RURAL AND NEW TOWN PLANNING COMMITTEE
OF THE TOWN PLANNING BOARD

RNTPC Paper No. 1/19

For Consideration by

the Rural and New Town Planning Committee on 8.3.2019

PROPOSED AMENDMENTS TO

THE APPROVED FANLING/SHEUNG SHUI OUTLINE ZONING PLAN

NO. S/FSS/22

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1. Introduction

This paper is to seek Members' agreement that:

(a) the proposed amendments to the approved Fanling/Sheung Shui Outline Zoning Plan (OZP) No. S/FSS/22 (**Attachment I**) as shown on the draft OZP No. S/FSS/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 3.1.2017, the Chief Executive in Council (CE in C), under section 9(1)(a) of the Ordinance, approved the draft Fanilng/Sheung Shui OZP, which was subsequently renumbered as S/FSS/22. On 30.1.2018, the CE in C referred the approved Fanling/Sheung Shui OZP No. S/FSS/22 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance.

3. Background

3.1 According to the 2013 Policy Address, the Government would adopt a multi-pronged approach to build up land reserve with a view to meeting housing and other development needs. It was reaffirmed in the 2014 Policy Address that the Government would continue to review various land uses and rezone sites as appropriate for residential use. This includes reviews on the Government land (GL) currently vacant, under Short Term Tenancies or different short-term or government uses. In this regard, some 150 potential housing sites (including **Amendment Items** (**Items**) **A1**, **A2** and **A4** mentioned below) were identified. In the 2017 Policy Address, through the on-going land use reviews, 26 additional potential housing sites (including **Item A3**) have been further identified.

3.2 The current proposed amendments to the OZP are mainly related to four potential housing sites (all on GL), including three in Sheung Shui (**Items A1 to A3**) for

public housing development by Hong Kong Housing Authority (HA) and one in Fanling (**Item A4**) for subsidized housing development by Hong Kong Housing Society (HKHS).

3.3 To take forward a s.12A application (No. Y/FSS/13) agreed by the Committee on 23.6.2017, OZP amendments are proposed to rezone a site at Wu Tip Shan from "Government, Institution or Community" ("G/IC") to "Residential (Group A)6" ("R(A)6") (**Item B**) for private residential development cum supporting retail facilities. Opportunity has been taken to amend the OZP to reflect other current as-built conditions of roads (**Items C1 to C3**), and to revise the Notes to incorporate the latest revision of the Master Schedule of Notes to Statutory Plans (MSN).

4. Items A1 to A3 – Rezoning of three potential Public Housing Sites: Sheung Shui Area 30 Site, Sheung Shui Area 4 Site and Po Shek Wu Road North Site

4.1 Three potential housing sites in Sheung Shui, namely Sheung Shui Area 30 Site (**Item A1**), Sheung Shui Area 4 Site (**Item A2**) and Po Shek Wu Road North Site (**Item A3**), are proposed for public housing developments by HA. A maximum domestic plot ratio (PR) of 6 has been adopted for these proposed housing developments with some non-domestic PR for facilities (e.g. retail and kindergarten) serving the residents and local community. Taking into account the comments of concerned departments including Food and Health Bureau (FHB), Transport Department (TD) and Social Welfare Department (SWD) and to meet the needs of the locals, District Health Centre, public vehicle park, public transport facilities, community and social welfare facilities have been included in these developments. The conceptual schemes of these three sites are at **Plans 5a to 5g** and their main development parameters are summarized below:

	Sheung Shui Area 30 Site	**Sheung Shui Area 4 Site**	**Po Shek Wu Road North Site**
Site Area (ha)	1.55	1.36	1.38
Domestic PR	6	6	6
Non-domestic PR	0.4 (including retail and kindergarten)	0.6 (including retail and post office)	0.9 (including retail and kindergarten)
No. of Flats (About)	2,000	1,500	1,800
	Total 5,300		
Building Height (BH)	Maximum 130mPD (Not more than 40 storeys (domestic towers))		
Transport and community facilities[#]	- Public transport interchange (PTI)	- Public vehicle park with about 306 spaces (300	-

	Sheung Shui Area 30 Site	**Sheung Shui Area 4 Site**	**Po Shek Wu Road North Site**
Site Area (ha)	1.55	1.36	1.38
	- Community hall - Residential Care Home for the Elderly (100-place) - Day Activity Centre - Hostel for Severely Mentally Handicapped Persons - Hostel for Moderately Mentally Handicapped Persons - Integrated Vocational Rehabilitation Services Centre	for private cars, 6 for LGVs)	
Tentative population in-take	2025-2028 (by phases)		

[#] Public vehicle parks, public transport facilities and GIC facilities as required by the Government, are exempted from PR calculation.

Item A1: Sheung Shui Area 30 Site (**Plans 2a, 3a and 4a**)

4.2 With an area of 1.55 ha, the site is located on the west side of Po Shek Wu Road, to the northwest of the centre of Sheung Shui New Town and is about 600m from MTR Sheung Shui Station. It is bounded by Po Shek Wu Road to the east, Choi Yuen Road to the south and southwest, and Choi Fai Street to its north. The western portion of the site is a temporary public car park held under Short Term Tenancy while the eastern portion is vacant land covered by trees and shrubs (**Plans 3a and 4a**). The site falls within the eastern fringe of Sheung Shui Area 30, which is zoned "Industrial" ("I") on the OZP.

4.3 On its east across Po Shek Wu Road is the existing residential areas including Choi Po Court (BH of 100mPD) and Choi Yuen Estate (BH of 65mPD), and Po Shek Wu Estate under construction (BH of 114mPD). On its south across Shek Sheung River is an area of village type development (Tai Tau Leng, mainly 3-storey buildings). On its north and northwest is Sheung Shui Area 30 industrial area which has three existing industrial buildings mainly for non-manufacturing industrial uses including warehouses and storage, Sheung Shui Ambulance Depot, some temporary public car parks held under Short Term

Tenancy and some vacant land. The area is undergoing transformation, and planning permissions have been granted for wholesale conversion of the three existing industrial buildings (i.e. Jumbo Plaza (application No. A/FSS/209), Advanced Technology Centre (application No. A/FSS/246) and Hi Tech Centre (application No. A/FSS/241)) for 'Eating Place', 'Office' (for application No. A/FSS/241 only) and 'Shop and Services' (**Plan 2a**). East Rail Line lies on the further north.

4.4 It is proposed to rezone the site from "I" to "R(A)4" for public housing purpose. To allow design flexibility of the proposed housing development, a maximum PR of 6.6 and a maximum BH of 130mPD are proposed to be stipulated in the OZP.

4.5 On the basis of the findings of Traffic Impact Assessment (TIA) report, a PTI is proposed at the site as part of the measures to mitigate local traffic issues. Upon requests of the Secretary for Food and Health (SFH) and the Director of Social Welfare (DSW), a District Health Centre and various social welfare facilities are also included in the development to serve the local community and North District.

Item A2: Sheung Shui Area 4 Site (**Plans 2a, 3a and 4b**)

4.6 With an area of 1.36 ha, the site is located on the west side of Po Shek Wu Road, to the north of Sheung Shui Area 30 Site on the opposite side of railway. It is bounded by Po Shek Wu Road to its southeast, San Wan Road and East Rail Line to its southwest, and Ka Fu Close to its northeast. Majority of the site is occupied by a temporary public car park held under Short Term Tenancy, and a part of the site is occupied by a temporary works area of Water Supplies Department (**Plans 3a and 4b**). The site is zoned "Other Specified Uses" annotated "Bus Depot" ("OU(Bus Depot)") with a small portion zoned "I" on the OZP. To meet the car parking demand in the area, a public vehicle park with 306 spaces will be included in the proposed development.

4.7 On its southeast across Po Shek Wu Road is another potential housing site (Po Shek Wu Road North Site, **Item A3**). On its south across Po Shek Wu Road is the existing residential areas including Po Shek Wu Estate under construction (BH of about 114mPD). On its southwest across East Rail Line are Sheung Shui Area 30 and the potential housing site under **Item A1**. On its northwest and north is Sheung Shui Area 4 industrial area with several existing industrial buildings which are mainly for non-manufacturing industrial uses including warehouses and storage. There is an approved s.16 application (No. A/FSS/234) for wholesale conversion of an existing industrial building (i.e. Alpha Appliances Building) for 'Eating Place', 'Office' and 'Shop and Services' uses at the further northwest (**Plan 2a**).

4.8 It is proposed to rezone the site from "OU(Bus Depot)" (about 1.03 ha) and "I" (about 0.33 ha) to "R(A)4" for public housing purpose, with a maximum PR of 6.6 and a maximum BH of 130mPD.

Item A3: Po Shek Wu Road North Site (**Plans 2a, 3a and 4c**)

4.9 With an area of 1.38 ha, the site is located on the east side of Po Shek Wu Road, to the northwest of the centre of Sheung Shui New Town and about 400m from MTR

Sheung Shui Station. It is bounded by San Wan Road to its southeast and southwest, and Po Shek Wu Road to its northwest. The site is occupied by a temporary bus depot of Kowloon Motor Bus (KMB) under Short Term Tenancy (**Plans 3a and 4c**). It falls within an area zoned "Open Space" ("O") on the OZP. A reprovisioning site has been identified for the bus depot. Leisure and Cultural Services Department (LCSD) has no objection to the proposed rezoning.

4.10 On its east is Shek Wu Hui (**Plan 1b**), which is an existing market town with commercial and residential uses, and predominantly low-rise buildings (about 25mPD) with some individual commercial/residential developments of about 60-90mPD. Landmark North (about 96mPD) is located at the southern fringe of Shek Wu Hui. On southwest of the site across San Wan Road and East Rail Line is the existing residential areas including Po Shek Wu Estate under construction. On its northwest is the potential housing site under **Item A2**. Shek Wu Hui Jockey Club Playground is at its immediate north.

4.11 It is proposed to rezone the site from "O" to "R(A)5" for public housing purpose. To allow design flexibility of the proposed housing development, a maximum PR of 7.0 and a maximum BH of 130mPD are proposed to be stipulated in the OZP.

Planning Briefs

4.12 The above proposed public housing developments will be guided by individual planning briefs which would set out planning parameters, design requirements as well as any further technical assessments to be conducted for the developments.

Technical assessments for Items A1 to A3

4.13 To ascertain the technical feasibility of the proposed three public housing developments, HA has conducted various technical assessments including TIA, parking study, Visual Appraisal (VA), Air Ventilation Assessment (Expert Evaluation) (AVA(EE)), Preliminary Environmental Assessment (PEA), Sewerage Impact Assessment (SIA), Ecological Impact Assessment (EcoIA), Broad Brush Tree Survey, and Quantitative Risk Assessment (QRA). The consolidated Technical Assessment Report is at **Attachment V**. It has confirmed that the proposed developments would not cause insurmountable problems on traffic, visual, air ventilation, environment and infrastructural capacity aspects. The findings were summarized in the following paragraphs.

Traffic Aspect

4.14 Taking into account these proposed housing developments, the TIA (Appendix 2 of **Attachment V**) reveals that the associated junctions along the accessing/leaving routes would operate satisfactorily after the implementation of the committed/proposed junction improvement schemes along the major roads/junctions and other traffic improvement projects[1] in the area (**Plan 7a to 7l**)

[1] To cater for the population increase by planned housing developments in North District, e.g. Fanling North and Kwu Tung North New Development Areas (NDAs), Queen's Hill housing development, the Government have committed to implement a series of traffic improvement proposals in the area, including Lung Shan Tunnel (to be completed in 2019) and Fanling Bypass (Eastern Section) (targeted to be completed in 2024), and improvement works for individual roads.

which will be completed progressively before the population intake of these housing developments from 2025 to 2028 in phases. HA will closely liaise with the relevant government departments on the details of the junction improvement scheme in the later design stage. To further enhance the vehicular accessibility in the vicinity of the potential housing sites, widening of Po Shek Wu Road Southbound from two lanes to three lanes is additionally recommended (**Plan 7l**).

4.15 To facilitate pedestrian circulation amongst the three housing sites, Po Shek Wu Estate and MTR Sheung Shui Station, a network of new footbridges (**Plan 5a**) will be constructed to connect Area 30 Site to Po Shek Wu Estate, from Area 4 Site to Po Shek Wu Road North Site and to MTR Sheung Shui Station, and between Po Shek Wu Road North Site and Po Shek Wu Estate. Future pedestrian condition was assessed, and no pedestrian circulation problems are envisaged with the proposed footbridges in place. Commissioner for Transport (C for T) has no in-principle objection to the proposed developments from traffic perspective.

Visual Appraisal

4.16 To assess the visual impact of the proposed housing developments, a VA has been conducted (Appendix 4 of **Attachment V**). Suitable viewing points (VPs) frequently visited by the public are selected for illustration.

4.17 A VA (Appendix 4 of **Attachment V**) was undertaken to assess the possible visual impact of the proposed public housing developments. As shown in the photomontages (**Plans 6a** and **6b**), the proposed developments are not incompatible in development scale and height with the neighbouring developments such as Po Shek Wu Estate (114mPD) and Choi Po Court (104mPD). According to the VA, the proposed public housing developments with appropriate design mitigation measures including stepped building height and building separation would not have unacceptable visual impact on their vicinity. Additional design measures will be explored at the detailed design stage to further reduce the potential visual impact.

Air Ventilation Assessment

4.18 An AVA(EE) (Appendix 5 of **Attachment V**) was conducted for the three proposed public housing developments. According to HA's indicative scheme, to enhance the wind performance of the proposed developments and minimize localized ventilation impact on the surroundings, building separations are provided at each site, with two 15m-wide separations at Sheung Shui Area 30 Site, one 15m-wide separation at Sheung Shui Area 4 Site, and one 15m-wide and on 17m-wide separations at the Po Shek Wu Road North Site (**Plans 5b to 5g**) in order to allow wind penetration across each site. Empty bays are provided at ground floor and/or podium floor at each site in order to enhance wind permeability. For the Po Shek Wu Road North Site, a 15m tower setback from the northern boundary is provided to allow wind penetration towards Po Shek Wu Road.

4.19 In addition, the AVA(EE) has recommended that a further quantitative AVA would be conducted for assessing the effectiveness of the above recommended mitigation measures at the detailed design stage as well as optimizing the

development schemes.

Ecological Aspect

4.20 As the Sheung Shui Area 30 Site is close to Shek Sheung River which is of some ecological value and Long Valley wetland which is an ecological sensitive area, an EcoIA for the proposed housing development was conducted. No floral and faunal species of conservation importance have been recorded within the site. The EcoIA concludes that the ecological value of Sheung Shui Area 30 Site is very low. With mitigation measures including good construction site practices and habitat enhancement measures (e.g. planting of native species) in place, no significant adverse ecological impact is anticipated. The Director of Agriculture, Fisheries and Conservation (DAFC) has no adverse comment on the EcoIA.

Tree Survey and Landscape Aspects

4.21 According to the broad brush tree survey (Appendix 8 of **Attachment V**) conducted in 2018, there were approximately 680 trees within the boundary of Sheung Shui Area 30 Site, 45 trees within Sheung Shui Area 4 Site and 30 trees within Po Shek Wu Road North Site. There is no Old and Valuable Trees (OVTs) within these sites. The existing trees surveyed are generally species commonly found in Hong Kong, with average health and amenity value. There are no recommended treatments of tree (retain/ transplant/ fell) at this early stage as the recommendations are subject to detailed tree survey and design development. As extensive site formation works are expected, more than 90% of the existing trees are anticipated to be transplanted or felled. A detailed tree survey will be carried out at next stage to provide basis for tree treatment recommendations.

4.22 All compensatory planting for loss of vegetation will be carried out according to "Development Bureau Technical Circular (Works) No. 7/2015 Tree Preservation". Overall site green coverage of at least 20% of gross site area will be applied. At least 50% of the overall site greening coverage will be provided at-grade and on the podium level. The schematic landscape plans are in Appendix 9 of **Attachment V**.

Environmental Aspect

4.23 PEA studies were conducted. The proposed developments will be subject to potential impacts of traffic noise from surrounding roads and railway noise from the East Rail Line as well as potential fixed noise sources including fixed rooftop plants, louvers/exhaust fans on façade and ground level industrial activities in the vicinity. It is recommended that proper building layout and design should be adopted, and mitigation measures such as building setback, acoustic window design, fixed glazing, acoustic fins should be considered and exhaustively adopted in order to alleviate the nose impacts. With the incorporation of the necessary practicable noise mitigation measures, it is anticipated that the noise compliance rate can be improved.

4.24 A PTI is proposed at Sheung Shui Area 30 Site underneath a residential block. Based on the tentative design, the proposed ingress/egress of the PTI at Choi Fai Street will face to an industrial building and is away from all noise sensitive

receivers. It will be covered under a podium decking with full height side walls to avoid line of sights to the subject developments and other sensitive receivers in the proximity as far as practicable. Potential noise nuisance arising from the proposed PTI is therefore not anticipated.

4.25 Chimney surveys were conducted and no chimney was identified within 500m of the proposed housing sites. No adverse air quality impact is envisaged. The Shek Wu Hui Sewage Treatment Works (SWHSTW) and Sheung Shui Slaughterhouse (SSS) are located at about 300-800m to the northwest of Sheung Shui Area 30 and Area 4 Sites. Desktop study has revealed that there will be no adverse odour impact arising from the expanded SWHSTW and SSS to the proposed developments.

4.26 Based on the preliminary site appraisal and desktop study regarding land contamination, land contamination activities were not identified within Sheung Shui Area 30 and Area 4 Sites, but potential land contamination may occur within Po Shek Wu Road North Site. Detailed land contamination assessment for Po Shek Wu Road North Site will be carried out by the current land user, KMB, and any necessary remediation works will be implemented before the site is handed back to the Government for public housing development. Hence, potential health risk due to land contamination to the future public housing residents is not anticipated.

4.27 With the implementation of appropriate mitigation measures, no insurmountable environmental issue is anticipated. HA will conduct an Environmental Assessment Study (EAS) at the detailed design stage to address the potential environmental impacts with respect to the HKPSG and suitable mitigation measures will be proposed. In view of the above and the future EAS, The Director of Environmental Protection (DEP) has no in-principle objection to the proposed developments from environmental perspective.

Sewerage Aspect

4.28 To assess the possible impact of the proposed housing developments on the existing sewerage system, a SIA has been conducted. Sewage from the three public housing developments will be discharged to the existing sewers. The collected sewage will be conveyed to SWHSTW which has sufficient capacity. The SIA confirms that no insurmountable sewerage impact is anticipated with the implementation of mitigation measures. DEP and Chief Engineer/Mainland North (CE/MN) of Drainage Services Department (DSD) have no adverse comment on the SIA.

Other Aspects

4.29 HA has conducted a QRA Study in relation to a LPG Store in Choi Po Court to assess the increased risk due to the proposed housing developments. Only Sheung Shui Area 30 Site and Po Shek Wu Road North Site fall within the study area of 200m radius from the LPG Store. The results show that the risk at both construction and operation stage due to the population increase of the proposed development is negligible. The Director of Electrical and Mechanical Services has no adverse comment on the QRA.

5. <u>Item A4 – Rezoning of a potential Subsidised Housing Site: Jockey Club Road Site</u> (Plans 2b, 3b and 4d)

5.1 A potential housing site at Jockey Club Road Site, Fanling is proposed for subsidized housing development by HKHS. A maximum domestic PR of 6 has been adopted with non-domestic PR of 0.6 for supporting retail facilities. A public vehicle park and a Residential Care Home for the Elderly (RCHE) will be included in the development. The conceptual scheme proposed by HKHS is at **Plans 5h and 5i** and their main development parameters are summarized below:

Site Area (ha)	0.55
Domestic PR	6
Non-domestic PR	0.6 (including retail and other ancillary facilities)
No. of Flats (About)	640
Building Height	Maximum 100mPD (about 24 storeys (domestic towers))
Transport and community facilities[#]	- Residential Care Home for the Elderly (100-place) - Public vehicle park with about 135 space (130 for private cars, 5 for LGVs)
Tentative population in-take	2025

[#] Public vehicle parks and GIC facilities as required by the Government are exempted from PR calculation.

5.2 With an area of 0.55 ha, the site is located at about 400m to the northwest of MTR Fanling Station. It is bounded by Jockey Club Road to the northeast and Pik Fung Road to the northwest. The northwest portion of the site is a temporary tennis court managed by LCSD while the remaining portion is vacant GL covered by trees (**Plans 3b and 4d**). The site falls within an area zoned "G/IC" on the OZP, which has no designated use.

5.3 On its southeast is the former Fanling Magistracy, which is a Grade 3 historic building revitalized for a training centre with a hostel and eating place (a subject of an approved s.16 Application No. A/FSS/222). On its further southeast across Sha Tau Kok Road is the existing public housing estate Cheung Wah Estate (about 110mPD). On its immediate south and northwest across Pik Fung Road are two GIC clusters (ranging from 26mPD to 62mPD) respectively which include Fanling Law Courts Building, North District Government Offices, the site proposed for the future New Territories East Cultural Centre, Fanling Health Centre and Pentecostal Gin Mao Sheng Primary School. On its north across Jockey Club Road is a low density residential area (La Verte, about 24mPD) and

village type development (Fan Leng Lau, mainly 3-storey buildings).

5.4 It is proposed to rezone the site from "G/IC" to "R(A)4" for subsidized housing development, with a maximum PR of 6.6 and a maximum BH of 100mPD.

Technical assessments

5.5 To ascertain the technical feasibility of the proposed housing developments, HKHS has conducted various technical assessments including TIA, Visual Impact Assessment (VIA), AVA(EE), Tree Assessment, Environmental Assessment (EA), Water Supply Impact Assessment (WSIA), SIA and Drainage Impact Assessment (DIA). The consolidated Technical Assessment Report is at **Attachment VI**. It has confirmed that the proposed development would not cause insurmountable problems on traffic, environment, visual, air ventilation and infrastructural capacity aspects. The findings were summarized in the following paragraphs.

Traffic Aspect

5.6 The TIA (Appendix 1 of **Attachment VI**) reveals that most junctions will have sufficient capacities to accommodate the future traffic growth and the traffic generated by the proposed development during the peak hours, except for the junction between So Kwun Po Road and Fanling Highway Slip Roads which will operate near capacity under the future scenarios. Nevertheless, the traffic impact caused by the proposed development (e.g. less than 20 pcu/hour passing through So Kwun Po Road southbound (critical arm) during peak hour) is insignificant. The TIA concluded that the proposed housing development will not induce significant traffic impact on the surrounding road network and the development is acceptable from traffic engineering point of view.

5.7 The site is well served by road-based public transport routes. MTR Fanling Station and multiple bus and GMB stops are located within 500m from the site. C for T has no in-principle objection to the proposed developments from traffic perspective.

Visual Impact Assessment

5.8 The proposed housing development consists of two residential towers of 100mPD which is compatible with the existing developments in the surroundings such as Cheung Wah Estate (about 110mPD) and Fanling Town Centre (about 95mPD) (**Plans 6c and 6d**). The massing and disposition of the towers have been designed to avoid causing visual blockage to the surroundings. A 34.5m wide visual corridor is proposed to reduce the visual impact especially along the northeast-southwest visual axis.

5.9 The VIA (Appendix 3 of **Attachment VI**) concluded that the visual changes caused by the proposed development is not significant when viewed from the identified VPs. The overall visual impact is slightly adverse. While some degree of visual obstruction will occur, they are generally insignificant. Design mitigation measures such as provision of visual corridor and mindful disposition of buildings will help alleviate some potential impacts. Green measures and façade treatments will be explored in detailed design stage to further improve the

aesthetics and visual interests of the proposed development.

Air Ventilation Assessment

5.10 An AVA(EE) (Appendix 2 of **Attachment VI**) was conducted for the proposed development. To minimize the potential adverse air ventilation impact induced by the proposed development on the surrounding, the proposal has incorporated various mitigation/design measures including (i) a 30m-wide building separation between towers; (ii) 11m-wide setback at ground floor; (iii) 18m-wide setback at 1/F; (iv) northeast-southwest aligned building disposition and (v) terraced podium design. With the proposed mitigation measures, the proposed development would not have significant adverse air ventilation impact to the surrounding environment. Considering the proposed development may result in potential adverse air ventilation impact on some focus areas where pedestrians frequently access, it is recommended in the AVA(EE) that a quantitative AVA should be undertaken at detailed design stage to optimize scheme design and/or to prove that the future scheme would perform no worse than the current scheme in ventilation performances.

Tree Assessment

5.11 According to the tree assessment (Appendix 4 of **Attachment VI**) conducted, there are 46 trees within the boundary of the site, with no OVTs. All trees are common species in Hong Kong with low to medium amenity value. Majority of them are in fair to poor form and health condition. It is proposed to retain three trees on site and the other 43 trees are proposed to be felled. No tree was recommended for transplanting due to their poor health condition and low amenity value. To compensate the trees proposed to be felled, 109 new heavy standard trees would be planted.

Environmental Aspect

5.12 According to the EA conducted, the proposed development will be subject to potential impact of traffic noise from surrounding roads, in particular Sha Tau Kok Road – Lung Yeuk Tau and Jockey Club Road. In order to minimise the road traffic noise impact, it is proposed to adopt design measures, such as minimizing direct facing of residential units towards Jockey Club Road, orientating majority of the residential units to face towards internal courtyard/open landscape, positioning noise-tolerant rooms along façade fronting Jockey Club Road, and implementing additional noise mitigation measures as necessary. With the implementation of recommended mitigation measures which include fixed glazing, acoustic windows, balcony and fins, full compliance with noise standard requirement could be achieved. The EA also concluded that adverse rail noise impact and industrial noise impact are not anticipated.

5.13 There is no chimney found within 500m of the site. Vehicular emission has been assessed for air quality impact and no adverse impact on the proposed development is anticipated. In view of the above, DEP has no in-principle objection to the proposed development from environmental perspective.

Infrastructural Aspects

5.14 Regarding water supply impact, the WSIA pointed out that the additional water demand from the proposed development is relatively small and would have minimal impact to the existing waterworks installations. Director of Water Supplies (DWS) has no objection to the proposed development.

5.15 According to the SIA conducted, sewage from the proposed development will be discharged to the existing nearby sewer network which is conveyed to SWHSTW eventually. The SIA concluded that no adverse sewerage impact is anticipated. DEP and CE/MN of DSD have no adverse comment on the SIA.

5.16 The DIA conducted showed that the drainage system along Pik Fung Road and Jockey Club Road will have spare capacity to take up the additional stormwater arising from the proposed development, and concluded that no adverse drainage impact is anticipated. CE/MN of DSD have no adverse comment on the DIA.

6. Item B - Rezoning of a site at Wu Tip Shan arising from an approved section 12A Application (Plans 2c, 3c and 4e)

6.1 On 23.6.2017, the Committee agreed to a s.12A application (No. Y/FSS/13) to rezone the subject site at Wu Tip Shan from "G/IC" to "R(A)4" for residential development cum supporting retail facilities. The proposed development would have a domestic GFA of 19,750 m^2 (equivalent to PR of 5.46) and a non-domestic GFA of 3,092 m^2 (equivalent to PR of 0.8548) and a maximum BH of 128mPD/31 storeys.

6.2 With an area of 0.36 ha, the site is private land and currently fenced off and occupied by several vacant domestic dwelling structures (**Plans 3c and 4e**). It falls within an area zoned "G/IC" on the OZP.

6.3 The site is currently without vehicular access. The applicant of the s.12A application proposed to construct a new roundabout extending from the northern end of Yan Shing Lane to serve the proposed development and the adjacent areas (**Plan 2c**). The roundabout would be constructed by the applicant. TD and HyD would take up the long-term management and maintenance of the roundabout respectively in the future.

6.4 To take forward the Committee's decision, it is proposed to rezone the site from "G/IC" to "R(A)6" to facilitate the proposed residential development with supporting retail facilities, with a maximum domestic GFA of 19,750 m^2, a maximum non-domestic GFA of 3,092m^2 and a maximum BH of 128mPD.

Review of the Remaining "G/IC" zone

6.5 The above site falls within a large "G/IC" zone at Pak Wo Road and Wah Ming Road. In agreeing to the s.12A application, the Committee considered that a review of the residual land in the "G/IC" zone was necessary, and findings of the review should be submitted to the Committee for consideration together with the

rezoning of the housing site.

6.6 In accordance with the Committee's decision, a review has been conducted. Apart from the proposed private housing site under **Item B**, a s.16 planning application for mixed housing development by HKHS (comprising public rental housing, subsidized sale flats and elderly flats under the Senior Citizen Residences Scheme) (No. A/FSS/254) (**Plan 2c**) in the eastern portion of the "G/IC" zone along Pak Wo Road was approved by the Committee on 3.2.2017. The "G/IC" zoning for this site should be retained for providing appropriate planning control on the above HKHS development. When HKHS's development is completed, appropriate zoning will be further considered.

6.7 The northern and southern parts of the "G/IC" zone are occupied by existing GIC facilities, including Fung Ying Seen Koon, two secondary schools and one special school. There is no proposal for redevelopment of these GIC facilities.

6.8 The middle part of the "G/IC" zone (the site edged red on **Plan 2d**) has an area of about 0.5 ha and is occupied by some low-rise and low-density domestic structures on sloping land which is partly GL and partly private land. The site sits on platforms on a steep slope ranging from 26mPD to 40mPD with an elongated configuration, and overlooked by steep natural terrain of Wu Tip Shan to its west. The existing domestic structures on the site can only be accessed via a footpath leading from Pak Wo Road from the north. The provision of an access road to the site from the proposed roundabout at Yan Shing Lane is constrained by the limited width and the sloping gradient of the site. Given the constraints of access, natural topography, geotechnical condition and site configuration, the scope for intensive development at this site is limited. It is considered more appropriate to retain the site as "G/IC" to cater for possible G/IC uses in future to meet the needs of increasing population in the area.

6.9 Taking into account the above, it is proposed to retain the "G/IC" zoning for the remaining area to reflect the current GIC uses as well as serve as GIC reserve to meet the future needs of the community.

7. Item C1 to C3 – Technical Amendments to reflect current use and as-built conditions (Plans 2a, 3a, 4a to 4c)

Opportunity has been taken to rezone strips of land in Sheung Shui Areas 4 and 30 from "I", "OU(Bus Depot)" or "O" to areas shown as 'Road' to reflect the as-built alignment. Details are in paragraph 9.1 below (**Plans 2a, 3a and 4a**).

8. Provision of GIC Facilities and Open Space

8.1 Taking into account the four proposed public housing developments and the private residential development at Wu Tip Shan, the planned population of the Planning Scheme Area would be about 288,600 persons. Based on the requirements in HKPSG and the planned population, as shown in **Attachment VII**, the planned provision for GIC facilities (e.g. schools and hospital beds) in the area is generally sufficient. There is sufficient provision of planned local and

district open spaces within the Area (about 31 ha and 0.6 ha surplus respectively) to meet the need of the planned population.

8.2 According to the population-based planning standards for elderly services and facilities recently incorporated into the HKPSG, there will be shortfalls in Community Care Services Facilities and Residential Care Homes for the Elderly of 1,211 places and 532 beds in the Area respectively. As the HKPSG requirements for these two facilities are a long-term goal, the actual provision would be subject to the consideration of the SWD in the planning and development process as appropriate. Since these facilities are premises based, consideration will be given to include facilities requested by SWD in the planned GIC and residential development in Fanling and Sheung Shui area as well as in Kwu Tung North and Fanling North NDAs.

9. Proposed Amendments to the Matters shown on the OZP

9.1 The proposed amendments as shown on the draft Fanling/Sheung Shui OZP No. S/FSS/22A (**Attachment II**) are as follows:

(a) **Item A1** (about 1.55 ha)

Rezoning Sheung Shui Area 30 Site from "I" to "R(A)4" with a maximum BH of 130mPD.

(b) **Item A2** (about 1.36 ha)

Rezoning Sheung Shui Area 4 Site from "I" and "OU(Bus Depot)" to "R(A)4" with a maximum BH of 130mPD.

(c) **Item A3** (about 1.38 ha)

Rezoning Po Shek Wu Road Site from "O" to "R(A)5" with a maximum BH of 130mPD.

(d) **Item A4** (about 0.55 ha)

Rezoning Jockey Club Road Site from "G/IC" to "R(A)4" with a maximum BH of 100mPD.

(e) **Item B** (about 0.36 ha)

Rezoning a site at Wu Tip Shan from "G/IC" to "R(A)6" with a maximum BH of 128mPD.

(f) **Item C1** (about 1.23 ha)

Rezoning a strip of land in Sheung Shui Area 30 from "I" to an area shown as 'Road' to reflect the existing condition as part of Choi Yuen Road.

(g) **Item C2** (about 0.93 ha)

Rezoning a strip of land in Sheung Shui Area 4 from "I" and "OU(Bus Depot)" to an area shown as 'Road' to reflect the existing condition as part of San Wan Road.

(h) **Item C3** (about 0.54 ha)

to rezone a strip of land to the southwest of Item A3 from "O" to an area shown as 'Road' to reflect the existing condition as part of San Wan Road.

9.2 A proposed roundabout (subject to detailed design) at Yan Shing Lane, as mentioned in paragraph 6.3 above, will be shown on the OZP for information (**Attachment II**).

10. Proposed Amendments to the Notes of the OZP

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

"R(A)" zone

10.1 In relation to the **Items A1** to **A4**, to allow flexibility for the provision of public vehicle parks at the relevant public housing sites to meet local parking demand, 'Public Vehicle Park (excluding container vehicle) (on land designated "R(A)1" only)' Column 1 will be amended to 'Public Vehicle Park (excluding container vehicle) (on land designated "R(A)1", "R(A)4" and "R(A)5" only)' .

10.2 In relation to **Items A1** to **A4** and **B**, the Remarks for "R(A)" zone will be revised to incorporate development restrictions for "R(A)4", "R(A)5" and "R(A)6" sub-areas.

10.3 In relation to **Items A1** to **A4**, to facilitate the provision of required public vehicle park, public transport facilities and/or GIC facilities, a new clause under the Remarks for disregarding the floor space for public vehicle parks, public transport facilities and GIC facilities as required by the Government in PR calculation for "R(A)4" and "R(A)5" sub-areas will be incorporated.

Technical amendments

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

(a) deletion of 'Market' from Column 1 use in "Commercial/Residential" zone;

(b) deletion of 'Market' from Column 2 use in "Residential (Group B)" and "Village Type Development" zones; and

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

11. Revision to the Explanatory Statement (ES) 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 the 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.

12. Plan Number

Upon exhibition for public inspection, the Plan will be renumbered as S/FSS/23.

13. Consultation

Consultation with NDC

13.1 On 21.1.2019, the Planning Department, together with Housing Department (HD), HKHS and TD consulted the District Minor Works and Environmental Improvement Committee (DMW) of the NDC on the proposed pubic housing schemes and corresponding proposed OZP amendments. In general, members were supportive to provision of more public housing developments to meet the needs of the community, but concerns were raised on whether there were sufficient and timely provision of traffic infrastructure to meet the demand of the increased population. After voting, the DMW expressed support to the proposed housing developments and OZP amendments. A copy of the draft minutes of the meeting is at **Attachment VIII**.

Departmental Consultation

13.2 The proposed amendments have been circulated to relevant bureaux/departments for comment. Comments from relevant bureaux/departments have been incorporated into the above paragraphs, where appropriate. The following bureaux/departments have no objection to/no comment on the proposed amendments:

(a) Secretary for Education;
(b) Antiquities and Monuments Office, Development Bureau;
(c) District Land Officer/North, Lands Department;
(d) Chief Building Surveyor/New Territories West, Buildings Department;
(e) Commissioner for Transport;
(f) Chief Highway Engineer/New Territories East, HyD;
(g) Chief Engineer/Mainland North, DSD;
(h) Chief Engineer/Construction, WSD;
(i) Director of Fire Services;
(j) Director of Agriculture, Fisheries and Conservation;

(k) Director of Environmental Protection;
(l) Project Manager/North, Civil Engineering and Development Department;
(m) Head of Geotechnical Engineering Office, Civil Engineering and Development Department;
(n) Director of Electrical and Mechanical Services;
(o) Director of Leisure and Cultural Services;
(p) Director of Social Welfare;
(q) District Officer (North), Home Affairs Department;
(r) Director of Food and Environmental Health;
(s) Government Property Administrator;
(t) Director of Health;
(u) Director of Housing;
(v) Commissioner of Police;
(w) Director-General of Trade and Industry;
(x) Chief Engineer/Railway Development 2-3, Railway Development Office, HyD; and
(y) Chief Town Planner/Urban Design & Landscape, Planning Department.

Public Consultation

13.3 If the proposed amendments are agreed by the Committee, the draft OZP (to be renumbered to S/FSS/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 NDC and respective Rural Committees will be further consulted on the amendments during the exhibition period of the amended OZP.

14. Decision Sought

Members are invited to:

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

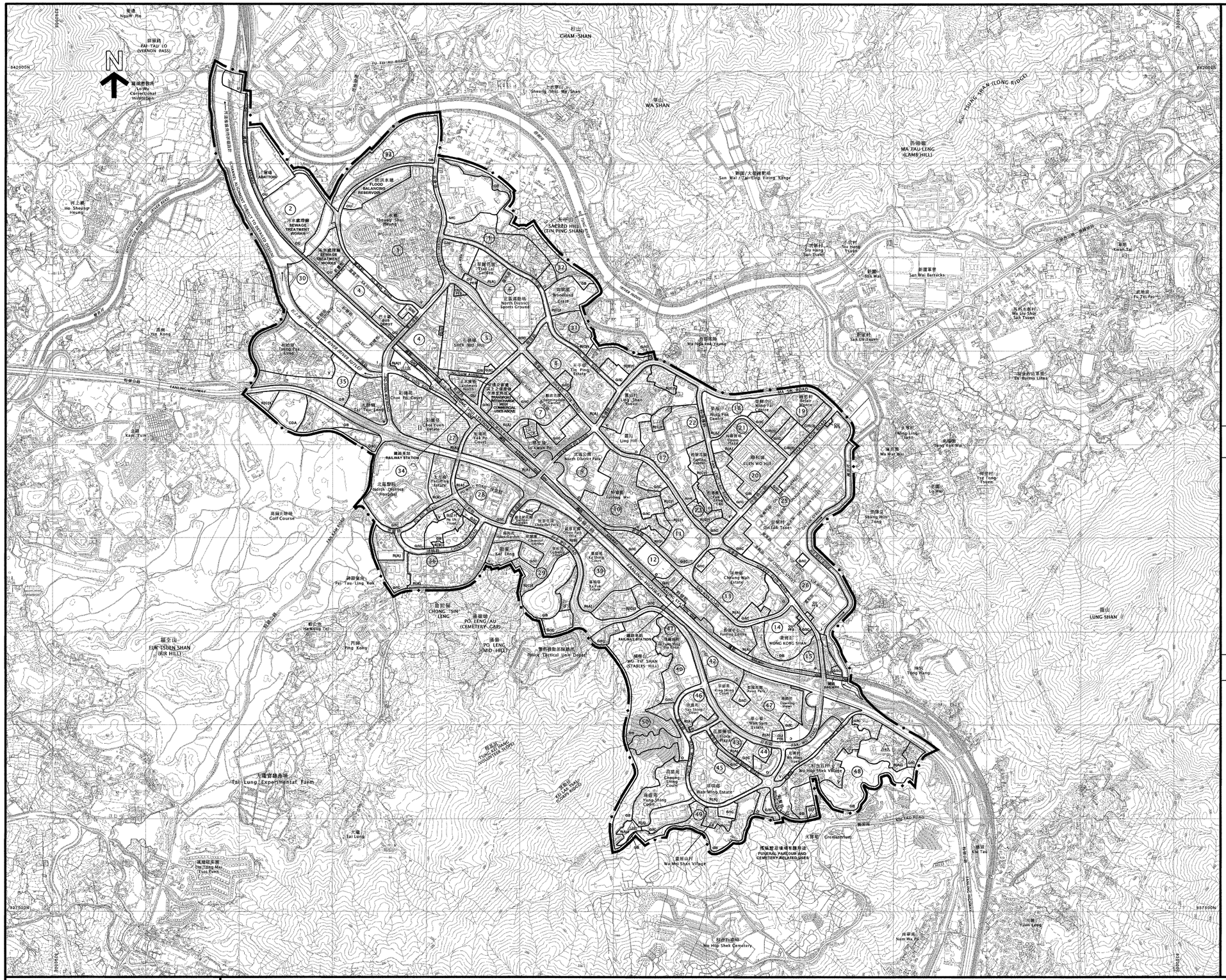
(b) adopt the revised ES at **Attachment IV** for the draft Fanling/Sheung Shui OZP No. S/FSS/23 as an expression of the planning intentions and objectives of the Board for various land use zonings of the OZP and the revised ES will be published together with the OZP.

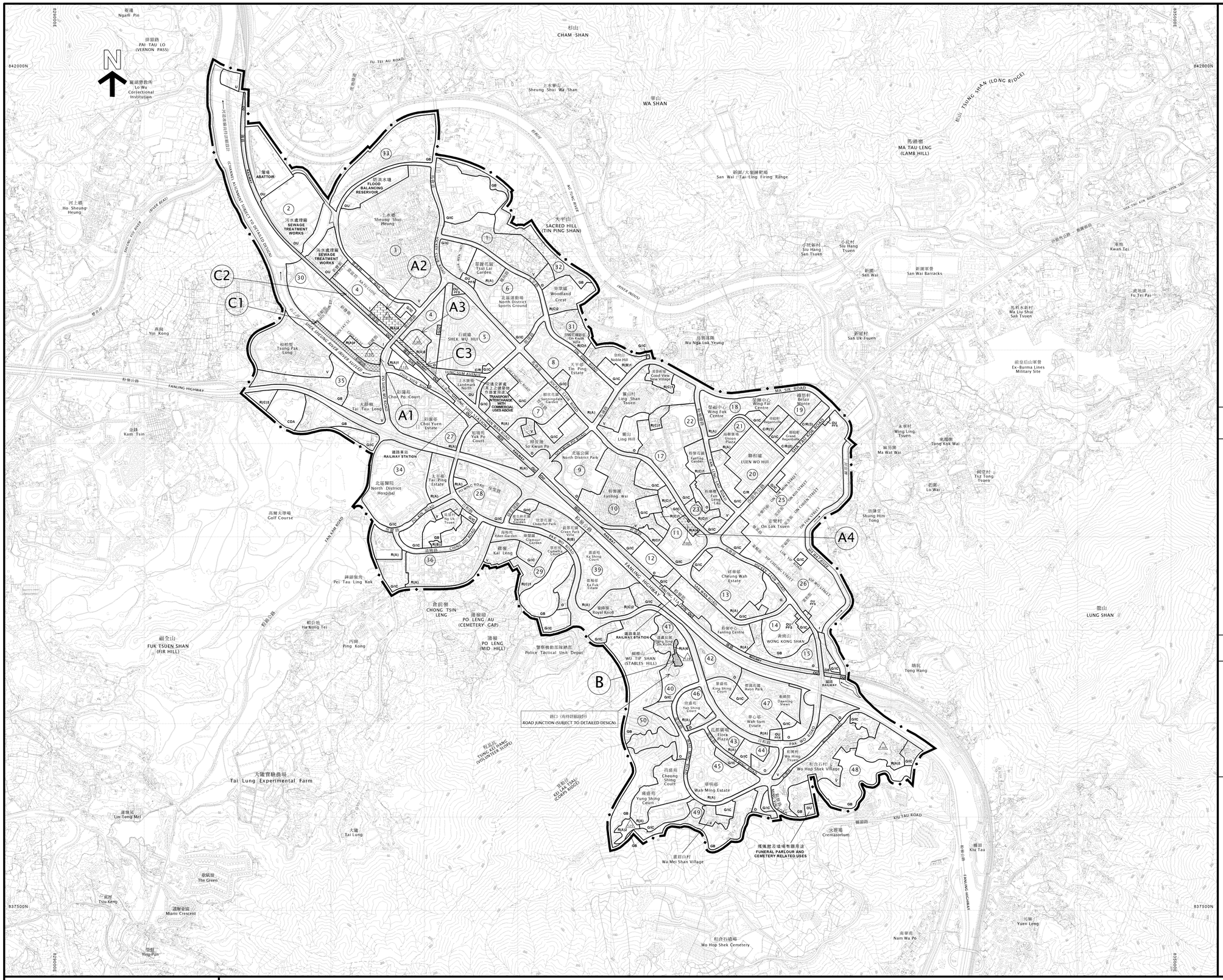
15. Attachments

Attachment I	Approved Fanling/Sheung Shui OZP No. S/FSS/22 (reduced to A3)
Attachment II	Draft Fanling/Sheung Shui OZP No. S/FSS/22A
Attachment III	Revised Notes of Draft Fanling/Sheung Shui OZP No. S/FSS/22A

Attachment IV	Revised Explanatory Statement of Fanling/Sheung Shui OZP No. S/FSS/22A
Attachment V	Technical Assessments Report for Proposed Public Housing Developments at Sheung Shui Area 30 Site, Sheung Shui Area 4 Site and Po Shek Wu Road North Site
Attachment VI	Technical Assessments Report for Proposed Subsidised Housing Development at Jockey Club Road Site
Attachment VII	Provision of Major Community Facilities and Open Space in Fanling and Sheung Shui District
Attachment VIII	Draft minute of the District Minor Works and Environmental Improvement Committee of the North District Council meeting on 21.1.2019
Plan 1a to 1b	Location Plan
Plan 2a to 2d	Site Plan
Plan 3a to 3c	Aerial Photo
Plan 4a to 4e	Site Photo
Plan 5a to 5i	Indicative Layout
Plan 6a to 6d	Photomontages
Plan 7a to 7l	Committed/Proposed Traffic Improvement Measures and Major Road Works

PLANNING DEPARTMENT
MARCH 2019


N
CHAM SHAN
WA SHAN
MA TAU LENG (LAMB HILL)
SACRED HILL (TIN PING SHAN)
FAN LING (SHEUNG SHUI) OUTLINE ZONING PLAN
SCALE 1:10 000
FANLING HIGHWAY
SHEUNG SHUI BYPASS
SHEK WU HUI
FANLING
SHEUNG SHUI
LUEN WO HUI
KWU TUNG
SHEUNG SHUI TOWN CENTRE
FANLING TOWN CENTRE
FANLING RAILWAY STATION
SHEUNG SHUI RAILWAY STATION
NORTH DISTRICT HOSPITAL
NORTH DISTRICT PARK
FANLING GOLF COURSE
SHEUNG SHUI SLAUGHTERHOUSE
SHEUNG SHUI WOODLAND CEMETERY
FUNERAL PARLOUR AND CEMETERY RELATED USES
CREMATORIUM
POLICE TACTICAL UNIT DEPOT
SEWAGE TREATMENT WORKS
FLOOD BALANCING RESERVOIR
ABATTOIR
TRANSPORT INTERCHANGE WITH COMMERCIAL DEVELOPMENT ABOVE
TAI LUNG EXPERIMENTAL FARM
WA HOP SHEK CEMETERY
WO HOP SHEK VILLAGE
SAN WAI BARRACKS
MA LIU SHUI SAI TSUEN
FU TEI PO
TSUNG PAK LONG
KWAN TEI
SHEUNG TSUEN
FAN KAM ROAD
LUNG SHAN
KAU TAU KWU
KIM TAU
NAM WA PO
HUEN HANG
TSUNG MEI TSAI TOWER
FIN TSUEN SHAN (FIR HILL)
PO LENG (MID HILL)
CHONG SIN LENG
PEI TAU LING KOK
NGAU PAI
FAI TAU LO (EVERION PASS)
LO WU CORRECTIONAL INSTITUTION
SHAN TSUEN
HO SHEUNG HEUNG
YUK KONG
PING KONG
HENG TAI
KAN TSUEN
KAU TSUEN
KWAN TEI SOUTH
KWAN TEI NORTH
SAN WAI / TAI LENG FIRING RANGE
SHAN TSUEN
SHEUNG TSUEN
TSUNG PAK LONG
TSUNG YUEN HA
TSUNG YUEN HA



圖例
NOTATION

ZONES 地帶

COMPREHENSIVE DEVELOPMENT AREA	CDA	綜合發展區
COMMERCIAL / RESIDENTIAL	C/R	商業 / 住宅
RESIDENTIAL (GROUP A)	R(A)	住宅（甲類）
RESIDENTIAL (GROUP B)	R(B)	住宅（乙類）
RESIDENTIAL (GROUP C)	R(C)	住宅（丙類）
VILLAGE TYPE DEVELOPMENT	V	鄉村式發展
INDUSTRIAL	I	工業
GOVERNMENT, INSTITUTION OR COMMUNITY	G/IC	政府、機構或社區
OPEN SPACE	O	休憩用地
OTHER SPECIFIED USES	OU	其他指定用途
UNDETERMINED	U	未決定用途
GREEN BELT	GB	綠化地帶

COMMUNICATIONS 交通

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
PLANNING AREA NUMBER	(1)	規劃區編號
MAXIMUM BUILDING HEIGHT (IN METRES ABOVE PRINCIPAL DATUM)	130	最高建築物高度（在主水平基準上若干米）
PETROL FILLING STATION	P F S	加油站

土地用途及面積一覽表
SCHEDULE OF USES AND AREAS

USES	大約面積及百分率 APPROXIMATE AREA & % 公頃 HECTARES	% 百分率	用途
COMPREHENSIVE DEVELOPMENT AREA	3.16	0.47	綜合發展區
COMMERCIAL / RESIDENTIAL	22.07	3.31	商業 / 住宅
RESIDENTIAL (GROUP A)	119.91	17.97	住宅（甲類）
RESIDENTIAL (GROUP B)	8.18	1.23	住宅（乙類）
RESIDENTIAL (GROUP C)	22.92	3.43	住宅（丙類）
VILLAGE TYPE DEVELOPMENT	83.30	12.48	鄉村式發展
INDUSTRIAL	47.84	7.17	工業
GOVERNMENT, INSTITUTION OR COMMUNITY	102.91	15.42	政府、機構或社區
OPEN SPACE	42.30	6.34	休憩用地
OTHER SPECIFIED USES	34.46	5.16	其他指定用途
UNDETERMINED	0.90	0.13	未決定用途
GREEN BELT	68.78	10.31	綠化地帶
RIVER CHANNEL	24.25	3.63	河道
MAJOR ROAD ETC.	86.27	12.95	主要道路等
TOTAL PLANNING SCHEME AREA	667.25	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/FSS/22 的修訂
AMENDMENTS TO APPROVED PLAN No. S/FSS/22

按照城市規劃條例第 5 條展示的修訂
AMENDMENTS EXHIBITED UNDER SECTION 5 OF THE TOWN PLANNING ORDINANCE

修訂項目 A 1 項 AMENDMENT ITEM A1		修訂項目 B 項 AMENDMENT ITEM B	
修訂項目 A 2 項 AMENDMENT ITEM A2		修訂項目 C 1 項 AMENDMENT ITEM C1	
修訂項目 A 3 項 AMENDMENT ITEM A3		修訂項目 C 2 項 AMENDMENT ITEM C2	
修訂項目 A 4 項 AMENDMENT ITEM A4		修訂項目 C 3 項 AMENDMENT ITEM C3	

（參看附表）
(SEE ATTACHED SCHEDULE)

按照城市規劃條例第 5 條展示的
核准圖編號 S/FSS/22 的修訂
AMENDMENTS TO APPROVED PLAN No. S/FSS/22 EXHIBITED UNDER SECTION 5 OF THE TOWN PLANNING ORDINANCE ON

SECRETARY
TOWN PLANNING BOARD
城市規劃委員會秘書

香港城市規劃委員會依據城市規劃條例擬備的粉嶺／上水分區計劃大綱圖
TOWN PLANNING ORDINANCE, HONG KONG TOWN PLANNING BOARD
FANLING / SHEUNG SHUI - OUTLINE ZONING PLAN

SCALE 1 : 10 000 比例尺

米 METRES 250 0 500 1 000 1 500 METRES 米

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/FSS/22A**

~~APPROVED~~ ***DRAFT*** FANLING/SHEUNG SHUI OUTLINE ZONING PLAN NO. S/FSS/22***A***

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

NOTES

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

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

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

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

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

(c) For the purposes of sub-paragraph (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, taxi rank, nullah, public utility pipeline, electricity mast, lamp pole, telephone booth, telecommunications radio base station, automatic teller machine and shrine;

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

(c) maintenance or repair of watercourse and grave.

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

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

(9) In the "Undetermined" zone, all uses or developments except those specified in paragraph (7) above require permission from the Town Planning Board.

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

(11) In these Notes,

"existing building" means a building, including a structure, which is physically existing and is in compliance with any relevant legislation and the conditions of the Government lease concerned.

"New Territories Exempted House" means a domestic building other than a guesthouse or a hotel; or a building primarily used for habitation, other than a guesthouse or a hotel, the ground floor of which may be used as 'Shop and Services' or 'Eating Place', the building works in respect of which are exempted by a certificate of exemption under Part III of the Buildings Ordinance (Application to the New Territories) Ordinance (Cap. 121).

~~APPROVED~~ ***DRAFT*** FANLING/SHEUNG SHUI OUTLINE ZONING PLAN NO. S/FSS/22***A***

Schedule of Uses

	Page
COMPREHENSIVE DEVELOPMENT AREA	1
COMMERCIAL/RESIDENTIAL	4
RESIDENTIAL (GROUP A)	6
RESIDENTIAL (GROUP B)	~~8~~***9***
RESIDENTIAL (GROUP C)	~~10~~***11***
VILLAGE TYPE DEVELOPMENT	~~12~~***13***
INDUSTRIAL	~~14~~***15***
GOVERNMENT, INSTITUTION OR COMMUNITY	~~17~~***18***
OPEN SPACE	~~18~~***19***
OTHER SPECIFIED USES	~~19~~***20***
GREEN BELT	~~21~~***22***

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 Eating Place Educational Institution Flat Government Refuse Collection Point Government Use (not elsewhere specified) Hospital Hotel House Institutional Use (not elsewhere specified) Library Petrol Filling Station 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 School Shop and Services Social Welfare Facility Training Centre Utility Installation for Private Project

Planning Intention

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

(Please see next page)

COMPREHENSIVE DEVELOPMENT AREA (Cont'd)

Remarks

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

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

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

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

(Please see next page)

COMPREHENSIVE DEVELOPMENT AREA (Cont'd)

(b) 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.

(c) 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 0.8, a maximum site coverage of 27% and a maximum building height of 3 storeys over one-storey carport.

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

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

COMMERCIAL/RESIDENTIAL

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 Eating Place Educational Institution (in a commercial building or in the purpose-designed non-residential portion[@] of an existing building only) Exhibition or Convention Hall Flat Government Use (not elsewhere specified) Hotel House Library ~~Market~~ Off-course Betting Centre Office Place of Entertainment Place of Recreation, Sports or Culture Private Club Public Clinic Public Transport Terminus or Station Public Utility Installation Public Vehicle Park (excluding container vehicle) Residential Institution School (in free-standing purpose-designed school building, in a commercial building or in the purpose-designed non-residential portion[@] of an existing building only) Shop and Services (not elsewhere specified) Social Welfare Facility Training Centre Utility Installation for Private Project Wholesale Trade	Broadcasting, Television and/or Film Studio Commercial Bathhouse/Massage Establishment Educational Institution (not elsewhere specified) Government Refuse Collection Point Hospital Institutional Use (not elsewhere specified) Petrol Filling Station Public Convenience Recyclable Collection Centre Religious Institution School (not elsewhere specified) Shop and Services (Motor-vehicle Showroom only)

[@]Excluding floors containing wholly or mainly car parking, loading/unloading bay and/or plant room

Planning Intention

This zone is intended primarily for commercial and/or residential development. Commercial, residential and mixed commercial/residential uses are always permitted.

(Please see next page)

COMMERCIAL/RESIDENTIAL (Cont'd)

Remarks

(a) No new development shall exceed the maximum plot ratio/gross floor area and building height specified below:

Sub-area	Maximum Plot Ratio/ Gross Floor Area	Maximum Building Height
C/R (with site area less than 340m²)	domestic plot ratio of 3.9 or non-domestic plot ratio of 6.7	20 metres
C/R (with site area 340m² and greater)	domestic plot ratio of 5.0 or non-domestic plot ratio of 9.5	81 metres
C/R(1)	domestic plot ratio of 5.0 or non-domestic plot ratio of 9.5	135mPD
C/R(2)	domestic gross floor area (GFA) of 35,292m² and non-domestic GFA of 48,848m² (of which not less than 27,277m² of the non-domestic GFA should be for Government uses)	135mPD
C/R(3)	domestic plot ratio of 5.0 or non-domestic plot ratio of 9.5	123mPD

For new development of a building that is partly domestic and partly non-domestic, the plot ratio for the domestic part of the building shall not exceed the product of the difference between the maximum permitted non-domestic plot ratio for the building and the actual non-domestic plot ratio proposed for the building and the maximum permitted domestic plot ratio for the building divided by the maximum permitted non-domestic plot ratio for the building. The maximum permitted domestic and non-domestic plot ratios are as stipulated above.

(b) 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) stated in paragraph (a) above, 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 (a) 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.

(c) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the plot ratio/gross floor area/building height restrictions stated in paragraph (a) 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)1"***, "R(A)4" and "R(A)5"*** 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) 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 ***(not elsewhere specified)*** Training Centre

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

(Please see next page)

RESIDENTIAL (GROUP A) (Cont'd)

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

(a) On land designated "Residential (Group A)1" ("R(A)1"), no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum gross floor area (GFA) of 69,500m^2 and a maximum building height in terms of metres above Principal Datum as stipulated on the Plan or the GFA and height of the existing building, whichever is the greater.

(b) On land designated "Residential (Group A)2" ("R(A)2"), no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum GFA of 38,500m^2 and a maximum building height in terms of metres above Principal Datum as stipulated on the Plan or the GFA and height of the existing building, whichever is the greater.

(c) On land designated "Residential (Group A)3" ("R(A)3"), no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum GFA of 178,100m^2 and a maximum building height in terms of metres above Principal Datum as stipulated on the Plan or the GFA and height of the existing building, whichever is the greater.

(d) On land designated "Residential (Group A)4" ("R(A)4")), 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 6.6 and a maximum building height in terms of metres above Principal Datum as stipulated on the Plan or the plot ratio and height of the existing building, whichever is the greater.

(e) On land designated "Residential (Group A)5" ("R(A)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 a maximum plot ratio of 7.0 and a maximum building height in terms of metres above Principal Datum as stipulated on the Plan or the plot ratio and height of the existing building, whichever is the greater.

(f) On land designated "Residential (Group A)6" ("R(A)6"), 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 GFA of 19,750m^2, a maximum non-domestic GFA of 3,092m^2 and a maximum building height in terms of metres above Principal Datum as stipulated on the Plan or the GFAs and height of the existing building, whichever is the greater.

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

RESIDENTIAL (GROUP A) *(Cont'd)*

(h) ***In determining the maximum plot ratio for the purpose of paragraphs (d) and (e) above, any floor space that is constructed or intended for use solely as public vehicle parks, public transport facilities and Government, institution or community facilities, as required by the Government, may be disregarded.***

~~(e)~~***(i)*** Based on the individual merits of a development or redevelopment proposal, minor relaxation of the GFA/***plot ratio/***building height restrictions stated in paragraphs (a)~~, (b) and (c)~~ ***to (f)*** above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

RESIDENTIAL (GROUP B)

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

Planning Intention

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

(Please see next page)

RESIDENTIAL (GROUP B) (Cont'd)

Remarks

(a) 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 plot ratio of 3.0 and a maximum building height of 20 storeys.

(b) On land designated "Residential (Group B)2", no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum plot ratio of 5.0 and a maximum building height of 39 storeys above two-storey car-parking podium.

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

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

RESIDENTIAL (GROUP C)

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 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) Library Petrol Filling Station 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 School Shop and Services Social Welfare Facility Training Centre

Planning Intention

This zone is intended primarily for low-rise, low-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 C) (Cont'd)

Remarks

(a) On land designated "Residential (Group C)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 0.8, a maximum site coverage of 50%, and a maximum building height of 3 storeys over one-storey carpark or the height of the existing building, whichever is the greater.

(b) On land designated "Residential (Group C)2", no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum plot ratio of 1.5 and a maximum building height of 12 storeys including carpark.

(c) On land designated "Residential (Group C)3", no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum gross floor area of 5,504m^2, a maximum site coverage of 24% and a maximum building height of 4 storeys over one-storey carpark.

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

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

VILLAGE TYPE DEVELOPMENT

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Agricultural Use Government Use (Police Reporting Centre, Post Office only) House (New Territories Exempted House only) On-Farm Domestic Structure Religious Institution (Ancestral Hall only) Rural Committee/Village Office	Burial Ground Eating Place Flat Government Refuse Collection Point Government Use (not elsewhere specified)# House (not elsewhere specified) Institutional Use (not elsewhere specified)# ~~Market~~ Petrol Filling Station 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) Religious Institution (not elsewhere specified)# Residential Institution# School# Shop and Services Social Welfare Facility# Utility Installation for Private Project
In addition, the following uses are always permitted on the ground floor of a New Territories Exempted House:	
Eating Place Library School Shop and Services	

(Please see next page)

VILLAGE TYPE DEVELOPMENT (Cont'd)

Planning Intention

The planning intention of this zone is to designate both existing recognized villages and areas of land considered suitable for village expansion. Land within this zone is primarily intended for development of Small Houses by indigenous villagers. It is also intended to concentrate village type development within this zone for a more orderly development pattern, efficient use of land and provision of infrastructures and services. Selected commercial and community uses serving the needs of the villagers and in support of the village development are always permitted on the ground floor of a New Territories Exempted House. Other commercial, community and recreational uses may be permitted on application to the Town Planning Board.

Remarks

(a) No new development, or addition, alteration and/or modification to or redevelopment of an existing building (except development or redevelopment to those annotated with #) shall result in a total development and/or redevelopment in excess of a maximum building height of 3 storeys (8.23m) or the height of the existing building, whichever is the greater.

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

INDUSTRIAL

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Ambulance Depot Art Studio (excluding those involving direct provision of services or goods) Bus Depot Cargo Handling and Forwarding Facility (not elsewhere specified) Eating Place (Canteen, Cooked Food Centre only) Government Refuse Collection Point Government Use (not elsewhere specified) Industrial Use (not elsewhere specified) Information Technology and Telecommunications Industries Office (Audio-visual Recording Studio, Design and Media Production, Office Related to Industrial Use only) Public Convenience Public Transport Terminus or Station Public Utility Installation Public Vehicle Park (excluding container vehicle) Radar, Telecommunications Electronic Microwave Repeater, Television and/or Radio Transmitter Installation Recyclable Collection Centre Research, Design and Development Centre Shop and Services (Motor-vehicle Showroom on ground floor, Service Trades only) Utility Installation for Private Project Vehicle Repair Workshop Warehouse (excluding Dangerous Goods Godown)	Broadcasting, Television and/or Film Studio Cargo Handling and Forwarding Facility (Container Freight Station, free-standing purpose-designed Logistics Centre only) Concrete Batching Plant Container Vehicle Park/Container Vehicle Repair Yard Dangerous Goods Godown Eating Place (not elsewhere specified) (in wholesale conversion of an existing building only) Educational Institution (in wholesale conversion of an existing building only) Exhibition or Convention Hall Industrial Use (Bleaching and Dyeing Factory, Electroplating/Printed Circuit Board Manufacture Factory, Metal Casting and Treatment Factory/Workshop only) Institutional Use (not elsewhere specified) (in wholesale conversion of an existing building only) Off-course Betting Centre Offensive Trades Office (not elsewhere specified) Open Storage Petrol Filling Station Place of Entertainment (in wholesale conversion of an existing building only) Place of Recreation, Sports or Culture (not elsewhere specified) Private Club Public Clinic (in wholesale conversion of an existing building only) Religious Institution (in wholesale conversion of an existing building only) Shop and Services (not elsewhere specified) (ground floor only, except in wholesale conversion of an existing building and Ancillary Showroom[#] which may be permitted on any floor) Training Centre (in wholesale conversion of an existing building only) Vehicle Stripping/Breaking Yard Wholesale Trade

(Please see next page)

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

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

Planning Intention

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

Remarks

(a) On land designated "Industrial" at Planning Areas 4 and 30, 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, and a maximum building height of 25 metres or the plot ratio and the height of the existing building, whichever is the greater.

(b) On land designated "Industrial" at Planning Areas 25 and 26, 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, and a maximum building height of 65 metres (excluding basements) or the plot ratio and the height of the existing building, whichever is the greater.

INDUSTRIAL (Cont'd)

(c) In determining the maximum plot ratio for the purposes of paragraph (b) above, any floor space that is constructed or intended for use solely as public vehicle park, as required by the Government, may be disregarded.

(d) In determining the maximum plot ratio for the purposes of paragraphs (a) and (b) 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.

(e) 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 of the building on land to which paragraph (a) or (b) 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 (a) and (b) above may thereby be exceeded.

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

GOVERNMENT, INSTITUTION OR COMMUNITY

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

Planning Intention

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

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	Cable Car Route and Terminal Building
Barbecue Spot	Eating Place
Field Study/Education/Visitor Centre	Government Refuse Collection Point
Park and Garden	Government Use (not elsewhere specified)
Pavilion	Holiday Camp
Pedestrian Area	Place of Entertainment
Picnic Area	Place of Recreation, Sports or Culture
Playground/Playing Field	Private Club
Public Convenience	Public Transport Terminus or Station
Sitting Out Area	Public Utility Installation
Zoo	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 "Transport Interchange with Commercial Uses Above" only

Eating Place
Educational Institution
Exhibition or Convention Hall
Government Use (not elsewhere specified)
Hotel
Library
Off-course Betting Centre
Office
Place of Entertainment
Private Club
Public Clinic
Public Convenience
Public Transport Terminus or Station
Public Utility Installation
Public Vehicle Park (excluding container vehicle)
Recyclable Collection Centre
School
Shop and Services
Utility Installation for Private Project

Ambulance Depot
Broadcasting, Television and/or Film Studio
Commercial Bathhouse/Massage Establishment
Flat
Government Refuse Collection Point
Petrol Filling Station
Place of Recreation, Sports or Culture
Religious Institution
Residential Institution

Planning Intention

This zone is primarily to provide land for a public transport interchange with commercial uses above.

(Please see next page)

OTHER SPECIFIED USES (Cont'd)

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
For "Railway Station" only	
Railway Station	Government Use (not elsewhere specified) Public Utility Installation Utility Installation for Private Project

Planning Intention

This zone is primarily to provide land for railway station.

For All Other Sites (Not Listed Above)	
As Specified on the Plan	Government Use (not elsewhere specified) Public Utility Installation Utility Installation for Private Project

Planning Intention

This zone is primarily to provide/reserve land for specific purposes and uses.

GREEN BELT

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

Planning Intention

The planning intention of this zone is primarily for defining the limits of urban and sub-urban development areas by natural features and to contain urban sprawl as well as to provide passive recreational outlets. There is a general presumption against development within this zone.

~~APPROVED~~*DRAFT* FANLING/SHEUNG SHUI OUTLINE ZONING PLAN NO. S/FSS/22*A*

EXPLANATORY STATEMENT

~~Approved~~*Draft* Fanling/Sheung Shui Outline Zoning Plan No. S/FSS/22*A*

Explanatory Statement

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~~APPROVED~~*DRAFT* FANLING/SHEUNG SHUI OUTLINE ZONING PLAN NO. S/FSS/22*A*

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

EXPLANATORY STATEMENT

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

1. INTRODUCTION

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

2. AUTHORITY FOR THE PLAN AND PROCEDURE

2.1 On 8 July 1986, the then Secretary for Lands and Works, under the power delegated by the then Governor, directed the Board under section 3 of the Town Planning Ordinance (the Ordinance) to prepare an OZP for Fanling/Sheung Shui area.

2.2 On 23 October 1987, the draft Fanling/Sheung Shui OZP No. S/FSS/1 was exhibited for public inspection under section 5 of the Ordinance. The OZP was subsequently amended several times and exhibited for public inspection under section 7 of the Ordinance.

2.3 On 22 June 1999, the Chief Executive in Council (CE in C), under section 9(1)(a) of the Ordinance, approved the draft Fanling/Sheung Shui OZP, which was subsequently renumbered as S/FSS/8. On 10 April 2001, the CE in C referred the approved OZP to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. The OZP was subsequently amended and exhibited for public inspection under section 5 of the Ordinance.

2.4 On 22 October 2002, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft Fanling/Sheung Shui OZP, which was subsequently renumbered as S/FSS/10. On 8 July 2003, the CE in C referred the approved OZP to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. ***The OZP was subsequently amended and exhibited for public inspection under section 5 of the Ordinance.***

~~2.5 On 31 October 2003, the draft Fanling/Sheung Shui OZP No. S/FSS/11 was exhibited for public inspection under section 5 of the Ordinance. During the exhibition period, no objection was received.~~

~~2.6~~***2.5*** On 5 October 2004, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft Fanling/Sheung Shui OZP, which was subsequently renumbered as S/FSS/12. ~~On 15 October 2004, the approved Fanling/Sheung Shui OZP No. S/FSS/12 was exhibited for public inspection under section 9(5) of the Ordinance.~~ ***On 3 January 2006, the CE in C referred the approved OZP to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. The OZP was subsequently amended and exhibited for public inspection under section 5 of the Ordinance.***

~~2.7 On 3 January 2006, the CE in C referred the approved Fanling/Sheung Shui~~

~~OZP No. S/FSS/12 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance.~~

~~2.8 On 31 March 2006, the draft Fanling/Sheung Shui OZP No. S/FSS/13 was exhibited for public inspection under section 5 of the Ordinance. During the two-month exhibition period, no representation was received.~~

~~2.9~~***2.6*** On 27 March 2007, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft Fanling/Sheung Shui OZP, which was subsequently renumbered as S/FSS/14. On 2 November 2010, the CE in C referred the approved ~~Fanling/Sheung Shui~~ OZP ~~No. S/FSS/14~~ to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. ***The OZP was subsequently amended and exhibited for public inspection under section 5 of the Ordinance.***

~~2.10 On 30 June 2011, the draft Fanling/Sheung Shui OZP No. S/FSS/15, was exhibited for public inspection under section 5 of the Ordinance. One valid representation was received during the two-month exhibition period. The representation was noted by the Board on 3 February 2012.~~

~~2.11~~***2.7*** On 5 June 2012, the CE in C under section 9(1)(a) of the Ordinance, approved the draft Fanling/Sheung Shui OZP, which was subsequently re-numbered as S/FSS/16. On 8 January 2013, the CE in C referred the approved ~~Fanling/Sheung Shui~~ OZP ~~No. S/FSS/16~~ to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. The OZP was subsequently amended ~~once~~ and exhibited ***for public inspection*** under section 5 of the Ordinance.

~~2.12~~***2.8*** On 10 September 2013, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft Fanling/Sheung Shui OZP, which was subsequently renumbered as S/FSS/18. On 5 November 2013, the CE in C~~, under section 12(1)(b)(ii) of the Ordinance,~~ referred the approved OZP to the Board for amendment ***under section 12(1)(b)(ii) of the Ordinance***. The OZP was subsequently amended ~~once~~ and exhibited ***for public inspection*** under section 5 of the Ordinance.

~~2.13~~***2.9*** On 16 June 2015, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft Fanling/Sheung Shui OZP, which was subsequently renumbered as S/FSS/20. ~~On 19 June 2015, the approved Fanling/Sheung Shui OZP No. S/FSS/20 was exhibited for public inspection under section 9(5) of the Ordinance.~~ ***On 8 September 2015, the CE in C referred the approved OZP to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. The OZP was subsequently amended and exhibited for public inspection under section 5 of the Ordinance.***

~~2.14 On 8 September 2015, the CE in C, under section 12(1)(b)(ii) of the Ordinance, referred the approved Fanling/Sheung Shui OZP to the Board for amendment. The reference back of the OZP was notified in the Gazette on 25 September 2015 under section 12(2) of the Ordinance.~~

~~2.15 On 29 January 2016, the draft Fanling/Sheung Shui OZP No. S/FSS/21 was exhibited for public inspection under section 5 of the Ordinance. The main amendments on the Plan included (i) the rezoning of a site at Fanling/Sheung Shui Planning Area 48 mainly zoned "Industrial" ("I") with a minor portion falling within "Green Belt" ("GB") zone to "Residential (Group A)3" ("R(A)3") zone to facilitate a public housing development, and "Government, Institution or Community" ("G/IC") zones for schools and other Government uses; and (ii) revision to building height restriction from 25m to 65m (excluding basements) in On Lok Tsuen (Planning Areas 25 and 26) under the "I" zone. During the exhibition period, a total of nine representations were received. On 15 April 2016, the Board published the representations for three weeks for public comments and 226 comments were received. After~~

~~giving consideration to the representations and comments on 23 September 2016, the Board decided not to propose any amendment to the draft OZP to meet the representations~~.

~~2.16~~***2.10*** On 3 January 2017, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft Fanling/Sheung Shui OZP, which was subsequently renumbered as S/FSS/22. On 13.1.2017, the approved Fanling/Sheung Shui OZP No. S/FSS/22 ~~(the Plan)~~ was exhibited for public inspection under section 9(5) of the Ordinance.

2.11 On 30 January 2018, the CE in C, under section 12(1)(b)(ii) of the Ordinance, referred the approved Fanling/Sheung Shui OZP to the Board for amendment. The reference back of the OZP was notified in the Gazette on 9 February 2018 under section 12(2) of the Ordinance.

2.12 On xx 2019, the draft Fanling/Sheung Shui OZP No. S/FSS/23 (the Plan) was exhibited for public inspection under section 5 of the Ordinance. The main amendments on the Plan included (i) the rezoning of a housing site at Fanling/Sheung Shui Planning Area 30 from "Industrial" ("I") to "Residential (Group A)4" ("R(A)4"); (ii) the rezoning of a housing site at Fanling/Sheung Shui Planning Area 4 from "I" and "Other Specified Uses" annotated "Bus Depot" ("OU(Bus Depot") to "R(A)4"; (iii) the rezoning of a housing site at Po Shek Wu Road from "Open Space" ("O") to "R(A)5"; (iv) the rezoning of a housing site at Jockey Club Road from "Government, Institution or Community" ("G/IC") to "R(A)4"; and (v) the rezoning of a site at Wu Tip Shan from "G/IC" to "R(A)6".

3. OBJECT OF THE PLAN

3.1 The object of the Plan is to indicate the broad land use zones and major road network for the Fanling/Sheung Shui New Town so that development and redevelopment of land within the New Town can be put under statutory planning control. It also provides the planning framework for preparing more detailed non-statutory plans which form the basis for public works planning and site reservation for various uses.

3.2 The Plan is to illustrate the broad principles of development and planning control only. It is a small-scale plan and the road 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 zonings, there would be situations in which small strips of land not intended for building development purposes and carry no development right under the lease, such as the areas restricted for garden, slope maintenance and access road purposes, are included in the residential zones. The general principle is that such areas should not be taken into account in plot ratio and site coverage calculation. Development within residential zones should be restricted to building lots carrying development right in order to maintain the character and amenity of the Fanling/Sheung Shui area and not to overload the road network in this area.

4. NOTES OF THE PLAN

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

needs.

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

5. THE PLANNING SCHEME AREA

5.1 The Planning Scheme Area (the Area) covered by the Plan is approximately 667 hectares. It generally coincides with the existing area for the Fanling/Sheung Shui New Town. The boundary of the Area is shown by a heavy broken line on the Plan.

5.2 The New Town is located in the river plains associated with Rivers Ng Tung (Indus), Shek Sheung (Sutlej), Sheung Yue (Beas) and Ma Wat. The main features delineating the New Town boundary are Tin Ping Shan and Ma Sik Road to the north, Ma Wat River to the east and the foothills of Wo Hop Shek Cemetery and golf course to the south and west.

5.3 The Area includes several large traditional villages, notably Sheung Shui Heung and Fanling Wai, and the two existing market towns of Shek Wu Hui and Luen Wo Hui. Some public housing estates and private residential developments have been developed around these market towns.

6. POPULATION

~~According to the 2011 Census~~***Based on 2016 Population By-census***, the ~~total~~ population of the Area was ***estimated by the Planning Department as*** about ~~254,300~~ ***259,450*** persons. It is ~~expected~~ ***estimated*** that the ~~total~~ planned population of the Area would be about ~~290,300~~ ***288,600*** persons.

7. LAND USE ZONINGS

7.1 "Comprehensive Development Area" ("CDA") : Total Area 3.16 ha

7.1.1 The planning intention of this zone is for comprehensive development/redevelopment of the area for residential use 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.

7.1.2 A site located in the western periphery of Fanling/Sheung Shui New Town in Planning Area 35 is designated as "CDA", within which any development or redevelopment proposals will be subject to a maximum plot ratio of 0.8, a maximum site coverage of 27% and a maximum building height of 3 storeys over one-storey carport.

7.1.3 To provide flexibility for innovative design adapted to the characteristics of the site, minor relaxation of the plot ratio, site coverage and building height restrictions stated above may be considered by the Board through the planning permission system. Each proposal will be considered on the individual planning merits.

7.1.4 Any development proposal in the zone requires the 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 of the Plan for the approval of the Board under section 4A(2) of the Ordinance. A copy of the approved MLP will be made available in the Land Registry for public inspection pursuant to section 4A(3) of the Ordinance.

7.1.5 By requiring submission of MLP for approval of the Board, it allows the Board to exercise appropriate planning control on the design, layout and provision of facilities of the future development within this zone.

7.1.6 The "CDA" site will share a common ingress/egress point with the adjoining low-rise, low-density residential development.

7.2 "Commercial/Residential" ("C/R") : Total Area 22.07 ha

7.2.1 The planning intention of this zone is intended primarily for commercial and/or residential development. Commercial, residential and mixed commercial/residential uses are always permitted.

7.2.2 The existing market towns of Shek Wu Hui and Luen Wo Hui are zoned "C/R". This implies that sites may be developed for either residential or commercial uses, or with purpose-designed buildings containing both commercial and residential accommodation.

7.2.3 Except for the sub-areas of this zone, i.e. "C/R(1)", "C/R(2)" and "C/R(3)", for sites with an area of less than 340m^2, only buildings of up to 20m in height with a maximum domestic plot ratio of 3.9 or a maximum non-domestic plot ratio of 6.7 will be permitted. In order to encourage the amalgamation of sites for more comprehensive development, the height limit has been relaxed to 81m with a maximum domestic plot ratio of 5.0 or a maximum non-domestic plot ratio of 9.5 for sites of 340m^2 or greater.

7.2.4 Three sub-areas to the north-east of Luen Wo Hui in Planning Area 19 are under this zone, namely "C/R(1)", "C/R(2)" and "C/R(3)". For "C/R(1)", development is subject to a maximum building height of 135 mPD and a maximum domestic plot ratio of 5.0 or a maximum non-domestic plot ratio of 9.5. For "C/R(2)", development is subject to a maximum building height of 135 mPD, a maximum domestic gross floor area (GFA) of 35,292m^2 and a maximum non-domestic GFA of 48,848m^2, of the latter, not less than 27,277m^2 for Government uses. For "C/R(3)", development is subject to a maximum building height of 123 mPD and a maximum domestic plot ratio of 5.0 or a maximum non-domestic plot ratio of 9.5.

7.2.5 To provide flexibility for innovative design adapted to the characteristics of particular sites, minor relaxation of the plot ratio, GFA and building height restrictions stated above may be considered by the Board through the planning permission system. Each proposal will be considered on the individual planning merits.

7.3 "Residential (Group A)" ("R(A)") : Total Area ~~114.70~~ ***119.91*** ha

7.3.1 The planning intention of this zone is 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.

7.3.2 The "R(A)" zone includes sites for private residential developments in proximity to the two existing market towns, East Rail Sheung Shui and Fanling Stations as well as existing and proposed public housing estates, home ownership schemes and high-density private housing schemes. A range of compatible non-residential uses including a number of commercial uses on the lowest three floors of the buildings are always permitted within this zone.

7.3.3 This zoning includes ~~three~~ ***six*** sub-areas which are subject to the following development restrictions:

"Residential (Group A)1" ("R(A)1") : Total Area 1.24 ha

(a) The planned public housing development at Choi Yuen Road in Planning Area 27 is under this zoning. Development/redevelopment within this zoning is subject to a maximum total GFA of 69,500m^2 and a building height restriction as shown on the Plan, or the GFA and height of the existing building, whichever is the greater. The building height restriction stipulated on the Plan is the maximum permitted height. Staggered building heights ranging from 24 to 32 storeys (including podium levels) should be adopted to create a stepped height profile.

(b) Suitable provision has been incorporated in the Notes for the reprovisioning of an existing public car park on site as part of the proposed development as required by the Transport Department.

"Residential (Group A)2" ("R(A)2") : Total Area 0.82 ha

(c) The planned public housing development to the south of Yung Shing Court in Planning Area 49 is under this zoning. Development/redevelopment within this zoning is subject to a maximum total GFA of 38,500m^2 and a building height restriction as shown on the Plan, or the GFA and height of the existing building, whichever is the greater. A landscape area as a non-building transition zone would be provided at the southwestern portion as specified in the development concept plan in the Planning Brief for the proposed development.

