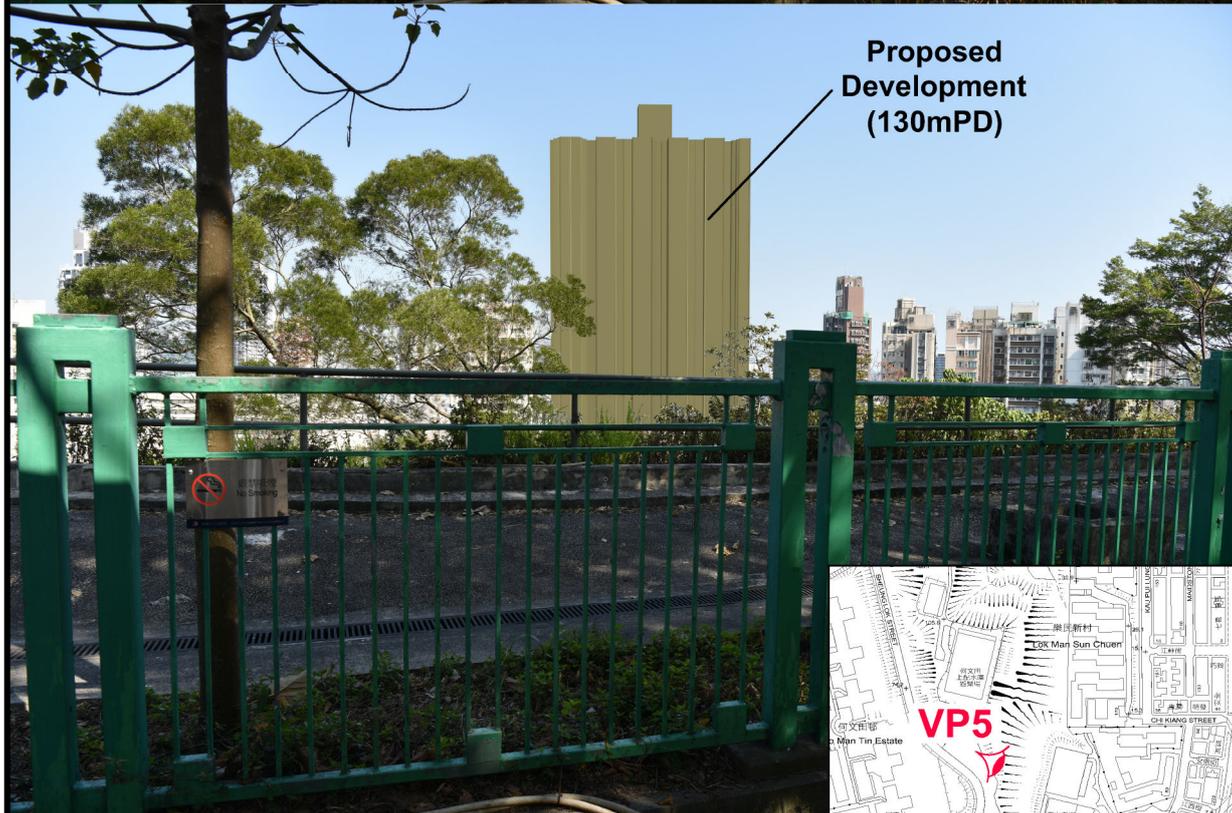
 **HOUSING DEPARTMENT
PLANNING SECTION**

PLAN 5.4

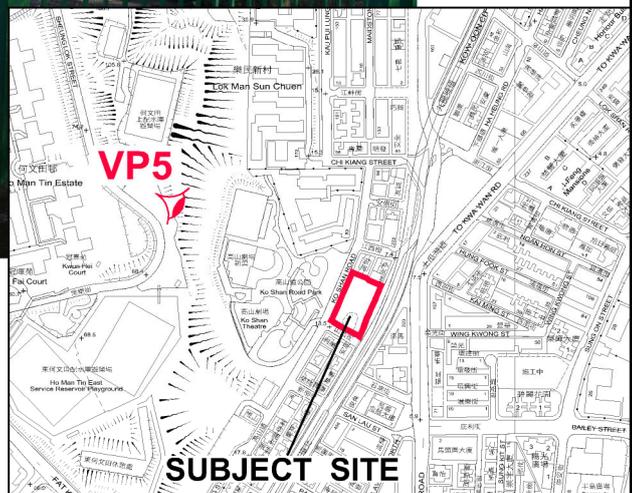
**DATE :
22. 1. 2018**



With
Proposed
GIC
Development



With
Proposed
Development



LEGEND:

 Behind Existing Structure

**PHOTOMONTAGE AT VIEWPOINT 5
(VIEW FROM SHEUNG LOK STREET
GARDEN)**

 **HOUSING DEPARTMENT
PLANNING SECTION**

PLAN 5.5

**DATE :
22. 1. 2018**



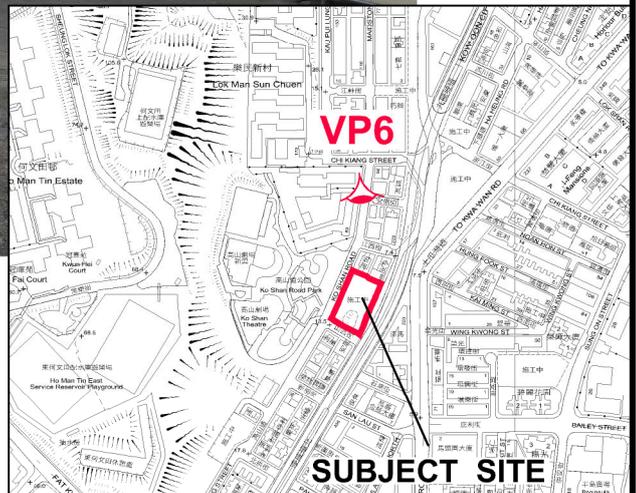
Proposed
GIC
Development
(3 Storeys)

With
Proposed
GIC
Development



Proposed
Development
(130mPD)

With
Proposed
Development



SUBJECT SITE

**PHOTOMONTAGE AT VIEWPOINT 6
(VIEW FROM LOK MAN SAN CHUEN)**



**HOUSING DEPARTMENT
PLANNING SECTION**

PLAN 5.6

**DATE :
22. 1. 2018**



Proposed Subsidized Sale Flats (SSF) Development at Ko Shan Road, To Kwa Wan

Document Title: Brief Summary on Preliminary Findings of Environmental Assessment Study

Background

We are carrying out an Environmental Assessment Study (EAS) to evaluate the environmental acceptability for the Proposed Subsidized Sale Flats (SSF) Development at Ko Shan Road, To Kwa Wan, with respect to the Hong Kong Planning Standards and Guidelines (HKPSG).

Development Considerations

The subject site is located at To Kwa Wan, bounded by Ko Shan Road, Shansi Street and Chatham Road North, and opposite to the Ko Shan Road Park. In the current scheme, the proposed development consists of one 35-storey residential block with a total of 483 flats on a non-noise sensitive podium structure which consists of water tank and pump room, security equipment room, electric meter room, lobby, refuse collect point, driveway, a private vehicle park at LI level serving the residents and a public vehicle park at lower ground level serving commercial vehicles. The target population intake of the proposed development is anticipated to be in year 2023/24.

Potential Environmental Impacts

The proposed development would be subject to potential impacts of traffic noise and potential air quality impacts arising from the vehicle emissions from nearby roads such as East Kowloon Corridor, Chatham Road, Ko Shan Road and Shansi Street etc, as well as chimney emissions, if any, from nearby source(s).

Preliminary Findings

Mitigation measures including building setback from noisy roads, non-noise sensitive podium structure, acoustic windows, enhanced acoustic balconies and fixed glazing will be incorporated into the layout design to alleviate the potential road traffic noise impact. With the incorporation of the recommended mitigation measures into the proposed development, the reduction of road traffic noise could be achieved up to 12 dB(A). It is anticipated that the relevant HKPSG's requirements on traffic noise impact can be met.

Based on the preliminary findings, it is evident that the minimum horizontal separation distances are more than the HKPSG's recommended buffer distances. It is also found that no chimney was identified within the study area of 500m. Insurmountable air quality impacts associated with the proposed rezoning of the subject site are not anticipated as the buffer distance requirements for vehicular and chimney emissions stipulated under the Hong Kong Planning Standards and Guidelines (ref. Table 3.1, Chapter 9, HKPSG) are satisfied.





Conclusion

With the implementation of appropriate mitigation measures, full compliance to relevant HKPSG's requirements will be achieved. Detailed findings and conclusions will be presented in the EAS under preparation.



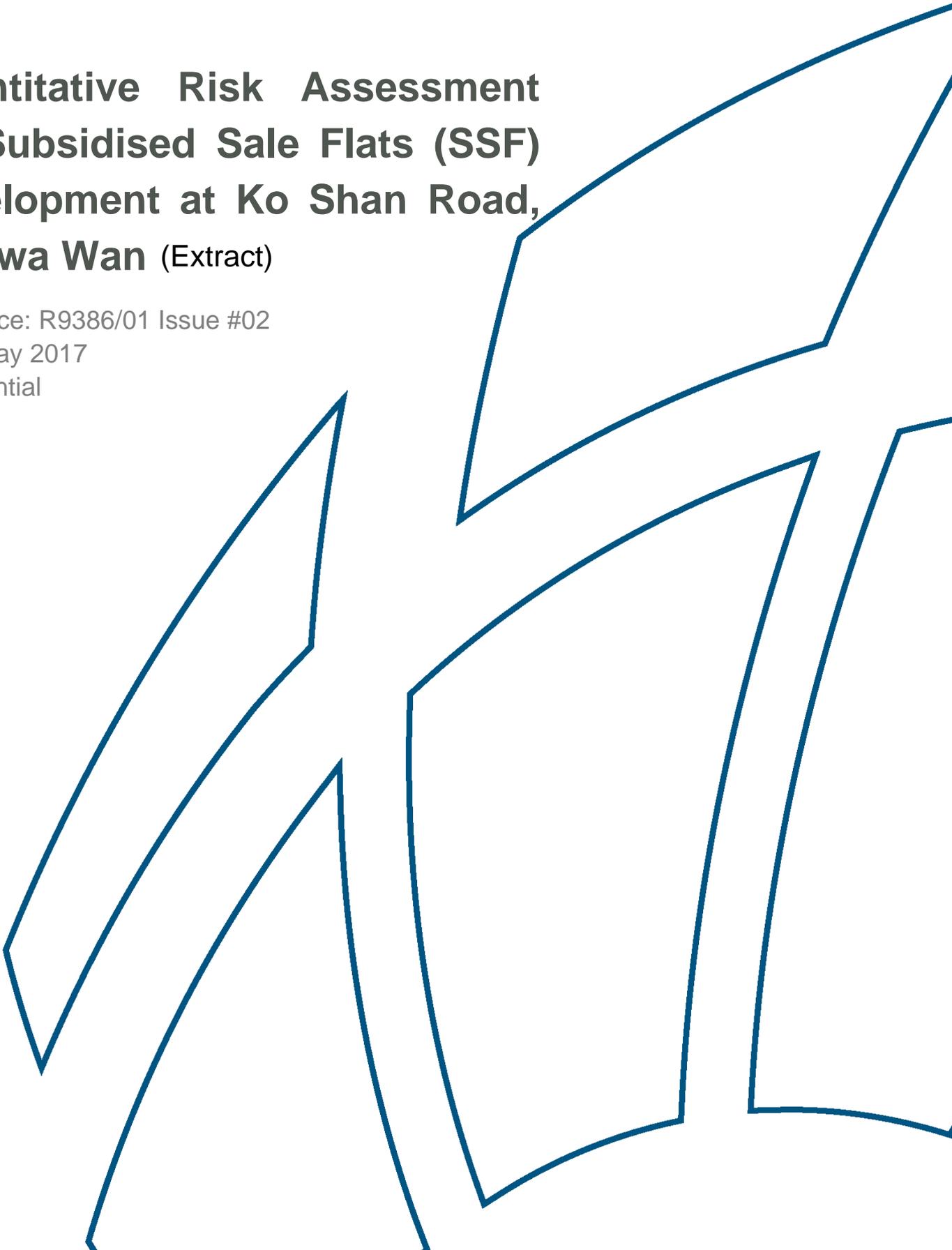
Hong Kong Housing Authority

Quantitative Risk Assessment for Subsidised Sale Flats (SSF) Development at Ko Shan Road, To Kwa Wan (Extract)

Reference: R9386/01 Issue #02

Date: May 2017

Confidential



Hong Kong Housing Authority

Quantitative Risk Assessment for Subsidised Sales Flats (SSF) Development at Ko Shan Road, To Kwa Wan

Prepared under the Management of:

Name: *David Lee*
Position: *Engineer*

Signature:



Reviewed and Approved by:

Name: *Michael Lee*
Position: *Principal Engineer*

Signature:



Reference: R9386/01 Issue #02

Date: 17 May 2017

Filename: [J:\9386 - QRA for a Proposed Public Housing Development at Ko Shan Road, To Kwa Wan\Report\Draft Report\9386-1-R2.docx](#)

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Executive Summary

A Quantitative Risk Assessment (QRA) was carried out for the Esso LPG Store in Lok Man Sun Chuen, in order to assess the increase of risk due to the proposed Subsidised Sale Flats (SSF) development in Ko Shan Road.

The risk of construction stage and operation stage was assessed and expressed in form of individual risk contour and F-N curve. The result was compared with the risk guidelines as stipulated in Chapter 12.4.4 of the Hong Kong Planning Standards and Guidelines (HKPSG). Results showed that the individual risk complied with the standard and societal risk fell in the “acceptable” region. The total Potential Loss of Life contribution due to the development was less than 0.5%.

1 Introduction

1.1 Background

Hong Kong Housing Authority (HKHA) is conducting a feasibility study on a proposed Subsidised Sale Flats (SSF) Development at Ko Shan Road, To Kwa Wan (the Site). Since the site is within the 200-m consultation zone of the LPG store at Lok Man Sun Chuen, which is a Notifiable Gas Installation (NGI), a Quantitative Risk Assessment (QRA) was required to be submitted to Electrical and Mechanical Services Department (EMSD) for approval.

A comprehensive QRA has been carried out by BMT Asia Pacific Limited to assess the overall risk level of the vicinity due to the proposed development.

The project site is temporary allocated to the Highways Department as the MTRCL works area for the Shatin to Central Link. One residential block will be constructed to provide around 500 flats. Subject site location is shown in **Figure 1**.

1.2 Scope of Work

The scope of this study is outlined as follows:

- to identify potential hazards and to estimate associated frequencies by review of the LPG system design and historical data;
- to carry out QRA as to determine the risk levels posed by the LPG storage installation;
- to present the QRA results in the form of iso-risk contours and “FN” curve for individual risk and societal risk respectively;
- to compare the QRA results, both existing land use (Existing Scenario) and the proposed residential development (Future Scenario) scenarios, with the Government risk guidelines, and propose risk mitigation measures if necessary.

The scope of the study is limited by the following criteria:

1. The risks associated with the transport of LPG by road tankers have been restricted to the consideration of their final approach to the LPG storage installation;
2. The risk assessment has been limited to those events which have the potential for off-site fatalities.

1.3

Hong Kong Risk Guidelines

Since the LPG storage installation in Lok Man Sun Chuen stores LPG in bulk quantities (more than 130L nominal water capacity), the storage vessel itself together with the outlet pipework, vaporisers, pressure-regulating device etc. are classified as a notifiable gas installation (NGI) under the Gas Safety Ordinance, Cap. 51.

A set of Risk Guidelines (RG) has been adopted by the Coordinating Committee on Land-use Planning and Control relating to Potentially Hazardous Installations (CCPHI). These RG are expressed in terms of individual and societal risks. The criterion for individual risk is that no person off-site shall be subject to an additional risk of 1×10^{-5} / year due to the operation of the LPG storage installation. The societal RG specified ranges of risk values which define the limits of “acceptable” and “unacceptable” risk limits. Societal risk which exceeds the “acceptable” risk limits but not the “unacceptable” risk limits, cost effective measures should be taken to reduce the risk “as low as reasonably practicable” (ALARP). The societal risk guidelines are shown in **Figure 2**.

2 Site Description

2.1 The Proposed Project

The proposed residential development is at Ko Shan Road, To Kwa Wan, next to the current Faerie Court. Around 500 flats will be provided by one tower. The project will be completed in year 2023/2024 tentatively.

2.2 Study Area

The LPG installation is located in southern corner of Lok Man Sun Chuen and is at the west side of the proposed development. A study area of 200 metres radius from the LPG storage installation was adopted in the study. The study area is shown in **Figure 3**.

The study area mainly covers residential buildings, as well as Ko Shan Road Park and Ko Shan Theatre.

2.3 Existing LPG Storage Installation

ExxonMobil Hong Kong Limited (Esso) is the operator of the LPG storage installation which supplies LPG to Lok Man Sun Chuen. The location of LPG compound is shown in **Figure 3**. As per the information provided by the operator, the LPG storage installation consists of single underground vessel with maximum carrying capacity of around 2.8 tonnes of LPG, taking the ullage requirement of not filling more than 80% of the vessel volume into account. There are 2 vaporisers on site. **Figure 4** illustrates a schematic diagram of a typical LPG compound[1]. During normal operation, LPG vessel is not always full. Therefore, it is assumed that there is 20% of time with full inventory (2.8 tonnes) and 80% of time with 60% of full inventory (2.1 tonnes).

Since the vessel had to be designed, manufactured and examined in accordance with the requirements of EMSD, the storage vessel should be covered with corrosion protecting coating, stress relieved and 100% radiographed.

2.4 LPG Delivery and Transfer

LPG is delivered to the LPG storage installation by road tankers. The maximum capacity of the road tanker is about 9 tonnes. Based on the information supplied by the operator, LPG is delivered 4 times per week at maximum, thus 208 annual LPG deliveries are adopted in the study. Since LPG road tanker is not always full during the unloading operation, it is assumed that there is 20% of time with full inventory (9 tonnes) and 80% of time with half inventory (4.5 tonnes).

The residence time of a road tanker in the LPG storage installation is typically around 20 minutes for unloading. Road tankers are assumed to be operated in accordance with the Code of Practice for Hong Kong LPG Industry – Module 3 Handling and Transport of LPG in Bulk by Road [2].

2.5 Population of the Proposed Development

Societal risk is a measure of the consequence magnitude and frequency of the hazardous events. In order to establish the impact of any release on the number of people likely to be affected, it is necessary to have a good knowledge of the current population levels around the LPG storage installation. It includes residential and institutional population, but excludes staff present at the LPG storage installation as these are considered to be voluntary takers of risk. According to the project data, the proposed development will provide around 500 flats and maximum 1540 occupants (assuming average household size of 2.8 persons plus 10% variation).

During the construction phase of the project site 100 on-site workers are assumed for day time in weekday and 50 workers for day time in weekend. No on-site workers are assumed working during night time.

2.6 Population in the Vicinity

The LPG compound is at the southern corner of Lok Man Sun Chuen. The surrounding population is the direct receiver of the hazardous events due to loss of containment of LPG. The population in the year of project completion was used as a base case of risk calculation, and comparison was made between the risk level before and after the completion of proposed development. Since there is a decreasing trend of population at the tertiary planning unit (TPU-241) where the project site is located, no population growth factor was applied from current year to completion year as a conservative approach in population estimation.

Table 2-1 Population change in TPU-241 (from Projections of Population Distribution by Census and Statistics Department, HK)

| Year | Population |
|------|------------|
| 2011 | 46 900 |
| 2012 | 47 700 |
| 2013 | 47 400 |
| 2014 | 46 600 |
| 2015 | 46 200 |
| 2016 | 45 600 |
| 2017 | 45 600 |
| 2018 | 45 400 |
| 2019 | 45 100 |
| 2020 | 45 000 |

A site survey was conducted to identify and update the surrounding population. The surrounding population is listed in **Appendix A**. The population areas considered in this study is shown in **Figure 5**.

Population in residential areas is estimated according to Hong Kong 2011 Population Census. As no growth rate is applied to the study, population in project completion year is deemed the same as that in year 2011.

Since the population in each area is distributed in different height of the building, exposure factors are adopted to address that some populations receive no hazardous effect from the fire or explosion scenarios. Exposure factor is the ratio of population considered to be affected by the hazardous scenario in that area. Exposure factor to fireball of 0.5 is applied to those persons indoors protected by the structure and façade of the buildings, so that only the population indoors facing the LPG compound is affected by fireball while those people at the rear of the building is protected[3]. The result of preliminary consequence modelling in **Section 5.4** shows that the flash fire due to rupture of LPG tank can reach up to 35m high. Therefore, exposure factor to flash fire which is the ratio of the height exposed to flash fire after taking account of terrain and the building height is applied to consider the affected population in the population area. Since the dispersion cloud may engulf the lower level of the building, the exposure factor to flash fire does not discount the population in the rear of the building. It is assumed that the jet fire is horizontal or near-horizontal which is the worst-case scenario to affect the greatest number of population [3]. The exposure factor of jet fire is considered the same as flash fire since the near-horizontal jet flame could not reach up to 35m high.