"Residential (Group A)3" ("R(A)3"): Total Area 4.00 ha

(d) The planned public housing development in Planning Area 48 is under this zoning. Development/redevelopment within this zoning is subject to a maximum total GFA of 178,100m^2 and a building height restriction as shown on the Plan, or the GFA and height of existing building, whichever is the greater. While the building height restriction stipulated on the Plan is the maximum permitted height, a discernible stepped height profile should be adopted to enhance the visual compatibility of the development with the surroundings.

"Residential (Group A)4" ("R(A)4"): Total Area 3.47 ha

(e) The planned public housing developments in Planning Areas 4 and 30, and planned subsidized housing development in Planning Area 11 are under this zoning. Development/redevelopment within this zoning is subject to a maximum plot ratio of 6.6 and the building height restrictions

as shown on the Plan, or the plot ratio and height of existing building, whichever is the greater. The building height restrictions stipulated on the Plan are the maximum permitted height. Staggered building heights as appropriate should be adopted to create a stepped height profile.

(f) In order to facilitate provision of public vehicle parks, public transport facilities and Government, institution or community (GIC) facilities, in determining the maximum plot ratio of the development and/or redevelopments, any floor space that is constructed or intended for use solely as public vehicle parks, public transport facilities and GIC facilities, as required by the Government, may be disregarded.

(g) To facilitate the provision of public vehicle parking spaces to meet the local demand, 'public vehicle parking (excluding container vehicle)' use is always permitted within the sub-area.

(h) As recommended in the Air Ventilation Assessment (Expert Evaluation) (AVA(EE)) conducted for the two planned public housing developments in Planning Areas 4 and 30, further quantitative AVA(s) would be conducted for optimizing the scheme and assessing the effectiveness of the mitigation measures recommended in the AVA(EE) at detailed design stage. The requirement for further quantitative AVA studies and design measures for individual public housing site will be incorporated in the respective planning brief for implementation as appropriate.

(i) As recommended in the AVA(EE) conducted for the planned subsidized housing development in Planning Area 11, various mitigation measures should be incorporated for better penetration of the prevailing winds. A quantitative AVA should be undertaken at detailed design stage to optimize scheme design and/or to prove that the future scheme would perform no worse than the current scheme in ventilation performance.

"Residential (Group A)5" ("R(A)5"): Total Area 1.38 ha

(j) The planned public housing development at the east of Po Shek Wu Road in Planning Area 4 is under this zoning. Development/redevelopment within this zoning is subject to a maximum plot ratio of 7.0 and the building height restriction as shown on the Plan, or the plot ratio and height of existing building, whichever is the greater. The building height restriction stipulated on the Plan is the maximum permitted height. Staggered building heights as appropriate should be adopted to create a stepped height profile.

(k) In order to facilitate provision of public vehicle parks, public transport facilities and GIC facilities, in determining the maximum plot ratio of the development and/or redevelopments, any floor space that is constructed or intended for use solely as public vehicle parks, public transport facilities and GIC facilities, as required by the Government, may be disregarded.

(l) To facilitate the provision of public vehicle parking spaces to

meet the local demand, 'public vehicle parking (excluding container vehicle)' use is always permitted within the sub-area.

(m) As recommended in the AVA(EE) conducted for the planned public housing developments in Planning Area 4, further quantitative AVA(s) would be conducted for optimizing the scheme and assessing the effectiveness of the mitigation measures recommended in the AVA(EE) at detailed design stage. The requirement for further quantitative AVA studies and design measures for individual public housing site will be incorporated in the respective planning brief for implementation as appropriate.

"Residential (Group A)6" ("R(A)6"): Total Area 0.36 ha

(n) The planned private housing development with supporting retail use at Wu Tip Shan in Planning Area 40 is under this zoning. Development/redevelopment within this zoning is subject to a maximum domestic GFA of 19,750m^2, a maximum non-domestic GFA of 3,092m^2 and a building height restriction as shown on the Plan, or the GFA and height of existing building, whichever is the greater.

7.3.4 Minor relaxation of the GFA***/plot ratio*** and building height restrictions for the "R(A)1", ~~"R(A)2" and "R(A)3"~~ ***to "R(A)6"*** zones may be considered by the Board on application under section 16 of the Town Planning Ordinance. Each application for minor relaxation of GFA***/plot ratio/***building height restrictions will be considered on its own merits.

7.4 "Residential (Group B)" ("R(B)") : Total Area 8.18 ha

7.4.1 The planning intention of this zone is primarily for medium-density residential developments where commercial uses serving the residential neighbourhood may be permitted on application to the Board.

7.4.2 Developments within the "R(B)" zone will be basically for residential use, although there is provision in the Notes for planning application to be made to the Board for a limited range of commercial or community type uses.

7.4.3 A site in Planning Area 31 is zoned "R(B)1" which is subject to a maximum plot ratio of 3.0 and a maximum building height of 20 storeys. Another site in Planning Area 36 is zoned "R(B)2". This site is subject to a maximum plot ratio of 5.0 and a maximum building height of 39 storeys above two-storey car-parking podium.

7.4.4 To provide flexibility for innovative design adapted to the characteristics of particular sites, minor relaxation of the plot ratio and building height restrictions stated above may be considered by the Board through the planning permission system. Each proposal will be considered on its individual planning merits.

7.5 "Residential (Group C)" ("R(C)") : Total Area 22.92 ha

7.5.1 The planning intention of this zone is primarily for low-rise, low-density residential developments where commercial uses serving the residential neighbourhood may be permitted on application to the

Board.

7.5.2 In terms of use, the "R(C)" zone is similar to but slightly more restrictive than the "R(B)" zone. However, its most notable feature is that the height of buildings, plot ratio and site coverage will be limited to ensure that developments are in character with the nearby traditional villages and attractive countryside areas, and that the road and utility service infrastructure are not over-loaded. Under this zone, there are three sub-areas, namely "R(C)1", "R(C)2" and "R(C)3". For "R(C)1", development is subject to a maximum plot ratio of 0.8, a maximum site coverage of 50% and a maximum height of 3 storeys over one-storey carpark or the height of the existing building, whichever is the greater whereas development within the "R(C)2" is restricted to a maximum plot ratio of 1.5 and a maximum height of 12 storeys including carpark. For "R(C)3" development, development is subject to a maximum GFA of 5,504m^2, a maximum site coverage of 24% and a maximum height of 4 storeys over one-storey carpark.

7.5.3 To provide flexibility for innovative design adapted to the characteristics of particular sites, minor relaxation of the plot ratio, GFA, site coverage and building height restrictions stated above may be considered by the Board through the planning permission system. Each proposal will be considered on its individual planning merits.

7.6 "Village Type Development" ("V") : Total Area 83.30 ha

7.6.1 The planning intention of this zone is to designate both existing recognized villages and areas of land considered suitable for village expansion. Land within this zone is primarily intended for development of Small Houses by indigenous villagers. It is also intended to concentrate village type development within this zone for a more orderly development pattern, efficient use of land and provision of infrastructures and services. Selected commercial and community uses serving the needs of the villagers and in support of the village development are always permitted on the ground floor of a New Territories Exempted House. Other commercial, community and recreational uses may be permitted on application to the Board.

7.6.2 In order to ensure that any future development or redevelopment within these villages would retain the village character, a maximum building height of 3 storeys (8.23m) or the height of the existing building, whichever is the greater, is imposed under this zoning.

7.6.3 To provide flexibility for innovative design adapted to the characteristics of particular sites, minor relaxation of the building height restriction stated above may be considered by the Board through the planning permission system. Each proposal will be considered on the individual planning merits.

7.7 "Industrial" ("I") : Total Area ~~51.57~~ ***47.84*** ha

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

7.7.2 This zone covers areas at the north-western periphery of Sheung Shui (Planning Areas 4 and 30) and On Lok Tsuen (Planning Areas 25 and 26), Fanling.

7.7.3 Planning Areas 4 and 30 are subject to a maximum plot ratio of 5.0, and a maximum building height of 25m or the plot ratio and height of the existing building, whichever is the greater.

7.7.4 On Lok Tsuen in Planning Areas 25 and 26 is close to the East Rail Fanling Station and a major employment node for Fanling/Sheung Shui New Town and the North District. Developments within On Lok Tsuen are subject to a maximum plot ratio of 5.0 and a maximum building height of 65m (excluding basements) which is compatible with the overall townscape in the area allowing a height profile stepping down from Luen Wo Hui to the low-rise village settlement to its east.

7.7.5 There is a strong demand for public vehicle parks in On Lok Tsuen to serve the local needs. In order to facilitate provision of industrial floorspace while ensuring adequate provision of public vehicle parking spaces for the area, in determining the maximum plot ratio for development in the On Lok Tsuen Industrial Area, any floor space that is constructed or intended for use solely as public vehicle parks, as required by the Government, may be disregarded in the calculation of GFA.

7.7.6 Future development/redevelopment of sites within On Lok Tsuen is encouraged to adopt building design with reduced footprint to enhance the air and visual permeability and provide more opportunity for at-grade greening and better streetscape. Consideration would be given to providing non-building area/setback/amenity area at an appropriate location upon development/redevelopment. Such requirements would be shown in the On Lok Tsuen Layout Plan to guide the detailed district planning works and processing of development/redevelopment proposals in the Area. To better serve the workers and enhance vitality of the area, food outlets and local retail stores on the ground floor of industrial buildings along major pedestrian routes within On Lok Tsuen would be considered subject to approval of the Board.

7.7.7 To provide incentive for development/redevelopment within this zone, minor relaxation of the plot ratio and building height restrictions may be considered by the Board on application under section 16 of the Ordinance. Each application for minor relaxation of plot ratio/building height restriction will be considered on its individual merits. Relevant considerations including amalgamating smaller sites for achieving better layout design and local area improvement, providing better streetscape/good quality street level public space, innovative building design and other planning merits will be taken into account in considering such applications.

7.8 "Government, Institution or Community" ("G/IC") : Total Area ~~103.81~~ ***102.91*** ha

7.8.1 The planning intention of this zone is 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. Smaller sites have generally been absorbed into other compatible zones

on the Plan and many facilities such as schools and social centres will be provided within public housing estates and other mixed-use developments and have not been shown separately on the Plan.

7.8.2 Some examples of major regional and district facilities are the Police Driving School of the Hong Kong Police Force in Planning Area 17, the Sheung Shui Divisional Police Station in Planning Area 25, the North District Hospital in Planning Area 34, the swimming pool complex adjacent to a large recreational open space in Planning Area 12, an indoor recreational centre, an integrated sports complex and a swimming pool complex in Planning Area 6, the Government Offices and the Fanling Law Courts Building in Planning Area 11 and indoor recreational centres in Planning Areas 28 and 44.

7.8.3 Planned developments include a cross-district ~~community~~ cultural centre in Planning Area 11, a community hall in Planning Area 44 and primary schools in Planning Area 48.

7.9 "Open Space" ("O") : Total Area ~~44.23~~ ***42.30*** ha

7.9.1 The planning intention of this zone is 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.

7.9.2 District open spaces within the New Town, including the North District Park in Planning Areas 7 and 9, are within this zoning. Smaller local open spaces will be provided as appropriate within other zones such as "Residential", "Industrial" and "Government, Institution or Community" as part of detailed planning.

7.10 "Other Specified Uses" ("OU") : Total Area ~~35.82~~ ***34.46*** ha

7.10.1 The planning intention of this zone is primarily to provide/reserve land for specific purposes and uses.

7.10.2 Sites reserved for specific uses such as abattoir, sewage treatment works, ~~bus depot,~~ flood balancing reservoir, railway stations and petrol filling stations are included in the "OU" zone, and the specified uses are indicated on the Plan. Of particular note is Landmark North, which is located near the East Rail Sheung Shui Station in Planning Area 7. It is a major transport interchange and public car park with commercial uses including shops and offices above.

7.11 "Undetermined" ("U") : Total Area 0.90 ha

This zone denotes land reserved to meet unforeseen requirements in the longer term and areas where further detailed planning study is required to identify the most appropriate use of land.

7.12 "Green Belt" ("GB") : Total Area 68.78 ha

7.12.1 Areas within the New Town boundary which are unsuitable for or are to be protected from encroachment by urban development are included within the "GB" zone. This includes areas with attractive landscape, such as peripheral hills and fung shui features. The "GB" zoning can facilitate conservation as well as provide opportunities for additional outdoor recreational outlets.

7.12.2 The planning intention of this zone is primarily for defining the limits of urban and sub-urban development areas by natural features and to contain urban sprawl as well as to provide passive recreational outlets.

There is a general presumption against development within this zone. Any application for development will be considered by the Board on individual merits. For the general reference of the public, the Board has published a set of guidelines for 'Application for Development within "Green Belt" zone under section 16 of the Town Planning Ordinance'. The 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.

8. COMMUNICATIONS

8.1 Roads

8.1.1 Only the major road network required to serve the New Town is shown on the Plan. This basically consists of the trunk road, namely Fanling Highway and the district distributor roads. Only a few major local distributor roads are shown.

8.1.2 The trunk road caters for through traffic and provides a high standard road link to the other New Towns including Tai Po, Sha Tin and Yuen Long and the main urban areas of Kowloon and Hong Kong.

8.1.3 The district distributor roads provide access to and between various planning areas within the New Town. Three connections are provided between the trunk road and the distributor road system via grade-separated junctions.

8.2 Mass Transit Railway

Fanling/Sheung Shui New Town is served by the MTR which provides an important transport link between the Fanling/Sheung Shui New Town and Kowloon as well as between the Hong Kong Special Administrative Region and the Mainland. There are two railway stations, Fanling and Sheung Shui, within the Area.

8.3 Others

8.3.1 Public transport interchange facilities are provided in Planning Areas 7 and 13 adjacent to the railway stations. A major bus terminus is also provided in Planning Area 19 and a district bus terminus is provided in Planning Area 45. A public transport interchange has been provided within the public housing estate in Planning Area 36. In addition, local bus and taxicab termini are also provided in some public housing estates and at strategic locations.

8.3.2 A comprehensive system of segregated cycle tracks and pedestrian routes has been substantially completed throughout Fanling and Sheung Shui.

9. UTILITY SERVICES

9.1 Water Supply

Supply of fresh water to the Area is provided by Sheung Shui Water Treatment Works via Table Hill, Tong Hang and Kwu Tung Fresh Water Service Reservoirs. A new Ping Che Fresh Water Service Reservoir has also been commissioned. Currently, temporary mains fresh water for flushing is provided to the Area as supply of seawater flushing is not available.

9.2 Town Gas

Town gas supply is available in Fanling/Sheung Shui since completion of the gas production plant in Tai Po. The trunk main runs alongside the Fanling Highway.

9.3 Electricity

The Area is supplied with electricity and sites for electricity substations have been provided in detailed planning.

9.4 Sewage Treatment

The New Town is served by the sewage treatment works in Planning Area 2, together with trunk sewers and pumping stations in Planning Area 25. To cope with the new development, the upgrading of the sewage treatment works in Planning Area 2 from 80,000m^3/d to 93,000m^3/d has been completed. Besides, under the recommendations of the 'Review of the North District and Tolo Harbour Sewerage Master Plans', a revised Sewerage Master Plan is to be formulated for the provision of adequate sewage collection, treatment and disposal facilities for the Area and other parts of the North District up to 2016.

10. CULTURAL HERITAGE

There is one declared monument located within the Area, i.e. Liu Man Shek Tong (Ancestral Hall) in Sheung Shui. There are graded and proposed graded historic buildings within the Area. On 19 March 2009, the Antiquities Advisory Board (AAB) released the list of 1,444 historic buildings, in which some buildings within the Area have been given proposed gradings. Details of these historic buildings have been uploaded onto the website of the AAB at http://www.aab.gov.hk. A number of proposed gradings of historic buildings have been endorsed by AAB, which are remarked on the list of 1,444 historic buildings in AAB's website. The AAB also released a list of new items in addition to the list of 1,444 historic buildings. These items are subject to grading assessment by the AAB. Details of the list of 1,444 historic buildings and the new items have been uploaded onto the website of the AAB at http://www.aab.gov.hk. Prior consultation with the Antiquities and Monuments Office ~~of the Leisure and Cultural Services Department~~ should be made if any development, redevelopment or rezoning proposals might affect the above declared monument, historic buildings/structures, new items pending grading assessment and their/its immediate environs.

11. IMPLEMENTATION

11.1 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.

11.2 This 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 within the Government as the basis for public works planning and site reservation. 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 Architectural Services Department and the Highways Department. In the implementation of the Plan, the North District Council would be consulted as appropriate.

11.3 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 the departmental outline development plans and layout plans, and guidelines published by the Board. The outline development plans and layout plans are available for public inspection at the Planning Department. Guidelines published by the Board are available from the Board's website, the Secretariat of the Board and the Technical Services Division of the Planning Department. Application forms and Guidance Notes for planning applications can be downloaded from the Board's website and are available from the Secretariat of the Board, and the Technical Services Division and the relevant District Planning Office of the Planning Department. Applications should be supported by such materials as the Board thinks appropriate to enable it to consider the applications.

TOWN PLANNING BOARD
~~JANUARY 2016~~ ***MARCH 2019***

1. Introduction

1.1 Sheung Shui Areas 4 and 30 Site 1 and Site 2 (Site 1 and Site 2) and Po Shek Wu Road (PSW) (Subject Sites) are located at close proximity to Sheung Shui Town Centre, New Territories. The Subject Sites comprise areas of about 1.44 ha, 1.13 ha and 1.38 ha for Site 1, Site 2 and PSW respectively. Site 1 is zoned "Industrial" ("I"); Site 2 is zoned "I" and "Other Specified Use (Bus Depot)" ("OU (Bus Depot)"); and PSW is zoned "Open Space" ("O") on the Approved Fanling / Sheung Shui OZP No. S/FSS/22 (**Plan 1**). The Subject Sites are proposed to be rezoned to "Residential (A)" zones tentatively scheduled for 2019.

2. Proposed Public Housing Developments

2.1 The Subject Sites are located at the Sheung Shui Town Centre and are within about 500m walking distance to the northwest of Sheung Shui MTR Station. They are surrounded by Choi Yuen Road, San Wan Road and Po Shek Wu Road. Site 1 and Site 2 are situated at the industrial area. To the east of Site 1 and Site 2 is Po Shek Wu Road. Shek Wu Hui Jockey Club Playground is located to the north of PSW, while Choi Yuen Estate and Po Shek Wu Estate are located to the south and Shek Wu Hui to the east.

2.2 Preliminary development parameters are shown in **Table 1** and conceptual layout plan in **Appendix 1**.

Table 1 Preliminary Development Parameters for Proposed Public Housing Developments at Site 1, Site 2 and PSW

	Site 1	**Site 2**	**PSW**
Site Area	1.44 ha (about)	1.13 ha (about)	1.38 ha (about)
Total Plot Ratio#	6.6	6.6	7
Flat Production	2,040	1,480	1,850
Maximum Building Height in mPD	130mPD	130mPD	130mPD
Other uses/ public facilities	● Social welfare facilities: ■ Day Activity Centre (DAC) ■ Residential Care Home for Elderly (RCHE) ■ Hostel for Moderately Mentally Handicapped Persons (HMMH) ■ Hostel for the Severely Mentally Handicapped Persons (HSMH) ■ Integrated Vocational Rehabilitation Services Centre (IVRSC). ● Public transport interchange (PTI) ● Community hall ● District health centre ● Retail shops ● Kindergarten ● Other ancillary uses	● 300 Public car park ● Post office ● Retail shops ● Other ancillary uses	● Retail shops ● Kindergarten ● Other ancillary uses
Target Completion Year	2024/25 and 2027/28	2025/26	2026/27

Assumed exemption on the GFA of social welfare and community facilities, PTI, public carpark and ancillary parking facilities.

3. Summary of Technical Assessments

Traffic Impact Assessment (TIA)

3.1 TIA has been undertaken to examine the impacts of the traffic generated by the proposed public housing developments on the existing and planned road networks, particularly with respect to the performances of the affected junctions in the vicinity; and to present the findings and results of analyses of the traffic and transport issues related to the proposed public housing developments (**Appendix 2**).

3.2 To appreciate the existing traffic conditions, comprehensive classified traffic counts have been conducted at the key junctions in the vicinity of the Subject Sites. Junction capacity analyses have been carried out at the key junctions in vicinity of the Subject Sites and all analysed results reveal that the associated junctions along the accessing/ leaving routes will be performing within capacity, with proposed road improvement schemes by CEDD under other project proponents and by Hong Kong Housing Authority (HA) in place (**Appendix 3**).

3.3 A possible improvement scheme at Po Shek Wu Road southbound is recommended in the TIA report which consists of central divider modification for an additional lane at the Po Shek Wu Road southbound (Section between Fanling Highway and Choi Yuen Road). CEDD will undertake this improvement of Po Shek Wu Road. The implementation details, design and construction responsibility will be further investigated at the detailed design stage. In addition, a PTI is proposed underneath a residential block within Site 1 to facilitate redistribution of public transport routes and relieve the traffic condition of North District.

3.4 Future pedestrian conditions have been assessed for Site 1, Site 2 and PSW. Possible footbridge connections are proposed to connect (i) Site 1 to Po Shek Wu Estate; (ii) Site 2 to PSW; and (iii) PSW to existing footbridge linking Choi Yuk House on the south and Landmark North to the north. The comprehensive footbridge network connecting different public housing developments will enhance the pedestrian accessibility. For Site 1, Site 2 and PSW, based on the Level of Service (LOS) assessment, all existing pedestrian facilities in the vicinity of the proposed developments will be operating within capacity with LOS C or better with proposed improvement schemes in place, except the footbridge connecting MTR Sheung Shui Station and Landmark North which operates at LOS D. A possible footbridge connection between the existing footbridge to Sheung Shui MTR Station will be provided subject to further investigation at the detailed design stage.

3.5 For the affected existing public car parks under STTs at Site 1 and Site 2, about 300 public car parking spaces will be reprovided in the new car park block at Site 2. During the construction stage of Site 1 and Site 2, the public car parking spaces will be temporarily accommodated at Site 1 and/or Site 2 before the operation of the new car park block at Site 2.

3.6 In short, the proposed public housing developments will not induce adverse traffic impact on the surrounding road network and pedestrian network upon completion and considered acceptable from traffic point of view.

Visual Appraisal (VA)

3.7 VA has been undertaken to assess the visual impact of the proposed public housing developments (**Appendix 4**). With further public housing developments extending to the northwest fringe from the Sheung Shui Town Centre, there will undoubtedly be some changes to the general neighborhoods, and visual impact of the proposed developments will be inevitable, efforts have been made to mitigate the impact to a more acceptable level. Measures to reduce the building bulk will further be explored as far as practicable at the detailed design stage. The possible design measures to improve the schemes are summarized as below:

- The building height profile of the proposed developments with the building heights of not more than 130mPD and some stepping descending from the centre near the railway station to the fringe (i.e. from east to west) will act some visual interests to the surrounding.
- The building blocks will be positioned to facilitate the 15m building separation requirement for ventilation and visual considerations.
- The color scheme of the domestic blocks will be carefully worked out at the detailed design stage, together with appropriate façade design and treatments, such as the provision of greening features and colored pattern etc., which will help to add visual interest to the developments.
- Podium structure will be designed with void facing the proposed shopping street to help break down the visual scale of the podium and improve permeability.
- Minimum 20% green coverage with half of the planting at-grade will be provided through providing landscape elements at various levels. Vertical greening and roof top greening will also be explored as far as practicable to enhance the aesthetic value of the proposed developments at the detailed

design stage.

3.8 The VA concludes that the proposed housing developments with design mitigation measures will not cause unacceptable visual impact to its vicinity.

Air Ventilation Assessment - Expert Evaluation (AVA-EE)

3.9 AVA-EE has been undertaken to identify characteristics of the site wind availability data of the Subject Sites and assess the wind performance under existing development situation and the proposed building design option in a qualitative way (**Appendix 5**).

3.10 Under annual wind condition, Site 1 and Site 2 will induce wind shadow at Tai Tau Leng Playground and the low-rise villages of Tai Tau Leng under NNE wind. Site 1 will inevitably induce some wind shadow along Choi Yuen Road under easterly quadrant wind direction, the PTI at ground level will allow wind penetration at pedestrian level to mitigate the ventilation impact. Blocks 1 and 3 of Site 2 will induce wind shadow towards the pedestrian areas around Jumbo Plaza under NNE wind. The presence of Block 3 of Site 2 and PSW will induce small wind shadow at San Wan Road. The ventilation impact at San Wan Road will in turn affect the ventilation performance of Po Shek Wu Estate and part of Po Shek Wu Road as well.

3.11 Under summer wind condition, the presence of Site 1 will induce wind blockage effect along Choi Fai Street. As Site 2 is located at the downstream area of Site 1 and PSW, Site 2 will have lower wind availability and localized wind shadow. The wind shielding effect of upstream developments, such as Site 2 and PSW, will cause localized wind shadows at Shek Wu Hui Jockey Club Playground. The presence of Site 2 will also cause certain ventilation impact at Ka Fu Close, carpark and Sheung Shui Wai villages.

3.12 The results conclude that the developments have certain ventilation impact to the surroundings under summer and annual wind condition. Therefore, several enhancement features are recommended to increase wind permeability, including breaking up of podium, provision of building separation and empty bays. AVA-Initial Study will be conducted at the detailed design stage to assess the above recommended mitigation measures for scheme optimization.

Preliminary Environmental Assessment (PEA)

3.13 PEA has been conducted and identified road noise, rail noise and fixed noise impacts are the major environmental concerns at the Subject Sites. Potential air quality

impact and land contamination have also been reviewed.

3.14 Preliminary road traffic noise assessments have been conducted on preliminary scheme layouts. During the process of designing the development layout, self-protecting block design has been adopted in all residential blocks to avoid direct line of sight to the East Rail and the nearby industrial areas. Such design could also provide noise screening from Po Shek Wu Road. Despite this, some facades facing Po Shek Wu Road and Choi Yuen Road will still unavoidably be exposed to traffic noise. It is recommended that proper building layout and design should be adopted. Noise mitigation measures, such as acoustic window design, conversion of openable window to fixed glazing, acoustic fins etc., should also be considered and exhaustively adopted in order to alleviate the impacts. With all these mitigation measures in place, noise compliance rate could be improved. Fixed glazing, mechanical ventilation and air conditioning or re-arrangement of the noise sensitive rooms away from roads are recommended for some façades of the proposed kindergarten, Estate Management Office (EMO) and ancillary facility block which noise exceedances are found.

3.15 East Rail line is running parallel to San Wan Road. Preliminary rail noise assessments indicate that with proper building layout, design and provision of fixed glazing for facades of the residential blocks facing the rail line, the proposed residential developments, kindergartens and EMO will comply with the respective Acceptable Noise Level (ANL) under Noise Control Ordinance and Hong Kong Planning Standards and Guidelines' (HKPSG's) criteria. Provision of fixed glazing, mechanical ventilation and air conditioning at the affected façades are recommended for some facades of the ancillary facility block during night time which noise exceedances are found. Alternatively, noise sensitive uses with night time operation should be planned away from the rail tracks. With the provision of proper mitigation measures, the ancillary facility block will also meet the respective ANL and HKPSG's criteria.

3.16 There are also a number of fixed noise sources in the vicinity of the Subject Sites (**Appendix 6**). Preliminary assessments indicate that with proper building layout and design, the proposed residential blocks, EMO and ancillary facility block will comply with the respective noise criteria. It is recommended to review the internal layout of the kindergarten at the detailed design stage to avoid sensitive uses facing the fixed noise sources for some facades of the kindergarten which exceed the fixed noise criterion. Alternatively, fixed glazing, mechanical ventilation and air conditioning

could be considered at the affected façades of the kindergarten.

3.17 A PTI is proposed underneath a residential block within Site 1. It is located at about 110m to the south of Site 2, 130m to the southwest of PSW, 70m to the west of Po Shek Wu Estate, 100m to the nearest existing receivers. Based on the tentative design, the proposed ingress/egress of PTI will connect to Choi Fai Street facing to an existing industrial building and is away from all noise sensitive receivers. The residential blocks at Site 1 and Site 2 have been designed with blank façades facing the PTI. The proposed PTI will be designed with due consideration to the HKPSG. It will be covered under a podium decking with full height side walls to avoid line of sights to the subject developments and other sensitive receivers in the proximity as far as practicable. Louvers and silencers will be provided on any opening or exhaust on the side walls of the PTI if necessary. Potential noise nuisance arising from the proposed PTI and other sensitive receivers in the proximity is therefore not anticipated.

3.18 The current schemes allow sufficient setback distances to meet the minimum requirement as stipulated in HKPSG. Based on the chimney survey, no chimney is identified within 500m of the Subject Sites. No adverse air quality impact is anticipated. The Shek Wu Hui Sewage Treatment Work (SWHSTW) and Sheung Shui Slaughterhouse (SSS) are located at about 300-800m to the northwest of the Site 1 and Site 2. Desktop study has revealed that there will be no adverse odour impact arising from the expanded SWHSTW and SSS to the proposed developments.

3.19 Based on the preliminary site appraisal and desktop study, land contamination activities are not identified within Site 1 and Site 2. For the existing bus depot at PSW, HA confirmed with LandsD and the Kowloon Motor Bus Co. Ltd. (KMB) that detailed land contamination assessment will be carried out by KMB in accordance with the Environmental Protection Department's (EPD's) Practice Guide for Investigation and Remediation of Contaminated Land and any necessary remediation works will be implemented prior to site handover to HA. Hence, potential health risk due to land contamination to the future public housing residents is not anticipated.

3.20 With proper building layout, design and mitigation measures, it is anticipated that the relevant HKPSG requirements on noise and air quality impacts can be met. HA will conduct an Environmental Assessment Study (EAS) at the detailed design stage to address the potential environmental impacts with respect to the HKPSG and suitable mitigation measures will be proposed.

Sewerage Impact Assessment (SIA)

3.21 SIA has been conducted to evaluate the possible impacts on the existing sewerage system and the SWHSTW due to the proposed public housing developments. Assessments confirm that no insurmountable problem on sewerage system is anticipated with the implementation of the recommended mitigation measures.

3.22 For Site 1, the existing sewers at Choi Fai Street and Choi Fat Street are proposed to be upgraded so as to cater for the sewage generated from the proposed developments along this section. For Site 2 and PSW, the existing sewerage in the vicinity has sufficient capacity for the sewage generated from the proposed developments, thus no mitigation measure is required.

3.23 The sewage generated from the proposed public housing developments will impose loadings on the existing SWHSTW. HA had agreed with EPD that SWHSTW has sufficient capacity to treat the sewage generated from the proposed housing developments.

Ecological Impact Assessment (EcoIA)

3.24 Site 1 is located in the vicinity of Long Valley which is well-recognized as an ecologically sensitive area and its adjoining Shek Sheung River is identified of some ecological value under the North East New Territories New Development Areas project, thus EcoIA is required by Agriculture, Fisheries and Conservation Department. The habitat map is in **Appendix 7**. The EcoIA concludes that the ecological value of Site 1 is very low. No floral and faunal species of conservation importance have been recorded within the site. Mitigation measures including good construction site practices and habitat enhancement measures such as planting of native species will be implemented. With the mitigation measures in place, no significant adverse ecological impact arising from the proposed development is anticipated.

Landscape Aspects

3.25 A Broad Brush Tree Survey has been conducted and there are no Old and Valuable Trees (OVT) or rare species within the boundaries of the Subject Sites (**Appendix 8**). All compensatory planting for loss of vegetation will be carried out according to "Development Bureau Technical Circular (Works) No. 7/2015 Tree Preservation". Overall site green coverage of at least 20% of gross site area will be applied. At least 50% of the overall site greening coverage will be provided at-grade and on the

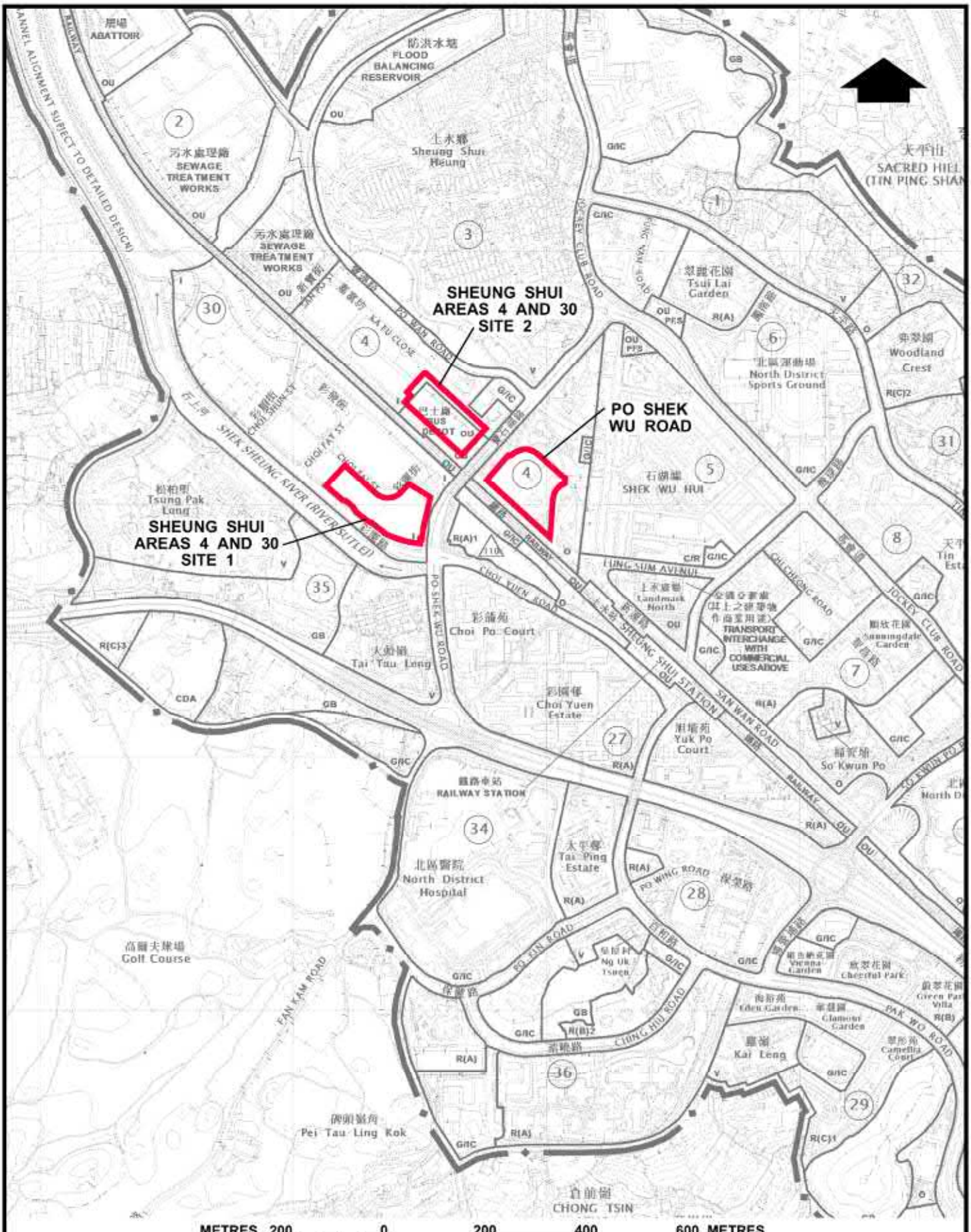
podium level. The schematic landscape plans are in **Appendix 9**.

Quantitative Risk Assessment (QRA)

3.26 Site 1 is in the vicinity of LPG Store of Choi Po Court (**Appendix 10**). QRA has been conducted to ascertain the risk level. The 1×10^{-5} per year contour for individual risk is not found beyond the boundary of the LPG Store and within its 200m study area. Individual risk is acceptable and in compliance with the Hong Kong Risk Guidelines. Societal risk falls into the lower ALARP of the Hong Kong Risk Guidelines. For comparison of risk levels between Year 2028 scenarios with and without the proposed development, there is only marginal increase of total Potential Loss of Life (PLL) with around 1% due to the proposed development, while the increase of total PLL for Year 2025 scenarios due to the proposed development is even negligible (around 0.001%). It is thus considered that the risk due to population increase of the proposed development is negligible throughout the construction and operation period.

4. Conclusion

4.1 In conclusion, the technical assessments have demonstrated the feasibility of the proposed public housing developments with incorporation of the appropriate mitigation measures identified.



SHEUNG SHUI AREAS 4 AND 30 SITE 1 & 2 AND PO SHEK WU ROAD

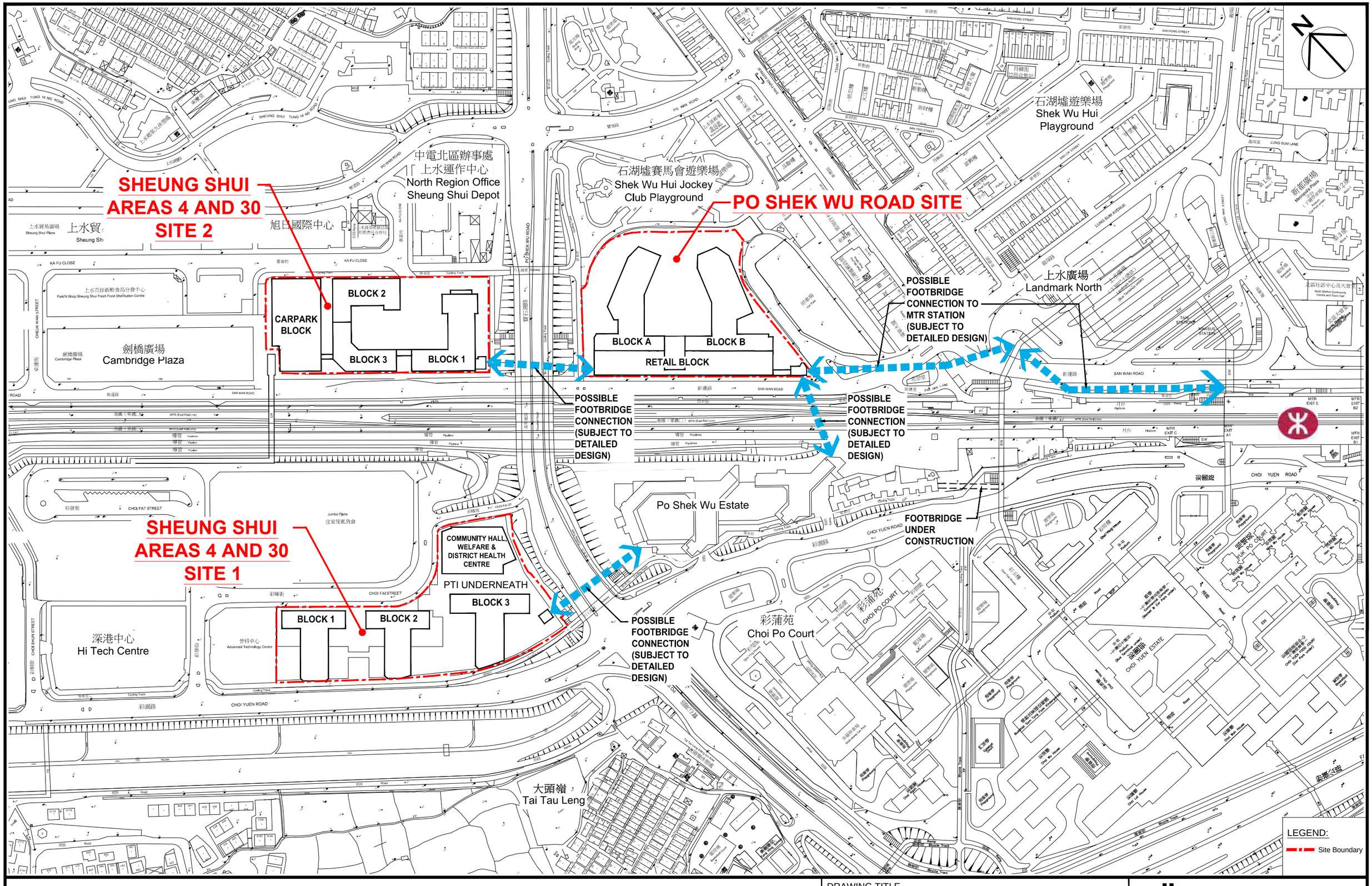
HOUSING DEPARTMENT
PLANNING SECTION

Plan 1

DATE : Feb 2019

BASE EXTRACTED FROM OZP No. S/FSS/22

18_0225N_OZP



SHEUNG SHUI AREAS 4 AND 30 SITE 1, SITE 2, AND PO SHEK WU ROAD SITE

DRAWING TITLE

CONCEPTUAL LAYOUT PLAN

(FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

SCALE : 1:2500 (A3)

房屋署
HOUSING DEPARTMENT

編號 PLAN NO.

日期 DATE: Feb 2019

201900204_03

Hong Kong Housing Authority

Proposed Public Housing Development Sites 1 & 2 in Sheung Shui Areas 4 and 30

Traffic Impact Assessment

Revised Final Report

Revision 12 | January 2019

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 236072-09

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ARUP

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1 INTRODUCTION

1.1 Background

1.1.1 Arup was appointed by Hong Kong Housing Authority (HKHA) to conduct a Traffic Impact Assessment (TIA) for the land rezoning of the proposed public housing development at Sites 1 and 2 in Sheung Shui Areas 4 and 30 (the Sites). Sites 1 and 2 are public rental housing (PRH) development at Choi Yuen Road and San Wan Road respectively.

1.1.2 Site 1 is bounded by Choi Fai Street on the north, Choi Yuen Road on the south and Po Shek Wu Road on the east. It is zoned "Industrial" ("I") and currently an existing public car park under Short Term Tenancy (STT). The proposed PRH development will comprise of about 2,040 flats and is envisaged to be completed by Year 2024/25 for Phase 1 (2 residential blocks) and Year 2027/28 for Phase 2 (1 residential block and public transport interchange). The site location and its environs in the vicinity are shown in **Figure 1**.

1.1.3 Site 2 is bounded by Ka Fu Close on the north, San Wan Road on the south and Po Shek Wu Road on the east. It is zoned "I" and "Other Specified Uses" annotated (Bus Depot) ("OU (Bus Depot)") and partly as an existing public car park under STT and partly as WSD's depot under TGLA. The proposed PRH development will comprise of about 1,480 flats (3 residential blocks) and is envisaged to be completed by Year 2025/26. The site location and its environs in the vicinity are shown in **Figure 1**.

1.1.4 This TIA study is to examine the impacts of the traffic generated by the proposed PRH development at the Sites on the existing and planned road networks, particularly with respect to the performances of the affected junctions in the vicinity; and present the findings and results of analyses of the other traffic and transport issues related to the proposed PRH developments. Any deficiency would be identified and improvement proposals would be recommended if necessary to resolve any foreseeable problem.

1.2 Study Tasks

1.2.1 The principal objective of the Study is to support the proposed PRH development by addressing the traffic-related issues and ensuring that the proposed developments would be feasible in terms of traffic without causing adverse impacts on the surrounding road network and pedestrian facilities.

1.2.2 To achieve this objective, the major tasks can be summarised as follows:

- to assess the existing traffic conditions in the vicinity of the proposed PRH development;
- to forecast traffic demands on the adjacent road network in the design years 2028 and 2031;

- to estimate the likely traffic generated by the proposed PRH development;
- to assess the impacts of traffic generated by the proposed PRH development on the adjacent road network using the forecast background flows and the traffic generated by the proposed developments;
- to recommend improvement measures, if necessary, to alleviate any traffic problems on the road network; and
- to investigate the public transport and pedestrian needs generated by the proposed PRH development.

1.3 Structure of the Report

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

Chapter 2 – Describes the existing traffic conditions;

Chapter 3 – Describes the planning parameters of the proposed PRH development, issues regarding the site access and provision of car parking and loading / unloading facilities;

Chapter 4 – Presents the trip generation of the proposed PRH development and the traffic forecasts; reports the results of the junction capacity assessments; reviews traffic condition in the vicinity of the proposed PRH development; and recommends measures to improve the traffic condition, if considered necessary;

Chapter 5 – Describes the sensitive analysis on the bus rerouting with the new public transport interchange (PTI) at Site 1 in place;

Chapter 6 – Describes the pedestrian impact assessment and any proposal for improving the pedestrian network where necessary;

Chapter 7 – Describes the public transport provision for the proposed PRH development; and

Chapter 8 – Summarises and concludes the study.

2 EXISTING TRAFFIC CONDITIONS

2.1 Locality and Access to the Site

2.1.1 Site 1 and Site 2 are located at north of Choi Yuen Road and north of San Wan Road respectively as shown in **Figure 1**. Site 1 can be accessed from Choi Fai Street / Choi Fat Street connecting to the district distributor Choi Yuen Road, which runs in the east-west direction connecting to Po Shek Wu Road on the west. Po Shek Wu Road is a primary distributor running in the north-south direction connecting to the Jockey Club Road on the north and Fanling Highway on the south. Site 2 can be accessed from the district distributor San Wan Road or the local distributor Ka Fu Close connecting to San Po Street, which connects to Po Wan Road leading to Po Shek Wu Road. The access/egress routes to/from the site are shown as in **Figure 2**.

2.2 Existing Road Network

2.2.1 As indicated above, the Sites are served by a comprehensive road network to / from all districts. Some major road network in the vicinity of the proposed housing development are listed as follows:

- Choi Yuen Road

  Choi Yuen Road is a single carriageway two-way district distributor running in the east-west direction. It joins Po Shek Wu Road on the west and Pak Wo Road on the east. It is also the major access to MTR Sheung Shui Station.

- San Wan Road

  San Wan Road is a single/dual carriageway two-way district distributor running in the east-west direction. It joins San Po Street on the west and Jockey Club Road/Sha Tau Kok Road on the east. It is another major access to MTR Sheung Shui Station.

- Po Shek Wu Road

  Po Shek Wu Road is a dual-two lane primary distributor running in the north-south direction. It connects to the junction with Jockey Club Road on the north and the Fanling Highway Interchange on the south.

- Fanling Highway

  Fanling Highway is a dual-three lane expressway linking to San Tin Highway to the west and Tolo Highway to the east.

- Jockey Club Road

  Jockey Club Road is a dual-two lane primary distributor connecting to Man Kam To Road and Fanling Highway at the junction with Pak Wo Road.

- Ka Fu Close

  Ka Fu Close is a single-two lane local distributor in the industrial area. It forms a local road network with other local roads, i.e. San Po Street and Cheuk Wan Street.

2.3 Existing Traffic Condition

2.3.1 To appreciate the existing traffic conditions, comprehensive classified traffic counts were conducted at the following key junctions and links. The assessments have been based on the latest junction layouts and method of control. Locations of these surveyed junctions and links are listed below and shown in **Figure 1**.

- J1 – Jockey Club Road / Po Shek Wu Road (Roundabout)
- J2 – Po Shek Wu Road / Po Wan Road (Signal Junction)
- J3 – Po Shek Wu Road / Choi Yuen Road (Signal Junction)
- J4 – Choi Yuen Road / Pak Wo Road (Roundabout)
- J5 – Jockey Club Road / Lung Sum Avenue (Signal Junction)
- J6 – Jockey Club Road / So Kwun Po Road (Signal Junction)
- J7 – So Kwun Po Road Interchange (Roundabout)
- J8 – Po Shek Wu Road Interchange (Roundabout)
- J9 – Po Wan Road / San Po Street (Signal Junction)
- J10 – San Wan Road / San Po Street (Priority)
- J11 – Choi Yuen Road / Choi Fai Street (Priority)
- J12 – Choi Fat Street / Choi Fai Street (Priority)
- J13 – Ka Fu Close / San Po Street (Priority)
- J14 – Ka Fu Close / Cheuk Wan Street (Priority)
- L1 – Po Shek Wu Road – Section between Choi Yuen Road and Fanling Highway (Link)
- L2 – Po Shek Wu Road – Section between Choi Yuen Road and Po Wan Road (Link)
- L3 - Po Shek Wu Road – Section between Jockey Club Road and Po Wan Road (Link)
- L4 - Po Wan Road (Link)
- L5 – San Wan Road (Link)
- L6 – Choi Fat Road (Link)
- L7 – Choi Yuen Road (Link)

2.3.2 The traffic counts were undertaken on a normal weekday in 2016 during the periods 0730 - 0930 and 1730 - 1930 hours. Supplementary survey was conducted in May 2017 at Junctions J6, J7, J8 and Link L1. The surveyed traffic flows in 2017 are in general higher than those of 2016. It is revealed that the observed total flows of the most critical road links in the town, i.e. Po Shek Wu Road and So Kwun Po Road, in 2017 is

about 14% and 10% higher than those of 2016 during AM and PM peak hours respectively. In view thereof, adjustment factor of 1.14 (for AM peak) and 1.10 (for PM peak) to the traffic flows observed in 2016 is therefore applied for assessment of existing traffic condition, except for Junction J6, J7, J8 and Link L1 in which the observed traffic flows in 2017 are adopted. The adopted traffic flows to assess 2017 existing junction performance are presented in **Figure 3**. From the observed traffic flows in 2017, the morning and evening peak hours were identified as 0730-0830 hours and 1730-1830 respectively. In general, the morning peak hour flows were observed to be higher than the evening peak periods.

2.3.3 Junction and link capacity analyses have been carried out at the key junctions and links along the key access routes of the Sites. Results of the capacity assessment are shown in **Tables 2.1 and 2.2** below.

Table 2.1 Year 2017 Existing Junction Performance

Junction (1)		Type	Performance (2)	
			AM	PM
J1	Jockey Club Road / Po Shek Wu Road	Roundabout	0.36	0.44
J2	Po Shek Wu Road / Po Wan Road	Signal	29%	19%
J3	Po Shek Wu Road / Choi Yuen Road	Signal	4%	7%
J4	Choi Yuen Road / Pak Wo Road	Roundabout	0.47	0.43
J5	Jockey Club Road / Lung Sum Avenue	Signal	14%	17%
J6	Jockey Club Road / So Kwun Po Road	Signal	12%	37%
J7	So Kwun Po Road Interchange (3)	Roundabout	0.96	0.92
J8	Po Shek Wu Road Interchange (4)	Roundabout	0.96	0.99
J9	Po Wan Road / San Po Street	Signal	>100%	>100%
J10	San Wan Road / San Po Street	Priority	0.24	0.16
J11	Choi Yuen Road / Choi Fai Street	Priority	0.28	0.15
J12	Choi Fat Street / Choi Fai Street	Priority	0.16	0.07
J13	Ka Fu Close / San Po Street	Priority	0.03	0.05
J14	Ka Fu Close / Cheuk Wan Street	Priority	0.07	0.05

Notes:

(1) Please refer to **Figure 1** for the location of the assessed junctions; and

(2) Figures shown represent "Reserve Capacity" (RC) for the signal controlled junctions and "Design Flow to Capacity" (DFC) ratio for the priority junctions and roundabouts. A signal-controlled junction with a reserve capacity (RC) of 0% implies that it is operating at capacity while a negative RC suggests that the junction is overloaded. RC >= 15 % implies that the signal-controlled junction is operating satisfactory. For roundabout, the performance indicator is the DFC. DFC ratio of 1.00 indicates continual queuing and could not be considered acceptable. A DFC ratio of 0.85, indicating that queuing would theoretically be avoided in 85% of cases, can be considered reasonable. A DFC of 0.70 indicates that queuing will be avoided in 0.95 of cases.

(3) Vehicular traffic queue was observed along Po Shek Wu Road Southbound during AM and PM peak hours. In general, the end of traffic queue was observed near Choi Yuen Road (i.e. Junction J3 - Po Shek Wu Road / Choi Yuen Road) which is about 350m in length from Junction J8 – Po Shek Wu Road Interchange.

(4) Vehicular traffic queue was observed along So Kwun Po Road Southbound during AM and PM peak hours. In general, the end of traffic queue was observed near Jockey Club Road (i.e. Junction J6 - Jockey Club Road / So Kwun Po Road) which

is about 390m in length from Junction J7 – Po Shek Wu Road Interchange. For southern side, the end of traffic queue was occasionally observed along Pak Wo Road near J4 - Ching Hiu Road/ Pak Wo Road which is about 300m in length from Junction J7 – So Kwun Po Road Interchange.

Table 2.2 Year 2017 Existing Road Link Performance

Road Links		Direction	Capacity (pcu/hr) [1]	Flow (pcu/hr)		V/C Ratio [2]	
				AM	PM	AM	PM
L1	Po Shek Wu Road – Section between Choi Yuen Road and Fanling Highway	NB	4,700	1,810	2,175	0.39	0.46
		SB	3,000	1,910	2,050	0.64	0.68
L2	Po Shek Wu Road – Section between Choi Yuen Road and Po Wan Road	NB	2,800	1,405	1,585	0.50	0.57
		SB	2,800	1,290	1,425	0.46	0.51
L3	Po Shek Wu Road – Section between Jockey Club Road and Po Wan Road	NB	2,800	705	1,050	0.25	0.38
		SB	2,800	880	1,205	0.31	0.43
L4	Po Wan Road	EB	900	250	215	0.28	0.24
		WB	1,800	315	170	0.18	0.09
L5	San Wan Road	EB	1,800	110	100	0.06	0.06
		WB	1,800	70	130	0.04	0.07
L6	Choi Fat Street	EB	900	30	35	0.03	0.04
		WB	900	105	85	0.12	0.09
L7	Choi Yuen Road	EB	2,700	395	210	0.15	0.08
		WB	1,800	215	315	0.12	0.18

Note:
[1] Road capacity is defined in accordance to STM Model and TPDM Volume 2 Chapter 2.4 Table 2.4.1.1 by converting the vehicles to pcu for analysis;
[2] A V/C ratio of 0.7 might infer adequate operating conditions, the effect of junctions or traffic signals both within and at the end of the road link may be such that the design flow could never be achieved in practice, and the link might be severely congested well before a V/C ratio of 1.0 is reached.

2.3.4 Results of the analysis indicate that all junctions and links in the vicinity of the Sites are currently operating within capacity.

2.4 Public Transport Facilities

2.4.1 The Sites are served by various modes of public transport services in vicinity. The key modes of public transport are:

- Franchised Bus Services – The Sites are served by comprehensive franchised bus services operating within the surrounding road network. The bus services operating in the vicinity of the Site are summarised in **Table 2.3**.
- Green Minibus (GMB) Services – The Sites are also served by GMB services operating within the surrounding road network. A summary of GMB services are found in **Table 2.3**.

- The Sites are located within approximately 600m walking distance west of MTR Sheung Shui Station.

2.4.2 **Figure 4** shows the locations of existing bus stops and GMB stops in vicinity of the Sites.

2.4.3 In summary, the Sites are serving with comprehensive public transport services via the adjacent railway network and the road-based public transport services (including franchised bus and GMB services).

2.4.4 In view of comprehensive coverage of the public transport services and the available different choices on transport modes, the proposed housing development is considered to have good accessibility via public transport.

Table 2.3 Existing Public Transport Services

Route No.		Origin - Destination	Frequency (minutes)	Remarks
Bus	**70K**	Wah Ming B/T ↔ Ching Ho	15 – 20	Circular route
	73K	Sheung Shui B/T ↔ Man Kam To	15 – 30	
	76K	Ching Ho B/T ↔ Long Ping Estate B/T	20 – 30	
	77K	Sheung Shui B/T ↔ Yuen Long (Fung Cheung Road) B/T	20 – 30	
	78K	Sheung Shui B/T ↔ Sha Tau Kok B/T	15 – 30	
	79K	Sheung Shui B/T ↔ Ta Kwu Ling	20 – 30	
	261	Sam Shing ↔ Ting Ping Estate B/T	20 – 30	
	261P	Ng Tau Road (Tsing Lun Road) → Tin Ping Estate B/T	-	Monday to Saturday morning peak hour service only
	270	Tin Ping Estate ↔ Tsui Lai Garden B/T	7 – 10	Circular Route
	270A	Sheung Shui B/T ↔ Tsim Sha Tsui East (Mody Road)	10 – 20	
	270B	Sheung Shui B/T ↔ Shum Shui Po	15 – 60	Monday to Saturday morning peak hour service only Sunday noon peak hour service only
	270P	Sheung Shui B/T ↔ Kowloon Station	-	Monday to Saturday morning peak hour service only
	270S	Tsim Sha Tsui East (Mody Road) ↔ Luen Wo Hui B/T	-	00:45-02:00 only
	273A	Choi Yuen B/T ↔ Wah Ming	4 – 10	Circular route
	273B	Ching Ho Estate B/T ↔ Sheung Shui Station	5 – 10	Circular route
	273D	Sheung Shui B/T ↔ Wah Ming	15 – 30	Circular route
	276	Tin Tsz B/T ↔ Sheung Shui B/T	15 - 25	
	276A	Tin Heng Estate B/T ↔ Tai Ping	5 – 15	
	276B	Tin Fu ↔ Choi Yuen B/T	15 – 20	
	276P	Tin Shui Wai Station ↔ Sheung Shui B/T	5 – 20	
	277E	Tin Ping Estate B/T ↔ Lam Tin Station B/T	20	
	277P	Tin Ping Estate B/T ↔ Lam Tin Station B/T	30	Monday to Friday morning peak hour service only
	278X	Sheung Shui B/T ↔ Tsuen Wan (Nina Tower)	5 – 20	

Route No.		Origin - Destination	Frequency (minutes)	Remarks
	279X	Luen Wo Hui B/T ↔ Tsing Yi Station B/T	9 – 15	
	373	Sheung Shui B/T ↔ Central (Hong Kong Station)	-	Monday to Saturday morning and afternoon peak hour service only
	673	Sheung Shui B/T ↔ Central (Hong Kong Station)	30	
	678	Sheung Shui B/T ↔ Causeway Bay	-	Monday to Friday morning peak hour service only
	978	Wah Ming B/T ↔ Wan Chai North	10 – 30	
	978A	Luen Wo Hui B/T ↔ Wan Chai North	-	Monday to Friday morning peak hour service only
	978B	Chi Fok Circuit ↔ Wan Chai North	-	Monday to Friday morning peak hour service only
	A43	Luen Wo Hui B/T ↔ Airport (Ground Transportation Centre) Terminus	15 – 30	
	A43P	Luen Wo Hui B/T ↔ Airport (Ground Transportation Centre) Terminus	25 – 30	
	N42A	Luen Wo Hui B/T ↔ Tung Chung Station	-	Night route
	N42P	Sheung Shui Station ↔ Airport (Ground Transportation Centre) Terminus	-	Night route
	N73	Sheung Shui B/T ↔ Lok Ma Chau B/T	30	Night route
	T270	Cheung Wah B/T ↔ Tsim Sha Tsui East (Mody Road)	-	Monday to Friday morning peak hour service only
	T277	Sheung Shui B/T ↔ Lam Tin Station B/T	-	Monday to Friday morning peak hour service only
GMB	**44**	Tuen Mun Ferry Pier ↔ Sheung Shui Station	2 – 3	
	44A	Tuen Mun Station PTI ↔ Sheung Shui Station	2 – 5	
	50A	Sheung Shui Station ↔ Kwu Tung (South)	10 – 15	Circular route
	50K	Sheung Shui Station ↔ Hang Tau	5 – 25	
	51K	Sheung Shui Station ↔ Ho Sheung Heung	7 – 20	
	55K	Sheung Shui Station ↔ Sha Tau Kok (Shun Lung Street)	4 – 10	
	57K	Sheung Shui Station ↔ Tong Kung Leng	8 – 30	
	58K	Sheung Shui Station ↔ Ping Kong	10 – 30	
	58S	Mong Kok Station ↔ Sheung Shui Station	12 – 15	Night route
	59K	Sheung Shui Station ↔ Lin Ma Hang	15 – 60	

Route No.		Origin - Destination	Frequency (minutes)	Remarks
	501S	Sheung Shui Station ↔ Yue Man Square	15 – 20	Night route
	605	Ki Lun Tsuen ↔ Sheung Shui Station	25	

3 THE PROPOSED HOUSING DEVELOPMENT

3.1 Site Description

3.1.1 Site 1 is bounded by Choi Fai Street on the north, Choi Yuen Road on the south and Po Shek Wu Road on the east. It is zoned "Industrial" ("I") and currently an existing public car park under Short Term Tenancy (STT). The proposed PRH development will comprise of about 2,040 flats and is envisaged to be completed by Year 2024/2025 for Phase 1 (2 residential blocks) and Year 2027/2028 for Phase 2 (1 residential block and PTI). The site location and its environs in the vicinity are shown in **Figure 1**.

3.1.2 Site 2 is bounded by Ka Fu Close on the north, San Wan Road on the south and Po Shek Wu Road on the east. It is zoned "I" and "Other Specified Uses" annotated (Bus Depot) ("OU (Bus Depot)") and partly as an existing public car park under STT and partly as WSD's depot under TGLA. The proposed PRH development will comprise of about 1,480 flats (3 residential blocks) and is envisaged to be completed by Year 2025/2026. The site location and its environs in the vicinity are shown in **Figure 1**.

3.2 Development Schedule

3.2.1 **Table 3.1** below summarises the latest development schedule of proposed housing development.

Table 3.1 Summary of Development Schedule

Development	Site 1 (PRH)	Site 2 (PRH)
PRH	2,040 flats (For Assessment: 2,244 flats)*	1,480 flats (For Assessment: 1,628 flats)*
Retail	400 sqm GFA	700 sqm GFA
Post Office	N/A	560 sqm GFA
Welfare Facilities	8,710 sqm GFA	N/A
Kindergarten	6 classrooms	N/A
Avg. Household Size	2.8	2.8
Population	5,712 (For Assessment: 6,283)*	4,144 (For Assessment: 4,558)*

Notes:
*With additional 10% allowance for the proposed number of flats for assessment purpose.

3.3 Car Parking and Loading / Unloading Provision

3.3.1 The proposed provision of parking and loading/unloading facilities were provided by HKHA based on the Hong Kong Planning Standards and Guidelines (HKPSG). The proposed provisions described in **Table 3.2** have fully considered the subject development.

Table 3.2 Parking and Loading / Unloading Facilities Provision

Development	Facility	HKPSG Guideline	Requirement	Proposed Provision
Public Housing Development at Site 1 (PRH)				
PRH (2,040 flats, including 368 nos. of 1P/2P flats) (3 Residential Blocks)	Private Car Parking	1 per 26-40 flats (excluding 1P/ 2P flats)	42-65 nos.	65 + 15 (1) nos.
	Light Goods Vehicle Parking	1 per 200-600 flats (excluding 1P/ 2P flats)	3-9 nos.	9 nos.
	Motor cycle Parking	1 per 110-250 flats (excluding 1P/ 2P flats)	7-16 nos.	16 nos.
	Loading / Unloading	1 per residential block	3 nos.	3 nos.
	Bicycle Parking	1 per 15 flats	136 nos.	136 + 40 (1) nos.
Retail (400 sqm GFA)	Private Car Parking	1 per 200-300 sqm GFA	2 nos.	2 nos. parking spaces
	Loading / Unloading	1 per 800-1200 sqm GFA	1 no.	1 nos. loading/ unloading bay
Community Hall (1,050 sqm GFA)	Private Car Parking	As Per Operator's Requirements	-	
	Loading / Unloading		1 no.	
Welfare Facilities (8,710 m^2 GFA)	16-seater Van	As Per Operator's Requirements	1 no.	
	24-seater Van		1 no.	
	Loading / Unloading		1 no.	
Kindergarten (6 classrooms)	Private Car Parking	For schools and kindergartens within public housing estates, the carparking provisions, taxi and private car lay-bys and loading/unloading provisions should be subject to the requirements of Housing Authority.	1 no.	
	Loading / Unloading		1 no.	
Public Housing Development at Site 2 (PRH)				
PRH (1,480 flats including 175 nos. of 1P/2P flats) (3 Residential Blocks)	Private Car Parking	1 per 26-40 flats (excluding 1P/ 2P flats)	33 - 51 nos.	51 + 15 (1) nos.
	Light Goods Vehicle Parking	1 per 200-600 flats (excluding 1P/ 2P flats)	3-7 nos.	7 nos.
	Motor cycle Parking	1 per 110-250 flats (excluding 1P/ 2P flats)	6 - 12 nos.	12 nos.
	Loading / Unloading	1 per housing block	3 nos.	3 nos.
	Bicycle Parking	1 per 15 flats	99 nos.	99 + 40 (1) nos.
Retail (700 sqm GFA)	Private Car Parking	1 per 200-300 sqm GFA	3 - 4 nos.	4 nos.
	Loading / Unloading	1 per 800-1200 sqm GFA	1 no.	1 no.
Post Office (560 sqm GFA)	Goods Vehicle Parking	As Per Operator's Requirements	1 no.	

Note:
(1) Additional private car and bicycle parking provision in accordance with the agreement with Transport Department.

3.4 Access Arrangement / Pedestrian Facilities

Site 1

3.4.1 Vehicles can access the Site 1 at Choi Fai Street via Choi Yuen Road connecting to Po Shek Wu Road, which links to Jockey Club Road to the north and Fanling Highway to the south.

3.4.2 There will be 2 nos. of vehicular accesses for the Site to provide Emergency Vehicular Accesses (EVA). The detailed arrangement of the proposed vehicular accesses is indicated in **Figure 1**.

3.4.3 The internal road system within the proposed development is subject to detailed design. The Emergency Vehicular Access (EVA) should be of a minimum 6m in width wherever applicable in the internal road system and fully comply with requirements of "Code of Practices of Means of Access for Firefighting and Rescue" by Buildings Department.

3.4.4 The existing pedestrian facilities are well-developed in the vicinity of the Site. The existing footpath will be maintained on Choi Fat Street and Choi Yuen Road. Pedestrians can access the proposed development via the surrounding pedestrian facilities connecting to the nearby bus / GMB termini and MTR Sheung Shui Station.

3.4.5 A footbridge is proposed to connect the proposed development to the future public housing development site at Choi Yuen Road Sites 3 and 4 (now named as Po Shek Wu Estate), with new footbridges connecting to Po Shek Wu Road Site and the existing footbridge linking Choi Yuk House on the south and Landmark North on the north. An operational capacity assessment for existing pedestrian facilities have been conducted and will be discussed in **Section 5** to access the capability of existing facilities to cater for future demand.

Site 2

3.4.6 Vehicles can access the Site 2 at Ka Fu Close via San Po Street and Po Wan Road connecting to Po Shek Wu Road, which links to Jockey Club Road to the north and Fanling Highway to the south.

3.4.7 There will be 1 no. of vehicular access for the Site on Ka Fu Close and a separate vehicular access to serve the car park block via Ka Fu Close. The detailed arrangement of the proposed vehicular accesses is indicated in **Figure 1**.

3.4.8 The internal road system within the proposed development is subject to detailed design. The Emergency Vehicular Access (EVA) should be of a minimum 6m in width wherever applicable in the internal road system and fully comply with requirements of "Code of Practice for Fire Safety in Buildings 2011" by Buildings Department.

3.4.9 The existing pedestrian facilities are well-developed in the vicinity of the Site. The existing footpath will be maintained on San Wan Road and Ka Fu Close. A new footbridge is proposed to connect the proposed development to Po Shek Wu Road Site, with new footbridges connecting to Po Shek Wu Estate and the existing footbridge linking Choi Yuk House on the south and Landmark North on the north. The comprehensive footbridge network connecting different public housing developments will enhance the pedestrian accessibility. Details on the pedestrian facilities assessment will be discussed in **Section 5**.

3.4.10 In addition, a possible footbridge connection connecting the existing footbridge to Sheung Shui MTR Station would be provided subject to further investigation at detail design stage. **Figure 15** shows the overview of the proposed footbridge network in the vicinity of the subject site.

3.5 Re-provision of Private Car Parking Space

3.5.1 Separate parking study was conducted in 2016 to review the parking condition in vicinity of the proposed developments, it was observed that there would be shortfall in about 270 nos. of private car parking spaces after closure of the affected public car parks under STT (currently providing about 470 nos. of car parking spaces) as mentioned in Section 3.1.2.

3.5.2 Permanent re-provision of private car parking space will be provided in the new car park block at Site 2, providing about 300 nos. of private car parking spaces.

3.5.3 During the construction stage of proposed development and the new car park block which is planned to be commenced in early 2020, 300 nos. of private car parking spaces will be temporarily provided at portion of Site 1 and/or Site 2 under STT. Construction work at this portion of Site 1 and/or Site 2 will be commenced after the operation of the new car park block at Site 2 targeted in 2022. In conclusion, 300 nos. of private car parking space will always be provided during and after the construction works.

3.5.4 For goods vehicle parking, HKHA already suggested LandsD and relevant departments to make new STT sites and convert the existing STT car parks for goods vehicles and coach/bus parking only, in order to provide additional parking provision for large vehicles after closure of the concerned STT Car Parks for tackling the public car park issue in short term. For long term solution, it will be explored in the upcoming Phase 2 study of Sheung Shui Areas 4 and 30 pending the findings of Phase 1 Study.

4 FUTURE TRAFFIC CONDITIONS

4.1 Assessment Scenarios

4.1.1 To evaluate the associated traffic impact likely to be induced by the proposed change in land use, four scenarios were analysed and compared. The 1st and 3rd scenarios are Reference Scenario (without the proposed housing developments) in Year 2028 and 2031. The 2nd and 4th scenarios are Design Scenarios (with the proposed housing developments) in Year 2028 and 2031, respectively.

4.1.2 Taking into consideration that the proposed PRH development will be completed by 2027/2028 and phased commissioning of NDA development area and Fanling Bypass, years 2028 and 2031 were adopted as the design years in the study. The year 2028 scenario would demonstrate the traffic conditions in the study area after completion of the proposed PRH development. The year 2031 scenario would demonstrate the traffic conditions in the study area 3 years after completion of the proposed PRH development respectively, taking into account of the change of traffic pattern before/ after the phased commissioning of NDA development area and Fanling Bypass.

4.1.3 Four assessment scenarios were assessed for the design years, namely:

- 2028 Reference Case (2028 Background Traffic Flows including generated/attracted traffic related to other planned developments in the vicinity)
- 2028 Design Case (2028 Reference Case Traffic Flows + generated/attracted traffic related to the proposed PRH development)
- 2031 Reference Case (2031 Background Traffic Flows including generated/attracted traffic related to other planned developments in the vicinity)
- 2031 Design Case (2031 Reference Case Traffic Flows + generated/attracted traffic related to the proposed PRH development)

4.1.4 The methodology adopted to forecast the traffic for the future years is presented in the next section.

4.1.5 The forecasted traffic flows for above assessment scenarios are shown in **Figures 5** to **8**.

4.2 Forecasting Methodology

Proposed Area of Influence (AOI)

4.2.1 Area of Influence (AOI) is proposed and presented in **Figure 1**. It covers the critical road junctions and road networks in Sheung Shui Town, which may be affected by the proposed development in the Site. Necessary data and information within the AOI have been collected and assembled for assessments.

New Development Area (NDA)

4.2.2 Considering the traffic impact of the future development at New Development Area (NDA), it is expected that the future traffic patterns (i.e. design years 2028 and 2031) will be complex by the changes in the NDA. The complexity of growth in overall transport demand, coupled with the anticipated significant changes in pattern, would complicate the future traffic forecast. To maintain accuracy, it is recommended that comprehensive traffic forecast should be adopted, taking into account of the latest development proposal of NDA and the future road network and highway for the Year 2028 and Year 2031 traffic.

Other Planned/Committed Developments in the Vicinity of Site

4.2.3 Besides NDA, there are some other planned/committed developments in the vicinity of the Sites, including:

- Proposed Committed Public Housing Development at Po Shek Wu Estate;
- Proposed Public Housing Development at Po Shek Wu Road, Sheung Shui;
- Proposed Wholesale Conversion into Retail Development from Existing Advanced Technology Centre at No.2 Choi Fat Street, Sheung Shui;
- Proposed Wholesale Conversion into Office-cum-Retail Building from Existing Industrial Building at No.9 Choi Yuen Road, Sheung Shui;
- Proposed Wholesale Conversion into Retail Development at No. 6 Choi Fai Street, Sheung Shui; and
- Proposed Wholesale Conversion into Office-cum-Retail Building at No. 21 Po Wan Road, Sheung Shui

4.2.4 The estimated trips of these developments have also been reviewed and incorporated into the development of traffic forecast, as appropriate. Trip generation / attraction by proposed housing development of Po Shek Wu Estate are reference to the HKHA's Traffic Impact Assessment (TIA) Report for Po Shek Wu Estate. Trip generation / attraction of Site at Po Shek Wu Road are estimated from trip generation rates of public housing development stipulated in TPDM as shown in **Table 4.1**. Summary of the trip generation of these public housing development is given in **Table 4.2** respectively.

Table 4.1 Trip Generation / Attraction Rates for Public Housing Development at Po Shek Wu Road

Development Type	AM Peak		PM Peak	
	Generation	Attraction	Generation	Attraction
Subsidised Housing: HOS/PSPS/SSF (pcu/flat/hr) (1)	0.0622	0.0426	0.0297	0.0401
Retail / Shopping Complex (pcu/hr/100 m2 GFA) (1)	0.2296	0.2434	0.3100	0.3563

Note:
(2) Reference to "Traffic Rates for Residential Developments at 95% Confidence Level", Transport Planning and Design Manual (TPDM), Volume 1

Table 4.2 Estimated Trip Generation / Attraction for other Planned Public Housing Development in the Vicinity of the Sites

Development	AM Peak		PM Peak	
	Generation	Attraction	Generation	Attraction
Public Housing Development at Po Shek Wu Estate (1)				
PRH (Planned: 1,160 flats) (1)	65	53	34	41
Retail (790 m^2 GFA) (1)	2	2	3	3
6-Classroom Kindergarten, Welfare facilities (2,604 m^2 GFA) (1)	30	30	30	30
Public Car Park (221 nos. of space) (1)	18	35	42	40
Total of Po Shek Wu Estate	**115**	**120**	**109**	**114**
Public Housing Development at Po Shek Wu Road				
SSF (Planned: 1,850 flats)	115	79	55	74
Retail (3,000 m^2 GFA)	7	7	9	11
Kindergarten (6-Classroom) (2)	30	30	30	30
Total of Site at Po Shek Wu Road	**152**	**116**	**94**	**115**

Note:
(1) Trip generation / attraction of Po Shek Wu Estate are reference to HKHA's TIA Report of Po Shek Wu Estate; and
(2) For the kindergarten and welfare facilities, a nominal traffic of total 30 pcu/hr each way is assumed for these facilities as a conservative approach, in view of the minimal trips induced on the road networks during ordinary peak hours.

4.2.5 Trip generation / attraction by planned private retail and office development are reference to the Traffic Impact Assessment (TIA) Report by the corresponding developers under the S.16 Application.

Summary of the trip generation of these private development is given in **Table 4.3** respectively.

Table 4.3 Estimated Trip Generation / Attraction for Other Planned Private Development in the Vicinity of the Sites

Development	AM Peak		PM Peak	
	Generation	Attraction	Generation	Attraction
Proposed Wholesale Conversion into Retail Development from Existing Advanced Technology Centre at No.2 Choi Fat Street, Sheung Shui (1)	24	16	15	19
Proposed Wholesale Conversion into Office-cum-Retail Building from Existing Industrial Building at No.9 Choi Yuen Road, Sheung Shui (2)	45	64	37	34
Proposed Wholesale Conversion into Retail Development at No. 6 Choi Fai Street, Sheung Shui (3)	69	73	93	107
Proposed Wholesale Conversion into Office-cum-Retail Building at No. 21 Po Wan Road, Sheung Shui (3)	9	12	12	12

Note:
(1) Trip generation / attraction are reference to the net changes of trip generation / attraction stipulated in Developer's TIA Report under the S.16 Application No. A/FSS/246;
(2) Trip generation / attraction are reference to the net changes of trip generation / attraction stipulated in Developer's TIA Report under the S.16 Application No. A/FSS/241; and
(3) Trip generation / attraction are reference to the estimated trip generation / attraction stipulated in TIA Report under S.16 Application No. A/FSS/241.

2-Tier Transport Modelling

4.2.6 A two-tier modelling approach was adopted. The upper tier involved the use of Arup's in-house CTS-compatible Traffic Model (TM) which produced traffic forecasts on a strategic basis. The cordoned matrices from the TM would then be input into the lower tier Local Area Traffic Model (LATM) which would be used to predict the future year traffic flow on a more local perspective. The modelling approach is elaborated in the following sections.

Upper Tier Model

4.2.7 Arup's in-house CTS-compatible TM was applied as the upper tier model. The TM was capable of producing trip matrices for the base and future years throughout the territory. The TM also offered the advantage of being capable of reflecting the traffic impacts especially the mode choice caused due to changes of road networks. It was hence recommended to adopt this model as the basis, and updated using the latest available planning data in the Enhanced 2011-based Territorial Population and Employment Data Matrix (TPEDM), planned and committed new infrastructures and local developments, including private development at Castle Peak Road – Kwu Tung (Rezoning Application No. Y/FSS/14), private development at Pak Wo Road 5

(Rezoning Application No. Y/FSS/13), public housing development at Sheung Shui Area 36 Phase 4 (Ching Ho Extension), Kong Nga Po Police Facilities and Sandy Ridge Columbarium and Crematorium Development for this study.

4.2.8 In order to ensure the traffic patterns predicted by the model could reasonably replicate the current traffic condition and hence provided confidence in forecasting the future year traffic, the output from the base year TM was compared against observed traffic flows as published in the Annual Traffic Census for both the AM and PM peak hours.

Lower Tier Model

4.2.9 Matrices cordoned from the TM were input into the LATM. Despite the LATM only performs traffic assignment, it offered the benefit of giving more detailed accounting of queuing, junction control and delays, making it more suitable for the evaluation of localized traffic impacts.

4.2.10 The development of the LATM would follow the same approach as TD's latest 2008-based Base District Traffic Model (BDTM). The compatibility between the 2 tiers was ensured by the control of the external trip ends, which were essentially the link flows of Fanling Highway, Fan Kam Road, Castle Peak Road – Kwu Tung, obtained from the TM. The link flows and junction turning counts on a more local level would be produced by the LATM assignments for subsequent impact assessments.

4.2.11 Validation was also carried out for the LATM and additional focus was given to the comparison of observed and modelled flows at both strategic and local road links. Supplementary traffic survey had been conducted to provide traffic flows and turning counts which were not available in the Annual Traffic Census.

4.2.12 As survey counts represented the Year 2017 observed traffic flows, it was proposed to adopt Year 2017 as the LATM base year, and the LATM was validated to Year 2017 conditions.

4.2.13 The LATM has been developed for the area of N.T. North District, in which the traffic condition could be fully represented.

Trip Generation / Attraction for Proposed Public Housing Development of Sites 1 and 2 at Sheung Shui Areas 4 and 30

4.2.14 For the proposed development trip generation and attraction, trip rates were made reference to Transport Department's Transport Planning and Design Manual (TPDM) Volume 1 Chapter 3 - Transport Considerations in Town Plans. The adopted trip rates for the proposed PRH development are shown in **Table 4.4**.

Table 4.4 Adopted Trip Generation / Attraction Rates for Proposed Housing Development Sites 1 and 2

Development	AM Peak		PM Peak	
	Generation	Attraction	Generation	Attraction
Subsidised Housing: Public Rental Average Flat Size of 30sqm (pcu/flat/hr) (1)	0.0242	0.0226	0.0177	0.0201
Retail / Shopping Complex (pcu/hr/100 m^2 GFA) (1)	0.2296	0.2434	0.3100	0.3563

Source:
(1) 'Traffic Rates for Residential Developments at 95% Confidence Level', Transport Planning and Design Manual (TPDM), Volume 1

4.2.15 Trip rates of proposed PRH development had also been referenced to the traffic generation survey conducted at the similar development in North District. The traffic generation surveys were undertaken during AM & PM peak hours on a normal weekday. The observed peak traffic generation rates are tabulated in **Table 4.5**.

Table 4.5 Summary on Surveyed Trip Rates at Existing Public Housing Development in North District

Development	AM Peak		PM Peak	
	Generation	Attraction	Generation	Attraction
PRH: Wah Ming Estate – 5,340 flats (pcu/flat/hr)	0.0171	0.0125	0.0073	0.0127
PRH: Ching Ho Estate – 7,200 flats (pcu/flat/hr)	0.0175	0.0085	0.0078	0.0158

4.2.16 For public housing development, it is observed that the surveyed trips rates for both AM and PM peaks shown in **Table 4.5** are much lower than the mean values of PRH stated in TPDM according to **Table 4.4**. It is therefore recommended to adopt the mean values of PRH stated in TPDM for conservative assessment purpose.

4.2.17 For Site 1, there are about 2,040 flats in the PRH development, 400 sqm GFA of retail facilities, 8,710 sqm GFA of social welfare facilities, 777 sqm GFA of kindergarten. To adopt a conservative approach for the subject planned housing sites, a 10% increase in flat number (i.e. 2,244 flats for PRH) is adopted for estimating the traffic generated / attracted by the development for traffic impact assessment purpose. For the kindergarten and welfare facilities in the Site, a nominal traffic of total 30 pcu/hr each way is assumed for these facilities, since they are expected to induce minimal trips on the road network.