The transient population (road population) in the vicinity is derived from the Traffic Impact Assessment for the proposed development at year 2023 by Traffic Consultant.

2.7 Indoor / Outdoor Ratio

Indoor and outdoor ratio significantly affects the fire and explosion risk impacts to the population in the vicinity. 95% indoor ratio is assigned to the population in residential buildings, educational institute and industrial buildings due to the protection of façade and building structure. Roads and parks are considered 100% outdoor.

2.8 Temporal Change in Population

Four representative time modes (TM) are identified to address the variations in levels of activities which could lead to a release and population variation with time in the study area. The time periods used in the study is shown in **Table 2-2**. Daytime is defined as 07:00 to 19:00 and night-time from 19:00 to 07:00 next day.

Table 2-2 Definition of Time Modes

| Time Mode (TM) | Name | Fraction of time in a year |
|----------------|--------------------------|----------------------------|
| 1 | Weekday daytime (WDD) | 0.357 |
| 2 | Weekday night time (WDN) | 0.357 |

| Time Mode (TM) | Name | Fraction of time in a year |
|----------------|--------------------------|----------------------------|
| 3 | Weekend daytime (WED) | 0.143 |
| 4 | Weekend night time (WEN) | 0.143 |

2.9

Meteorological Information

Meteorological conditions affect the consequences of gas release, in particular wind directions, speed and stability which influence the direction and degree of turbulence of gas dispersion. Meteorological data from Kai Tak Automatic Weather Station (Year 2016) was collected from the Hong Kong Observatory and adopted in the consequence model to determine the various gas dispersion, fire and explosion effects. The data are rationalised into a set of weather classes in accordance with TNO Purple Book [4]. The meteorological data can be expressed in combination of wind speed and Pasquill stability classes. Pasquill classes (A to F) represent the atmospheric turbulence with class A being the most turbulent class while class F being the least turbulent class.

The six most dominant sets of wind speed-stability class combination for both day-time and night-time are listed in **Table 2-3** and **Table 2-4** below respectively. **Figure 6** shows the respective wind roses.

Table 2-3 Meteorological Data for Kai Tak Automatic Weather Station at day-time

| Direction | B | D1 | D4 | D7 | E | F | Total |
|-----------|--------|--------|--------|--------|--------|--------|---------------|
| 0 | 0.0172 | 0.0035 | 0.0032 | 0.0005 | 0.0025 | 0.0065 | 0.0334 |
| 22.5 | 0.0132 | 0.0030 | 0.0090 | 0.0005 | 0.0027 | 0.0057 | 0.0341 |
| 45 | 0.0172 | 0.0017 | 0.0075 | 0.0000 | 0.0032 | 0.0025 | 0.0321 |
| 67.5 | 0.0177 | 0.0032 | 0.0045 | 0.0002 | 0.0020 | 0.0017 | 0.0294 |
| 90 | 0.0717 | 0.0027 | 0.0513 | 0.0174 | 0.0065 | 0.0050 | 0.1547 |
| 112.5 | 0.0829 | 0.0055 | 0.0555 | 0.0072 | 0.0077 | 0.0037 | 0.1626 |
| 135 | 0.1300 | 0.0152 | 0.0364 | 0.0005 | 0.0112 | 0.0139 | 0.2072 |
| 157.5 | 0.0324 | 0.0080 | 0.0042 | 0.0002 | 0.0010 | 0.0085 | 0.0543 |
| 180 | 0.0269 | 0.0057 | 0.0040 | 0.0007 | 0.0010 | 0.0025 | 0.0408 |
| 202.5 | 0.0127 | 0.0030 | 0.0012 | 0.0002 | 0.0002 | 0.0015 | 0.0189 |
| 225 | 0.0426 | 0.0047 | 0.0052 | 0.0005 | 0.0022 | 0.0032 | 0.0585 |
| 247.5 | 0.0379 | 0.0027 | 0.0045 | 0.0005 | 0.0015 | 0.0020 | 0.0491 |
| 270 | 0.0184 | 0.0042 | 0.0065 | 0.0027 | 0.0010 | 0.0065 | 0.0394 |
| 292.5 | 0.0149 | 0.0035 | 0.0072 | 0.0017 | 0.0020 | 0.0045 | 0.0339 |
| 315 | 0.0122 | 0.0027 | 0.0100 | 0.0007 | 0.0037 | 0.0045 | 0.0339 |
| 337.5 | 0.0082 | 0.0017 | 0.0032 | 0.0000 | 0.0022 | 0.0022 | 0.0177 |

| Direction | B | D1 | D4 | D7 | E | F | Total |
|--------------|---------------|---------------|---------------|---------------|---------------|---------------|----------|
| Total | 0.5562 | 0.0712 | 0.2134 | 0.0339 | 0.0508 | 0.0745 | 1 |

Table 2-4 Meteorological Data for Kai Tak Automatic Weather Station at night-time

| Direction | B | D1 | D4 | D7 | E | F | Total |
|--------------|----------|---------------|---------------|---------------|---------------|---------------|---------------|
| 0 | 0 | 0.0005 | 0.0055 | 0.0008 | 0.0095 | 0.0326 | 0.0489 |
| 22.5 | 0 | 0.0003 | 0.0075 | 0.0000 | 0.0140 | 0.0181 | 0.0399 |
| 45 | 0 | 0.0008 | 0.0083 | 0.0000 | 0.0168 | 0.0128 | 0.0386 |
| 67.5 | 0 | 0.0003 | 0.0065 | 0.0003 | 0.0080 | 0.0088 | 0.0238 |
| 90 | 0 | 0.0008 | 0.0850 | 0.0171 | 0.0379 | 0.0216 | 0.1623 |
| 112.5 | 0 | 0.0015 | 0.0936 | 0.0090 | 0.0406 | 0.0381 | 0.1828 |
| 135 | 0 | 0.0003 | 0.0376 | 0.0003 | 0.0630 | 0.0773 | 0.1783 |
| 157.5 | 0 | 0.0013 | 0.0053 | 0.0000 | 0.0178 | 0.0434 | 0.0677 |
| 180 | 0 | 0.0008 | 0.0015 | 0.0003 | 0.0095 | 0.0256 | 0.0376 |
| 202.5 | 0 | 0.0005 | 0.0005 | 0.0000 | 0.0048 | 0.0100 | 0.0158 |
| 225 | 0 | 0.0000 | 0.0068 | 0.0005 | 0.0115 | 0.0166 | 0.0354 |
| 247.5 | 0 | 0.0003 | 0.0118 | 0.0000 | 0.0100 | 0.0198 | 0.0419 |
| 270 | 0 | 0.0010 | 0.0060 | 0.0013 | 0.0080 | 0.0191 | 0.0354 |
| 292.5 | 0 | 0.0008 | 0.0103 | 0.0018 | 0.0130 | 0.0128 | 0.0386 |
| 315 | 0 | 0.0005 | 0.0093 | 0.0015 | 0.0100 | 0.0105 | 0.0319 |
| 337.5 | 0 | 0.0008 | 0.0058 | 0.0005 | 0.0045 | 0.0095 | 0.0211 |
| Total | 0 | 0.0100 | 0.3012 | 0.0331 | 0.2792 | 0.3765 | 1 |

2.10

Source of Ignition

The Lower Explosive Limit (LEL) and Upper Explosive Limit (UEL) of LPG is 1.8% and 9.5% by volume respectively. LPG within these concentrations can be ignited by ignition sources such as sparks, naked flames, hot surfaces or electrical lines and causes various types of fires/explosion based on the physical condition of the flammable cloud during ignition. Each of these physical effects will be further explained in **Section 5.2**. The two major contributions of ignition sources in this study are defined as population itself and transportation route segments. The default correlation factor for correlating population and ignition strength in the simulation software DNV Safeti 7.2 is used. Information of transportation ignition source and other ignition sources are summarized in **Table 2-5**. **Figure 7** shows the map highlighting the ignition sources identified.

Table 2-5 List of Ignition Sources

| Name | Type |
|------|------|
|------|------|

| | |
|-------------------------|-------------------------|
| ESS_1 | Electricity sub-station |
| ESS_2 | Electricity sub-station |
| ESS_3 | Electricity sub-station |
| ESS_4 | Electricity sub-station |
| Ko Shan Road (R1) | Road |
| Anhui Street (R2) | Road |
| Kiang Hsi Street (R3) | Road |
| Chi Kiang Street (R4) | Road |
| Chatham Road North (R5) | Road |
| Ma Tau Wai Road (R6) | Road |
| Ma Tau Wai Road (R7) | Road |

3 Hazard Identification

3.1 Properties of LPG

LPG supplied in Hong Kong is a pressurized mixture of propane and butane (3:7 in mole ratio). Upon release to the ambient environment, it vaporises and mixes with air forming a dense flammable gas cloud which tends to flow and disperse close to the ground. The gas cloud may extend over a long distance until it becomes too diluted or encounters ignition sources.

3.2 Event Leading to an Accidental LPG Release

The main hazard associated with the LPG facilities is an accidental uncontrolled release of LPG resulting in a fire or explosion upon ignition. The initial events leading to an LPG release could be one of the following:

- Spontaneous failure of pressurised LPG equipment due to material / design / construction defect, fatigue, corrosion, erosion, etc.;
- Loading failure, i.e. an LPG release occurs as a direct result of the road tanker unloading operation;
- Spontaneous failure of vaporiser; and
- External events.

LPG storage vessel failure

Failure of the LPG storage vessel may result from:

- Spontaneous cold catastrophic failure leading to instantaneous release of full inventory;
- Spontaneous partial failure (leak) leading to continuous release of full inventory;
- Over-pressurisation due to accidental overfilling during unloading from the LPG road tanker;
- External events such as earthquake.

LPG road tanker failure

Failure of the LPG road tanker may result from:

- Spontaneous cold catastrophic failure leading to instantaneous release of full inventory;

- Spontaneous partial failure (leak) leading to continuous release of full inventory;

Pipework failure

Spontaneous failure of the LPG pipework is possible due to material defects, corrosion, fatigue and erosion. Most of the LPG pipework is mounted on the concrete floor/structure, which includes the liquid inlet pipework for LPG unloading to the LPG storage vessel, the liquid supply line to the vaporisers and the vapour line from the LPG storage vessel to the gas regulators of the gas distribution pipework. Pipework may fail in an earthquake, and some of the pipework may be subjected to failure due to impact of the LPG road tanker.

Flexible hose failure

An accidental release from the flexible hose may be caused by spontaneous failure due to material degradation, fatigue, corrosion and erosion. It can also result from the following unloading operations:

- Hose misconnection error – an error where the driver / operator fails to properly connect the loading hose and the hose comes adrift during unloading; and
- Hose disconnection error – an error where the driver / operator inadvertently disconnects the hose while the valve is still open or has failed open;
- LPG road tanker drive-away error – an error where the driver inadvertently drives the LPG road tanker away during unloading;

External events

An LPG release may occur due to external events and the consequence could be catastrophic failure or leak. The related external events are listed as follows:

- Earthquake;
- Aircraft crash;
- Car crash;
- Landslide;
- Severe environmental events;
- Lightning strike;
- Dropped object;
- Subsidence; and

- External fire.

3.3

Safety Provisions

Various safety provisions are installed in a LPG compound in accordance with the Code of Practice for Hong Kong LPG Industry published by EMSD. These provisions can act in different combinations to prevent or mitigate the hazards due to an accidental LPG release.

Non-return valve

A non-return valve on the liquid inlet pipework can prevent back flow from the LPG storage vessel.

Excess flow valve

Excess flow valves installed at the LPG road tanker and LPG storage vessel are used to stop the liquid flow when a large release occurs (e.g. guillotine failure of the pipe / hose).

Breakaway coupling

It is possible that the LPG road tanker may be driven away while the hose is still connected, which may cause damage to the facilities and lead to an LPG release. The breakaway coupling is installed to prevent the LPG spillage due to LPG road tanker drive-away during unloading.

Double-check valve

A double-check valve is installed to prevent the release back from the LPG storage vessel. The design of the valve is essentially two non-return valves in series.

Pressure relief valve

Pressure relief valves are installed on the LPG road tanker and LPG storage vessel to protect against excessive pressure build-up due to overfilling or over-heating by fire. The pressure relief valve can prevent the excessive pressure causing leak or catastrophic failure of the LPG road tanker / LPG storage vessel.

Chartek coating

The Chartek coating is a safety feature for the LPG road tankers in Hong Kong. It was reported that the coating could give a protection for at least 30 minutes in case of jet fire impingement[3]. The coating can prevent formation of hot spots on the LPG road tanker upon jet fire impingement which induces thermal weakening of the LPG road tanker wall and leads to a boiling liquid expanding vapour explosion (BLEVE) event.

Dry powder fire extinguishers and sand buckets

Dry powder fire extinguishers and sand buckets are provided for general firefighting uses.

Fire service

Fire brigade is available within a few minutes upon an emergency call in case of fire. BLEVE events could be prevented by effective firefighting measures by the well-trained firefighters.

3.4 **Outcome of an Accident LPG Release**

The following outcomes could result from an accidental LPG release:

- Jet fire;
- Flash fire;
- Vapour cloud explosion (VCE);
- Fireball; and
- BLEVE.

Catastrophic failure of the LPG road tankers may lead to a fireball, flash fire or VCE. A partial failure (leak) in LPG storage vessel / LPG road tanker, pipework / flexible hose failure may cause jet fire or flash fire. Potential fire escalation to a BLEVE event is considered if a jet fire impinges on the LPG road tanker over a period of time, causing the formation of hot spots on the LPG road tanker wall and subsequent structural failure. The LPG storage vessel in the store is buried underground in a concrete compartment filled with washed sand. Escalation to BLEVE is considered unlikely for the underground LPG storage vessel. If there is no ignition source in the LPG vapour cloud or along the migration path of the cloud with the wind, the LPG vapour cloud will dissipate and cause no hazardous impact.

3.5 **LPG Release Scenarios Considered**

Representative LPG accidental release scenarios considered in this study are summarized in **Table 3-1**.

Table 3-1 Representative LPG accidental release scenarios considered

| Equipment | Failure Type | Release Type | Potential Hazardous Outcomes |
|---|-------------------------------------|---------------|------------------------------|
| LPG Storage Vessel | Catastrophic failure | Instantaneous | Flash Fire |
| | Partial failure (leak) | Continuous | Flash fire, jet fire |
| LPG Road Tanker | Catastrophic failure | Instantaneous | Flash Fire, fireball, BLEVE |
| | Partial failure (leak) | Continuous | Flash fire, jet fire |
| LPG Filling Line to Vessel | Guillotine failure | Continuous | Flash fire, jet fire |
| LPG Filling Line to Flexible Hose | Guillotine failure | Continuous | Flash fire, jet fire |
| Liquid Line Supply to Vaporiser | Guillotine failure | Continuous | Flash fire, jet fire |
| Vaporiser | Guillotine failure (of liquid coil) | Continuous | Flash fire, jet fire |
| Flexible Hose (Fed from LPG Storage Vessel) | Guillotine failure | Continuous | Flash fire, jet fire |
| Flexible Hose (Fed from LPG Road Tanker) | Guillotine failure | Continuous | Flash fire, jet fire |

4 Frequency Analysis

4.1 Overview

A frequency assessment involves analysis of likelihood of LPG containment failure leading to an accidental LPG release and subsequent outcome probabilities. The initiating failure probabilities are estimated from the historical accident statistics, published failure data report, industrial testing results and expert judgment. Base failure frequencies of LPG facilities (vessels, pipework, etc.) are derived from the initiating failure events by applying failure analysis techniques such as fault tree analysis. Occurrences of subsequent hazardous outcomes in an accident are estimated by event tree analysis, taking severity of the release event and surrounding environment into account.

4.2 Spontaneous Failure

LPG storage vessel failure

LPG storage vessel failure refers to cold catastrophic failure leading to instantaneous release of the whole inventory or cold partial failure causing a continuous leak. For a LPG vessel being used over 20 years, 3.6×10^{-7} per vessel per year and 1.0×10^{-5} per vessel per year are adopted for cold catastrophic and partial failures respectively [3]. The LPG storage vessel is assumed to be stress relieved and 100% radiographically examined.

LPG road tanker failure

LPG road tanker can be regarded as a mobile LPG storage vessel. The cold spontaneous failure rate for LPG road tankers could be higher than for a fixed storage vessel because of stress experienced by the road tanker due to vibration during transportation and cyclic loading associated with filling / unloading of the LPG road tanker. The catastrophic and partial failure probabilities of a LPG road tanker are 2.0×10^{-6} per vessel per year and 5.0×10^{-6} per vessel per year respectively [3].

Pipework failure

Failure of LPG pipework can be guillotine failure (full bore rupture) and partial failure (leak from pipe cracks). For a LPG installation, leak from pipework is considered insignificant contributors to the overall risk levels [3]. The generic guillotine failure rate of LPG pipework is taken as 1.0×10^{-6} per metre per year [3]. It should be noted that failure of pipework can result in uncontrolled continuous release of LPG if isolation fails, i.e. simultaneous failure of safety equipment (non-return valve, excess flow valve and ESD valve) and manual shut-off valves.

Vaporizer failure

LPG from the storage vessel is vaporized in the water-heated coils of the vaporizers. The fluid flowing through the heating coil is of two-phase. In this assessment,

guillotine failure of the coils leading to liquid release is assumed, which is deemed conservative. Failure rate of 1.0×10^{-6} per meter per year [3] are adopted for the coil failure, which gives a failure frequency of 5.0×10^{-6} per year assuming an average coil length of 5 m.

Flexible hose failure

Cold spontaneous failure of flexible hose may occur during the road tanker unloading operations. Likelihood of a guillotine failure is taken as 9.0×10^{-8} per hour [3]. As same as pipework failure mention in 4.2.3, partial failure is considered insignificant and not further modelled in this study [3].

4.3 **LPG Road Tanker Unloading**

Hose misconnection error

A misconnection error could occur if the hose is improperly connected to the filling point. A failure rate of 3×10^{-5} per operation [3] is adopted in the analysis. It is assumed the error causes the hose to come completely apart, leading to a full-bore release.

Hose disconnection error (during tanker unloading)

This error is caused by inadvertently disconnecting the filling hose during the unloading operation, which requires a complete disregard of normal operating procedures, as well as the failure to re-tightening the coupling immediately upon loosening it. A gross human error of 2×10^{-6} per operation [3] is adopted in the analysis, assuming it results in a full-bore release.

Disconnection with valve open

A release may ensue when the hose is disconnected if isolating valves are left open or fail to close. This event is considered insignificant because it involves failure of a series of safety valves (non-return valve, and double-check filler valve), in additional to failure of the driver and his assistant to close the manual shut-off valve, 0.5 per operation [3].

Road tanker drive-away error

A drive-away error could occur due to repositioning of the truck during delivery or inadvertent drive-away before completion of replenishment. The outcome of this failure matches those of hose misconnection. A full-bore release is assumed in the analysis. A number of measures such as the use of wheel chocks, interlocks on shutters and parking brake have been implemented in Hong Kong. Repositioning during delivery is deemed remote because there is a dedicated unloading bay in the LPG store. The driver and his assistant are responsible for monitoring the unloading process during replenishment. Thus, the probability of drive-away error before operation completion is deemed very low and a failure rate of 4×10^{-6} per operation [3] is adopted.

Road tanker impact onto LPG facilities

The road tanker may strike the LPG installation during truck manoeuvring within the LPG compound, causing damage to the LPG installation or the road tanker. A likelihood of 1.5×10^{-4} per operation [3] is adopted for this human error. The road tanker moves very slowly during manoeuvring to its unloading bay. A release from the road tanker due to slight impact is considered remote because the road tanker is equipped with side and rear end protection (mechanical barriers & rear protection bumper) for the vessel, fittings, valves and pipework fitted to it. The probability of damaging the filling pipework is considered very low as it is protected by a steel framework and the vehicle bumper, minimizing the chance and energy of direct tanker impact on the pipework. A release from the damaged pipework could ensue only if the driver neglects his duty to check the pipework integrity and possible leakage before unloading starts.

Road tanker collision during unloading

The LPG road tanker parks in a designated unloading bay of the LPG Store, which can only be accessed from a private road. Warning traffic cones and speed bump at the entrance are provided in the compound. The collision by other vehicles to an unloading road tanker is considered very unlikely; nevertheless, a frequency of 1×10^{-8} per operation [3] is used in the analysis.

Loading pipework over-pressurisation

In an unloading operation it is possible that the driver makes an error that he forgets to open all valves on the filling line to the storage vessel, which would potentially result in over-pressurization of the loading pipework. However, it requires that the over-pressurization protection system of the road tanker does not work, as well as isolation fails such as excess flow valve, emergency stop system and closure of manual valve(s). The potential scenario is of much lower probability than the "misconnection" error event (which will lead to a similar outcome) and the misconnection error is considered already accounted for this factor.