4.2.18 For Site 2, there are about 1,480 flats in the PRH development, 700 sqm GFA of retail facilities, 560 sqm GFA of post office and a public car park in the Site. To adopt a conservative approach for the subject planned housing sites, a 10% increase in flat number (i.e. 1,628 flats for PRH) is adopted for estimating the traffic generated / attracted by the development for traffic impact assessment purpose. On the other hand, as the subject site is currently a public car park (providing about 470

nos. of private car parking space), the proposed future car park (providing about 300 nos. of private car parking space) should not induce additional increase of traffic in view of the similar use as existing facilities. It is also considered to be conservative in view of the smaller scale of the proposed car park compared with the existing car park. On the other hand, as the traffic generated / attracted from/to the post office are expected to fall outside the peak hours and would be minimal during the peak hours, the traffic from these facilities are neglected in the assessment.

4.2.19 The traffic generation by the proposed development are summarised in **Table 4.6**. The total trips would be around 249 and 218 two-way pcus/hr during the AM and PM peak periods respectively.

Table 4.6 Estimated Trips for the Subject Site

Development	AM Peak		PM Peak	
	Generation	**Attraction**	**Generation**	**Attraction**
Public Housing Development at Site 1				
PRH *(Planned: 2,040 flats Assessment Purpose: 2,244 flats) (1)	55	51	40	46
Retail (400 m^2 GFA)	1	1	2	2
Kindergarten (6 classrooms) and Welfare facilities (8,710 m^2 GFA)	30	30	30	30
Total of Site 1	**86**	**82**	**72**	**78**
Public Housing Development at Site 2				
PRH *(Planned: 1,480 flats Assessment Purpose: 1,628 flats) (1)	40	37	29	33
Retail (700 m^2 GFA)	2	2	3	3
Public Car Park (about 300 spaces)	no additional traffic generated / attracted are expected in view of the existing car park within the site			
Post Office (560 m^2 GFA)	traffic generated / attracted are expected to fall outside the peak hours and would be minimal during the peak hours			
Total of Site 2	**42**	**39**	**32**	**36**
Total (Site 1+ Site 2)	**128**	**121**	**104**	**114**

Note:
(1) With additional 10% allowance for the proposed number of flats

Planned/ Committed Junction Improvement Schemes by Other Projects

4.2.20 Junction improvement schemes were recommended in other study of projects in the vicinity of the Sites. The junction improvement schemes, which are considered in the study, are summarized in **Table 4.7** below. The junction improvement schemes considered are based on the latest public available information. The general arrangement are shown as **Appendix A**.

Table 4.7 Summary of Junction Improvement Schemes by Others

Junction (1)		Type	Description	Completion Year	Design Scenarios Considered	Drawing No. in Appendix A (2)
J3	Po Shek Wu Road / Choi Yuen Road	Signal	Phase 1 ➢ Lane arrangement of the Choi Yuen Road westbound to be revised for providing two left-turn lanes Phase 2 ➢ Po Shek Wu Interchange Improvement which provides a flyover to allow the right turning traffic from Po Shek Wu Road southbound to Fanling Highway westbound to bypass the existing Po Shek Wu Interchange ➢ Po Shek Wu Road southbound would be narrowed from 5 lanes to 4 lanes	Already Completed under Queen's Hill Project (Phase 1) Year 2029 (Phase 2)	Year 2028 (Phase 1) Year 2031 (Phase 2)	A1, A2
J5	Jockey Club Road / Lung Sum Avenue	Signal	➢ Lane arrangement of the Lung Sum Avenue northbound/southbound to be revised for allowing straight-ahead traffic to use two traffic lanes ➢ Widening the Lung Sum Avenue northbound by narrowing the central median of Lung Sum Avenue	Year 2021	Year 2028 & Year 2031	A3
J7	So Kwun Po Road Interchange	Roundabout	➢ Local widening of southbound approach arm of So Kwun Po Road for a smoother entrance to the elevated roundabout	Year 2021	Year 2028 & Year 2031	A4

Junction [1]		Type	Description	Completion Year	Design Scenarios Considered	Drawing No. in Appendix A [2]
J8	Po Shek Wu Road Interchange	Roundabout	➢ Local widening of southbound approach arm of Po Shek Wu Road to 10m to have two traffic lanes when approaching the roundabout	Year 2021	Year 2028 & Year 2031	A5

Notes:
[1] Please refer to **Figure 1** for the location of the assessed junctions.
[2] The general arrangement of junction improvement scheme are shown in **Appendix A**.
[3] Road L4 and Kwu Tung Interchange are assumed to be in place in Year 2029 assessment scenarios.

4.3 Junction Capacity Assessment

4.3.1 Junction and link capacity assessment were undertaken based on the methodology presented in the TPDM. The results for the 2028 and 2031 reference and design cases are shown in **Tables 4.8 - 4.11**.

Table 4.8 Summary of Junction Performance – Year 2028

Junction [1]		Type	Junction Performance			
			Reference Case [2]		Design Case [2]	
			AM	PM	AM	PM
J1	Jockey Club Road / Po Shek Wu Road	Roundabout	0.42	0.54	0.42	0.54
J2	Po Shek Wu Road / Po Wan Road	Signal	2%	7%	-4%	5%
J3	Po Shek Wu Road / Choi Yuen Road	Signal	8%	9%	4%	5%
J4	Choi Yuen Road / Pak Wo Road	Roundabout	0.52	0.53	0.54	0.54
J5	Jockey Club Road / Lung Sum Avenue	Signal	-2%	25%	-4%	23%
J6	Jockey Club Road / So Kwun Po Road	Signal	-26%	-10%	-27%	-10%
J7	So Kwun Po Road Interchange	Roundabout	1.00	1.02	1.00	1.02
J8	Po Shek Wu Road Interchange	Roundabout	0.89	0.94	0.92	0.96
J9	Po Wan Road / San Po Street	Signal	77%	>100%	68%	>100%
J10	San Wan Road / San Po Street	Priority	0.31	0.08	0.31	0.08
J11	Choi Yuen Road / Choi Fai Street	Priority	0.33	0.33	0.41	0.44
J12	Choi Fat Street / Choi Fai Street	Priority	0.14	0.15	0.23	0.28
J13	Ka Fu Close / San Po Street	Priority	0.06	0.03	0.12	0.06
J14	Ka Fu Close / Cheuk Wan Street	Priority	0.10	0.08	0.11	0.10

Notes:
[1] Please refer to **Figure 1** for the location of the assessed junctions; and
[2] Figures shown represent "Reserve Capacity" (RC) for the signal controlled junctions and "Design Flow to Capacity" (DFC) ratio for the roundabout. A signal-controlled junction with a reserve capacity (RC) of 0% implies that it is operating at capacity while a negative RC suggests that the junction is overloaded. RC >= 15 % implies that the signal-controlled junction is operating satisfactory. For roundabout, the performance indicator is the DFC. DFC ratio of 1.00 indicates continual queuing and could not be considered acceptable. A DFC ratio of 0.85, indicating that queuing would theoretically be avoided in 85% of cases, can be

considered reasonable. A DFC of 0.70 indicates that queuing will be avoided in 0.95 of cases.

Table 4.9 Year 2028 Road Link Performance

Road Links		Direction	Capacity (pcu/hr) (1)	Road Link Performance							
				Reference Case				Design Case			
				Flow (pcu/hr)		V/C Ratio (2)		Flow (pcu/hr)		V/C Ratio (2)	
				AM	PM	AM	PM	AM	PM	AM	PM
L1	Po Shek Wu Road – Section between Choi Yuen Road and Fanling Highway	NB	3,000	1,940	2,410	0.65	0.80	2,035	2,495	0.68	0.83
		SB	3,000	2,530	2,625	0.84	0.88	2,595	2,690	0.87	0.90
L2	Po Shek Wu Road – Section between Choi Yuen Road and Po Wan Road	NB	2,800	1,815	1,875	0.65	0.67	1,850	1,900	0.66	0.68
		SB	2,800	1,715	1,860	0.61	0.66	1,745	1,890	0.62	0.68
L3	Po Shek Wu Road – Section between Jockey Club Road and Po Wan Road	NB	2,800	1,045	1,360	0.37	0.49	1,080	1,370	0.39	0.49
		SB	2,800	1,220	1,640	0.44	0.59	1,230	1,650	0.44	0.59
L4	Po Wan Road	EB	900	285	220	0.32	0.24	315	240	0.35	0.27
		WB	1,800	575	195	0.32	0.11	615	220	0.34	0.12
L5	San Wan Road	EB	1,800	205	150	0.11	0.08	220	160	0.12	0.09
		WB	1,800	135	95	0.08	0.05	140	105	0.08	0.06
L6	Choi Fat Street	EB	900	55	100	0.06	0.11	135	180	0.15	0.20
		WB	900	95	70	0.11	0.08	155	135	0.17	0.15
L7	Choi Yuen Road	EB	2,700	445	350	0.16	0.13	505	410	0.19	0.15
		WB	1,800	395	520	0.22	0.29	480	600	0.27	0.33

Note:

(1) Road capacity is defined in accordance to STM Model and TPDM Volume 2 Chapter 2.4 Table 2.4.1.1 by converting the vehicles to pcu for analysis;

(2) A V/C ratio of 0.7 might infer adequate operating conditions, the effect of junctions or traffic signals both within and at the end of the road link may be such that the design flow could never be achieved in practice, and the link might be severely congested well before a V/C ratio of 1.0 is reached.

Table 4.10 Summary of Junction Performance – Year 2031

Junction [1]		Type	Junction Performance			
			Reference Case [2]		Design Case [2]	
			AM	PM	AM	PM
J1	Jockey Club Road / Po Shek Wu Road	Roundabout	0.54	0.55	0.55	0.55
J2	Po Shek Wu Road / Po Wan Road	Signal	-7%	-5%	-8%	-6%
J3	Po Shek Wu Road / Choi Yuen Road	Signal	15%	15%	12%	13%
J4	Choi Yuen Road / Pak Wo Road	Roundabout	0.48	0.43	0.48	0.44
J5	Jockey Club Road / Lung Sum Avenue	Signal	0%	33%	-2%	31%
J6	Jockey Club Road / So Kwun Po Road	Signal	-28%	-14%	-29%	-14%
J7	So Kwun Po Road Interchange	Roundabout	1.04	1.02	1.04	1.02
J8	Po Shek Wu Road Interchange	Roundabout	0.79	0.75	0.82	0.77
J9	Po Wan Road / San Po Street	Signal	86%	>100%	76%	>100%
J10	San Wan Road / San Po Street	Priority	0.31	0.10	0.31	0.10
J11	Choi Yuen Road / Choi Fai Street	Priority	0.32	0.42	0.44	0.53
J12	Choi Fat Street / Choi Fai Street	Priority	0.15	0.20	0.26	0.32
J13	Ka Fu Close / San Po Street	Priority	0.03	0.03	0.10	0.07
J14	Ka Fu Close/ Cheuk Wan Street	Priority	0.09	0.07	0.10	0.09

Notes:

[1] Please refer to **Figure 1** for the location of the assessed junctions; and

[2] Figures shown represent "Reserve Capacity" (RC) for the signal controlled junctions and "Design Flow to Capacity" (DFC) ratio for the roundabout. A signal-controlled junction with a reserve capacity (RC) of 0% implies that it is operating at capacity while a negative RC suggests that the junction is overloaded. RC >= 15 % implies that the signal-controlled junction is operating satisfactory. For roundabout, the performance indicator is the DFC. DFC ratio of 1.00 indicates continual queuing and could not be considered acceptable. A DFC ratio of 0.85, indicating that queuing would theoretically be avoided in 85% of cases, can be considered reasonable. A DFC of 0.70 indicates that queuing will be avoided in 0.95 of cases.

Table 4.11 Year 2031 Road Link Performance

Road Links		Direction	Capacity (pcu/hr) [1]	Road Link Performance							
				Reference Case				Design Case			
				Flow (pcu/hr)		V/C Ratio [2]		Flow (pcu/hr)		V/C Ratio [2]	
				AM	PM	AM	PM	AM	PM	AM	PM
L1	Po Shek Wu Road – Section between Choi Yuen Road and Fanling Highway	NB	3,000	2,140	2,565	0.71	0.86	2,230	2,645	0.74	0.88
		SB	3,000	1,865	1,990	0.62	0.66	1,920	2,050	0.64	0.68
L2	Po Shek Wu Road – Section between Choi Yuen Road and Po Wan Road	NB	2,800	1,825	1,850	0.65	0.66	1,860	1,875	0.66	0.67
		SB	2,800	1,055	1,085	0.38	0.39	1,075	1,110	0.38	0.40
L3	Po Shek Wu Road – Section between Jockey Club Road and Po Wan Road	NB	2,800	1,130	1,455	0.40	0.52	1,160	1,465	0.41	0.52
		SB	2,800	1,690	1,725	0.60	0.62	1,700	1,735	0.61	0.62
L4	Po Wan Road	EB	900	275	280	0.31	0.31	310	300	0.34	0.33
		WB	1,800	550	195	0.31	0.11	585	220	0.33	0.12

Road Links		Direction	Capacity (pcu/hr) (1)	Road Link Performance							
				Reference Case				Design Case			
				Flow (pcu/hr)		V/C Ratio (2)		Flow (pcu/hr)		V/C Ratio (2)	
				AM	PM	AM	PM	AM	PM	AM	PM
L5	San Wan Road	EB	1,800	205	125	0.11	0.07	215	135	0.12	0.08
		WB	1,800	120	135	0.07	0.08	125	145	0.07	0.08
L6	Choi Fat Street	EB	900	85	130	0.09	0.14	165	205	0.18	0.23
		WB	900	100	70	0.11	0.08	155	130	0.17	0.14
L7	Choi Yuen Road	EB	2,700	470	355	0.17	0.13	530	415	0.20	0.15
		WB	1,800	510	635	0.28	0.35	590	710	0.33	0.39

Note:
(1) Road capacity is defined in accordance to STM Model and TPDM Volume 2 Chapter 2.4 Table 2.4.1.1 by converting the vehicles to pcu for analysis;
(2) A V/C ratio of 0.7 might infer adequate operating conditions, the effect of junctions or traffic signals both within and at the end of the road link may be such that the design flow could never be achieved in practice, and the link might be severely congested well before a V/C ratio of 1.0 is reached.

4.3.2 All analysed results revealed the assessed junctions and links would still be performing with desirable capacity in Year 2028 and 2031, except for Junctions J2 - Po Shek Wu Road / Po Wan Road, J3 - Po Shek Wu Road / Choi Yuen Road, J5 - Jockey Club Road / Lung Sum Avenue, J6 - Jockey Club Road / So Kwun Po Road, J7 - So Kwun Po Road Interchange and J8 - Po Shek Wu Road Interchange (in Year 2028). Improvement measures are proposed and discussed in succeeding sections.

4.4 Proposed Junction Improvement Schemes

Proposed Junction Improvement of Junction J2 – Po Shek Wu Road / Po Wan Road, J3 - Po Shek Wu Road / Choi Yuen Road, J5 - Jockey Club Road / Lung Sum Avenue and J8 - Po Shek Wu Road Interchange

4.4.1 Under the CEDD's project "Site Formation and Infrastructure Works for Police Facilities in Kong Nga Po" (hereafter named Kong Nga Po Project), junction improvement schemes are proposed in North District, including J2 – J/O Po Shek Wu Road / Po Wan Road, J3 - Po Shek Wu Road / Choi Yuen Road, J5 - Jockey Club Road / Lung Sum Avenue and J8 - Po Shek Wu Road Interchange. The site formation and infrastructure works, with the corresponding proposed junction improvement works, are tentatively be completed before the population intake year of the subject development under the current available information, while the junction improvement work will be implemented under NDA project as confirmed by CEDD.

4.4.2 The details of the proposed junction improvement schemes are summarized as follows. The general layout of the proposed junction improvement scheme is shown in **Appendix B**:

Junction J2 – Po Shek Wu Road / Po Wan Road

4.4.3 Under the Kong Nga Po Project, the improvement scheme will mainly include the modification of lane configurations at Po Shek Wu Road and Po Wan Road:

a) Lane arrangement of Po Shek Wu Road southbound to be revised for allowing straight-ahead traffic to use three traffic lanes; and

b) Lane arrangement of Po Wan Road eastbound to be revised for allowing right-turn traffic to use two traffic lanes

c) Local widening of Po Shek Wu Road southbound from 2 to 3 lanes

4.4.4 However, the junction J2 would still be operating close to capacity with the above improvement scheme in place. Thus, the following further enhancement is proposed under this study for implementation in Year 2028 and 2031, and to be implemented by the NDA project. HKHA will closely liaise with the NDA project on the details of the junction improvement scheme in later design stage, in order to implement the junction improvement scheme before population intake of the proposed public housing development:

a) Lane arrangement of Po Shek Wu Road northbound to be revised for allowing left-turn traffic to use two traffic lanes; and

b) Local widening of Po Wan Road westbound from 1 to 2 lanes

Junction J3 - Po Shek Wu Road / Choi Yuen Road

4.4.5 The improvement scheme will include local widening of Po Shek Wu Road northbound to allow straight-ahead traffic to use three traffic lanes.

Junction J5 - Jockey Club Road / Lung Sum Avenue

4.4.6 The improvement scheme will include widening of Jockey Club Road and Lung Sum Avenue:

a) Local widening with one additional straight-ahead traffic lane on Jockey Club Road eastbound

b) Local widening with one additional straight-ahead traffic lane on Lung Sum Avenue northbound

Junction J8 – Po Shek Wu Road Interchange

4.4.7 The improvement scheme will include local widening of the entry arm of Fanling Highway westbound slip road from existing two lanes to three lanes. The widening works is not at the critical arm of the roundabout and will not result in changes in Design Flow to Capacity (DFC). However, the local widening of entry arm will enhance the left-turn traffic to Fan Kam Road southbound by increasing the available queuing length for traffic entering the circulation lanes of the interchange.

<u>Proposed Junction Improvement of J6 - Jockey Club Road / So Kwun Po Road</u>

4.4.8 Junction improvement schemes at J6 - Jockey Club Road / So Kwun Po Road are being reviewed and explored under NDA, which includes:

a) Lane arrangement of the Jockey Club Road northbound to be revised for allowing left-turn traffic to use two traffic lanes; and

b) Method-of-Control (MOC) to be revised for minimizing / optimizing the intergreen time

c) Lane arrangement of Ma Sik Road southbound to be revised for allowing three traffic lanes for vehicles to travel straight ahead

d) Local widening of So Kwun Po Road southbound from 2 to 3 lanes

4.4.9 However, the junction J6 would still be operating over capacity with the above improvement scheme in place in both Year 2028 and 2031. Thus, the following further enhancement is proposed under this study for implementation:

a) Local widening with one additional straight-ahead traffic lane on So Kwun Po Road northbound

b) Local widening of Ma Sik Road northbound from 2 to 3 lanes

4.4.10 HKHA will closely liaise with the NDA project on the details and implementation of the junction improvement scheme.

4.4.11 The general layout of the proposed junction improvement scheme is shown in **Appendix B**.

4.4.12 With the above proposed junction improvement schemes in place, the results of junction capacity assessment of Junctions J2, J3, J5, J6 and J8 are shown in **Table 4.12** below:

Table 4.12 Summary of Junction Performance – With Proposed Junction Improvement Schemes in Place

Junction [1]		Type	Junction Performance [2]							
			Year 2028				Year 2031			
			Reference Case		Design Case		Reference Case		Design Case	
			AM	PM	AM	PM	AM	PM	AM	PM
J2	Po Shek Wu Road / Po Wan Road	Signal	23%	24%	18%	22%	20%	14%	15%	12%
J3	Po Shek Wu Road / Choi Yuen Road	Signal	14%	14%	11%	10%	15%	16%	12%	13%
J5	Jockey Club Road / Lung Sum Avenue	Signal	17%	58%	14%	57%	20%	52%	17%	50%
J6	Jockey Club Road / So Kwun Po Road	Signal	10%	32%	10%	32%	11%	27%	11%	26%
J8	Po Shek Wu Road Interchange [3]	Round about	0.89	0.94	0.92	0.96	0.79	0.75	0.82	0.77

Notes:

(1) Junction Improvement Scheme had been incorporated in both reference and design case; and

(2) Figures shown represent "Reserve Capacity" (RC) for the signal controlled junctions and "Design Flow to Capacity" (DFC) ratio for the roundabout. A signal-controlled junction with a reserve capacity (RC) of 0% implies that it is operating at capacity while a negative RC suggests that the junction is overloaded. RC >= 15 % implies that the signal-controlled junction is operating satisfactory. For roundabout, the performance indicator is the DFC. DFC ratio of 1.00 indicates

continual queuing and could not be considered acceptable. A DFC ratio of 0.85, indicating that queuing would theoretically be avoided in 85% of cases, can be considered reasonable. A DFC of 0.70 indicates that queuing will be avoided in 0.95 of cases.

(3) The proposed widening works is not at the critical arm of the roundabout and thus does not result in changes in Design Flow to Capacity (DFC).

4.4.13 With the proposed junction improvement scheme in place, performance of all junction would be improved with RC higher than those before the proposed housing developments in place (i.e. Reference Case as presented in **Tables 4.8 and 4.10**). HKHA will closely liaise with the relevant government departments on the details of the junction improvement scheme in later design stage, in order to implement the junction improvement scheme before population intake of the proposed public housing development. HKHA will consider taking up the junction improvement works at J2 and J3 as described in Section 4.4.4 and 4.4.5 respectively, in which the traffic generated/attracted by the proposed housing development have direct impact to these junctions, by government funding in case the junction improvement works undertaken by others could not meet HKHA's population intake of the proposed housing development.

4.4.14 The proposed road improvement works under Kong Nga Po project by CEDD would be implemented under NDA project by CEDD as confirmed by CEDD.

4.5 Proposed Improvement Scheme at Po Shek Wu Road

4.5.1 To further enhance the vehicular accessibility in the vicinity of the proposed housing sites and alleviate the existing traffic queue problem on Po Shek Wu Road southbound, a improvement scheme at Po Shek Wu Road Southbound is shown in **Figure 9**. The improvement scheme consists of widening the Po Shek Wu Road Southbound (Section between Fanling Highway and Choi Yuen Road) with 1 no. of additional lane.

4.5.2 As mentioned in Section 2.4, Po Shek Wu Road Interchange is currently operating close to its capacity, mainly due to high traffic volume from Po Shek Wu Road Southbound approach arm. Due to the short available queuing length for vehicles waiting to enter the interchange, the left-turn traffic to Fanling Highway Eastbound would frequently be hindered from the vehicle queue at the interchange. Vehicles would easily queue up along Po Shek Wu Road Southbound, reaching Choi Yuen Road (i.e. Junction J3 - Po Shek Wu Road / Choi Yuen Road), and further extend to Po Wan Road (i.e. Junction J2 - Po Shek Wu Road / Po Wan Road) at intermittent critical condition.

4.5.3 The proposed improvement scheme will widen Po Shek Wu Road Southbound to 3 nos. of lanes all the way. This could accommodate an additional lane with approximately 300m in length. The total available length of traffic lanes for queueing at existing condition and after

implementation of the proposed improvement scheme are summarized in **Table 4.13**.

Table 4.13 Summary of Available Length of Traffic Lanes for Queuing of Po Shek Wu Road Southbound (Section between Po Shek Wu Road Interchange and Choi Yuen Road)

Location	Available Length of Traffic Lanes for Queuing (m)	
	Existing (2 lanes)	With Possible Improvement Scheme in Place (3 lanes)
Po Shek Wu Road Southbound (Section between Po Shek Wu Road Interchange and Choi Yuen Road)	~600	~850

4.5.4 The traffic entering the interchange could utilize either middle or right lane, and the traffic to Fanling Highway Eastbound can enter the dedicated left-turn lane by utilizing the additional lane at Po Shek Wu Road Southbound. It is anticipated that the traffic condition at Po Shek Wu Road Southbound could be improved by minimizing the weaving movements and increasing the queuing length.

4.5.5 CEDD Civil Engineering Office will undertake the improvement of Po Shek Wu Road. The implementation details, design and construction responsibility will be further investigated in the later design stage.

4.5.6 With the proposed Po Shek Wu Road widening scheme in place, the results of link capacity assessment of Link L1 – Po Shek Wu Road southbound (Section between Choi Yuen Road and Fanling Highway) for Year 2028 and 2031 are summarized in **Table 4.14** and **4.15** respectively.

Table 4.14 Summary of Road Link Performance in Year 2028 – With Proposed Po Shek Wu Road Widening Schemes in Place

Road Links		Direction	Capacity (pcu/hr) [1]	Road Link Performance							
				Reference Case				Design Case			
				Flow (pcu/hr)		V/C Ratio [2]		Flow (pcu/hr)		V/C Ratio [2]	
				AM	PM	AM	PM	AM	PM	AM	PM
L1	Po Shek Wu Road – Section between Choi Yuen Road and Fanling Highway	SB	Before Widening 3,000	2,530	2,625	0.84	0.88	2,595	2,690	0.87	0.90
		SB	After Widening 4,700	2,530	2,625	0.54	0.56	2,595	2,690	0.55	0.57

Note:
[1] Road capacity is defined in accordance to STM Model and TPDM Volume 2 Chapter 2.4 Table 2.4.1.1 by converting the vehicles to pcu for analysis;
[2] A V/C ratio of 0.7 might infer adequate operating conditions, the effect of junctions or traffic signals both within and at the end of the road link may be such that the design flow could never be achieved in practice, and the link might be severely congested well before a V/C ratio of 1.0 is reached.

Table 4.15 Summary of Road Link Performance in Year 2031 – With Proposed Po Shek Wu Road Widening Schemes in Place

Road Links		Direction	Capacity (pcu/hr) [1]	Road Link Performance							
				Reference Case				Design Case			
				Flow (pcu/hr)		V/C Ratio [2]		Flow (pcu/hr)		V/C Ratio [2]	
				AM	PM	AM	PM	AM	PM	AM	PM
L1	Po Shek Wu Road – Section between Choi Yuen Road and Fanling Highway	SB	Before Widening 3,000	1,865	1,990	0.62	0.66	1,920	2,050	0.64	0.68
		SB	After Widening 4,700	1,865	1,990	0.40	0.42	1,920	2,050	0.41	0.44

Note:
[1] Road capacity is defined in accordance to STM Model and TPDM Volume 2 Chapter 2.4 Table 2.4.1.1 by converting the vehicles to pcu for analysis;
[2] A V/C ratio of 0.7 might infer adequate operating conditions, the effect of junctions or traffic signals both within and at the end of the road link may be such that the design flow could never be achieved in practice, and the link might be severely congested well before a V/C ratio of 1.0 is reached.

4.5.7 It is revealed that the widening work will greatly improve the link performance (i.e. reducing the V/C ratio of Po Shek Wu Road southbound from 0.90 to 0.57 during the most critical 2028 design case PM peak).

4.5.8 It is worth to note that the future Po Shek Wu Interchange Improvement which provides a flyover to allow the right turning traffic from Po Shek Wu Road southbound to Fanling Highway westbound and bypass the existing Po Shek Wu Interchange. The traffic flow on Po Shek Wu Road southbound, between Choi Yuen Road and Fanling Highway, will be reduced by about 24% to 26% (by comparing the 2028 and 2031 traffic flows in **Tables 4.14 and 4.15** respectively) and the traffic queue problem is expected to be further alleviated.

4.6 Other Improvement Schemes to Existing Interchanges

4.6.1 Besides the future Po Shek Wu Interchange Improvement, it is noted that the government is planning to carry out a feasibility study for a new infrastructure connecting the northern and southern side of Fanling Highway. The new North South Link will be able to divert traffic and relieve the traffic condition in the existing interchanges, i.e. Junctions J7 – So Kwun Po Road Interchange and J8 –Po Shek Wu Road Interchange.

4.6.2 **Table 4.16** summarizes the improvement scheme as proposed amongst different concurrent projects.

Table 4.16 Summary of Junction Improvement Schemes

Junction (1)		Type	Description	Proposed by Project	Anticipated Implementation Schedule	Drawing No. in Appendix B (2)
J2	Po Shek Wu Road/ Po Wan Road	Signal	➢ Lane arrangement of Po Shek Wu Road southbound to be revised for allowing straight-ahead traffic to use three traffic lanes ➢ Lane arrangement of Po Wan Road eastbound to be revised for allowing right-turn traffic to use two traffic lanes	Kong Nga Po	To tie in with the programme of phased population intake of NDA. The current target of completion is 2023.	B1
			➢ Lane arrangement of Po Shek Wu Road northbound to be revised for allowing left-turn traffic to use two traffic lanes; and ➢ Local widening of Po Wan Road westbound from 1 to 2 lanes	Sheung Shui Areas 4 and 30 Sites 1 &2 (to be incorporated in Kong Nga Po)	To tie in with the programme of phased population intake of NDA. The current target of completion is 2023.	B1
J3	Po Shek Wu Road/ Choi Yuen Road	Signal	➢ Lane arrangement of the Choi Yuen Road westbound to be revised for providing two left-turn lanes	Queen's Hill	Already completed under Queen's Hill Project	A1
			➢ local widening of Po Shek Wu Road northbound to allow straight-ahead traffic to use three traffic lanes	Kong Nga Po	To tie in with the programme of phased population intake of NDA. The current target of completion is 2023.	B3
			➢ Po Shek Wu Interchange Improvement which provides a flyover to allow the right turning traffic from Po Shek Wu Road southbound to Fanling Highway westbound to bypass the existing Po Shek Wu Interchange ➢ Po Shek Wu Road southbound would be narrowed from 5 lanes to 4 lanes	NDA	To tie in with the programme of phased population intake of NDA. The current target of completion is 2029.	A2
J5	Jockey Club Road/	Signal	➢ Lane arrangement of the Lung Sum Avenue northbound/southbound to	Queen's Hill	Year 2021	A3

Junction (1)		Type	Description	Proposed by Project	Anticipated Implementation Schedule	Drawing No. in Appendix B (2)
	Lung Sum Avenue		be revised for allowing straight-ahead traffic to use two traffic lanes ➢ Widening the Lung Sum Avenue northbound by narrowing the central median of Lung Sum Avenue		(Queen's Hill Infrastructure works undertaken by CEDD)	
			➢ Local widening with one additional straight-ahead traffic lane on Jockey Club Road eastbound ➢ Local widening with one additional straight-ahead traffic lane on Lung Sum Avenue northbound	Kong Nga Po	To tie in with the programme of phased population intake of NDA. The current target of completion is 2023.	B4
J6	Jockey Club Road/ So Kwun Po Road	Signal	➢ Lane arrangement of the Jockey Club Road northbound to be revised for allowing left turn traffic to use two traffic lanes ➢ Method-of-Control (MOC) to be revised for minimizing/ optimizing the intergreen time ➢ Lane arrangement of Ma Sik Road southbound to be revised for allowing three traffic lanes for vehicles to travel straight ahead ➢ Local widening of So Kwun Po Road southbound from 2 to 3 lanes	NDA	To tie in with the programme of phased population intake of NDA. The current target of completion is 2023.	B5
			➢ Local widening with one additional straight-ahead traffic lane on So Kwun Po Road northbound ➢ Local widening of Ma Sik Road northbound from 2 to 3 lanes	Sheung Shui Areas 4 and 30 Sites 1 &2 (to be incorporated in NDA)	To tie in with the programme of phased population intake of NDA. The current target of completion is 2023.	B5
J7	So Kwun Po Road Interchange	Roundabout	➢ Local widening of southbound approach arm of So Kwun Po Road for a smoother entrance to the elevated roundabout	Queen's Hill	Year 2021 (Queen's Hill Infrastructure works undertaken by CEDD)	A4

Junction (1)		Type	Description	Proposed by Project	Anticipated Implementation Schedule	Drawing No. in Appendix B (2)
			➢ New infrastructure to connect the northern and southern side of Fanling Highway	Subject to further Gov. study	Nil	Nil
J8	Po Shek Wu Road Interchange	Roundabout	➢ Local widening of southbound approach arm of Po Shek Wu Road to 10m to have two traffic lanes when approaching the roundabout	Queen's Hill	2021 (Queen's Hill Infrastructure works undertaken by CEDD)	A5
			➢ Local widening section of southbound of Po Shek Wu Road between Choi Yuen Road and Po Shek Wu Road Interchange	Sheung Shui Areas 4 and 30 Sites 1 &2	Year 2023/24 (undertaken by CEDD Civil Engineering Office)	Nil
			➢ local widening of the entry arm of Fanling Highway westbound slip road from existing two lanes to three lanes	Kong Nga Po	To tie in with the programme of phased population intake of NDA. The current target of completion is 2023.	B6
			➢ Po Shek Wu Interchange Improvement which provides a flyover to allow the right turning traffic from Po Shek Wu Road southbound to Fanling Highway westbound and bypass the existing Po Shek Wu Interchange	NDA	To tie in with the programme of phased population intake of NDA. The current target of completion is 2029.	A2

Notes:

(1) Please refer to **Figure 1** for the location of the assessed junctions.

(2) The general arrangement of junction improvement schemes are shown in **Appendix A and B**.

(3) The proposed road improvement works under Kong Nga Po project by CEDD would be implemented under NDA project by CEDD as confirmed by CEDD.

5 SENSITIVITY TEST

5.1 Sensitivity Test for Proposed Public Transport Interchange at Site 1

5.1.1 As discussed in the Section 4.3, Junction J7 – So Kwun Po Road Interchange would be operating at DFC slightly over 1.0 in Years 2028 and 2031. For long-term, the new North South Link as discussed in Section 4.6.1 will be able to divert traffic at J7. As J7 is a critical junction, short term measures should also be proposed to improve the condition as far as possible. In view thereof, it is proposed to provide a new public transport Interchange (PTI) at Site 1 to facilitate redistribution of public transport routes. It will thus reduce the amount of public transport passing through J7 and relieve the traffic condition. Around 100 pcu/hr of public transport is assumed to be diverted away from J7 and redistribute to J3 – Po Shek Wu Road / Choi Yuen Road and J4 – Choi Yuen Road / Pak Wo Road. **Figure 10** shows an example of public transport routing before and after public transport redistribution. The exact junction performance will be subject to public transport rerouting to be planned.

5.1.2 Below **Table 5.1** shows the junction capacity assessment after public transport redistribution for Year 2028 and 2031.

Table 5.1 Junction Performance Before and After Public Transport Redistribution

Junction [1]		Junction Performance [2]							
		Year 2028 Design Case				Year 2031 Design Case			
		Before Public Transport Redistribution		After Public Transport Redistribution		Before Public Transport Redistribution		After Public Transport Redistribution	
		AM	PM	AM	PM	AM	PM	AM	PM
J3	Po Shek Wu Road / Choi Yuen Road	11%	10%	1%	5%	12%	13%	1%	1%
J4	Choi Yuen Road / Pak Wo Road	0.54	0.54	0.61	0.59	0.48	0.44	0.55	0.48
J7	So Kwun Po Road Interchange	1.00	**1.02**	0.96	0.98	**1.04**	**1.02**	0.99	0.98

Notes:

(1) Please refer to **Figure 1** for the location of the assessed junctions; and

(2) Figures shown represent "Reserve Capacity" (RC) for the signal controlled junctions and "Design Flow to Capacity" (DFC) ratio for the roundabout. A signal-controlled junction with a reserve capacity (RC) of 0% implies that it is operating at capacity while a negative RC suggests that the junction is overloaded. RC >= 15 % implies that the signal-controlled junction is operating satisfactory. For roundabout, the performance indicator is the DFC. DFC ratio of 1.00 indicates continual queuing and could not be considered acceptable. A DFC ratio of 0.85, indicating that queuing would theoretically be avoided in 85% of cases, can be

considered reasonable. A DFC of 0.70 indicates that queuing will be avoided in 0.95 of cases.

5.1.3 J7 will be improved with DFC reduced from 1.04 to 0.99 at the critical Year 2031 AM peak, while J3 and J4 will still be operating within capacity, after public transport redistribution.

5.1.4 It is suggested to conduct a comprehensive review when the traffic condition becomes stable after commissioning of the Lung Shan Tunnel which will commission in end 2018 and cause changes in the traffic pattern in Fanling/Sheung Shui.

5.2 Sensitivity Test on the Programme Slippage of Major Improvement Works

5.2.1 This sensitivity test will investigate the impact on the surrounding road network in case of slippage of the major improvement works, i.e. Fanling Bypass (Eastern Section), for the 2028 Design Case Scenario. Other local junction improvement schemes considered for the 2028 Design Case Scenario as stated in **Table 4.16** are scheduled to be completed by Year 2023/24, which are unlikely to be postponed beyond the population intake of the subject development. Therefore, the local junction improvement schemes are assumed to be in place in this sensitivity test. The sensitivity test also considers the public transport redistribution as described in Section 5.1.

5.2.2 The sensitivity test scenario will exclude Fanling Bypass (Eastern Section) from the Base Design Case Scenario to reflect any programme slippage. Fanling North NDA (Advance Phase) will also be excluded.

5.2.3 **Table 5.2** compares the assumptions considered in the Base Design Case Scenario and in the sensitivity analysis.

Table 5.2 Major Assumptions for Sensitivity Test Scenarios

Test	Land Use Planning Assumptions			Transport Infrastructure Assumptions		
	Sheung Shui Area 30	Fanling North NDA (Advance Phase)	Fanling North NDA (Remaining Phase)	Fanling Bypass (Eastern Section)	Fanling Bypass (Western Section) and associated road works	Other infras-tructures in Remain-ing Phase of NDA (including Po Shek Wu Flyover, Fanling Highway widening, and Fanling Bypass Western Section)
Base Design Case Scenario	✔	✔		✔		
Sensitivity Test Scenario	✔					

5.2.4 The above sensitivity test scenario was also reviewed in the Report on Traffic and Transport Impact Assessment Review (August 2018) under Agreement No. CE 13/2014 (CE) Development of Kwu Tung North and Fanling North New Development Areas, Phase 1 Design and Construction (i.e. Test 6 under Section 4.5 of the aforesaid report). It is revealed that all key junctions in Sheung Shui area will still be operating with DFC < 1.0 or RC > 0% and considered acceptable.

6 PEDESTRIAN TRAFFIC IMAPCT ASSESSMENT

6.1 Existing Pedestrian Conditions

6.1.1 Pedestrian count surveys were conducted on normal weekdays in September 2016 / February & April 2017 at selected locations during the periods 0700-1000 and 1700-2000 hours. These locations of the surveyed pedestrian facilities are detailed in **Figure 11** and summarized in **Table 6.1**.

Table 6.1 Critical Pedestrian Facilities

Index [1]	Type
I	Footpath
K	Footbridge
L	Footbridge
M	Staircase
O	Footpath
Q	Footpath
R	Subway
S	Subway
T	Staircase
AE	Footbridge
AF	Staircase
AH	Footpath
AI	Staircase
AK	Footbridge
AL	Staircase
AM	Footbridge
AN	Footpath
AO	Staircase
AT	Footbridge
BA	Footpath
BB	Footpath
BC	Footpath
BD	Footpath
BF	Crossing
BG	Footpath

Note:

[1] Refer to **Figure 11** for the location of the assessed pedestrian facilities.

6.1.2 It was observed that the peak pedestrian period was occurred in the morning peak during 0830 – 0930 and evening peak during 1745 - 1845. ‘Level of Service’ and “volume to capacity ratio (V/C)” assessment have been undertaken.

Level of Service (LOS)

6.1.3 'Level of Service' (LOS) analysis of the existing pedestrian facilities was carried out based on the definitions presented in the Highways Capacity Manual 2000. This follows the approach currently being recommended by Transport Department. In general, LOS C and D are typical values and LOS A and B would provide a very good LOS. At a LOS of A, 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. At a LOS of B, pedestrians would continue to freely select their own walking speed, can bypass slower pedestrians, and avoid crossing conflicts with others. At a LOS of C, pedestrians are restricted in selecting walking speed and in bypassing other pedestrians. A LOS of D would represent a further deterioration of the pedestrian movements but would still provide reasonable fluid flow. At a LOS of E or lower, it was determined that mitigation measures or improvement schemes should be considered to achieve a LOS of D or better. For the purposes of this pedestrian impact assessment, a LOS of C or above would be considered acceptable while a LOS of D would be marginally acceptable. **Table 6.2** shows the various LOS 'quantified' in terms of pedestrian flow rates.

Table 6.2 Level of Service (LOS) for Walkway

LOS	Flow rate (ped/min/m)	Description
A	<= 16	Pedestrians move in desired paths. Walking speeds are freely selected and conflicts between pedestrians are unlikely.
B	16 - 23	Sufficient space is provided for pedestrians to freely select walking speeds, to bypass other pedestrians and to avoid crossing conflicts with others. Pedestrians become aware of other pedestrians.
C	23 - 33	Sufficient space is available to select normal walking speeds and to bypass other pedestrians in unidirectional stream. Minor conflicts will occur in reverse direction or crossing movements.
D	33 - 49	Freedom to select individual walking speeds and bypass other pedestrians is restricted. Probability of conflicts is high in crossing or reverse-flow movements. LOS provides reasonable fluid flow, however, friction and interactions between pedestrians are likely to occur.
E	49 - 75	All pedestrians would have normal walking speeds restricted. Space is insufficient to pass over slower pedestrians. Cross and reverse movements are possible only with extreme difficulties. Design volumes approach the limit of walking capacity.
F	> 75	Walking speeds are severely restricted. Forward progress is made by shuffling. Cross and reverse movements are virtually impossible. Space is more characteristic of queued pedestrians than of moving pedestrian streams.

6.1.4 Based on the pedestrian count surveys, **Table 6.3** details the results of the LOS assessment.

Table 6.3 Existing (2016/2017) Pedestrian Facilities Assessment Results

Location (1)	Type	Clear Width (m)	Capacity (ppm/m) (2)	Pedestrian Demand (pph)		Flow Rate (ppm/m) (3)		LOS		V/C Ratio	
				AM	PM	AM	PM	AM	PM	AM	PM
I(4)	Footpath	2.2	50	1,210	1,145	11.2	10.6	A	A	0.22	0.21
K	Footbridge	3.5	50	1,260	1,270	8.4	8.5	A	A	0.17	0.17
L	Footbridge	3.5	50	1,380	1,460	9.2	9.7	A	A	0.18	0.19
M	Staircase	3.0	40	160	315	1.3	2.6	A	A	0.03	0.07
O(4)	Footpath	3.5	50	715	730	3.8	3.9	A	A	0.08	0.08
Q	Footpath	1.2	50	45	10	0.9	0.2	A	A	0.02	0.00
R	Footpath	2.1	50	385	595	5.8	9.0	A	A	0.12	0.18
S	Subway	2.6	50	385	620	4.0	6.5	A	A	0.08	0.13
T	Staircase	3.0	40	10	0	0.1	0.0	A	A	0.00	0.00
AE(4)	Footbridge	5.3	50	5,135	8,560	19.9	33.2	B	D	0.40	0.66
AF	Staircase	5.2	40	7,400	6,785	29.4	26.9	C	C	0.73	0.67
AH	Footpath	6.5	50	3,080	5,730	8.9	16.5	A	B	0.18	0.33
AI	Staircase	2.0	40	710	995	11.8	16.6	A	B	0.30	0.41
AK	Footbridge	4.5	50	1,220	2,315	5.8	11.0	A	A	0.12	0.22
AL	Staircase	3.4	40	35	145	0.2	1.0	A	A	0.01	0.03
AM	Footbridge	3.5	50	785	955	5.2	6.4	A	A	0.10	0.13
AN(4)	Footpath	3.5	50	2,615	3,655	14.1	19.7	A	B	0.28	0.39
AO	Staircase	3.0	40	665	755	5.5	6.3	A	A	0.14	0.16
AT(4)	Footbridge	3.2	50	3,995	2,855	30.3	21.6	C	B	0.61	0.43
BA	Footpath	3.0	40	1,000	795	8.3	6.6	A	A	0.21	0.17
BB	Footpath	3.5	50	800	640	4.8	3.8	A	A	0.10	0.08
BC	Footpath	2.5	50	480	385	4.4	3.6	A	A	0.09	0.07
BD	Footpath	3.5	50	385	495	2.3	2.9	A	A	0.05	0.06
BF	Crossing	3.7	12.4	2,040	3,070	9.2	13.8	-	-	0.74	**1.12**
BG	Footpath	3.5	50	905	1,430	5.4	8.5	A	A	0.11	0.17
BH(5)	Footpath	2.3	50	2,830	3,820	24.8	33.5	C	D	0.50	0.67

Notes:

(1) Refer to **Figure 11** for the location of the assessed pedestrian facilities;

(2) Refer to TPDM Vol. 2 Ch. 3 Table 3.7.7.1 for capacity of walkway/ staircase, and TPDM Vol. 4 Chapter 3 Para 3.2.5.6 for capacity of signalized crossing;

(3) Computed based on effective width for footpath/footbridge/staircase, by assuming 0.2m and 0.5m lateral clearance to railing/planter/tree and wall/fence according to Highway Capacity Manual 2000 Chapter 18 Exhibit 18-1;

(4) In view of the reduced surveyed pedestrian flows in Year 2016/2017 at locations I, O, AE, AN and AT compared with the Year 2014 surveyed pedestrian flows under the pedestrian assessment of Po Shek Wu Estate, the highest surveyed pedestrian flows among Year 2014 and Year 2016/2017 are adopted for conservative assessment purpose, with the aims of taking into account the fluctuation impacts of the parallel trade activities; and

(5) Taking into account of the bus passenger queue and reducing the effective footpath width by 1m, the flow rate of BH becomes 52.4 ppm/m and 70.7 ppm/m (i.e LOS E) during AM and PM peak respectively.

6.1.5 As shown in **Table 6.3** all existing pedestrian facilities are operating with LOS C or better and V/C ratio <= 1, except for locations AE, BF and BH.

6.2 Pedestrian Demand Forecasting

Background Pedestrian Flows and Other Planned/Committed Developments in the Vicinity of Site

6.2.1 Pedestrian flows adopted in this study were primarily based on the existing Year 2016 pedestrian counts undertaken (details refer to **Section 6.1**). Pedestrian trip generation/attraction for other planned/committed developments in the vicinity of the Sites had been incorporated in the background pedestrian flows, including the following developments:

- Proposed Committed Public Housing Development at Po Shek Wu Estate;
- Proposed Public Housing Development at Po Shek Wu Road, Sheung Shui;
- Proposed Wholesale Conversion into Retail Development from Existing Advanced Technology Centre at No. 2 Choi Fat Street, Sheung Shui;
- Proposed Wholesale Conversion into Office-cum-Retail Building from Existing Industrial Building at No.9 Choi Yuen Road, Sheung Shui;
- Proposed Wholesale Conversion into Retail Development at No. 6 Choi Fai Street, Sheung Shui; and
- Proposed Wholesale Conversion into Office-cum-Retail Building at No. 21 Po Wan Road, Sheung Shui.

6.2.2 The estimated pedestrian trips of these developments have also been reviewed and incorporated into the development of pedestrian forecast, as appropriate. Pedestrian trip generation / attraction by proposed housing development of Po Shek Wu Estate are reference to the HKHA's Traffic Impact Assessment (TIA) Report for Po Shek Wu Estate. To estimate the pedestrian generation for other planned/committed development in the vicinity of Site, reference has been made to in-house pedestrian survey conducted for the existing PRH, SSF, office, retail facilities and kindergarten. The trip rates were applied to the development parameters of the planned/committed development to derive the pedestrian trips as shown in **Table 6.4**.

Table 6.4 Trip Generation Rates and Pedestrian Demand for Other Planned/Committed Developments in the Vicinity of the Sites

Parameter	Unit	Trip Rates#				Trip Generations (ped/hr)			
		AM		PM		AM		PM	
		GEN	ATT	GEN	ATT	GEN	ATT	GEN	ATT
Public Housing Development at Po Shek Wu Estate (1)									
PRH cum retail facilities (1160 flats and 790 m^2 GFA retail facilities)	ped/hr/flat	0.742	0.259	0.298	0.614	899	314	361	744
Kindergarten (6 classrooms)	ped/hr/classroom	12.020	30.310	2.750	1.000	72	182	17	6
Welfare facilities (3,498m^2 GFA) and multi-function area (396m^2 GFA)	expected to serve mainly the Site residents and will only induce minimal pedestrian trips								
Public Car Park (221 nos. of spaces)	ped/hr/vehicular trip	2	2	2	2	38	70	84	82
Total (Po Shek Wu Estate)						**1,009**	**566**	**462**	**832**
Public Housing Development at Po Shek Wu Road									
SSF cum retail facilities (1,850 flats and 3,000m^2 GFA retail facilities)	ped/hr/flat	0.580	0.120	0.200	0.380	1,073	222	370	703
Kindergarten (6 classrooms)	ped/hr/classroom	12.020	30.310	2.750	1.000	72	182	17	6
Total (Public Housing Development at Po Shek Wu Road)						**1,145**	**404**	**387**	**709**
Proposed Wholesale Conversion into Retail Development from Existing Advanced Technology Centre at No. 2 Choi Fat Street, Sheung Shui (2)									
Retail (12,445 m^2 GFA)	ped/100m^2 GFA	0.000	0.000	2.011	2.132	30	30	250	265
Total (No. 2 Choi Fat Street, Sheung Shui)						**30**	**30**	**250**	**265**
Proposed Wholesale Conversion into Office-cum-Retail Building from Existing Industrial Building at No.9 Choi Yuen Road, Sheung Shui (3)									
Retail (6,219 m^2 GFA)	ped/100m^2 GFA	0.000	0.000	2.011	2.132	30	30	125	133
Office (21,821 m^2 GFA)	ped/100m^2 GFA	0.222	1.934	1.567	0.266	48	422	342	58
Total (No. 9 Choi Yuen Road, Sheung Shui)						**78**	**452**	**467**	**191**
Proposed Wholesale Conversion into Retail Development at No. 6 Choi Fai Street, Sheung Shui (4)									
Retail (29,821 m^2 GFA)	ped/100m^2 GFA	0.000	0.000	2.011	2.132	30	30	600	636
Total (No. 6 Choi Fai Street, Sheung Shui)						**30**	**30**	**600**	**636**
Proposed Wholesale Conversion into Office-cum-Retail Building at No. 21 Po Wan Road, Sheung Shui (4)									
Retail (2,601 m^2 GFA)	ped/100m^2 GFA	0.000	0.000	2.011	2.132	30	30	52	55
Office (1,676 m^2 GFA)	ped/100m^2 GFA	0.222	1.934	1.567	0.266	4	32	26	4
Total (No. 21 Po Wan Road, Sheung Shui)						**34**	**62**	**79**	**60**

Note:

(1) Trip generation / attraction of Po Shek Wu Estate are reference to HKHA's TIA Report of Po Shek Wu Estate;

(2) Development parameters are reference to Developer's TIA Report under S.16 Application No. A/FSS/246;

(3) Development parameters are reference to Developer's TIA Report under S.16 Application No. A/FSS/241;

(4) Development parameters are reference to the parameters stipulated in TIA Report under S.16 Application No. A/FSS/241.

\# Pedestrian trip rates for public housing development at Po Shek Wu Road and private redevelopment are reference to in-house pedestrian survey conducted at similar existing SSF, office and retail facilities:

a) SSF – Choi Po Court (No. 2 Choi Yuen Road, Sheung Shui);
b) Office – Office Tower of Landmark North (No. 39 Lung Sum Avenue, Sheung Shui); and
c) Retail – Retail shops in Fanling Town Centre (No.18 Fanling Station Road, Fanling)

For conservative assessment purpose, a nominal pedestrian generation / attraction with 30 ped/hour is assumed for the retail facilities during AM peak hours.

Pedestrian trip rates for kindergarten school are reference to HKHA's TIA Report of Po Shek Wu Estate.

Development Trip Generations

6.2.3 To estimate the pedestrian generation for the proposed development, reference has been made to in-house pedestrian survey conducted for the existing PRH, retail facilities and kindergarten school. The trip rates were applied to the proposed additional number of flats to derive the resident trips. These rates and the estimated pedestrian trips are tabulated in **Table 6.5**. For the development type of welfare facilities, they are expected to serve mainly the local residents and will only induce minimal pedestrian trips on the walkway network. On the other hand, for the post office, pedestrian trips generated / attracted are expected to fall outside the peak hours and would be minimal during the peak hours. These development types are therefore excluded from the estimation.

Table 6.5 Trip Generation Rates and Pedestrian Demand for Proposed Public Housing Development Sites 1 and 2

Parameter	Unit	Trip Rates#				Trip Generations (ped/hr)			
		AM		PM		AM		PM	
		GEN	ATT	GEN	ATT	GEN	ATT	GEN	ATT
Public Housing Development at Site 1									
PRH cum retail facilities (2,040 flats and 400 m^2 GFA retail facilities) (1)	ped/hr/flat	0.742	0.259	0.298	0.614	1,668	582	670	1,381
Kindergarten (6 classrooms)	ped/hr/classroom	12.020	30.310	2.750	1.000	72	182	17	6
Welfare facilities (8,710 m^2 GFA)	expected to serve mainly the Site residents and will only induce minimal pedestrian trips								
					Total (Site 1)	**1,740**	**764**	**686**	**1,387**
Public Housing Development at Site 2									
PRH cum retail facilities (1,480 flats and 700 m^2 GFA retail facilities) (1)	ped/hr/flat	0.742	0.259	0.298	0.614	1,208	422	485	1,000
Post Office (560 m^2 GFA)	pedestrian trips generated / attracted are expected to fall outside the peak hours and would be minimal during the peak hours								
					Total (Site 2)	**1,208**	**422**	**485**	**1,000**

Note:
(1) An additional 10% allowance for the proposed number of flats has been taken into account.
Pedestrian trip rates for PRH and kindergarten school are reference to HKHA's TIA Report of Po Shek Wu Estate.

6.2.4 Trip rates of proposed housing development and kindergarten facilities had also been referenced to the traffic generation survey conducted at the similar development in North District. The traffic generation surveys were undertaken during AM & PM peak hours on a normal weekday. The observed peak traffic generation rates are tabulated in **Table 6.6**.

Table 6.6 Summary on Surveyed Pedestrian Trip Rates at Existing Public Housing Development and Kindergartens in North District

Development	AM Peak		PM Peak	
	Generation	Attraction	Generation	Attraction
PRH cum Retail Facilities				
PRH: Wah Ming Estate – 5,340 flats (ped/hr/flat) (1)	0.523	0.164	0.159	0.429
PRH: Ching Ho Estate – 7,200 flats (ped/hr/flat) (1)	0.550	0.187	0.176	0.496
Kindergarten				
Kindergarten: Buddhist Sum Tong Fook Kindergarten - 8 classrooms (ped/hr/classroom)	10.625	29.500	1.500	0.500

6.2.5 For public housing development and kindergarten, it is observed that the surveyed pedestrian trips rates for both AM and PM peaks shown in **Table 6.6** are lower than the trip rates adopted for approved HKHA's TIA Report of Po Shek Wu Estate stated in **Table 6.5**. It is therefore recommended to adopt the pedestrian trip rates adopted for HKHA's TIA Report of Po Shek Wu Estate, for conservative assessment purpose.

6.2.6 As indicated in **Table 6.5**, the proposed development would generate some 2,948 and 1,171 pedestrians per hour during AM and PM peak hour period respectively. And the attraction would be some 1,186 and 2,387 pedestrians per hour during AM and PM peak hour respectively. The generated pedestrian demand would be superimposed onto the surrounding pedestrian facilities according to the observed trip distribution at the existing public housing site, to produce the future forecast pedestrian flows (i.e. Year 2028 upon completion of the Sites).

6.2.7 As mentioned in **Section 3.4**, a footbridge is proposed to connect the proposed development at Site 1 to Po Shek Wu Estate, with new footbridges connecting to Po Shek Wu Road Site and the existing footbridge linking Choi Yuk House on the south and Landmark North on the north. For Site 2, a footbridge is proposed to connect the proposed development to Po Shek Wu Road Site, with new footbridges connecting to Po Shek Wu Estate and the existing footbridge linking Choi Yuk House on the south and Landmark North on the north. The indicative alignment is shown in **Figure 11**. Their engineering feasibility should be reviewed by other civil and structural studies etc and subjected to detailed design stage. It is anticipated that some residents of the proposed development at the Sites 1 & 2 will be diverted to use the proposed comprehensive footbridge network. Examination of the pedestrian impacts on the existing pedestrian network due to the aforesaid new footbridges will be included in the pedestrian facilities assessment in the succeeding section.

Proposed Pedestrian Facilities Improvement Schemes by Other Projects

6.2.8 Under the TIA report of proposed Public Housing Development at Po Shek Wu Estate, location I will be operating over-capacity. Associated improvement measure has been proposed to alleviate the condition. Diversion of the existing cycle track via the adjacent cycle parking area was proposed to facilitate footpath widening at location I. The clear footpath width will be widen to 3m, taking into account of the provision of railing along road kerb. The existing cycle parking area will be modified with expansion of new cycle parking facilities to the western side, underneath the existing footbridge connecting Landmark North and Choi Yuen Estate. Below figure demonstrates the preliminary layout of the aforesaid diverted cycle track, modified cycle parking area and footpath widening at Location I.



Proposed Improvement Measure at Location I by Proposed Public Housing Development at Po Shek Wu Estate

6.2.9 The aforesaid proposed improvement scheme will be included in the pedestrian facilities assessment in succeeding section.

6.3 Future Pedestrian Condition

6.3.1 Considering the site-related trips as described in the preceding sections, a forecast LOS assessment has been undertaken at the selected footpaths as shown in **Figure 11**. The pedestrian routings to/from the subject sites are shown in **Figure 12**.

6.3.2 The LOS and V/C ratio assessment results of pedestrian footpaths are shown in **Tables 6.7**.

Table 6.7 Future Pedestrian Facilities Assessment Results

Location (1)	Type	Clear Width (m)	Capacity (ppm/m) (2)	Pedestrian Demand (pph)		Flow Rate (ppm/m) (3)		LOS		V/C Ratio	
				AM	PM	AM	PM	AM	PM	AM	PM
I(4) (10)	Footpath	3	50	3,410	4,040	21.9	25.9	B	C	0.44	0.52
K	Footbridge	3.5	50	1,260	1,270	8.4	8.5	A	A	0.17	0.17
L	Footbridge	3.5	50	2,340	2,635	15.6	17.6	A	B	0.31	0.35
M	Staircase	3	40	395	800	3.3	6.7	A	A	0.08	0.17
O(10)	Footpath	3.5	50	2,680	3,135	14.4	16.9	A	B	0.29	0.34
Q	Footpath	1.2	50	45	10	0.9	0.2	A	A	0.02	0.00
R	Subway	2.1	50	690	1,630	10.5	24.7	A	C	0.21	0.49
S	Subway	2.6	50	725	1,785	7.6	18.6	A	B	0.15	0.37
T	Staircase	3	40	10	0	0.1	0.0	A	A	0.00	0.00
AE(10)	Footbridge	5.3	50	5,525	8,875	21.4	34.4	B	D	0.43	0.69
AF	Staircase	5.2	40	7,400	6,785	29.4	26.9	C	C	0.73	0.67
AH	Footpath	6.5	50	3,080	5,730	8.9	16.5	A	B	0.18	0.33
AI	Staircase	2	40	710	995	11.8	16.6	A	B	0.30	0.41
AK	Footbridge	4.5	50	1,580	2,760	7.5	13.1	A	A	0.15	0.26
AL	Staircase	3.4	40	35	145	0.2	1.0	A	A	0.01	0.03
AM	Footbridge	3.5	50	4,120	4,455	27.5	29.7	C	C	0.55	0.59
AN(10)	Footpath	3.5	50	3,285	3,905	17.7	21.0	B	B	0.35	0.42
AO	Staircase	3	40	665	755	5.5	6.3	A	A	0.14	0.16
AT(10)	Footbridge	3.2	50	3,995	2,855	30.3	21.6	C	B	0.61	0.43
BA	Footpath	4.5	50	1,910	1,235	15.9	10.3	A	A	0.32	0.21
BB	Footpath	3.5	50	1,710	1,080	10.2	6.4	A	A	0.20	0.13
BC	Footpath	2.5	50	480	385	4.4	3.6	A	A	0.09	0.07
BD	Footpath	3.5	50	885	765	5.3	4.6	A	A	0.11	0.09
BF	Crossing	3.7	12.4	2,710	3,320	12.2	15.0	-	-	0.99	**1.21**
BG	Footpath	3.5	50	1,145	1,625	6.8	9.7	A	A	0.14	0.19
BH (11)	Footpath	2.3	50	3,285	3,905	28.8	34.3	C	D	0.58	0.69
FA (5)	Proposed Footbridge	3	50	925	1,020	7.7	8.5	A	A	0.15	0.17
FB (6)	Proposed Footbridge	3	50	2,620	2,925	21.8	24.4	B	C	0.44	0.49
FC (7)	Proposed Footbridge	3	50	1,560	1,960	13.0	16.3	A	B	0.26	0.33
FD (8)	Proposed Footbridge	3	50	1,430	1,845	11.9	15.4	A	A	0.24	0.31
FE (9)	Proposed Footbridge	3	50	2,375	2,325	19.8	19.4	B	B	0.40	0.39

Notes:

(1) Refer to **Figure 11** for the location of the assessed pedestrian facilities;

(2) Refer to TPDM Vol. 2 Ch. 3 Table 3.7.7.1 for capacity of walkway/ staircase;

(3) Computed based on effective width for footpath/footbridge/staircase, by assuming 0.2m and 0.5m lateral clearance to railing/planter/tree and wall/fence according to Highway Capacity Manual 2010 Chapter 18 Exhibit 18-1;

(4) Assumed proposed improvement scheme by Po Shek Wu Estate in place (details refer to **Section 5.2**);

(5) Proposed footbridge between Site 2 and Po Shek Wu Road Site. Assume minimum 3m clear width to be adopted;

(6) Proposed footbridge between Site 1 and Po Shek Wu Estate. Assume minimum 3m clear width to be adopted;

(7) Proposed footbridge of Po Shek Wu Estate. Assume minimum 3m clear width to be adopted;

(8) Proposed footbridge between Po Shek Wu Road Site and Po Shek Wu Estate. Assume minimum 3m clear width to be adopted;

(9) Proposed footbridge of Po Shek Wu Road Site. Assume minimum 3m clear width to be adopted;

(10) In view of the reduced surveyed pedestrian flows in Year 2016/2017 at locations I, O, AE, AN and AT compared with the Year 2014 surveyed pedestrian flows under the pedestrian assessment of Po Shek Wu Estate, the highest surveyed pedestrian flows among Year 2014 and Year 2016/2017 are adopted for

pedestrian flow forecast as the conservative assessment purpose, with the aims of taking into account the fluctuation impacts of the parallel trade activities; and

(11) Taking into account of the bus passenger queue and reducing the effective footpath width by 1m, the flow rate of BH becomes 66.9 ppm/m and 74.5 ppm/m (i.e LOS E) during AM and PM peak respectively.

6.3.3 The pedestrian facilities with the proposed footbridge in place would be adequate to cater for the additional pedestrian demand generated from the proposed development, with LOS "C" or better, except for location AE, BF and BH, under the future pedestrian facilities assessment.

6.3.4 It is worth to note that the proposed public housing developments would not induce significant impact to footbridge location AE, which is the footbridge connecting MTR Sheung Shui Station and Landmark North, and operating at LOS D in existing year. Site-related trip to/from these major attraction nodes could mainly use the at-grade footpaths and footbridges (i.e. locations L and AM) instead of AE. For locations BF and BH, improvement measures are proposed and discussed in succeeding sections.

6.4 Proposed Improvement Measure of Pedestrian Facilities

Proposed Improvement Scheme for Location BF – Pedestrian Crossing across San Wan Road at the junction with San Fung Avenue

6.4.1 As shown in **Table 6.7**, this crossing will be operating over capacity. It is proposed to widen the pedestrian crossing from 3.7m to 6.5m as shown in **Figure 13**. The V/C ratio assessment results of the pedestrian crossing with the improvement scheme in place are shown in **Table 6.8**.

Table 6.8 Future Assessment Results for Location BF with improvement scheme

Location *(1)*	Type	Clear Width (m)	Capacity (ppm/m)	Pedestrian Demand (pph)		Flow Rate (ppm/m)		LOS		V/C Ratio	
				AM	PM	AM	PM	AM	PM	AM	PM
BF	Crossing	6.5	12.4	2,710	3,320	6.9	8.5	-	-	0.56	0.69

Notes:
(1) Refer to **Figure 11** for the location of the assessed pedestrian facilities;

6.4.2 It is revealed that the pedestrian crossing will operate within capacity with the proposed widening work in place. However, its implementation will be subject to modification of the existing box culvert at San Wan Road westbound. Further study on the feasibility of the proposed widening of pedestrian crossing and detailed design would be carried out in forthcoming design stage.

Proposed Improvement Scheme for Location BH – Footpath along San Wan Road

6.4.3 As shown in **Table 6.7**, the footpath will be operating with LOS D. It is proposed to widen the footpath by removal of planter by at least 0.6m as shown in **Figure 13**. The LOS assessment results of the footpath with the improvement scheme in place are shown in **Tables 6.9**.

Table 6.9 Future Assessment Results for Location BH with improvement scheme

Location *(1)*	Type	Clear Width (m)	Capacity (ppm/m) *(2)*	Pedestrian Demand (pph)		Flow Rate (ppm/m) *(3)*		LOS		V/C Ratio	
				AM	PM	AM	PM	AM	PM	AM	PM
BH (3)	Footpath	2.9	50	3,285	3,905	21.9	26.0	C	C	0.44	0.52

Notes:
(1) Refer to **Figure 11** for the location of the assessed pedestrian facilities; and
(2) Computed based on effective width for footpath/footbridge/staircase, by assuming 0.2m and 0.5m lateral clearance to railing/planter/tree and wall/fence according to Highway Capacity Manual 2000 Chapter 18 Exhibit 18-1.
(3) Taking into account of the bus passenger queue and reducing the effective footpath width by 1m, the flow rate of BH becomes 40.2 ppm/m and 44.7 ppm/m (i.e LOS D) during AM and PM peak respectively, which is better than the existing condition as shown in **Table 6.3** Footnote (5).

6.4.4 With the improvement scheme in place, the footpath at location BH will be operating with LOS C. Further study on the feasibility of the proposed footpath widening and liaison with relevant parties (e.g. LCSD) would be carried out in forthcoming design stage.

7 PRELIMINARY PROPOSAL OF PUBLIC TRANSPORT FACILITIES

7.1 Proposed Public Transport Facilities for Site 1

7.1.1 As mentioned in **Section 2.6**, the Site 1 is served by various modes of public transport services. The key modes of public transport include:

a) Franchised Bus Services – The Site 1 is served by franchised bus services operating within the surrounding road network;

b) Green Minibus (GMB) Services – The Site 1 is also served by GMB services operating within the surrounding road network.

c) The Site 1 is located within approximately 600m walking distance west of MTR Sheung Shui Station.

7.1.2 With the provision of proposed footbridge connecting Site 1 and Po Shek Wu Estate, the approximate walking distance between Site 1 and MTR Sheung Shui Station / Landmark North Bus Terminus and journey time are summarized as **Table 7.1** below:

Table 7.1 Summary of Approximate Walking Distance and Journey Time between Site 1 and Landmark North Bus Terminus / MTR Sheung Shui Station

Pedestrian Movement	Approximate Walking Distance (m)	Approximate Journey Time (min) (1)
Site 1 ←→ Landmark North Bus Terminus	~525	8 (2)
Site 1 ←→ MTR Sheung Shui Station	~550	8

Notes:
(1) Estimation based on average pedestrian walking speed of 1.2m/sec as reference to TPDM Vol.4; and
(2) Additional 0.5 mins induced by level change of utilizing staircase of footbridge across San Wan Road.

7.1.3 In addition, a new PTI is proposed to be located in Site 1. An preliminary PTI layout is shown in **Figure 14**. It is expected that residents of Site 1 will utilize the PTI and the existing public transport service at major transport hubs such as Landmark North Bus Terminus and MTR Sheung Shui Station to access different destinations.

7.1.4 Besides, 5 nos. of bus routes are currently located at the bus stops at Po Shek Wu Road and Choi Yuen Road, within 500m walking distance from the Site 1. It is anticipated that some residents could also utilize the bus services at the mentioned bus stops to access different destinations.

7.2 Proposed Public Transport Facilities for Site 2

7.2.1 As mentioned in **Section 2.6**, the Site 2 is also served by various modes of public transport services. The key modes of public transport include:

a) Franchised Bus Services – The Site 2 is served by franchised bus services operating within the surrounding road network;

b) Green Minibus (GMB) Services – The Site 2 is also served by GMB services operating within the surrounding road network.

c) The Site 2 is located within approximately 600m walking distance west of MTR Sheung Shui Station.

7.2.2 With the provision of proposed footbridge connecting Site 2 and Po Shek Wu Road Site, footbridge connecting Po Shek Wu Road Site and the existing footbridge, and the direct at-grade footpath along San Wan Road and Po Shek Wu Road, the approximate walking distance between Site 2 and MTR Sheung Shui Station / Landmark North Bus Terminus / proposed PTI at Site 1 and journey time are summarized as **Table 7.2** below:

Table 7.2 Summary of Approximate Walking Distance and Journey Time between Site 2 and Landmark North Bus Terminus / MTR Sheung Shui Station / Proposed PTI at Site 1

Pedestrian Movement	Approximate Walking Distance (m)	Approximate Journey Time (min) (1)
Site 2 ←→ Landmark North Bus Terminus	~455	6.5
Site 2 ←→ MTR Sheung Shui Station	~580	8
Site 2 ←→ Proposed PTI at Site 1	~350	5

Notes:
(1) Estimation based on average pedestrian walking speed of 1.2m/sec as reference to TPDM Vol.4; and

7.2.3 It is expected that residents of Site 2 will utilize the proposed PTI at Site 1 and the existing public transport service at major transport hubs such as Landmark North Bus Terminus and MTR Sheung Shui Station to access different destinations.

7.2.4 Besides, 5 nos. of bus / minibus routes are currently located at the bus stops at Po Shek Wu Road and San Fung Avenue, within 500m walking distance from the Site 2. It is anticipated that some residents could also utilize the bus services at the mentioned bus stops to access different destinations.

7.2.5 In addition, the existing planter area on San Wan Road at the southern frontage of Site 2 could be converted as bus lay-by to accommodate 3 nos. of bus, as shown in **Figure 14**.

7.3 Review of Impact on East Rail Line

7.3.1 According to the Review and Update of the Railway Development Strategy 2000 - Executive Summary published by Highways Department, the future North South Corridor (formed by the East Rail Line, Lok Ma Chau Spur Line and Hung Hom to Admiralty Section of the Shatin to Central Link) will have a maximum carrying capacity of 80,000 persons per hour per direction.

7.3.2 According to the Public Transport Strategy Study published by Transport and Housing Bureau in June 2017, about 37% of public transport trips will use heavy rail, such that the proposed public housing development is expected to generate some additional 1,091 passengers one-way during the critical AM peak hour. The increase in passenger demand on the future North South Corridor is no more that 1.4% of its carrying capacity. Hence, the additional passenger demand on the future North South Corridor is considered negligible.

7.3.3 In addition, the future Northern Link (NOL) will connect the East Rail Line and the West Rail Line, forming a loop in the northern New Territories. This will allow residents in the New Territories to have more route choices without straining the road network. It is expected that NOL would reduce reliance on road-based transport and alleviating the associated congestion.

8 SUMMARY AND CONCLUSION

8.1 Summary

8.1.1 Arup was appointed by Hong Kong Housing Authority to conduct a Traffic Impact Assessment (TIA) for the land rezoning of the proposed Public Rental Housing (PRH) development at Sites 1 and 2 in Sheung Shui Areas 4 and 30 (the Sites).

8.1.2 Hong Kong Housing Authority intends to develop the Sites for public residential development with an approximate development schedule of 2,040 PRH flats and 1,480 PRH flats for Site 1 and Site 2 respectively. Full population intake will be by Year 2027/2028.

8.1.3 The parking and servicing facilities provision for the proposed development will be provided with reference to relevant standard and guideline.

8.1.4 To appreciate the existing traffic conditions, comprehensive classified traffic counts were conducted at the key junctions in the vicinity of the Site. Junction capacity analyses have been carried out at the key junctions in vicinity of the Site. Results of the analysis indicate that all assessed junctions are currently operating within capacity during both morning and evening peaks.

8.1.5 Junction capacity assessment was undertaken for scenarios of design years 2028 and 2031. All analysed results revealed that the associated junctions along the accessing/ leaving routes would still be performing within capacity, with proposed improvement work in place.

8.1.6 Future pedestrian condition was also assessed. A footbridge is proposed to connect the proposed development at Site 1 to Po Shek Wu Estate, with new footbridges connecting to Po Shek Wu Road Site and the existing footbridge linking Choi Yuk House on the south and Landmark North on the north. For Site 2, a footbridge is proposed to connect the proposed development to Po Shek Wu Road Site, with new footbridges connecting to Po Shek Wu Estate and the existing footbridge linking Choi Yuk House on the south and Landmark North on the north. The comprehensive footbridge network connecting different public housing developments will enhance the pedestrian accessibility.

8.1.7 Based on the LOS assessment, all existing pedestrian would be adequate to cater for the additional pedestrian demand generated from the proposed development, with LOS “C” or better, with proposed improvement schemes in place, except for location AE, which is the footbridge connecting MTR Sheung Shui Station and Landmark North, and operating at LOS D in existing year. Site-related trip to/from these major attraction nodes could mainly use the at-grade footpaths and footbridges (i.e. locations L and AM) instead of AE.

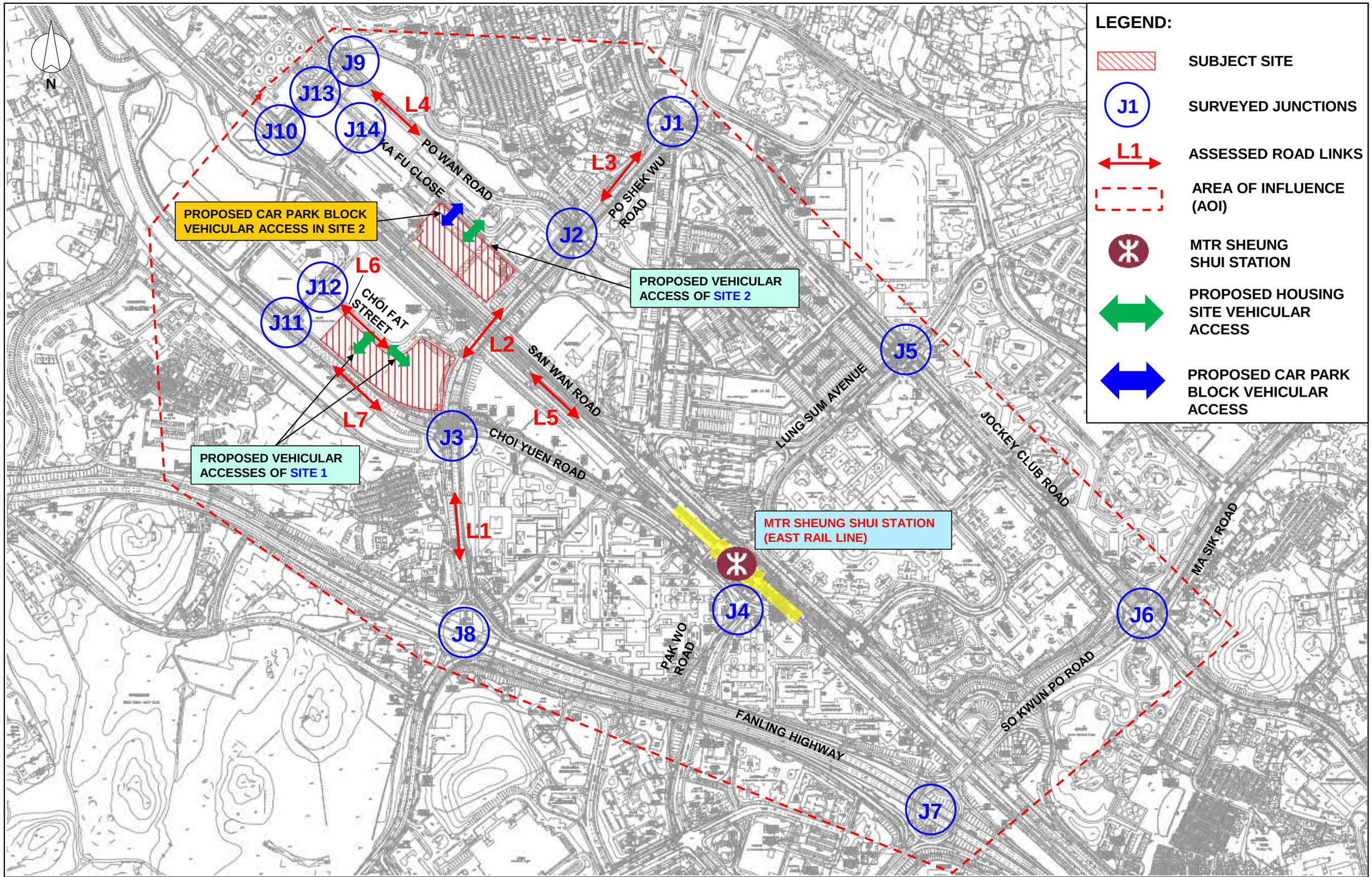
8.1.8 A new PTI is proposed at Site 1 and the proposed Site 1 and Site 2 are located in the vicinity of major transport hubs i.e. MTR Sheung Shui Station / Landmark North Bus Terminus. Both Site 1 and Site 2 are served by various modes of public transport services in vicinity. In

addition, provision of public transport facilities near the proposed development are proposed on San Wan Road.

8.2 Conclusion

8.2.1 Based on the above discussion, it is concluded that the proposed public housing development at Sites 1 and 2 in Sheung Shui Areas 4 and 30 (the Sites) would not induce adverse traffic impact on the surrounding road network and pedestrian network upon completion at design years 2028 and 2031. Therefore, the proposed development is considered acceptable with the timely implementation of the improvement works from the traffic point of view.

Figures



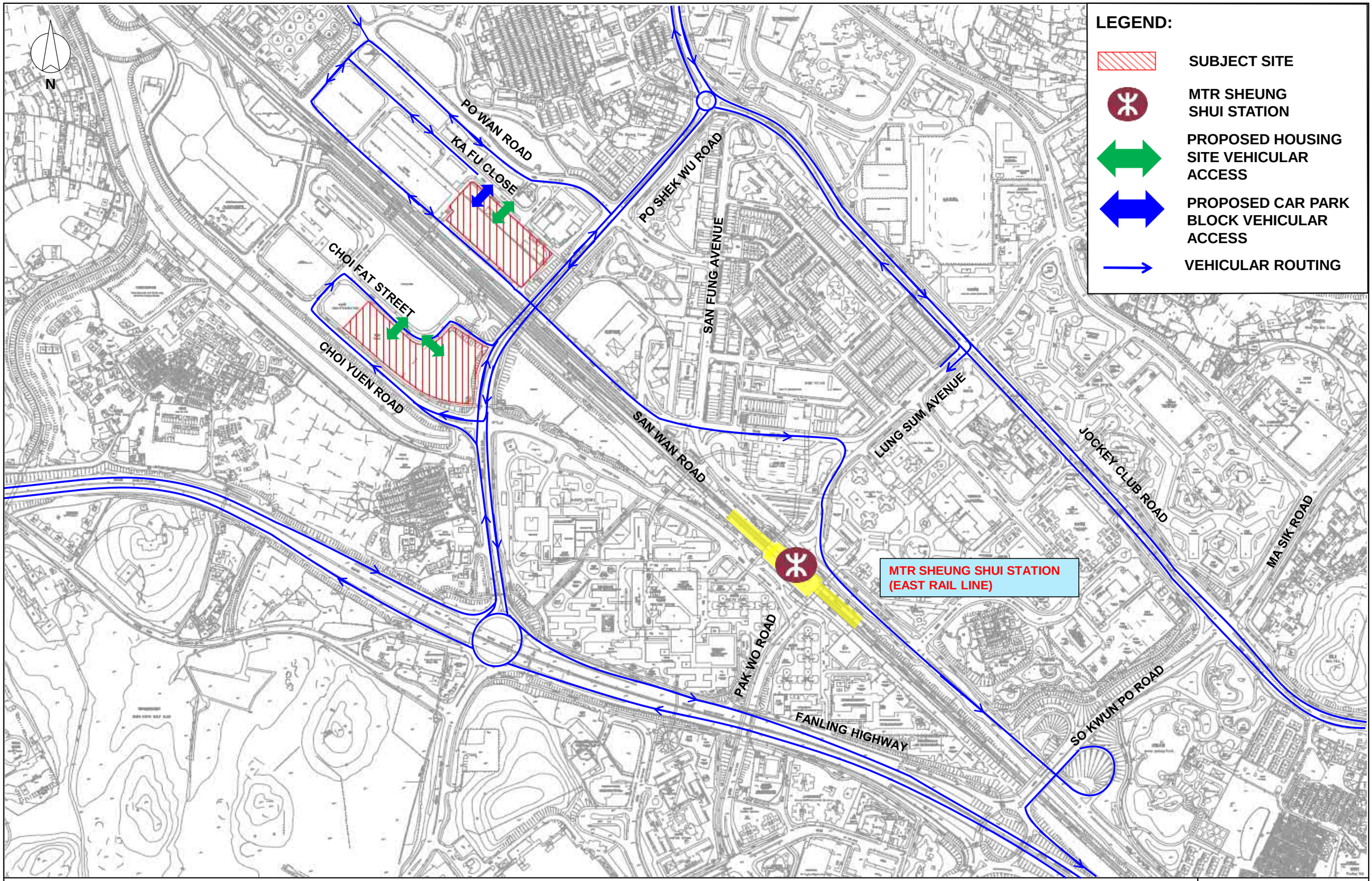
Job Title

PROPOSED PUBLIC HOUSING DEVELOPMENT SITES 1 & 2 IN SHEUNG SHUI AREAS 4 AND 30

FIGURE 1

Date	Scale	Drawing Title
08/2018	N.T.S.	**SUBJECT SITE AND ASSESSED JUNCTIONS AND LINKS LOCATIONS**
Drawn: WC	Job No.: 236072-09	

ARUP



Job Title

PROPOSED PUBLIC HOUSING DEVELOPMENT SITES 1 & 2 IN SHEUNG SHUI AREAS 4 AND 30

FIGURE 2

Date	Scale	Drawing Title
08/2018	N.T.S.	**ACCESSIBILITY TO/FROM THE PROPOSED DEVELOPMENT**
Drawn: WC	Job No.: 236072-09	ARUP

N

LUNG SUM AVE

SO KWUN PO ROAD

JOCKEY CLUB ROAD

120(130)
620(990)
5 (0)

90 (105)
175 (220)
95 (90)

45 (35)
145 (125)
140 (115)

94 (159)
199 (180)
273 (223)

80 (55)
720 (645)
215 (205)

605 (960)
205 (205)
0 (0)

35 (85)
310 (185)
390 (345)

545 (450)
30 (25)

10 (135)
220 (190)
340 (280)

525 (530)
960 (695)
340 (290)

120 (80)
245 (225)
305 (200)

SAN PO STREET

85 (145)
930 (1195)

0 (0)
40 (30)
245 (205)

PO WAN ROAD

25 (25)
20 (5)
305 (180)

CHEUK WAN STREET

KA FU CLOSE

SAN WAN ROAD

0 (0)
90 (60)

CHOI FAI STREET

340 (185)
785 (1140)
495 (495)

195 (165)
1250 (1375)
35 (40)

0 (0)
105 (50)

30 (45)
20 (40)

0 (5)
200 (100)

0 (0)
230 (60)
165 (150)

0 (0)

195 (110)

125 (15)
465 (585)
430 (335)

CHOI YUEN ROAD

50 (85)
170 (230)

345 (190)
5 (15)
775 (745)

0 (0)
90 (20)
5 (10)

465 (305)
10 (20)
0 (0)

PAK WO ROAD

180 (260)
1240 (1425)
660 (720)
1065 (885)

1565
(1635)

825 (925)
1950 (1860)

INSET A

75 (140)
5 (15)
0 (0)

0 (0)
195 (90)
15 (25)

0 (0)
210 (180)
150 (10)

25 (90)
0 (5)
15 (0)

SAN PO STREET

150 (40)
20 (10)

20 (10)
5 (5)

KA FU CLOSE

10 (20)
5 (5)

10 (20)
20 (15)

35 (75)
5 (5)

30 (20)
5 (5)

CHEUK WAN STREET

0 (0)
10 (10)

0 (5)
170 (50)

SAN WAN ROAD

45 (95)
10 (10)

220 (155)

395 (435)

1140 (1215)

545 (575)

FANLING HIGHWAY

280 (290)

210 (255)

1260 (1270)

400 (485)

970 (815)

700 (645)

PO SHEK WU ROAD

700 (700)

985 (860)

LEGEND:

110 (220) PM PEAK HOUR FLOW (PCU/HR)

AM PEAK HOUR FLOW (PCU/HR)

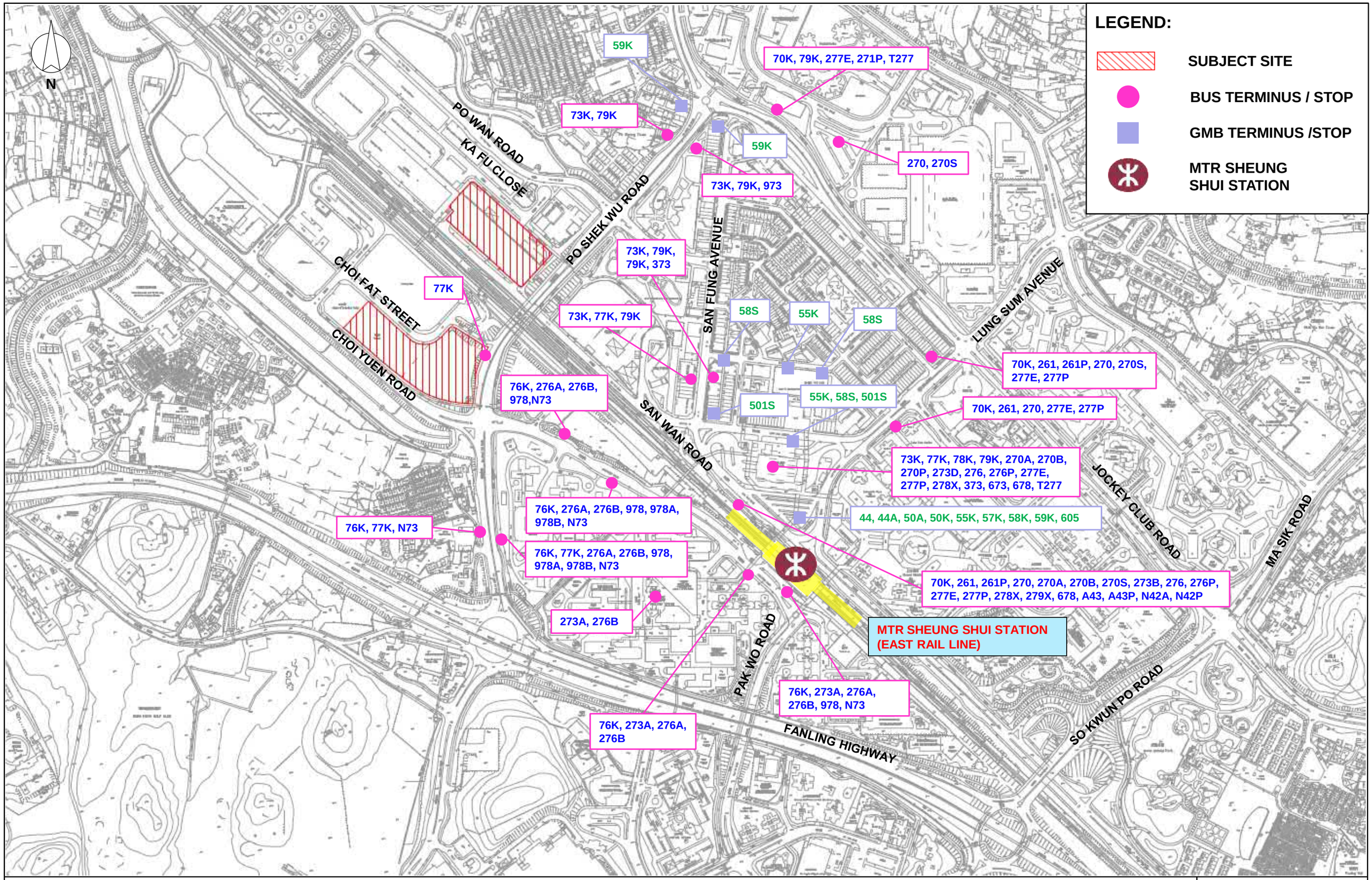
Job Title

PROPOSED PUBLIC HOUSING DEVELOPMENT SITES 1 & 2 IN SHEUNG SHUI AREAS 4 AND 30

FIGURE 3

Date	Scale	Drawing Title
08/2018	N.T.S.	**YEAR 2017 TRAFFIC FLOWS**
Drawn	Job No.	
WC	236072-09	

ARUP



Job Title

PROPOSED PUBLIC HOUSING DEVELOPMENT SITES 1 & 2 IN SHEUNG SHUI AREAS 4 AND 30

FIGURE 4

Date	Scale	Drawing Title
08/2018	N.T.S.	**PUBLIC TRANSPORT FACILITIES IN THE VICINITY OF SUBJECT SITE**
Drawn: WC	Job No.: 236072-09	

ARUP

N

LUNG SUM AVE

SO KWUN PO ROAD

JOCKEY CLUB ROAD

260 (145)
750 (1250)
0 (5)

140 (140)
535 (245)
105 (85)

85 (35)
245 (230)
290 (140)

85 (160)
245 (145)
665 (290)

45 (60)
1060 (1140)
110 (145)

530 (1140)
490 (220)
15 (0)

30 (105)
145 (95)
470 (395)

315 (240)
30 (25)

290 (245)
275 (265)
10 (115)

370 (425)
1015 (845)
395 (425)

250 (100)
260 (135)
555 (410)

70 (105)
1150 (1535)

SAN PO STREET

5 (0)
40 (20)
240 (200)

PO WAN ROAD

CHEUK WAN STREET

KA FU CLOSE

SAN WAN ROAD

5 (5)
130 (105)

CHOI FAI STREET

560 (195)
1015 (1330)
575 (440)

25 (30)
15 (5)
375 (185)

100 (90)
1310 (1475)
300 (295)

85 (125)
50 (95)
0 (0)
95 (70)

5 (5)
260 (175)
5 (5)
220 (170)
0 (0)
305 (230)
140 (115)

145 (25)
595 (765)
350 (360)

CHOI YUEN ROAD

130 (215)
265 (305)

275 (395)
1425 (1650)
540 (705)

390 (225)
20 (35)
1075 (1030)

0 (0)
115 (20)
5 (10)

720 (375)
10 (40)
0 (0)

PAK WO ROAD

INSET A

70 (120)
5 (10)
0 (0)

0 (0)
165 (80)
15 (30)

60 (35)
5 (10)
20 (5)

SAN PO STREET

0 (0)
380 (180)
190 (15)

190 (35)
20 (15)

20 (10)
5 (5)

KA FU CLOSE

20 (10)
5 (5)

80 (35)
5 (5)

45 (35)
5 (5)

20 (10)
35 (25)

CHEUK WAN STREET

35 (5)
170 (50)

SAN WAN ROAD

0 (0)
20 (10)

85 (40)
10 (5)

775 (820)
1800 (2160)

345 (150)
710 (470)

1370 (1670)
580 (515)

FANLING HIGHWAY

1010 (955)
880 (820)

PO SHEK WU ROAD

750 (1250)
2400 (2415)

415 (375)
160 (235)

1805 (1555)
340 (495)

570 (980)
1005 (1235)

LEGEND:

110 (220) → PM PEAK HOUR FLOW (PCU/HR)

AM PEAK HOUR FLOW (PCU/HR)

Job Title

PROPOSED PUBLIC HOUSING DEVELOPMENT SITES 1 & 2 IN SHEUNG SHUI AREAS 4 AND 30

FIGURE 5

Date	Scale	Drawing Title
08/2018	N.T.S.	**YEAR 2028 REFERENCE TRAFFIC FLOWS**
Drawn	Job No.	
WC	236072-09	

ARUP

N

LUNG SUM AVE

SO KWUN PO ROAD

JOCKEY CLUB ROAD

260 (145)
750 (1250)
0 (5)

140 (145)
565 (250)
105 (85)

85 (35)
245 (230)
290 (140)

90 (165)
250 (150)
690 (295)

45 (60)
1060 (1140)
110 (150)

530 (1140)
525 (230)
15 (0)

35 (105)
145 (95)
480 (405)

290 (245)
275 (265)
10 (115)

325 (250)
30 (25)

370 (425)
1015 (845)
400 (430)

245 (100)
260 (135)
555 (410)

70 (105)
1160 (1545)

SAN PO STREET

15 (0)
40 (20)
260 (220)

PO WAN ROAD

CHEUK WAN STREET

KA FU CLOSE

SAN WAN ROAD

5 (5)
130 (105)

595 (220)
1040 (1340)
575 (440)

25 (30)
15 (5)
375 (185)

CHOI FAI STREET

0 (0)
150 (130)

110 (100)
1330 (1490)
300 (295)

130 (175)
85 (125)

0 (0)
315 (245)
190 (165)

5 (5)
275 (230)
5 (5)

5 (5)
260 (175)

145 (25)
610 (780)
350 (360)

CHOI YUEN ROAD

215 (295)
265 (305)

340 (455)
1455 (1670)
540 (705)

395 (225)
30 (40)
1075 (1030)

0 (0)
115 (20)
5 (10)

735 (385)
10 (40)
0 (0)

PAK WO ROAD

INSET A

70 (120)
5 (10)
0 (0)

0 (0)
165 (80)
15 (30)

65 (35)
5 (10)
50 (25)

SAN PO STREET

0 (0)
380 (180)
225 (40)

190 (35)
55 (40)

55 (35)
5 (5)

KA FU CLOSE

55 (30)
5 (5)

5 (5)
80 (35)

50 (45)
5 (5)

50 (30)
45 (40)

CHEUK WAN STREET

35 (5)
170 (50)

SAN WAN ROAD

0 (0)
20 (10)

85 (40)
10 (5)

835 (855)
1845 (2195)

345 (150)
710 (470)

1400 (1685)
605 (530)

FANLING HIGHWAY

1040 (975)
895 (840)

PO SHEK WU ROAD

755 (1265)
2400 (2420)

415 (375)
160 (235)

1805 (1555)
340 (500)

575 (990)
1005 (1235)

LEGEND:

110 (220) → PM PEAK HOUR FLOW (PCU/HR)

← AM PEAK HOUR FLOW (PCU/HR)

Job Title

PROPOSED PUBLIC HOUSING DEVELOPMENT SITES 1 & 2 IN SHEUNG SHUI AREAS 4 AND 30

FIGURE 6

Date	Scale	Drawing Title
08/2018	N.T.S.	**YEAR 2028 DESIGN TRAFFIC FLOWS**
Drawn	Job No.	
WC	236072-09	

ARUP

N

JOCKEY CLUB ROAD

LUNG SUM AVE

SO KWUN PO ROAD

PO WAN ROAD

CHOI YUEN ROAD

FANLING HIGHWAY

PAK WO ROAD

PO SHEK WU ROAD

SAN PO STREET

CHEUK WAN STREET

KA FU CLOSE

SAN WAN ROAD

CHOI FAI STREET

INSET A

SAN PO STREET

KA FU CLOSE

CHEUK WAN STREET

SAN WAN ROAD

LEGEND:

110 (220) → PM PEAK HOUR FLOW (PCU/HR)

AM PEAK HOUR FLOW (PCU/HR)

Job Title: PROPOSED PUBLIC HOUSING DEVELOPMENT SITES 1 & 2 IN SHEUNG SHUI AREAS 4 AND 30		FIGURE 7
Date: 08/2018	Scale: N.T.S.	Drawing Title: YEAR 2031 REFERENCE TRAFFIC FLOWS
Drawn: WC	Job No.: 236072-09	ARUP

N

LUNG SUM AVE

SO KWUN PO ROAD

JOCKEY CLUB ROAD

165 (55)
1120 (1355)
5 (25)

575 (1210)
580 (260)
0 (0)

30 (55)
135 (85)
580 (380)

65 (90)
1630 (1645)

160 (175)
510 (120)
100 (70)

50 (25)
275 (230)
295 (160)

10 (105)
270 (285)
275 (230)

340 (235)
30 (25)

85 (160)
210 (130)
645 (155)

75 (65)
1095 (1110)
45 (145)

400 (400)
1115 (940)
325 (550)

240 (70)
305 (130)
560 (430)

SAN PO STREET

PO WAN ROAD

10 (0)
35 (20)
265 (275)

25 (25)
15 (5)
435 (385)

105 (95)
745 (910)
230 (105)

570 (215)
1125 (1435)
570 (425)

CHEUK WAN STREET

KA FU CLOSE

SAN WAN ROAD

5 (5)
120 (85)

CHOI FAI STREET

5 (5)
150 (125)

120 (150)
160 (200)

5 (5)
260 (160)

5 (5)
275 (210)

0 (0)
340 (260)
190 (155)

145 (25)
560 (635)
350 (285)

CHOI YUEN ROAD

285 (355)
310 (360)

460 (580)
1465 (1665)
605 (740)

390 (210)
25 (35)
985 (985)

660 (355)
10 (30)
0 (0)

0 (0)
110 (20)
0 (10)

PAK WO ROAD

INSET A

65 (135)
5 (10)
0 (0)

0 (0)
175 (100)
15 (10)

50 (40)
5 (5)
50 (30)

0 (0)
355 (185)
225 (35)

190 (25)
50 (30)

SAN PO STREET

50 (30)
5 (5)

KA FU CLOSE

40 (30)
5 (5)

65 (50)
5 (5)

45 (40)
5 (5)

40 (30)
40 (35)

CHEUK WAN STREET

0 (0)
20 (5)

35 (0)
170 (30)

SAN WAN ROAD

75 (60)
10 (10)

330 (255)

800 (730)

835 (730)

510 (495)

1120 (1390)
935 (1015)

1545 (1450)
935 (1115)

PO SHEK WU ROAD

FANLING HIGHWAY

460 (415)

1810 (1575)

175 (210)

315 (450)

795 (1230)
2450 (2410)

650 (990)
1095 (1245)

LEGEND:

110 (220) PM PEAK HOUR FLOW (PCU/HR)

AM PEAK HOUR FLOW (PCU/HR)

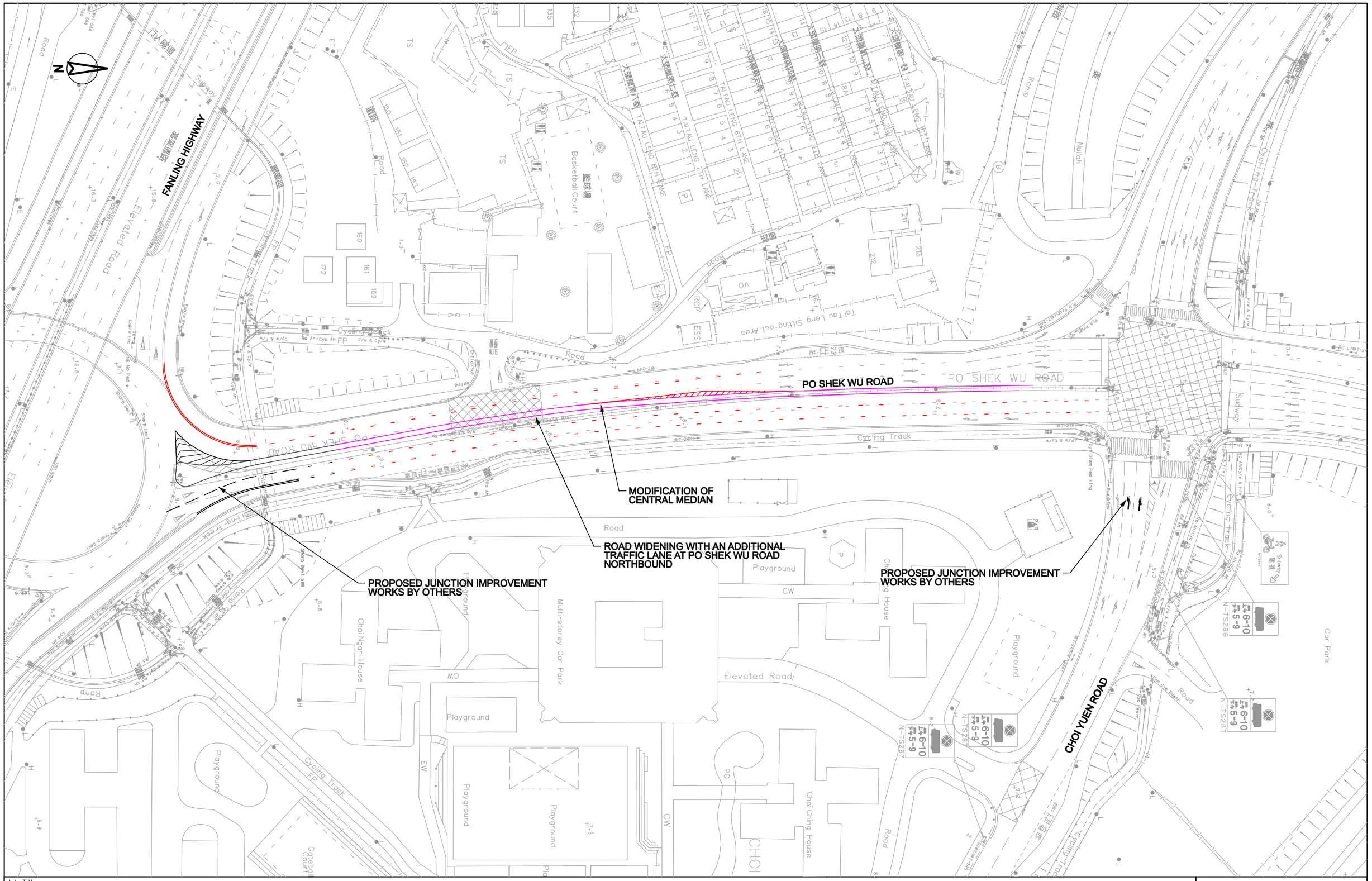
Job Title

PROPOSED PUBLIC HOUSING DEVELOPMENT SITES 1 & 2 IN SHEUNG SHUI AREAS 4 AND 30

FIGURE 8

Date	Scale	Drawing Title
08/2018	N.T.S.	**YEAR 2031 DESIGN TRAFFIC FLOWS**
Drawn	Job No.	
WC	236072-09	

ARUP



Job Title

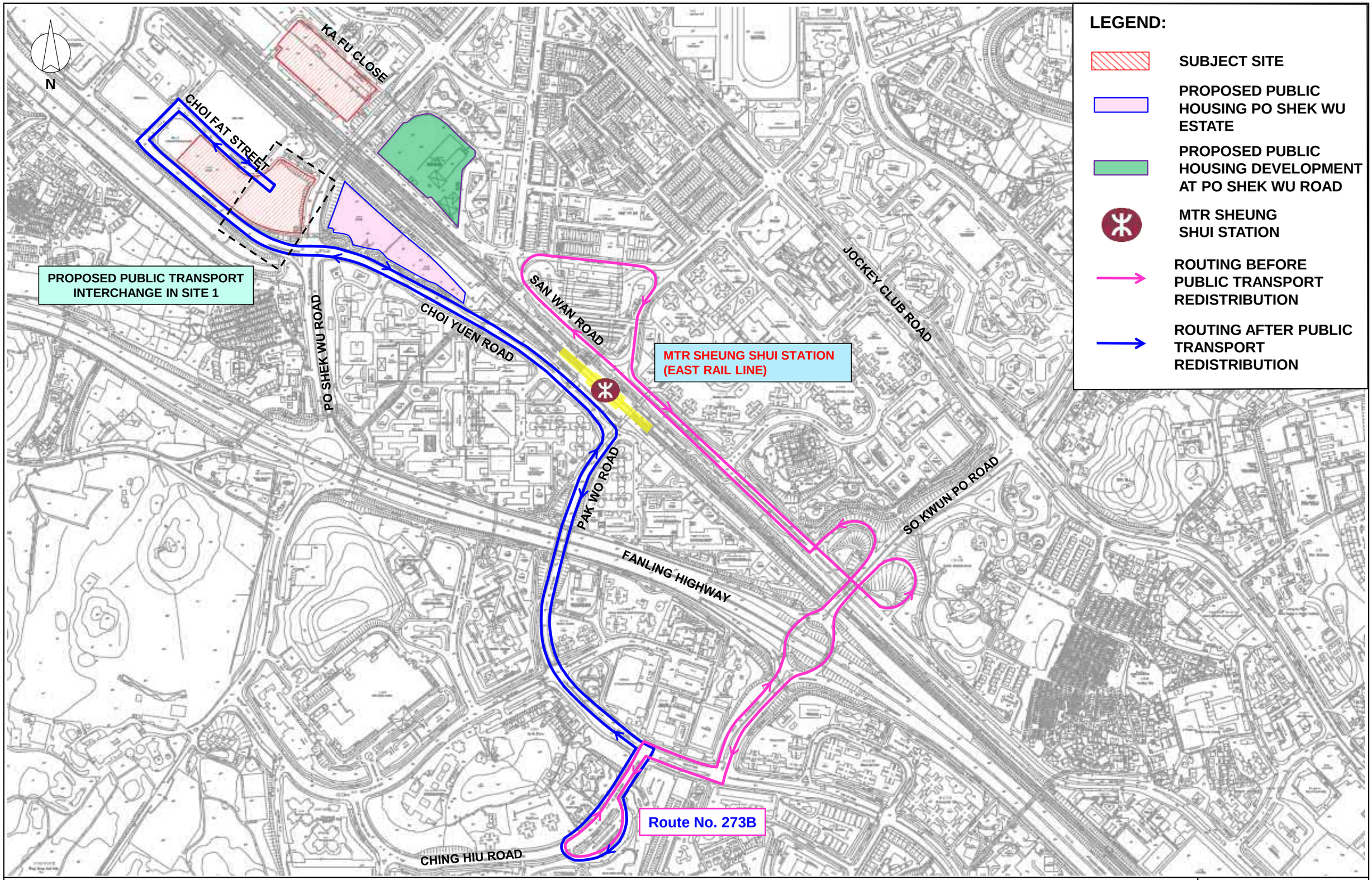
PROPOSED PUBLIC HOUSING SITES (SITE 1 & 2) IN SHEUNG SHUI AREAS 4 AND 30

FIGURE 9

Date	Scale	Drawing Title
01/2018	1 : 1000 @ A3	POSSIBLE TRAFFIC IMPROVEMENT SCHEME AT PO SHEK WU ROAD EASTBOUND
Drawn	Job No.	
WKKL	236072 - 09	

ARUP

PRINTED BY: williamlol 8/29/2018 9:55:26 AM
FILENAME: m:\Drawing\236000\236072-09 Instruction No. A19, Traffic Impact Assessment for Sites 1& 2 at FanlingSheung Shui Area 30\drawing\20180703 (Figure 9)\Figure 9.dgn



Job Title: PROPOSED PUBLIC HOUSING DEVELOPMENT SITES 1 & 2 IN SHEUNG SHUI AREAS 4 AND 30		FIGURE 10
Date: 08/2018	Scale: N.T.S.	Drawing Title: EXAMPLE OF PUBLIC TRANSPORT ROUTING BEFORE AND AFTER PUBLIC TRANSPORT REDISTRIBUTION
Drawn: WC	Job No.: 236072-09	ARUP

N

SAN WAN ROAD

PO WAN ROAD

PO WAN ROAD

PO SHEK WU ROAD

CHOI FAT STREET

CHOI FAI STREET

CHOI YUEN ROAD

SAN WAN ROAD

PROPOSED FOOTBRIDGE BETWEEN SITE 2 AND PO SHEK WU ROAD SITE

FA

BD

PROPOSED FOOTBRIDGE BETWEEN PO SHEK WU ROAD SITE AND PO SHEK WU ESTATE

BB

BC

FB

T

S

R

Q

FD

BG

BA

BF

FE

PROPOSED FOOTBRIDGE OF PO SHEK WU ROAD SITE

AK

AL

AM

AO

AN

PROPOSED FOOTBRIDGE BETWEEN SITE 1 AND PO SHEK WU ESTATE

PO SHEK WU ROAD

CHOI YUEN ROAD

L

FC

M

O

K

I

PROPOSED FOOTBRIDGE OF PO SHEK WU ESTATE

SAN WAN ROAD

BH

AF

AE

AH

AI

AT

MTR SHEUNG SHUI STATION (EAST RAIL LINE)

LEGEND:

- SUBJECT SITE
- PROPOSED PUBLIC HOUSING PO SHEK WU ESTATE
- PROPOSED PUBLIC HOUSING DEVELOPMENT AT PO SHEK WU ROAD
- PROPOSED FOOTBRIDGE BETWEEN SITE 1 AND PO SHEK WU ESTATE
- PROPOSED FOOTBRIDGE OF PO SHEK WU ESTATE
- PROPOSED FOOTBRIDGE BETWEEN PO SHEK WU ROAD SITE AND PO SHEK WU ESTATE
- PROPOSED FOOTBRIDGE BETWEEN SITE 2 AND PO SHEK WU ROAD SITE
- PROPOSED FOOTBRIDGE OF PO SHEK WU ROAD SITE
- MTR SHEUNG SHUI STATION
- FOOTPATH
- STAIRCASE
- SUBWAY
- FOOTBRIDGE
- CROSSING

Job Title

PROPOSED PUBLIC HOUSING DEVELOPMENT SITES 1 & 2 IN SHEUNG SHUI AREAS 4 AND 30

FIGURE 11

Date	Scale	Drawing Title
08/2018	N.T.S.	**LOCATION PLAN FOR ASSESSED PEDESTRIAN FACILITIES**
Drawn	Job No.	
WC	236072-09	

ARUP

N

SAN WAN ROAD

PO WAN ROAD

PO WAN ROAD

PO SHEK WU ROAD

CHOI FAT STREET

CHOI FAI STREET

CHOI YUEN ROAD

SAN WAN ROAD

PROPOSED FOOTBRIDGE BETWEEN SITE 2 AND PO SHEK WU ROAD SITE

PROPOSED FOOTBRIDGE BETWEEN PO SHEK WU ROAD SITE AND PO SHEK WU ESTATE

PROPOSED FOOTBRIDGE OF PO SHEK WU ROAD SITE

TO/FROM LANDMARK NORTH

PROPOSED FOOTBRIDGE BETWEEN SITE 1 AND PO SHEK WU ESTATE

PO SHEK WU ROAD

CHOI YUEN ROAD

PROPOSED FOOTBRIDGE OF PO SHEK WU ESTATE

TO/FROM MTR SHEUNG SHUI STATION

SAN WAN ROAD

LUNG WAN STREET

MTR SHEUNG SHUI STATION (EAST RAIL LINE)

LEGEND:

- SUBJECT SITE
- PROPOSED PUBLIC HOUSING PO SHEK WU ESTATE
- PROPOSED PUBLIC HOUSING DEVELOPMENT AT PO SHEK WU ROAD
- PROPOSED FOOTBRIDGE BETWEEN SITE 1 AND PO SHEK WU ESTATE
- PROPOSED FOOTBRIDGE OF PO SHEK WU ESTATE
- PROPOSED FOOTBRIDGE BETWEEN PO SHEK WU ROAD SITE AND PO SHEK WU ESTATE
- PROPOSED FOOTBRIDGE BETWEEN SITE 2 AND PO SHEK WU ROAD SITE
- PROPOSED FOOTBRIDGE OF PO SHEK WU ROAD SITE
- MTR SHEUNG SHUI STATION
- PEDESTRIAN ROUTINGS TO/FROM SUBJECT SITE
- PEDESTRIAN ROUTINGS IN PUBLIC HOUSING SITES (INDICATIVE)

Job Title

PROPOSED PUBLIC HOUSING DEVELOPMENT SITES 1 & 2 IN SHEUNG SHUI AREAS 4 AND 30

FIGURE 12

Date	Scale	Drawing Title
08/2018	N.T.S.	**PEDESTRIAN ROUTINGS TO/FROM THE PROPOSED DEVELOPMENT**
Drawn: WC	Job No.: 236072-09	ARUP

N

SAN WAN ROAD

PO WAN ROAD

PO SHEK WU ROAD

PO WAN RO

SAN WAN ROAD

BF

LUNG SUM AVENUE

LUNG WAN STREET

LUNG SUM LANE

CHOI YUEN ROAD

SAN WAN ROAD

BH

MTR SHEUNG SHUI STATION
(EAST RAIL LINE)

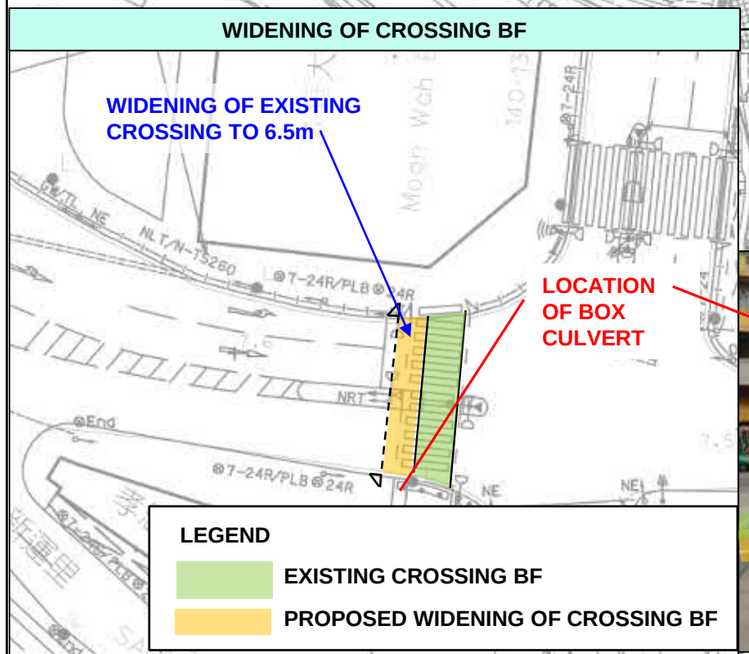
FOOTPATH WIDENING AT FOOTPATH BH



LEGEND

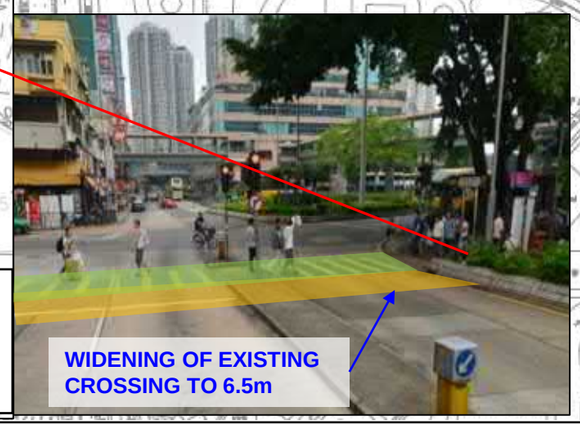
- EXISTING FOOTPATH
- EXISTING PLANTER TO BE REMOVED

WIDENING OF CROSSING BF



LEGEND

- EXISTING CROSSING BF
- PROPOSED WIDENING OF CROSSING BF



Job Title

PROPOSED PUBLIC HOUSING DEVELOPMENT SITES 1 & 2 IN SHEUNG SHUI AREAS 4 AND 30

FIGURE 13

Date	Scale	Drawing Title
08/2018	N.T.S.	**PROPOSED IMPROVEMENT SCHEMES FOR PEDESTRIAN FACILITIES**
Drawn: WC	Job No.: 236072-09	

ARUP

N

PO WAN ROAD

KA FU CLOSE

CHOI FAT STREET

SAN WAN ROAD

CHOI YUEN ROAD

PO SHEK WU ROAD

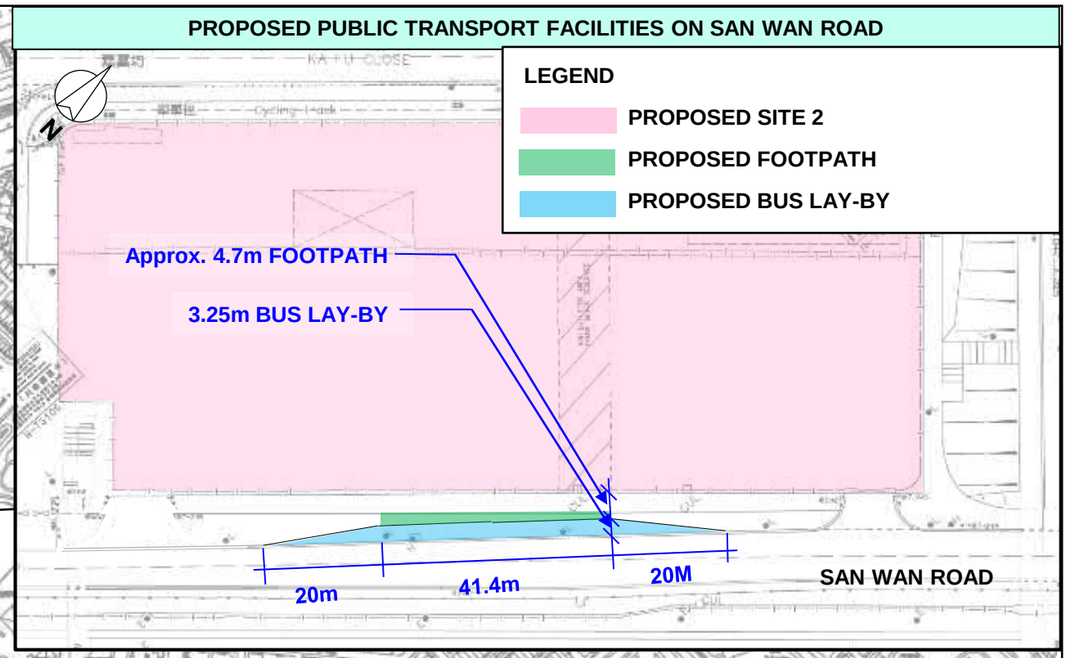
PAK WO ROAD

FANLING HIGHWAY

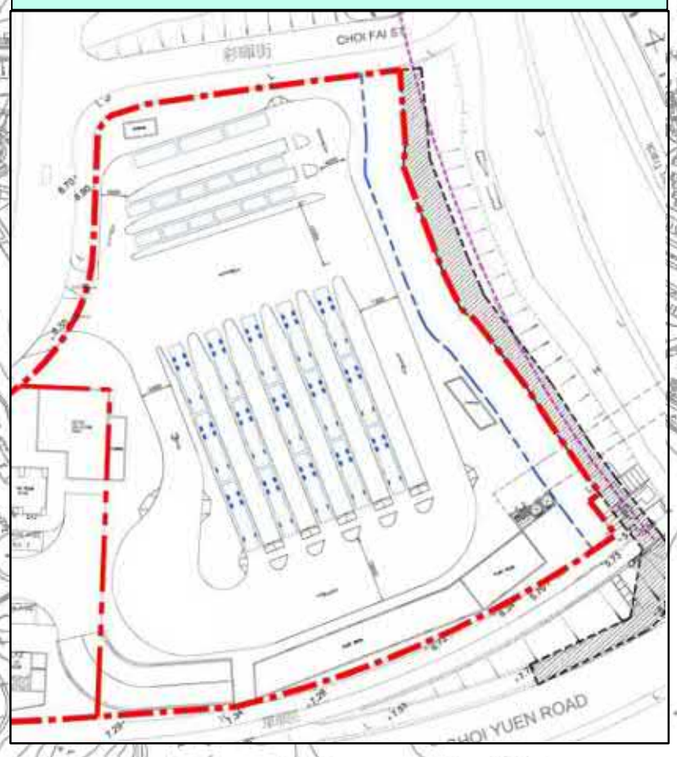
JOCKEY CLUB ROAD

SO KWUN PO ROAD

PROPOSED PUBLIC TRANSPORT FACILITIES ON SAN WAN ROAD



PROPOSED PUBLIC TRANSPORT INTERCHANGE IN SITE 1



Job Title: **PROPOSED PUBLIC HOUSING DEVELOPMENT SITES 1 & 2 IN SHEUNG SHUI AREAS 4 AND 30**			**FIGURE 14**
Date: **08/2018**	Scale: **N.T.S.**	Drawing Title: **PROPOSED PUBLIC TRANSPORT FACILITIES**	ARUP
Drawn: **WC**	Job No.: **236072-09**		

N

SAN WAN ROAD

PO WAN ROAD

PO WAN ROAD

PO SHEK WU ROAD

CHOI FAT STREET

CHOI FAI STREET

CHOI YUEN ROAD

SAN WAN ROAD

PROPOSED FOOTBRIDGE BETWEEN SITE 2 AND PO SHEK WU ROAD SITE

PROPOSED FOOTBRIDGE BETWEEN PO SHEK WU ROAD SITE AND PO SHEK WU ESTATE

PROPOSED FOOTBRIDGE OF PO SHEK WU ROAD SITE

PROPOSED FOOTBRIDGE BETWEEN SITE 1 AND PO SHEK WU ESTATE

PO SHEK WU ROAD

CHOI YUEN ROAD

PROPOSED FOOTBRIDGE OF PO SHEK WU ESTATE

POSSIBLE FOOTBRIDGE CONNECTION TO MTR STATION

SAN WAN ROAD

MTR SHEUNG SHUI STATION (EAST RAIL LINE)

LEGEND:

- SUBJECT SITE
- PROPOSED PUBLIC HOUSING PO SHEK WU ESTATE
- PROPOSED PUBLIC HOUSING DEVELOPMENT AT PO SHEK WU ROAD
- PROPOSED FOOTBRIDGE BETWEEN SITE 1 AND PO SHEK WU ESTATE
- PROPOSED FOOTBRIDGE OF PO SHEK WU ESTATE
- PROPOSED FOOTBRIDGE BETWEEN PO SHEK WU ROAD SITE AND PO SHEK WU ESTATE
- PROPOSED FOOTBRIDGE BETWEEN SITE 2 AND PO SHEK WU ROAD SITE
- PROPOSED FOOTBRIDGE OF PO SHEK WU ROAD SITE
- POSSIBLE FOOTBRIDGE CONNECTION TO MTR STATION
- MTR SHEUNG SHUI STATION

The engineering feasibility of the proposed footbridges should be reviewed by other civil and structural studies etc and subjected to detailed design stage.

Job Title

PROPOSED PUBLIC HOUSING DEVELOPMENT SITES 1 & 2 IN SHEUNG SHUI AREAS 4 AND 30

FIGURE 15

Date	Scale	Drawing Title
08/2018	N.T.S.	**OVERVIEW OF PROPOSED FOOTBRIDGE NETWORK**
Drawn	Job No.	
WC	236072-09	

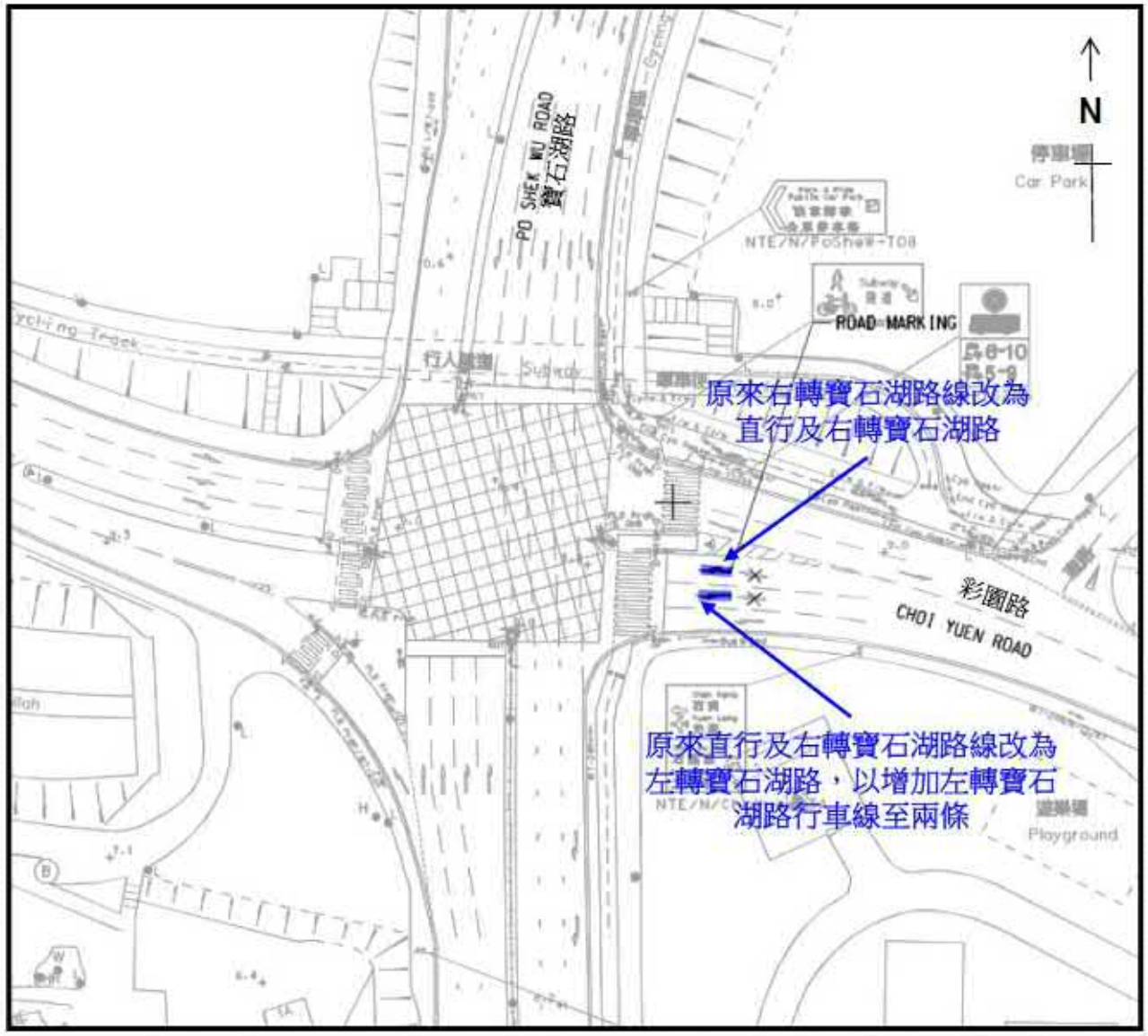
ARUP

Appendix A

Planned/ Committed Junction Improvement Schemes by Other Projects

Drawing No. A1

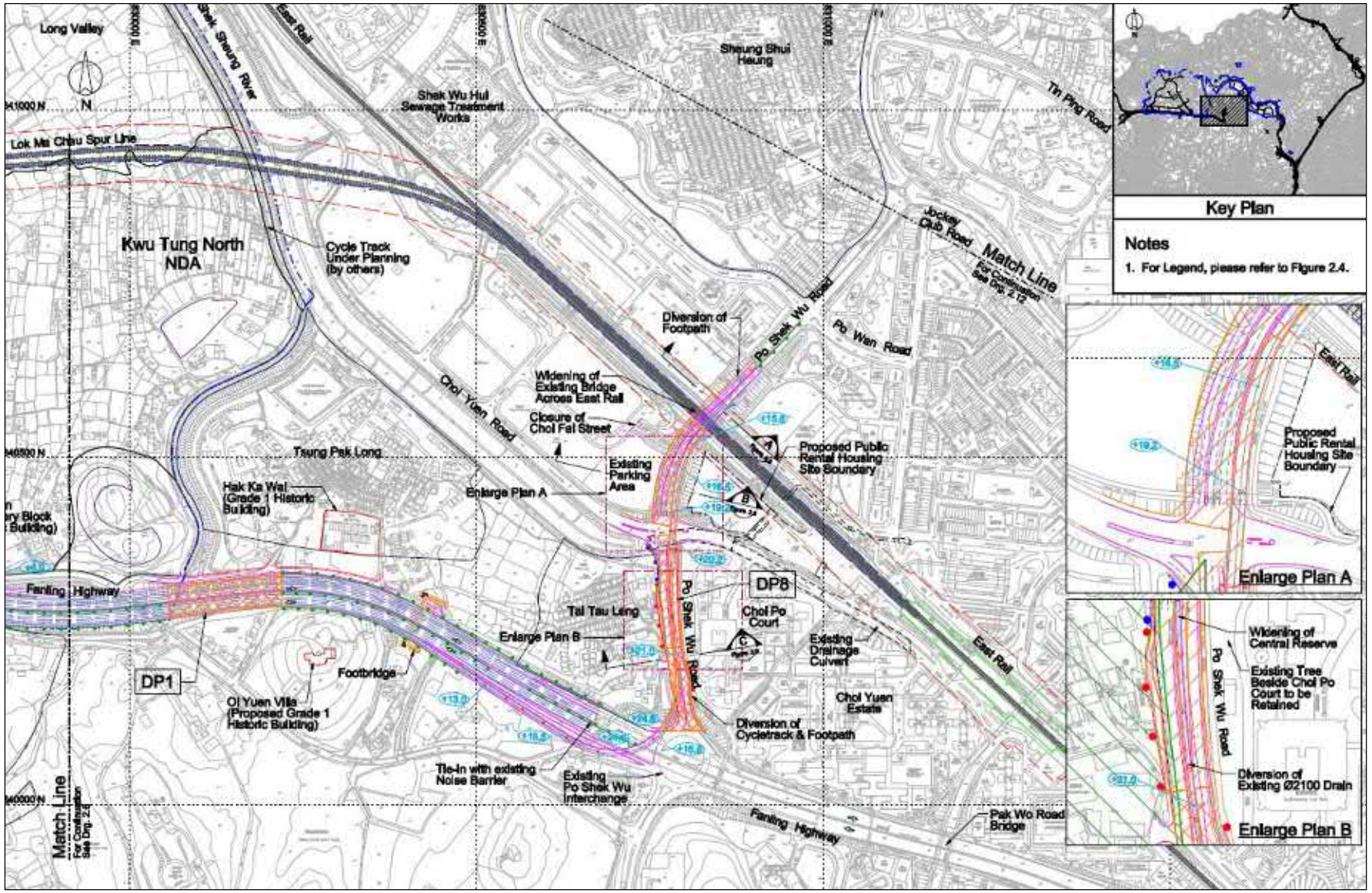
J3 – Po Shek Wu Road / Choi Yuen Road



Drawing No. A2

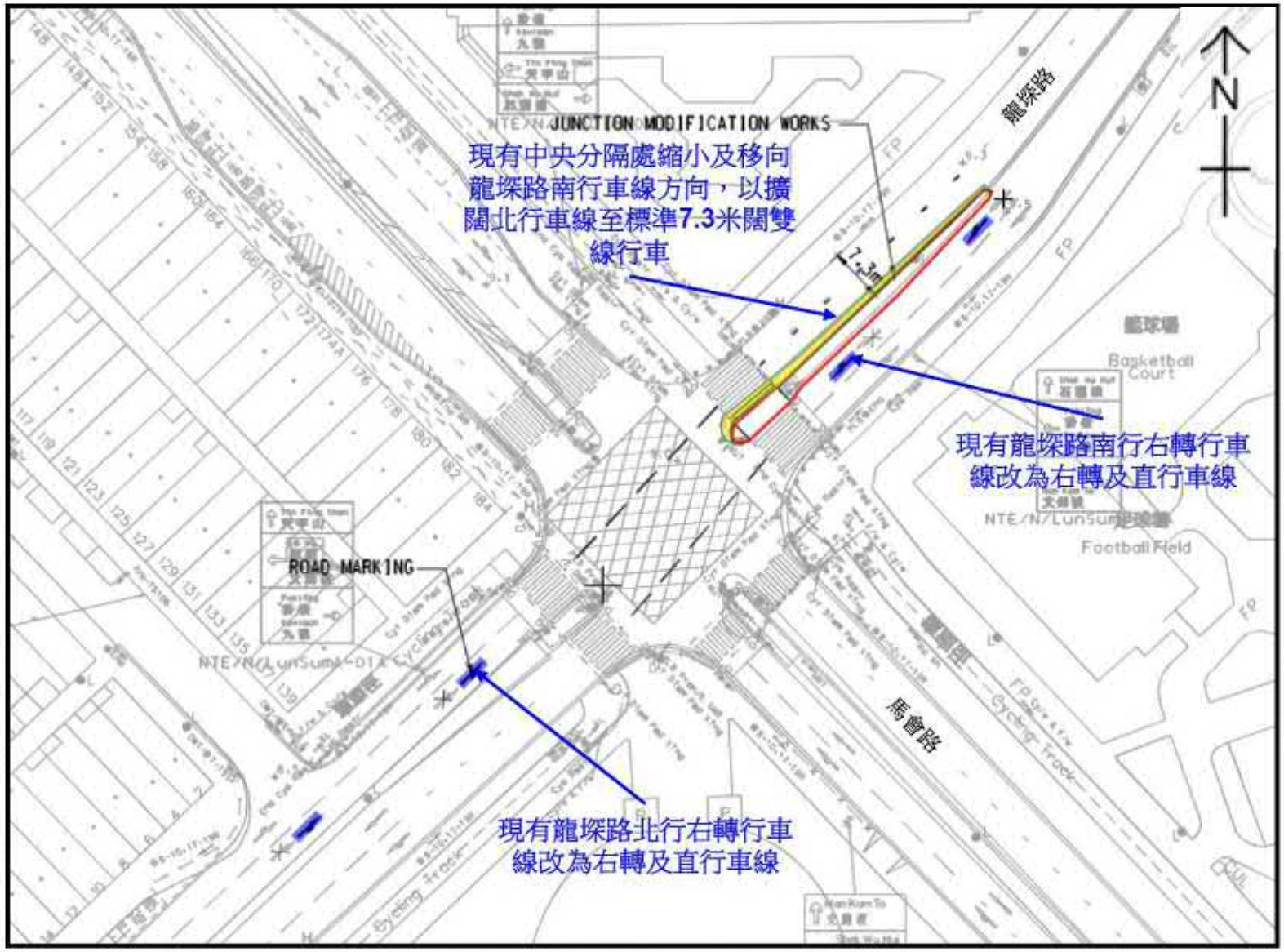
J3 – Po Shek Wu Road / Choi Yuen Road

(Proposed Po Shek Wu Interchange Improvement)

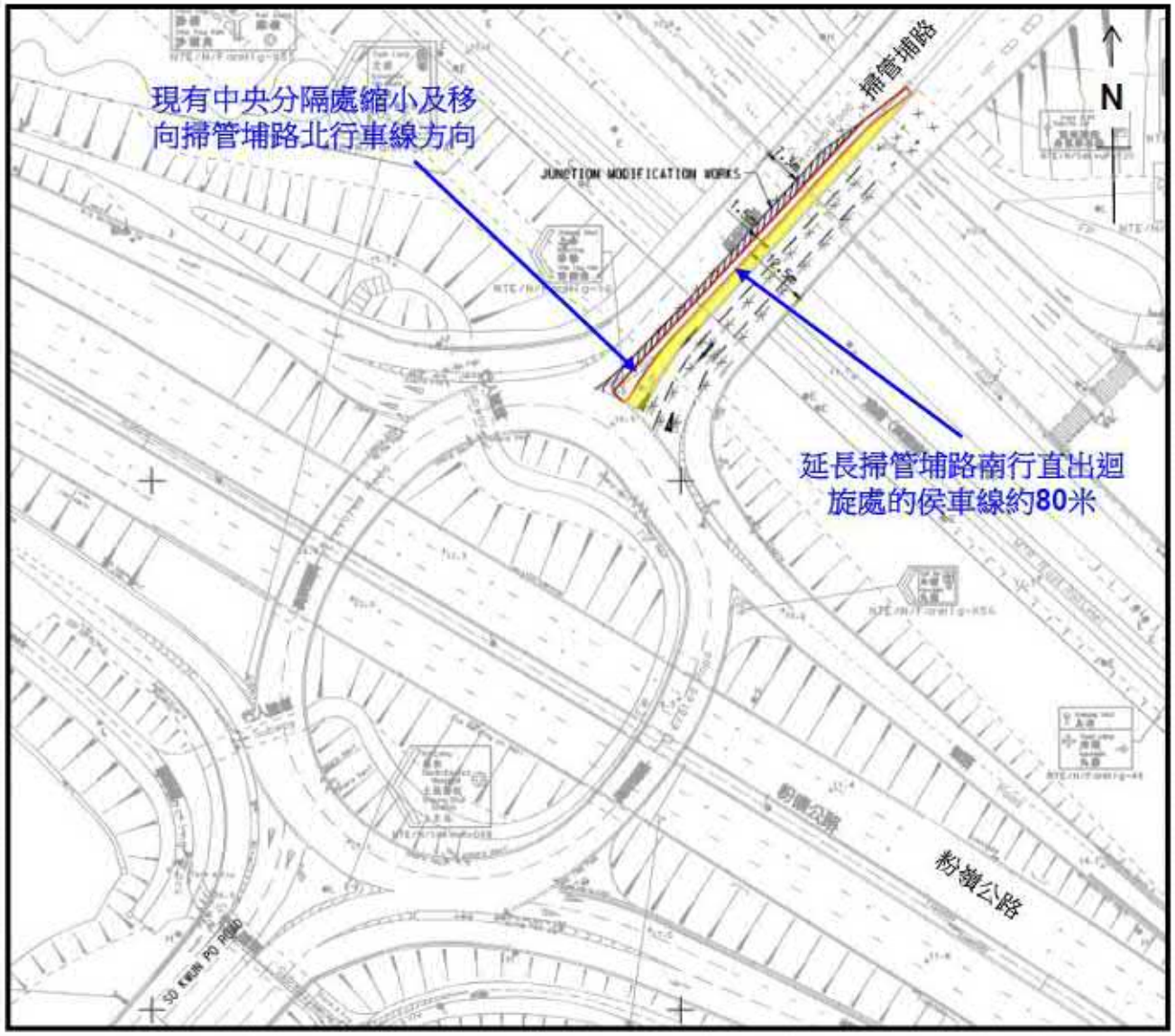


Drawing No. A3

J5 – Jockey Club Road / Lung Sum Avenue

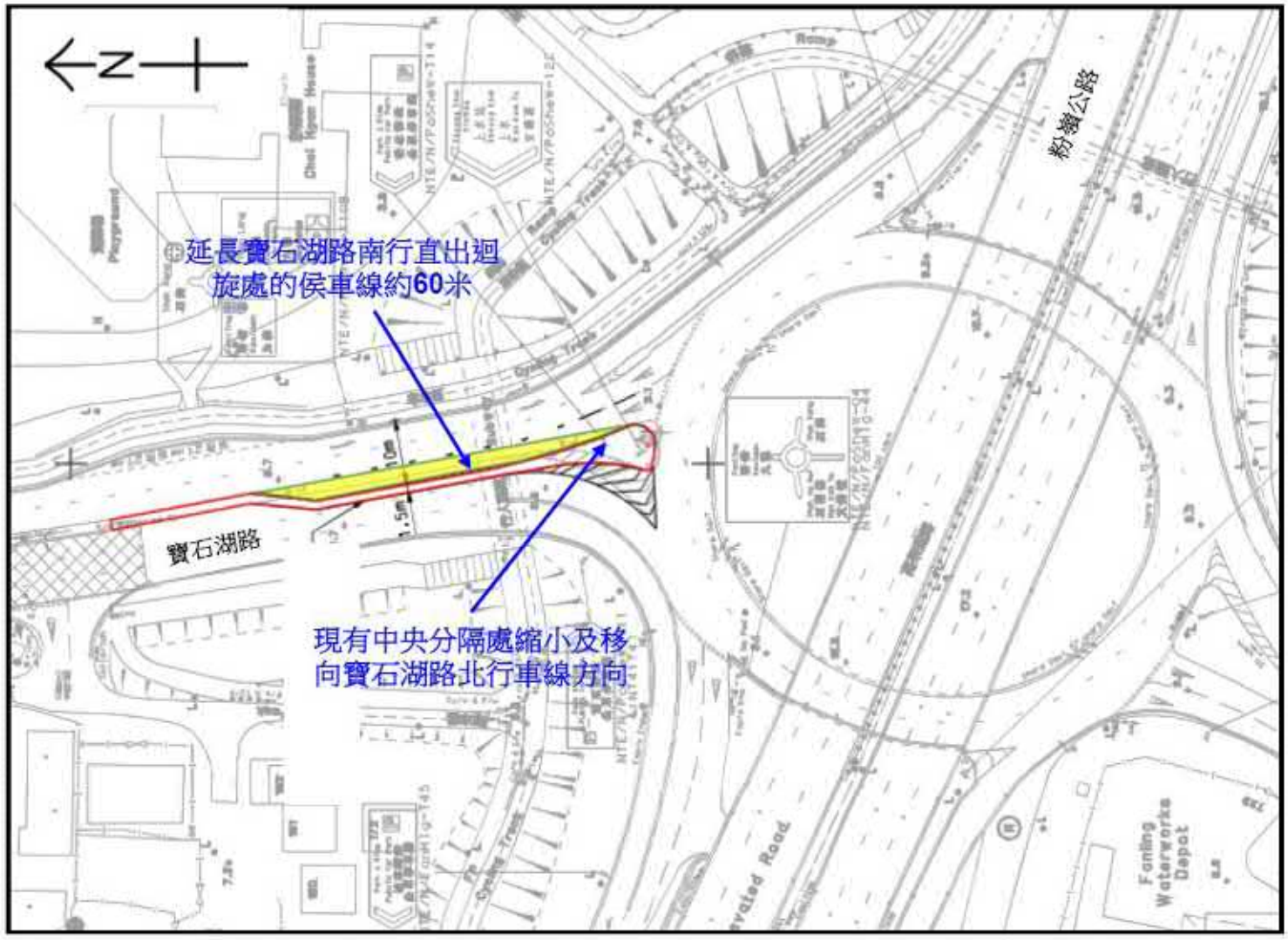


Drawing No. A4
J7 – So Kwun Po Road Interchange



Drawing No. A5

J8 – Po Shek Wu Road Interchange

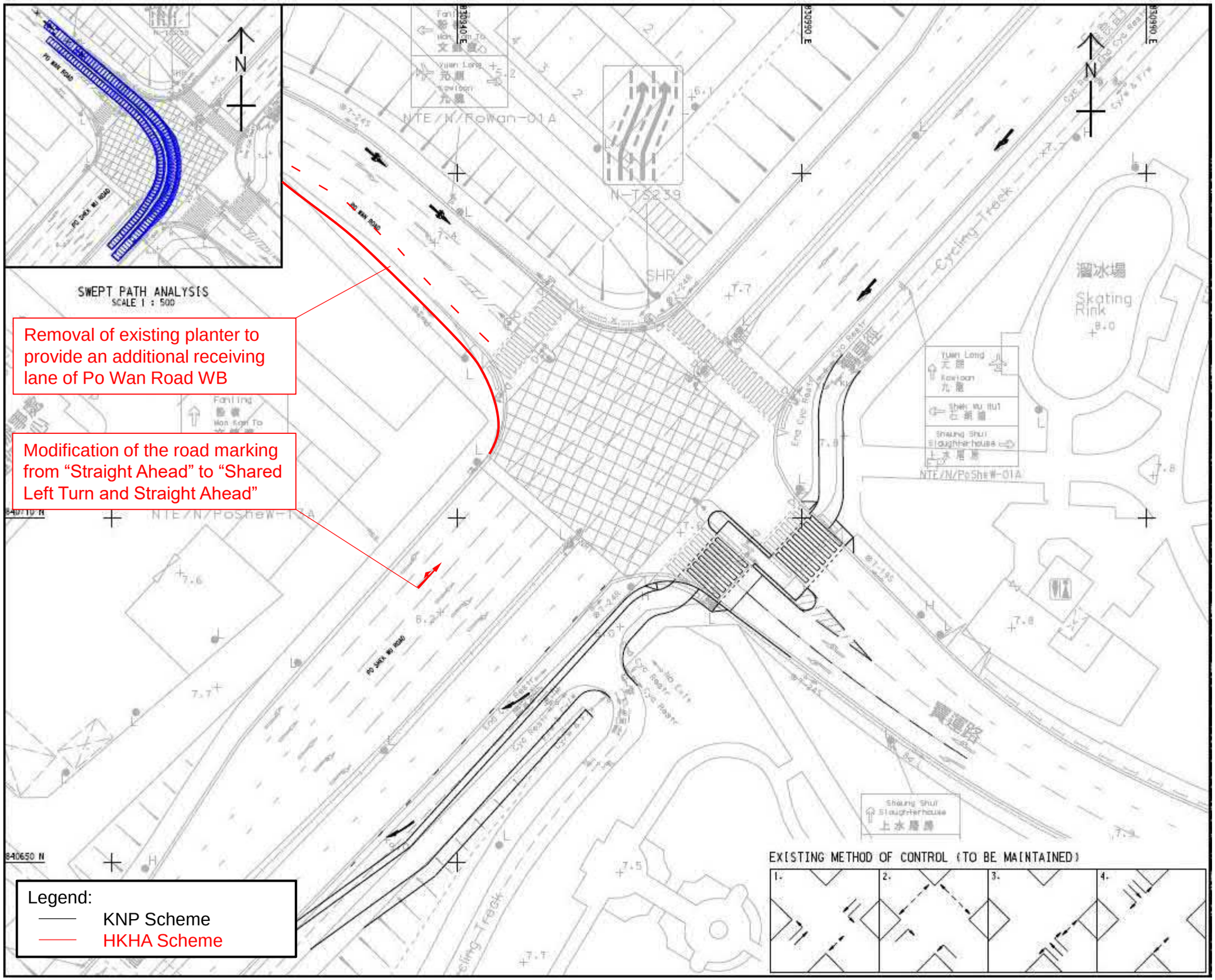


Appendix B

Proposed Junction Improvement Schemes

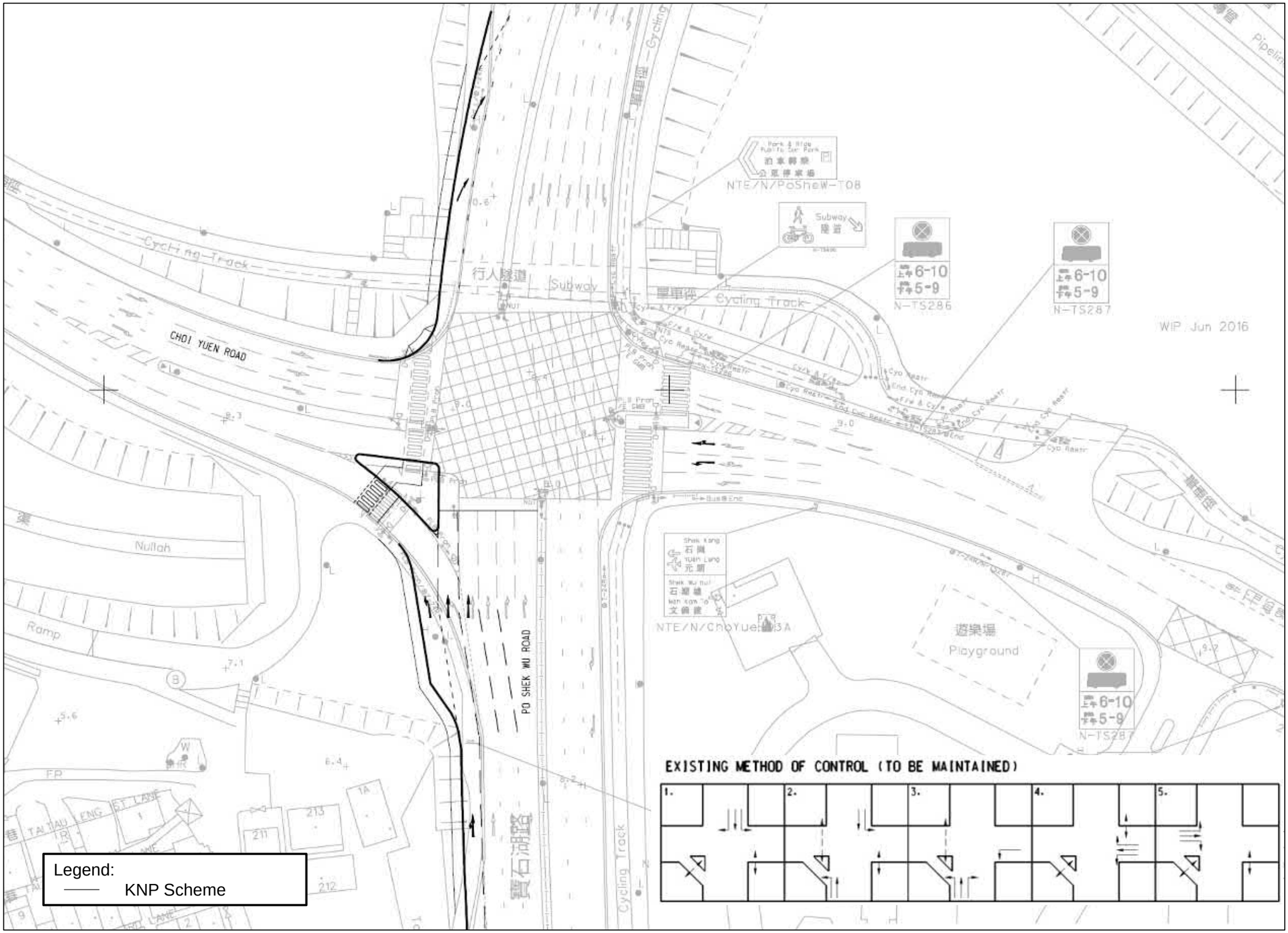
Drawing No. B1

J2 – Po Shek Wu Road / Po Wan Road (to be Completed by 2023)



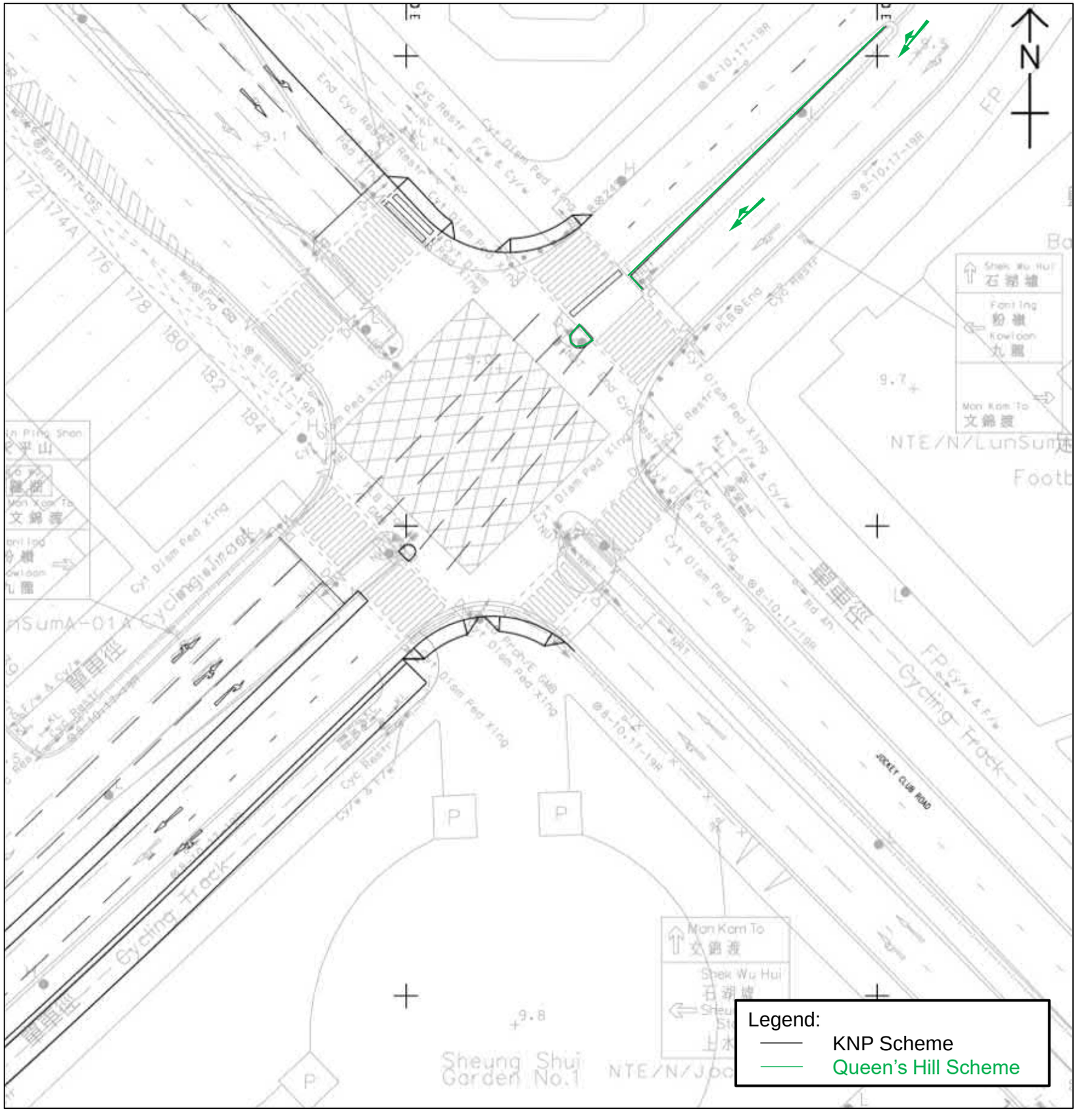
Drawing No. B3

J3 – Po Shek Wu Road / Choi Yuen Road (to be Completed by 2023)



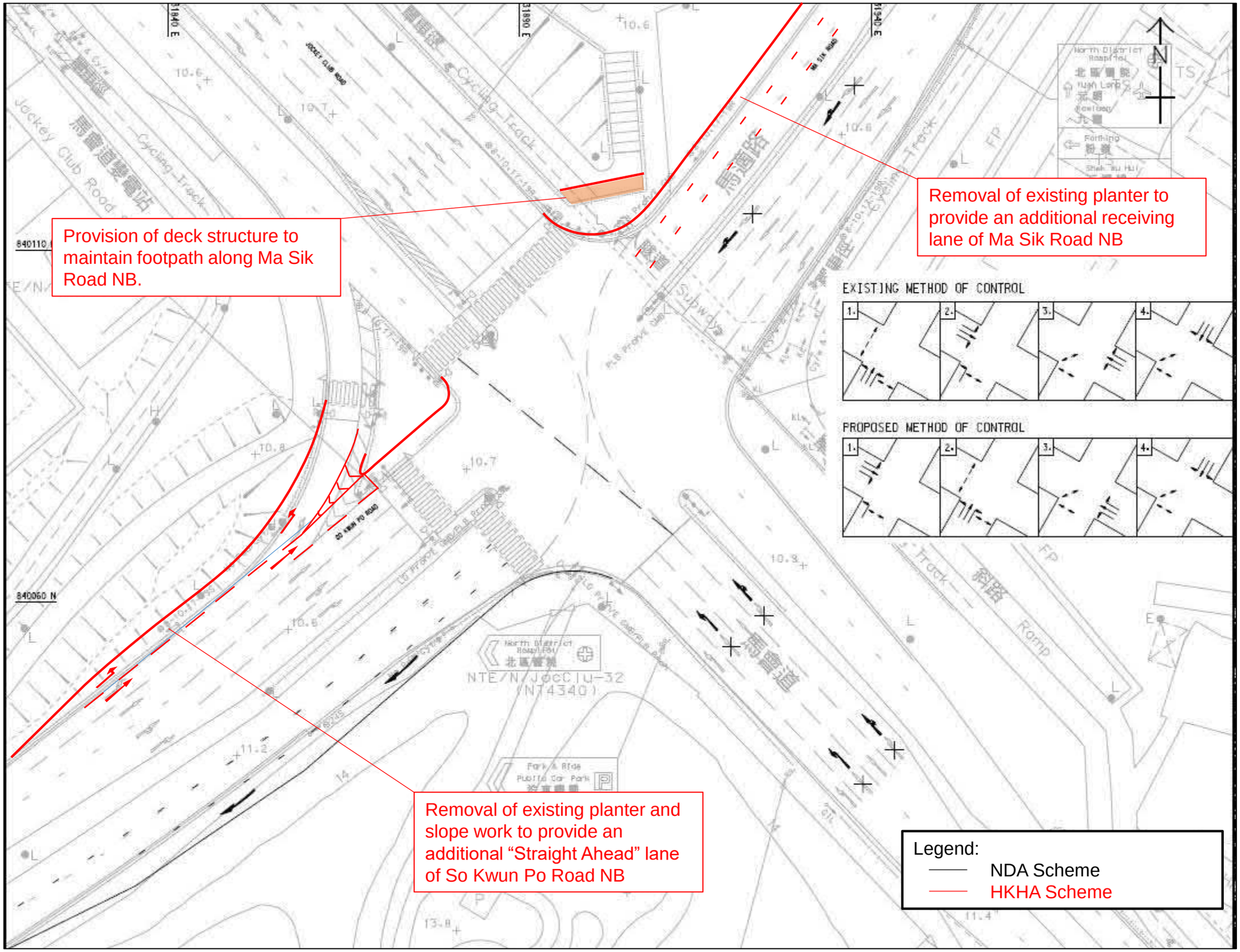
Drawing No. B4

J5 – Jockey Club Road / Lung Sum Avenue (to be Completed by 2023)



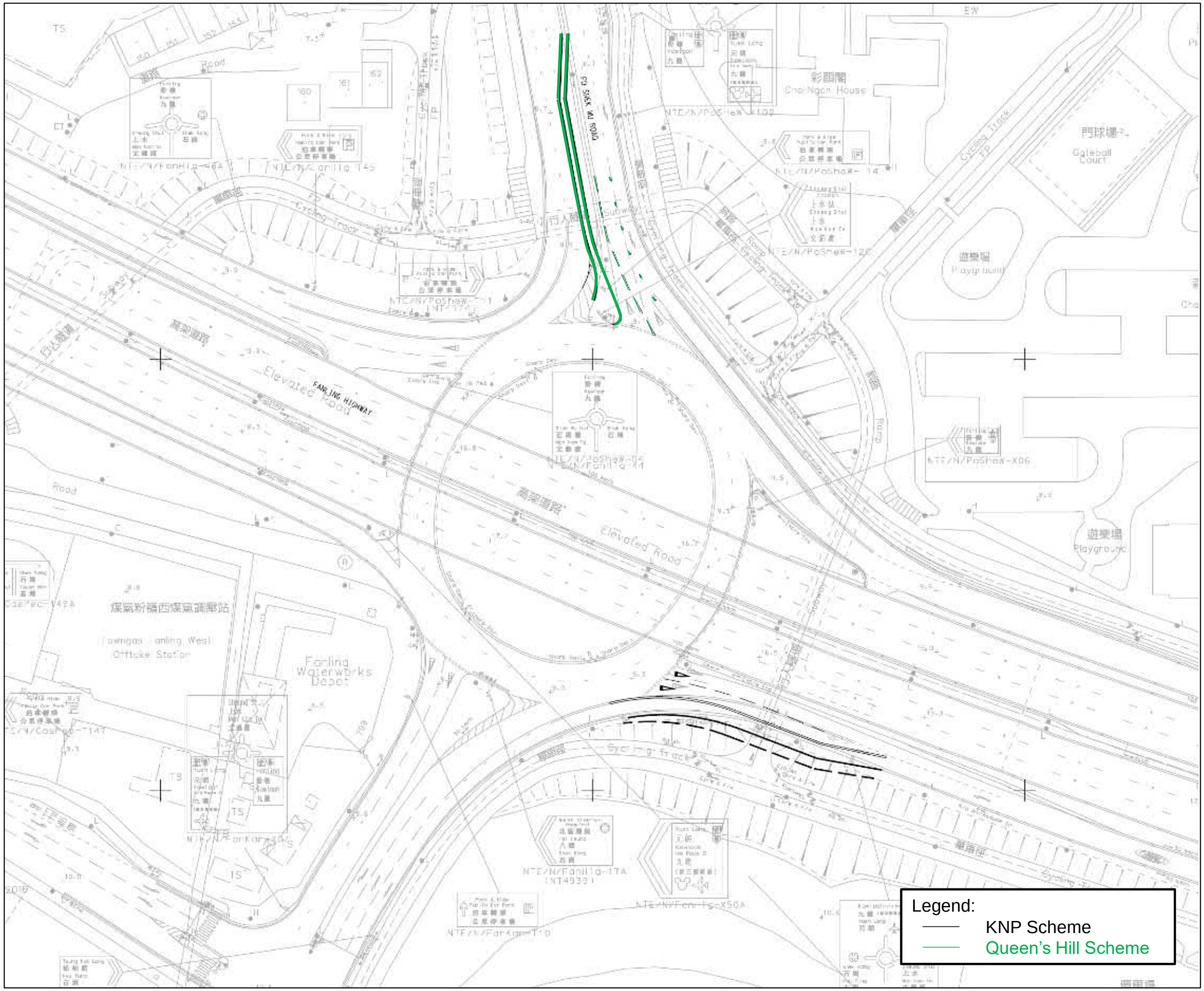
Drawing No. B5

J6 – Jockey Club Road / So Kwun Po Road (to be Completed by 2023)



Drawing No. B6

J8 – Po Shek Wu Road Interchange (to be Completed by 2023)



Hong Kong Housing Authority

Proposed Housing Site at Po Shek Wu Road, Sheung Shui

Traffic Impact Assessment

Revised Final Report

Revision 10 | January 2019

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 236072-12

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1 INTRODUCTION

1.1 Background

1.1.1 Arup was appointed by Hong Kong Housing Authority to conduct a Traffic Impact Assessment (TIA) for the land rezoning of the proposed public housing development at Po Shek Wu Road, Sheung Shui (the Site). The Site is Subsidised Sale Flats (SSF) Development at San Wan Road.

1.1.2 The Site is bounded by Shek Wu Hui Jockey Club Playground on the north, San Wan Road on the south, an access road on the east and Po Shek Wu Road on the west. It is zoned "Open Space" ("O") and as a temporary bus depot under Short Term Tenancy (STT). The proposed SSF development will comprise of about 1,850 flats and is envisaged to be completed by Year 2026/27. The site location and its environs in the vicinity are shown in **Figure 1**.