Storage tank overfilling/ over-pressurisation

During unloading operation the driver should stay close to the road tanker while his assistant should monitor the filling in progress at the LPG tank. Generally bulk tanks shall not be filled more than 85% of the tank volume, and each bulk tank shall be equipped with at least two gauges for indicating the quantity of content, one of which shall be of a fixed liquid level type. In Hong Kong it is an offence to overfill an LPG storage vessel, and the possibility is considered to be 2×10^{-2} per operation[3]. However, even if overfilling occurs, a release due to over-pressurization will not occur unless all of the following takes place:

- Failure truck pump over-pressurization protection system;
- Failure of pressure relief valve on the storage vessel; and

- Failure of the driver and his assistant to detect the problem and take effective mitigation actions.

Human Error

In case of accidental failure, it is very probable that the onsite staff can rectify the problem before and after any hazard event occurs. Two competent persons (usually the driver and his assistant) are required to be engaged in the whole unloading process. They are suitably trained in unloading operation, first aid, firefighting and emergency response. Nevertheless, they may make errors in a series of operations. The probability is taken as 0.01, "error in a routine operation where care is required" in "A Guide to Practical Human Reliability Assessment" [10]. Probability of human error becomes much higher under emergency situations once a hazard event occurs, because the operator has to take immediate actions (e.g. closing the manual shut-off valve) under extreme stresses, and also possibly puts himself in some danger from the LPG release. This chance of human errors in this case is 0.3, "general rate for errors involving very high stress levels" [5]. Nevertheless, a more conservative probability of 0.5 [3] is adopted in this analysis considering the operators are facing the dangers from an LPG release.

4.4

External Events

Earthquake

Hong Kong is situated on the southern coast of mainland China and facing the South East China Sea. Hong Kong is not located within the seismic belt and according to Hong Kong Observatory, earthquakes occurring in the circum-Pacific seismic belt which passes through Taiwan and Philippines are too far away to affect Hong Kong significantly. Buildings and infrastructures in Hong Kong are designed to withstand earthquakes up to Modified Mercalli Intensity (MMI) VII.

It is estimated that MMI VIII is of sufficient intensity to cause damage to specially designed structures. In this analysis, it is assumed that such earthquake may result in storage vessel leakage and pipework rupture at a probability of 0.01 [6]. The probability of earthquake occurrence at MMI VIII and higher in Hong Kong is very low comparing with other regions and is estimated to be 1.0×10^{-5} per year [3].

Aircraft crash

The LPG Store is far away from the Hong Kong International Airport with a distance of about 27 km. The frequency of aircraft crash is estimated using the HSE methodology [7]. The number of flights from 2002 to 2012 is extracted from the Civil Aviation Department, and extrapolated to year 2023 by linear regression. The calculated impact frequency due to aircraft crash is 4.35×10^{-17} per year at year 2023, which is much smaller than 1.0×10^{-9} per year. It is therefore not further considered in the analysis.

Car crash

No entry of unauthorised vehicle and speed restriction are imposed within the LPG Store. The Store is fenced from the access road with a concrete wall. Only minor car accident might be expected at the site, which is considered to impose negligible threat to the LPG installation. It is deemed this risk has been included in the "Road tanker collision during unloading".

Landslide

Since there is no slope feature near the LPG store, landslide risk is not further considered.

Severe environmental events

Loss of containment due to severe environmental events such as typhoon or tsunami (large scale tidal wave) is considered unlikely since the LPG vessel is buried underground. The LPG installation is designed safe to withstand the wind load for typhoon. Therefore, the risk is deemed unlikely and not further considered in the analysis.

Lightning strike

The frequency of lightning strike on a properly protected building structure is extremely low in Hong Kong. Risk resulting from lightning strike on facilities in the LPG Store is extremely low as the compound is fitted with lightning rod and surrounded by several high-rise buildings. It is deemed possibility of lightning strike is remote, therefore not further considered in this assessment.

Dropped object

The LPG Store is mainly surrounded by Ko Shan Road Park that the chance having dropped object with sufficient weight and velocity to damage the LPG store is very remote. The nearest high-rise building near the LPG store is the Lok Man Sun Chuen Block I. However, the nearest window of that building is not directly facing the LPG store and is separated from the LPG store at least 10 meters. One need to deliberately throw the object at an angle for it to land on the LPG store. It is expected that any dropped object fall on the LPG can only cause neglectable effect because most of the equipment in LPG Store is covered by concrete cover. In addition, the LPG Store is fenced which help prevent object in projectile motion falling into LPG Store. Therefore, it is considered the threat from dropped objects to the LPG Store is remote and not further assessed in the analysis.

Subsidence

Excessive subsidence may lead to failure of the structure and ultimately loss of containment scenario. However, subsidence is usually slow in movement and such movement can be observed and remedial action can be taken in time. Risk from subsidence is therefore deemed remote and not further considered.

External fire

External fire refers to the occurrence of a fire event outside the LPG Store which may lead to the failure of the LPG facilities. This might be expected from minor accidents on the private access road, probably involving engine failures (e.g. overheating during hot summer). The resulting fire is usually small, only affecting a few meters around the car, and could be quickly extinguished using fire extinguishers or by the fire brigade. In addition, the key facilities inside are further protected by concrete building structures. The risk of escalation of external fire to the LPG facilities is deemed negligible and not further considered in the analysis.

4.5 Failure Frequencies

Fault Tree Analysis (FTA) was performed based on the initiating events as described above. The analysis derived a number of loss of containment scenarios that will lead to the release of LPG to the atmosphere. The failure rates adopted in the Fault Tree are summarized in **Table 4-1**. The Fault Trees are listed in **Appendix B** and the derived frequencies of loss of containment scenarios are summarized in **Table 4-2**.

Table 4-1 Failure Rate and Probabilities Adopted

| Item | | Failure Rate | Unit | Remark |
|---|--------------|----------------------|---------------------|--------|
| <u>Spontaneous Failure</u> | | | | |
| - LPG storage vessel failure | Catastrophic | 3.6×10^{-7} | per vessel per year | (1) |
| | Partial | 1.0×10^{-5} | per vessel per year | (1) |
| - LPG road tanker failure | Catastrophic | 2.0×10^{-6} | per vessel per year | (1) |
| | Partial | 5.0×10^{-6} | per vessel per year | (1) |
| - Pipework (filling line) failure | Guillotine | 1.0×10^{-6} | per metre per year | (1) |
| - Vaporizer failure | Guillotine | 1.0×10^{-6} | per metre per year | (1) |
| - Flexible hose failure | Guillotine | 9.0×10^{-8} | per hour | (1) |
| <u>LPG Road Tanker Unloading Failure / Vehicle Impact</u> | | | | |
| - Hose misconnection error | | 3×10^{-5} | per operation | (1) |
| - Hose disconnection error | | 2×10^{-6} | per operation | (1) |
| - Road-tanker drive away | | 4×10^{-6} | per operation | (1) |
| - Road-tanker impact onto LPG facilities | | 1.5×10^{-4} | per operation | (1) |
| - Vehicle impact onto road-tanker | | 1×10^{-8} | per operation | (1) |
| - Overfilling / over-pressurisation | | 2×10^{-2} | per operation | (1) |
| <u>External Event</u> | | | | |
| - Earthquake MMIVIII affects LPG storage area | | 1×10^{-5} | per year | (1) |
| <u>Failure of Safety System</u> | | | | |
| - Tank truck pump overpressure protection system failure | | 1×10^{-4} | per demand | (2) |
| - Pressure relief valve failure | | 1×10^{-2} | per demand | (7) |
| - Non-return valve failure | | 0.013 | per demand | (1) |
| - Excess flow valve failure (on vessel) | | 0.13 | per demand | (1) |
| - Excess flow valve failure (on tanker) | | 0.013 | per demand | (5) |
| - Emergency Shutdown (ESD) System fails | | 1×10^{-4} | per demand | (1) |
| - Breakaway coupling failure | | 0.013 | per demand | (1) |
| - Double-check valve failure | | 2.6×10^{-3} | per demand | (1) |
| <u>Human Error in Activating Safety Provision</u> | | | | |
| - Operator fails to close manual valve | | 0.5 | per demand | (1) |
| - Operator fails to activate ESD | | 0.1 | per demand | (3) |
| <u>Fire Protection / Fighting System Failure</u> | | | | |
| - Protective fire coating failing to prevent BLEVE | | 0.1 | per demand | (1) |
| - Fire services failing to prevent BLEVE | | 0.5 | per demand | (1) |
| <u>Failure Probabilities</u> | | | | |
| - Catastrophic failure of LPG vessel due to overfilling | | 0.01 | | (6) |
| - Partial failure of LPG vessel due to overfilling | | 0.1 | | (6) |
| - Catastrophic failure of road tanker due to vehicle impact | | 1×10^{-4} | | (6) |

| Item | Failure Rate | Unit | Remark |
|---|--------------------|------|--------|
| - Partial failure of road tanker due to vehicle impact | 1×10^{-3} | | (6) |
| - Guillotine failure of vessel filling line due to road tanker impact | 1×10^{-3} | | (6) |
| - Guillotine failure of supply line to vaporiser due to road tanker impact | 1×10^{-3} | | (6) |
| - Guillotine failure of filling line to flexible hose due to vehicle impact | 1×10^{-3} | | (6) |
| - Guillotine failure of liquid supply vaporiser coil due to overfilling | 0.5 | | (6) |
| - Guillotine failure of pipework due to earthquake | 0.01 | | (4) |

Note

1. Reference: Quantitative Risk Assessment Methodology for LPG Installations [3]
2. Assume to be same as trip system fails
3. Reference: A Guide to Practical Human Reliability Assessment[5]
4. Reference: Risk of Hazardous Materials Release Following an Earthquake.[6]
5. Assume to be one-tenth of excess flow valve failure rate on tanker.
6. By assumption
7. Reference: Lee's Loss Prevention in Process Industries[8]

Table 4-2 Failure Frequencies of Scenario Considered

| Hazardous Event (Loss of Containment scenario) | Event ID | Frequency (per year) |
|---|----------|-------------------------|
| Cold Catastrophic Failure of LPG Storage Vessel | VESL_RUP | 7.21E-07 |
| Cold Partial Failure of LPG Storage Vessel | VESL_LEK | 2.01E-05 |
| Cold Catastrophic Failure of LPG Road Tanker | TANK_RUP | 2.11E-08 |
| Cold Partial Failure of LPG Road Tanker | TANK_LEK | 5.34E-08 |
| Guillotine Failure of Filling Line (failed to isolate from Vessel) | VVEL_LRU | 2.86E-10 |
| Guillotine Failure of Filling Line (ailed to isolate from Tanker) | VTAK_LRU | 9.00E-09 |
| Guillotine Failure of Supply Line to Vaporiser | SVAP_LRU | 3.11E-06 |
| Failure of Vaporiser | VAPO_LRU | 1.01E-05 |
| Guillotine Failure of Flexible Hose (failed to isolate from Vessel) | FLXV_LRU | 2.51E-08 |
| Guillotine Failure of Flexible Hose (Fed from LPG Road Tanker) | FLXT_LRU | 9.66E-07 |
| LPG Road Tanker BLEVE | TANK_BLE | 1.30E-10 |

5 Consequence Analysis

5.1 Source Term Modelling

LPG is modelled as a mixture of 30% propane and 70% butane. LPG stored in a tank is pressurised to medium pressure to reach an equilibrium state between the liquid and vapour phases, depending on the ambient temperature. Instantaneous release of the whole inventory is assumed for catastrophic rupture of LPG tanks. For a continuous release, discharge rate is calculated by DNV Safeti based on the leak size, release temperature, release pressure and fluid phase. Duration of discharge is determined by discharge rate and total inventory.

5.2 Physical Effect Modelling

The built-in UDM model in DNV Safeti is used for the dispersion of unignited vapour cloud following an accidental LPG release. The model takes various transition phases into account, from dense cloud dispersion to buoyant passive gas dispersion in both instantaneous and continuous releases.

LPG vaporises rapidly upon a release. A number of possible outcomes may occur depending on whether the vapour is ignited immediately or ignited after a period of time. The dispersion characteristics are influenced by meteorological conditions and material properties, such as density of the vapour cloud.

Different kinds of fire scenarios may be developed in the presence of ignition sources in the proximity of a LPG release. Flash fire could occur once the cloud encounters active ignition sources. It may result in a vapour cloud explosion in a confined space or a congested area. If no ignition source exists, the vapour cloud would disperse downwind and be diluted to the concentration below its lower flammability limit (LFL). In this case, the vapour cloud would become too lean to ignite and have no harmful effect.

Jet Fire

For flammable fluids stored under pressure, release from an orifice would become a flame jet (i.e. jet fire) when ignited immediately. The combustion of the jet is influenced by the momentum of the release.

Fireball and BLEVE

Immediate ignition of an instantaneous release of the whole inventory inside a pressurised vessel would result in a fireball. A fireball is characterized by its high thermal radiation intensity and short duration time. The principal hazard of fireball arises from thermal radiation, which is not significantly influenced by weather, wind direction or source of ignition. A BLEVE is similar to a fireball except that is caused by integrity failure from fire impingement and therefore occurs as fire escalation events. The physical effects are calculated in the same way as fireballs.

Thermal Radiation of Fires

The following Probit equation is used to determine lethal doses for various fire scenarios [9]:

$$Pr = -36.38 + 2.56 \ln Q^{4/3} t$$

where Q is the thermal radiation intensity in W/m² and t is the exposure time in seconds.

A building is assumed to offer protection to its occupants against hazards from fires. The protection factor is assumed to be 50% for indoor population within fireball radius[3]

Flash Fire

An LPG release, if not ignited immediately, would vaporise and form a vapour cloud around the release source. This cloud would move in the downwind direction, entraining air as it disperses and get diluted. If it gets ignited before it is diluted to below its LFL, a flash fire would result. Major hazards from flash fire are thermal radiation and direct flame contact. Since the flash combustion of a gas cloud normally lasts for a short duration, thermal radiation effect on people near a flash fire is limited. Humans who are encompassed outdoor by the flash fire would be fatally injured. A fatality rate of unity is assumed for outdoor population, and 90% protection factor is assumed for indoor occupants [3]

Vapour Cloud Explosion

If the vapour cloud passes through an area of congestion (e.g. cluster of pipe racks or a confined space) and gets ignited, the confinement would limit the degree of expansion of the burning cloud, causing an explosion and damage to the surroundings by the resulting overpressure. In DNV Safeti, the hazardous effects are modelled by two concentric circular areas corresponding to heavy and light building damage respectively. Fatality rates for persons outdoor and indoor are determined from the HSE method and CIA guidelines [9].

5.3

Event Tree Analysis

Event tree analysis (ETA) is used to develop the evolution of a failure event from its initial release (as developed in **Section 4**, Frequency Assessment) to the final outcome scenarios, namely, jet fire, flash fire, fireball, etc. It depends on various factors such as release type (instantaneous or continuous), ignition sources and probabilities, and degree of congestion to cause a vapour cloud explosion.

Catastrophic Failure of LPG Bulk Tank

For catastrophic failure (tank rupture) of LPG storage vessels and road tankers, the event trees are shown in **Appendix C-1** and **Appendix C-3**. Immediate ignition is assumed a probability of 0.9 for large releases [3]. It is assumed that immediate

ignition will result in a fireball, as the content would be instantly released to the ambient. It is only applicable to road tanker, since the storage vessel is buried underground and fireball of the storage vessel is expected to have little effect.

A delayed ignition may produce a flash fire or vapour cloud explosion (VCE). The occurrence of VCE requires ignition of a dispersed gas cloud present in a confined or congested space. Past analysis suggested that in Hong Kong situation the maximum overpressure obtained from VCE would be too low to contribute significantly to the overall risk [3]. Hence it is assumed that a delayed ignition will have 100% chance to cause a flash fire instead.

Leak from LPG Bulk Tank/ Failure of LPG Pipes

For small leaks of LPG storage vessels and road tankers, as well as releases from LPG pipes (pipework, vaporizers, etc.), a lower probability of 0.05 is adopted for immediate ignition[3]. Immediate ignition of a continuous pressurized release results in a jet fire. There is a 20% chance the cloud will be ignited later and lead to a flash fire [3]. The event tree is shown in **Appendix C-2**, **Appendix C-4** to **Appendix C-9**.

Fire Escalation to BLEVE

It is possible a jet flame from pipe/hose failure may impinge on the road tanker and cause tank failure over a period of time. The probability of flame impingement is assumed as 0.01. In Hong Kong the LPG road tankers are protected by a layer of Chartek coating, preventing the formation of hot spots above the liquid level of the tank. The probability of coating failure is assigned as 0.1 [3]. Consideration is also given to fire services which may be ineffective in preventing a BLEVE, and the probability is assumed as 0.5 [3]. LPG storage vessels are considered free from flame impingement because it is buried underground. The event tree of the pipe/hose failure leading to a BLEVE is presented in **Appendix C-5** to **Appendix C-9**.

5.4

Hazardous Impacts on Offsite Population

Population in the vicinity of the LPG Store can be potentially affected by the hazardous events depending on the consequences. Fireball and BLEVE from the LPG road tanker have a radius of up to 62.47 m. LPG jet fire flame can extend up to 33.7 m for the road tanker leakage and 46.5 m for the filling hose failure. In the absence of ignition sources, the large flammable vapour cloud resulting from an instantaneous rupture of a LPG vessel or road tanker may drift downwind up to 296 m at high wind speeds. However, it is very likely the cloud would get ignited during its migration due to presence of plenty ignition sources such as moving vehicles, road lamps, and various human activities near the LPG Store.

Full height of the surrounding buildings could be affected by fireball and BLEVE considering their size and lift-off. Fireball and BLEVE would only affect flats overlooking the LPG Store, but not those at the rear of the buildings. LPG dispersion cloud due to full rupture of tanker can reach up to 35 m high, which may be ignited to cause flash fire affecting population up to this height.

6 Risk Assessment

6.1 Risk Summation

Risk summation integrates the likelihood and consequence of hazardous loss of containment under meteorological information, population data and ignition source distribution to generate a quantitative measure of risk impact due to the operation of LPG compound. The risk analysis is conducted by the simulation software, Safeti v7.2, developed by DNV. The risk results are presented in terms of individual risk (as iso-risk contours) and societal risk (as F-N curve or Potential Loss of Life (PLL)). The risk results are compared to the criteria stipulated in the risk guidelines as specified in **Section 1.3**.

6.2 Results of Individual Risk

The individual risk contour of the LPG compound is presented in **Figure 8**. The highest individual risk contour is 1×10^{-7} per year, i.e. Individual risk level inside the project site is lower than the risk criteria 1×10^{-5} per year. Therefore, in terms of individual risk, the criteria set in the Hong Kong Risk Guidelines are satisfied.

6.3 Results of Societal Risk

The Societal Risk F-N Curve of the study area is presented in **Figure 9**. The FN data with and without development is shown in **Table 6-1**. The F-N curve is within the "Acceptable" region. The graph shows that there is only a slight change in societal risk due to the development.

Societal risk can also be represented in the form of Potential Loss of Life (PLL). It expresses the risk to the population as a whole and for each scenario and its location. The PLL is an integrated measure of societal risk obtained by summing the product of each F-N pair:

$$PLL = f_1 N_1 + f_2 N_2 + \dots + f_n N_n$$

The comparison of PLL for the operation phase with proposed development is shown in **Table 6-2**. The PLL contribution of the potential development is 1.049×10^{-7} per year, which is 0.43% of the total PLL of the area. It indicated that the proposed development has only a very small impact on change of risk level.