1.1.3 This TIA study is to examine the impacts of the traffic generated by the proposed SSF development on the existing and planned road networks, particularly with respect to the performances of the affected junctions in the vicinity; and present the findings and results of analyses of the other traffic and transport issues related to the proposed SSF developments. Any deficiency would be identified and improvement proposals would be recommended if necessary to resolve any foreseeable problem.

1.2 Study Tasks

1.2.1 The principal objective of the Study is to support the proposed SSF development by addressing the traffic-related issues and ensuring that the proposed developments would be feasible in terms of traffic without causing adverse impacts on the surrounding road network and pedestrian facilities.

1.2.2 To achieve this objective, the major tasks can be summarised as follows:

- to assess the existing traffic conditions in the vicinity of the proposed SSF development;
- to forecast traffic demands on the adjacent road network in the design years 2027 and 2031;
- to estimate the likely traffic generated by the proposed SSF development;
- to assess the impacts of traffic generated by the proposed SSF development on the adjacent road network using the forecast background flows and the traffic generated by the proposed developments;
- to recommend improvement measures, if necessary, to alleviate any traffic problems on the road network; and

- to investigate the public transport and pedestrian needs generated by the proposed SSF development.

1.3 Structure of the Report

1.3.1 Following this introductory chapter, there are six further chapters:

Chapter 2 – Describes the existing traffic conditions;

Chapter 3 – Describes the planning parameters of the proposed SSF development, issues regarding the site access and provision of car parking and loading / unloading facilities;

Chapter 4 – Presents the trip generation of the proposed SSF development and the traffic forecasts; reports the results of the junction capacity assessments; reviews traffic condition in the vicinity of the proposed SSF development; and recommends measures to improve the traffic condition, if considered necessary;

Chapter 5 – Describes the pedestrian impact assessment and any proposal for improving the pedestrian network where necessary;

Chapter 6 – Describes the sensitive analysis on the programme slippage of major improvement works; and

Chapter 7 – Summarises and concludes the study.

2 EXISTING TRAFFIC CONDITIONS

2.1 Locality and Access to the Site

2.1.1 The Site are located at north of San Wan Road as shown in **Figure 1**. The Site can be accessed from the local access road at the east connecting to the district distributer San Wan Road, which runs in the east-west direction connecting to Jockey Club Road on the east and Sheung Shui Sewerage Treatment Works on the west. Jockey Club Road is a primary distributor also running in the east-west direction connecting to Sha Tau Kok Road on the east and Po Wan Road to the west. Po Shek Wu Road, which is on the west of the Site, is a primary distributor running in the north-south direction connecting to the Jockey Club Road on the north and Fanling Highway on the south. The access/egress routes to/from the Site are shown as in **Figure 2**.

2.2 Existing Road Network

2.2.1 As indicated above, the Sites are well served by a comprehensive road network to / from all districts. Some major road network in the vicinity of the proposed housing development are listed as follows:

- Choi Yuen Road

  Choi Yuen Road is a single carriageway two-way district distributor running in the east-west direction. It joins Po Shek Wu Road on the west and Pak Wo Road on the east. It is also the major access to MTR Sheung Shui Station.

- San Wan Road

  San Wan Road is a single/dual carriageway two-way district distributor running in the east-west direction. It joins San Po Street on the west and Jockey Club Road/Sha Tau Kok Road on the east. It is another major access to MTR Sheung Shui Station.

- Po Shek Wu Road

  Po Shek Wu Road is a dual-two lane primary distributor running in the north-south direction. It connects to the junction with Jockey Club Road on the north and the Fanling Highway Interchange on the south.

- Fanling Highway

  Fanling Highway is a dual-three lane expressway linking to San Tin Highway to the west and Tolo Highway to the east.

- Jockey Club Road

  Jockey Club Road is a dual-two lane primary distributor connecting to Man Kam To Road and Fanling Highway at the junction with Pak Wo Road.

2.3 Existing Traffic Condition

2.3.1 To appreciate the existing traffic conditions, comprehensive classified traffic counts were conducted at the following key junctions. The assessments have been based on the latest junction layouts and method of control. Locations of these surveyed junctions are listed below and shown in **Figure 1**.

- J1 – Jockey Club Road / Po Shek Wu Road (Roundabout)
- J2 – Po Shek Wu Road / Po Wan Road (Signal Junction)
- J3 – Po Shek Wu Road / Choi Yuen Road (Signal Junction)
- J4 – Choi Yuen Road / Pak Wo Road (Roundabout)
- J5 – Jockey Club Road / Lung Sum Avenue (Signal Junction)
- J6 – Jockey Club Road / So Kwun Po Road (Signal Junction)
- J7 – So Kwun Po Road Interchange (Roundabout)
- J8 – Po Shek Wu Road Interchange (Roundabout)
- J9 – Po Wan Road / San Po Street (Signal Junction)
- J10 – San Wan Road / San Po Street (Priority)
- J13 – Ka Fu Close / San Po Street (Priority)
- J15 – San Fung Avenue / Lung Sum Avenue (Signal Junction)
- J16 – San Fung Avenue / Po Wan Road (Signal Junction)
- L1 – Po Shek Wu Road – Section between Choi Yuen Road and Fanling Highway (Link)
- L2 – Po Shek Wu Road – Section between Choi Yuen Road and Po Wan Road (Link)
- L3 - Po Shek Wu Road – Section between Jockey Club Road and Po Wan Road (Link)
- L4 - Po Wan Road (Link)
- L5 – San Wan Road (Link)

2.3.2 The traffic counts were undertaken on a normal weekday in 2016 during the periods 0730 - 0930 and 1730 - 1930 hours. Supplementary survey was conducted in May 2017 at Junctions J6, J7 and J8. The surveyed traffic flows in 2017 are in general higher than those of 2016. It is revealed that the observed total flows of the most critical road links in the town, i.e. Po Shek Wu Road and So Kwun Po Road, in 2017 is about 14% and 10% higher than those of 2016 during AM and PM peak hours respectively. In view thereof, adjustment factor of 1.14 (for AM peak) and 1.10 (for PM peak) to the traffic flows observed in 2016 is therefore applied for assessment of existing traffic condition, except for Junction J6, J7 and J8 in which the observed traffic flows in 2017 are adopted. The adopted traffic flows to assess 2017 existing junction performance are presented in **Figure 3**. From the observed traffic flows in 2017, the morning and evening peak hours were identified as 0730-

0830 hours and 1730-1830 respectively. In general, the morning peak hour flows were observed to be higher than the evening peak periods.

2.3.3 Junction and link capacity analyses have been carried out at the key junctions and links along the key access routes of the Sites. Results of the capacity assessment are shown in **Tables 2.1 and 2.2** below.

Table 2.1 Year 2017 Existing Junction Performance

Junction (1)		Type	Performance (2)	
			AM	PM
J1	Jockey Club Road / Po Shek Wu Road	Roundabout	0.36	0.44
J2	Po Shek Wu Road / Po Wan Road	Signal	29%	19%
J3	Po Shek Wu Road / Choi Yuen Road	Signal	4%	7%
J4	Choi Yuen Road / Pak Wo Road	Roundabout	0.47	0.43
J5	Jockey Club Road / Lung Sum Avenue	Signal	14%	17%
J6	Jockey Club Road / So Kwun Po Road	Signal	12%	37%
J7	So Kwun Po Road Interchange	Roundabout	0.96	0.92
J8	Po Shek Wu Road Interchange	Roundabout	0.96	0.99
J9	Po Wan Road / San Po Street	Signal	>100%	>100%
J10	San Wan Road / San Po Street	Priority	0.24	0.16
J13	Ka Fu Close / San Po Street	Priority	0.03	0.05
J15	San Fan Avenue / Lung Sum Avenue	Signal	>100%	>100%
J16	San Fung Avenue / Po Wan Road	Signal	98%	>100%

Notes:

(1) Please refer to **Figure 1** for the location of the assessed junctions; and

(2) Figures shown represent "Reserve Capacity" (RC) for the signal controlled junctions and "Design Flow to Capacity" (DFC) ratio for the priority junctions and roundabouts. A signal-controlled junction with a reserve capacity (RC) of 0% implies that it is operating at capacity while a negative RC suggests that the junction is overloaded. RC >= 15 % implies that the signal-controlled junction is operating satisfactory. For roundabout, the performance indicator is the DFC. DFC ratio of 1.00 indicates continual queuing and could not be considered acceptable. A DFC ratio of 0.85, indicating that queuing would theoretically be avoided in 85% of cases, can be considered reasonable. A DFC of 0.70 indicates that queuing will be avoided in 0.95 of cases.

(3) Vehicular traffic queue was observed along Po Shek Wu Road Southbound during AM and PM peak hours. In general, the end of traffic queue was observed near Choi Yuen Road (i.e. Junction J3 - Po Shek Wu Road / Choi Yuen Road) which is about 350m in length from Junction J8 – Po Shek Wu Road Interchange.

(4) Vehicular traffic queue was observed along So Kwun Po Road Southbound during AM and PM peak hours. In general, the end of traffic queue was observed near Jockey Club Road (i.e. Junction J6 - Jockey Club Road / So Kwun Po Road) which is about 390m in length from Junction J7 – Po Shek Wu Road Interchange. For southern side, the end of traffic queue was occasionally observed along Pak Wo Road near J4 - Ching Hiu Road/ Pak Wo Road which is about 300m in length from Junction J7 – So Kwun Po Road Interchange.

Table 2.2 Year 2017 Existing Road Link Performance

Road Links		Direction	Capacity (pcu/hr) [1]	Flow (pcu/hr)		V/C Ratio [2]	
				AM	PM	AM	PM
L1	Po Shek Wu Road – Section between Choi Yuen Road and Fanling Highway	NB	4,700	1,810	2,175	0.39	0.46
		SB	3,000	1,910	2,050	0.64	0.68
L2	Po Shek Wu Road – Section between Choi Yuen Road and Po Wan Road	NB	2,800	1,405	1,585	0.50	0.57
		SB	2,800	1,290	1,425	0.46	0.51
L3	Po Shek Wu Road – Section between Jockey Club Road and Po Wan Road	NB	2,800	705	1,050	0.25	0.38
		SB	2,800	880	1,205	0.31	0.43
L4	Po Wan Road	EB	900	250	215	0.28	0.24
		WB	1,800	315	170	0.18	0.09
L5	San Wan Road	EB	1,800	110	100	0.06	0.06
		WB	1,800	70	130	0.04	0.07

Note:
[1] Road capacity is defined in accordance to STM Model and TPDM Volume 2 Chapter 2.4 Table 2.4.1.1 by converting the vehicles to pcu for analysis;
[2] A V/C ratio of 0.7 might infer adequate operating conditions, the effect of junctions or traffic signals both within and at the end of the road link may be such that the design flow could never be achieved in practice, and the link might be severely congested well before a V/C ratio of 1.0 is reached.

2.3.4 Results of the analysis indicate that all junctions in the vicinity of the Sites are currently operating within capacity.

2.4 Public Transport Facilities

2.4.1 The Site is well served by various modes of public transport services in close vicinity. The key modes of public transport are:

- Franchised Bus Services – The Sites are well-served by comprehensive franchised bus services operating within the surrounding road network. The bus services operating in the vicinity of the Site are summarised in **Table 2.3**.
- Green Minibus (GMB) Services – The Sites are also well-served by GMB services operating within the surrounding road network. A summary of GMB services are found in **Table 2.3**.
- The Site is located within 500m walking distance west of MTR Sheung Shui Station.

2.4.2 **Figure 4** shows the locations of existing bus stops and GMB stops in vicinity of the Sites.

Table 2.2 Existing Public Transport Services

Route No.		Origin - Destination	Frequency (minutes)	Remarks
Bus	**70K**	Wah Ming B/T ↔ Ching Ho	15 – 20	Circular route
	73K	Sheung Shui B/T ↔ Man Kam To	15 – 30	
	76K	Ching Ho B/T ↔ Long Ping Estate B/T	20 – 30	
	77K	Sheung Shui B/T ↔ Yuen Long (Fung Cheung Road) B/T	20 – 30	
	78K	Sheung Shui B/T ↔ Sha Tau Kok B/T	15 – 30	
	79K	Sheung Shui B/T ↔ Ta Kwu Ling	20 – 30	
	261	Sam Shing ↔ Ting Ping Estate B/T	20 – 30	
	261P	Ng Tau Road (Tsing Lun Road) → Tin Ping Estate B/T	-	Monday to Saturday morning peak hour service only
	270	Tin Ping Estate ↔ Tsui Lai Garden B/T	7 – 10	Circular Route
	270A	Sheung Shui B/T ↔ Tsim Sha Tsui East (Mody Road)	10 – 20	
	270B	Sheung Shui B/T ↔ Shum Shui Po	15 – 60	Monday to Saturday morning peak hour service only Sunday noon peak hour service only
	270P	Sheung Shui B/T ↔ Kowloon Station	-	Monday to Saturday morning peak hour service only
	270S	Tsim Sha Tsui East (Mody Road) ↔ Luen Wo Hui B/T	-	00:45-02:00 only
	273A	Choi Yuen B/T ↔ Wah Ming	4 – 10	Circular route
	273B	Ching Ho Estate B/T ↔ Sheung Shui Station	5 – 10	Circular route
	273D	Sheung Shui B/T ↔ Wah Ming	15 – 30	Circular route
	276	Tin Tsz B/T ↔ Sheung Shui B/T	15 - 25	
	276A	Tin Heng Estate B/T ↔ Tai Ping	5 – 15	
	276B	Tin Fu ↔ Choi Yuen B/T	15 – 20	
	276P	Tin Shui Wai Station ↔ Sheung Shui B/T	5 – 20	
	277E	Tin Ping Estate B/T ↔ Lam Tin Station B/T	20	
	277P	Tin Ping Estate B/T ↔ Lam Tin Station B/T	30	Monday to Friday morning peak hour service only
	278X	Sheung Shui B/T ↔ Tsuen Wan (Nina Tower)	5 – 20	

Route No.		Origin - Destination	Frequency (minutes)	Remarks
	279X	Luen Wo Hui B/T ↔ Tsing Yi Station B/T	9 – 15	
	373	Sheung Shui B/T ↔ Central (Hong Kong Station)	-	Monday to Saturday morning and afternoon peak hour service only
	673	Sheung Shui B/T ↔ Central (Hong Kong Station)	30	
	678	Sheung Shui B/T ↔ Causeway Bay	-	Monday to Friday morning peak hour service only
	978	Wah Ming B/T ↔ Wan Chai North	10 – 30	
	978A	Luen Wo Hui B/T ↔ Wan Chai North	-	Monday to Friday morning peak hour service only
	978B	Chi Fok Circuit ↔ Wan Chai North	-	Monday to Friday morning peak hour service only
	A43	Luen Wo Hui B/T ↔ Airport (Ground Transportation Centre) Terminus	15 – 30	
	A43P	Luen Wo Hui B/T ↔ Airport (Ground Transportation Centre) Terminus	25 – 30	
	N42A	Luen Wo Hui B/T ↔ Tung Chung Station	-	Night route
	N42P	Sheung Shui Station ↔ Airport (Ground Transportation Centre) Terminus	-	Night route
	N73	Sheung Shui B/T ↔ Lok Ma Chau B/T	30	Night route
	T270	Cheung Wah B/T ↔ Tsim Sha Tsui East (Mody Road)	-	Monday to Friday morning peak hour service only
	T277	Sheung Shui B/T ↔ Lam Tin Station B/T	-	Monday to Friday morning peak hour service only
GMB	**44**	Tuen Mun Ferry Pier ↔ Sheung Shui Station	2 – 3	
	44A	Tuen Mun Station PTI ↔ Sheung Shui Station	2 – 5	
	50A	Sheung Shui Station ↔ Kwu Tung (South)	10 – 15	Circular route
	50K	Sheung Shui Station ↔ Hang Tau	5 – 25	
	51K	Sheung Shui Station ↔ Ho Sheung Heung	7 – 20	
	55K	Sheung Shui Station ↔ Sha Tau Kok (Shun Lung Street)	4 – 10	
	57K	Sheung Shui Station ↔ Tong Kung Leng	8 – 30	
	58K	Sheung Shui Station ↔ Ping Kong	10 – 30	
	58S	Mong Kok Station ↔ Sheung Shui Station	12 – 15	Night route
	59K	Sheung Shui Station ↔ Lin Ma Hang	15 – 60	

Route No.		Origin - Destination	Frequency (minutes)	Remarks
	501S	Sheung Shui Station ↔ Yue Man Square	15 – 20	Night route
	605	Ki Lun Tsuen ↔ Sheung Shui Station	25	

2.4.3 In summary, the Sites are serving with comprehensive public transport services via the adjacent railway network and the road-based public transport services (including franchised bus and GMB services).

2.4.4 In view of comprehensive coverage of the public transport services and the available different choices on transport modes, the proposed housing development is considered to have good accessibility via public transport.

3 THE PROPOSED HOUSING DEVELOPMENT

3.1 Site Description

3.1.1 The Site is bounded by Shek Wu Hui Jockey Club Playground on the north, San Wan Road on the south, an access road on the east and Po Shek Wu Road on the west. It is zoned "Open Space" ("O") and as a temporary bus depot under Short Term Tenancy (STT). The proposed SSF development will comprise of about 1,850 flats and is envisaged to be completed by Year 2026/27. The site location and its environs in the vicinity are shown in **Figure 1**.

3.2 Development Schedule

3.2.1 Hong Kong Housing Authority intends to develop the Site for public residential development with an approximate development schedule of 1,850 SSF flats for the Site. The Site would tentatively be completed by Year 2026/2027.

3.2.2 **Table 3.1** below summarises the latest development schedule of proposed housing development.

Table 3.1 Summary of Development Schedule

Development	The Site (SSF)
SSF	1,850 flats
Retail	3,000 sqm GFA
Kindergarten	6 classrooms
Avg. Household Size	2.80
Population	5,180

3.3 Car Parking and Loading / Unloading Provision

3.3.1 The proposed provision of parking and loading/unloading facilities were provided based on the Interim Parking Standards for Home Ownership Scheme (i.e. SSF) and Hong Kong Planning Standards and Guidelines (HKPSG) for kindergarten. The proposed provisions described in **Table 3.2** have fully considered the subject development.

Table 3.2 Parking and Loading / Unloading Facilities Provision

Development	Facility	Interim Parking Standards for HOS (i.e. SSF) and HKPSG Guideline	Requirement	Proposed Provision
Proposed Housing Site at Po Shek Wu Road, Sheung Shui				
SSF (1,850 flats) (2 Residential Blocks)	Private Car Parking	1 per 15-22 flats	84-124 nos.	124 nos. (Incl. 2 nos. of parking space for the persons with disabilities)
	Light Goods Vehicle Parking	Nil	-	-
	Visitor Car Parking	5 per residential block ^	10 nos.	10 nos.
	Motor cycle Parking	1 per 110 flats	17 nos.	17 nos.
	Loading / Unloading	1 per residential block	2 nos.	2 nos.
	Bicycle Parking	1 per 15 flats	124 nos.	124 + 40 ^ nos.
Retail (3,000 sqm GFA)	Private Car Parking	1 per 200 sqm GFA	15 nos.	15 nos.
	Loading / Unloading	1 per 800-1200 sqm GFA	3-4 nos.	4 nos.
Kindergarten # (6 classrooms)	Private Car Parking	For kindergartens within public housing estates, the parking and loading/unloading facilities provision would be subject to requirements of Housing Authority under HKPSG. The kindergarten is planned to be within buildings in the housing sites. Nil provision is proposed for kindergarten.		1 no.
	Loading / Unloading			1 no.

Remark:

* Interim Parking Standards for Home Ownership Scheme (i.e. SSF) is adopted. Classification of flat type between SSF and PRH is different. If according to HKPSG for public rental housing developments (within 500m radius), 1 per 31-46 flats (exclude 1P/2P flats) is adopted for private car parking; 1 per 200-600 flats (exclude 1P/2P flats) is adopted for lights goods vehicle parking, and no visitor car park is required. There is no difference between the two standards for other parking provisions.

\# HKPSG's parking standards are adopted for kindergarten. Interim Parking Standards are adopted for other types of development.

^ Parking provision in accordance with the agreement with Transport Department.

3.4 Access Arrangement / Pedestrian Facilities

3.4.1 Vehicles can access the Site via access road on the east connecting to San Wan Road, which links to Jockey Club Road to the east.

3.4.2 There will be 1 no. of vehicular access for the Site to provide Emergency Vehicular Accesses (EVA). The detailed arrangement of the proposed vehicular accesses is indicated in **Figure 1**.

3.4.3 The internal road system within the proposed development is subject to detailed design. The Emergency Vehicular Access (EVA) should be of a minimum 6m in width wherever applicable in the internal road system and fully comply with requirements of "Code of Practice for Fire Safety in Buildings 2011" by Buildings Department.

3.4.4 The existing pedestrian facilities are well-developed in the vicinity of the Site. The existing footpath will be maintained on San Wan Road and access road on the east. Three new footbridges are proposed to connect the proposed development to the future public housing development site at Sheung Shui Areas 4 and 30 Site 2, the future public housing development site at Choi Yuen Road Sites 3 and 4 (now named

as Po Shek Wu Estate) and the existing footbridge linking Choi Yuk House on the south and Landmark North on the north. Pedestrians can access the proposed development via the surrounding pedestrian facilities connecting to the nearby bus / GMB termini and MTR Sheung Shui Station.

3.4.5 In addition, a possible footbridge connection connecting the existing footbridge to Sheung Shui MTR Station would be provided subject to further investigation at detail design stage. **Figure 14** shows the overview of the proposed footbridge network in the vicinity of the subject site.

4 FUTURE TRAFFIC CONDITIONS

4.1 Assessment Scenarios

4.1.1 To evaluate the associated traffic impact likely to be induced by the proposed change in land use, four scenarios were analysed and compared. The 1st and 3rd scenarios are Reference Scenario (without the proposed housing developments) in Year 2027 and 2031. The 2nd and 4th scenarios are Design Scenarios (with the proposed housing developments) in Year 2027 and 2031, respectively.

4.1.2 Taking into consideration that the proposed SSF development will be completed by 2026/2027 and phased commissioning of NDA and Fanling Bypass, years 2027 and 2031 were adopted as the design years in the study. The year 2027 scenario would demonstrate the traffic conditions in the study area after completion of the proposed SSF development. The year 2031 scenario would demonstrate the traffic conditions in the study area 4 years after completion of the proposed SSF development respectively, taking into account of the change of traffic pattern before/ after the phased commissioning of NDA and Fanling Bypass.

4.1.3 Four assessment scenarios were assessed for the design years, namely:

- 2027 Reference Case (2027 Background Traffic Flows including generated/attracted traffic related to other planned developments in the vicinity)
- 2027 Design Case (2027 Reference Case Traffic Flows + generated/attracted traffic related to the proposed SSF development)
- 2031 Reference Case (2031 Background Traffic Flows including generated/attracted traffic related to other planned developments in the vicinity)
- 2031 Design Case (2031 Reference Case Traffic Flows + generated/attracted traffic related to the proposed SSF development)

4.1.4 The methodology adopted to forecast the traffic for the future years is presented in the next section.

4.1.5 The forecasted traffic flows for above assessment scenarios are shown in **Figures 5** to **8**.

4.2 Forecasting Methodology

Proposed Area of Influence (AOI)

4.2.1 Area of Influence (AOI) is proposed and presented in **Figure 1**. It covers the critical road junctions and road networks in Sheung Shui Town, which may be affected by the proposed development in the Site. Necessary data and information within the AOI have been collected and assembled for assessments.

New Development Area (NDA)

4.2.2 Considering the traffic impact of the future development at New Development Area (NDA), it is expected that the future traffic patterns (i.e. design years 2027 and 2031) will be complex by the changes in the NDA. The complexity of growth in overall transport demand, coupled with the anticipated significant changes in pattern, would complicate the future traffic forecast. To maintain accuracy, it is recommended that comprehensive traffic forecast should be adopted, taking into account of the latest development proposal of NDA and the future road network and highway for the Year 2027 and Year 2031 traffic.

Other Planned/Committed Developments in the Vicinity of Site

4.2.3 Besides NDA, there are some other planned/committed developments in the vicinity of the Sites, including:

- Proposed Committed Public Housing Development at Po Shek Wu Estate;
- Proposed Public Housing Development Sites 1 & 2 in Sheung Shui Areas 4 and 30;
- Proposed Wholesale Conversion into Retail Development from Existing Advanced Technology Centre at No.2 Choi Fat Street, Sheung Shui;
- Proposed Wholesale Conversion into Office-cum-Retail Building from Existing Industrial Building at No.9 Choi Yuen Road, Sheung Shui;
- Proposed Wholesale Conversion into Retail Development at No. 6 Choi Fai Street, Sheung Shui; and
- Proposed Wholesale Conversion into Office-cum-Retail Building at No. 21 Po Wan Road, Sheung Shui

4.2.4 The estimated trips of these developments have also been reviewed and incorporated into the development of traffic forecast, as appropriate. Trip generation / attraction by proposed housing development of Po Shek Wu Estate are reference to the HKHA's Traffic Impact Assessment (TIA) Report for Po Shek Wu Estate. Trip generation / attraction of Sites 1 & 2 in Sheung Shui Areas 4 and 30 are estimated from trip generation rates of public housing development stipulated in TPDM as shown in **Table 4.1**. Summary of the trip generation of these public housing development is given in **Table 4.2** respectively.

Table 4.1 Trip Generation / Attraction Rates for Public Housing Development Sites 1 & 2 in Sheung Shui Areas 4 and 30

Development Type	AM Peak		PM Peak	
	Generation	Attraction	Generation	Attraction
Subsidised Housing: Public Rental (pcu/flat/hr) (1)	0.0242	0.0226	0.0177	0.0201
Retail / Shopping Complex (pcu/hr/100 m^2 GFA) (1)	0.2296	0.2434	0.3100	0.3563

Note:
(1) Reference to "Traffic Rates for Residential Developments at 95% Confidence Level", Transport Planning and Design Manual (TPDM), Volume 1

Table 4.2 Estimated Trip Generation / Attraction for other Planned Public Housing Development in the Vicinity of the Sites

Development	AM Peak		PM Peak	
	Generation	Attraction	Generation	Attraction
Public Housing Development at Po Shek Wu Estate (1)				
PRH (Planned: 1,160 flats) (1)	65	53	34	41
Retail (790 m^2 GFA) (1)	2	2	3	3
6-Classroom Kindergarten, Welfare facilities (2,604 m^2 GFA) (1)	30	30	30	30
Public Car Park (221 nos. of space) (1)	18	35	42	40
Total of Po Shek Wu Estate	**115**	**120**	**109**	**114**
Public Housing Development Site 1				
PRH (Planned: 2,040 flats Assessment Purpose: 2,244 flats) (2)	55	51	40	46
Retail (400 m^2 GFA)	1	1	2	2
Kindergarten (6 classrooms) and Welfare Facilities (8,710 m^2 GFA) (3)	30	30	30	30
Total of Site 1	**86**	**82**	**72**	**78**
Public Housing Development Site 2				
PRH (Planned: 1,480 flats Assessment Purpose: 1,628 flats) (2)	40	37	29	33

Development	AM Peak		PM Peak	
	Generation	Attraction	Generation	Attraction
Retail (700 m^2 GFA)	2	2	3	3
Car Park (about 300 spaces)	no additional traffic generated / attracted are expected in view of the existing car park within the site			
Post Office (560 m^2 GFA)	traffic generated / attracted are expected to fall outside the peak hours and would be minimal during the peak hours			
Total of Site 2	**42**	**39**	**32**	**36**
Total (Site 1 + Site 2)	**128**	**121**	**104**	**114**

Note:

(1) Trip generation / attraction of Po Shek Wu Estate are reference to HKHA's TIA Report of Po Shek Wu Estate;

(2) With additional 10% allowance for the proposed number of flats of Sites 1 & 2; and

(3) For the kindergarten and welfare facilities, a nominal traffic of total 30 pcu/hr each way is assumed for these facilities as a conservative approach, in view of the minimal trips induced on the road networks during ordinary peak hours.

4.2.5 Trip generation / attraction by planned private retail and office development are reference to the Traffic Impact Assessment (TIA) Report by the corresponding developers under the S.16 Application. Summary of the trip generation of these private development is given in **Table 4.3** respectively.

Table 4.3 Estimated Trip Generation / Attraction for Other Planned Private Development in the Vicinity of the Sites

Development	AM Peak		PM Peak	
	Generation	Attraction	Generation	Attraction
Proposed Wholesale Conversion into Retail Development from Existing Advanced Technology Centre at No.2 Choi Fat Street, Sheung Shui (1)	24	16	15	19
Proposed Wholesale Conversion into Office-cum-Retail Building from Existing Industrial Building at No.9 Choi Yuen Road, Sheung Shui (2)	45	64	37	34
Proposed Wholesale Conversion into Retail Development at No. 6 Choi Fai Street, Sheung Shui (3)	69	73	93	107
Proposed Wholesale Conversion into Office-cum-Retail Building at No. 21 Po Wan Road, Sheung Shui (3)	9	12	12	12

Note:

(1) Trip generation / attraction are reference to the net changes of trip generation / attraction stipulated in Developer's TIA Report under the S.16 Application No. A/FSS/246;

(2) Trip generation / attraction are reference to the net changes of trip generation / attraction stipulated in Developer's TIA Report under the S.16 Application No. A/FSS/241; and

(3) Trip generation / attraction are reference to the estimated trip generation / attraction stipulated in TIA Report under S.16 Application No. A/FSS/241.

2-Tier Transport Modelling

4.2.6 A two-tier modelling approach was adopted. The upper tier involved the use of Arup's in-house CTS-compatible Traffic Model (TM) which produced traffic forecasts on a strategic basis. The cordoned matrices from the TM would then be input into the lower tier Local Area Traffic Model (LATM) which would be used to predict the future year traffic flow on a more local perspective. The modelling approach is elaborated in the following sections.

Upper Tier Model

4.2.7 Arup's in-house CTS-compatible TM was applied as the upper tier model. The TM was capable of producing trip matrices for the base and future years throughout the territory. The TM also offered the advantage of being capable of reflecting the traffic impacts especially the mode choice caused due to changes of road networks. It was hence recommended to adopt this model as the basis, and updated using the latest available planning data in the Enhanced 2011-based Territorial Population and Employment Data Matrix (TPEDM), planned and committed new infrastructures and local developments, including private development at Castle Peak Road – Kwu Tung (Rezoning Application No. Y/FSS/14), private development at Pak Wo Road 5 (Rezoning Application No. Y/FSS/13), public housing development at Sheung Shui Area 36 Phase 4 (Ching Ho Extension), Kong Nga Po Police Facilities and Sandy Ridge Columbarium and Crematorium Development for this study.

4.2.8 In order to ensure the traffic patterns predicted by the model could reasonably replicate the current traffic condition and hence provided confidence in forecasting the future year traffic, the output from the base year TM was compared against observed traffic flows as published in the Annual Traffic Census for both the AM and PM peak hours.

Lower Tier Model

4.2.9 Matrices cordoned from the TM were input into the LATM. Despite the LATM only performs traffic assignment, it offered the benefit of giving more detailed accounting of queuing, junction control and delays, making it more suitable for the evaluation of localized traffic impacts.

4.2.10 The development of the LATM would follow the same approach as TD's latest 2008-based Base District Traffic Model (BDTM). The compatibility between the 2 tiers was ensured by the control of the external trip ends, which were essentially the link flows of Fanling Highway, Fan Kam Road, Castle Peak Road – Kwu Tung, obtained from the TM. The link flows and junction turning counts on a more local level would be produced by the LATM assignments for subsequent impact assessments.

4.2.11 Validation was also carried out for the LATM and additional focus was given to the comparison of observed and modelled flows at both strategic and local road links. Supplementary traffic survey had been

conducted to provide traffic flows and turning counts which were not available in the Annual Traffic Census.

4.2.12 As survey counts represented the Year 2017 observed traffic flows, it was proposed to adopt Year 2017 as the LATM base year, and the LATM was validated to Year 2017 conditions.

4.2.13 The LATM has been developed for the area of N.T. North District, in which the traffic condition could be fully represented.

Trip Generation / Attraction for Proposed Housing Site at Po Shek Wu Road, Sheung Shui

4.2.14 For the proposed development trip generation and attraction, trip rates were made reference to Transport Department's Transport Planning and Design Manual (TPDM) Volume 1 Chapter 3 - Transport Considerations in Town Plans. The adopted trip rates for the proposed SSF development are shown in **Table 4.4**.

Table 4.4 Adopted Trip Generation / Attraction Rates for Proposed Housing Site at Po Shek Wu Road, Sheung Shui

Development	AM Peak		PM Peak	
	Generation	Attraction	Generation	Attraction
Subsidised Housing: HOS/PSPS/SSF Average Flat Size of 50sqm (pcu/flat/hr) (1)	0.0622	0.0426	0.0297	0.0401
Retail / Shopping Complex (pcu/hr/100 m^2 GFA) (1)	0.2296	0.2434	0.3100	0.3563

Source:

(1) 'Traffic Rates for Residential Developments at 95% Confidence Level', Transport Planning and Design Manual (TPDM), Volume 1

4.2.15 For the Site, there are about 1,850 flats in the SSF development, 3,000 sqm GFA of retail facilities and 767 sqm GFA of kindergarten in the Site. For the kindergarten in the Site, a nominal traffic of total 30 pcu/hr each way is assumed for these facilities, since they are expected to induce minimal trips on the road network.

4.2.16 The traffic generation by the proposed development are summarised in **Table 4.5**. The total trips would be around 270 and 210 two-way pcus/hr during the AM and PM peak periods respectively.

Table 4.5 Estimated Trips for the Subject Site

Development	AM Peak		PM Peak	
	Generation	Attraction	Generation	Attraction
Public Housing Site at Po Shek Wu Road, Sheung Shui				
SSF (Planned: 1,850 flats)	115	79	55	74
Retail (3,000 m^2 GFA)	7	7	9	11
Kindergarten (767 m^2 GFA) (1)	30	30	30	30
Total of Site at Po Shek Wu Road	**152**	**116**	**94**	**115**

Note:
(1) As reference to HKHA's TIA Report of Po Shek Wu Estate, for the kindergarten, a nominal traffic of total 30 pcu/hr each way is assumed for these facilities as a conservative approach, in view of the minimal trips induced on the road networks during ordinary peak hours.

Planned/ Committed Junction Improvement Schemes by Other Projects

4.2.17 Junction improvement schemes were recommended in other study of projects in the vicinity of the Sites. The junction improvement schemes, which are considered in the study, are summarized in **Table 4.6** below. The junction improvement schemes considered are based on the latest public available information. The general arrangement are shown as **Appendix A**.

Table 4.6 Summary of Junction Improvement Schemes by Others

Junction (1)		Type	Description	Completion Year	Design Scenarios Considered	Drawing No. in Appendix A (2)
J3	Po Shek Wu Road / Choi Yuen Road	Signal	Phase 1 ➢ Lane arrangement of the Choi Yuen Road westbound to be revised for providing two left-turn lanes Phase 2 ➢ Po Shek Wu Interchange Improvement which provides a flyover to allow the right turning traffic from Po Shek Wu Road southbound to Fanling Highway westbound to bypass the existing Po Shek Wu Interchange ➢ Po Shek Wu Road southbound would be narrowed from 5 lanes to 4 lanes	Already Completed under Queen's Hill Project (Phase 1) Year 2029 (Phase 2)	Year 2027 (Phase 1) Year 2031 (Phase 2)	A1, A2

Junction (1)		Type	Description	Completion Year	Design Scenarios Considered	Drawing No. in Appendix A (2)
J5	Jockey Club Road / Lung Sum Avenue	Signal	➢ Lane arrangement of the Lung Sum Avenue northbound/southbound to be revised for allowing straight-ahead traffic to use two traffic lanes ➢ Widening the Lung Sum Avenue northbound by narrowing the central median of Lung Sum Avenue	Year 2021	Year 2027 & Year 2031	A3
J7	So Kwun Po Road Interchange	Roundabout	➢ Local widening of southbound approach arm of So Kwun Po Road for a smoother entrance to the elevated roundabout	Year 2021	Year 2027 & Year 2031	A4
J8	Po Shek Wu Road Interchange	Roundabout	➢ Local widening of southbound approach arm of Po Shek Wu Road to 10m to have two traffic lanes when approaching the roundabout	Year 2021	Year 2027 & Year 2031	A5

Notes:
(1) Please refer to **Figure 1** for the location of the assessed junctions.
(2) The general arrangement of junction improvement scheme are shown in **Appendix A**.
(3) Road L4 and Kwu Tung Interchange are assumed to be in place in Year 2029 assessment scenarios.

4.3 Junction Capacity Assessment

4.3.1 Junction and link capacity assessment were undertaken based on the methodology presented in the TPDM. The results for the 2027 and 2031 reference and design cases are shown in **Tables 4.7 - 4.10**.

Table 4.7 Summary of Junction Performance – Year 2027

Junction [1]		Type	Junction Performance			
			Reference Case [2]		Design Case [2]	
			AM	PM	AM	PM
J1	Jockey Club Road / Po Shek Wu Road	Roundabout	0.42	0.54	0.42	0.54
J2	Po Shek Wu Road / Po Wan Road	Signal	0%	6%	-3%	5%
J3	Po Shek Wu Road / Choi Yuen Road	Signal	8%	9%	5%	5%
J4	Choi Yuen Road / Pak Wo Road	Roundabout	0.53	0.54	0.53	0.54
J5	Jockey Club Road / Lung Sum Avenue	Signal	-2%	25%	-3%	24%
J6	Jockey Club Road / So Kwun Po Road	Signal	-26%	-9%	-26%	-10%
J7	So Kwun Po Road Interchange [3]	Roundabout	1.00	1.01	1.00	1.01
J8	Po Shek Wu Road Interchange [3]	Roundabout	0.87	0.94	0.91	0.95
J9	Po Wan Road / San Po Street	Signal	72%	>100%	69%	>100%
J10	San Wan Road / San Po Street	Priority	0.30	0.08	0.31	0.08
J13	Ka Fu Close / San Po Street	Priority	0.12	0.06	0.12	0.06
J15	San Fan Avenue / Lung Sum Avenue	Signal	83%	>100%	64%	>100%
J16	San Fung Avenue / Po Wan Road	Signal	86%	>100%	71%	>100%

Notes:

[1] Please refer to **Figure 1** for the location of the assessed junctions; and

[2] Figures shown represent "Reserve Capacity" (RC) for the signal controlled junctions and "Design Flow to Capacity" (DFC) ratio for the roundabout. A signal-controlled junction with a reserve capacity (RC) of 0% implies that it is operating at capacity while a negative RC suggests that the junction is overloaded. RC >= 15 % implies that the signal-controlled junction is operating satisfactory. For roundabout, the performance indicator is the DFC. DFC ratio of 1.00 indicates continual queuing and could not be considered acceptable. A DFC ratio of 0.85, indicating that queuing would theoretically be avoided in 85% of cases, can be considered reasonable. A DFC of 0.70 indicates that queuing will be avoided in 0.95 of cases.

Table 4.8 Year 2027 Road Link Performance

Road Links		Direction	Capacity (pcu/hr) [1]	Road Link Performance							
				Reference Case				Design Case			
				Flow (pcu/hr)		V/C Ratio [2]		Flow (pcu/hr)		V/C Ratio [2]	
				AM	PM	AM	PM	AM	PM	AM	PM
L1	Po Shek Wu Road – Section between Choi Yuen Road and Fanling Highway	NB	3,000	1,950	2,410	0.65	0.80	2,020	2,480	0.67	0.83
		SB	3,000	2,500	2,640	0.83	0.88	2,580	2,675	0.86	0.89
L2	Po Shek Wu Road – Section between Choi Yuen Road and Po Wan Road	NB	2,800	1,760	1,820	0.63	0.65	1,840	1,890	0.66	0.68
		SB	2,800	1,650	1,840	0.59	0.66	1,735	1,880	0.62	0.67
L3	Po Shek Wu Road – Section between Jockey Club Road and Po Wan Road	NB	2,800	1,075	1,360	0.38	0.49	1,075	1,360	0.38	0.49
		SB	2,800	1,225	1,645	0.44	0.59	1,225	1,645	0.44	0.59
L4	Po Wan Road	EB	900	315	240	0.35	0.27	315	240	0.35	0.27
		WB	1,800	610	220	0.34	0.12	610	220	0.34	0.12
L5	San Wan Road	EB	1,800	210	160	0.12	0.09	215	160	0.12	0.09
		WB	1,800	130	105	0.07	0.06	140	105	0.08	0.06

Note:

[1] Road capacity is defined in accordance to STM Model and TPDM Volume 2 Chapter 2.4 Table 2.4.1.1 by converting the vehicles to pcu for analysis;

[2] A V/C ratio of 0.7 might infer adequate operating conditions, the effect of junctions or traffic signals both within and at the end of the road link may be such that the design flow could never be achieved in practice, and the link might be severely congested well before a V/C ratio of 1.0 is reached.

Table 4.9 Summary of Junction Performance – Year 2031

Junction [1]		Type	Junction Performance			
			Reference Case [2]		Design Case [2]	
			AM	PM	AM	PM
J1	Jockey Club Road / Po Shek Wu Road	Roundabout	0.55	0.55	0.55	0.55
J2	Po Shek Wu Road / Po Wan Road	Signal	-6%	-6%	-8%	-6%
J3	Po Shek Wu Road / Choi Yuen Road	Signal	12%	14%	12%	13%
J4	Choi Yuen Road / Pak Wo Road	Roundabout	0.48	0.44	0.48	0.44
J5	Jockey Club Road / Lung Sum Avenue	Signal	-1%	32%	-2%	31%
J6	Jockey Club Road / So Kwun Po Road	Signal	-29%	-14%	-29%	-14%
J7	So Kwun Po Road Interchange [3]	Roundabout	1.04	1.02	1.04	1.02
J8	Po Shek Wu Road Interchange	Roundabout	0.81	0.76	0.82	0.77
J9	Po Wan Road / San Po Street	Signal	79%	>100%	76%	>100%
J10	San Wan Road / San Po Street	Priority	0.30	0.09	0.31	0.10
J13	Ka Fu Close / San Po Street	Priority	0.10	0.07	0.10	0.07
J15	San Fan Avenue / Lung Sum Avenue	Signal	90%	>100%	70%	>100%
J16	San Fung Avenue / Po Wan Road	Signal	79%	>100%	64%	99%

Notes:

[1] Please refer to **Figure 1** for the location of the assessed junctions; and

(2) Figures shown represent "Reserve Capacity" (RC) for the signal controlled junctions and "Design Flow to Capacity" (DFC) ratio for the roundabout. A signal-controlled junction with a reserve capacity (RC) of 0% implies that it is operating at capacity while a negative RC suggests that the junction is overloaded. RC >= 15 % implies that the signal-controlled junction is operating satisfactory. For roundabout, the performance indicator is the DFC. DFC ratio of 1.00 indicates continual queuing and could not be considered acceptable. A DFC ratio of 0.85, indicating that queuing would theoretically be avoided in 85% of cases, can be considered reasonable. A DFC of 0.70 indicates that queuing will be avoided in 0.95 of cases.

Table 4.10 Year 2031 Road Link Performance

Road Links		Direction	Capacity (pcu/hr) (1)	Road Link Performance							
				Reference Case				Design Case			
				Flow (pcu/hr)		V/C Ratio (2)		Flow (pcu/hr)		V/C Ratio (2)	
				AM	PM	AM	PM	AM	PM	AM	PM
L1	Po Shek Wu Road – Section between Choi Yuen Road and Fanling Highway	NB	3,000	2,160	2,575	0.72	0.86	2,230	2,645	0.74	0.88
		SB	3,000	1,900	2,025	0.63	0.68	1,920	2,050	0.64	0.68
L2	Po Shek Wu Road – Section between Choi Yuen Road and Po Wan Road	NB	2,800	1,780	1,805	0.64	0.64	1,860	1,875	0.66	0.67
		SB	2,800	1,050	1,085	0.38	0.39	1,075	1,110	0.38	0.40
L3	Po Shek Wu Road – Section between Jockey Club Road and Po Wan Road	NB	2,800	1,160	1,465	0.41	0.52	1,160	1,465	0.41	0.52
		SB	2,800	1,700	1,735	0.61	0.62	1,700	1,735	0.61	0.62
L4	Po Wan Road	EB	900	310	300	0.34	0.33	310	300	0.34	0.33
		WB	1,800	585	220	0.33	0.12	585	220	0.33	0.12
L5	San Wan Road	EB	1,800	210	135	0.12	0.08	215	135	0.12	0.08
		WB	1,800	120	140	0.07	0.08	125	145	0.07	0.08

Note:
(1) Road capacity is defined in accordance to STM Model and TPDM Volume 2 Chapter 2.4 Table 2.4.1.1 by converting the vehicles to pcu for analysis;
(2) A V/C ratio of 0.7 might infer adequate operating conditions, the effect of junctions or traffic signals both within and at the end of the road link may be such that the design flow could never be achieved in practice, and the link might be severely congested well before a V/C ratio of 1.0 is reached.

4.3.2 All analysed results revealed the assessed junctions would still be performing with desirable spare capacity in Year 2027 and 2031, except for Junctions J2 Po Shek Wu Road / Po Wan Road, J3 - Po Shek Wu Road / Choi Yuen Road, J5 - Jockey Club Road / Lung Sum Avenue, J6 Jockey Club Road / So Kwun Po Road, J7 - So Kwun Po Road Interchange and J8 - Po Shek Wu Road Interchange (in Year 2027). Improvement measures are proposed and discussed in succeeding sections.

4.4 Proposed Junction Improvement Schemes

Proposed Junction Improvement of Junction J2 – Po Shek Wu Road / Po Wan Road, J3 - Po Shek Wu Road / Choi Yuen Road, J5 - Jockey Club Road / Lung Sum Avenue and J8 - Po Shek Wu Road Interchange
Proposed Junction Improvement of Junction J2 – Po Shek Wu Road / Po Wan Road, J3 - Po Shek Wu Road / Choi Yuen Road, J5 - Jockey Club Road / Lung Sum Avenue and J8 - Po Shek Wu Road Interchange

4.4.1 Under the CEDD's project "Site Formation and Infrastructure Works for Police Facilities in Kong Nga Po" (hereafter named Kong Nga Po Project), junction improvement schemes are proposed in North District, including J2 – J/O Po Shek Wu Road / Po Wan Road, J3 - Po Shek Wu Road / Choi Yuen Road, J5 - Jockey Club Road / Lung Sum Avenue and J8 - Po Shek Wu Road Interchange. The site formation and infrastructure works, with the corresponding proposed junction improvement works, are tentatively be completed before the population intake year of the subject development under the current available information, while the junction improvement work will be implemented under NDA project as confirmed by CEDD.

4.4.2 The details of the proposed junction improvement schemes are summarized as follows. The general layout of the proposed junction improvement scheme is shown in **Appendix B**:

Junction J2 – Po Shek Wu Road / Po Wan Road

4.4.3 Under the Kong Nga Po Project, the improvement scheme will mainly include the modification of lane configurations at Po Shek Wu Road and Po Wan Road:

a) Lane arrangement of Po Shek Wu Road southbound to be revised for allowing straight-ahead traffic to use three traffic lanes; and

b) Lane arrangement of Po Wan Road eastbound to be revised for allowing right-turn traffic to use two traffic lanes

c) Local widening of Po Shek Wu Road southbound from 2 to 3 lanes

4.4.4 However, the junction J2 would still be operating close to capacity with the above improvement scheme in place. Thus, the following further enhancement is proposed under this study for implementation in Year 2027 and 2031, and to be implemented by the NDA project. HKHA will closely liaise with the NDA project on the details of the junction improvement scheme in later design stage, in order to implement the junction improvement scheme before population intake of the proposed public housing development:

a) Lane arrangement of Po Shek Wu Road northbound to be revised for allowing left-turn traffic to use two traffic lanes; and

b) Local widening of Po Wan Road westbound from 1 to 2 lanes

Junction J3 - Po Shek Wu Road / Choi Yuen Road

4.4.5 The improvement scheme will include local widening of Po Shek Wu Road northbound to allow straight-ahead traffic to use three traffic lanes.

Junction J5 - Jockey Club Road / Lung Sum Avenue

4.4.6 The improvement scheme will include widening of Jockey Club Road and Lung Sum Avenue:

a) Local widening with one additional straight-ahead traffic lane on Jockey Club Road eastbound

b) Local widening with one additional straight-ahead traffic lane on Lung Sum Avenue northbound

Junction J8 – Po Shek Wu Road Interchange

4.4.7 The improvement scheme will include local widening of the entry arm of Fanling Highway westbound slip road from existing two lanes to three lanes. The widening works is not at the critical arm of the roundabout and will not result in changes in Design Flow to Capacity (DFC). However, the local widening of entry arm will enhance the left-turn traffic to Fan Kam Road southbound by increasing the available queuing length for traffic entering the circulation lanes of the interchange.

<u>Proposed Junction Improvement of J6 - Jockey Club Road / So Kwun Po Road</u>

4.4.8 Junction improvement schemes at J6 - Jockey Club Road / So Kwun Po Road are being reviewed and explored under NDA, which includes:

a) Lane arrangement of the Jockey Club Road northbound to be revised for allowing left-turn traffic to use two traffic lanes; and

b) Method-of-Control (MOC) to be revised for minimizing / optimizing the intergreen time

c) Lane arrangement of Ma Sik Road southbound to be revised for allowing three traffic lanes for vehicles to travel straight ahead

d) Local widening of So Kwun Po Road southbound from 2 to 3 lanes

4.4.9 However, the junction J6 would still be operating over capacity with the above improvement scheme in place in both Year 2027 and 2031. Thus, the following further enhancement is proposed under this study for implementation:

a) Local widening with one additional straight-ahead traffic lane on So Kwun Po Road northbound

b) Local widening of Ma Sik Road northbound from 2 to 3 lanes

4.4.10 HKHA will closely liaise with the NDA project on the details and implementation of the junction improvement scheme.

4.4.11 The general layout of the proposed junction improvement scheme is shown in **Appendix B**.

4.4.12 With the above proposed junction improvement schemes in place, the results of junction capacity assessment of Junctions J2, J3, J5, J6 and J8 are shown in **Table 4.11** below:

Table 4.11 Summary of Junction Performance – With Proposed Junction Improvement Schemes in Place

Junction[1]		Type	Junction Performance[2]							
			Year 2027				Year 2031			
			Reference Case		Design Case		Reference Case		Design Case	
			AM	PM	AM	PM	AM	PM	AM	PM
J2	Po Shek Wu Road / Po Wan Road	Signal	23%	27%	18%	23%	20%	14%	15%	12%
J3	Po Shek Wu Road / Choi Yuen Road	Signal	14%	14%	12%	10%	13%	14%	12%	13%
J5	Jockey Club Road / Lung Sum Avenue	Signal	15%	58%	15%	58%	18%	51%	17%	50%
J6	Jockey Club Road / So Kwun Po Road	Signal	10%	33%	10%	33%	11%	27%	11%	26%
J8	Po Shek Wu Road Interchange [3]	Round about	0.87	0.94	0.91	0.95	0.81	0.76	0.82	0.77

Notes:

(1) Junction Improvement Scheme had been incorporated in both reference and design case; and

(2) Figures shown represent "Reserve Capacity" (RC) for the signal controlled junctions and "Design Flow to Capacity" (DFC) ratio for the roundabout. A signal-controlled junction with a reserve capacity (RC) of 0% implies that it is operating at capacity while a negative RC suggests that the junction is overloaded. RC >= 15 % implies that the signal-controlled junction is operating satisfactory. For roundabout, the performance indicator is the DFC. DFC ratio of 1.00 indicates continual queuing and could not be considered acceptable. A DFC ratio of 0.85, indicating that queuing would theoretically be avoided in 85% of cases, can be considered reasonable. A DFC of 0.70 indicates that queuing will be avoided in 0.95 of cases.

(3) The proposed widening works is not at the critical arm of the roundabout and thus does not result in changes in Design Flow to Capacity (DFC).

4.4.13 With the proposed junction improvement scheme in place, performance of all junction would be improved with RC higher than those before the proposed housing developments in place (i.e. Reference Case as presented in **Tables 4.7 and 4.9**). HKHA will closely liaise with the relevant government departments on the details of the junction improvement scheme in later design stage, in order to implement the junction improvement scheme before population intake of the proposed public housing development. HKHA will consider taking up the junction improvement works at J2 and J3 as described in Section 4.4.4 and 4.4.5 respectively, in which the traffic generated/attracted by the proposed housing development have direct impact to these junctions, by government funding in case the junction improvement works undertaken by others could not meet HKHA's population intake of the proposed housing development.

4.4.14 The proposed road improvement works under Kong Nga Po project by CEDD would be implemented under NDA project by CEDD as confirmed by CEDD.

4.5 Possible Improvement Scheme at Po Shek Wu Road

4.5.1 To further enhance the vehicular accessibility in the vicinity of the proposed housing sites and alleviate the existing traffic queue problem on Po Shek Wu Road southbound, a improvement scheme at Po Shek Wu Road Southbound is shown in **Figure 9**. The improvement scheme consists of widening the Po Shek Wu Road Southbound (Section between Fanling Highway and Choi Yuen Road) with 1 no. of additional lane.

4.5.2 As mentioned in Section 2.4, Po Shek Wu Road Interchange is currently operating close to its capacity, mainly due to high traffic volume from Po Shek Wu Road Southbound approach arm. Due to the short available queuing length for vehicles waiting to enter the interchange, the left-turn traffic to Fanling Highway Eastbound would frequently be hindered from the vehicle queue at the interchange. Vehicles would easily queue up along Po Shek Wu Road Southbound, reaching Choi Yuen Road (i.e. Junction J3 - Po Shek Wu Road / Choi Yuen Road), and further extend to Po Wan Road (i.e. Junction J2 - Po Shek Wu Road / Po Wan Road) at intermittent critical condition.

4.5.3 The proposed improvement scheme will widen Po Shek Wu Road Southbound to 3 nos. of lanes all the way. This could accommodate an additional lane with approximately 300m in length. The total available length of traffic lanes for queueing at existing condition and after implementation of the proposed improvement scheme are summarized in **Table 4.12**.

Table 4.12 Summary of Available Length of Traffic Lanes for Queuing of Po Shek Wu Road Southbound (Section between Po Shek Wu Road Interchange and Choi Yuen Road)

Location	Available Length of Traffic Lanes for Queuing (m)	
	Existing	With Possible Improvement Scheme in Place
Po Shek Wu Road Southbound (Section between Po Shek Wu Road Interchange and Choi Yuen Road)	~600	~850

4.5.4 The traffic entering the interchange could utilize either middle or right lane, and the traffic to Fanling Highway Eastbound can enter the dedicated left-turn lane by utilizing the additional lane at Po Shek Wu Road Southbound. It is anticipated that the traffic condition at Po Shek Wu Road Southbound could be improved by minimizing the weaving movements and increasing the queuing length.

4.5.5 CEDD Civil Engineering Office will undertake the improvement of Po Shek Wu Road. The implementation details, design and construction responsibility will be further investigated in the later design stage.

4.5.6 With the proposed Po Shek Wu Road widening scheme in place, the results of link capacity assessment of Link L1 – Po Shek Wu Road southbound (Section between Choi Yuen Road and Fanling Highway) for Year 2027 and 2031 are summarized in **Table 4.13** and **4.14** respectively.

Table 4.13 Summary of Road Link Performance in Year 2027 – With Proposed Po Shek Wu Road Widening Schemes in Place

Road Links		Direction	Capacity (pcu/hr) (1)	Road Link Performance							
				Reference Case				Design Case			
				Flow (pcu/hr)		V/C Ratio (2)		Flow (pcu/hr)		V/C Ratio (2)	
				AM	PM	AM	PM	AM	PM	AM	PM
L1	Po Shek Wu Road – Section between Choi Yuen Road and Fanling Highway	SB	Before Widening 3,000	2,500	2,640	0.83	0.88	2,580	2,675	0.86	0.89
		SB	After Widening 4,700	2,500	2,640	0.53	0.56	2,580	2,675	0.55	0.57

Note:
(1) Road capacity is defined in accordance to STM Model and TPDM Volume 2 Chapter 2.4 Table 2.4.1.1 by converting the vehicles to pcu for analysis;
(2) A V/C ratio of 0.7 might infer adequate operating conditions, the effect of junctions or traffic signals both within and at the end of the road link may be such that the design flow could never be achieved in practice, and the link might be severely congested well before a V/C ratio of 1.0 is reached.

Table 4.14 Summary of Road Link Performance in Year 2031 – With Proposed Po Shek Wu Road Widening Schemes in Place

Road Links		Direction	Capacity (pcu/hr) (1)	Road Link Performance							
				Reference Case				Design Case			
				Flow (pcu/hr)		V/C Ratio (2)		Flow (pcu/hr)		V/C Ratio (2)	
				AM	PM	AM	PM	AM	PM	AM	PM
L1	Po Shek Wu Road – Section between Choi Yuen Road and Fanling Highway	SB	Before Widening 3,000	1,900	2,025	0.63	0.68	1,920	2,050	0.64	0.68
		SB	After Widening 4,700	1,900	2,025	0.40	0.43	1,920	2,050	0.41	0.44

Note:
(1) Road capacity is defined in accordance to STM Model and TPDM Volume 2 Chapter 2.4 Table 2.4.1.1 by converting the vehicles to pcu for analysis;
(2) A V/C ratio of 0.7 might infer adequate operating conditions, the effect of junctions or traffic signals both within and at the end of the road link may be such that the design flow could never be achieved in practice, and the link might be severely congested well before a V/C ratio of 1.0 is reached.

4.5.7 It is revealed that the widening work will greatly improve the link performance (i.e. reducing the V/C ratio of Po Shek Wu Road

southbound from 0.89 to 0.57 during the most critical 2027 design case PM peak).

4.5.8 It is worth to note that the future Po Shek Wu Interchange Improvement which provides a flyover to allow the right turning traffic from Po Shek Wu Road southbound to Fanling Highway westbound and bypass the existing Po Shek Wu Interchange. The traffic flow on Po Shek Wu Road southbound, between Choi Yuen Road and Fanling Highway, will be reduced by about 23% to 26% (by comparing the 2027 and 2031 traffic flows in **Tables 4.13 and 4.14** respectively) and the traffic queue problem is expected to be further alleviated.

4.6 Other Improvement Schemes to Existing Interchanges

4.6.1 Besides the future Po Shek Wu Interchange Improvement, it is noted that the government is planning to carry out a feasibility study for a new infrastructure connecting the northern and southern side of Fanling Highway. The new North South Link will be able to divert traffic and relieve the traffic condition in the existing interchanges, i.e. Junctions J7 – So Kwun Po Road Interchange and J8 –Po Shek Wu Road Interchange.

4.6.2 **Table 4.15** summarizes the improvement scheme as proposed amongst different concurrent projects.

Table 4.15 Summary of Junction Improvement Schemes

Junction (1)		Type	Description	Proposed by Project	Anticipated Implementation Schedule	Drawing No. in Appendix B (2)
J2	Po Shek Wu Road/ Po Wan Road	Signal	➢ Lane arrangement of Po Shek Wu Road southbound to be revised for allowing straight-ahead traffic to use three traffic lanes ➢ Lane arrangement of Po Wan Road eastbound to be revised for allowing right-turn traffic to use two traffic lanes	Kong Nga Po	To tie in with the programme of phased population intake of NDA. The current target of completion is 2023.	B1
			➢ Lane arrangement of Po Shek Wu Road northbound to be revised for allowing left-turn traffic to use two traffic lanes; and ➢ Local widening of Po Wan Road westbound from 1 to 2 lanes	Sheung Shui Areas 4 and 30 Sites 1 &2 (to be incorporated in Kong Nga Po)	To tie in with the programme of phased population intake of NDA. The current target of completion is 2023.	B1

Junction (1)		Type	Description	Proposed by Project	Anticipated Implementation Schedule	Drawing No. in Appendix B (2)
J3	Po Shek Wu Road/ Choi Yuen Road	Signal	➢ Lane arrangement of the Choi Yuen Road westbound to be revised for providing two left-turn lanes	Queen's Hill	Already completed under Queen's Hill Project	A1
			➢ local widening of Po Shek Wu Road northbound to allow straight-ahead traffic to use three traffic lanes	Kong Nga Po	To tie in with the programme of phased population intake of NDA. The current target of completion is 2023.	B3
			➢ Po Shek Wu Interchange Improvement which provides a flyover to allow the right turning traffic from Po Shek Wu Road southbound to Fanling Highway westbound to bypass the existing Po Shek Wu Interchange ➢ Po Shek Wu Road southbound would be narrowed from 5 lanes to 4 lanes	NDA	To tie in with the programme of phased population intake of NDA. The current target of completion is 2029.	A2
J5	Jockey Club Road/ Lung Sum Avenue	Signal	➢ Lane arrangement of the Lung Sum Avenue northbound/southbound to be revised for allowing straight-ahead traffic to use two traffic lanes ➢ Widening the Lung Sum Avenue northbound by narrowing the central median of Lung Sum Avenue	Queen's Hill	Year 2021 (Queen's Hill Infrastructure works undertaken by CEDD)	A3
			➢ Local widening with one additional straight-ahead traffic lane on Jockey Club Road eastbound ➢ Local widening with one additional straight-ahead traffic lane on Lung Sum Avenue northbound	Kong Nga Po	To tie in with the programme of phased population intake of NDA. The current target of completion is 2023.	B4
J6	Jockey Club Road/	Signal	➢ Lane arrangement of the Jockey Club Road northbound to be revised for	NDA	To tie in with the programme of phased population intake of	B5

Junction (1)		Type	Description	Proposed by Project	Anticipated Implementation Schedule	Drawing No. in Appendix B (2)
	So Kwun Po Road		allowing left turn traffic to use two traffic lanes ➢ Method-of-Control (MOC) to be revised for minimizing/ optimizing the intergreen time ➢ Lane arrangement of Ma Sik Road southbound to be revised for allowing three traffic lanes for vehicles to travel straight ahead ➢ Local widening of So Kwun Po Road southbound from 2 to 3 lanes		NDA. The current target of completion is 2023.	
			➢ Local widening with one additional straight-ahead traffic lane on So Kwun Po Road northbound ➢ Local widening of Ma Sik Road northbound from 2 to 3 lanes	Sheung Shui Areas 4 and 30 Sites 1 &2 (to be incorporated in NDA)	To tie in with the programme of phased population intake of NDA. The current target of completion is 2023.	B5
J7	So Kwun Po Road Interchange	Roundabout	➢ Local widening of southbound approach arm of So Kwun Po Road for a smoother entrance to the elevated roundabout	Queen's Hill	Year 2021 (Queen's Hill Infrastructure works undertaken by CEDD)	A4
			➢ New infrastructure to connect the northern and southern side of Fanling Highway	Subject to further Gov. study	Nil	Nil
J8	Po Shek Wu Road Interchange	Roundabout	➢ Local widening of southbound approach arm of Po Shek Wu Road to 10m to have two traffic lanes when approaching the roundabout	Queen's Hill	2021 (Queen's Hill Infrastructure works undertaken by CEDD)	A5
			➢ Local widening section of southbound of Po Shek Wu Road between Choi Yuen Road and Po Shek Wu Road Interchange	Sheung Shui Areas 4 and 30 Sites 1 &2	Year 2023/24 (undertaken by CEDD Civil Engineering Office)	Nil
			➢ local widening of the entry arm of Fanling Highway westbound slip road from	Kong Nga Po	To tie in with the programme of phased population intake of	B6

Junction (1)	Type	Description	Proposed by Project	Anticipated Implementation Schedule	Drawing No. in Appendix B (2)
		existing two lanes to three lanes		NDA. The current target of completion is 2023.	
		➢ Po Shek Wu Interchange Improvement which provides a flyover to allow the right turning traffic from Po Shek Wu Road southbound to Fanling Highway westbound and bypass the existing Po Shek Wu Interchange	NDA	To tie in with the programme of phased population intake of NDA. The current target of completion is 2029.	A2

Notes:
(1) Please refer to **Figure 1** for the location of the assessed junctions.
(2) The general arrangement of junction improvement scheme are shown in **Appendix A and B**.
(3) The proposed road improvement works under Kong Nga Po project by CEDD would be implemented under NDA project by CEDD as confirmed by CEDD.

4.7 Review of Impact on East Rail Line

4.7.1 According to the Review and Update of the Railway Development Strategy 2000 - Executive Summary published by Highways Department, the future North South Corridor (formed by the East Rail Line, Lok Ma Chau Spur Line and Hung Hom to Admiralty Section of the Shatin to Central Link) will have a maximum carrying capacity of 80,000 persons per hour per direction.

4.7.2 According to the Public Transport Strategy Study published by Transport and Housing Bureau in June 2017, about 37% of public transport trips will use heavy rail, such that the proposed public housing development is expected to generate some additional 424 passengers one-way during the critical AM peak hour. The increase in passenger demand on the future North South Corridor is no more than 0.5% of its carrying capacity. Hence, the additional passenger demand on the future North South Corridor is considered negligible.

4.7.3 In addition, the future Northern Link (NOL) will connect the East Rail Line and the West Rail Line, forming a loop in the northern New Territories. This will allow residents in the New Territories to have more route choices without straining the road network. It is expected that NOL would reduce reliance on road-based transport and alleviating the associated congestion.

5 SENSITIVITY TEST

5.1 Sensitivity Test for Proposed Public Transport Interchange at Sheung Shui Areas 4 and 30 Site 1

5.1.1 As discussed in the Section 4.3, Junction J7 – So Kwun Po Road Interchange would be operating at DFC slightly over 1.0 in Years 2027 and 2031. For long-term, the new North South Link as discussed in Section 4.6.1 will be able to divert traffic at J7. As J7 is a critical junction, short term measures should also be proposed to improve the condition as far as possible. In view thereof, it is proposed to provide a new public transport Interchange (PTI) at Sheung Shui Areas 4 and 30 Site 1 to facilitate redistribution of public transport routes. It will thus reduce the amount of public transport passing through J7 and relieve the traffic condition. Around 100 pcu/hr of public transport is assumed to be diverted away from J7 and redistribute to J3 – Po Shek Wu Road / Choi Yuen Road and J4 – Choi Yuen Road / Pak Wo Road. **Figure 10** shows an example of public transport routing before and after public transport redistribution. The exact junction performance will be subject to public transport rerouting to be planned.

5.1.2 Below **Table 5.1** shows the junction capacity assessment after public transport redistribution for Year 2027 and 2031.

Table 5.1 Junction Performance Before and After Public Transport Redistribution

Junction [1]		Junction Performance [2]							
		Year 2027 Design Case				Year 2031 Design Case			
		Before Public Transport Redistribution		After Public Transport Redistribution		Before Public Transport Redistribution		After Public Transport Redistribution	
		AM	PM	AM	PM	AM	PM	AM	PM
J3	Po Shek Wu Road / Choi Yuen Road	12%	10%	1%	5%	12%	13%	1%	1%
J4	Choi Yuen Road / Pak Wo Road	0.53	0.54	0.60	0.58	0.48	0.44	0.55	0.48
J7	So Kwun Po Road Interchange	1.00	**1.01**	0.95	0.97	**1.04**	**1.02**	0.99	0.98

Notes:

(1) Please refer to **Figure 1** for the location of the assessed junctions; and

(2) Figures shown represent "Reserve Capacity" (RC) for the signal controlled junctions and "Design Flow to Capacity" (DFC) ratio for the roundabout. A signal-controlled junction with a reserve capacity (RC) of 0% implies that it is operating at capacity while a negative RC suggests that the junction is overloaded. RC >= 15 % implies that the signal-controlled junction is operating satisfactory. For roundabout, the performance indicator is the DFC. DFC ratio of 1.00 indicates continual queuing and could not be considered acceptable. A DFC ratio of 0.85, indicating that queuing would theoretically be avoided in 85% of cases, can be

considered reasonable. A DFC of 0.70 indicates that queuing will be avoided in 0.95 of cases.

5.1.3 J7 will be improved with DFC reduced from 1.04 to 0.99 at the critical Year 2031 AM peak, while J3 and J4 will still be operating within capacity, after public transport redistribution.

5.1.4 It is suggested to conduct a comprehensive review when the traffic condition becomes stable after commissioning of the Lung Shan Tunnel which will commission in end 2018 and cause changes in the traffic pattern in Fanling/Sheung Shui.

5.2 Sensitivity Test on the Programme Slippage of Major Improvement Works

5.2.1 This sensitivity test will investigate the impact on the surrounding road network in case of slippage of the major improvement works, i.e. Fanling Bypass (Eastern Section), for the 2027 Design Case Scenario. Other local junction improvement schemes considered for the 2027 Design Case Scenario as stated in **Table 4.15** are scheduled to be completed by Year 2023/24, which are unlikely to be postponed beyond the population intake of the subject development. Therefore, the local junction improvement schemes are assumed to be in place in this sensitivity test. The sensitivity test also considers the public transport redistribution as described in Section 5.1.

5.2.2 The sensitivity test scenario will exclude Fanling Bypass (Eastern Section) from the Base Design Case Scenario to reflect any programme slippage. Fanling North NDA (Advance Phase) will also be excluded.

5.2.3 **Table 5.2** compares the assumptions considered in the Base Design Case Scenario and in the sensitivity analysis.

Table 5.2 Major Assumptions for Sensitivity Test Scenarios

Test	Land Use Planning Assumptions			Transport Infrastructure Assumptions		
	Sheung Shui Area 30	Fanling North NDA (Advance Phase)	Fanling North NDA (Remaining Phase)	Fanling Bypass (Eastern Section)	Fanling Bypass (Western Section) and associated road works	Other infras-tructures in Remain-ing Phase of NDA (including Po Shek Wu Flyover, Fanling Highway widening, and Fanling Bypass Western Section)
Base Design Case Scenario	✔	✔		✔		
Sensitivity Test Scenario	✔					

5.2.4 The above sensitivity test scenario was also reviewed in the Report on Traffic and Transport Impact Assessment Review (August 2018) under Agreement No. CE 13/2014 (CE) Development of Kwu Tung North and Fanling North New Development Areas, Phase 1 Design and Construction (i.e. Test 6 under Section 4.5 of the aforesaid report). It is revealed that all key junctions in Sheung Shui area will still be operating with DFC < 1.0 or RC > 0% and considered acceptable.

6 PEDESTRIAN TRAFFIC IMAPCT ASSESSMENT

6.1 Existing Pedestrian Conditions

6.1.1 Pedestrian count surveys were conducted on normal weekdays in September 2016 / April 2017 at selected locations during the periods 0700-1000 and 1700-2000 hours. These locations of the surveyed pedestrian facilities are detailed in **Figure 11** and summarized in **Table 6.1**.

Table 6.1 Critical Pedestrian Facilities

Index (1)	Type
I	Footpath
K	Footbridge
M	Staircase
AE	Footbridge
AF	Staircase
AH	Footpath
AI	Staircase
AK	Footbridge
AL	Staircase
AM	Footbridge
AN	Footpath
AO	Staircase
AT	Footbridge
BA	Footpath
BB	Footpath
BC	Footpath
BD	Footpath
BF	Crossing
BG	Footpath
BH	Footpath

Note: (1) Refer to **Figure 11** for the location of the assessed pedestrian facilities.

6.1.2 It was observed that the peak pedestrian period was occurred in the morning peak during 0830 – 0930 and evening peak during 1745 - 1845. 'Level of Service' and "volume to capacity ratio (V/C)" assessment have been undertaken.

Level of Service (LOS)

6.1.3 'Level of Service' (LOS) analysis of the existing pedestrian facilities was carried out based on the definitions presented in the Highways Capacity Manual 2000. This follows the approach currently being recommended by Transport Department. In general, LOS C and D are typical values and LOS A and B would provide a very good LOS. At a LOS of A, 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. At a LOS

of B, pedestrians would continue to freely select their own walking speed, can bypass slower pedestrians, and avoid crossing conflicts with others. At a LOS of C, pedestrians are restricted in selecting walking speed and in bypassing other pedestrians. A LOS of D would represent a further deterioration of the pedestrian movements but would still provide reasonable fluid flow. At a LOS of E or lower, it was determined that mitigation measures or improvement schemes should be considered to achieve a LOS of D or better. For the purposes of this pedestrian impact assessment, a LOS of C or above would be considered acceptable while a LOS of D would be marginally acceptable. **Table 6.2** shows the various LOS 'quantified' in terms of pedestrian flow rates.

Table 6.2 Level of Service (LOS) for Walkway

LOS	Flow rate (ped/min/m)	Description
A	<= 16	Pedestrians move in desired paths. Walking speeds are freely selected and conflicts between pedestrians are unlikely.
B	16 - 23	Sufficient space is provided for pedestrians to freely select walking speeds, to bypass other pedestrians and to avoid crossing conflicts with others. Pedestrians become aware of other pedestrians.
C	23 - 33	Sufficient space is available to select normal walking speeds and to bypass other pedestrians in unidirectional stream. Minor conflicts will occur in reverse direction or crossing movements.
D	33 - 49	Freedom to select individual walking speeds and bypass other pedestrians is restricted. Probability of conflicts is high in crossing or reverse-flow movements. LOS provides reasonable fluid flow, however, friction and interactions between pedestrians are likely to occur.
E	49 - 75	All pedestrians would have normal walking speeds restricted. Space is insufficient to pass over slower pedestrians. Cross and reverse movements are possible only with extreme difficulties. Design volumes approach the limit of walking capacity.
F	> 75	Walking speeds are severely restricted. Forward progress is made by shuffling. Cross and reverse movements are virtually impossible. Space is more characteristic of queued pedestrians than of moving pedestrian streams.

6.1.4 Based on the pedestrian count surveys, **Table 6.3** details the results of the LOS assessment.

Table 6.3 Existing (2016/2017) Pedestrian Facilities Assessment Results

Location *(1)*	Type	Clear Width (m)	Capacity (ppm/m) *(2)*	Pedestrian Demand (pph)		Flow Rate (ppm/m) *(3)*		LOS		V/C Ratio	
				AM	PM	AM	PM	AM	PM	AM	PM
I*(4)*	Footpath	2.2	50	1,210	1,145	11.2	10.6	A	A	0.22	0.21
K	Footbridge	3.5	50	1,260	1,270	8.4	8.5	A	A	0.17	0.17
M	Staircase	3.0	40	160	315	1.3	2.6	A	A	0.03	0.07
AE*(4)*	Footbridge	5.3	50	5,135	8,560	19.9	33.2	B	D	0.40	0.66
AF	Staircase	5.2	40	7,400	6,785	29.4	26.9	C	C	0.73	0.67
AH	Footpath	6.5	50	3,080	5,730	8.9	16.5	A	B	0.18	0.33
AI	Staircase	2.0	40	710	995	11.8	16.6	A	B	0.30	0.41
AK	Footbridge	4.5	50	1,220	2,315	5.8	11.0	A	A	0.12	0.22
AL	Staircase	3.4	40	35	145	0.2	1.0	A	A	0.01	0.03

Location (1)	Type	Clear Width (m)	Capacity (ppm/m) (2)	Pedestrian Demand (pph)		Flow Rate (ppm/m) (3)		LOS		V/C Ratio	
				AM	PM	AM	PM	AM	PM	AM	PM
AM	Footbridge	3.5	50	785	955	5.2	6.4	A	A	0.10	0.13
AN(4)	Footpath	3.5	50	2,615	3,655	14.1	19.7	A	B	0.28	0.39
AO	Staircase	3.0	40	665	755	5.5	6.3	A	A	0.14	0.16
AT(4)	Footbridge	3.2	50	3,995	2,855	30.3	21.6	C	B	0.61	0.43
BA	Footpath	3.0	40	1,000	795	8.3	6.6	A	A	0.21	0.17
BB	Footpath	3.5	50	800	640	4.8	3.8	A	A	0.10	0.08
BC	Footpath	2.5	50	480	385	4.4	3.6	A	A	0.09	0.07
BD	Footpath	3.5	50	385	495	2.3	2.9	A	A	0.05	0.06
BF	Crossing	3.7	12.4	2,040	3,070	9.2	13.8	-	-	0.74	**1.12**
BG	Footpath	3.5	50	905	1,430	5.4	8.5	A	A	0.11	0.17
BH(5)	Footpath	2.3	50	2,830	3,820	24.8	33.5	C	D	0.50	0.67

Notes:

(1) Refer to **Figure 11** for the location of the assessed pedestrian facilities;

(2) Refer to TPDM Vol. 2 Ch. 3 Table 3.7.7.1 for capacity of walkway/ staircase, and TPDM Vol. 4 Chapter 3 Para 3.2.5.6 for capacity of signalized crossing;

(3) Computed based on effective width for footpath/footbridge/staircase, by assuming 0.2m and 0.5m lateral clearance to railing/planter/tree and wall/fence according to Highway Capacity Manual 2000 Chapter 18 Exhibit 18-1;

(4) In view of the reduced surveyed pedestrian flows in Year 2016/2017 at locations I, AE, AN and AT compared with the Year 2014 surveyed pedestrian flows under the pedestrian assessment of Po Shek Wu Estate, the highest surveyed pedestrian flows among Year 2014 and Year 2016/2017 are adopted for conservative assessment purpose, with the aims of taking into account the fluctuation impacts of the parallel trade activities; and

(5) Taking into account of the bus passenger queue and reducing the effective footpath width by 1m, the flow rate of BH becomes 52.4 ppm/m and 70.7 ppm/m (i.e LOS E) during AM and PM peak respectively.

6.1.5 As shown in **Table 6.3** all existing pedestrian facilities are operating with LOS C or better and V/C ratio <= 1, except for locations AE, BF and BH.

6.2 Pedestrian Demand Forecasting

Background Pedestrian Flows and Other Planned/Committed Developments in the Vicinity of Site

6.2.1 Pedestrian flows adopted in this study were primarily based on the existing Year 2016 / 2017 pedestrian counts undertaken (details refer to **Section 6.1**). Pedestrian trip generation/attraction for other planned/committed developments in the vicinity of the Sites had been incorporated in the background pedestrian flows, including the following developments:

- Proposed Committed Public Housing Development at Po Shek Wu Estate;
- Proposed Public Housing Development Sites 1 & 2 in Sheung Shui Areas 4 and 30;

- Proposed Wholesale Conversion into Retail Development from Existing Advanced Technology Centre at No. 2 Choi Fat Street, Sheung Shui;
- Proposed Wholesale Conversion into Office-cum-Retail Building from Existing Industrial Building at No.9 Choi Yuen Road, Sheung Shui;
- Proposed Wholesale Conversion into Retail Development at No. 6 Choi Fai Street, Sheung Shui; and
- Proposed Wholesale Conversion into Office-cum-Retail Building at No. 21 Po Wan Road, Sheung Shui

6.2.2 The estimated pedestrian trips of these developments have also been reviewed and incorporated into the development of pedestrian forecast, as appropriate. Pedestrian trip generation / attraction by proposed housing development of Po Shek Wu Estate are reference to the HKHA's Traffic Impact Assessment (TIA) Report for Po Shek Wu Estate . To estimate the pedestrian generation for other planned/committed development in the vicinity of Site, reference has been made to in-house pedestrian survey conducted for the existing PRH, office, retail facilities and kindergarten. The trip rates were applied to the development parameters of the planned/committed development to derive the pedestrian trips as shown in **Table 6.4**. For the development type of welfare facilities, they are expected to serve mainly the local residents and will only induce minimal pedestrian trips on the walkway network. On the other hand, for the post office, pedestrian trips generated / attracted are expected to fall outside the peak hours and would be minimal during the peak hours. These development types are therefore excluded from the estimation.