Table 6-1 F-N Data

| Number of Fatality | Without Potential Development | With Potential Development (construction) | With Potential Development (operation) |
|--------------------|-------------------------------|---|--|
| 1 | 2.454E-06 | 2.565E-06 | 2.454E-06 |
| 2 | 1.816E-06 | 1.983E-06 | 1.817E-06 |
| 3 | 1.480E-06 | 1.623E-06 | 1.480E-06 |
| 4 | 1.210E-06 | 1.318E-06 | 1.211E-06 |
| 5 | 1.073E-06 | 1.168E-06 | 1.073E-06 |
| 6 | 1.020E-06 | 1.104E-06 | 1.020E-06 |
| 7 | 8.605E-07 | 9.297E-07 | 8.605E-07 |
| 8 | 6.384E-07 | 6.862E-07 | 6.384E-07 |
| 9 | 5.712E-07 | 6.096E-07 | 5.712E-07 |
| 10 | 5.390E-07 | 5.745E-07 | 5.390E-07 |
| 11 | 5.162E-07 | 5.503E-07 | 5.162E-07 |
| 12 | 4.944E-07 | 5.248E-07 | 4.944E-07 |
| 13 | 4.628E-07 | 4.913E-07 | 4.628E-07 |
| 14 | 4.357E-07 | 4.616E-07 | 4.357E-07 |
| 15 | 4.178E-07 | 4.456E-07 | 4.178E-07 |
| 16 | 3.980E-07 | 4.191E-07 | 3.980E-07 |
| 17 | 3.690E-07 | 3.850E-07 | 3.690E-07 |
| 18 | 3.358E-07 | 3.531E-07 | 3.358E-07 |
| 19 | 3.057E-07 | 3.249E-07 | 3.057E-07 |
| 20 | 2.920E-07 | 3.084E-07 | 2.920E-07 |
| 21 | 2.878E-07 | 3.029E-07 | 2.878E-07 |
| 22 | 2.791E-07 | 2.918E-07 | 2.791E-07 |
| 23 | 2.624E-07 | 2.715E-07 | 2.624E-07 |
| 25 | 2.339E-07 | 2.433E-07 | 2.339E-07 |
| 27 | 2.062E-07 | 2.113E-07 | 2.062E-07 |
| 30 | 1.886E-07 | 1.938E-07 | 1.886E-07 |
| 32 | 1.818E-07 | 1.865E-07 | 1.818E-07 |
| 34 | 1.731E-07 | 1.700E-07 | 1.731E-07 |
| 36 | 1.601E-07 | 1.560E-07 | 1.601E-07 |
| 38 | 1.541E-07 | 1.488E-07 | 1.541E-07 |
| 40 | 1.487E-07 | 1.438E-07 | 1.487E-07 |
| 43 | 1.418E-07 | 1.358E-07 | 1.418E-07 |
| 46 | 1.360E-07 | 1.306E-07 | 1.360E-07 |
| 50 | 1.196E-07 | 1.167E-07 | 1.196E-07 |
| 53 | 1.069E-07 | 9.952E-08 | 1.069E-07 |
| 56 | 9.963E-08 | 9.256E-08 | 9.963E-08 |
| 60 | 9.855E-08 | 9.111E-08 | 9.855E-08 |

| Number of Fatality | Without Potential Development | With Potential Development (construction) | With Potential Development (operation) |
|--------------------|-------------------------------|---|--|
| 63 | 9.357E-08 | 8.532E-08 | 9.357E-08 |
| 66 | 9.158E-08 | 8.278E-08 | 9.159E-08 |
| 69 | 8.333E-08 | 7.284E-08 | 8.333E-08 |
| 73 | 6.947E-08 | 5.779E-08 | 6.947E-08 |
| 77 | 4.957E-08 | 3.976E-08 | 4.957E-08 |
| 80 | 4.860E-08 | 3.809E-08 | 4.860E-08 |
| 87 | 4.279E-08 | 3.303E-08 | 4.279E-08 |
| 90 | 3.670E-08 | 2.837E-08 | 3.670E-08 |
| 97 | 2.936E-08 | 2.267E-08 | 2.936E-08 |
| 100 | 1.839E-08 | 1.384E-08 | 1.839E-08 |
| 105 | 1.068E-08 | 7.762E-09 | 1.068E-08 |
| 110 | 3.599E-10 | 3.933E-10 | 3.599E-10 |
| 115 | 3.914E-11 | 5.771E-11 | 3.911E-11 |
| 120 | 3.632E-11 | 4.697E-11 | 3.641E-11 |
| 125 | 3.473E-11 | 4.321E-11 | 3.470E-11 |
| 130 | 2.731E-11 | 3.556E-11 | 2.728E-11 |
| 135 | 2.621E-11 | 3.450E-11 | 2.617E-11 |
| 140 | 2.292E-11 | 2.909E-11 | 2.319E-11 |
| 145 | 1.919E-11 | 2.069E-11 | 1.931E-11 |
| 150 | 1.808E-11 | 1.951E-11 | 1.806E-11 |
| 160 | 1.334E-11 | 1.426E-11 | 1.332E-11 |
| 170 | 8.903E-12 | 1.152E-11 | 1.051E-11 |
| 180 | 7.025E-12 | 9.519E-12 | 7.033E-12 |
| 190 | 5.592E-12 | 8.624E-12 | 6.107E-12 |
| 200 | 4.577E-12 | 7.966E-12 | 4.650E-12 |
| 210 | 3.693E-12 | 5.722E-12 | 3.694E-12 |
| 220 | 3.099E-12 | 4.204E-12 | 3.101E-12 |
| 230 | 2.943E-12 | 3.705E-12 | 2.943E-12 |
| 250 | 2.050E-12 | 2.271E-12 | 2.050E-12 |
| 270 | 8.033E-13 | 6.900E-13 | 8.033E-13 |
| 300 | 3.005E-13 | 2.761E-13 | 3.005E-13 |
| 320 | 1.902E-13 | 1.893E-13 | 1.902E-13 |
| 340 | 4.150E-14 | 4.070E-14 | 4.150E-14 |
| 360 | 7.353E-16 | 7.347E-16 | 7.353E-16 |
| 380 | 6.021E-16 | 1.776E-16 | 6.021E-16 |

Table 6-2 Potential Loss of Life Breakdown

| Case | Potential Loss of Life (per year) | | % of Total PLL |
|------------------------------------|--------------------------------------|--------------|-------------------|
| | Overall | Subject Site | |
| Without Development | 2.436e-5 | 1.024e-7 | 0.42% |
| With Development (Construction) | 2.506e-5 | 8.346e-8 | 0.33% |
| With Development (Operation) | 2.437e-5 | 1.049e-7 | 0.43% |

7 Conclusion

A Quantitative Risk Assessment for a LPG compound in Lok Man Sun Chuen, To Kwa Wan was carried out to study the risk increase due to a residential development proposed by Hong Kong Housing Authority.

The possible hazards from the LPG compound were identified. The occurrence frequencies and the possible consequences of these hazards were assessed quantitatively. The results were presented in the form of individual risk contours and societal F-N curve, and compared with the Hong Kong Risk Guidelines.

The result revealed that the highest individual risk did not reach 1×10^{-5} per year, and the societal risk F-N curve for the base case (without proposed development) and developed case (with proposed development) lied within the “acceptable” region.

PLL increases by 0.01% due to the proposed development. The F-N curves for the base case and developed case overlap. Furthermore, the lower floors of the development are designed to be transfer plate, car park, retail and recreational facilities which has the lowest population density of the development. Hence, the proposed development contributes insignificantly to the risk level.

8**Reference**

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- [2] "Code of Practice for Hong Kong LPG Industry - Module 3 Handling and Transport of LPG in Bulk Road," Electrical and Mechanical Services Department, Hong Kong Special Administrative Region 2014.
- [3] A. B. Reeves, F. C. Minah, and V. H. K. Chow, "Quantitative Risk Assessment Methodology for LPG Installations, Conference on Risk & Safety Management in the Gas Industry," Hong Kong, 1997: EMSD & HKIE.
- [4] Guidelines for Quantitative Risk Assessment "Purple Book", CPR18E. Committee for the Prevention of Disasters, 2005.
- [5] B. Kirwan, "A Guide to Practical Human Reliability Assessment," CRC Press 0748400524, 1994.
- [6] K. J. Tierney, "Risk of Hazardous Materials Release Following an Earthquake," Disaster Research Centre, University of Delaware 1990.
- [7] "The Calculation of Aircraft Crash Risk in the UK," Health and Safety Executive, United Kingdom 1997.
- [8] S. Mannan and F. P. Lees, Lee's loss prevention in the process industries : hazard identification, assessment and control, 3rd ed. / [edited by] Sam Mannan. ed. Amsterdam ; London: Elsevier Butterworth-Heinemann, 2005.
- [9] "Guidance for the Location and Design of Occupied Buildings on Chemical Manufacturing Sites," Chemical Industry Association (CIA) 1998.

Figures

Hong Kong Housing Authority

Quantitative Risk Assessment
for Subsidised Sale Flats
(SSF) Development at Ko
Shan Road, To Kwa Wan

**Photo of the
Esso LPG Store
being studied.**

Figure 1

Scale: NTS



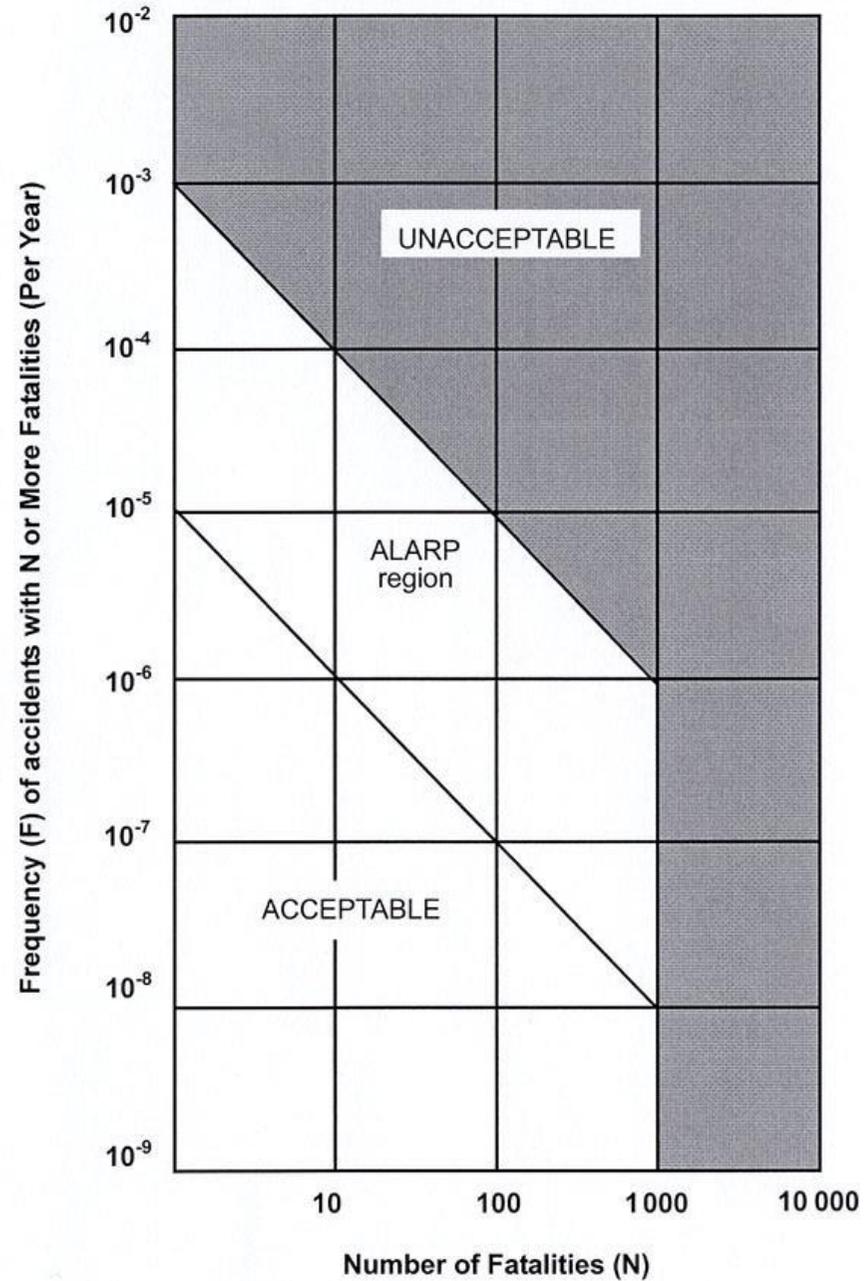
Hong Kong Housing Authority

Quantitative Risk Assessment
for Subsidised Sale Flats
(SSF) Development at Ko
Shan Road, To Kwa Wan

Societal Risk Guidelines

Figure 2

Scale: NTS



Hong Kong Housing Authority

Quantitative Risk Assessment
for Subsidised Sale Flats
(SSF) Development at Ko
Shan Road, To Kwa Wan

Location of Esso LPG Store, Study Area and the Location of the Proposed Development

Figure 3

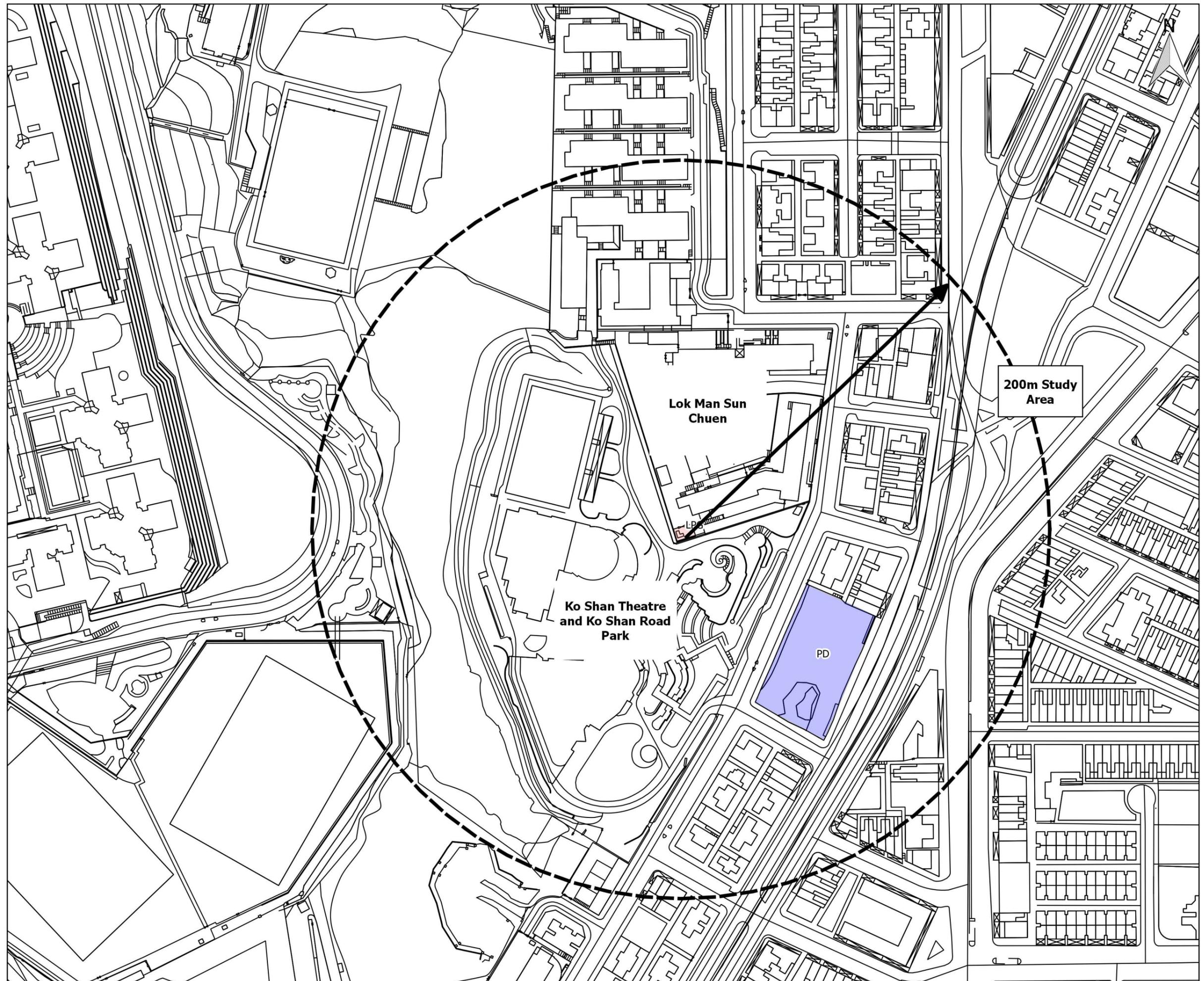
Population Polygon (This Study)

- LPG
- Proposed Development

Scale: 1:1,900

Date:

Rev.:



Hong Kong Housing Authority
 Quantitative Risk Assessment
 for Subsidised Sale Flats
 (SSF) Development at Ko
 Shan Road, To Kwa Wan

**Population
 Considered in
 this Study**

Figure 5

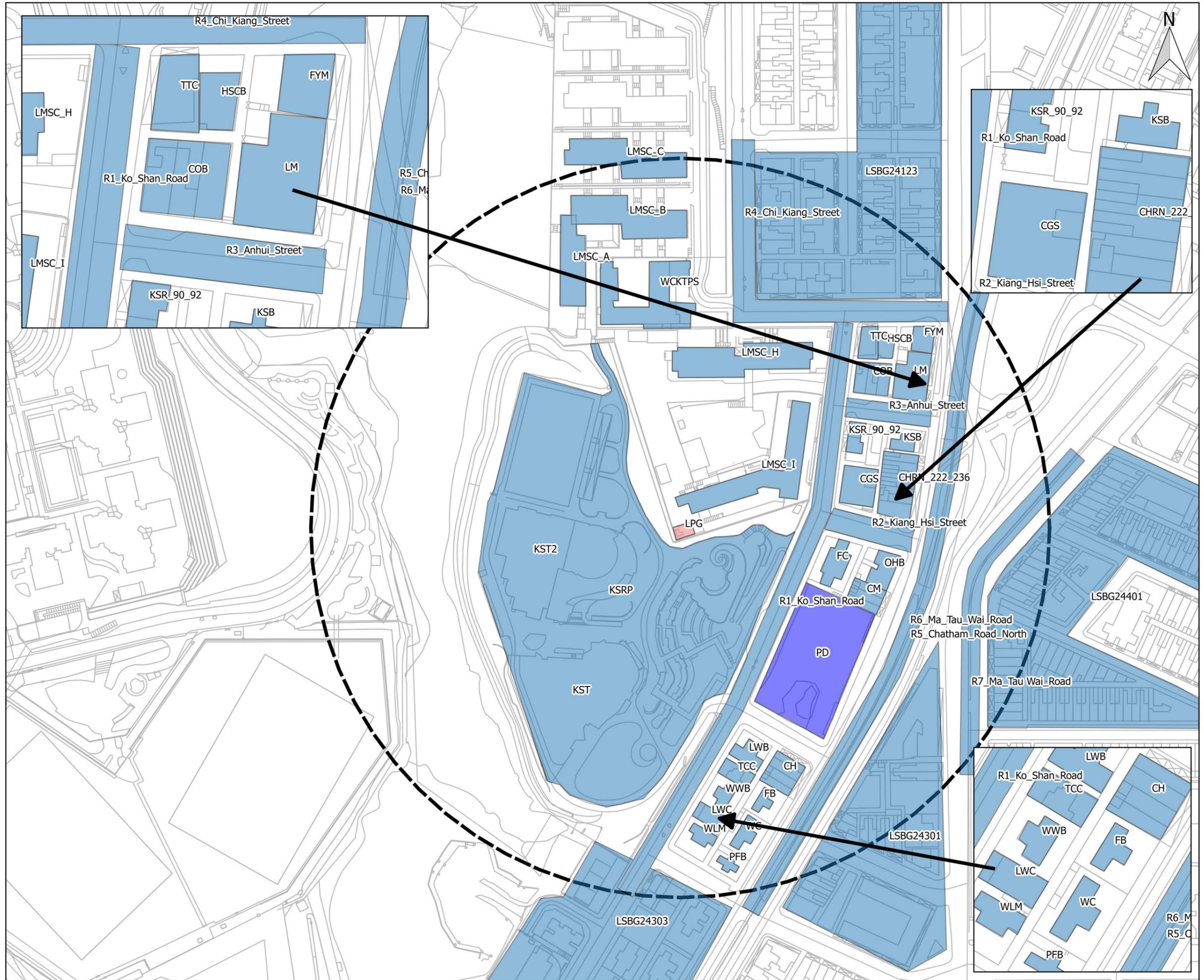
Population Polygon (This Study)

- Population Polygon
- LPG
- Proposed Development

Scale: 1:1,900

Date:

Rev.:



Hong Kong Housing Authority

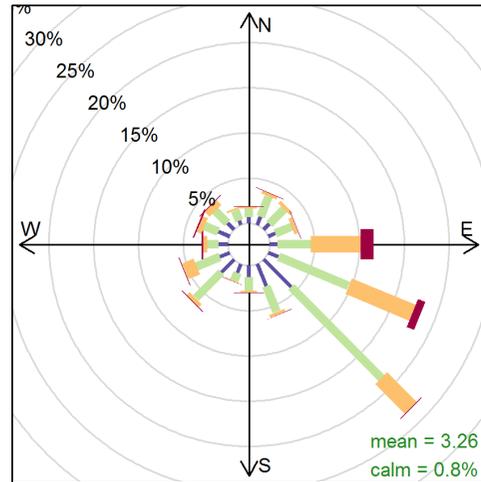
Quantitative Risk Assessment
for Subsidised Sale Flats
(SSF) Development at Ko
Shan Road, To Kwa Wan

Wind Roses of Daytime and Night Time

Figure 6

Scale: NTS

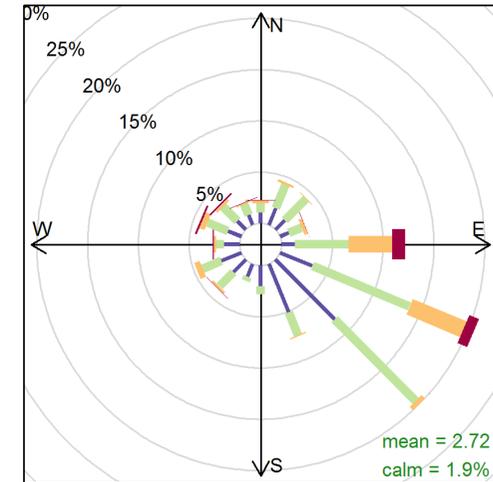
Day Time Wind Rose



0 to 2 2 to 4 4 to 6 6 to 12.6
(m s⁻¹)

Frequency of counts by wind direction (%)

Night Time Wind Rose



0 to 2 2 to 4 4 to 6 6 to 14.3
(m s⁻¹)

Frequency of counts by wind direction (%)

Ignition Sources considered in this Study

Figure 7

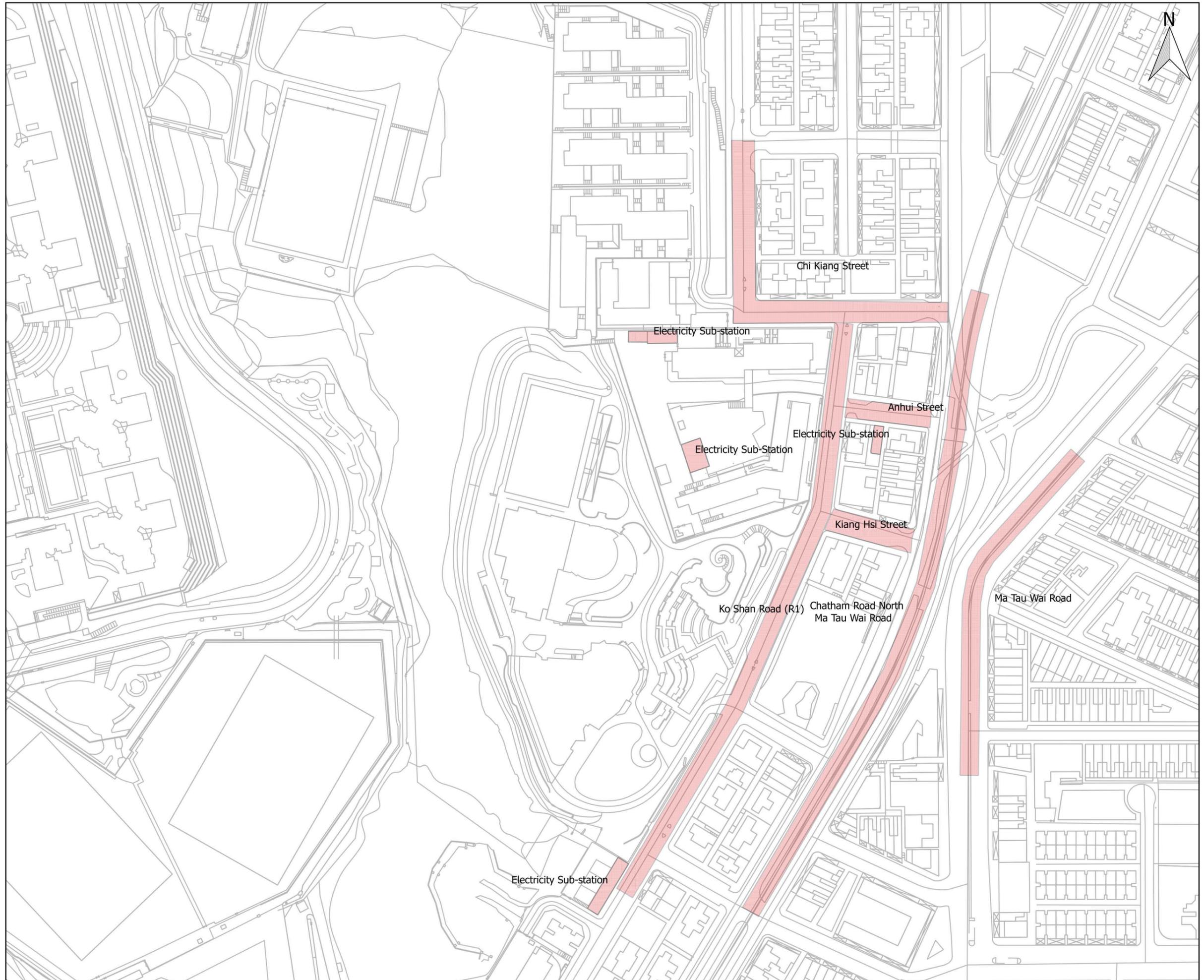
Legend

■ Ignition Source

Scale: 1:1,900

Date:

Rev.:



Hong Kong Housing Authority

Quantitative Risk Assessment
for Subsidised Sale Flats
(SSF) Development at Ko
Shan Road, To Kwa Wan

Individual Risk Contour

Figure 8

Population Polygon (This Study)

- Population Polygon
- LPG
- Proposed Development
- Ignition Source

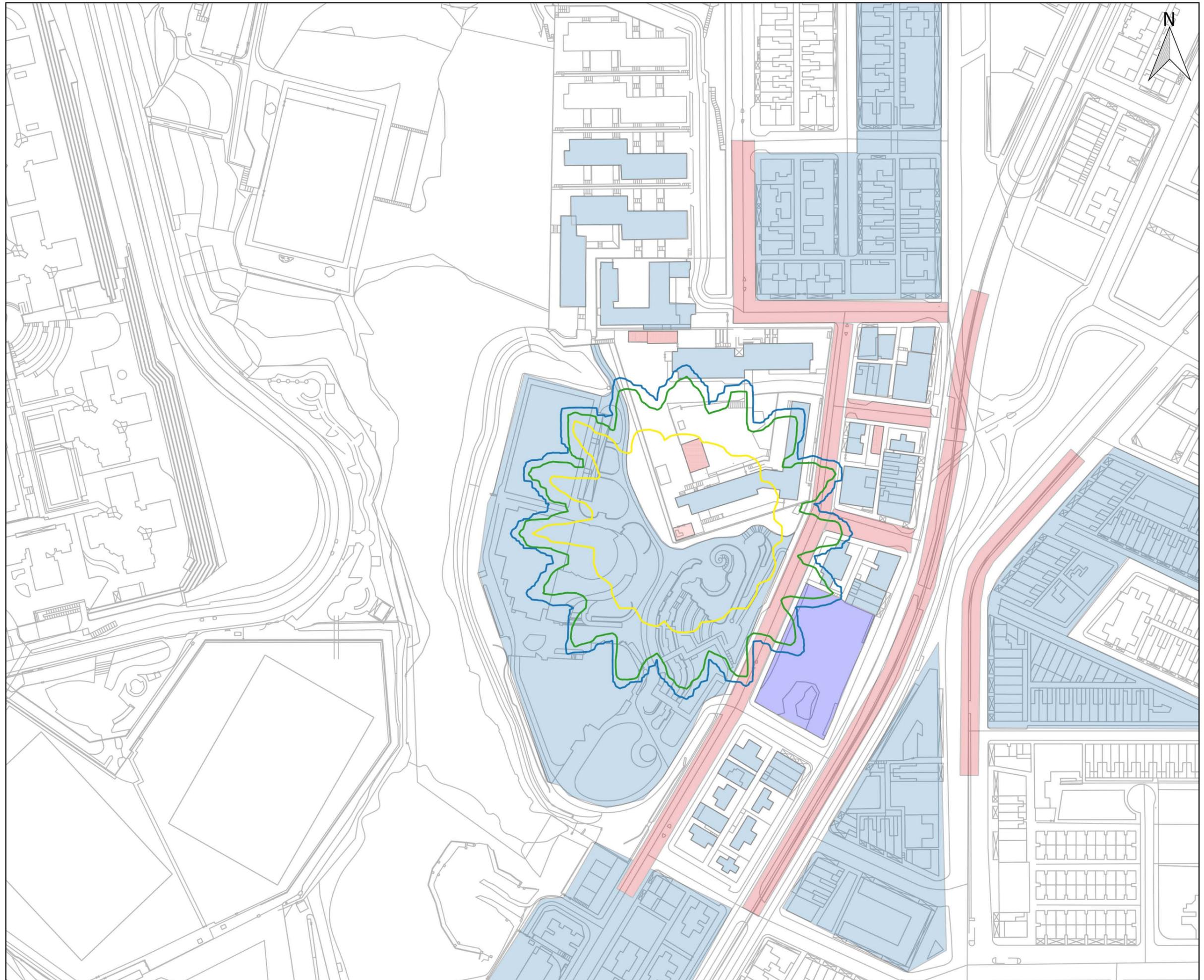
Individual Risk Contours

- 1e-05 /AvgeYear
- 1e-06 /AvgeYear
- 1e-07 /AvgeYear
- 1e-08 /AvgeYear
- 1e-09 /AvgeYear
- 1e-10 /AvgeYear

Scale: 1:1,900

Date:

Rev.:



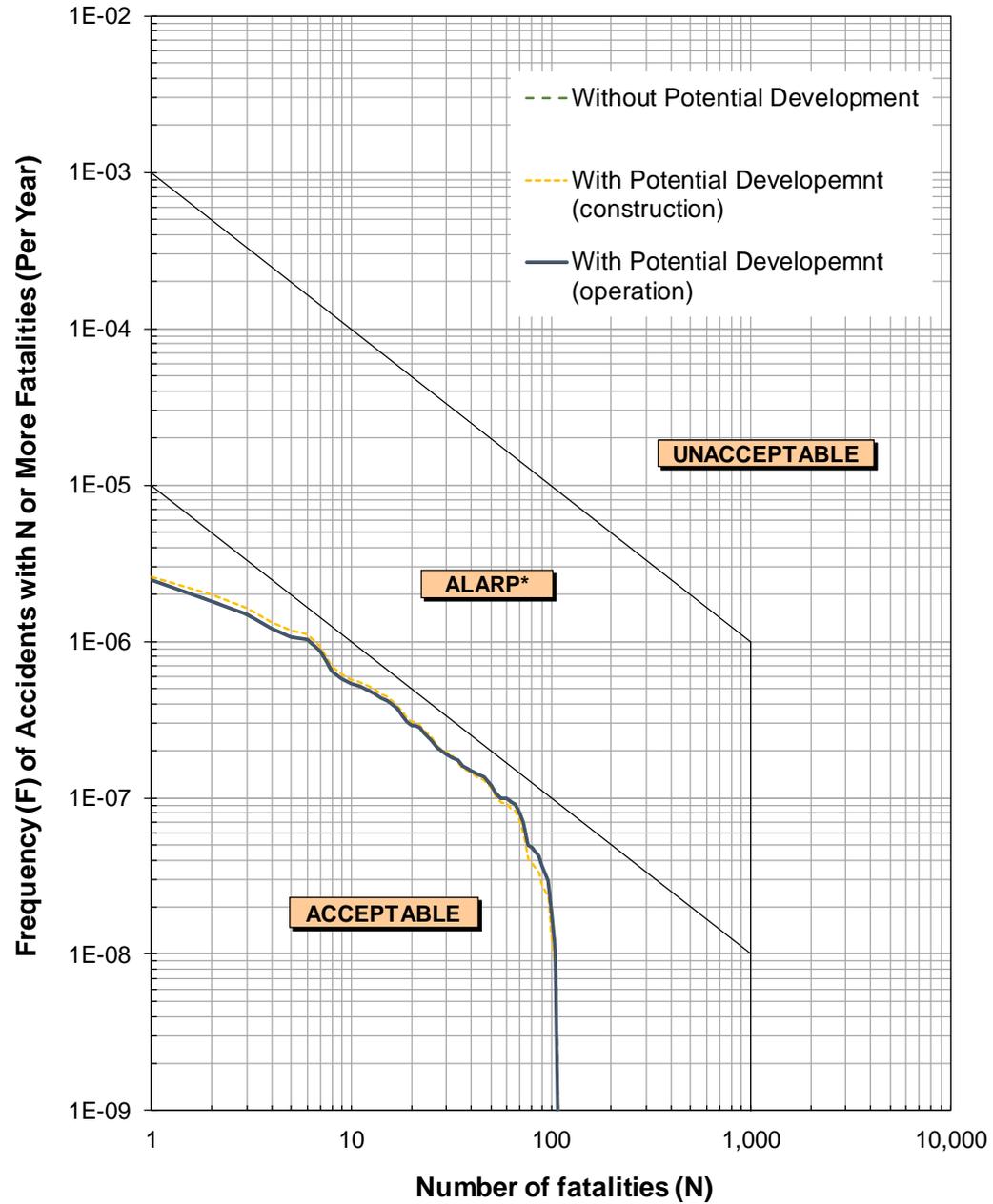
Hong Kong Housing Authority

Quantitative Risk Assessment
for Subsidised Sale Flats
(SSF) Development at Ko
Shan Road, To Kwa Wan

Societal Risk Curves

Figure 9

Scale: NTS



* Risk within this region should be reduced
to as low as reasonably practicable

**Provision of Open Space and Major Community Facilities in
Ma Tau Kok Area**

| Type of Facilities | Hong Kong Planning Standards and Guidelines (HKPSG) | HKPSG Requirement (based on planned population) | Provision | | Surplus/ Shortfall (against planned provision) |
|---|---|---|--------------------|-------------------|--|
| | | | Existing Provision | Planned Provision | |
| Local Open Space | 10 ha per 100,000 persons | 13.57ha | 5.89ha | 6.38ha | -7ha |
| District Open Space | 10 ha per 100,000 persons | 13.57ha | 16.69ha | 17.61ha | +4ha |
| Sports Centre | 1 per 50,000 to 65,000 persons | 2 | 2 | 2 | 0 |
| Sports Ground/ Sports Complex | 1 per 200,000 to 250,000 persons | 0 | 0 | 0 | 0 |
| Swimming Pool Complex - standard | 1 complex per 287,000 persons | 0 | 0 | 0 | 0 |
| Integrated Children and Youth Services Centre | 1 for 12,000 persons aged 6-24 | 1 | 1 | 1 | 0 |
| Integrated Family Services Centre | 1 for 100,000 to 150,000 persons | 0 | 2 | 2 | +2 |
| Library | 1 district library for every 200,000 persons | 0 | 2 | 2 | +2 |
| Special Clinic/ Polyclinic | 1 whenever a regional or district hospital is built | Not Applicable (NA) | 1 | 1 | NA |
| Clinic/Health Centre | 1 per 100,000 persons | 1 | 3 | 4 | +3 |
| District Police Station | 1 per 200,000 to 500,000 persons | 0 | 0 | 0 | 0 |

| Type of Facilities | Hong Kong Planning Standards and Guidelines (HKPSG) | HKPSG Requirement (based on planned population) | Provision | | Surplus/ Shortfall (against planned provision) |
|---------------------------|--|---|--------------------|-------------------|--|
| | | | Existing Provision | Planned Provision | |
| Divisional Police Station | 1 per 100,000 to 200,000 persons | 0 | 1 | 1 | +1 |
| Post Office | accessible within 1.2 Km in urban & within 3.2 Km in rural | Not Applicable (NA) | 2 | 2 | NA |
| Secondary School | 1 whole-day classroom for 40 persons aged 12 -17 | 152 classrooms | 88 | 88 | -64 classrooms |
| Primary School | 1 whole-day classroom for 25.5 persons aged 6 - 11 | 219 classrooms | 273 | 285 | +66 classrooms |
| Kindergarten/ Nursery | 26 classrooms for 1,000 children aged 3 to 6 | 64 classrooms | 77 | 77 | +13 classrooms |

Note:

1. The population of the Area in 2016 was about 133,100.
2. The planned population of the Area (including the rezoning proposals) would be about 135,730 (usual residents and mobile residents). This is the basis for assessment of open space. Planned provision includes existing provision and planned but not yet developed facilities.
3. Some facilities do not have set requirement under HKPSG, e.g. elderly facilities, community hall, study room, etc. They are not included in this table.
4. Some facilities are assessed on a wider district basis by the relevant departments, e.g. district open space, secondary school, primary school, sports ground. The shortfall in the OZP area could be addressed by the provision in the adjoining area within the Kowloon City District, subject to the assessment of concerned departments.
5. Some facilities do not require reservation of a standalone site, e.g. post office, kindergarten / nursery, and their shortfall can be addressed by provision in premises in developments.



九龍寨城公園
KOWLOON WALLED CITY PARK

賈炳達道公園
CARPENTER ROAD PARK

九龍城廣場
KOWLOON CITY PLAZA

A 項
ITEM A

賈炳達道
CARPENTER ROAD

侯王道
HAU WONG ROAD

衙前聖道
NGA TSIN LONG ROAD

南角道
NAM KOK ROAD

龍角道
LUNG KONG ROAD

城南道
SOUTH WALL ROAD

打鼓嶺道
TAK KU LING ROAD

衙前圍道

衙前圍道
NGA TSIN WAI ROAD

侯王道

衙前聖道

南角道

龍角道

城南道

打鼓嶺道

太子道東
PRINCE EDWARD RD EAST

新行人隧道往宋皇臺站
NEW PEDESTRIAN SUBWAY
TO SUNG WONG TOI STATION

界線只作識別用
BOUNDARY FOR IDENTIFICATION
PURPOSE ONLY

本圖於2018年1月24日擬備，
所根據的資料為地政總署於
2017年2月13日拍得的
航攝照片編號E014250C

PLAN PREPARED ON 24.1.2018
BASED ON AERIAL PHOTO No.
E014250C TAKEN ON 13.2.2017
BY LANDS DEPARTMENT

航攝照片 AERIAL PHOTO

馬頭角分區計劃大綱核准圖編號S/K10/22的擬議修訂
(A項)

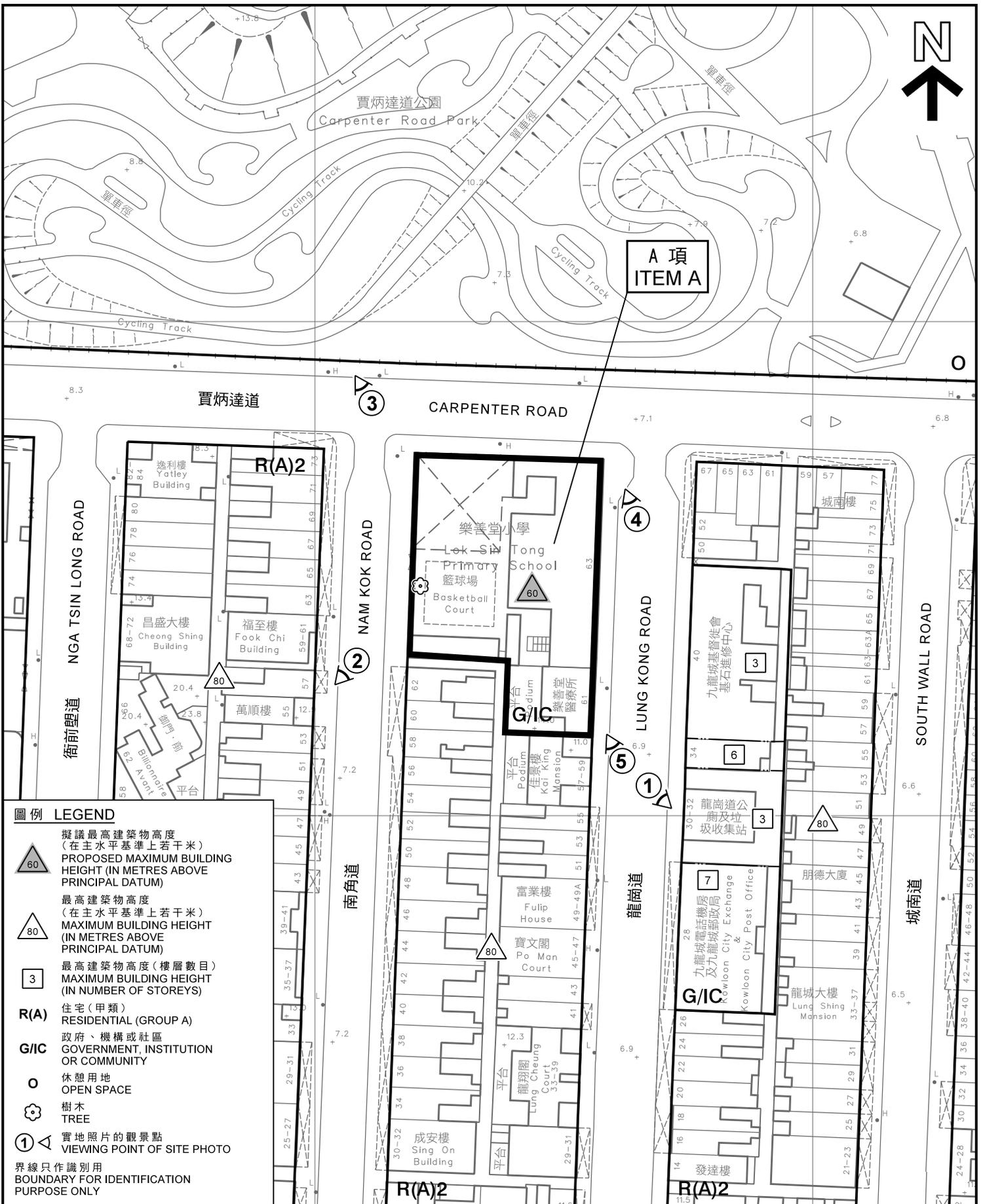
PROPOSED AMENDMENTS TO THE
APPROVED MA TAU KOK OUTLINE ZONING PLAN No. S/K10/22
(ITEM A)