Table 6.4 Trip Generation Rates and Pedestrian Demand for Other Planned/Committed Developments in the Vicinity of the Sites

Parameter	Unit	Trip Rates#				Trip Generations (ped/hr)			
		AM		PM		AM		PM	
		GEN	ATT	GEN	ATT	GEN	ATT	GEN	ATT
Public Housing Development at Po Shek Wu Estate (1)									
PRH cum retail facilities (1160 flats and 790 m^2 GFA retail facilities)	ped/hr/flat	0.742	0.259	0.298	0.614	899	314	361	744
Kindergarten (6 classrooms)	ped/hr/classroom	12.020	30.310	2.750	1.000	72	182	17	6
Welfare facilities (3,498m^2 GFA) and multi-function area (396m^2 GFA)	expected to serve mainly the Site residents and will only induce minimal pedestrian trips								
Public Car Park (221 nos. of spaces)	ped/hr/vehicular trip	2	2	2	2	38	70	84	82
Total (Po Shek Wu Estate)						**1,009**	**566**	**462**	**832**
Public Housing Development at Site 1 (2)									
PRH cum retail facilities (2,040 flats and 400 m^2 GFA retail facilities) (2)	ped/hr/flat	0.742	0.259	0.298	0.614	1,668	582	670	1,381
Kindergarten (6 classrooms)	ped/hr/classroom	12.020	30.310	2.750	1.000	72	182	17	6
Welfare facilities (8,710m^2 GFA)	expected to serve mainly the Site residents and will only induce minimal pedestrian trips								
Total (Site 1)						**1,740**	**764**	**686**	**1,387**
Public Housing Development at Site 2 (2)									

Parameter	Unit	Trip Rates#				Trip Generations (ped/hr)			
		AM		PM		AM		PM	
		GEN	ATT	GEN	ATT	GEN	ATT	GEN	ATT
PRH cum retail facilities (1,480 flats and 700 m^2 GFA retail facilities) (2)	ped/hr/flat	0.742	0.259	0.298	0.614	1,208	422	485	1,000
Post Office (560m^2 GFA)	Pedestrian trips generated / attracted are expected to fall outside the peak hours and would be minimal during the peak hours								
Total (Site 2)						**1,208**	**422**	**485**	**1,000**
Proposed Wholesale Conversion into Retail Development from Existing Advanced Technology Centre at No. 2 Choi Fat Street, Sheung Shui (3)									
Retail (12,445 m^2 GFA)	ped/100m^2 GFA	0.000	0.000	2.011	2.132	30	30	250	265
Total (No. 2 Choi Fat Street, Sheung Shui)						**30**	**30**	**250**	**265**
Proposed Wholesale Conversion into Office-cum-Retail Building from Existing Industrial Building at No.9 Choi Yuen Road, Sheung Shui (4)									
Retail (6,219 m^2 GFA)	ped/100m^2 GFA	0.000	0.000	2.011	2.132	30	30	125	133
Office (21,821 m^2 GFA)	ped/100m^2 GFA	0.222	1.934	1.567	0.266	48	422	342	58
Total (No. 9 Choi Yuen Road, Sheung Shui)						**78**	**452**	**467**	**191**
Proposed Wholesale Conversion into Retail Development at No. 6 Choi Fai Street, Sheung Shui (5)									
Retail (29,821 m^2 GFA)	ped/100m^2 GFA	0.000	0.000	2.011	2.132	30	30	600	636
Total (No. 6 Choi Fai Street, Sheung Shui)						**30**	**30**	**600**	**636**
Proposed Wholesale Conversion into Office-cum-Retail Building at No. 21 Po Wan Road, Sheung Shui (5)									
Retail (2,601 m^2 GFA)	ped/100m^2 GFA	0.000	0.000	2.011	2.132	30	30	52	55
Office (1,676 m^2 GFA)	ped/100m^2 GFA	0.222	1.934	1.567	0.266	4	32	26	4
Total (No. 21 Po Wan Road, Sheung Shui)						**34**	**62**	**79**	**60**

Note:

(1) Trip generation / attraction of Po Shek Wu Estate are reference to HKHA's TIA Report of Po Shek Wu Estate;

(2) With additional 10% allowance for the proposed number of flats of Sites 1 and 2. Pedestrian trip rates for PRH and kindergarten school are reference to HKHA's TIA Report of Po Shek Wu Estate;

(3) Development parameters are reference to Developer's TIA Report under S.16 Application No. A/FSS/246;

(4) Development parameters are reference to Developer's TIA Report under S.16 Application No. A/FSS/241;

(5) Development parameters are reference to the parameters stipulated in TIA Report under S.16 Application No. A/FSS/241.

Pedestrian trip rates for public housing development at private redevelopment are reference to in-house pedestrian survey conducted at similar existing office and retail facilities:
a) Office – Office Tower of Landmark North (No. 39 Lung Sum Avenue, Sheung Shui); and
b) Retail – Retail shops in Fanling Town Centre (No.18 Fanling Station Road, Fanling)
For conservative assessment purpose, a nominal pedestrian generation / attraction with 30 ped/hour is assumed for the retail facilities during AM peak hours.
Pedestrian trip rates for kindergarten are reference to HKHA's TIA Report of Po Shek Wu Estate .

Development Trip Generations

6.2.3 To estimate the pedestrian generation for the proposed development, reference has been made to in-house pedestrian survey conducted for the existing SSF, retail facilities and kindergarten school. The trip rates were applied to the proposed additional number of flats to derive the resident trips. These rates and the estimated pedestrian trips are tabulated in **Table 6.5**.

Table 6.5 Trip Generation Rates and Pedestrian Demand for Proposed Housing Site at Po Shek Wu Road, Sheung Shui

Parameter	Unit	Trip Rates				Trip Generations (ped/hr)			
		AM		PM		AM		PM	
		GEN	ATT	GEN	ATT	GEN	ATT	GEN	ATT
Proposed Housing Site at Po Shek Wu Road, Sheung Shui									
SSF cum retail facilities (1,850 flats and 3,000 m^2 GFA retail facilities)	ped/hr/flat	0.580	0.120	0.200	0.380	1,073	222	370	703
Kindergarten (6 classrooms)	ped/hr/classroom	12.020	30.310	2.750	1.000	72	182	17	6
Total (Proposed Housing Site at Po Shek Wu Road)						**1,145**	**404**	**387**	**709**

6.2.4 As indicated in **Table 6.5**, the proposed development would generate some 1,145 and 387 pedestrians per hour during AM and PM peak hour period respectively. And the attraction would be some 404 and 709 pedestrians per hour during AM and PM peak hour respectively. The generated pedestrian demand would be superimposed onto the surrounding pedestrian facilities according to the observed trip distribution at the existing public housing site, to produce the future forecast pedestrian flows (i.e. Year 2027 upon completion of the Sites).

6.2.5 As mentioned in **Section 3.4**, three new footbridges are proposed to connect the proposed development to the future public housing development site at Sheung Shui Areas 4 and 30 Site 2, Po Shek Wu Estate and the existing footbridge linking Choi Yuk House on the south and Landmark North on the north. The indicative alignment is shown in **Figure 11**. Their engineering feasibility should be reviewed by other civil and structural studies etc and subjected to detailed design stage. It is anticipated that some residents of the proposed development will be diverted to use the proposed comprehensive footbridge network. Examination of the pedestrian impacts on the existing pedestrian network due to the aforesaid new footbridges will be included in the pedestrian facilities assessment in the succeeding section.

Proposed Pedestrian Facilities Improvement Schemes by Other Projects

6.2.6 Under the TIA report of proposed Public Housing Development at Po Shek Wu Estate, location I will be operating over-capacity. Associated improvement measure has been proposed to alleviate the condition. Diversion of the existing cycle track via the adjacent cycle parking area was proposed to facilitate footpath widening at location I. The clear footpath width will be widen to 3m, taking into account of the provision of railing along road kerb. The existing cycle parking area will be modified with expansion of new cycle parking facilities to the western side, underneath the existing footbridge connecting Landmark North and Choi Yuen Estate. Below figure demonstrates the preliminary layout of the aforesaid diverted cycle track, modified cycle parking area and footpath widening at Location I.



Proposed Improvement Measure at Location I by Proposed Public Housing Development at Po Shek Wu Estate

6.2.7 The aforesaid proposed improvement scheme will be included in the pedestrian facilities assessment in succeeding section.

6.3 Future Pedestrian Condition

6.3.1 Considering the site-related trips as described in the preceding sections, a forecast LOS assessment has been undertaken at the selected footpaths as shown in **Figure 11**. The pedestrian routings to/from the subject sites are shown in **Figure 12**.

6.3.2 The LOS and V/C ratio assessment results of pedestrian footpaths under all scenarios are shown in **Tables 6.6**.

Table 6.6 Future Pedestrian Facilities Assessment Results

Location *(1)*	Type	Clear Width (m)	Capacity (ppm/m) *(2)*	Pedestrian Demand (pph)		Flow Rate (ppm/m) *(3)*		LOS		V/C Ratio	
				AM	PM	AM	PM	AM	PM	AM	PM
I*(4) (10)*	Footpath	3	50	3,410	4,040	21.9	25.9	B	C	0.44	0.52
K	Footbridge	3.5	50	1,260	1,270	8.4	8.5	A	A	0.17	0.17
M	Staircase	3	40	395	800	3.3	6.7	A	A	0.08	0.17
AE*(10)*	Footbridge	5.3	50	5,525	8,875	21.4	34.4	B	D	0.43	0.69
AF	Staircase	5.2	40	7,400	6,785	29.4	26.9	C	C	0.73	0.67
AH	Footpath	6.5	50	3,080	5,730	8.9	16.5	A	B	0.18	0.33
AI	Staircase	2	40	710	995	11.8	16.6	A	B	0.30	0.41
AK	Footbridge	4.5	50	1,580	2,760	7.5	13.1	A	A	0.15	0.26
AL	Staircase	3.4	40	35	145	0.2	1.0	A	A	0.01	0.03
AM	Footbridge	3.5	50	4,120	4,455	27.5	29.7	C	C	0.55	0.59
AN*(10)*	Footpath	3.5	50	3,285	3,905	17.7	21.0	B	B	0.35	0.42
AO	Staircase	3	40	665	755	5.5	6.3	A	A	0.14	0.16

Location (1)	Type	Clear Width (m)	Capacity (ppm/m) (2)	Pedestrian Demand (pph)		Flow Rate (ppm/m) (3)		LOS		V/C Ratio	
				AM	PM	AM	PM	AM	PM	AM	PM
AT(10)	Footbridge	3.2	50	3,995	2,855	30.3	21.6	C	B	0.61	0.43
BA	Footpath	4.5	50	1,910	1,235	15.9	10.3	A	A	0.32	0.21
BB	Footpath	3.5	50	1,710	1,080	10.2	6.4	A	A	0.20	0.13
BC	Footpath	2.5	50	480	385	4.4	3.6	A	A	0.09	0.07
BD	Footpath	3.5	50	885	765	5.3	4.6	A	A	0.11	0.09
BF	Crossing	3.7	12.4	2,710	3,320	12.2	15.0	-	-	0.99	**1.21**
BG	Footpath	3.5	50	1,145	1,625	6.8	9.7	A	A	0.14	0.19
BH (11)	Footpath	2.3	50	3,285	3,905	28.8	34.3	C	D	0.58	0.69
FA (5)	Proposed Footbridge	3	50	925	1,020	7.7	8.5	A	A	0.15	0.17
FB (6)	Proposed Footbridge	3	50	2,620	2,925	21.8	24.4	B	C	0.44	0.49
FC (7)	Proposed Footbridge	3	50	1,560	1,960	13.0	16.3	A	B	0.26	0.33
FD (8)	Proposed Footbridge	3	50	1,430	1,845	11.9	15.4	A	A	0.24	0.31
FE (9)	Proposed Footbridge	3	50	2,375	2,325	19.8	19.4	B	B	0.40	0.39

Notes:

(1) Refer to **Figure 11** for the location of the assessed pedestrian facilities;

(2) Refer to TPDM Vol. 2 Ch. 3 Table 3.7.7.1 for capacity of walkway/ staircase;

(3) Computed based on effective width for footpath/footbridge/staircase, by assuming 0.2m and 0.5m lateral clearance to railing/planter/tree and wall/fence according to Highway Capacity Manual 2010 Chapter 18 Exhibit 18-1;

(4) Assumed proposed improvement scheme by Po Shek Wu Estate in place (details refer to **Section 5.2**);

(5) Proposed footbridge between Site 2 and Po Shek Wu Road Site. Assume minimum 3m clear width to be adopted;

(6) Proposed footbridge between Site 1 and Po Shek Wu Estate. Assume minimum 3m clear width to be adopted;

(7) Proposed footbridge of Po Shek Wu Estate. Assume minimum 3m clear width to be adopted;

(8) Proposed footbridge between Po Shek Wu Road Site and Po Shek Wu Estate. Assume minimum 3m clear width to be adopted;

(9) Proposed footbridge of Po Shek Wu Road Site. Assume minimum 3m clear width to be adopted;

(10) In view of the reduced surveyed pedestrian flows in Year 2016/2017 at locations I, AE, AN and AT compared with the Year 2014 surveyed pedestrian flows under the pedestrian assessment of Po Shek Wu Estate, the highest surveyed pedestrian flows among Year 2014 and Year 2016/2017 are adopted for pedestrian flow forecast as the conservative assessment purpose, with the aims of taking into account the fluctuation impacts of the parallel trade activities; and

(11) Taking into account of the bus passenger queue and reducing the effective footpath width by 1m, the flow rate of BH becomes 66.9 ppm/m and 74.5 ppm/m (i.e LOS E) during AM and PM peak respectively.

6.3.3 As shown in **Tables 6.6**, all existing pedestrian facilities in the vicinity of the proposed development operate within capacity with LOS "C" or better. The pedestrian facilities would be adequate to cater for the additional pedestrian demand generated from the proposed development, except for location AE, BF and BH, under the future pedestrian facilities assessment.

6.3.4 It is worth to note that the proposed public housing developments would not induce significant impact to footbridge location AE, which is the footbridge connecting MTR Sheung Shui Station and Landmark North, and operating at LOS D in existing year. Site-related trip to/from these major attraction nodes could mainly use the at-grade footpaths and footbridges instead of AE. For locations BF and BH, improvement measures are proposed and discussed in succeeding sections.

6.4 Proposed Improvement Measure of Pedestrian Facilities

Proposed Improvement Scheme for Location BF – Pedestrian Crossing across San Wan Road at the junction with San Fung Avenue

6.4.1 As shown in **Table 6.6**, this crossing will be operating over capacity. It is proposed to widen the pedestrian crossing from 3.7m to 6.5m as shown in **Figure 13**. The V/C ratio assessment results of the pedestrian crossing with the improvement scheme in place are shown in **Table 6.7**.

Table 6.7 Future Assessment Results for Location BF with improvement scheme

Location *(1)*	Type	Clear Width (m)	Capacity (ppm/m)	Pedestrian Demand (pph)		Flow Rate (ppm/m)		LOS		V/C Ratio	
				AM	PM	AM	PM	AM	PM	AM	PM
BF	Crossing	6.5	12.4	2,710	3,320	6.9	8.5	-	-	0.56	0.69

Notes:
(1) Refer to **Figure 11** for the location of the assessed pedestrian facilities;

6.4.2 It is revealed that the pedestrian crossing will operate within capacity with the proposed widening work in place. However, its implementation will be subject to modification of the existing box culvert at San Wan Road westbound. Further study on the feasibility of the proposed widening of pedestrian crossing and detailed design would be carried out in forthcoming design stage.

Proposed Improvement Scheme for Location BH – Footpath along San Wan Road

6.4.3 As shown in **Table 6.6**, the footpath will be operating with LOS D. It is proposed to widen the footpath by removal of planter by at least 0.6m as shown in **Figure 13**. The LOS assessment results of the footpath with the improvement scheme in place are shown in **Tables 6.8**.

Table 6.8 Future Assessment Results for Location BH with improvement scheme

Location *(1)*	Type	Clear Width (m)	Capacity (ppm/m) *(2)*	Pedestrian Demand (pph)		Flow Rate (ppm/m) *(3)*		LOS		V/C Ratio	
				AM	PM	AM	PM	AM	PM	AM	PM
BH (3)	Footpath	2.9	50	3,285	3,905	21.9	26.0	C	C	0.44	0.52

Notes:
(1) Refer to **Figure 11** for the location of the assessed pedestrian facilities; and
(2) Computed based on effective width for footpath/footbridge/staircase, by assuming 0.2m and 0.5m lateral clearance to railing/planter/tree and wall/fence according to Highway Capacity Manual 2000 Chapter 18 Exhibit 18-1.
(3) Taking into account of the bus passenger queue and reducing the effective footpath width by 1m, the flow rate of BH becomes 45.4 ppm/m (i.e LOS D) and 53.9 ppm/m (i.e LOS E) during AM and PM peak respectively, which is better than the existing condition as shown in **Table 5.3** Footnote (5).

6.4.4 With the improvement scheme in place, the footpath at location BH will be operating with LOS C. Further study on the feasibility of the proposed footpath widening and liaison with relevant parties (e.g. LCSD) would be carried out in forthcoming design stage.

7 SUMMARY AND CONCLUSION

7.1 Summary

7.1.1 Arup was appointed by Hong Kong Housing Authority to conduct a Traffic Impact Assessment (TIA) for the land rezoning of the proposed Subsidised Sale Flats (SSF) Development at Po Shek Wu Road (the Site).

7.1.2 Hong Kong Housing Authority intends to develop the Site for subsidised sale flats (SSF) development with an approximate development schedule of 1,850 SSF flats. The Site would tentatively be completed by Year 2026/2027.

7.1.3 The parking and servicing facilities provision for the proposed development will be provided with reference to relevant standard and guideline.

7.1.4 To appreciate the existing traffic conditions, comprehensive classified traffic counts were conducted at the key junctions in the vicinity of the Site. Junction capacity analyses have been carried out at the key junctions in vicinity of the Site. Results of the analysis indicate that all assessed junctions are currently operating within capacity during both morning and evening peaks.

7.1.5 Junction capacity assessment was undertaken for scenarios of design years 2027 and 2031. All analysed results revealed that the associated junctions along the accessing/ leaving routes would still be performing within capacity, with proposed junction improvement schemes in place.

7.1.6 Future pedestrian condition was also assessed. Based on the LOS assessment, the pedestrian facilities, with proposed improvement schemes in place, would be adequate to cater for the additional pedestrian demand generated from the proposed development, with LOS “C” or better, except for location AE, which is the footbridge connecting MTR Sheung Shui Station and Landmark North, and operating at LOS D in existing year. Site-related trip to/from these major attraction nodes could mainly use the at-grade footpaths and footbridges (i.e. location AM) instead of AE.

7.2 Conclusion

7.2.1 Based on the above discussion, it is concluded that the proposed housing site at Po Shek Wu Road, Sheung Shui (the Site) would not induce adverse traffic impact on the surrounding road network and pedestrian network upon completion at design years 2027 and 2031. Therefore, the proposed development is considered acceptable with the timely implementation of the improvement works from the traffic point of view.

Figures

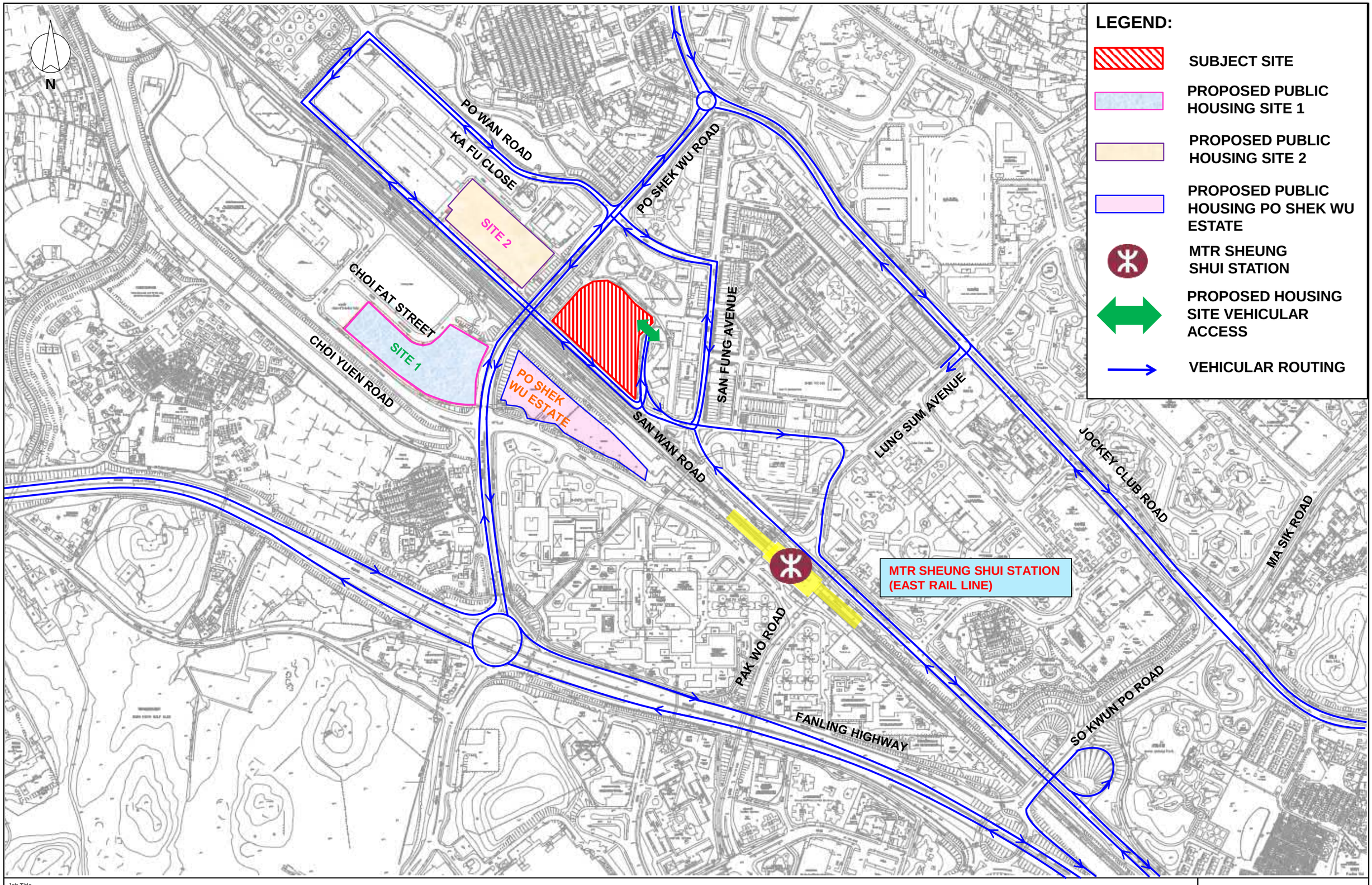
N

J9
J13
J10
L4
KA FU CLOSE
PO WAN ROAD
PROPOSED PRH SITE 2
SITE 2
CHOI FAT STREET
SITE 1
PROPOSED PRH SITE 1
J3
CHOI YUEN ROAD
L1
PROPOSED PRH SITES 3 & 4
J1
L3
PO SHEK WU ROAD
J2
J16
PROPOSED VEHICULAR ACCESS OF SSF SITE AT PO SHEK WU ROAD
L2
SAN WAN ROAD
PO SHEK WU ESTATE
L5
J15
SAN FUNG AVENUE
J5
LUNG SUM AVENUE
JOCKEY CLUB ROAD
MTR SHEUNG SHUI STATION (EAST RAIL LINE)
J4
J8
PAK WO ROAD
FANLING HIGHWAY
J7
J6
SO KWUN PO ROAD
MA SIK ROAD

LEGEND:

- SUBJECT SITE
- PROPOSED PUBLIC HOUSING SITE 1
- PROPOSED PUBLIC HOUSING SITE 2
- PROPOSED PUBLIC HOUSING PO SHEK WU ESTATE
- J1 — SURVEYED JUNCTIONS
- L1 — ASSESSED ROAD LINKS
- AREA OF INFLUENCE (AOI)
- MTR SHEUNG SHUI STATION
- PROPOSED HOUSING SITE VEHICULAR ACCESS

Job Title: **PROPOSED HOUSING SITE AT PO SHEK WU ROAD, SHEUNG SHUI**		**FIGURE 1**
Date: **12/2016**	Scale: **N.T.S.**	Drawing Title: **SUBJECT SITE AND SURVEYED JUNCTIONS LOCATIONS**
Drawn: **CYRL**	Job No.: **236072-12**	ARUP



Job Title: **PROPOSED HOUSING SITE AT PO SHEK WU ROAD, SHEUNG SHUI**		**FIGURE 2**
Date: **12/2016**	Scale: **N.T.S.**	Drawing Title: **ACCESSIBILITY TO/FROM THE PROPOSED DEVELOPMENT**
Drawn: **CYRL**	Job No.: **236072-12**	ARUP

N

LUNG SUM AVE

SO KWUN PO ROAD

JOCKEY CLUB ROAD

SAN FUNG AVE

SAN PO STREET

PO WAN ROAD

SAN HONG STREET

SAN WAN ROAD

LUNG SUM AVE

CHEUK WAN STREET

KA FU CLOSE

SAN WAN ROAD

CHOI YUEN ROAD

PAK WO ROAD

FANLING HIGHWAY

PO SHEK WU ROAD

INSET A

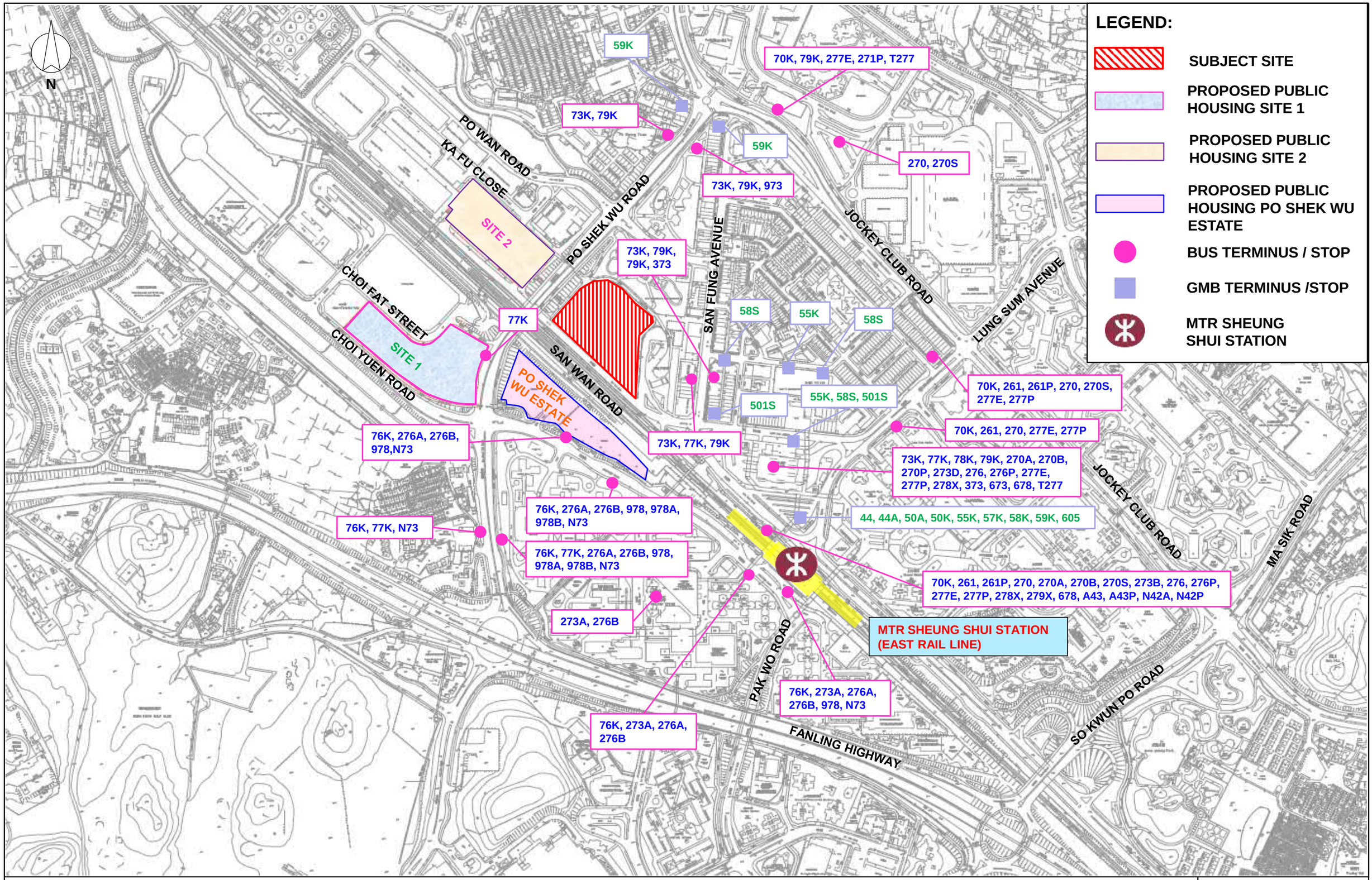
INSET B

LEGEND:

110 (220) PM PEAK HOUR FLOW (PCU/HR)

AM PEAK HOUR FLOW (PCU/HR)

Job Title: PROPOSED HOUSING SITE AT PO SHEK WU ROAD, SHEUNG SHUI		FIGURE 3
Date: 12/2016	Scale: N.T.S.	Drawing Title: YEAR 2017 TRAFFIC FLOWS
Drawn: CYRL	Job No.: 236072-12	ARUP



Job Title: PROPOSED HOUSING SITE AT PO SHEK WU ROAD, SHEUNG SHUI			FIGURE 4
Date: 12/2016	Scale: N.T.S.	Drawing Title: PUBLIC TRANSPORT FACILITIES IN THE VICINITY OF SUBJECT SITE	ARUP
Drawn: CYRL	Job No.: 236072-12		

N

LUNG SUM AVE

SO KWUN PO ROAD

255 (145)
745 (1240)
0 (5)

140 (145)
560 (245)
105 (85)

85 (35)
245 (225)
290 (135)

80 (155)
245 (145)
685 (290)

45 (60)
1055 (1135)
110 (150)

JOCKEY CLUB ROAD

530 (1135)
525 (230)
15 (0)

35 (100)
145 (95)
475 (405)

SAN FUNG AVE

10 (115)
270 (260)
275 (240)

320 (250)
30 (25)

370 (425)
1010 (840)
395 (430)

245 (100)
260 (135)
550 (410)

INSET B

SAN FUNG AVE

320 (165)
85 (5)
5 (5)

PO WAN ROAD

175 (180)
430 (315)

SAN HONG STREET

15 (0)
40 (20)
260 (215)

70 (105)
1155 (1535)

PO WAN ROAD

SAN HONG STREET

SAN PO STREET

CHEUK WAN STREET

KA FU CLOSE

SAN WAN ROAD

595 (220)
1035 (1335)
495 (365)

25 (30)
15 (5)
290 (145)

110 (100)
1245 (1445)
295 (295)

SAN WAN ROAD

LUNG SUM AVE

145 (25)
600 (780)
350 (355)

5 (10)
55 (20)

110 (95)
30 (5)

SAN WAN ROAD

155 (10)
275 (250)

LUNG SUM AVE

0 (0)
315 (245)
185 (165)

CHOI YUEN ROAD

215 (140)
315 (220)

SAN WAN ROAD

INSET A

390 (225)
30 (40)
1070 (1025)

340 (455)
1370 (1595)
540 (700)

0 (0)
110 (20)
5 (10)

725 (385)
10 (40)
0 (0)

PAK WO ROAD

730 (1225)
2390 (2400)

0 (0)
0 (10)
70 (120)

0 (0)
165 (80)
10 (30)

60 (30)
0 (5)
50 (20)

SAN PO STREET

0 (0)
380 (180)
225 (40)

185 (35)
55 (40)

KA FU CLOSE

55 (30)
5 (5)

70 (35)
5 (5)

CHEUK WAN STREET

35 (5)
165 (50)

SAN WAN ROAD

0 (0)
20 (10)

80 (40)
10 (5)

805 (825)
1760 (2150)

345 (150)
1340 (1670)

705 (470)
605 (525)

FANLING HIGHWAY

410 (375)
1795 (1545)

160 (230)
330 (480)

560 (970)
1000 (1220)

1010 (945)
870 (805)

PO SHEK WU ROAD

LEGEND:

110 (220) PM PEAK HOUR FLOW (PCU/HR)

AM PEAK HOUR FLOW (PCU/HR)

Job Title
PROPOSED HOUSING SITE AT PO SHEK WU ROAD, SHEUNG SHUI

FIGURE 5

Date
08/2018

Scale
N.T.S.

Drawn
WC

Job No.
236072-12

Drawing Title
YEAR 2027 REFERENCE TRAFFIC FLOWS

ARUP

N

JOCKEY CLUB ROAD

LUNG SUM AVE

SO KWUN PO ROAD

SAN FUNG AVE

PO WAN ROAD

SAN HONG STREET

SAN WAN ROAD

LUNG SUM AVE

CHOI YUEN ROAD

PAK WO ROAD

FANLING HIGHWAY

PO SHEK WU ROAD

SAN PO STREET

CHEUK WAN STREET

KA FU CLOSE

SAN WAN ROAD

INSET A

INSET B

LEGEND:

110 (220) PM PEAK HOUR FLOW (PCU/HR)

AM PEAK HOUR FLOW (PCU/HR)

Job Title: PROPOSED HOUSING SITE AT PO SHEK WU ROAD, SHEUNG SHUI		FIGURE 6
Date: 08/2018	Scale: N.T.S.	Drawing Title: YEAR 2027 DESIGN TRAFFIC FLOWS
Drawn: WC	Job No.: 236072-12	ARUP

N

JOCKEY CLUB ROAD

LUNG SUM AVE

SO KWUN PO ROAD

SAN FUNG AVE

PO WAN ROAD

SAN HONG STREET

SAN WAN ROAD

LUNG SUM AVE

CHOI YUEN ROAD

PAK WO ROAD

FANLING HIGHWAY

PO SHEK WU ROAD

SAN PO STREET

CHEUK WAN STREET

KA FU CLOSE

SAN WAN ROAD

INSET A

INSET B

LEGEND:

110 (220) PM PEAK HOUR FLOW (PCU/HR)

AM PEAK HOUR FLOW (PCU/HR)

Job Title: PROPOSED HOUSING SITE AT PO SHEK WU ROAD, SHEUNG SHUI		FIGURE 7
Date: 08/2018	Scale: N.T.S.	Drawing Title: YEAR 2031 REFERENCE TRAFFIC FLOWS
Drawn: WC	Job No.: 236072-12	ARUP

N

JOCKEY CLUB ROAD

LUNG SUM AVE

SO KWUN PO ROAD

SAN FUNG AVE

PO WAN ROAD

SAN HONG STREET

SAN WAN ROAD

LUNG SUM AVE

CHOI YUEN ROAD

PAK WO ROAD

FANLING HIGHWAY

PO SHEK WU ROAD

SAN PO STREET

CHEUK WAN STREET

KA FU CLOSE

SAN WAN ROAD

INSET A

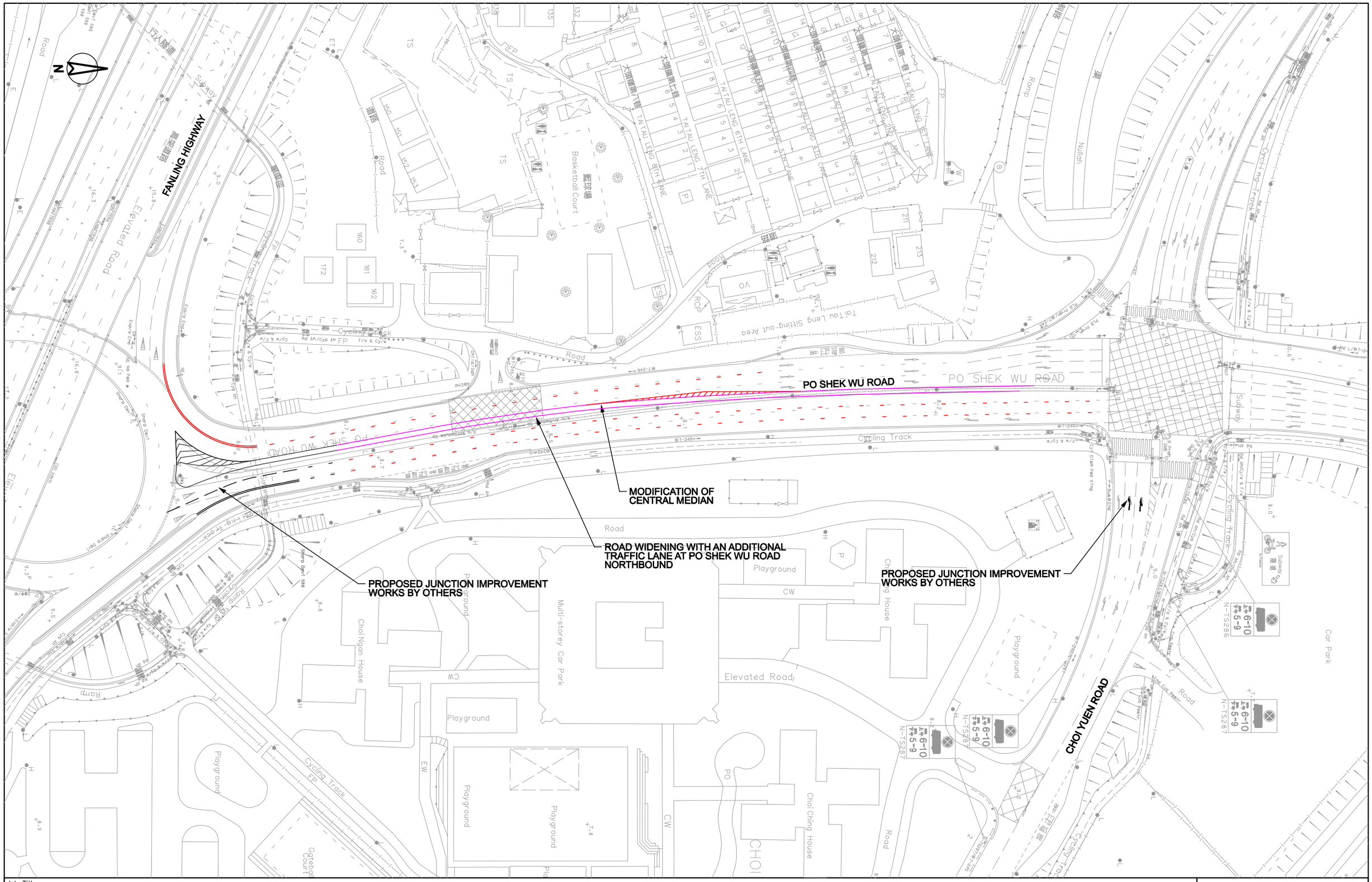
INSET B

LEGEND:

110 (220) → PM PEAK HOUR FLOW (PCU/HR)

AM PEAK HOUR FLOW (PCU/HR)

Job Title: PROPOSED HOUSING SITE AT PO SHEK WU ROAD, SHEUNG SHUI		FIGURE 8
Date: 08/2018	Scale: N.T.S.	Drawing Title: YEAR 2031 DESIGN TRAFFIC FLOWS
Drawn: WC	Job No.: 236072-12	ARUP



Job Title

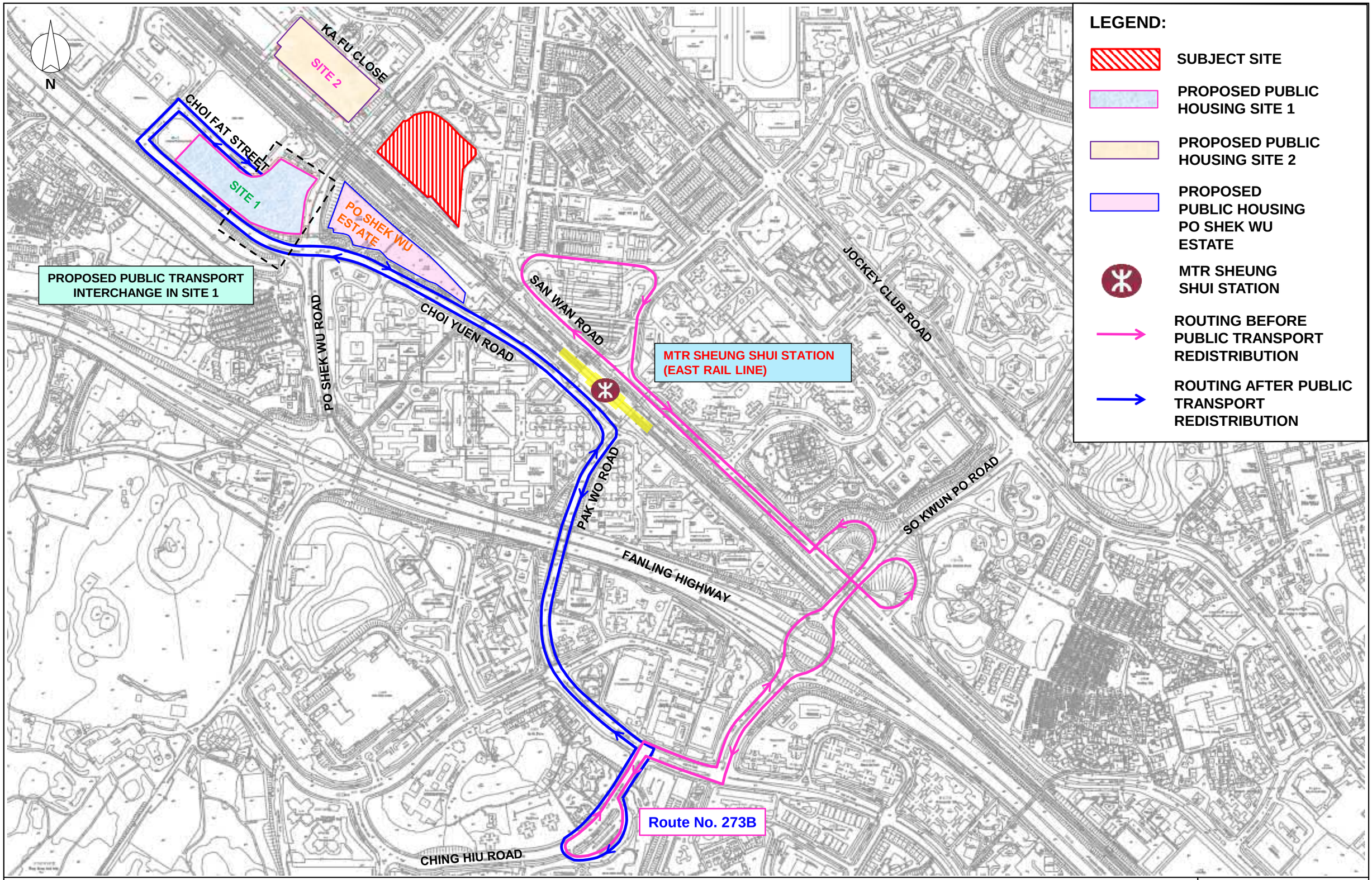
PROPOSED HOUSING SITE AT PO SHEK WU ROAD, SHEUNG SHUI

FIGURE 9

Date	Scale	Drawing Title
01/2018	1 : 1000 @ A3	**POSSIBLE TRAFFIC IMPROVEMENT SCHEME AT PO SHEK WU ROAD EASTBOUND**
Drawn	Job No.	
WKKL	236072 - 09	

ARUP

PRINTED BY: williamlol 8/29/2018 9:55:26 AM
FILENAME: m:\Drawing\236000\236072-09 Instruction No. A19, Traffic Impact Assessment for Sites 1& 2 at FanlingSheung Shui Area 30\drawing\20180703 (Figure 9)\Figure 9.dgn



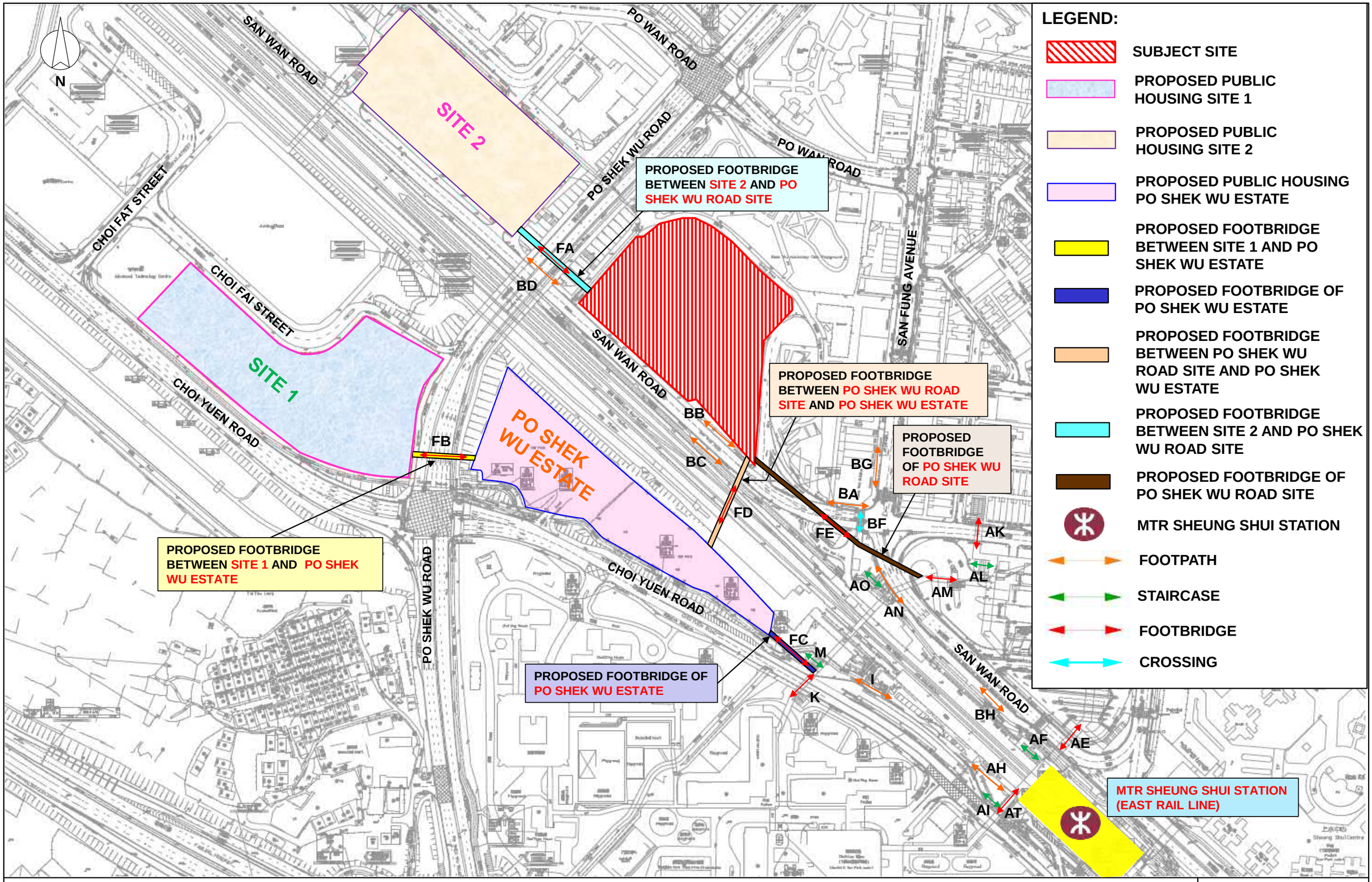
Job Title

PROPOSED HOUSING SITE AT PO SHEK WU ROAD, SHEUNG SHUI

FIGURE 10

Date	Scale	Drawing Title
12/2016	N.T.S.	**EXAMPLE OF PUBLIC TRANSPORT ROUTING BEFORE AND AFTER PUBLIC TRANSPORT REDISTRIBUTION**
Drawn: CYRL	Job No.: 236072-12	

ARUP



Job Title

PROPOSED HOUSING SITE AT PO SHEK WU ROAD, SHEUNG SHUI

FIGURE 11

Date	Scale	Drawing Title
12/2016	N.T.S.	**LOCATION PLAN FOR SURVEYED / ASSESSED PEDESTRIAN FACILITIES**
Drawn	Job No.	
CYRL	236072-12	

ARUP

N

SAN WAN ROAD

PO WAN ROAD

PO SHEK WU ROAD

PO WAN ROAD

CHOI FAT STREET

CHOI FAI STREET

SITE 2

SITE 1

PROPOSED FOOTBRIDGE BETWEEN SITE 2 AND PO SHEK WU ROAD SITE

SAN WAN ROAD

SAN FUNG AVENUE

PROPOSED FOOTBRIDGE BETWEEN PO SHEK WU ROAD SITE AND PO SHEK WU ESTATE

PO SHEK WU ESTATE

PROPOSED FOOTBRIDGE OF PO SHEK WU ROAD SITE

TO/FROM LANDMARK NORTH

CHOI YUEN ROAD

PROPOSED FOOTBRIDGE BETWEEN SITE 1 AND PO SHEK WU ESTATE

PO SHEK WU ROAD

CHOI YUEN ROAD

PROPOSED FOOTBRIDGE OF PO SHEK WU ESTATE

TO/FROM MTR SHEUNG SHUI STATION

SAN WAN ROAD

MTR SHEUNG SHUI STATION (EAST RAIL LINE)

LEGEND:

- SUBJECT SITE
- PROPOSED PUBLIC HOUSING SITE 1
- PROPOSED PUBLIC HOUSING SITE 2
- PROPOSED PUBLIC HOUSING PO SHEK WU ESTATE
- PROPOSED FOOTBRIDGE BETWEEN SITE 1 AND PO SHEK WU ESTATE
- PROPOSED FOOTBRIDGE OF PO SHEK WU ESTATE
- PROPOSED FOOTBRIDGE BETWEEN PO SHEK WU ROAD SITE AND PO SHEK WU ESTATE
- PROPOSED FOOTBRIDGE BETWEEN SITE 2 AND PO SHEK WU ROAD SITE
- PROPOSED FOOTBRIDGE OF PO SHEK WU ROAD SITE
- MTR SHEUNG SHUI STATION
- PEDESTRIAN ROUTINGS TO/FROM SUBJECT SITE
- PEDESTRIAN ROUTINGS IN PUBLIC HOUSING SITES (INDICATIVE)

Job Title

PROPOSED HOUSING SITE AT PO SHEK WU ROAD, SHEUNG SHUI

FIGURE 12

Date	Scale	Drawing Title
12/2016	N.T.S.	**PEDESTRIAN ROUTINGS TO/FROM SUBJECT HOUSING DEVELOPMENT**
Drawn: CYRL	Job No.: 236072-12	ARUP

N

SAN WAN ROAD

PO WAN ROAD

PO SHEK WU ROAD

PO WAN RO

SAN WAN ROAD

BF

LUNG SUM AVENUE

LUNG WAN STREET

LUNG SUM LANE

CHOI YUEN ROAD

SAN WAN ROAD

BH

MTR SHEUNG SHUI STATION
(EAST RAIL LINE)

FOOTPATH WIDENING AT FOOTPATH BH

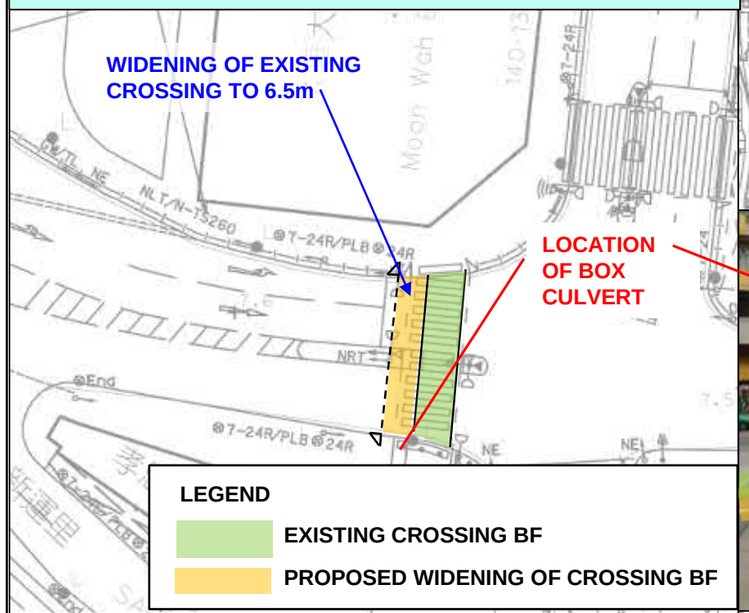


LEGEND

EXISTING FOOTPATH

EXISTING PLANTER TO BE REMOVED

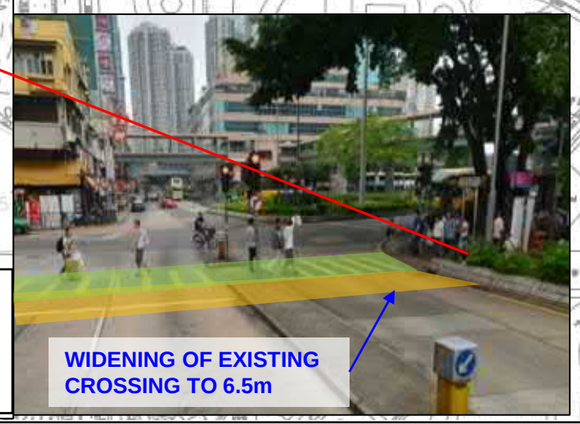
WIDENING OF CROSSING BF



LEGEND

EXISTING CROSSING BF

PROPOSED WIDENING OF CROSSING BF



Job Title

PROPOSED HOUSING SITE AT PO SHEK WU ROAD, SHEUNG SHUI

FIGURE 13

Date	Scale	Drawing Title
12/2016	N.T.S.	**PROPOSED IMPROVEMENT SCHEMES FOR PEDESTRIAN FACILITIES**
Drawn	Job No.	
CYRL	236072-12	

ARUP

N

SAN WAN ROAD

PO WAN ROAD

SITE 2

PO SHEK WU ROAD

PO WAN ROAD

CHOI FAT STREET

CHOI FAI STREET

SITE 1

CHOI YUEN ROAD

SAN WAN ROAD

SAN FUNG AVENUE

PO SHEK WU ESTATE

PROPOSED FOOTBRIDGE BETWEEN SITE 2 AND PO SHEK WU ROAD SITE

PROPOSED FOOTBRIDGE BETWEEN PO SHEK WU ROAD SITE AND PO SHEK WU ESTATE

PROPOSED FOOTBRIDGE OF PO SHEK WU ROAD SITE

PROPOSED FOOTBRIDGE BETWEEN SITE 1 AND PO SHEK WU ESTATE

PO SHEK WU ROAD

CHOI YUEN ROAD

PROPOSED FOOTBRIDGE OF PO SHEK WU ESTATE

POSSIBLE FOOTBRIDGE CONNECTION TO MTR STATION

SAN WAN ROAD

MTR SHEUNG SHUI STATION (EAST RAIL LINE)

LEGEND:

- SUBJECT SITE
- PROPOSED PUBLIC HOUSING SITE 1
- PROPOSED PUBLIC HOUSING SITE 2
- PROPOSED PUBLIC HOUSING PO SHEK WU ESTATE
- PROPOSED FOOTBRIDGE BETWEEN SITE 1 AND PO SHEK WU ESTATE
- PROPOSED FOOTBRIDGE OF PO SHEK WU ESTATE
- PROPOSED FOOTBRIDGE BETWEEN PO SHEK WU ROAD SITE AND PO SHEK WU ESTATE
- PROPOSED FOOTBRIDGE BETWEEN SITE 2 AND PO SHEK WU ROAD SITE
- PROPOSED FOOTBRIDGE OF PO SHEK WU ROAD SITE
- POSSIBLE FOOTBRIDGE CONNECTION TO MTR STATION
- MTR SHEUNG SHUI STATION

The engineering feasibility of the proposed footbridges should be reviewed by other civil and structural studies etc and subjected to detailed design stage.

Job Title

PROPOSED HOUSING SITE AT PO SHEK WU ROAD, SHEUNG SHUI

FIGURE 14

Date	Scale	Drawing Title
12/2016	N.T.S.	**OVERVIEW OF PROPOSED FOOTBRIDGE NETWORK**
Drawn	Job No.	
CYRL	236072-12	

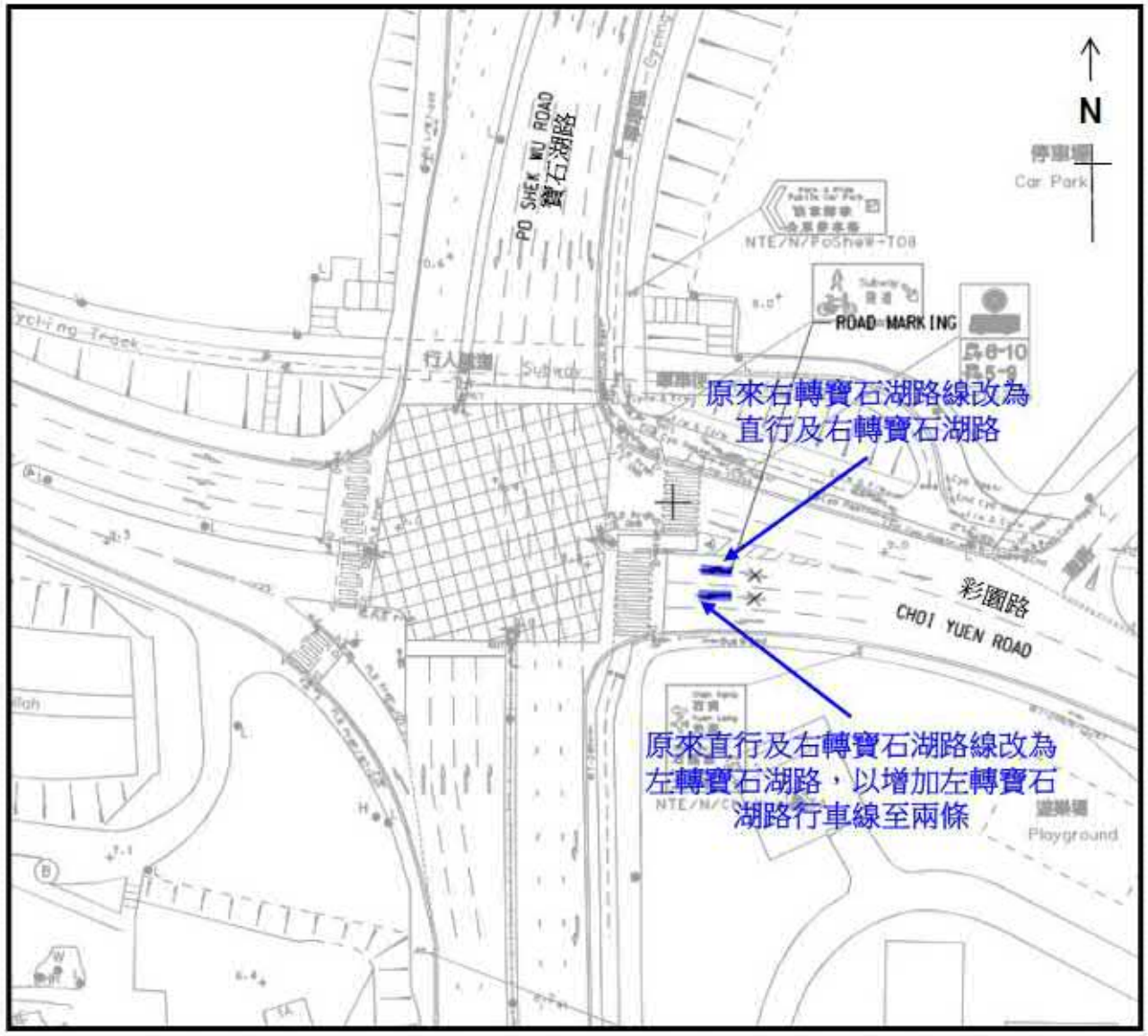
ARUP

Appendix A

Planned/ Committed Junction Improvement Schemes by Other Projects

Drawing No. A1

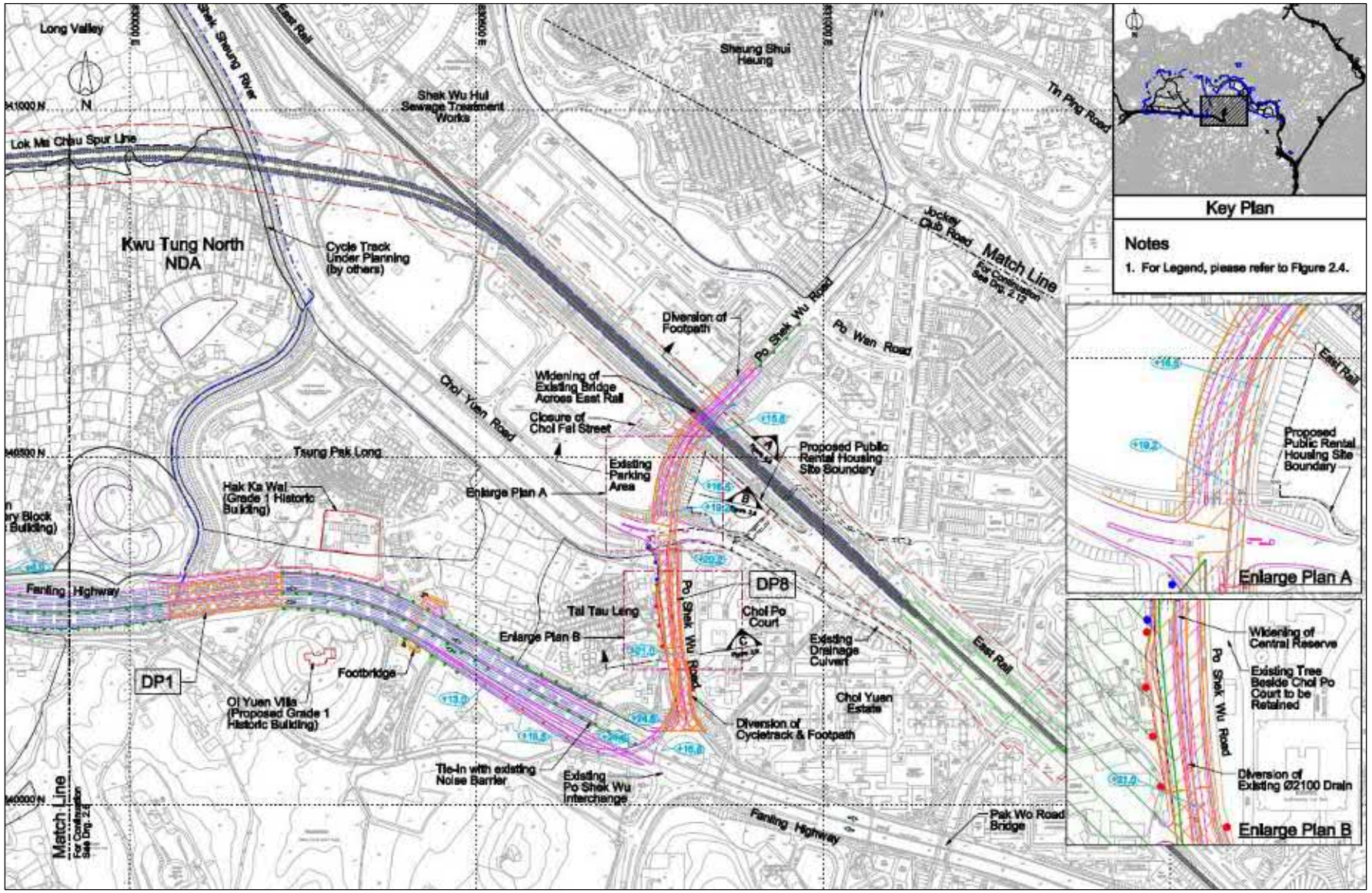
J3 – Po Shek Wu Road / Choi Yuen Road



Drawing No. A2

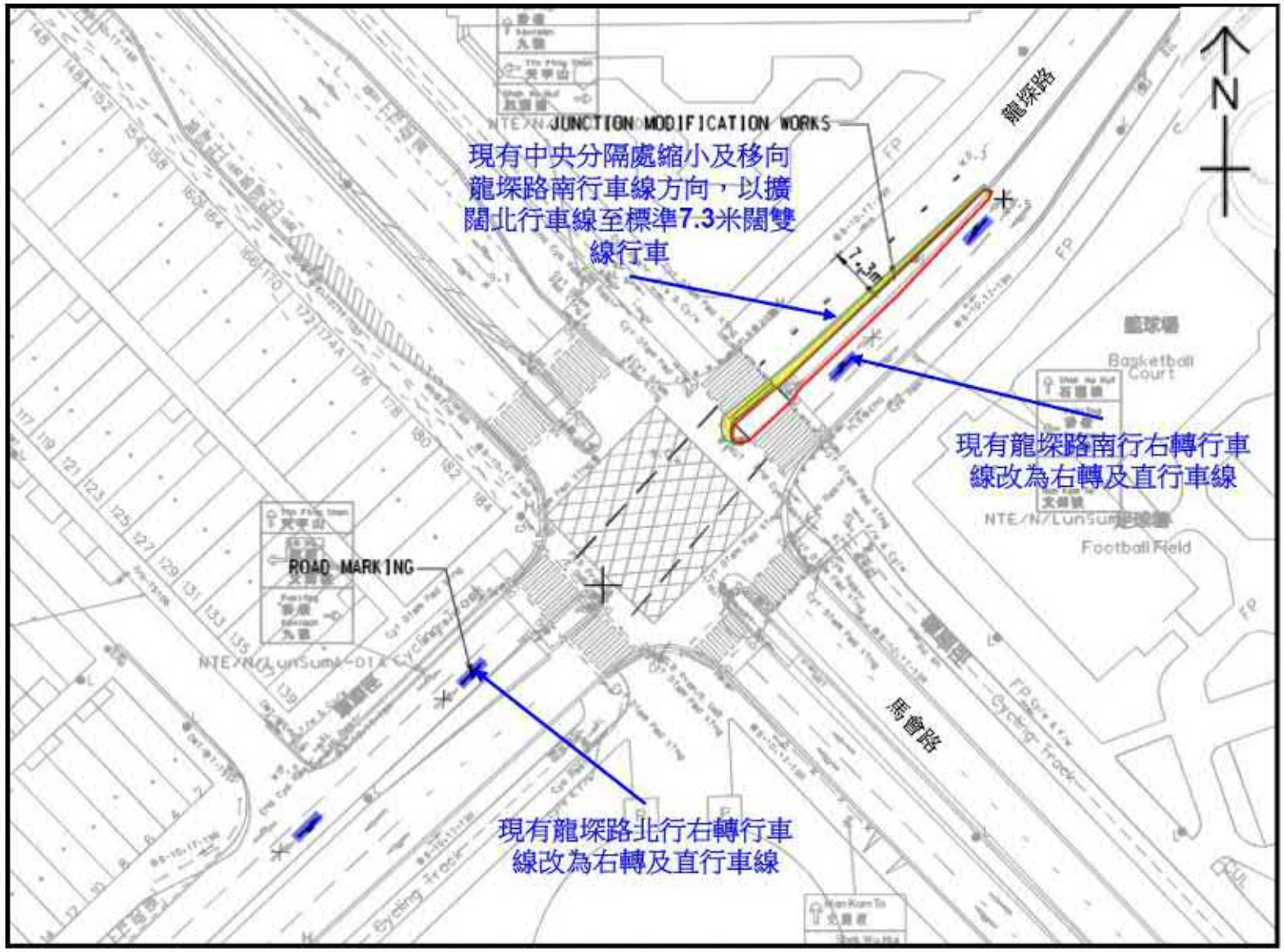
J3 – Po Shek Wu Road / Choi Yuen Road

(Proposed Po Shek Wu Interchange Improvement)

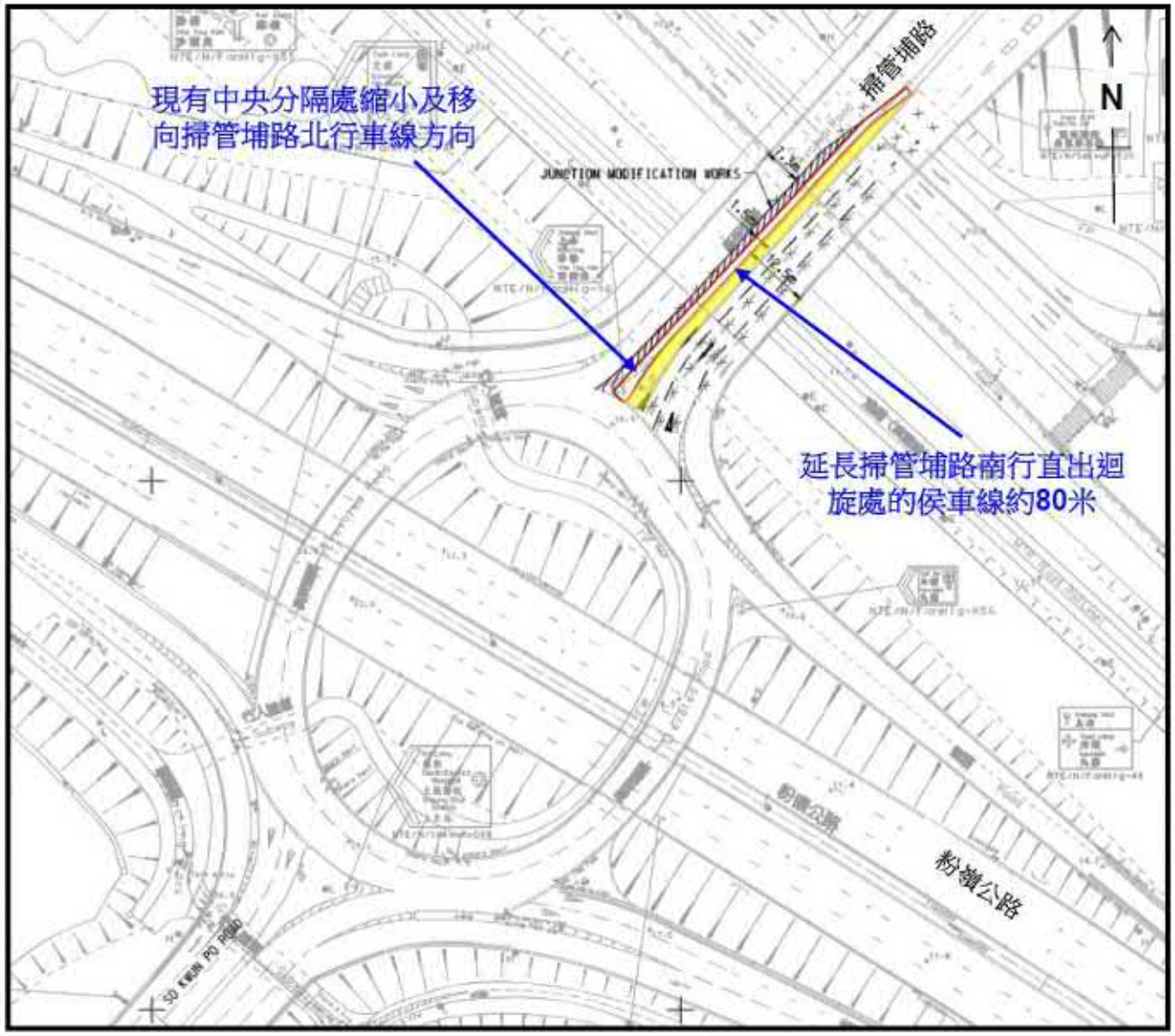


Drawing No. A3

J5 – Jockey Club Road / Lung Sum Avenue

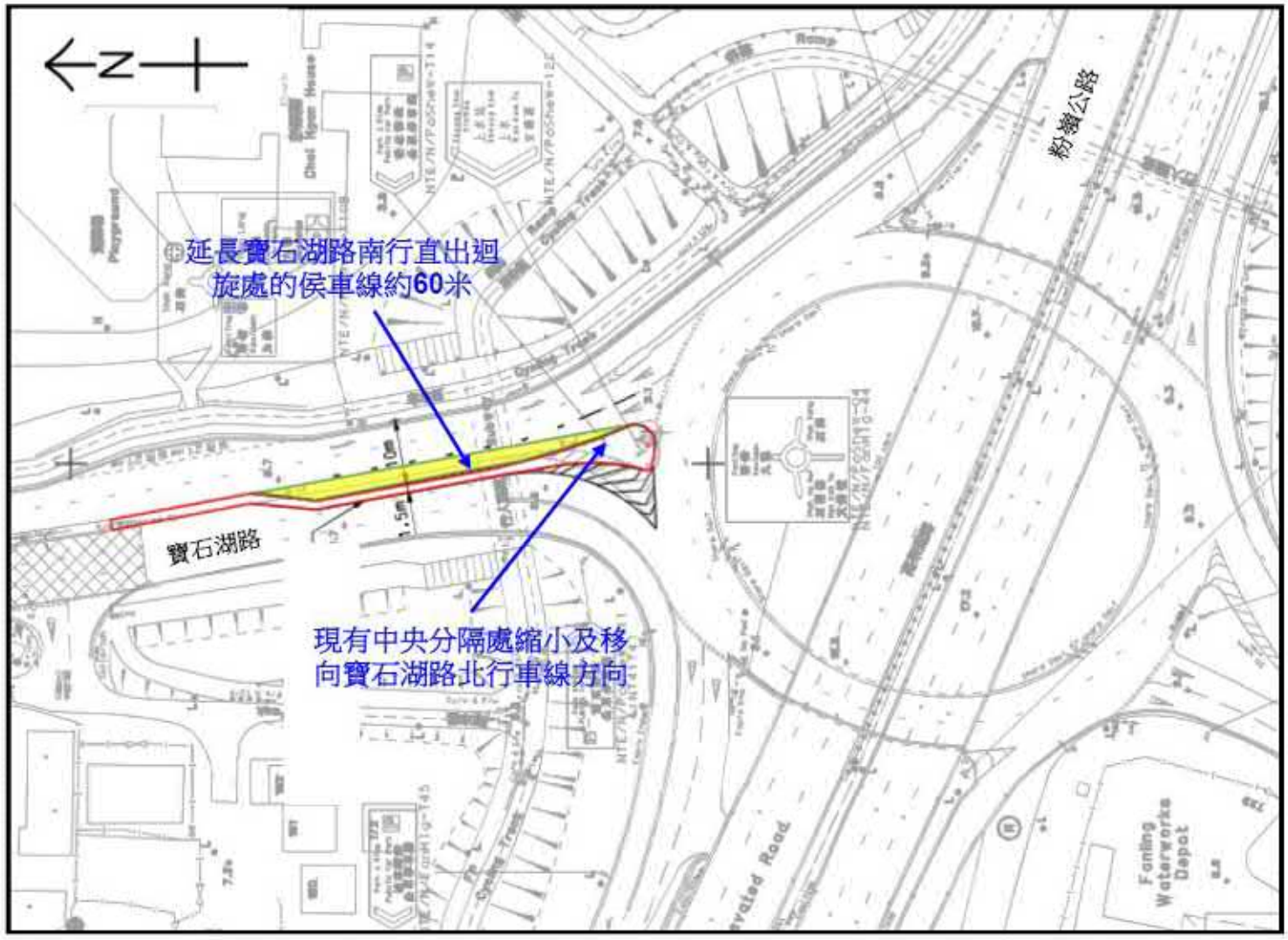


Drawing No. A4
J7 – So Kwun Po Road Interchange



Drawing No. A5

J8 – Po Shek Wu Road Interchange

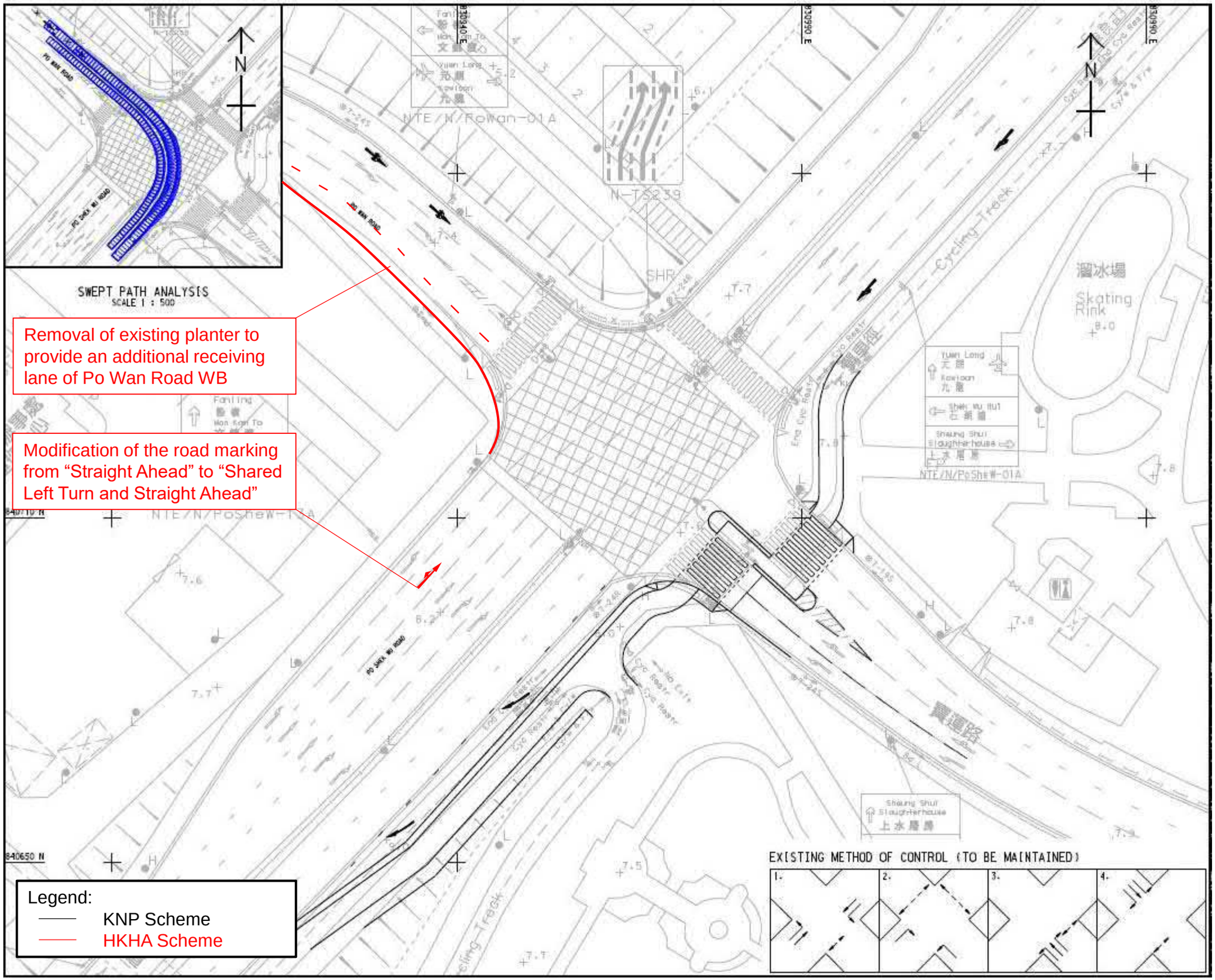


Appendix B

Proposed Junction Improvement Schemes

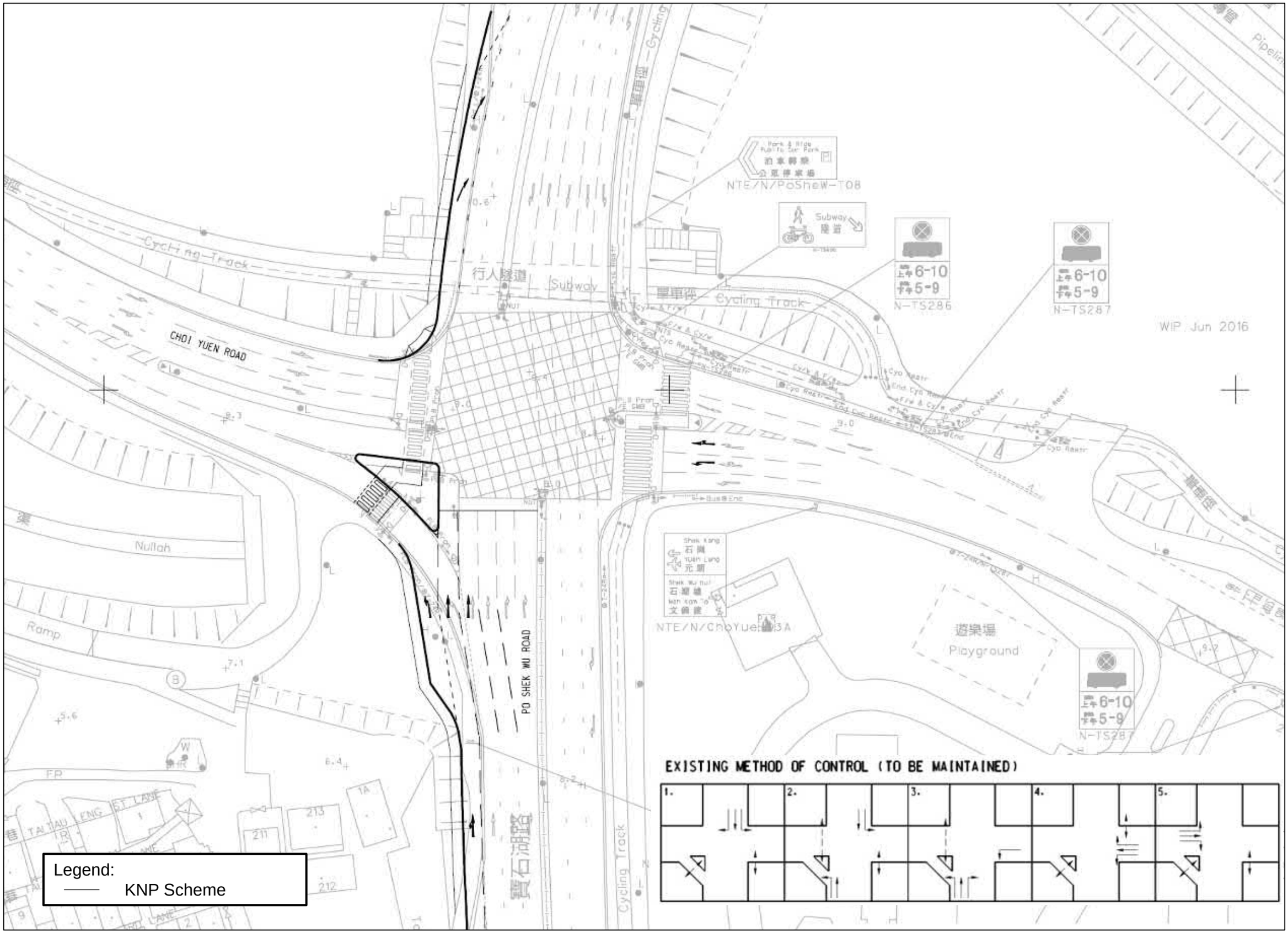
Drawing No. B1

J2 – Po Shek Wu Road / Po Wan Road (to be Completed by 2023)