規劃署
PLANNING
DEPARTMENT



參考編號
REFERENCE No.
M/K10/17/117

圖 PLAN
1b



圖例 LEGEND

- 擬議最高建築物高度 (在主水平基準上若干米)
PROPOSED MAXIMUM BUILDING HEIGHT (IN METRES ABOVE PRINCIPAL DATUM)
- 最高建築物高度 (在主水平基準上若干米)
MAXIMUM BUILDING HEIGHT (IN METRES ABOVE PRINCIPAL DATUM)
- 最高建築物高度 (樓層數目)
MAXIMUM BUILDING HEIGHT (IN NUMBER OF STOREYS)
- R(A)** 住宅 (甲類)
RESIDENTIAL (GROUP A)
- G/IC** 政府、機構或社區
GOVERNMENT, INSTITUTION OR COMMUNITY
- 休憩用地
OPEN SPACE
- 樹木
TREE
- 實地照片的觀景點
VIEWING POINT OF SITE PHOTO
- 界線只作識別用
BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

平面圖 SITE PLAN

馬頭角分區計劃大綱核准圖編號S/K10/22的擬議修訂 (A項)
PROPOSED AMENDMENTS TO THE APPROVED MA TAU KOK OUTLINE ZONING PLAN No. S/K10/22 (ITEM A)

規劃署
PLANNING DEPARTMENT

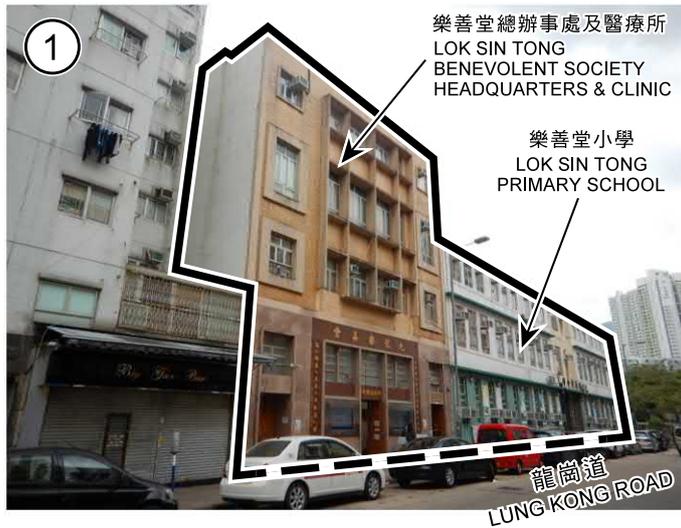


參考編號
REFERENCE No.
M/K10/17/117

圖 PLAN
1c



本摘要圖於2018年2月1日擬備，
所根據的資料為測量圖編號
11-NE-11A
EXTRACT PLAN PREPARED ON 1.2.2018
BASED ON SURVEY SHEET No.
11-NE-11A



界線只作識別用
BOUNDARY FOR IDENTIFICATION
PURPOSE ONLY

A 項
ITEM A

實地照片 SITE PHOTOS

本圖於2017年12月29日擬備，
所根據的資料為攝於
2017年12月13日的實地照片
PLAN PREPARED ON 29.12.2017
BASED ON SITE PHOTOS
TAKEN ON 13.12.2017

馬頭角分區計劃大綱核准圖編號S/K10/22的擬議修訂
(A項)
PROPOSED AMENDMENTS TO THE
APPROVED MA TAU KOK OUTLINE ZONING PLAN No. S/K10/22
(ITEM A)

規劃署
PLANNING
DEPARTMENT



參考編號
REFERENCE No.
M/K10/17/117

圖 PLAN
1d



界線只作識別用
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PURPOSE ONLY

本圖於2018年2月1日擬備，
所根據的資料為攝於
2017年12月13日的實地照片
PLAN PREPARED ON 1.2.2018
BASED ON SITE PHOTOS
TAKEN ON 13.12.2017

實地照片 SITE PHOTOS

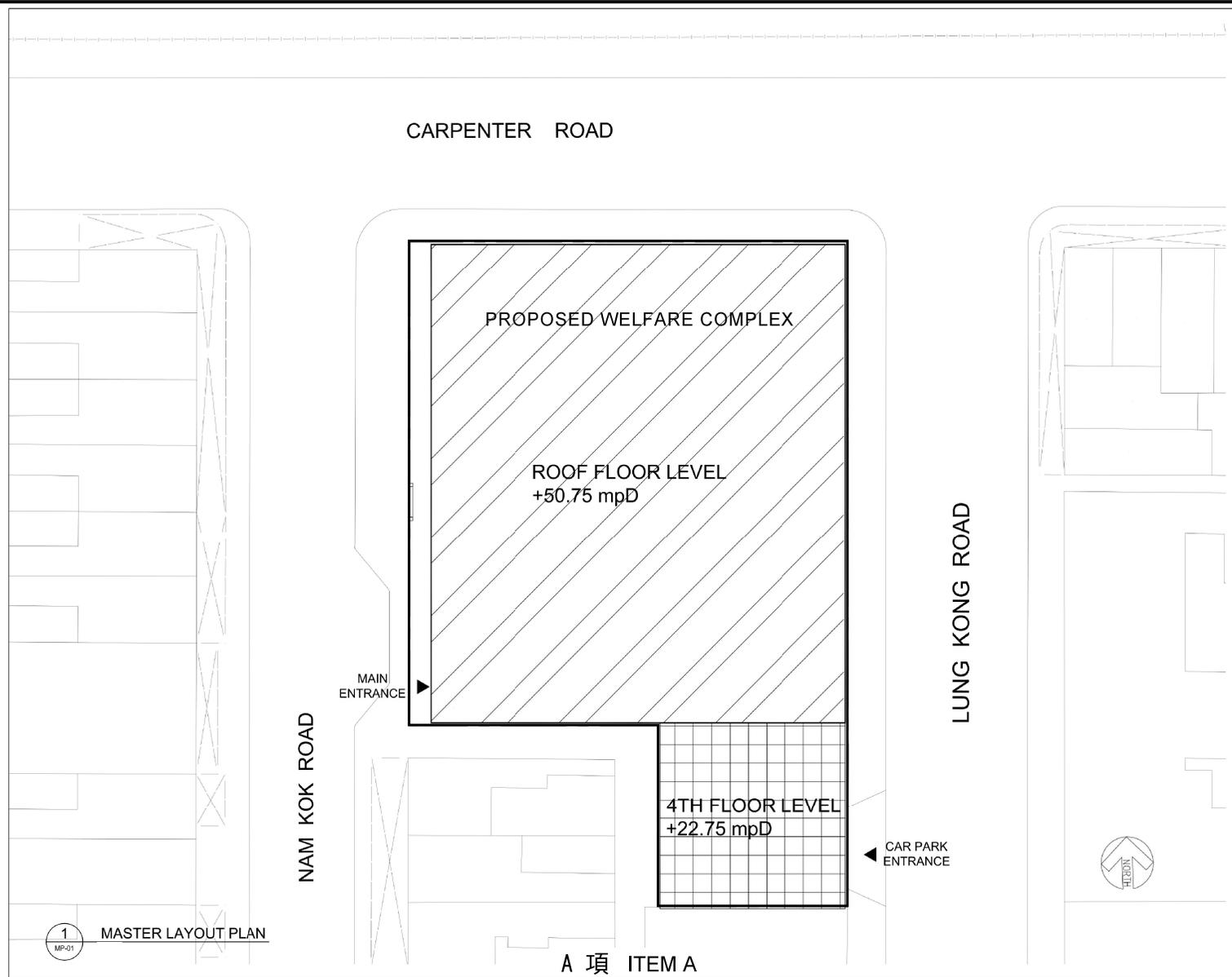
沿龍崗道的政府、機構或社區設施
GOVERNMENT, INSTITUTION OR COMMUNITY FACILITIES
ALONG LUNG KONG ROAD

規劃署
PLANNING
DEPARTMENT



參考編號
REFERENCE No.
M/K10/17/117

圖 PLAN
1e



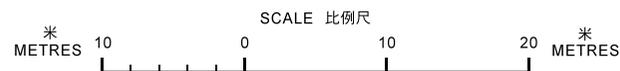
資料來源：由樂善堂提交
 SOURCE: SUBMITTED BY
 LOK SIN TONG
 BENEVOLENT SOCIETY

本圖於2018年2月1日擬備
 PLAN PREPARED ON 1.2.2018

擬議項目的平面圖 LAYOUT PLAN OF PROPOSED ITEM

馬頭角分區計劃大綱核准圖編號S/K10/22的擬議修訂
 (A項)

PROPOSED AMENDMENTS TO THE
 APPROVED MA TAU KOK OUTLINE ZONING PLAN No. S/K10/22
 (ITEM A)

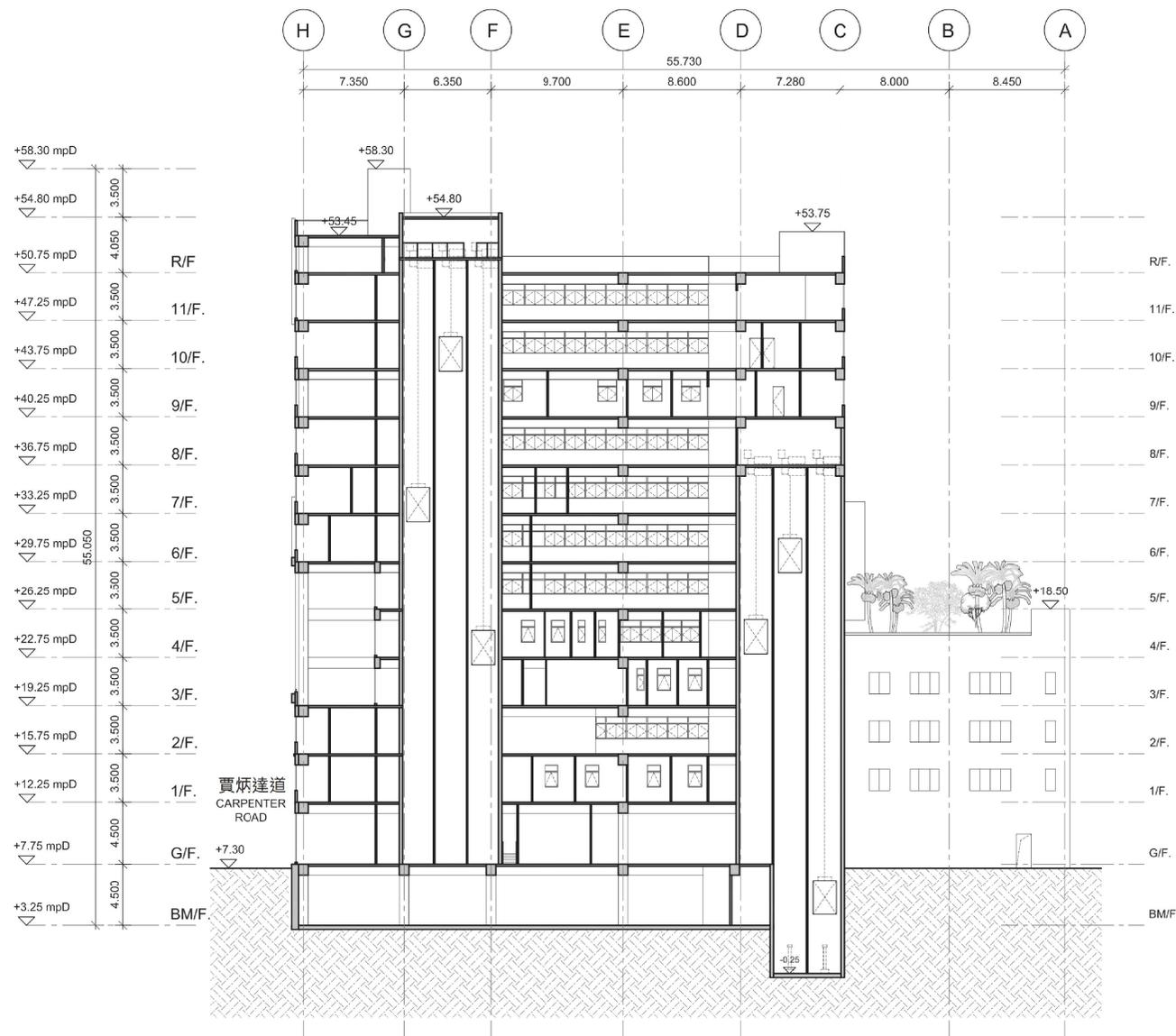


規劃署
 PLANNING
 DEPARTMENT



參考編號
 REFERENCE No.
 M/K10/17/117

圖 PLAN
 1f



1 SECTION 1
SEC-1

A 項 ITEM A

資料來源：由樂善堂提交
SOURCE: SUBMITTED BY
LOK SIN TONG
BENEVOLENT SOCIETY

本圖於2018年2月1日擬備
PLAN PREPARED ON 1.2.2018

擬議項目的剖面圖 SECTION PLAN OF PROPOSED ITEM

馬頭角分區計劃大綱核准圖編號S/K10/22的擬議修訂
(A項)
PROPOSED AMENDMENTS TO THE
APPROVED MA TAU KOK OUTLINE ZONING PLAN No. S/K10/22
(ITEM A)

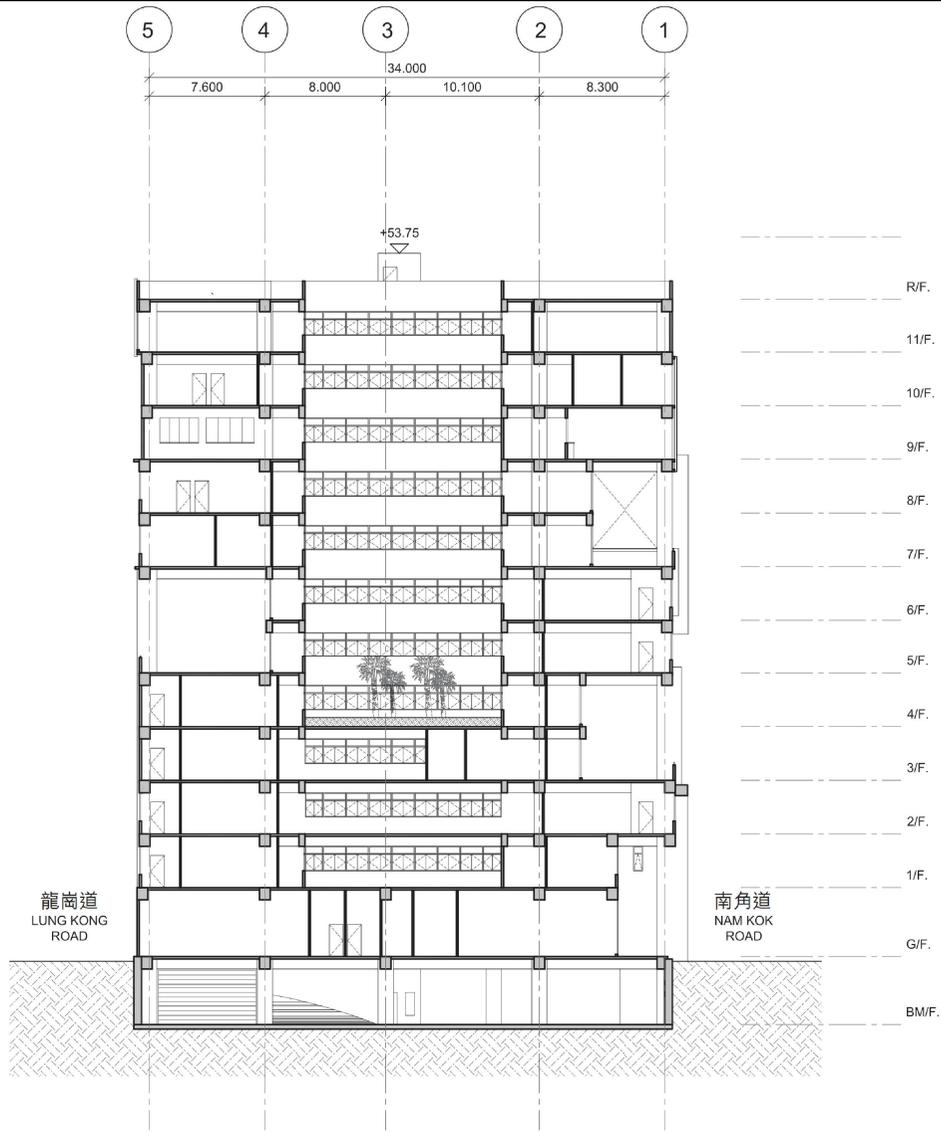
規劃署
PLANNING
DEPARTMENT



參考編號
REFERENCE No.
M/K10/17/117

圖 PLAN
1g

| | | |
|------------|-------|-------|
| +58.30 mpD | | |
| +54.80 mpD | 3.500 | |
| +50.75 mpD | 4.050 | R/F. |
| +47.25 mpD | 3.500 | 11/F. |
| +43.75 mpD | 3.500 | 10/F. |
| +40.25 mpD | 3.500 | 9/F. |
| +36.75 mpD | 3.500 | 8/F. |
| +33.25 mpD | 3.500 | 7/F. |
| +29.75 mpD | 3.500 | 6/F. |
| +26.25 mpD | 3.500 | 5/F. |
| +22.75 mpD | 3.500 | 4/F. |
| +19.25 mpD | 3.500 | 3/F. |
| +15.75 mpD | 3.500 | 2/F. |
| +12.25 mpD | 3.500 | 1/F. |
| +7.75 mpD | 4.500 | G/F. |
| +3.25 mpD | 4.500 | BM/F. |



1 SECTION 2
SEC-2

A 項 ITEM A

資料來源：由樂善堂提交
SOURCE: SUBMITTED BY
LOK SIN TONG
BENEVOLENT SOCIETY

本圖於2018年2月1日擬備
PLAN PREPARED ON 1.2.2018

擬議項目的剖面圖 SECTION PLAN OF PROPOSED ITEM

馬頭角分區計劃大綱核准圖編號S/K10/22的擬議修訂
(A項)
PROPOSED AMENDMENTS TO THE
APPROVED MA TAU KOK OUTLINE ZONING PLAN No. S/K10/22
(ITEM A)

規劃署
PLANNING
DEPARTMENT



參考編號
REFERENCE No.
M/K10/17/117

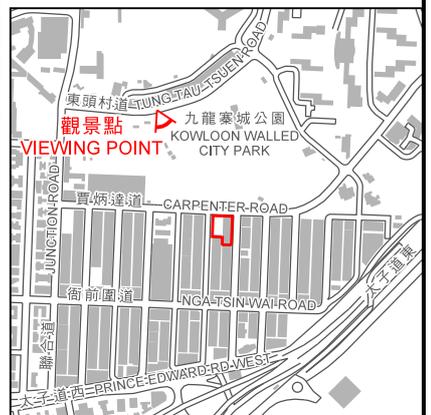
圖 PLAN
1h



EXISTING VIEW 現有景觀



PHOTOMONTAGE 合成照片



A 項
ITEM A

資料來源：由樂善堂提交
SOURCE: SUBMITTED BY
LOK SIN TONG
BENEVOLENT SOCIETY

本圖於2018年2月2日擬備
PLAN PREPARED ON 2.2.2018

合照照片 PHOTOMONTAGE

在東頭村道的觀景點
VIEWING POINT AT TUNG TAU TSUEN ROAD
馬頭角分區計劃大綱核准圖編號S/K10/22的擬議修訂
(A項)
PROPOSED AMENDMENTS TO THE
APPROVED MA TAU KOK OUTLINE ZONING PLAN No. S/K10/22
(ITEM A)

規劃署
PLANNING
DEPARTMENT

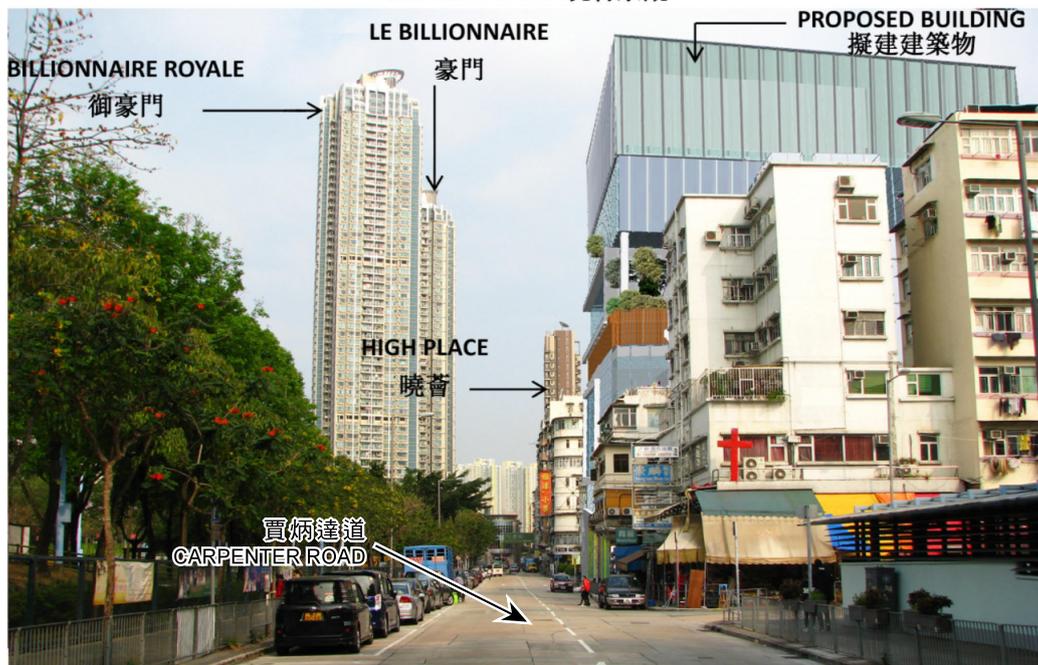


參考編號
REFERENCE No.
M/K10/17/117

圖 PLAN
1i



EXISTING VIEW 現有景觀



A 項
ITEM A



資料來源：由樂善堂提交
SOURCE: SUBMITTED BY
LOK SIN TONG
BENEVOLENT SOCIETY

本圖於2018年2月2日擬備
PLAN PREPARED ON 2.2.2018

合照照片 PHOTOMONTAGE

在賈炳達道近侯王道的觀景點
VIEWING POINT AT CARPENTER ROAD NEAR HAU WONG ROAD
馬頭角分區計劃大綱核准圖編號S/K 10/22的擬議修訂
(A項)

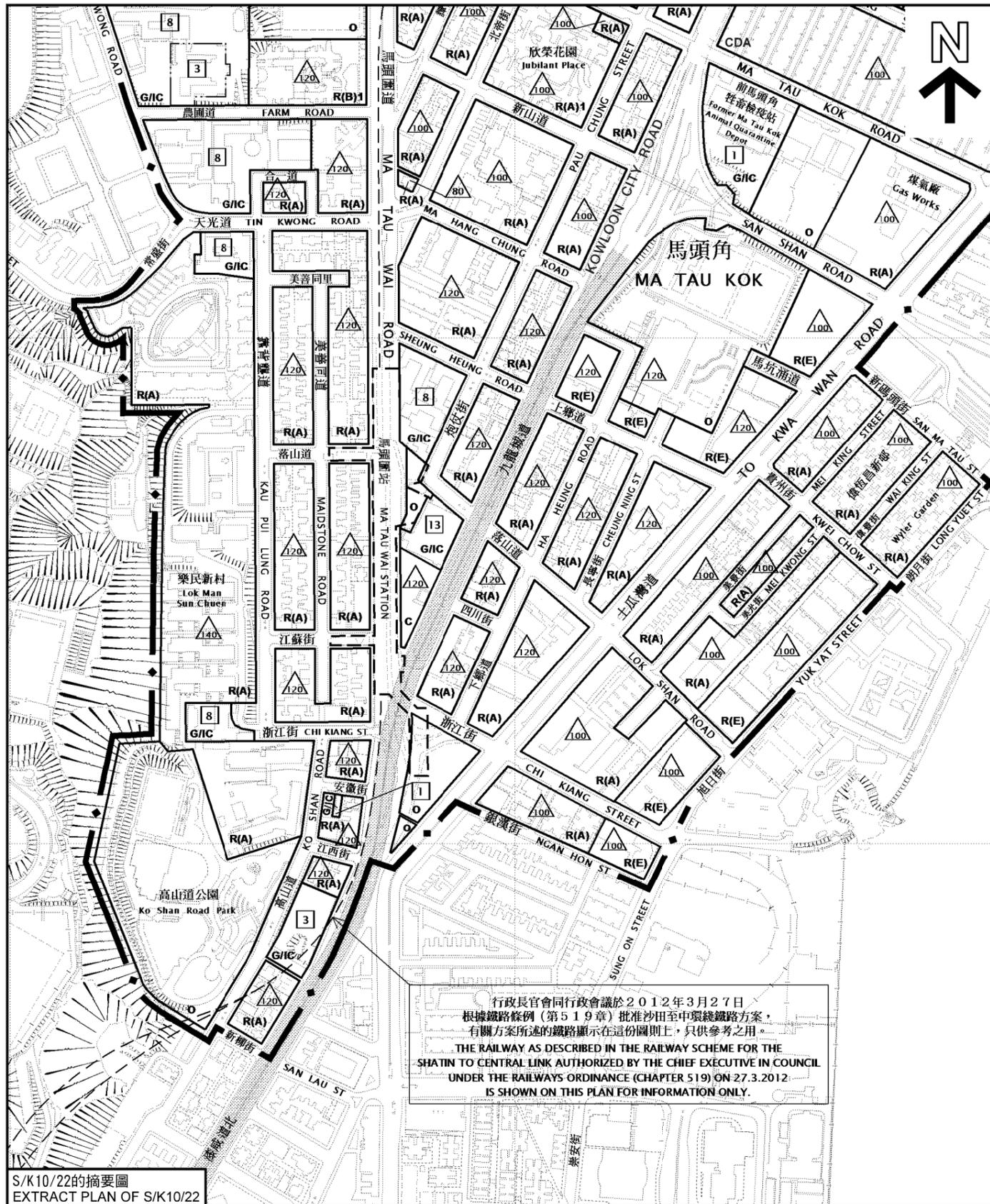
PROPOSED AMENDMENTS TO THE
APPROVED MA TAU KOK OUTLINE ZONING PLAN No. S/K10/22
(ITEM A)

規劃署
PLANNING
DEPARTMENT

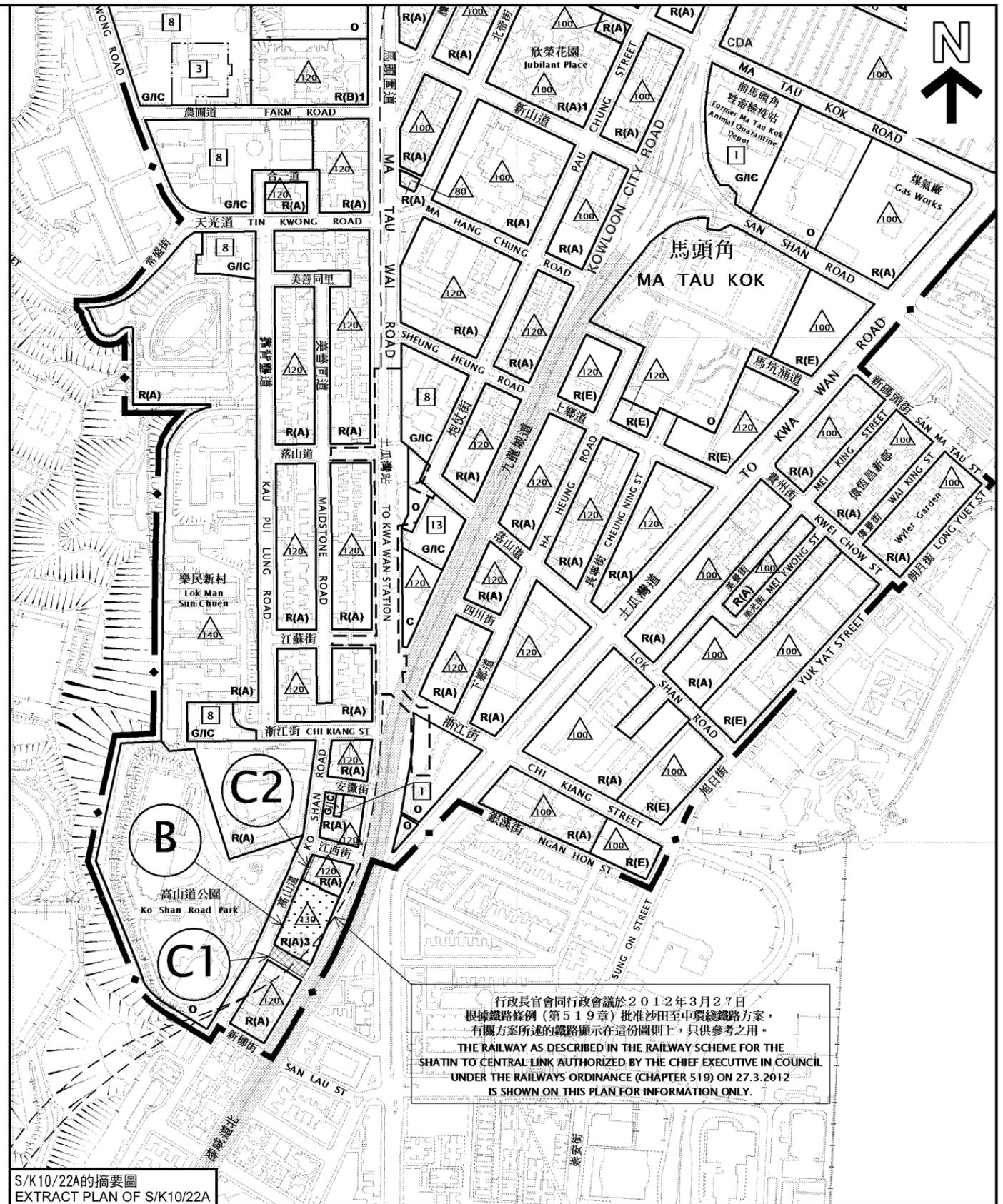


參考編號
REFERENCE No.
M/K10/17/117

圖 PLAN
1j



S/K10/22的摘要圖
 EXTRACT PLAN OF S/K10/22



S/K10/22A的摘要圖
 EXTRACT PLAN OF S/K10/22A

位置圖 LOCATION PLAN

馬頭角分區計劃大綱核准圖編號S/K10/22的擬議修訂
 (B、C1及C2項)

PROPOSED AMENDMENTS TO THE APPROVED MA TAU KOK OUTLINE ZONING PLAN No. S/K10/22
 (ITEMS B, C1 AND C2)

SCALE 1:5 000 比例尺



本摘要圖於2018年2月2日擬備,所根據的資料為於2016年4月5日核准的分區計劃大綱圖編號S/K10/22
 EXTRACT PLAN PREPARED ON 2.2.2018
 BASED ON OUTLINE ZONING PLAN No. S/K10/22 APPROVED ON 5.4.2016

規劃署
 PLANNING DEPARTMENT



參考編號
 REFERENCE No.

M/K10/17/117

圖 PLAN

2a



界線只作識別用
BOUNDARY FOR IDENTIFICATION
PURPOSE ONLY

本圖於2018年2月2日擬備，
所根據的資料為地政總署於
2017年2月13日拍得的
航攝照片編號E014113C

PLAN PREPARED ON 2.2.2018
BASED ON AERIAL PHOTO No.
E014113C TAKEN ON 13.2.2017
BY LANDS DEPARTMENT

航攝照片 AERIAL PHOTO

馬頭角分區計劃大綱核准圖編號S/K10/22的擬議修訂
(B、C1及C2項)

PROPOSED AMENDMENTS TO THE
APPROVED MA TAU KOK OUTLINE ZONING PLAN No. S/K10/22
(ITEMS B, C1 AND C2)

規劃署
PLANNING
DEPARTMENT

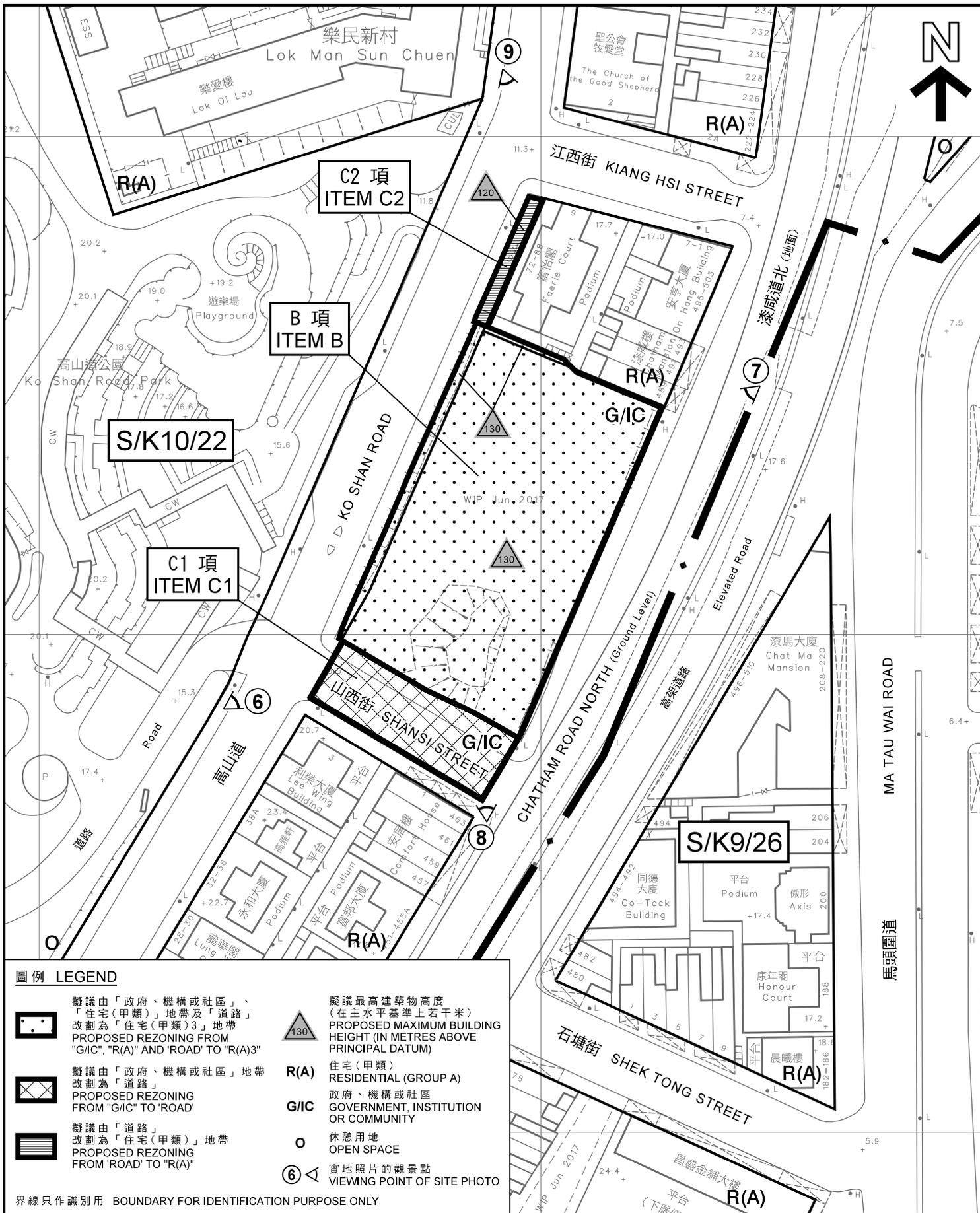


參考編號
REFERENCE No.

M/K10/17/117

圖 PLAN

2b



圖例 LEGEND

| | |
|---|--|
| <p> 擬議由「政府、機構或社區」、「住宅(甲類)」地帶及「道路」改劃為「住宅(甲類)3」地帶 PROPOSED REZONING FROM "G/I.C.", "R(A)" AND "ROAD" TO "R(A)3"</p> <p> 擬議由「政府、機構或社區」地帶改劃為「道路」 PROPOSED REZONING FROM "G/I.C." TO "ROAD"</p> <p> 擬議由「道路」改劃為「住宅(甲類)」地帶 PROPOSED REZONING FROM "ROAD" TO "R(A)"</p> | <p> 擬議最高建築物高度 (在主水平基準上若干米) PROPOSED MAXIMUM BUILDING HEIGHT (IN METRES ABOVE PRINCIPAL DATUM)</p> <p>R(A) 住宅(甲類) RESIDENTIAL (GROUP A)</p> <p>G/I.C 政府、機構或社區 GOVERNMENT, INSTITUTION OR COMMUNITY</p> <p> 休憩用地 OPEN SPACE</p> <p> 實地照片的觀景點 VIEWING POINT OF SITE PHOTO</p> |
|---|--|

界線只作識別用 BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

本摘要圖於2018年2月2日擬備，所根據的資料為測量圖編號 11-NW-20D
EXTRACT PLAN PREPARED ON 2.2.2018 BASED ON SURVEY SHEET No. 11-NW-20D

平面圖 SITE PLAN

馬頭角分區計劃大綱核准圖編號S/K10/22的擬議修訂 (B、C1及C2項)
PROPOSED AMENDMENTS TO THE APPROVED MA TAU KOK OUTLINE ZONING PLAN No. S/K10/22 (ITEMS B, C1 AND C2)

SCALE 1:1 000 比例尺

規劃署
PLANNING DEPARTMENT

| | |
|---|-----------------------------|
| <p>參考編號 REFERENCE No. M/K10/17/117</p> | <p>圖 PLAN 2c</p> |
|---|-----------------------------|

6

富怡閣
FAERIE COURT

B 項
ITEM B

傲形
AXIS



7

東九龍走廊
EAST KOWLOON CORRIDOR

利榮大廈
LEE WING BUILDING

B 項
ITEM B



界線只作識別用
BOUNDARY FOR IDENTIFICATION
PURPOSE ONLY

B 及 C1 項
ITEMS B AND C1

實地照片 SITE PHOTOS

本圖於2018年2月2日擬備，
所根據的資料為攝於
2017年12月13日的實地照片
PLAN PREPARED ON 2.2.2018
BASED ON SITE PHOTOS
TAKEN ON 13.12.2017

馬頭角分區計劃大綱核准圖編號S/K10/22的擬議修訂
(B及C1項)

PROPOSED AMENDMENTS TO THE
APPROVED MA TAU KOK OUTLINE ZONING PLAN No. S/K10/22
(ITEMS B AND C1)

規劃署
PLANNING
DEPARTMENT



參考編號
REFERENCE No.
M/K10/17/117

圖 PLAN
2d



界線只作識別用
BOUNDARY FOR IDENTIFICATION
PURPOSE ONLY

B、C1 及 C2 項
ITEMS B, C1 AND C2

實地照片 SITE PHOTOS

馬頭角分區計劃大綱核准圖編號S/K10/22的擬議修訂
(B、C1及C2項)
PROPOSED AMENDMENTS TO THE
APPROVED MA TAU KOK OUTLINE ZONING PLAN No. S/K10/22
(ITEMS B, C1 AND C2)