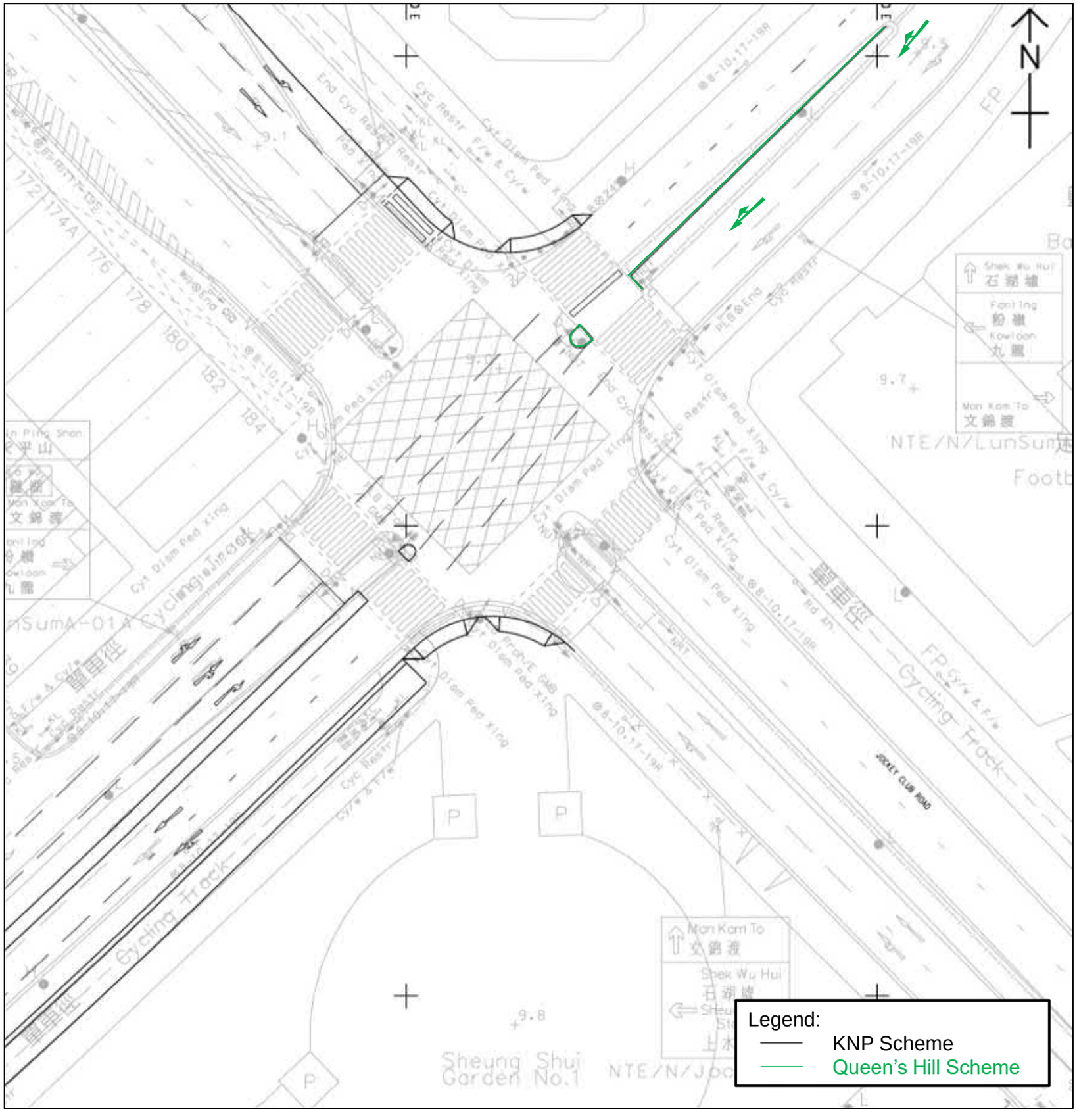
Drawing No. B3

J3 – Po Shek Wu Road / Choi Yuen Road (to be Completed by 2023)



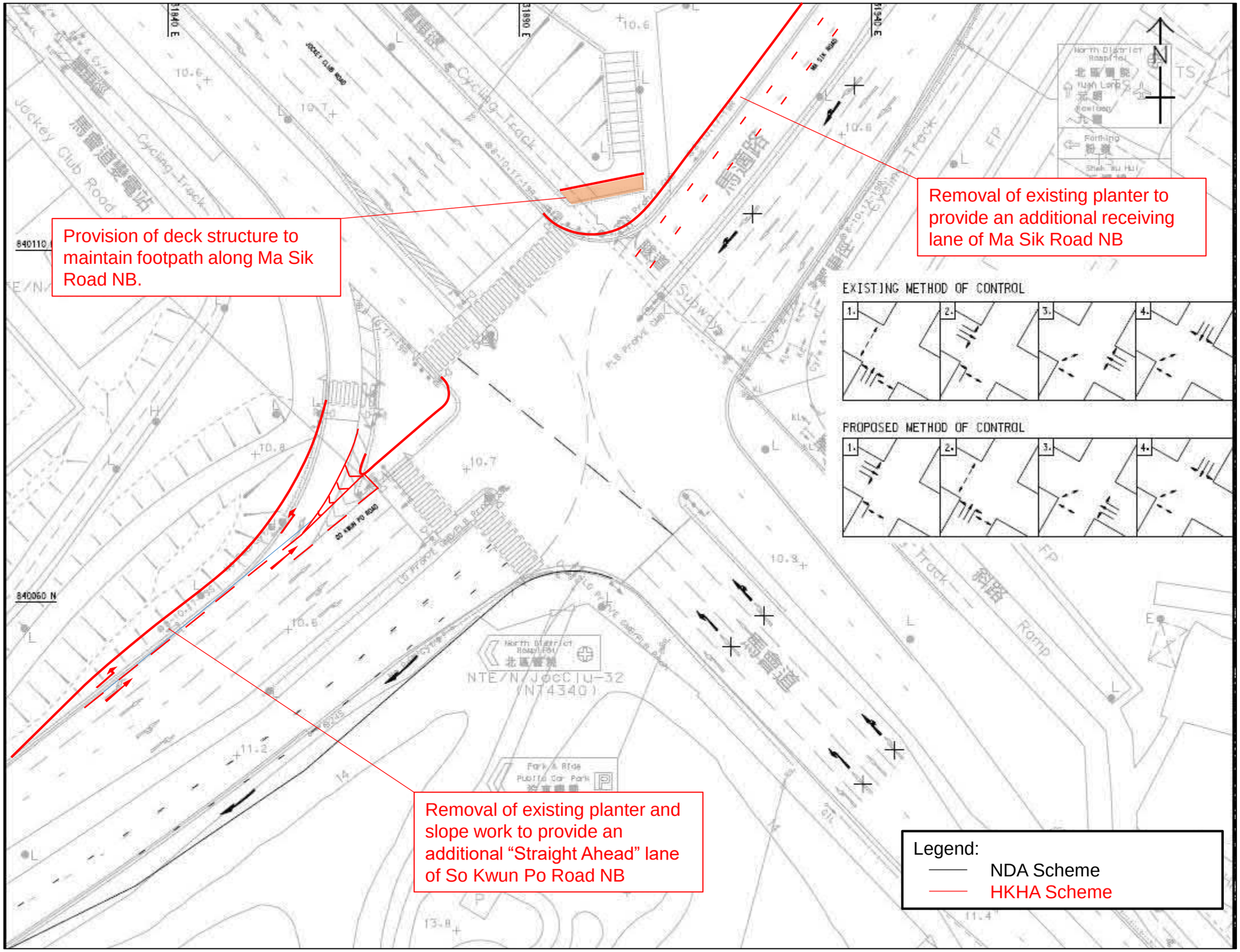
Drawing No. B4

J5 – Jockey Club Road / Lung Sum Avenue (to be Completed by 2023)



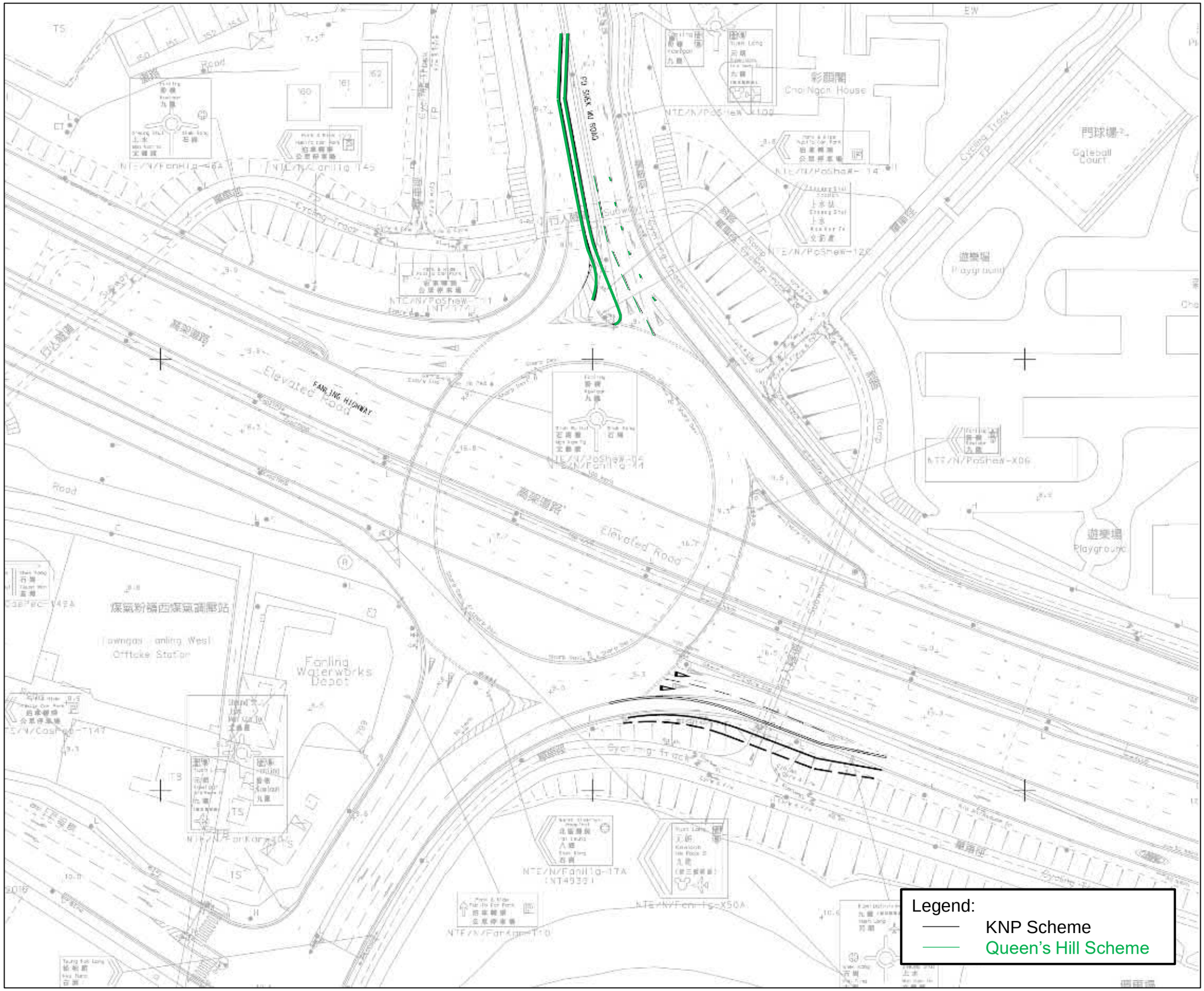
Drawing No. B5

J6 – Jockey Club Road / So Kwun Po Road (to be Completed by 2023)



Drawing No. B6

J8 – Po Shek Wu Road Interchange (to be Completed by 2023)



Summary of Junction Improvement Schemes

Junction		Type	Description	Proposed by Project [(1)]	Anticipated Implementation Schedule	Drawing No. [(2)]
J2	Po Shek Wu Road/ Po Wan Road	Signal	➢ Lane arrangement of Po Shek Wu Road southbound to be revised for allowing straight-ahead traffic to use three traffic lanes ➢ Lane arrangement of Po Wan Road eastbound to be revised for allowing right-turn traffic to use two traffic lanes	Kong Nga Po	To tie in with the programme of phased population intake of NDA. The current target of completion is 2023.	B1
			➢ Lane arrangement of Po Shek Wu Road northbound to be revised for allowing left-turn traffic to use two traffic lanes; and ➢ Local widening of Po Wan Road westbound from 1 to 2 lanes	Sheung Shui Areas 4 and 30 Sites 1 &2 (to be incorporated in Kong Nga Po)	To tie in with the programme of phased population intake of NDA. The current target of completion is 2023.	B1
J3	Po Shek Wu Road/ Choi Yuen Road	Signal	➢ Lane arrangement of the Choi Yuen Road westbound to be revised for providing two left-turn lanes	Queen's Hill	Already completed under Queen's Hill Project	A1
			➢ local widening of Po Shek Wu Road northbound to allow straight-ahead traffic to use three traffic lanes	Kong Nga Po	To tie in with the programme of phased population intake of NDA. The current target of completion is 2023.	B2
			➢ Po Shek Wu Interchange Improvement which provides a flyover to allow the right turning traffic from Po Shek Wu Road southbound to Fanling Highway westbound to bypass the existing Po Shek Wu Interchange ➢ Po Shek Wu Road southbound would be narrowed from 5 lanes to 4 lanes	NDA	To tie in with the programme of phased population intake of NDA. The current target of completion is 2029.	A2
J5	Jockey Club Road/ Lung Sum Avenue	Signal	➢ Lane arrangement of the Lung Sum Avenue northbound/southbound to be revised for allowing straight-ahead traffic to use two traffic lanes ➢ Widening the Lung Sum Avenue northbound by narrowing the central	Queen's Hill	Year 2021 (Queen's Hill Infrastructure works undertaken by CEDD)	A3

Junction		Type	Description	Proposed by Project [1]	Anticipated Implementation Schedule	Drawing No. [2]
			median of Lung Sum Avenue			
			➢ Local widening with one additional straight-ahead traffic lane on Jockey Club Road eastbound ➢ Local widening with one additional straight-ahead traffic lane on Lung Sum Avenue northbound	Kong Nga Po	To tie in with the programme of phased population intake of NDA. The current target of completion is 2023.	B3
J6	Jockey Club Road/ So Kwun Po Road	Signal	➢ Lane arrangement of the Jockey Club Road northbound to be revised for allowing left turn traffic to use two traffic lanes ➢ Method-of-Control (MOC) to be revised for minimizing/ optimizing the intergreen time ➢ Lane arrangement of Ma Sik Road southbound to be revised for allowing three traffic lanes for vehicles to travel straight ahead ➢ Local widening of So Kwun Po Road southbound from 2 to 3 lanes	NDA	To tie in with the programme of phased population intake of NDA. The current target of completion is 2023.	B4
			➢ Local widening with one additional straight-ahead traffic lane on So Kwun Po Road northbound ➢ Local widening of Ma Sik Road northbound from 2 to 3 lanes	Sheung Shui Areas 4 and 30 Sites 1 &2 (to be incorporated in NDA)	To tie in with the programme of phased population intake of NDA. The current target of completion is 2023.	B4
J7	So Kwun Po Road Interchange	Roundabout	➢ Local widening of southbound approach arm of So Kwun Po Road for a smoother entrance to the elevated roundabout	Queen's Hill	Year 2021 (Queen's Hill Infrastructure works undertaken by CEDD)	A4
			➢ New infrastructure to connect the northern and southern side of Fanling Highway	Subject to further Gov. study	Nil	Nil
J8	Po Shek Wu Road Interchange	Roundabout	➢ Local widening of southbound approach arm of Po Shek Wu Road to 10m to have two traffic lanes when approaching the roundabout	Queen's Hill	2021 (Queen's Hill Infrastructure works undertaken by CEDD)	A5
			➢ Local widening section of southbound of Po Shek Wu Road	Sheung Shui Areas 4 and 30	Year 2023/24 (undertaken by	B6

Junction		Type	Description	Proposed by Project [1]	Anticipated Implementation Schedule	Drawing No. [2]
			between Choi Yuen Road and Po Shek Wu Road Interchange	Sites 1 &2	CEDD Civil Engineering Office)	
			➢ local widening of the entry arm of Fanling Highway westbound slip road from existing two lanes to three lanes	Kong Nga Po	To tie in with the programme of phased population intake of NDA. The current target of completion is 2023.	B5
			➢ Po Shek Wu Interchange Improvement which provides a flyover to allow the right turning traffic from Po Shek Wu Road southbound to Fanling Highway westbound and bypass the existing Po Shek Wu Interchange	NDA	To tie in with the programme of phased population intake of NDA. The current target of completion is 2029.	A2

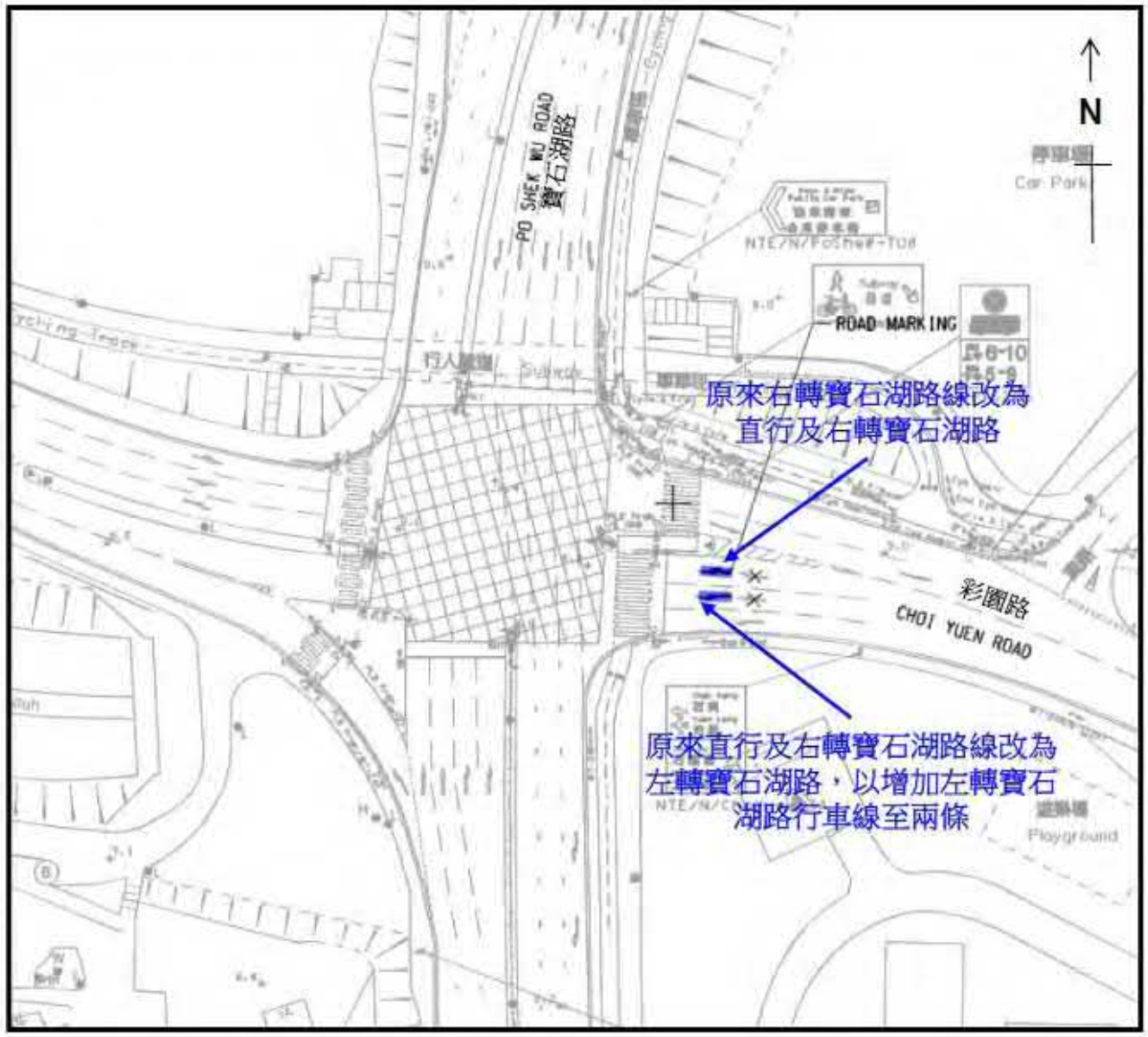
Notes:

(1) The proposed road improvement works under Kong Nga Po project by CEDD would be implemented under NDA project by CEDD as confirmed by CEDD.

(2) The actual junction improvement configuration would be subjected to detailed design.

Drawing No. A1

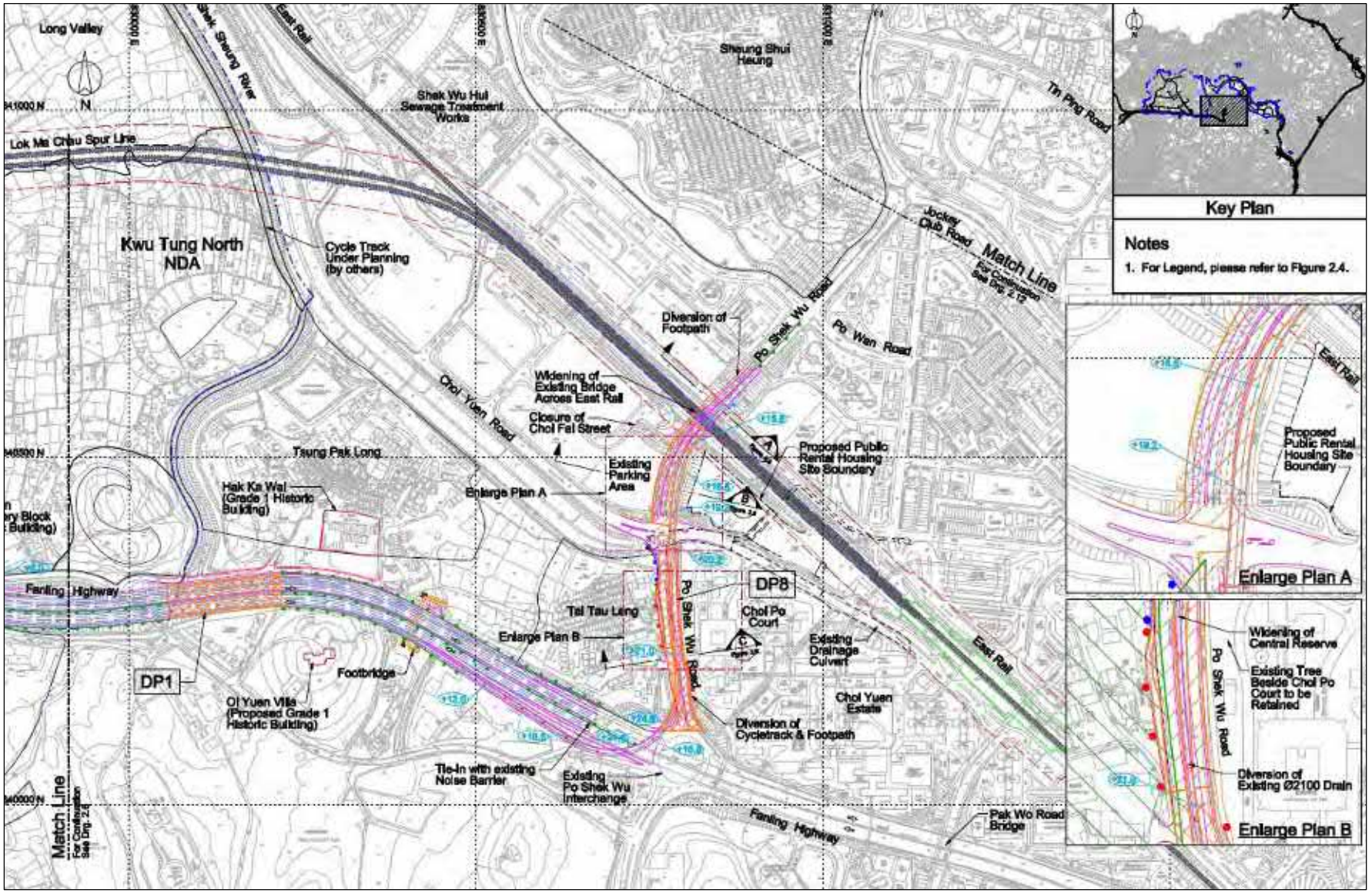
J3 – Po Shek Wu Road / Choi Yuen Road



Drawing No. A2

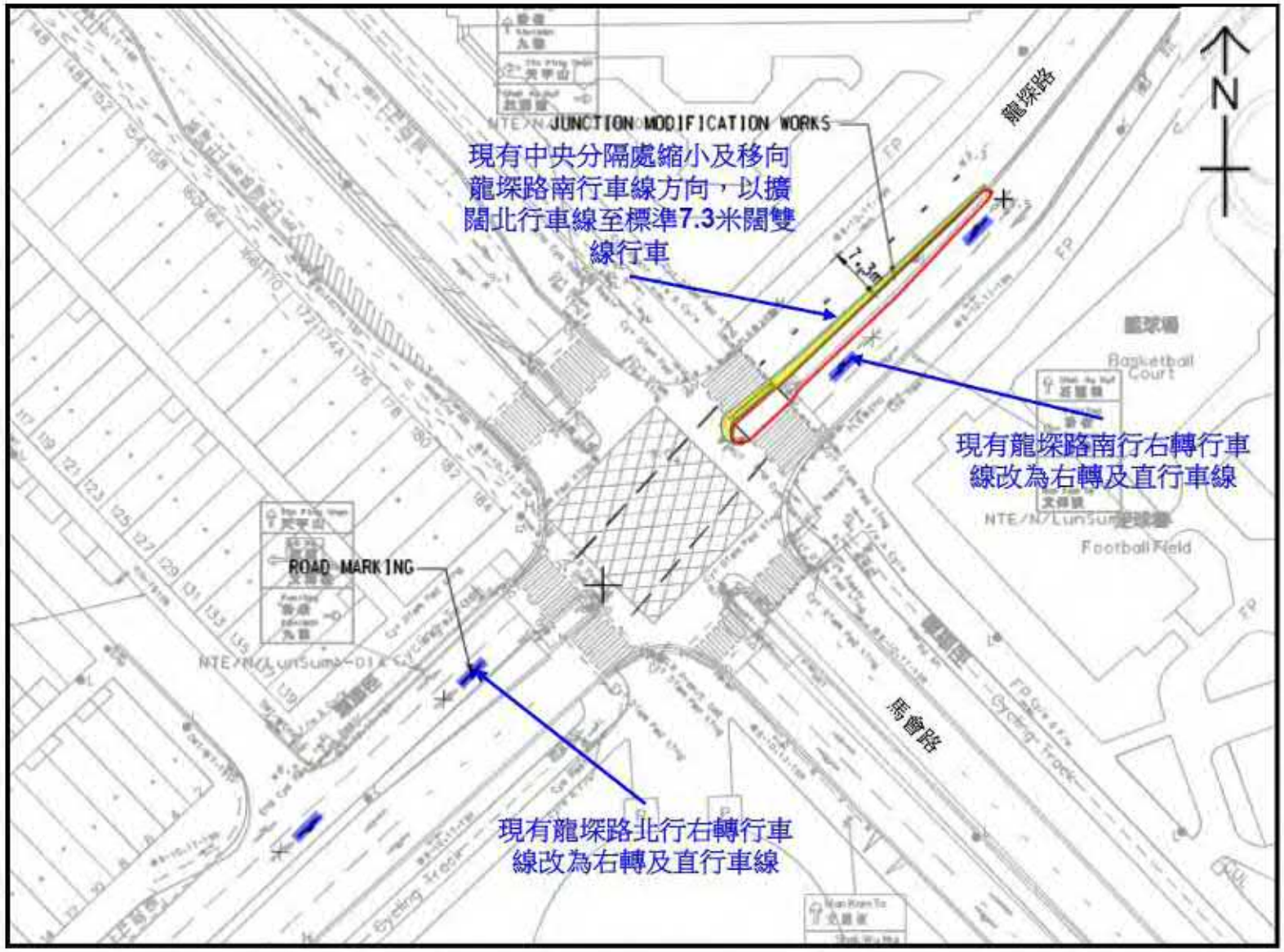
J3 – Po Shek Wu Road / Choi Yuen Road

(Proposed Po Shek Wu Interchange Improvement)



Drawing No. A3

J5 – Jockey Club Road / Lung Sum Avenue

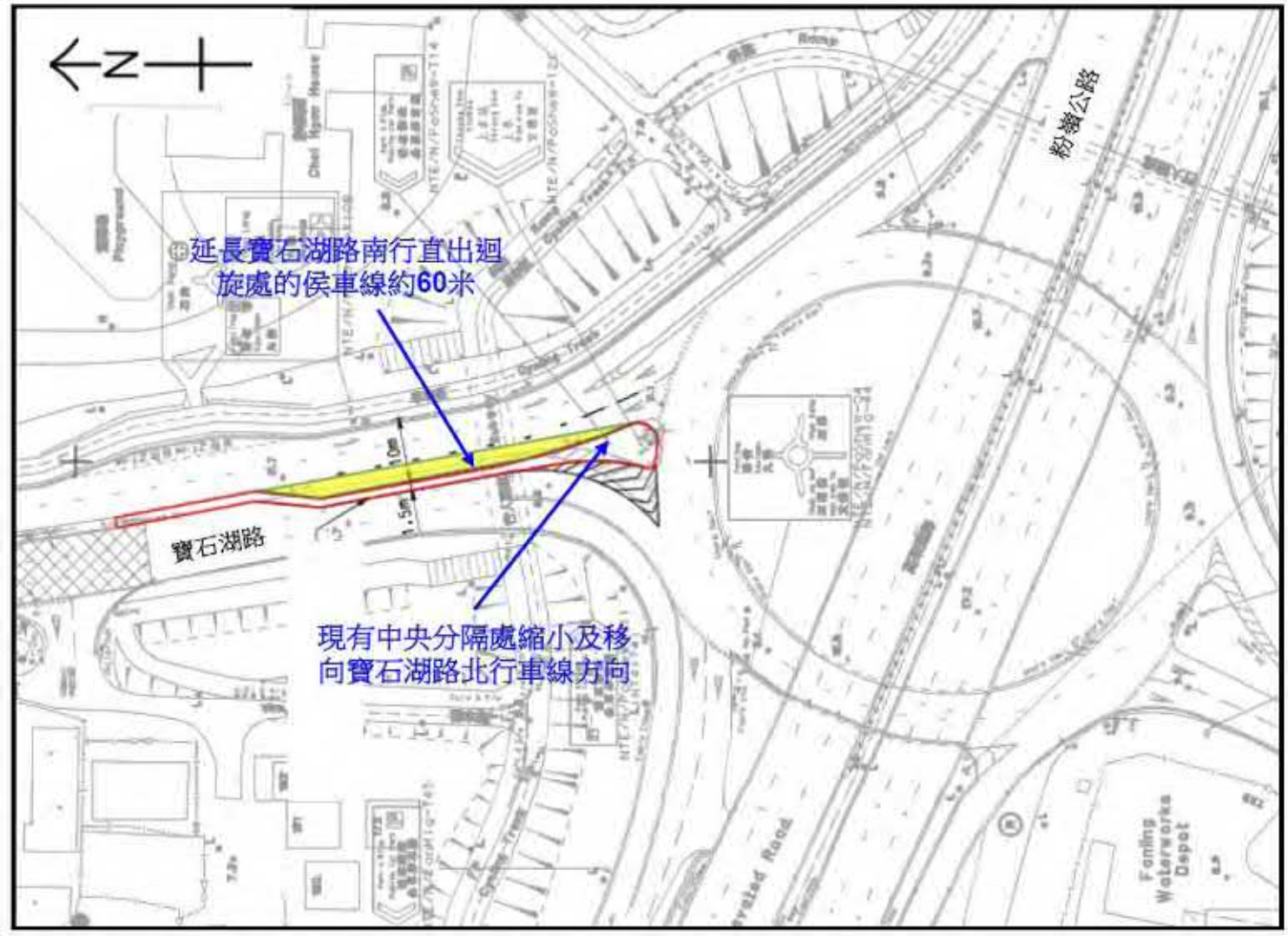


Drawing No. A4
J7 – So Kwun Po Road Interchange



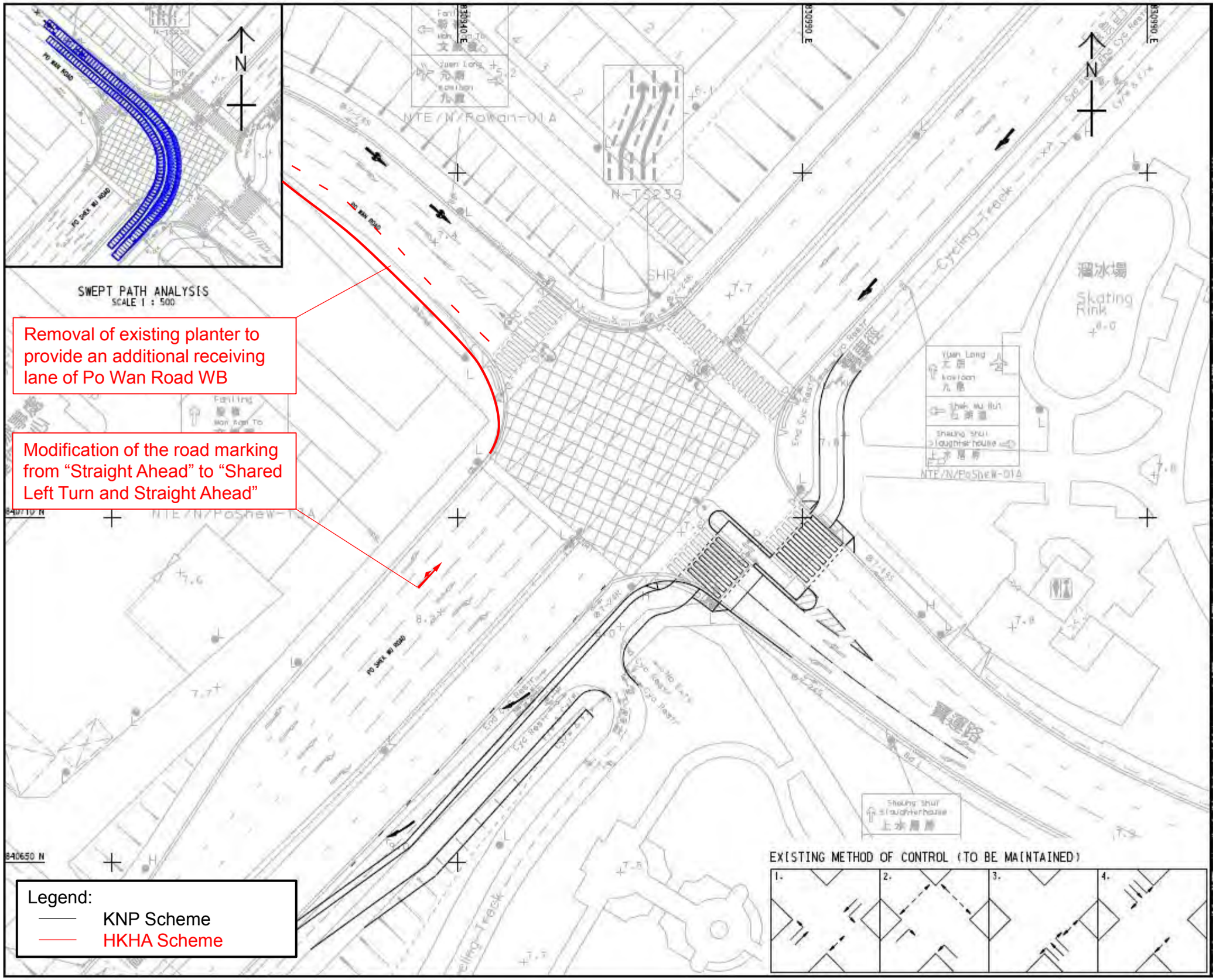
Drawing No. A5

J8 – Po Shek Wu Road Interchange



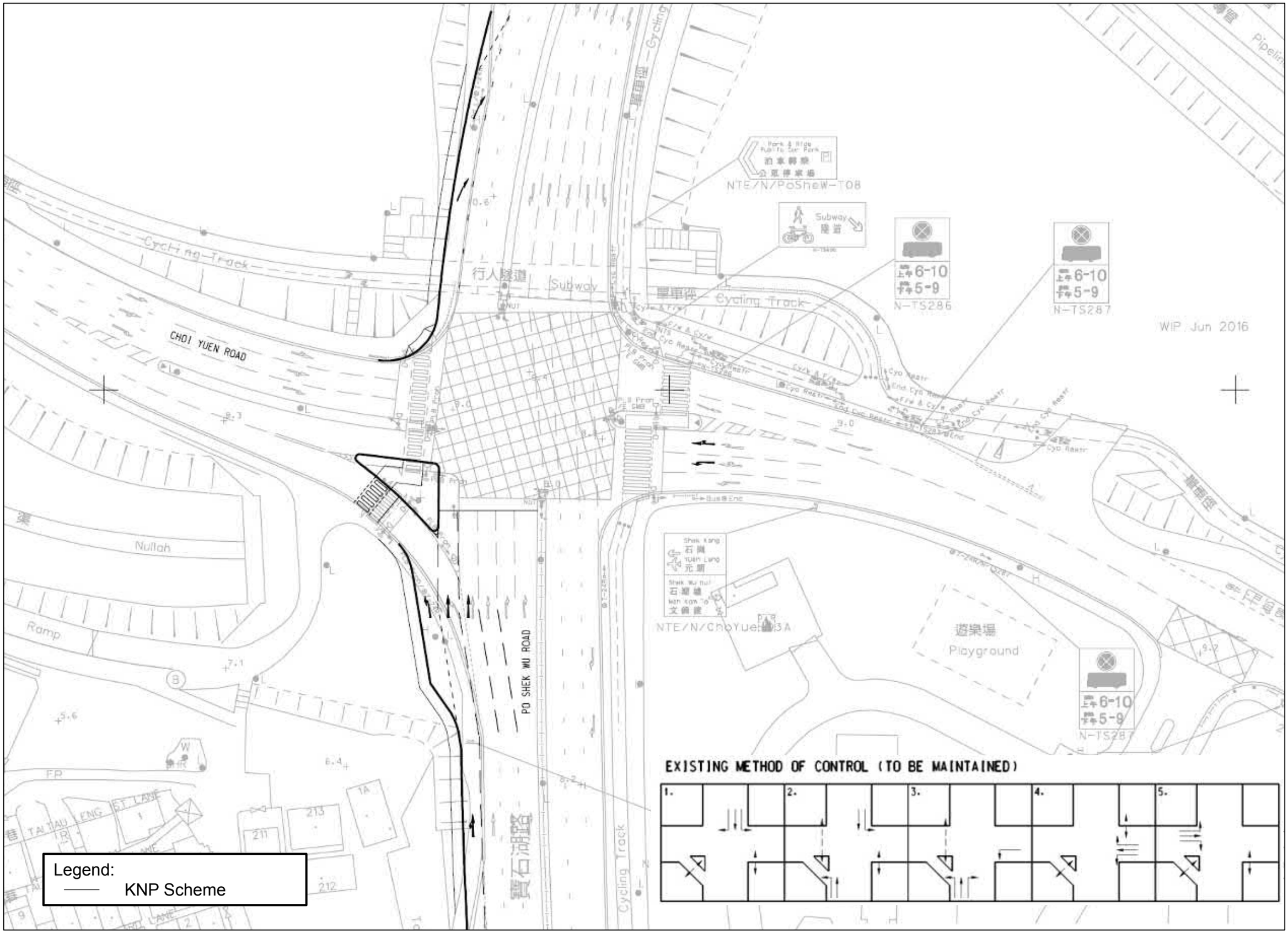
Drawing No. B1

J2 – Po Shek Wu Road / Po Wan Road (to be Completed by 2023)



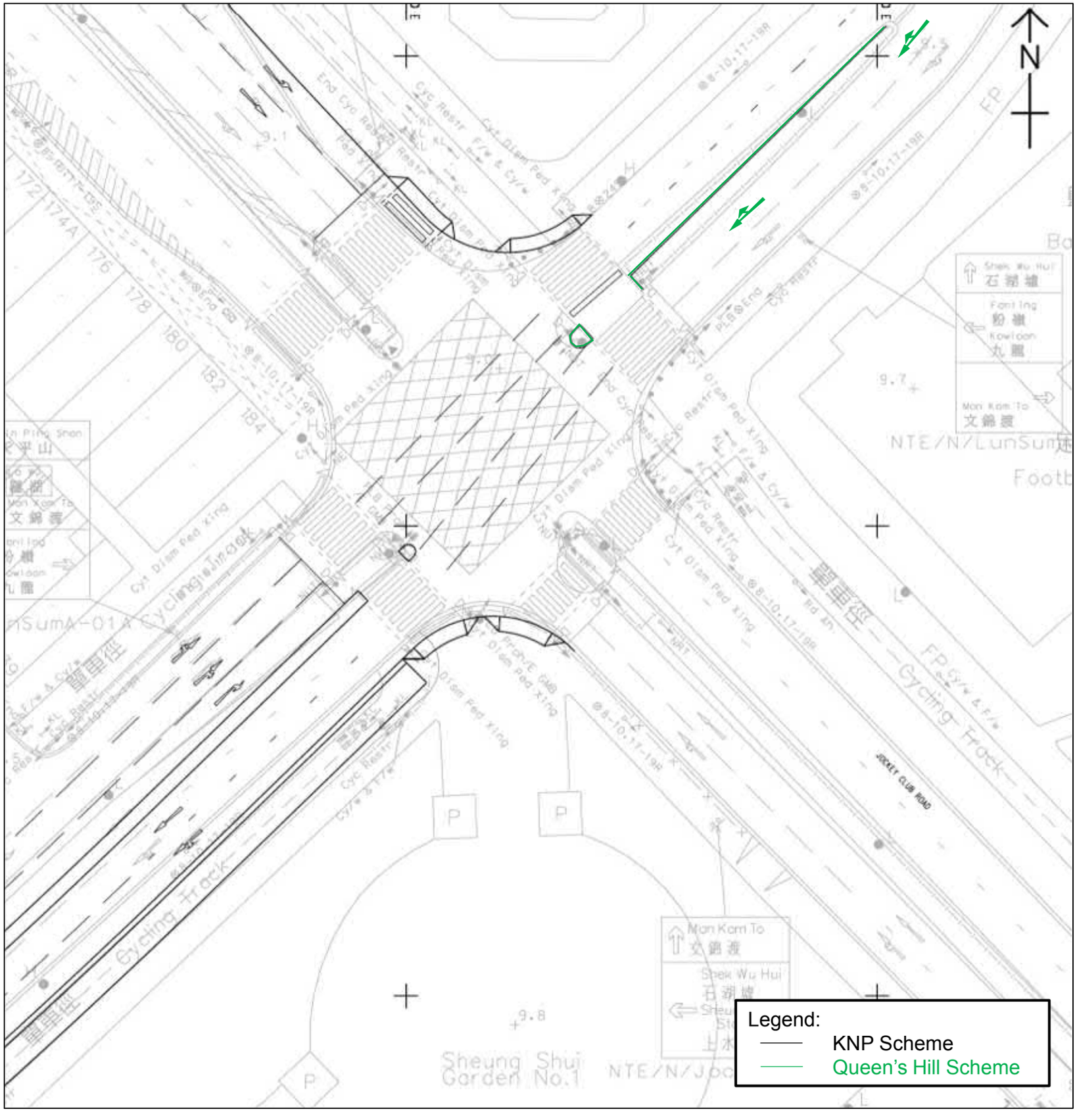
Drawing No. B2

J3 – Po Shek Wu Road / Choi Yuen Road (to be Completed by 2023)



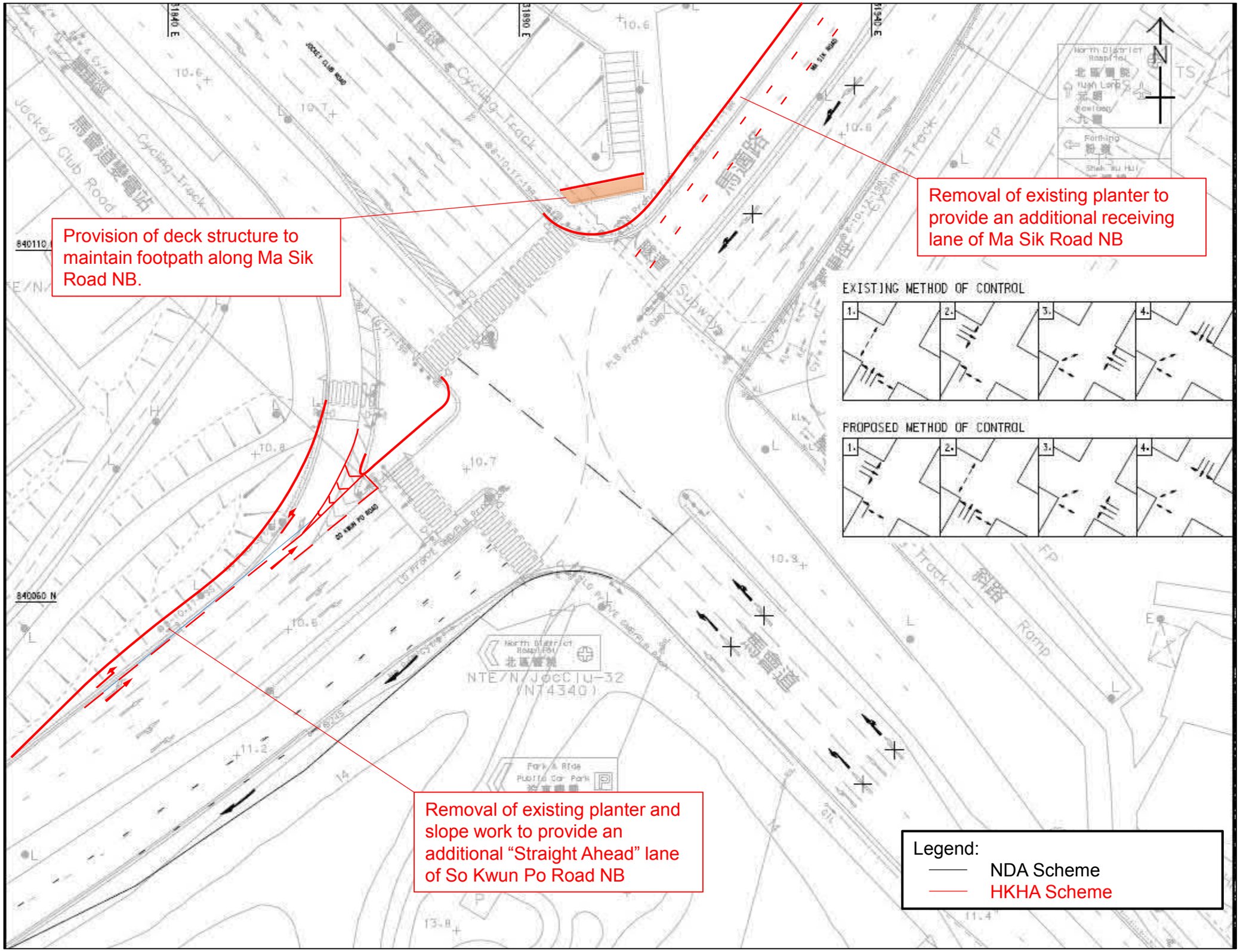
Drawing No. B3

J5 – Jockey Club Road / Lung Sum Avenue (to be Completed by 2023)



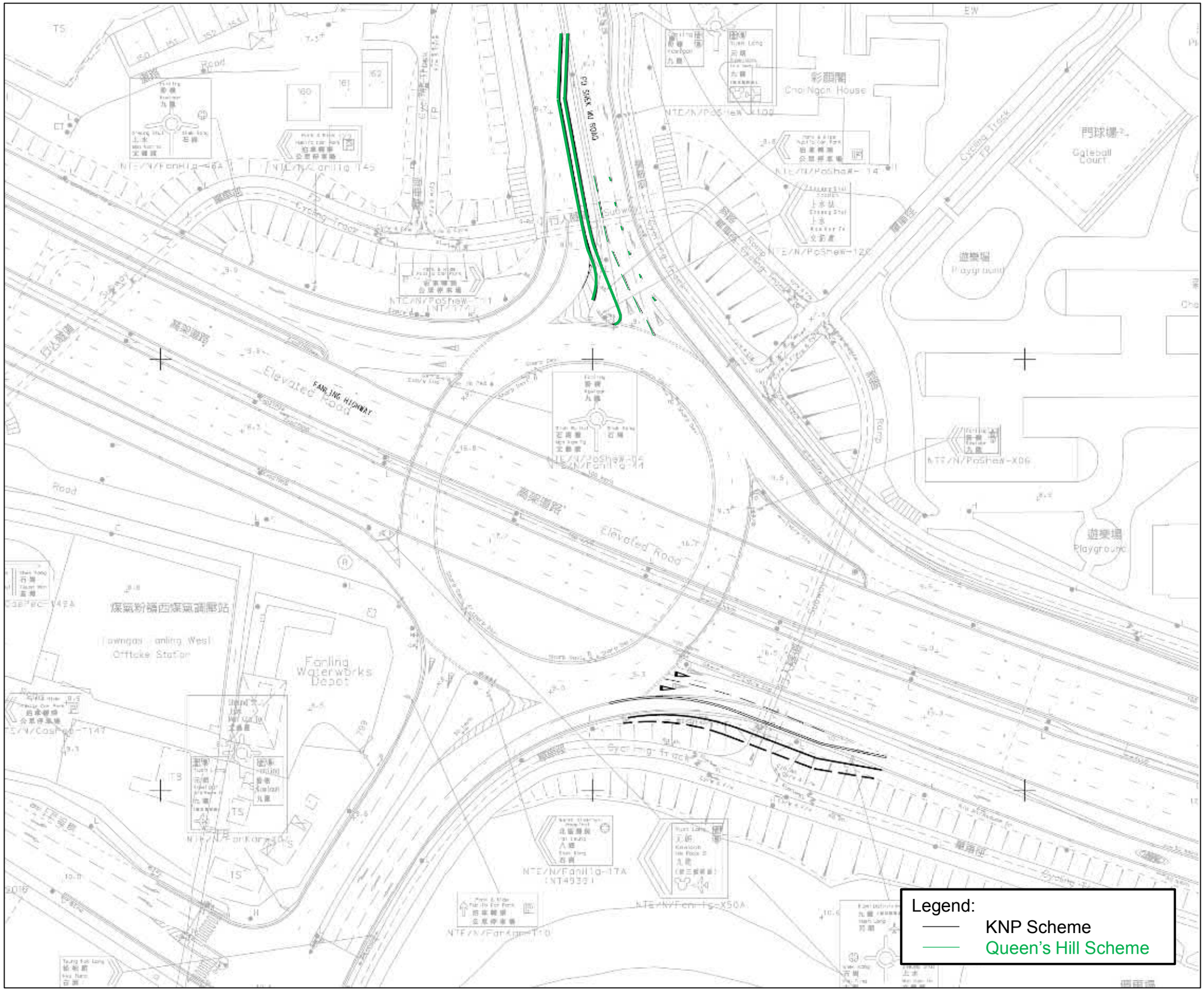
Drawing No. B4

J6 – Jockey Club Road / So Kwun Po Road (to be Completed by 2023)



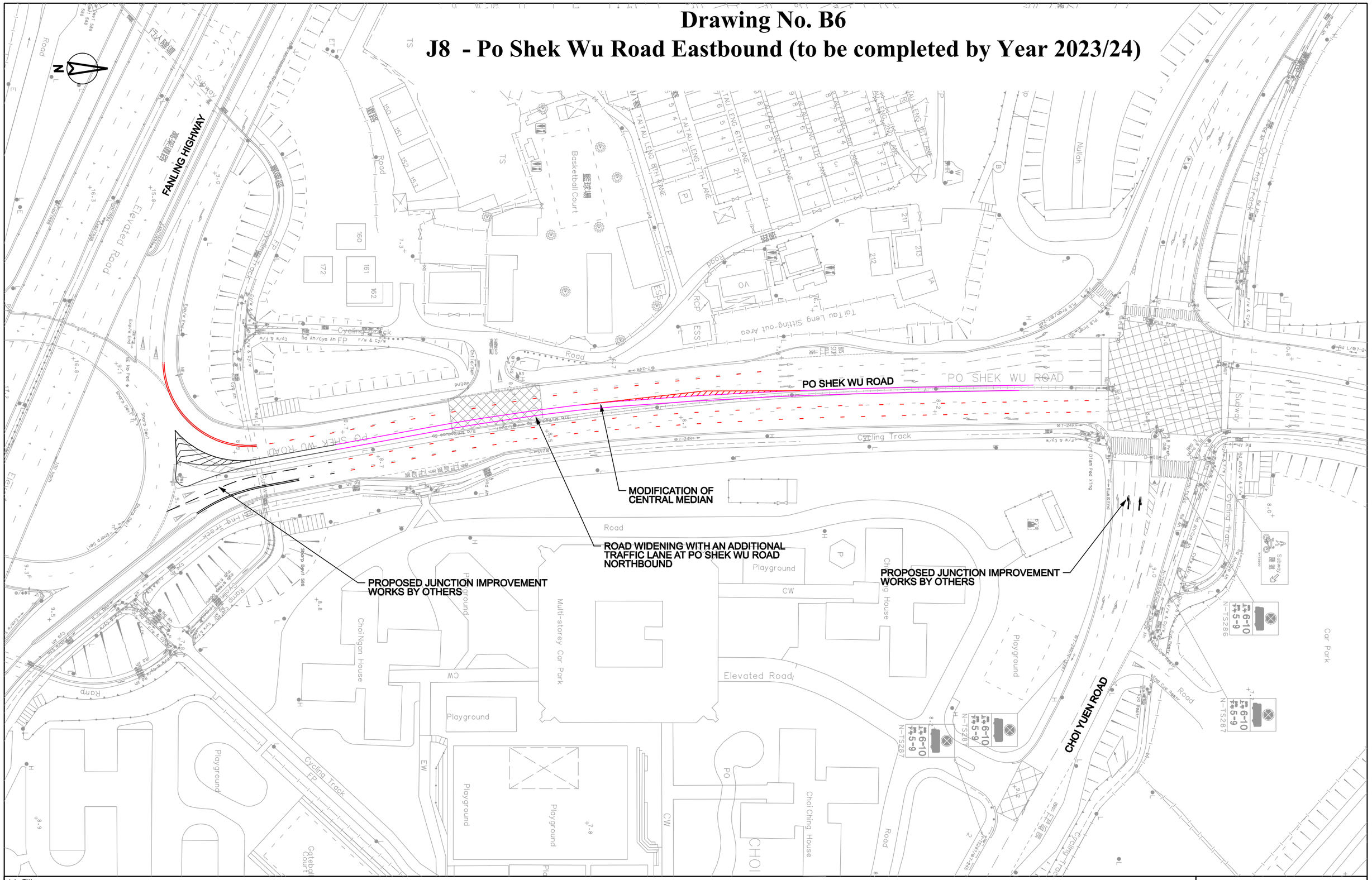
Drawing No. B5

J8 – Po Shek Wu Road Interchange (to be Completed by 2023)



Drawing No. B6

J8 - Po Shek Wu Road Eastbound (to be completed by Year 2023/24)



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Job Title

PROPOSED PUBLIC HOUSING SITES (SITE 1 & 2) IN SHEUNG SHUI AREAS 4 AND 30

Date	Scale	Drawing Title
01/2018	1 : 1000 @ A3	POSSIBLE TRAFFIC IMPROVEMENT SCHEME AT PO SHEK WU ROAD EASTBOUND
Drawn: WKKL	Job No.: 236072 - 09	

ARUP

PUBLIC HOUSING DEVELOPMENTS

AT SHEUNG SHUI AREAS 4 & 30 (SITES 1 & 2) & PO SHEK WU ROAD

VISUAL APPRAISAL

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1. Site Particulars and Proposed Developments
2. Viewpoints
3. Visual Appraisal
4. Conclusion

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Figure 2 Site 1 Schematic Site Section
Figure 3 Site 2 Layout Plan
Figure 4 Site 2 Schematic Site Section
Figure 5 PSW Layout Plan
Figure 6 PSW Schematic Site Section

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Plan 2 Photomontage of Viewpoint 1 (View from Sheung Shui MTR Station)
Plan 3 Photomontage of Viewpoint 2 (View from North District Sports Ground)
Plan 4 Photomontage of Viewpoint 3 (View from Sheung Shui Tung Hing Road Sitting-out area)
Plan 5 Photomontage of Viewpoint 4 (View from Footbridge at Choi Yuen Road)
Plan 6 Photomontage of Viewpoint 5 (View from Footbridge linking Tai Tau Leng and Hak Ka Wai)
Plan 7 Photomontage of Viewpoint 6 (View from Wu Tip Shan)

1. Site Particulars and Proposed Developments

1.1 Sheung Shui Areas 4 & 30 (Sites 1 & 2) and Po Shek Wu Road (PSW) (Subject Sites) are located at close proximity to Sheung Shui Town Center, New Territories, within 500m walking distance from Sheung Shui MTR Station. The Subject Sites comprise an area of about 1.44 ha, 1.13 ha and 1.38 ha for Site 1, Site 2 and PSW respectively. Site 1 is zoned "Industrial" ("I"); Site 2 is "I" and "Other Specified Use (Bus Depot)" ("OU (Bus Depot)") zones; PSW is zoned "Open Space" ("O") on the Approved Fanling / Sheung Shui OZP No. S/FSS/22.

1.2 The Subject Sites were earmarked for public housing developments in 2013. In order to maximize flat production and site efficiency under domestic Plot Ratio (PR) of 6 to address housing demand, a maximum building height (BH) of 130 mPD for the three sites with some stepping descending from the center near the railway station to the fringe (i.e. from east to west) can be taken as a reference for further assessments by HD and the associated design merits if any should also be highlighted in the assessments. The Subject Sites are tentatively scheduled to be rezoned to "Residential (A)" zones in 2019.

1.3 The Subject Sites are surrounded by Choi Yuen Road, San Wan Road and Po Shek Wu Road. Sites 1 & 2 are situated at the industrial area with industrial buildings located at the north and west. Village house developments are found further north and south to Sites 1 & 2. To the east of Sites 1 and 2 are Po Shek Wu Road and PSW site, Shek Wu Hui Jockey Club Playground is located at the immediate north of PSW. To the further east of the Subject Sites are medium- to high-rise developments at Sheung Shui Town Center. Choi Yuen Estate and a new PRH at Choi Yuen Road with domestic PR of 4.92, non-domestic PR of 1.81 and building height of 114mPD (approx.), which is now under construction, are located at the south of PSW.

1.4 Whilst major visual changes to the existing neighborhoods seem inevitable, the design of the proposed public housing developments has to take into account the following design requirements and site constraints: —

- The proposed schemes can maximize flat production and site efficiency under domestic PR 6 to address housing demand while maintaining some stepping descending from the center near the railway station to the fringe (i.e. from east to west).

- Further extension of development footprint is not feasible, as the three sites are all relatively small and subject to the following design considerations:

  - To adopt single aspect building design to screen off noise from road, railway and industrial buildings at its surrounding, while fulfilling Sustainable Building Design Guidelines (i.e. 15m building separation);
  - To set back buildings of around 20m due to Air Quality Requirement associated with Po Shek Wu Road and its road improvement works;
  - To have non-building area in view of drainage and waterworks reserve area in Site 2 and PSW; and
  - To achieve minimum 20% green coverage.

- In addition to the required facilities for the residents, the Sites have to accommodate different kinds of public facilities, including public transport interchange (PTI) with high floor ceiling, public car park, post office, community hall, social welfare facilities and district health center.

1.5 Major development parameters are shown in **Table 1** below, while indicative site layout plans and schematic site sections are shown in **Figures 1 to 6**.

Table 1: Major Development Parameters of the Proposed Public Housing Developments at Sites 1 & 2 and PSW

	Site 1	Site 2	PSW
Gross Site Area	1.44 ha (about)	1.13 ha (about)	1.38 ha (about)
Flat Production	2,040	1,480	1,850
Maximum No. of Storeys or BH in mPD (approx.)	34 to 39 domestic storeys and maximum building height of 130 mPD	33 to 39 domestic storeys and maximum building height of 130mPD	37 domestic storeys and maximum building height of 130mPD
Green Coverage	Minimum 20%		
Other uses/ public facilities	PTI, social welfare facilities, retail shops, kindergarten, community hall, district health center	Public car park, post office, retail shops	Retail shops, kindergarten

2. Viewpoints

2.1 This report provides an assessment on the likely visual effect that may be generated by the proposed developments. As agreed with the Urban Design and Landscape Section of Planning Department, the following six viewpoints (VPs) from different directions and distances were selected (**Plan 1** refers). These VPs represent the view of pedestrian nodes which are accessible by the public and/or from key public open spaces:

VP1: Sheung Shui MTR Station (**Plan 2** refers)
VP2: North District Sports Ground (**Plan 3** refers)
VP3: Sheung Shui Tung Hing Road Sitting-out Area (**Plan 4** refers)
VP4: Footbridge at Choi Yuen Road (**Plan 5** refers)
VP5: Footbridge linking Tai Tau Leng and Hak Ka Wai (**Plan 6** refers)
VP6: Wu Tip Shan (**Plan 7** refers)

3. Visual Appraisal

3.1 Six photomontages (**Plans 2 to 7**) were prepared to illustrate the visual effect of the proposed developments at the above VPs.

VP1: Sheung Shui MTR Station (**Plan 2** refers)

3.2 This VP is located at about 150m to the southeast of the proposed PSW development at the footbridge connecting from Choi Yuen Estate to Sheung Shui MTR station, representing the visual impact of the proposed developments to the south of the Subject Sites. The visual content consists of existing open car park and the PRH development of Choi Yuen Road in the front and other residential buildings in surrounding neighbourhood. As demonstrated by the photomontage, a direct sight to the proposed developments is envisaged.

3.3 The proposed developments will contrast with the surrounding neighborhoods particularly in terms of scale and heights, altering the visual character. Undeniably, its visual impact is **significant**. The proposed developments will reduce the visual openness of the area. However, the view will generally be dominated by the PRH development at Choi Yuen Road under construction in the foreground whereas the proposed developments situated in the background will be of similar scale and height.

3.4 To mitigate the visual impact while maximizing flat production, some stepping from

the center near the railway station to the fringe (i.e. from east to west) will be adopted (**Figure 2** refers). Additional considerations on building designs and treatments will also be given at the detailed design stage.

VP2: North District Sports Ground (**Plan 3** refers)

3.5 This VP is located at about 350m to the northeast of the proposed PSW development at North District Sports Ground, one of the largest sport centers in the neighborhoods, representing the visual impact of the proposed developments to the northeast of the Subject Sites. The view is taken at the edge of the Sports Ground near the parking lot, which consists of parking facilities and vegetation. The visual context is characterized by low-rise buildings with two high-rise buildings in the background.

3.6 The photomontage shows that the visual impact is **slight**. The potential development of Site 1 and PSW are partially blocked by residential buildings in the foreground, while Site 2 will be mostly screened off by the medium-rise stand-alone residential buildings, Kentwood Place and also San Fung Building. In brief, the potential development will not cause adverse visual impact to the users of the sports ground. The building height and massing of the proposed developments are not incompatible with the surrounding developments, and will not cause any significant adverse impact on the condition, quality and character of the assessment area.

VP3: Sheung Shui Tung Hing Road Sitting-out Area (**Plan 4** refers)

3.7 This VP is located at about 350m to the north of the proposed Site 2 development at the parking lot of Sheung Shui Wai Wai Loi Tsuen, representing the visual impact of the proposed developments to the north of the Subject Sites. The visual context of this view consists of some low-rise village housings at Po Sheung Tsuen and also vegetation in the sitting out area.

3.8 The photomontage shows that the visual impact is **slight** since the view is partially dominated by vegetation and the village houses. Parts of the proposed developments are mainly screened off by the village houses and vegetation. The proposed developments will block part of the sky view and reduce visual openness.

VP4: Footbridge at Choi Yuen Road (**Plan 5** refers)

3.9 This VP is located at about 150m to the west of the proposed Site 1 development at the footbridge across Shek Sheung River connecting to Choi Yuen Road, representing the visual impact of the proposed developments to the west of the Subject Sites. This is one of the closest views of the Subject Sites. The visual context consists of two

medium-rise industrial buildings on the left and some residential buildings (i.e. Choi Yuen Estate) on the right with vegetation and Shek Sheung River in the foreground.

3.10 With respect to the potential visual obstruction, the proposed developments will block the sky view and reduce the visual openness. Therefore, the visual impact is considered **moderate**. However, the scale of the proposed developments is similar to the existing residential developments and in keeping with the building height profile of the nearby Choi Yuen Estate blending with the character of the existing built-up area.

VP5: Footbridge linking Tai Tau Leng and Hak Ka Wai (**Plan 6** refers)

3.11 This VP is located at about 300m to the southwest of the proposed Site 1 development at the footbridge linking Tai Tau Leng and Hak Ka Wai, representing the visual impact of the proposed developments to southwest of the Subject Sites. The view context consists of some vegetation along the Fanling Highway and few residential buildings on the right. This VP captures an open view towards the proposed developments.

3.12 Although the proposed developments would slightly reduce the visual openness and creating **moderate** visual impact for Site 1 and **slight** visual impact for the Site 2 and PSW, the photomontage demonstrated that the lower part of the proposed developments would be screened off by the thick vegetation and the high-rise residential developments (i.e. Choi Yuen Estate and the public housing development under construction at Choi Yuen Road) in the foreground. The photomontage also demonstrated that the proposed developments would blend in well with the nearby high-rise residential developments and could be considered as an extension of the high-rise building clusters around Sheung Shui Town Centre.

3.13 To further mitigate the visual impact from this viewpoint, design measures such as provision of building separation of 15m at Site 1 are adopted to soften the massive building blocks as well as adding visual interest to the development.

VP6: Wu Tip Shan (**Plan 7** refers)

3.14 This VP is located at about 2.2km to the southeast of the proposed Site 1 development at the Wu Tip Shan Path, representing the visual impact of the proposed developments to the southeast of the Subject Sites. The path is one of the popular hiking trail and is easily been accessed by the public. The photomontage shows that the proposed developments are largely screened off by the surrounding residential buildings. The building height and massing of the proposed developments are compatible with the

surrounding buildings, and blends with the existing view, thus the proposed residential development will not create significant difference to the visual character. It can be concluded that the visual impact at Wu Tip Shan Path is considered **insignificant**.

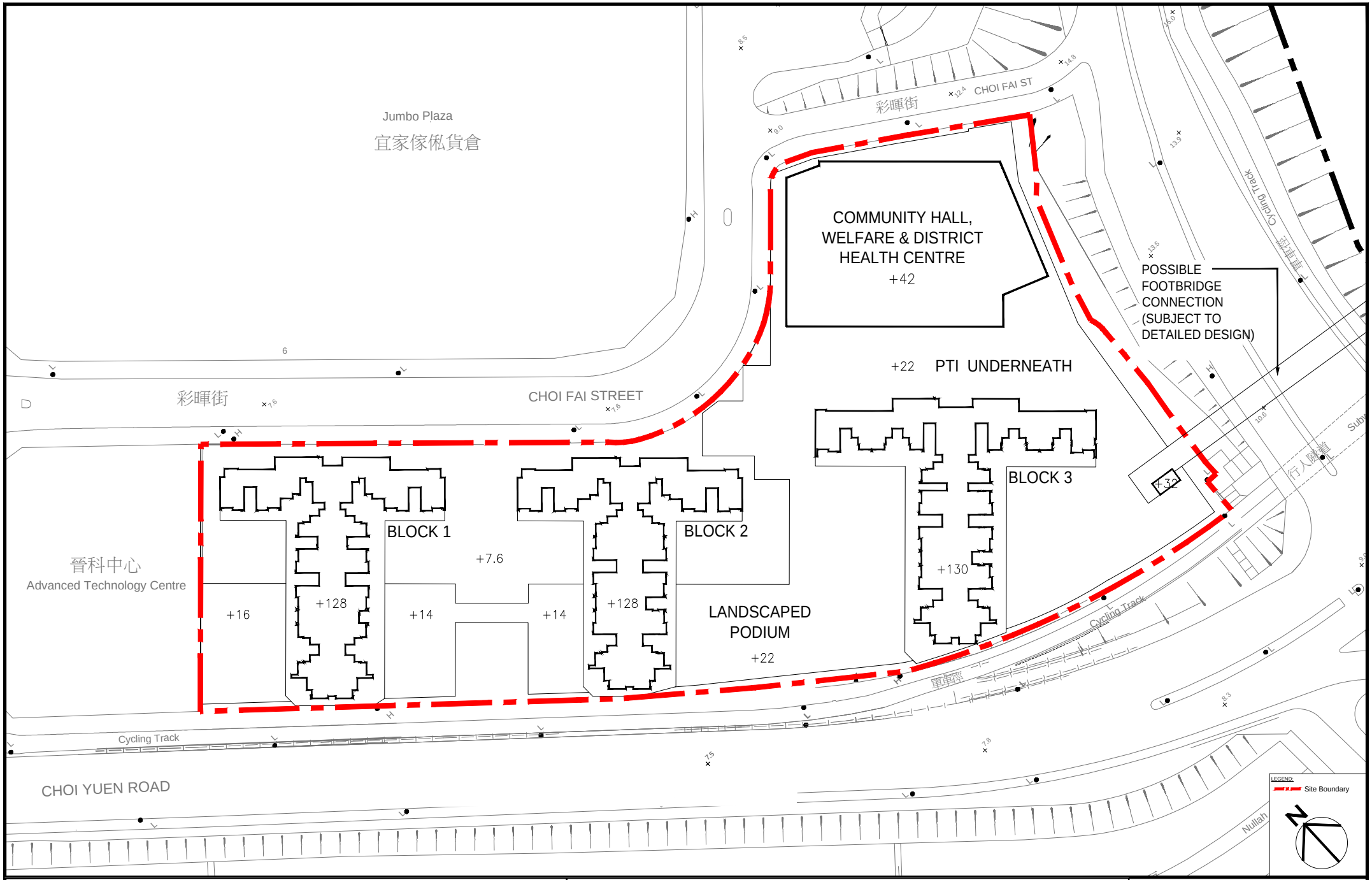
3.15 Even though the above appraisal demonstrated that the proposed developments would not be incompatible with the existing high-rise buildings surroundings, efforts have been made to mitigate the impact to a more acceptable level. Measures to reduce the building bulk will further be explored as far as practicable at the detailed design stage. The possible design measures to improve the schemes are summarized as below:

- The building height profile of the proposed developments with the building heights of not more than 130 mPD and some stepping descending from the center near the railway station to the fringe (i.e. from east to west) will act some visual interests to the surrounding.
- The building blocks will be positioned to facilitate the 15m building separation requirement for ventilation and visual considerations.
- The color scheme of the domestic blocks will be carefully worked out at the detailed design stage, together with appropriate façade design and treatments such as the provision of greening features and colored pattern etc. which will help to add visual interest to the developments.
- Podium structure will be designed with void facing the proposed shopping street to help break down the visual scale of the podium and improve permeability.
- Minimum 20% green coverage with half of the at-grade planting will be provided through providing landscape elements at various levels. Vertical greening and roof top greening will also be explored as far as practicable to enhance the aesthetic value of the proposed developments at the detailed design stage.

4. Conclusion

4.1 With further public housing developments including various required facilities extending to the northwest fringe from the Sheung Shui Town Center, there will undoubtedly be some changes to the general neighborhoods, and visual impact of the proposed developments will be inevitable. Efforts will be made to mitigate the impacts. After the visual appraisal at the six VPs, it can be concluded that the proposed public housing developments will not cause unacceptable visual impact to

the subject vicinity, with application of proper building design and screening measures. VPs with significant and moderate impacts (i.e. VP1, VP4 and VP5 respectively) will be attenuated by the design features including adoption of various building separation, some stepping, minimum 20% green coverage, green roof and other greening measures to be further explored at the detailed design stage.