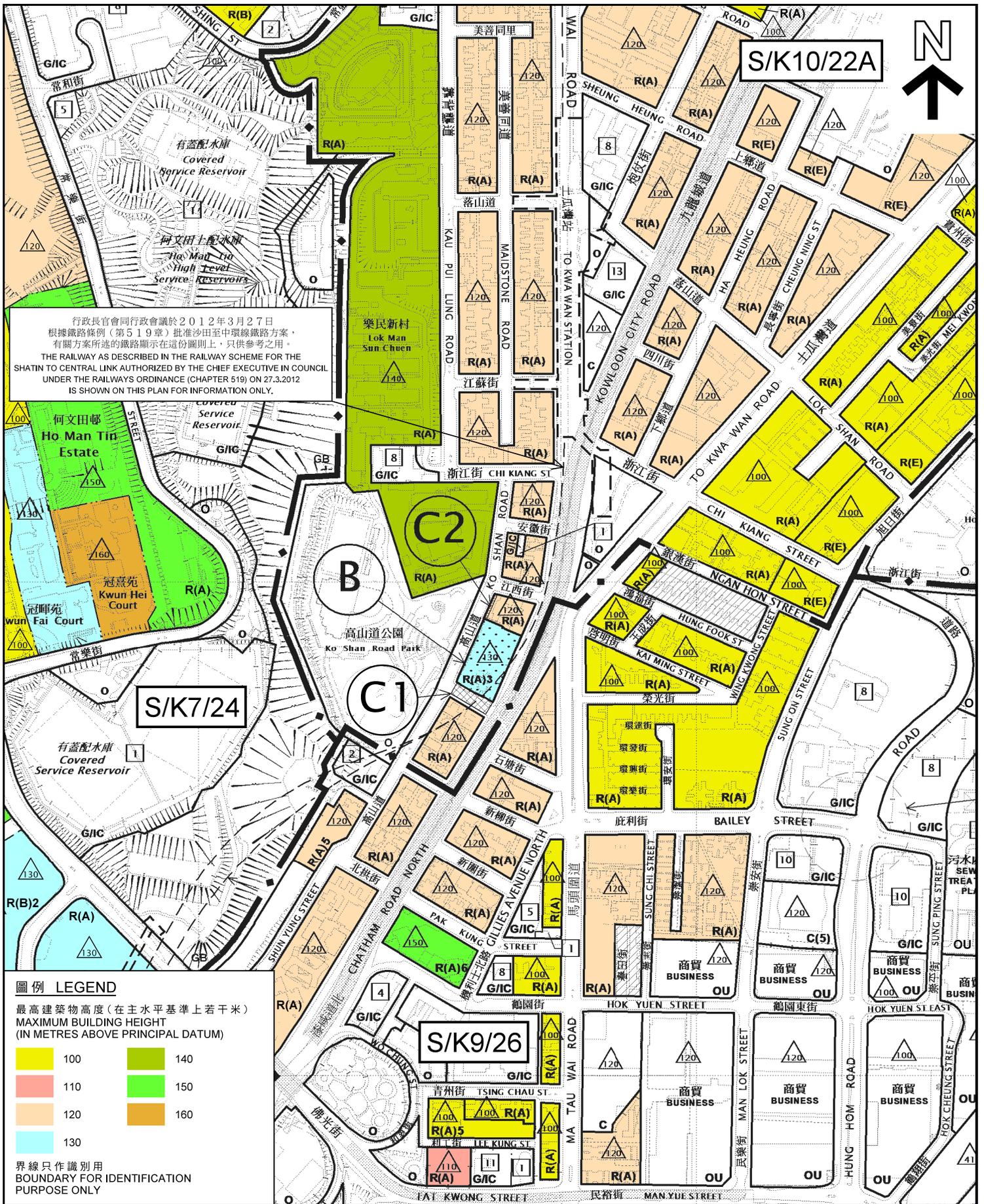
規劃署
PLANNING
DEPARTMENT



參考編號
REFERENCE No.
M/K10/17/117

圖 PLAN
2e

本圖於2018年2月2日擬備，
所根據的資料為攝於
2017年12月13日及
2018年1月19日的實地照片
PLAN PREPARED ON 2.2.2018
BASED ON SITE PHOTOS
TAKEN ON 13.12.2017 AND 19.1.2018



圖例 LEGEND

最高建築物高度(在主水平基準上若干米)
MAXIMUM BUILDING HEIGHT
(IN METRES ABOVE PRINCIPAL DATUM)

| | |
|-----|-----|
| 100 | 140 |
| 110 | 150 |
| 120 | 160 |
| 130 | |

界線只作識別用
BOUNDARY FOR IDENTIFICATION
PURPOSE ONLY

本摘要圖於2018年2月2日擬備,所根據的資料為:
於2015年9月8日核准的分區計劃大綱圖編號S/K7/24,以及於2017年10月31日核准的分區計劃大綱圖編號S/K9/26

EXTRACT PLAN PREPARED ON 2.2.2018
BASED ON OUTLINE ZONING PLANS No.
S/K7/24 APPROVED ON 8.9.2015 AND
S/K9/26 APPROVED ON 31.10.2017

位置圖 LOCATION PLAN

周邊的建築物高度限制
BUILDING HEIGHT RESTRICTIONS IN SURROUNDING AREAS

SCALE 1:5 000 比例尺

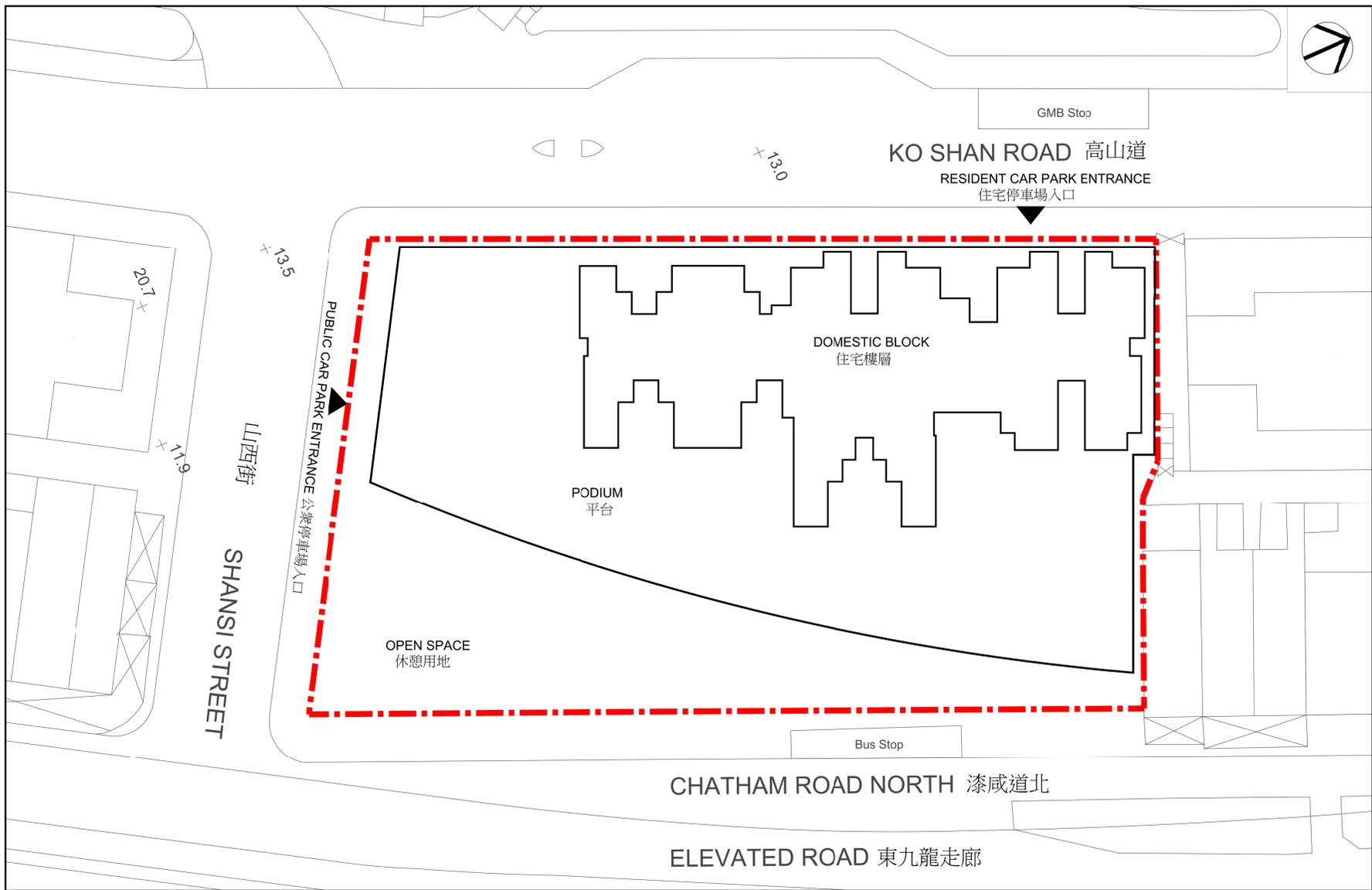
米 100 0 100 200 米
METRES

**規劃署
PLANNING
DEPARTMENT**



參考編號
REFERENCE No.
M/K10/17/117

圖 PLAN
2f

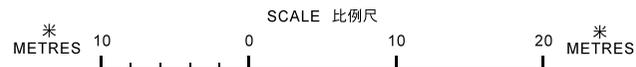


B 項 ITEM B

擬議項目的平面圖 LAYOUT PLAN OF PROPOSED ITEM

馬頭角分區計劃大綱核准圖編號S/K10/22的擬議修訂
(B項)

PROPOSED AMENDMENTS TO THE
APPROVED MA TAU KOK OUTLINE ZONING PLAN No. S/K10/22
(ITEM B)



資料來源：由房屋署提交
SOURCE: SUBMITTED BY
HOUSING DEPARTMENT

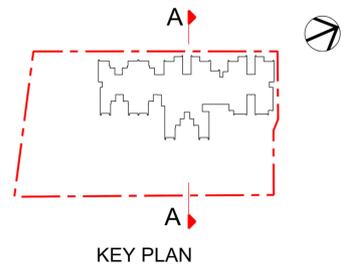
本圖於2018年2月1日擬備
PLAN PREPARED ON 1.2.2018

規劃署
PLANNING
DEPARTMENT



參考編號
REFERENCE No.
M/K10/17/117

圖 PLAN
2g



LEGEND:-
 Site Boundary

B 項 ITEM B

資料來源：由房屋署提交
 SOURCE: SUBMITTED BY HOUSING DEPARTMENT

本圖於2018年2月1日擬備
 PLAN PREPARED ON 1.2.2018

擬議項目的剖面圖
 SECTION PLAN OF PROPOSED ITEM

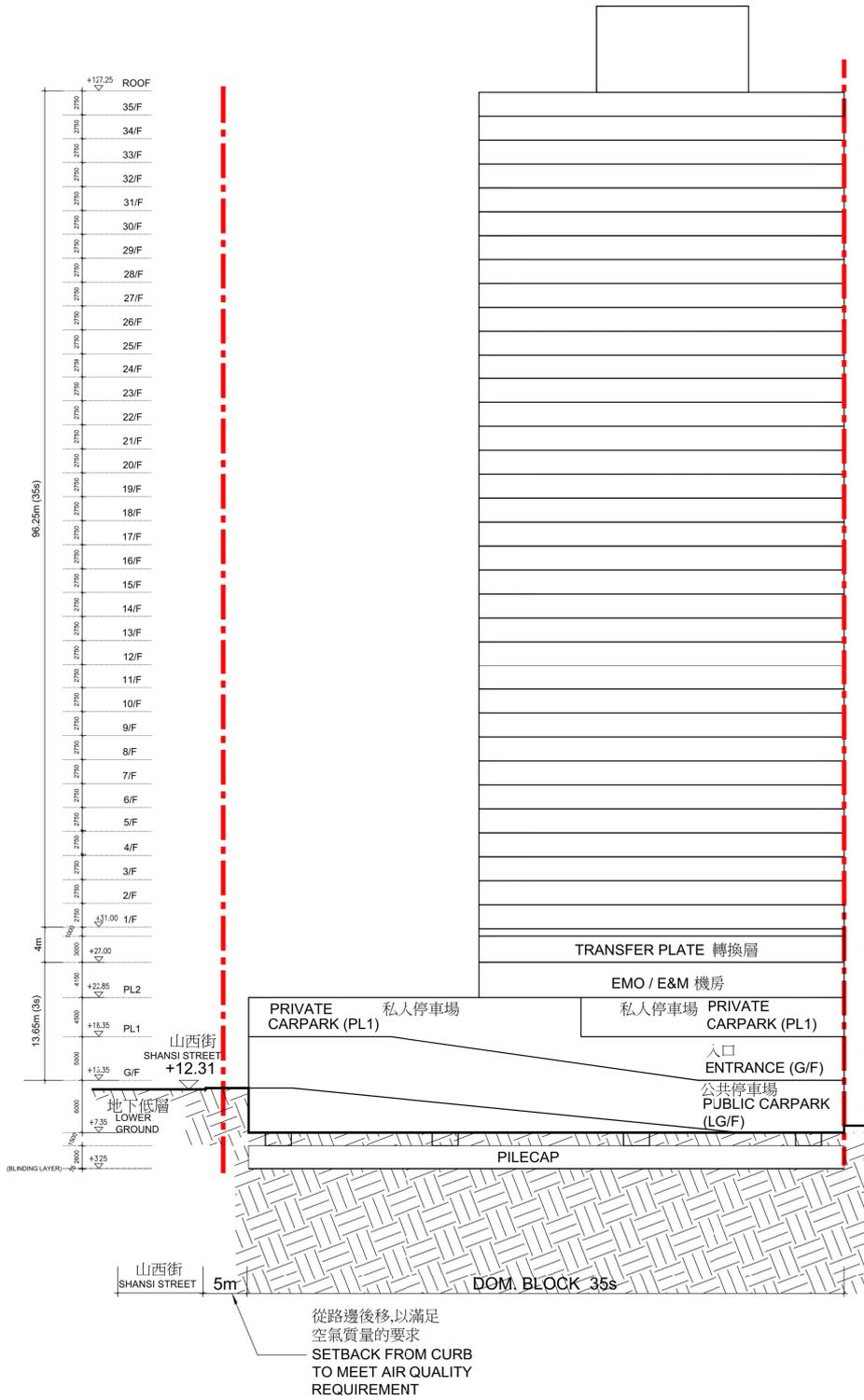
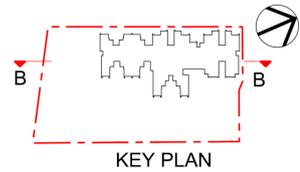
馬頭角分區計劃大綱核准圖編號S/K 10/22的擬議修訂
 (B項)
 PROPOSED AMENDMENTS TO THE APPROVED MA TAU KOK OUTLINE ZONING PLAN No. S/K10/22 (ITEM B)

規劃署
 PLANNING DEPARTMENT



參考編號
 REFERENCE No.
 M/K10/17/117

圖 PLAN
 2h



B 項 ITEM B

資料來源：由房屋署提交
SOURCE: SUBMITTED BY HOUSING DEPARTMENT

本圖於2018年2月2日擬備
PLAN PREPARED ON 2.2.2018

擬議項目的剖面圖
SECTION PLAN OF PROPOSED ITEM

馬頭角分區計劃大綱核准圖編號S/K10/22的擬議修訂 (B項)
PROPOSED AMENDMENTS TO THE APPROVED MA TAU KOK OUTLINE ZONING PLAN No. S/K10/22 (ITEM B)

規劃署
PLANNING DEPARTMENT



參考編號
REFERENCE No.
M/K10/17/117

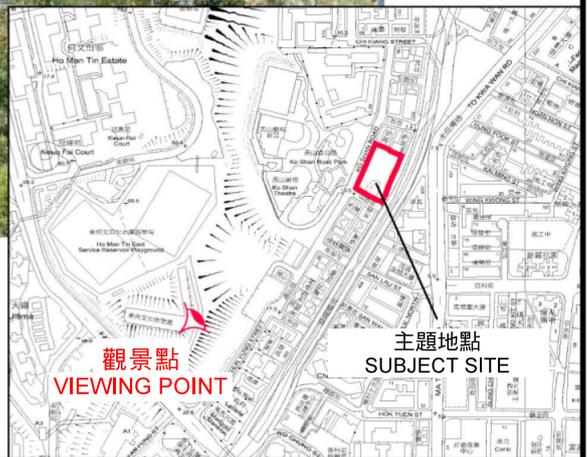
圖 PLAN
2i



圖例 LEGEND



在構築物後
BEHIND EXISTING STRUCTURE



B 項
ITEM B

資料來源：由房屋署提交
SOURCE: SUBMITTED BY
HOUSING DEPARTMENT

本圖於2018年2月2日擬備
PLAN PREPARED ON 2.2.2018

合成照片 PHOTOMONTAGE

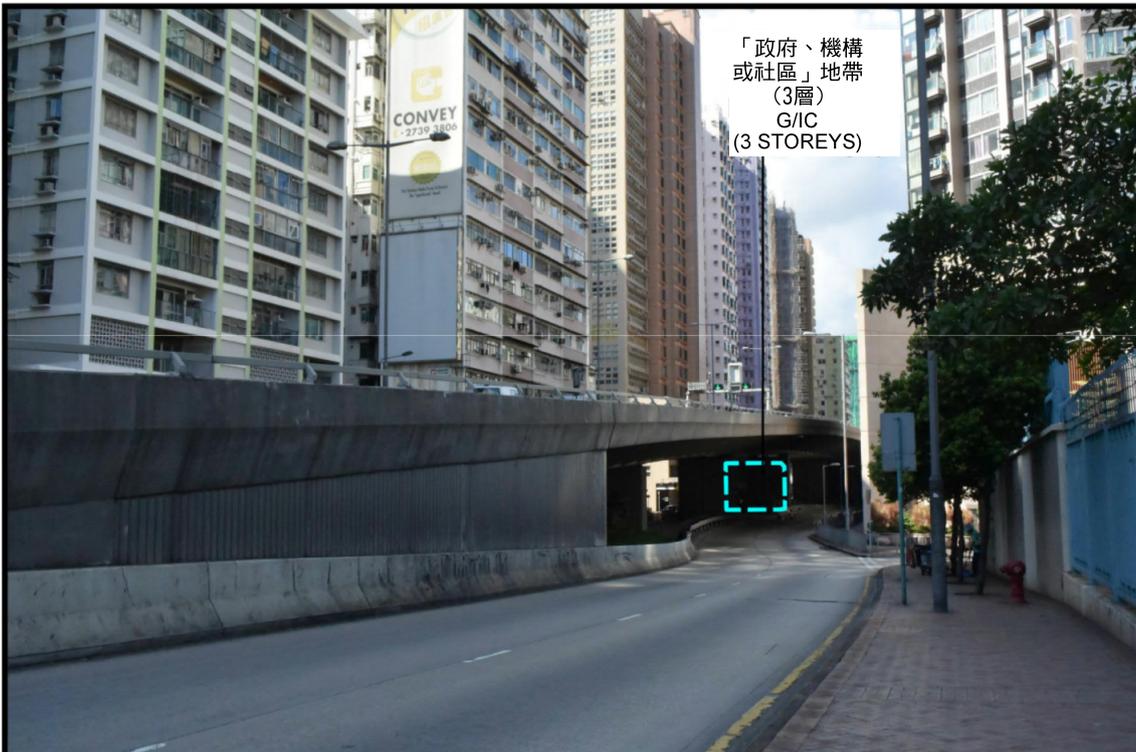
在東何文田配水庫遊樂場的觀景點
VIEWING POINT AT
HO MAN TIN EAST SERVICE RESERVOIR PLAYGROUND
馬頭角分區計劃大綱核准圖編號S/K10/22的擬議修訂
(B項)
PROPOSED AMENDMENTS TO THE
APPROVED MA TAU KOK OUTLINE ZONING PLAN No. S/K10/22
(ITEM B)

規劃署
PLANNING
DEPARTMENT



參考編號
REFERENCE No.
M/K10/17/117

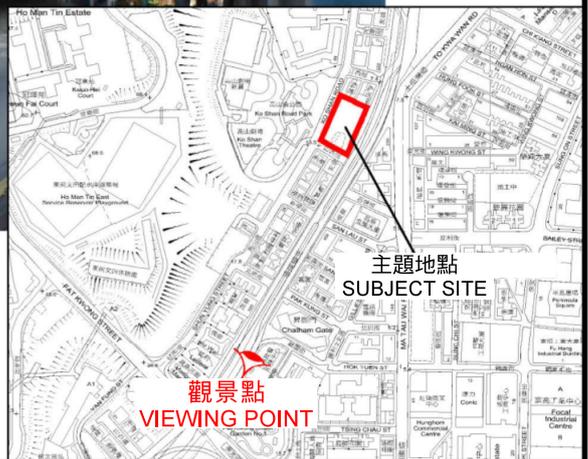
圖 PLAN
2j



「政府、機構
或社區」地帶
(3層)
G/IC
(3 STOREYS)



擬議住宅發展
(主水平基準上130米)
PROPOSED RESIDENTIAL
DEVELOPMENT
(130mPD)



主題地點
SUBJECT SITE

觀景點
VIEWING POINT

圖例 LEGEND

 在構築物後
BEHIND EXISTING STRUCTURE

B 項

ITEM B

資料來源：由房屋署提交
SOURCE: SUBMITTED BY
HOUSING DEPARTMENT

本圖於2018年2月2日擬備
PLAN PREPARED ON 2.2.2018

合成照片 PHOTOMONTAGE

在佛光街一號花園的觀景點
VIEWING POINT AT FAT KWONG STREET GARDEN No.1
馬頭角分區計劃大綱核准圖編號S/K10/22的擬議修訂
(B項)
PROPOSED AMENDMENTS TO THE
APPROVED MA TAU KOK OUTLINE ZONING PLAN No. S/K10/22
(ITEM B)

規劃署
PLANNING
DEPARTMENT



參考編號
REFERENCE No.
M/K10/17/117

圖 PLAN
2k