PROJECT

SHEUNG SHUI AREAS 4 AND 30 SITE 1

DRAWING TITLE

SITE 1 LAYOUT PLAN

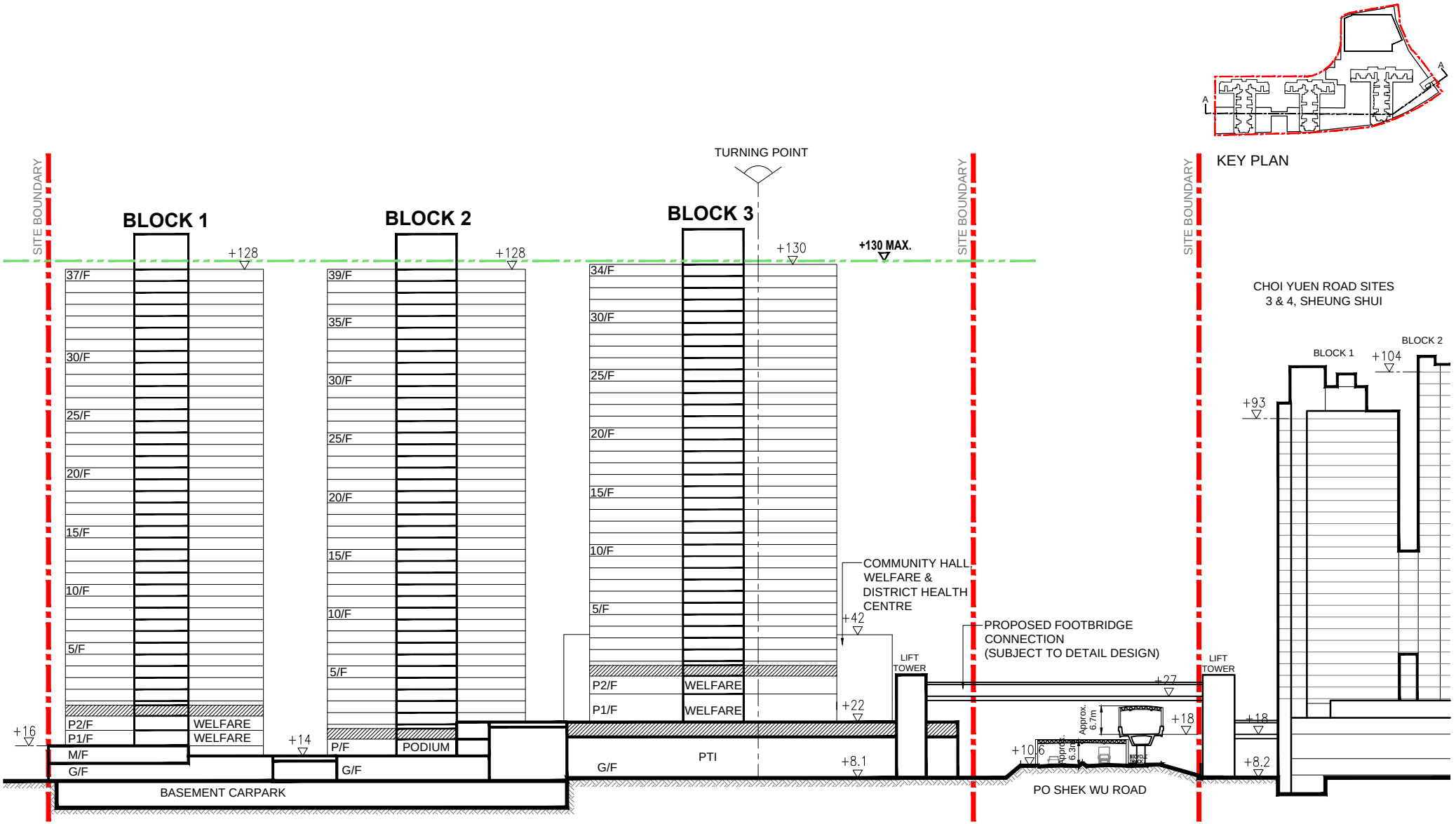
(FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

SCALE : 1:1000 (A4)

房屋署
HOUSING DEPARTMENT

DATE: 03. 01. 2019

FIGURE 1



SECTION A - A

PROJECT:

SHEUNG SHUI AREAS 4 AND 30 SITE 1

DRAWING TITLE:

SITE 1 SCHEMATIC SITE SECTION

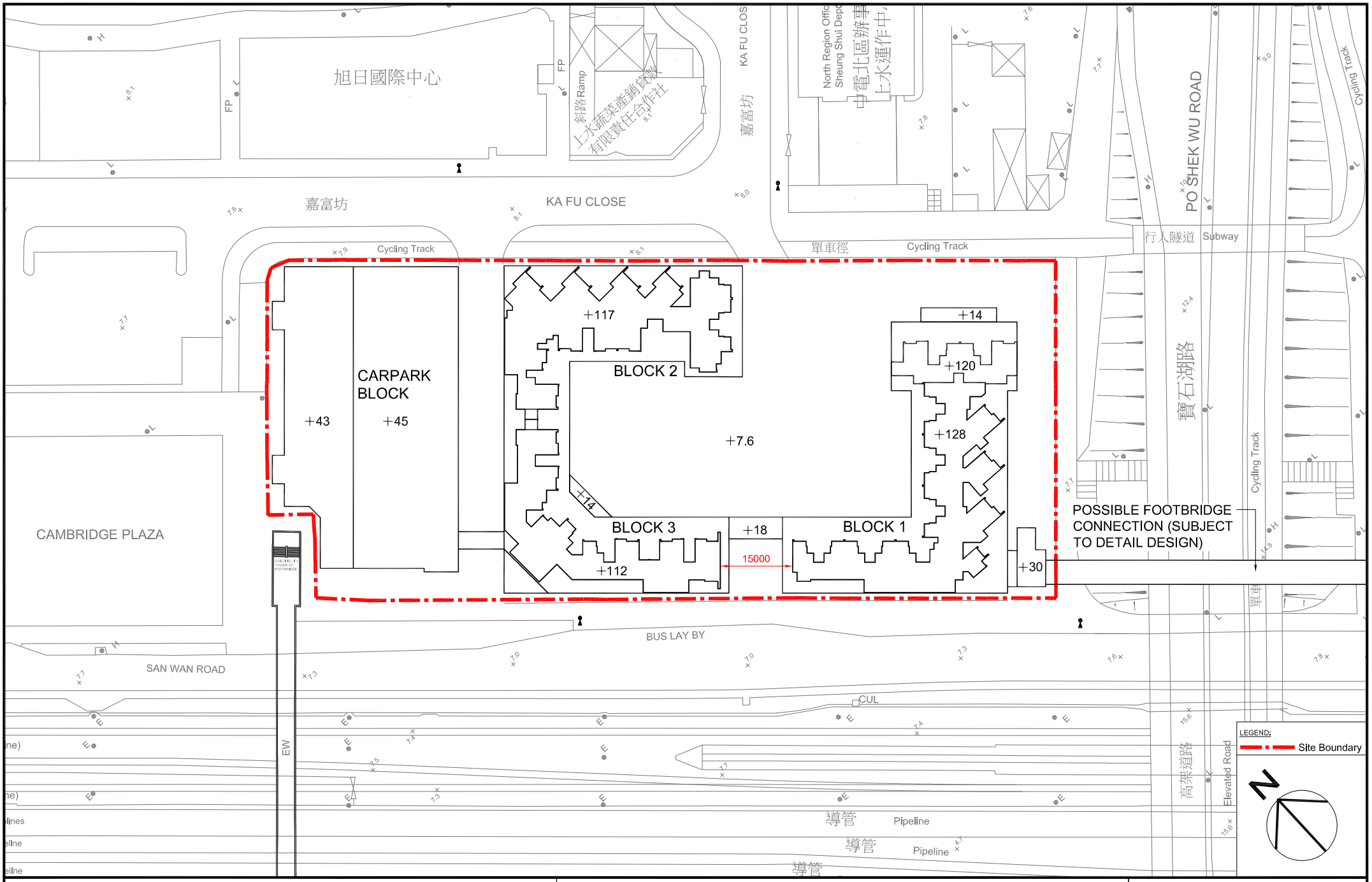
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房屋署
HOUSING DEPARTMENT

DATE: 03. 01. 2019

FIGURE 2



PROJECT

SHEUNG SHUI AREAS 4 AND 30 SITE 2

DRAWING TITLE

SITE 2 LAYOUT PLAN

(FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

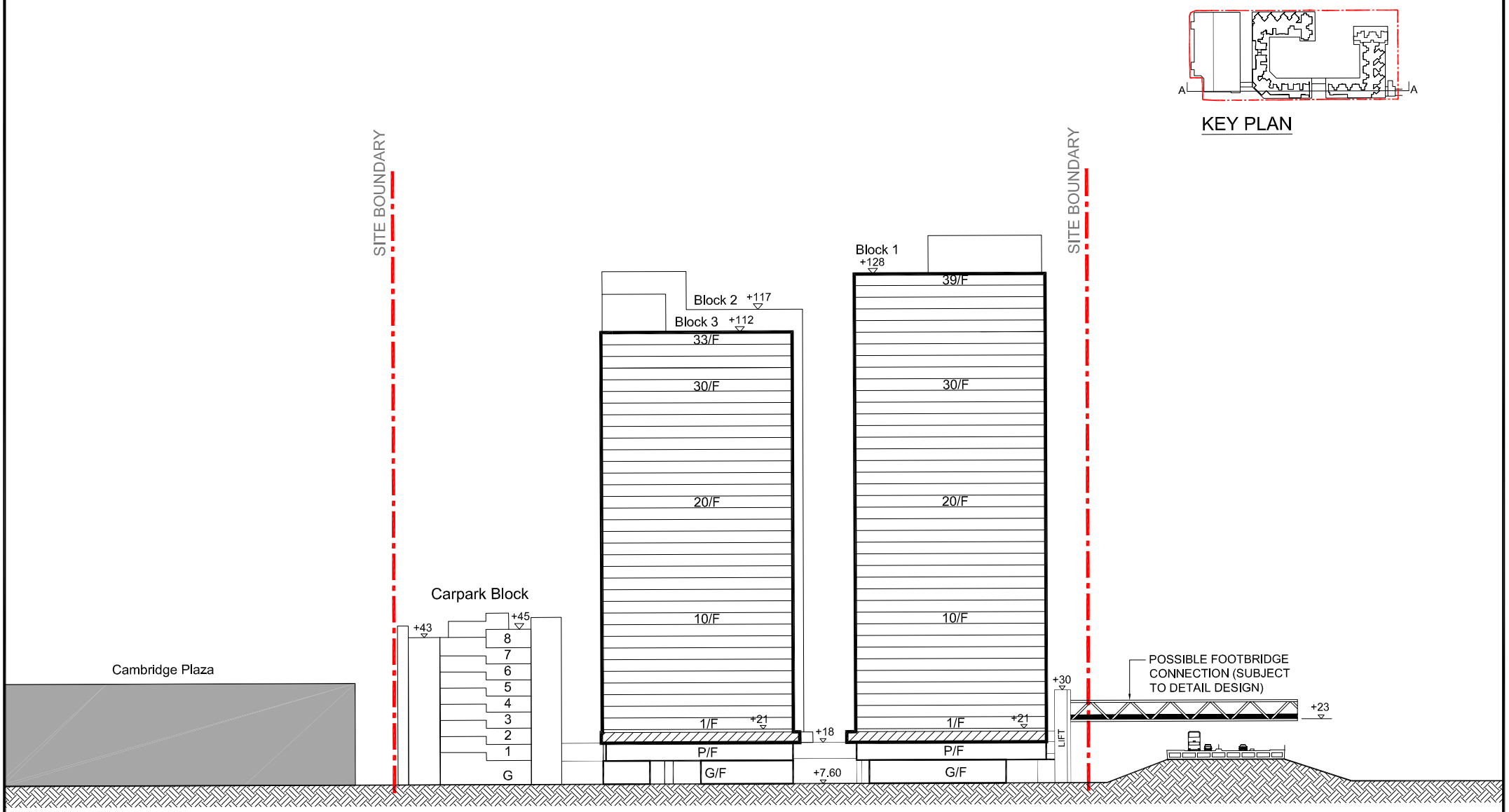
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房屋署
HOUSING DEPARTMENT

DATE: 04.01.2019

FIGURE 3

FIGURE 3



SECTION A-A

PROJECT

SHEUNG SHUI AREAS 4 AND 30 SITE 2

DRAWING TITLE

SITE 2 SCHEMATIC SITE SECTION A-A

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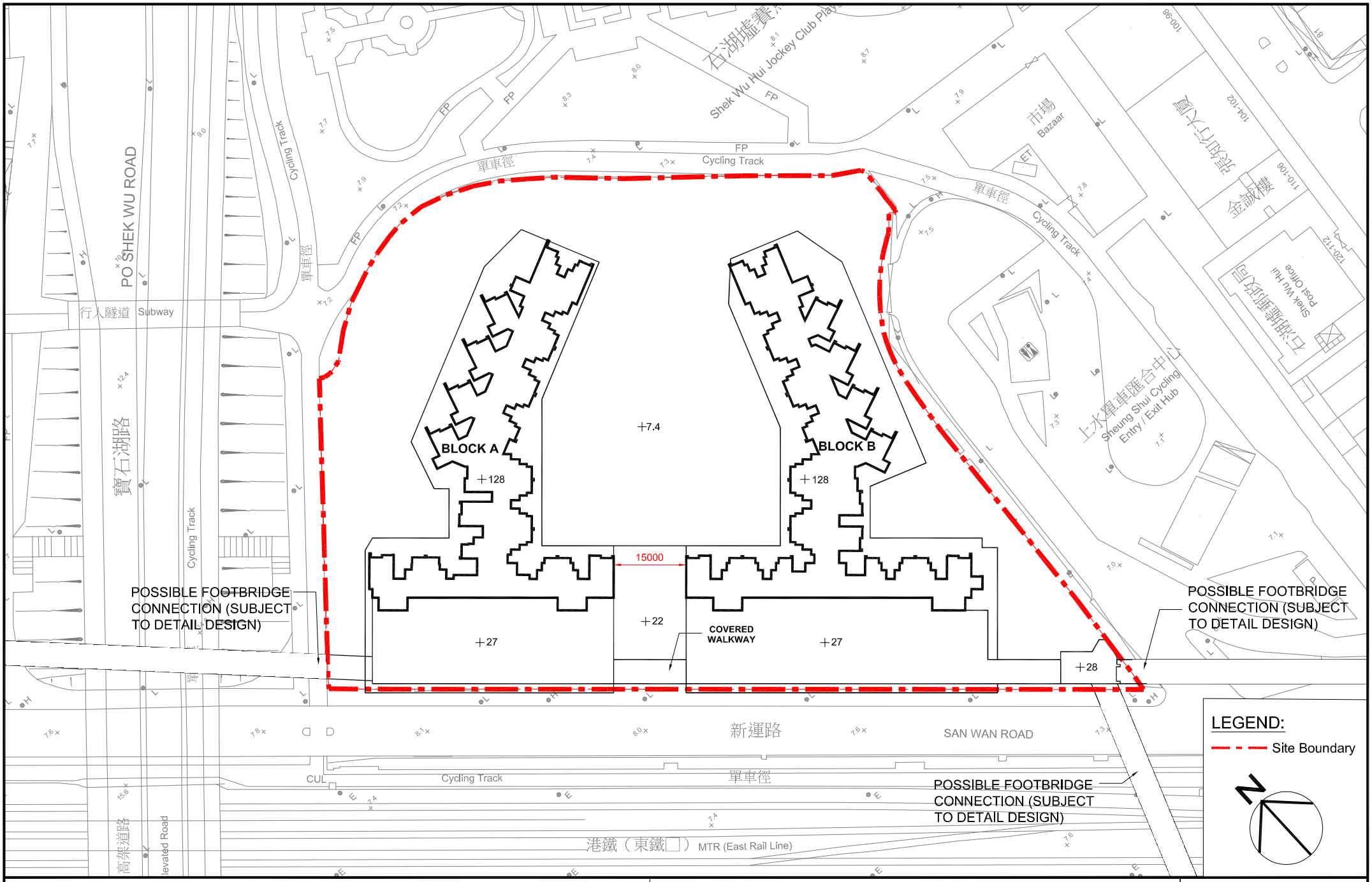
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房屋署
HOUSING DEPARTMENT

DATE: 04.01.2019

FIGURE 4

FIGURE 4



PROJECT:

PO SHEK WU ROAD, SHEUNG SHUI

DRAWING TITLE:

PSW LAYOUT PLAN

(FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

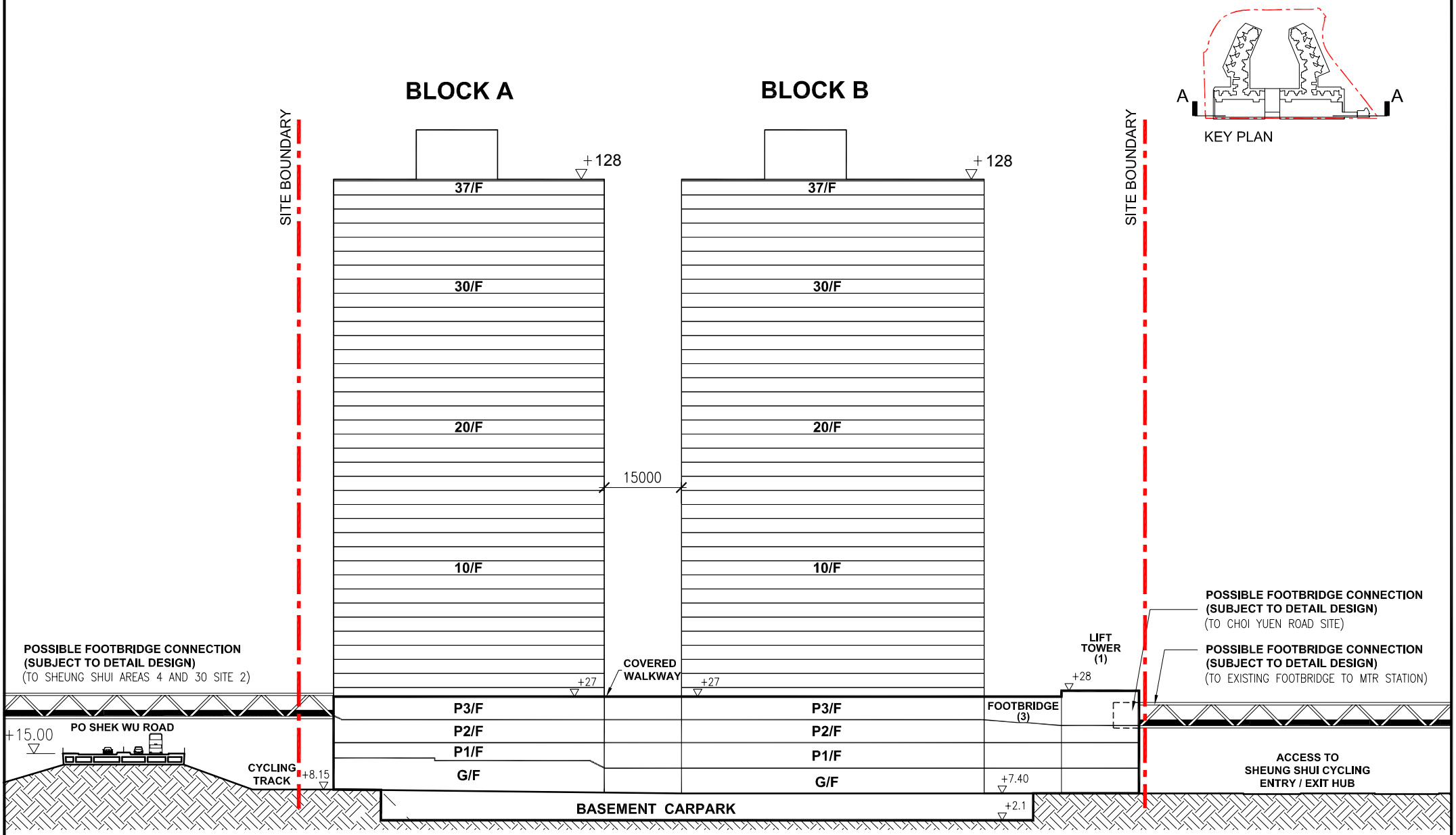
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房屋署
HOUSING DEPARTMENT

DATE: 04. 01. 2019

FIGURE 5

20190104_02



SECTION A - A

PROJECT:

PO SHEK WU ROAD, SHEUNG SHUI

DRAWING TITLE:

PSW SCHEMATIC SITE SECTION

(FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

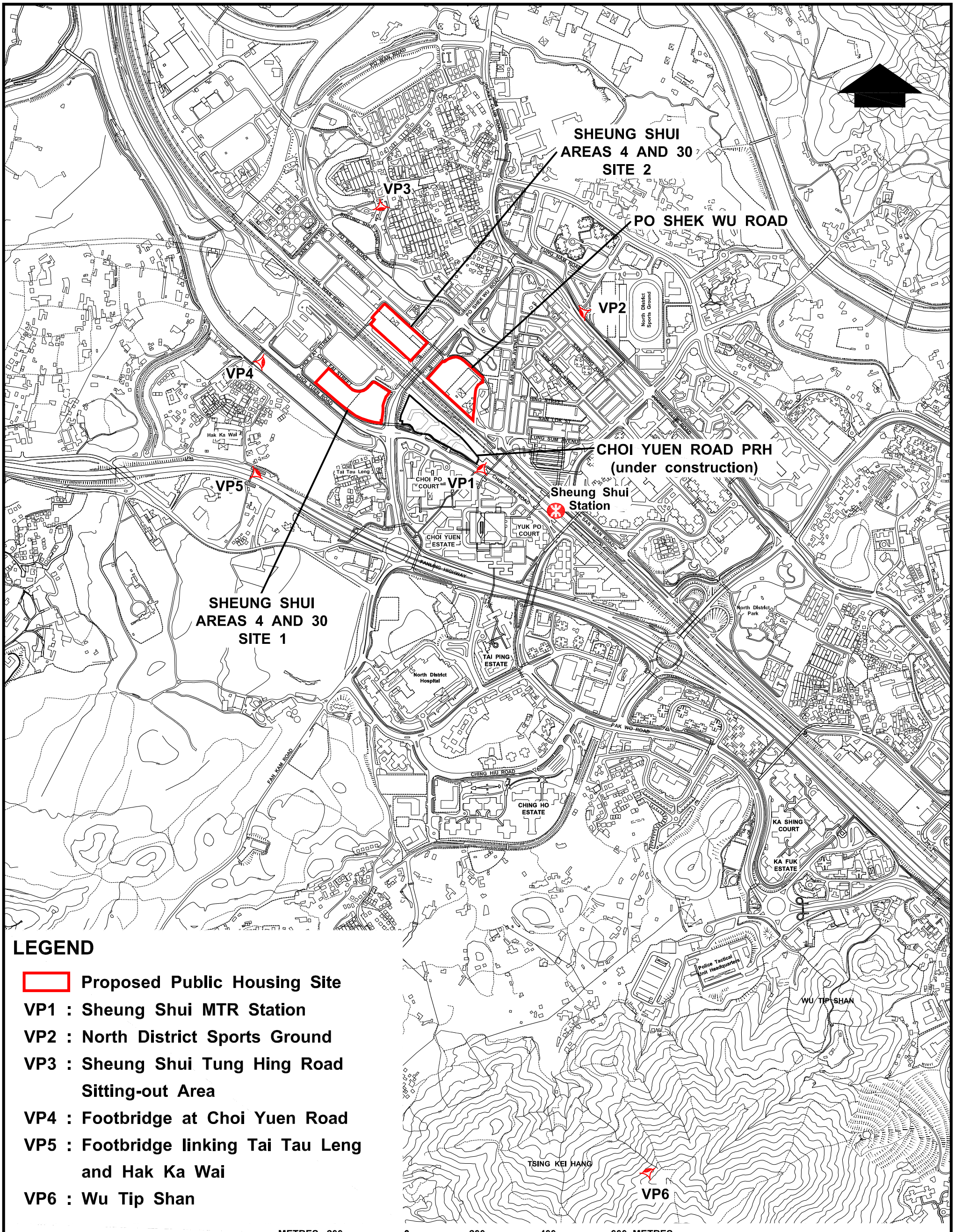
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房屋署 HOUSING DEPARTMENT

DATE: 04.01. 2019

FIGURE 6

20190104_01



VIEWPOINTS LOCATION PLAN FOR SHEUNG SHUI AREAS 4 AND 30 SITES 1 & 2 AND PO SHEK WU ROAD

HOUSING DEPARTMENT
PLANNING SECTIONS

PLAN 1

DATE :
7. 1. 2018

BASE EXTRACTED FROM SHT. Nos. 2-SE-B, 2-SE-D, 3-SW-A & 3-SW-C

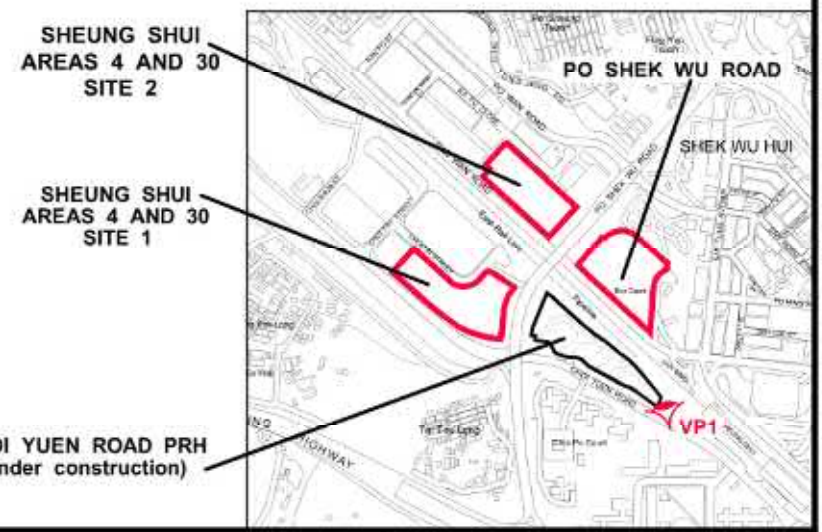
19_0016N_LocationPlan

Existing View



Photomontage





PHOTOMONTAGE AT VIEWPOINT 1 (VIEW FROM SHEUNG SHUI MTR STATION)

HOUSING DEPARTMENT
PLANNING SECTIONS

PLAN 2	DATE : 7. 1. 2019

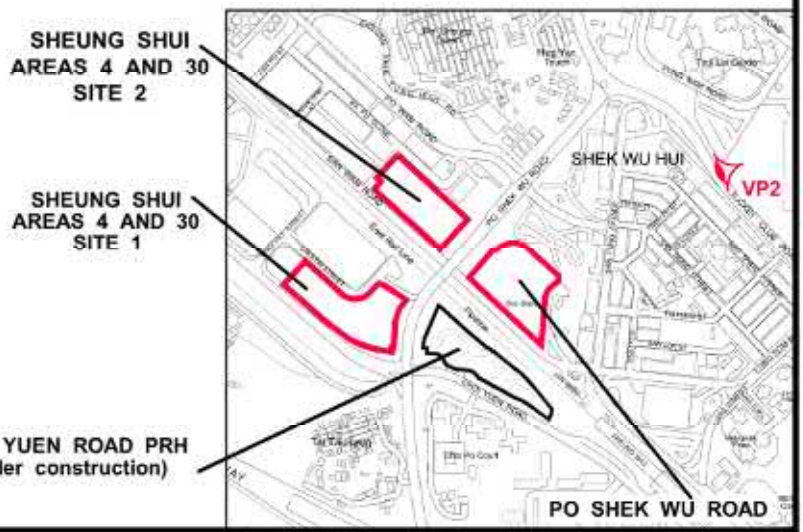
19_0016N_VP1

Existing View



Photomontage





PHOTOMONTAGE AT VIEWPOINT 2 (VIEW FROM NORTH DISTRICT SPORTS GROUND)

HOUSING DEPARTMENT
PLANNING SECTIONS

PLAN 3

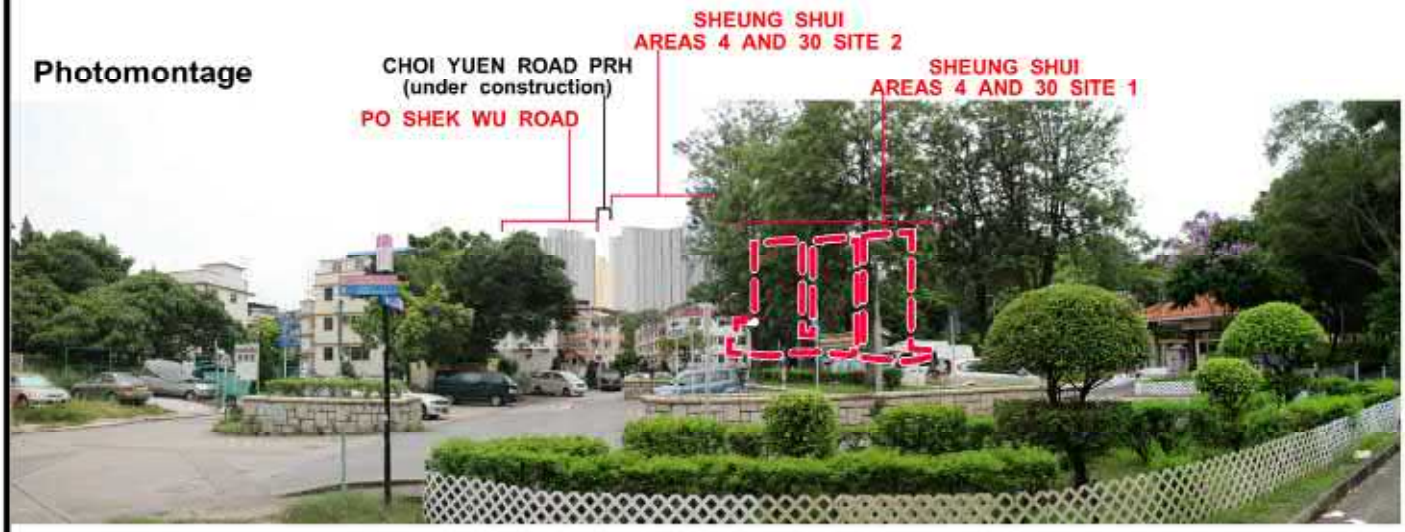
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7. 1. 2019

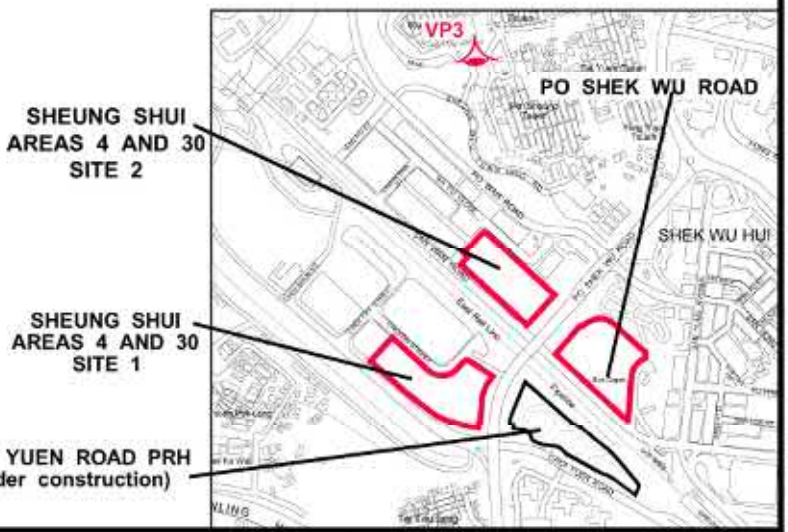
19_0016N_VP2

Existing View



Photomontage





PHOTOMONTAGE AT VIEWPOINT 3
(VIEW FROM SHEUNG SHUI TUNG HING ROAD SITTING-OUT AREA)

HOUSING DEPARTMENT
PLANNING SECTIONS

PLAN 4

DATE :
7 . 1. 2019

19_0016N_VP3

Existing View



Photomontage





PHOTOMONTAGE AT VIEWPOINT 4 (VIEW FROM FOOTBRIDGE AT CHOI YUEN ROAD)

HOUSING DEPARTMENT
PLANNING SECTIONS

PLAN 5

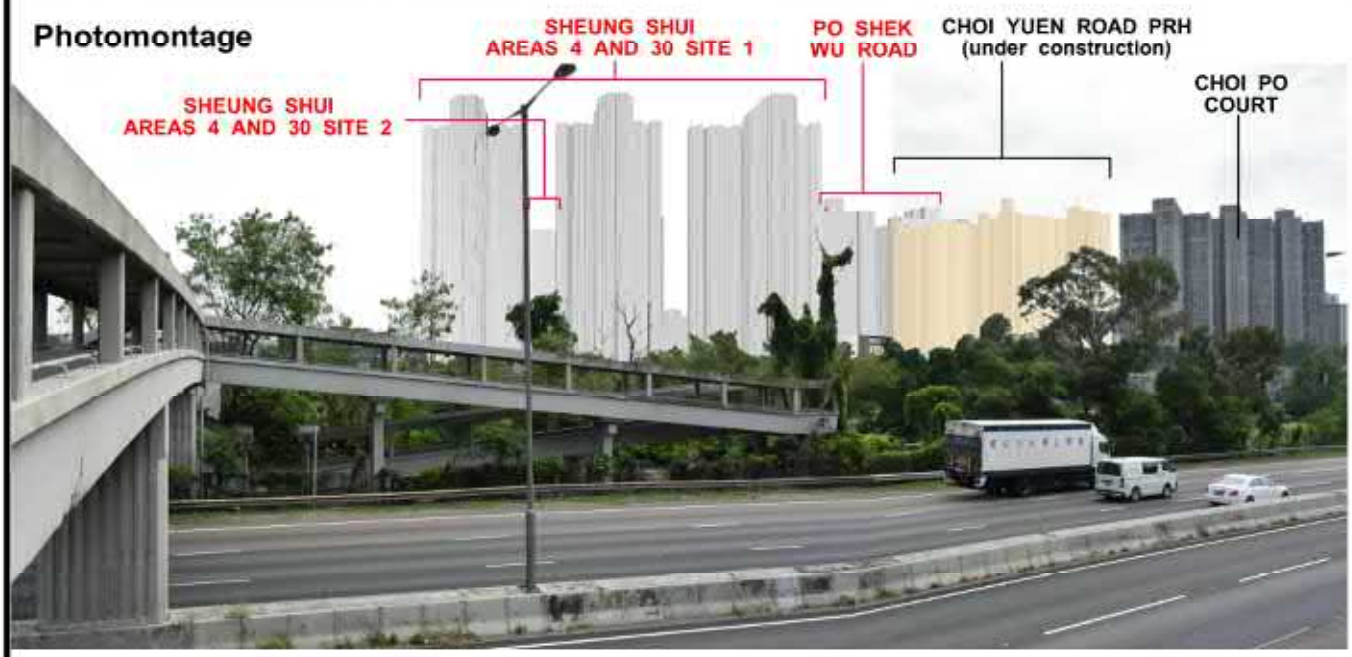
DATE : 7. 1. 2019

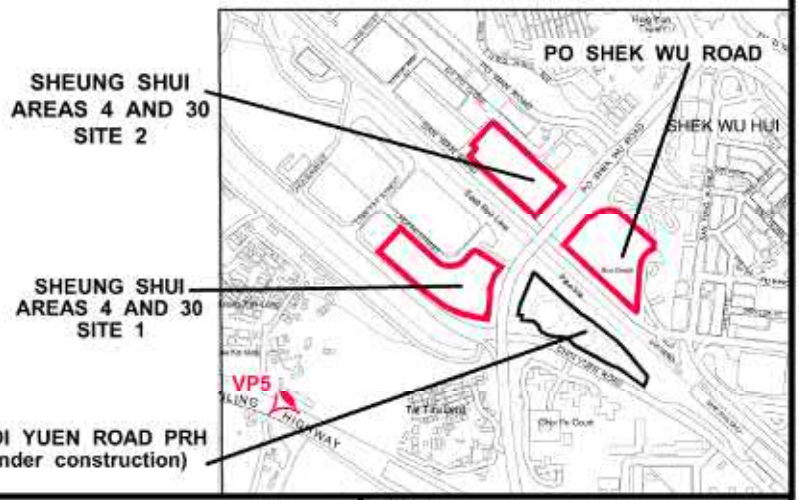
19_0016N_VP4

Existing View



Photomontage





PHOTOMONTAGE AT VIEWPOINT 5 (VIEW FROM FOOTBRIDGE LINKING TAI TAU LENG AND HAK KA WAI)

HOUSING DEPARTMENT
PLANNING SECTIONS

PLAN 6

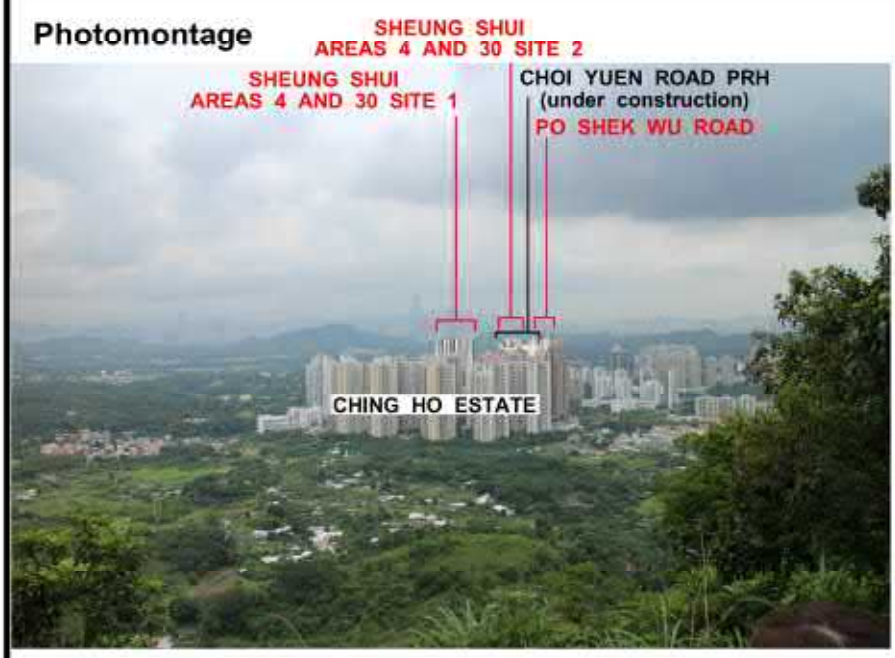
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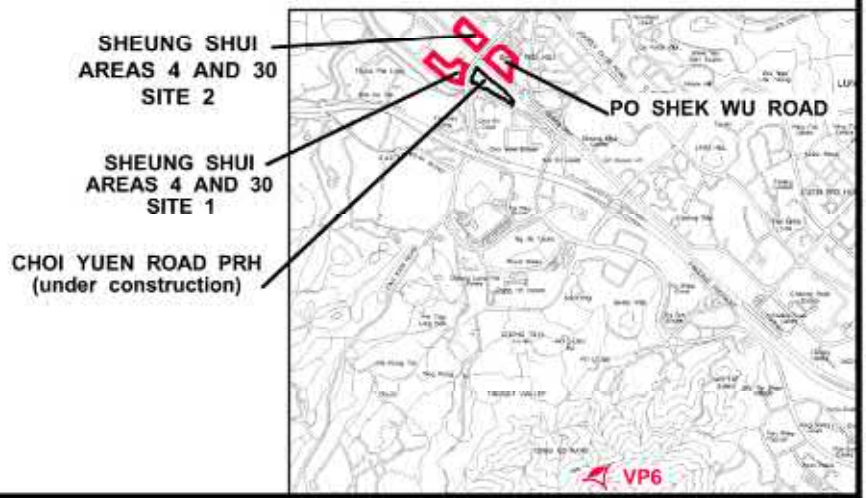
19_0016N_VP5

Existing View



Photomontage





PHOTOMONTAGE AT VIEWPOINT 6
(VIEW FROM WU TIP SHAN)

HOUSING DEPARTMENT
PLANNING SECTIONS

PLAN 7	DATE : 7. 1. 2019

19_0016N_VP6

Hong Kong Housing Authority

Air Ventilation Assessment of Proposed Developments at Sheung Shui Areas 4 & 30 Sites 1 & 2 and Po Shek Wu Road Site

Expert Evaluation Report

Issue 6 | 22 February 2019

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number

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Hong Kong
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ARUP

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1 Introduction

1.1 Project Background

Ove Arup & Partners Hong Kong Ltd (Arup) was commissioned by the Hong Kong Housing Authority (HKHA) to carry out an Air Ventilation Assessment (AVA) – Expert Evaluation for the proposed public housing developments at Sheung Shui Areas 4 & 30 Site 1 (hereafter "SS Site 1"), Sheung Shui Areas 4 & 30 Site 2 (hereafter "SS Site 2"), and the proposed public subsidised sale flat development at Po Shek Wu Road (hereafter "PSWR Site") in the North District.

1.2 Objective

The objective of this study is to evaluate the wind performance of SS Site 1, SS Site 2 and PSWR Site (hereafter "the Project Sites") using the methodology of Air Ventilation Assessment, based on the "*Housing Planning and Lands Bureau – Technical Circular No. 1/06, Environment, Transport and Works Bureau – Technical Circular No. 1/06*" issued on 19th July 2006 (the Technical Circular) and "*Technical Guide for Air Ventilation Assessment for Development in Hong Kong – Annex A*" (the Technical Guide). This report presents the findings for the study of Stage 1 – Expert Evaluation.

1.3 Study Tasks

The major task of this study is to carry out an expert evaluation on the characteristics of the site wind availability data of the Project Sites and assessment of the wind performance under existing development situation and the proposed building design option in a qualitative way. Through the study at this stage, the following tasks may be achieved.

The purposes of this report are:

- To identify the site wind condition;
- To assess the likely ventilation impact of the proposed developments to the surrounding developments at pedestrian level;
- To identify good design features;
- To identify obvious problem areas;
- To propose potential measures to improve the local air ventilation performances at the identified critical places; and
- To define methodologies of the Initial Study.

2 Site Characteristics

The Project Sites are along Po Shek Wu Road which is located in Sheung Shui Areas 4 & 30 in the North District and situated at a flat topology. As discussed in Section 1, the Project Sites includes SS Site 1, SS Site 2 and PSWR Site, as shown in Figure 1. Their individual site areas are approximately 1.44, 1.13 and 1.38 hectares, respectively.

The Project Sites are surrounded by a mixture of land uses, with the medium-rise building clusters to its northeast, high-rise residential developments including the Po Shek Wu Estate to its southeast, villages and farmlands to its south to southwest and medium-rise industrial clusters in its northwest vicinity. The topography of Sheung Shui area is shown in Figure 1. In addition, existing noise barriers of around 5.8m and 5m height are located at the immediate south of PSWR Site. Future noise barrier will be proposed at the southern part of Po Shek Wu Road in order to mitigate the noise impact to the future residents. Detailed indication of noise barriers is shown in Figure 2.



Figure 1 Topography of Sheung Shui Area (Source: Google Map)

Sheung Shui Areas 4 & 30 Site 1 (SS Site 1)

The existing SS Site 1 is functioned as open carpark. The site is situated at the junction of Po Shek Wu Road (Orange Dotted Line) and Choi Yuen Road (Pink line). It is surrounded by the industrial clusters such as Jumbo Plaza to the north, the village plot Tai Tau Leng to the south, the residential developments Po Shek Wu Estate to the east and the other village plot Hak Ka Wai and Tsung Pak Long to the west.

Sheung Shui Areas 4 & 30 Site 2 (SS Site 2)

The existing SS Site 2 is functioned as open carpark. The site is surrounded by the industrial clusters to the westerly quadrant and located at the junction of Po Shek Wu Road (Orange Dotted Line) and San Wan Road (Green Dotted Line). It is situated at the northeast of SS Site 1 and the northwest of PSWR Site. Low rise Sheung Shui Wai is located north of the Project Sites.

Po Shek Wu Road Site (PSWR Site)

The existing PSWR Site is functioned as bus depot. The site is located at the junction of Po Shek Wu Road (Orange Dotted Line) to the northwest and San Wan Road (Green Dotted Line) to the southwest. At the immediate surroundings are general open spaces, including the Shek Wu Hui Jockey Club Playground to the northeast and Sheung Shui Cycling Entry/Exit Hub to the southeast. At the further southeast region, there are generally medium-rise development clusters such as Cheung Chi Hang Building with high-rise developments nearby such as Landmark North. Also, it is surrounded by the Po Shek Wu Estate to the southwest and SS Site 2 to the northwest.

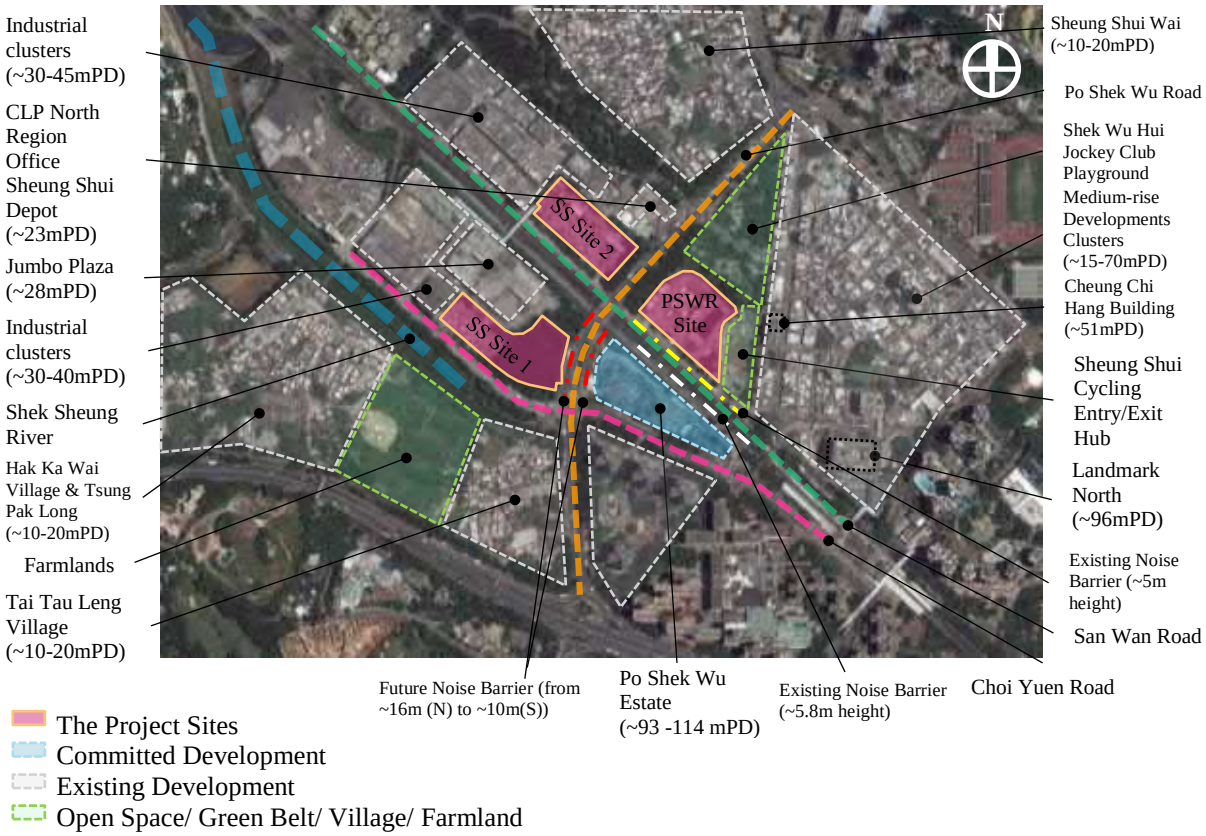


Figure 2 Surroundings of the Project Sites (Source: Google Map)

3 Site Wind Availability

To investigate the wind performance of the Project Sites, the characteristic of the natural wind availability of the site is essential. Site wind availability data presented in the wind rose could be used to assess the wind characteristics in terms of the magnitude and frequency of the approaching wind from different wind directions. There are two sources of site wind data for the Project Sites, including the simulated meso-scale numerical model Regional Atmospheric Modeling System (RAMS)[1] from the Planning Department (PlanD) and the nearby Hong Kong Observatory (HKO) Station – Ta Kwu Ling Weather Station.

3.1 RAMS Wind Data

As stipulated in the Technical Guide, the site wind availability would be presented by using appropriate mathematical models. Planning Department (PlanD) has set up a set of wind availability data of the Territory for AVA study, which was simulated using the RAMS and could be downloaded at Planning Department Website[2].

The location of the Project Sites is as indicated in Figure 3. In order to capture the topography effect to the prevailing winds, the wind availability data at 200mPD is selected at the grid of (x: 069, y: 083), (x: 070, y: 083) and (x: 070, y: 084) for this Expert Evaluation. The annual and summer wind roses for three selected grids are shown in Figure 4, Figure 5 and Figure 6 respectively.

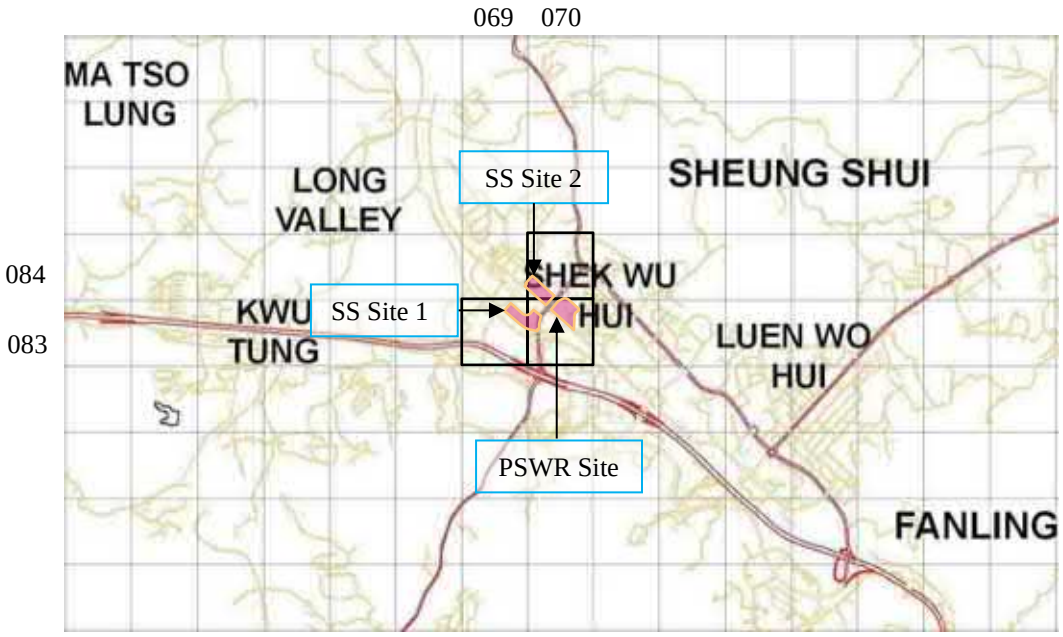


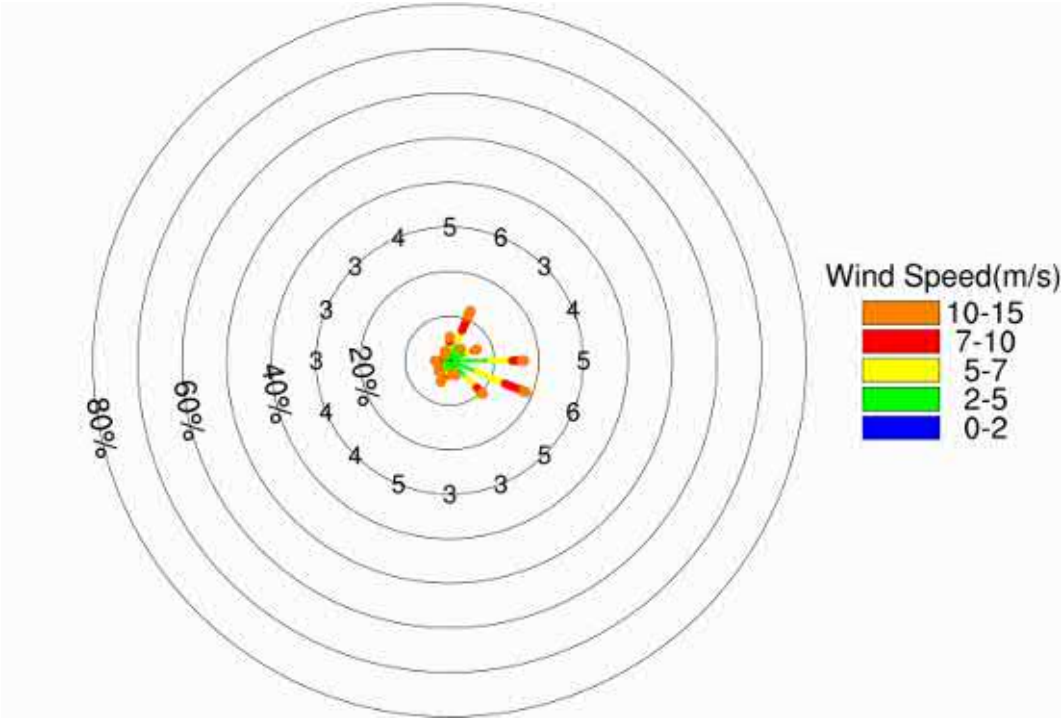
Figure 3 RAMS Grid and Location of the Project Sites

[1] http://www.pland.gov.hk/pland_en/p_study/comp_s/InceptionReport_webpage_11-12/final_report.pdf

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

3.1.1 Grid of (x: 069, y: 083)

Annual (200mPD)



Summer (200mPD)

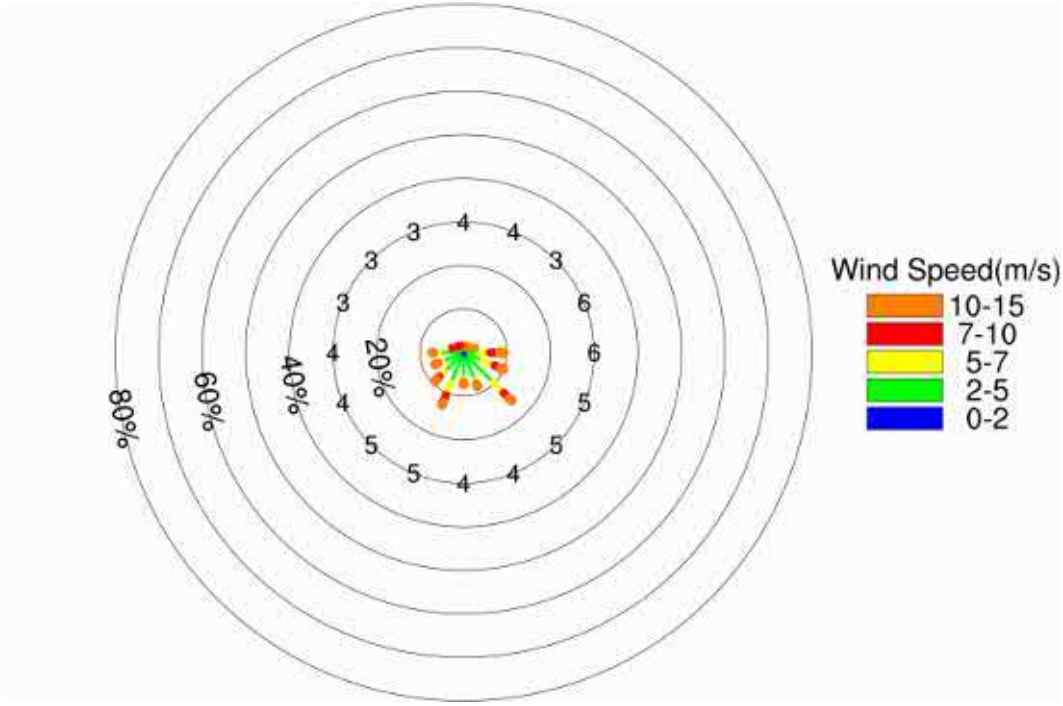
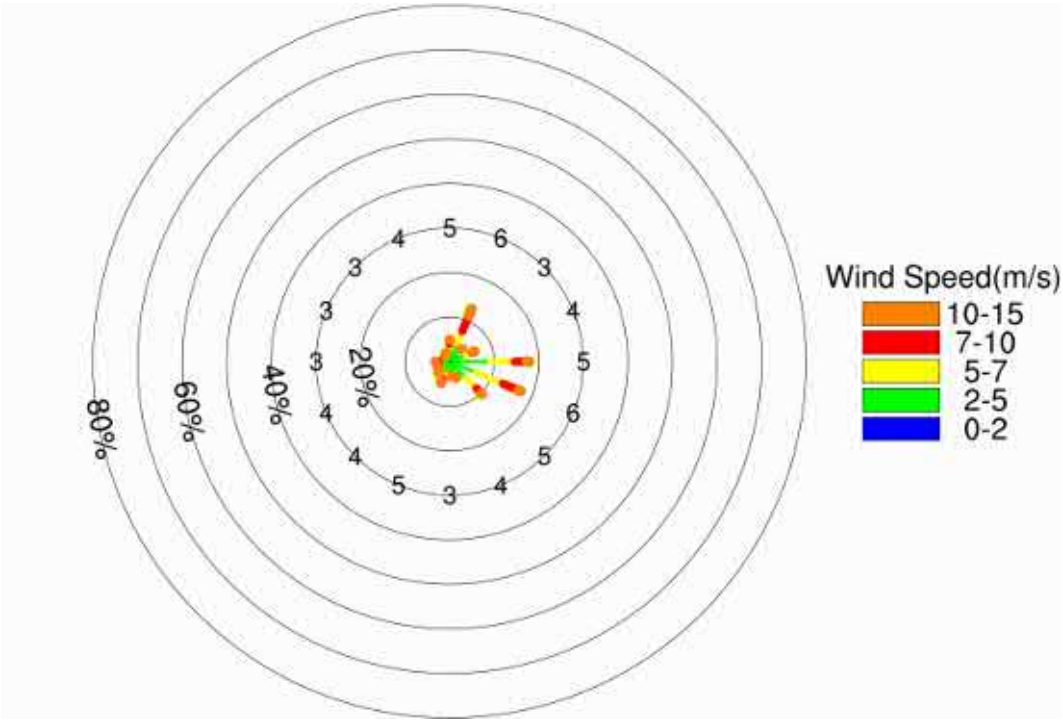


Figure 4 Wind Rose for Grid of (x: 069, y: 083) by RAMS Wind Data

3.1.2 Grid of (x: 070, y: 083)

Annual (200mPD)



Summer (200mPD)

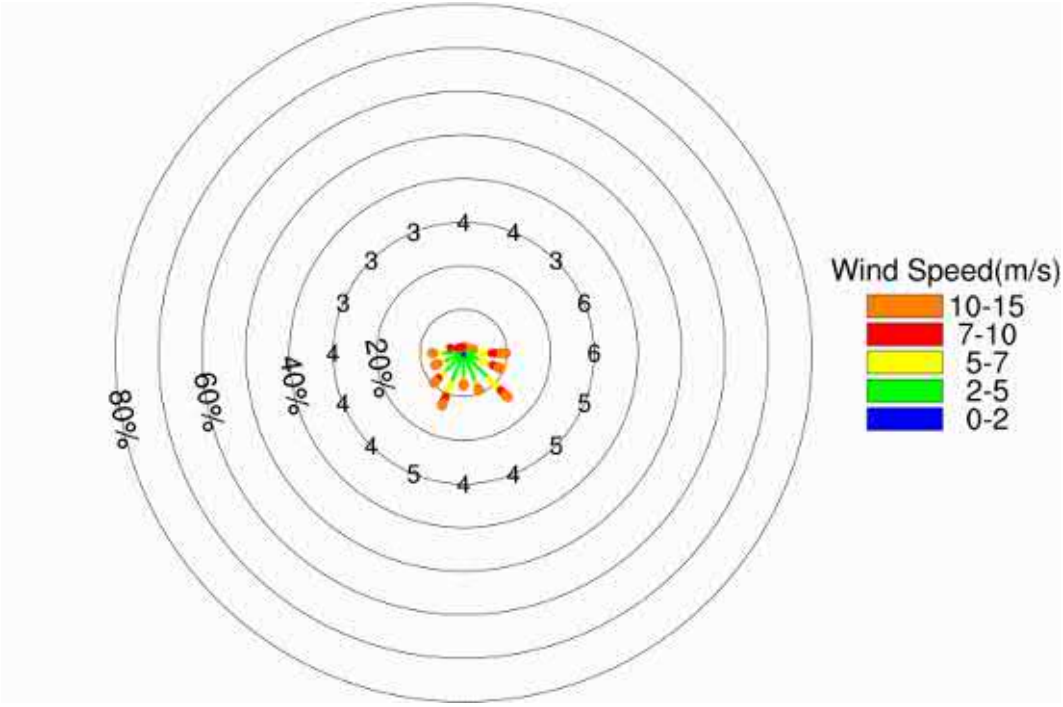
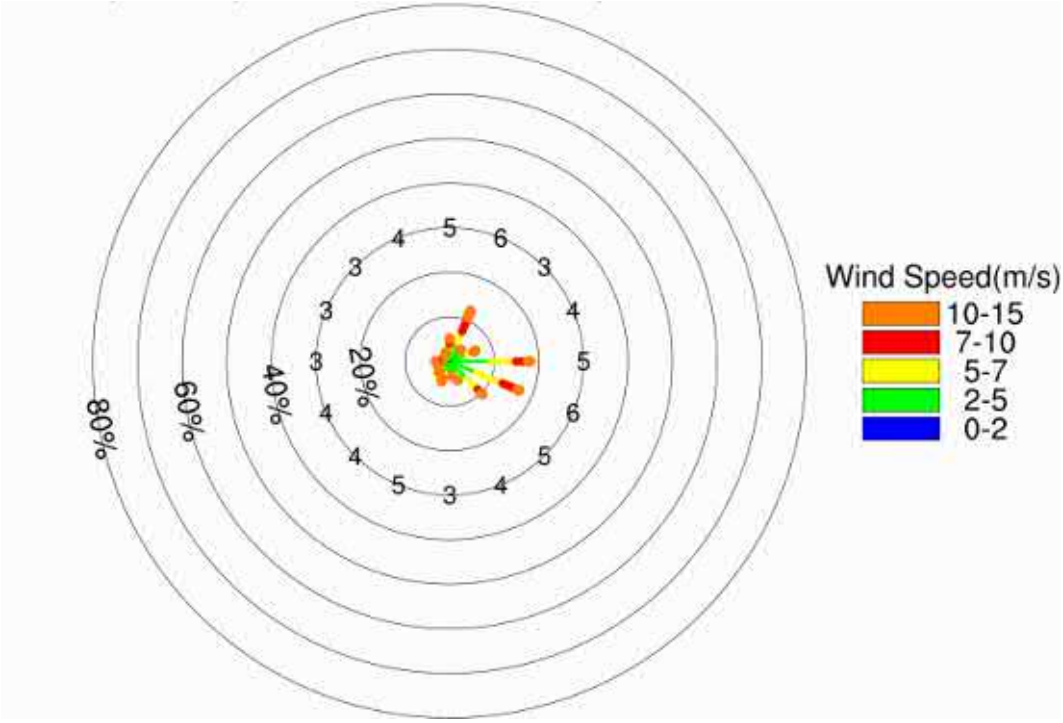


Figure 5 Wind Rose for Grid of (x: 070, y: 083) by RAMS Wind Data

3.1.3 Grid of (x: 070, y: 084)

Annual (200mPD)



Summer (200mPD)

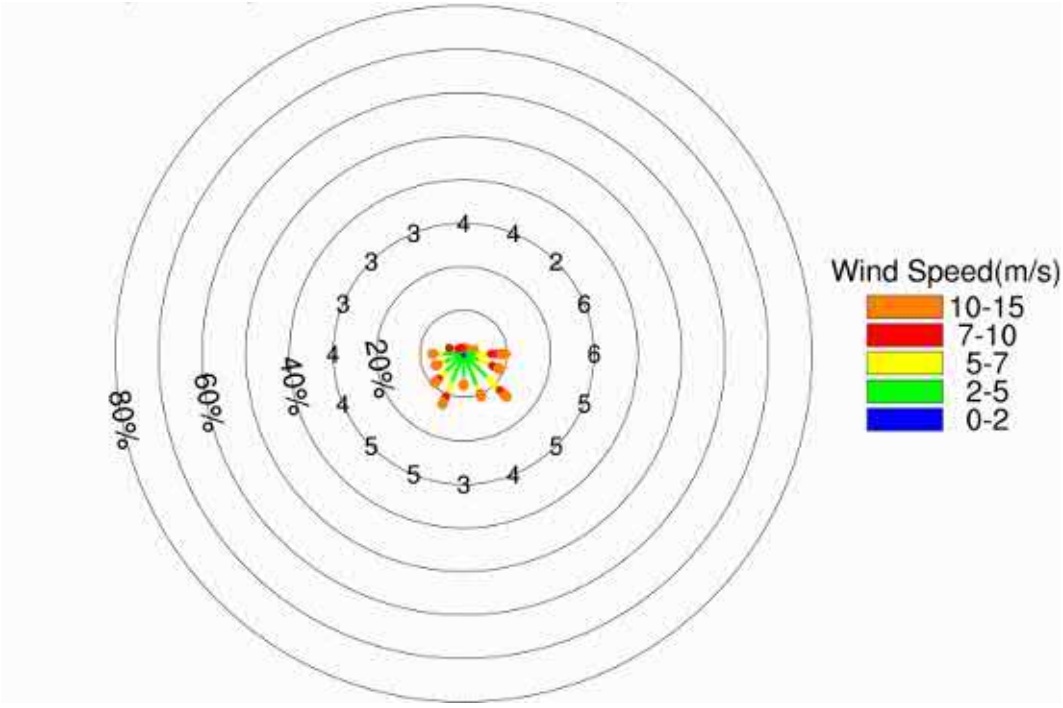


Figure 6 Wind Rose for Grid of (x: 070, y: 084) by RAMS Wind Data

Table 1 summarizes the major annual and summer prevailing winds available to the Project Sites. The wind roses show the 3 sites locations have similar annual prevailing wind directions which are north-northeast (NNE), east (E) and east-southeast (ESE), whereas the summer prevailing wind directions varies from east-southeast (ESE), southeast (SE), south-southeast (SSE) and south-southwest (SSW).

Table 1 Prevailing Wind Frequency by RAMS Wind Data

Location	Annual			Summer		
(x: 069, y: 083)	NNE	E	ESE	ESE	SE	SSW
(x: 070, y: 083)	NNE	E	ESE	SE	SSE	SSW
(x: 070, y: 084)	NNE	E	ESE	SE	SSE	SSW

3.2 Hong Kong Observatory

On the other hand, according to Technical Circular, wind data from the nearby weather station could also be referred. The prevailing wind direction measured at the closest weather station – Ta Kwu Ling Weather Station from the Hong Kong Observatory[3] is tabulated in Table 2 for each month in 2015. The E wind is the annual prevailing wind direction, while E and SSW winds are the summer prevailing winds, as tabulated in Table 2.

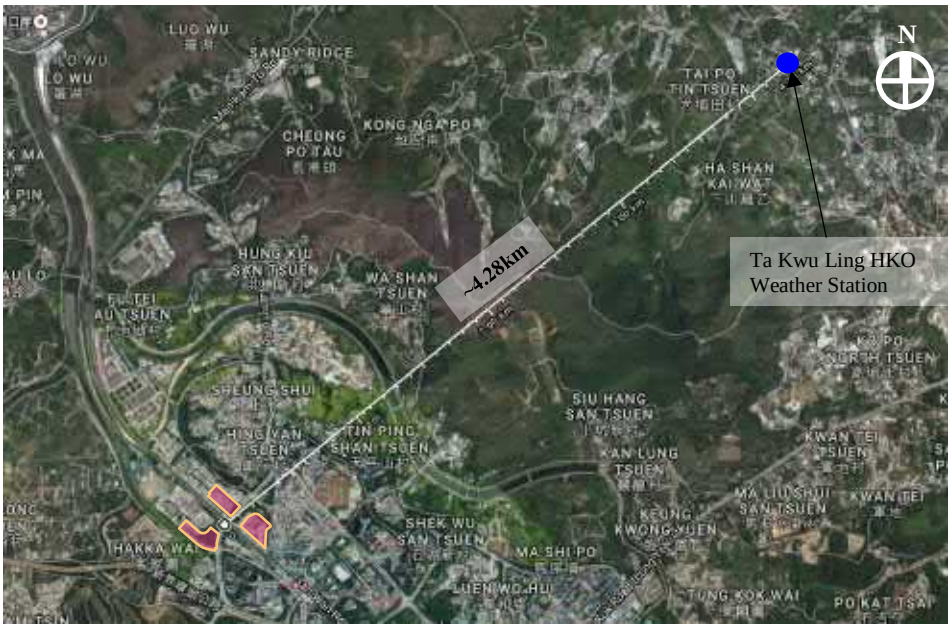


Figure 7 Distance between the Project Sites and Ta Kwu Ling HKO Station

[3] Summary of Meteorological and Tidal Observations in Hong Kong (2015)

Table 2 Monthly Wind Direction Recorded at Ta Kwu Ling Weather Station in 2015 (Source: Hong Kong Observatory)

Month		Prevailing Wind Direction (°)
January		100
February		100
March		100
April		100
May		100
June	**(Summer)**	**210**
July		**90**
August		**90**
September		90
October		90
November		90
December		360
Annual		**90**

3.3 Summary of Site Wind Availability

The wind data from RAMS published by PlanD and Ta Kwu Ling Weather Station have been studied and summarized in Table 3.

Table 3 Prevailing Wind Directions for the Project Sites

Prevailing Wind	Annual	Summer
RAMS	NNE/E/ESE	ESE/SE/SSE/SSW
HKO (Ta Kwu Ling Weather Station)	E	E/SSW

It could be concluded that the annual prevailing wind is from north-northeast (NNE), east (E) and east-southeast (ESE) directions, whereas the summer prevailing wind comes from east (E), east-southeast (ESE), southeast (SE), south-southeast (SSE) and south-southwest (SSW). The evaluation of site wind performance would consider both site wind availability data and site characteristics.

Prevailing Wind	Annual	Summer
Studied Wind Directions	NNE/E/ESE	E/ESE/SE/SSE/SSW

4 Qualitative Assessment of Existing Condition

4.1 Preliminary Assessment on Site Wind Performance

Three Project Sites – SS Site 1, SS Site 2 and PSWR Site – were assessed with the consideration of the existing as well as committed developments surrounded the Project Sites, such as Po Shek Wu Estate.

As discussed in Section 3.3, the annual / summer prevailing winds are from north-northeast (NNE), east (E), east-southeast (ESE), southeast (SE), south-southeast (SSE) and south-southwest (SSW). This section will further discuss the wind performance of the existing condition under the selected prevailing wind condition.

The existing condition of SS Site 1 and SS Site 2 are facilitated as open car park, while PSWR Site is functioned as bus depot. With no major wind obstruction structure in the Project Sites, the prevailing winds can penetrate through the Project Sites effectively.

4.1.1 NNE Prevailing Wind Direction

The general upwind built environments are mainly open spaces, low-rise villages and medium-rise industrial developments. Po Shek Wu Road situated at the center of SS Sites 1 & 2 and PSWR Site would serve as a major air path to allow the NNE wind travelling towards the existing village plot Tai Tau Leng.

SS Site 1

At the upwind side, there are Jumbo Plaza, open car park and SS Site 2. Jumbo Plaza is a 3-storey industrial building that would induce wind shadow to Choi Fai Street as well as the western portion of the SS Site 1. On the other hand, a portion of prevailing wind from the SS Site 2 could enter the eastern portion of the SS Site 1 and further travel towards Tai Tau Leng Playground and the existing village plot Tai Tau Leng.

SS Site 2

The upwind built environments are mainly open spaces, low-rise villages and medium-rise industrial developments, which includes Sheung Shui Wai, the Early Light International Centre and the CLP North Region Office Sheung Shui Depot. Since the Early Light International Centre is located at the upwind side, it is expected to induce wind shadows to part of SS Site 2 as well as a portion of Ka Fu Close. The prevailing wind could penetrate through the building separation between the CLP North Region Office Sheung Shui Depot and the Early Light International Centre across the SS site 2 and reach San Wan Road. There is a 1-2 storey building for Co-operative Society is located at the building separation. It is expected that such low-rise house would not impose significant ventilation impact to the prevailing wind flow through.

PSWR Site

The prevailing wind enters the PSWR Site from an open space, namely, Shek Wu Hui Jockey Club Playground. PSWR Site is located within part of the prevailing wind air path. Good ventilation condition are expected within the PSWR Site and along San Wan Road since there is no obstruction within the PSWR Site. The existing noise barriers along the train track at San Wan Road would block the NNE wind towards the Po Shek Wu Estate at pedestrian level, while the Po Shek Wu Estate is expected to further induce wind shadow toward the existing Choi Po Court.

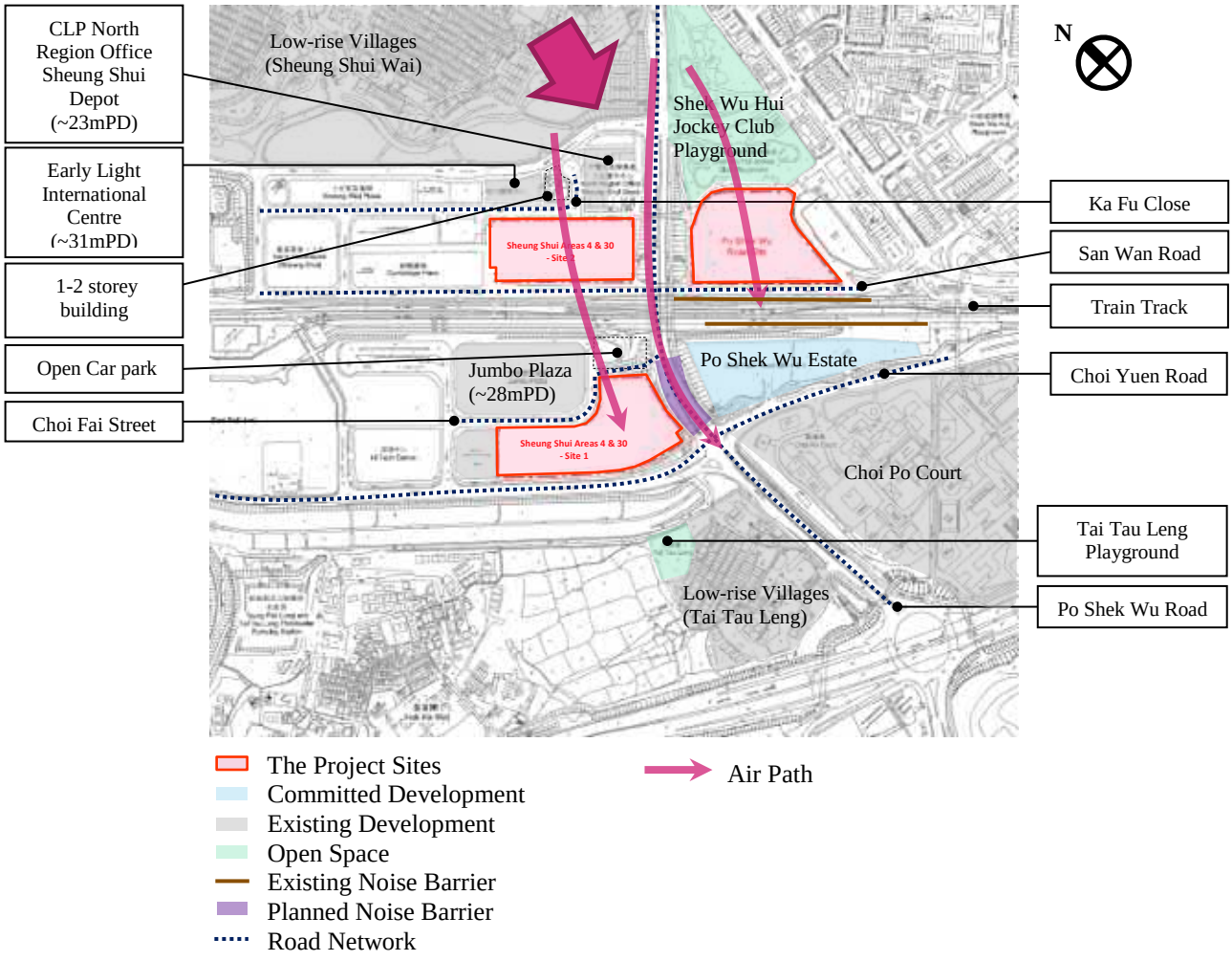


Figure 8 Wind Environment under NNE Wind

4.1.2 E Prevailing Wind Direction

The E prevailing wind mainly enters the Project Sites from medium-rise building clusters and along Choi Yuen Road. Choi Yuen Road could act as an air path to allow the prevailing wind travel towards the low-rise villages, namely, Hak Ka Wai. Shek Wu Hui Jockey Club Playground is relatively open that allow the penetration of E wind to reach the each Project Sites.

SS Site 1

The existing SS Site 1 is functioned as open carpark. The high-rise development Po Shek Wu Estate would induce wind shadow at the east portion of SS Site 1 as well as Po Shek Wu Road. While the west portion of SS Site 1 has better wind environment as the relatively open PSWR Site allows penetration of E wind to reach the site along Choi Fai Street. The prevailing wind are expected to flow along Choi Yuen Road and towards Hak Ka Wai.

SS Site 2

The E prevailing wind mainly enters the Project Sites from Shek Wu Hui Jockey Club Playground and PSWR Site. The CLP North Region Office Sheung Shui Depot is situated at the northeast side that would induce wind shadow to the northern region of the site as well as Ka Fu Close. As the existing conditions of the SS Site 2 is relatively open spaces of car parks, the prevailing wind enters the site from Po Shek Wu Road and penetrates through the SS Site 2 to reach San Wan Road.

PSWR Site

The prevailing wind would mainly skim over from the adjacent medium-rise building clusters and enter the PSWR Site from the east. The general wind environment is expected to be quite good at high level, while the amount of wind flowing at pedestrian level would be reduced due to the wind blockage of medium-rise building clusters. Thus, a small wake zone would be created on its immediate leeward area.

On the other hand, the buffer region of Sheung Shui Cycling Entry/ Exit Hub allow the wind to flow through and towards PSWR Site. Therefore, relatively good wind environment can be enjoyed at PSWR Site.

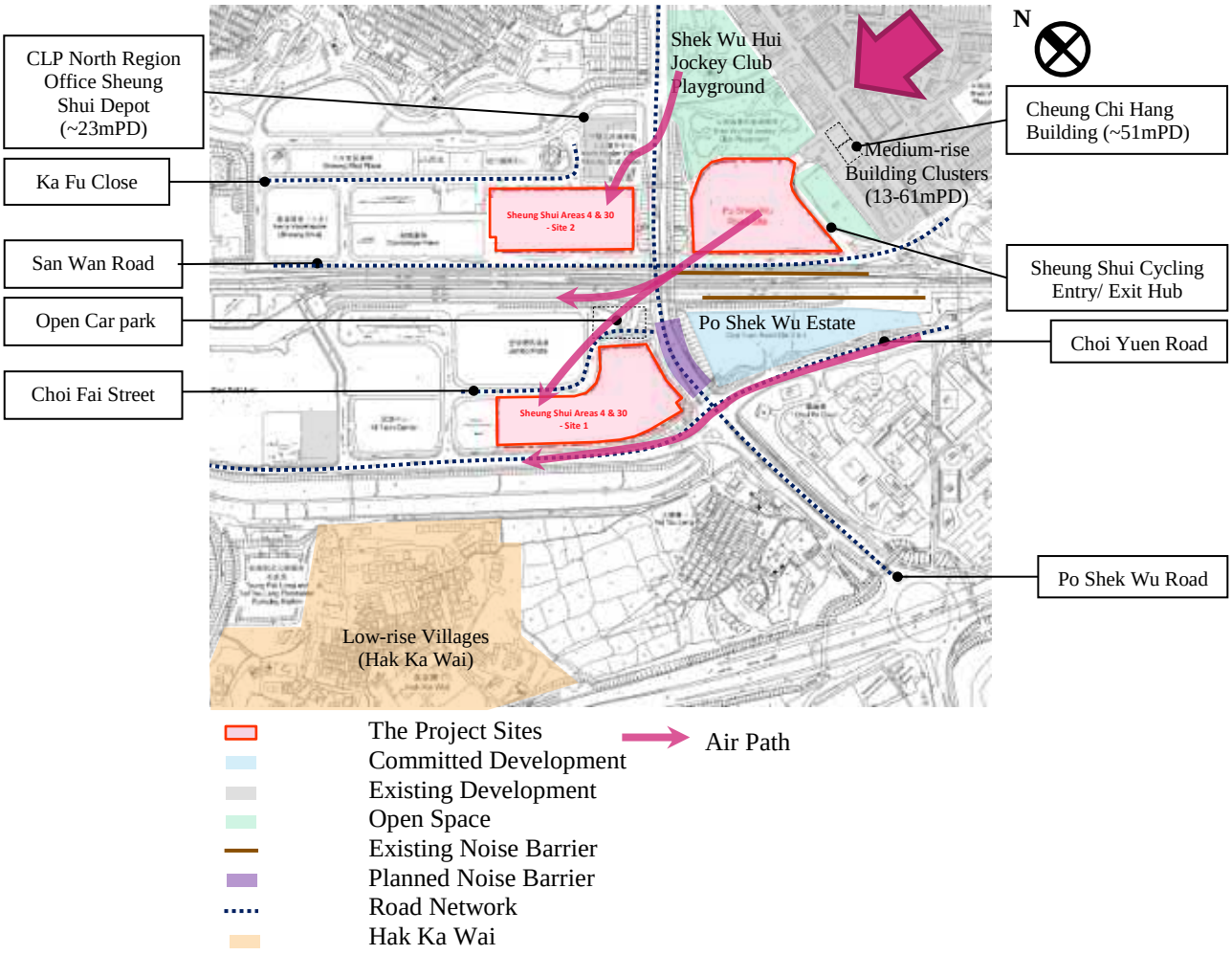


Figure 9 Wind Environment under E Wind

4.1.3 ESE Prevailing Wind Directions

The ESE prevailing wind mainly enters the Project Sites from medium-rise building clusters and along Choi Yuen Road. Choi Yuen Road could act as an air path to allow the ESE wind travel towards the low-rise villages, namely, Hak Ka Wai. Shek Wu Hui Jockey Club Playground is relatively open that allow the penetration of ESE wind to reach the each Project Sites.

SS Site 1

The existing SS Site 1 is functioned as open carpark. The high-rise development Po Shek Wu Estate would induce wind blockage effect to the immediate leeward region of SS Site 1. Therefore, relatively calm wind environment is expected at the east portion.

A portion of wind would flow along the train track and divert to the ESE direction after flowing through Po Shek Wu Road. The presence of Choi Fai Street help to channel the wind towards the west portion of SS Site 1. At the same time, the prevailing wind are expected to flow along Choi Yuen Road and towards Hak Ka Wai. A portion of wind from Choi Yuen Road would also reach the south part of SS Site 1. Thus, the wind environment at west and south portion is expected to be satisfactory.

SS Site 2

The prevailing wind mainly enters the Project Sites from Shek Wu Hui Jockey Club Playground. The CLP North Region Office Sheung Shui Depot is situated at the northeast side that would induce small wind shadow to the northern region of the site as well as Ka Fu Close. As the existing conditions of the SS Site 2 is relatively open spaces of car parks, the prevailing wind enters the site from Po Shek Wu Road and penetrates through the SS Site 2 to reach San Wan Road.

PSWR Site

The prevailing wind would mainly skim over from the adjacent medium-rise building clusters and enter the PSWR Site from the ESE direction. A portion of wind would also penetrate towards the site from San Wan Road. The general wind environment is expected to be quite good at high level, while the amount of wind flowing at pedestrian level would be reduced due to the wind blockage of medium-rise building clusters. Thus, a small wake zone would be created on its immediate leeward area.

The buffer region of Sheung Shui Cycling Entry/ Exit Hub allow the wind to flow through and towards PSWR Site. Therefore, relatively good wind environment can be enjoyed at PSWR Site.

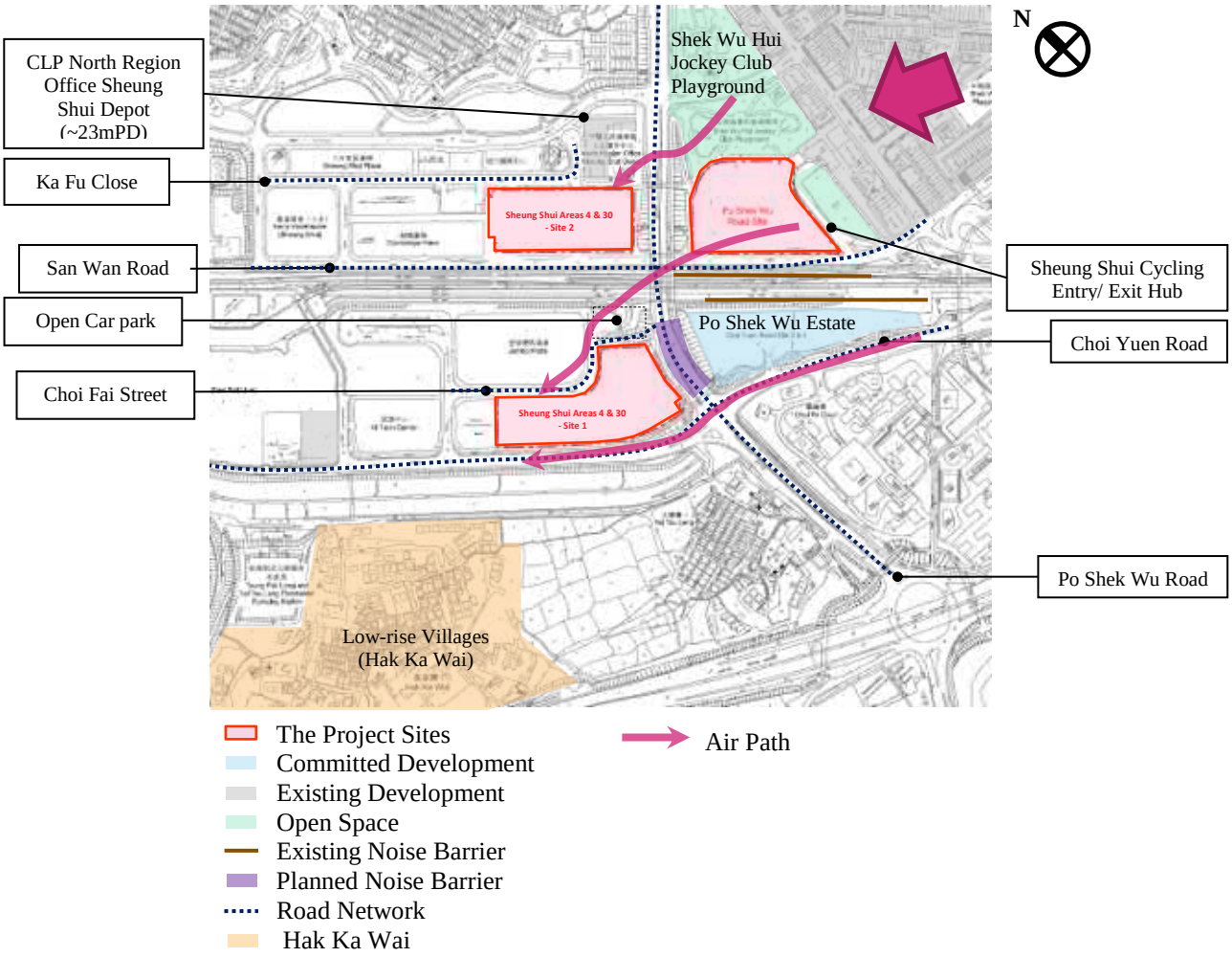


Figure 10 Wind Environment under ESE Wind

4.1.4 SE Prevailing Wind Direction

Under the SE prevailing wind, the train track and San Wan Road acts as a major breezeway to allow the prevailing wind flow towards the northwest part of Sheung Shui.

SS Site 1

The committed high-rise development Po Shek Wu Estate and the existing Choi Po Court is at the upwind side of the SS Site 1. These developments would evidently induce wind blockage effect and resulting wind shadow region at the SS Site 1, Tai Tau Leung and Po Shek Wu Road. The planned noise barrier with around 16m height (from N) to 10m height (from S) are located along Po Shek Wu Road would block some of the prevailing wind thus further reduce the amount of wind entering the SS Site 1 at the pedestrian level. Choi Yuen Road would act as an air path and allow the prevailing wind flow towards Hak Ka Wai.

SS Site 2

SS Site 2 is located at the immediate downwind side of the PSWR Site. The existing condition of the SS Site 2 is an open car park, which could facilitate the wind penetration through the SS Site 2 and reach the industry developments such as Cambridge Plaza Car Park and Park'n Sheung Shui Fresh Food Distribution Centre.

PSWR Site

The Landmark North is situated at the upwind side of the PSWR Site that may block some incoming SE wind and may reduce the amount of wind that can enter the PSWR Site. A portion of prevailing wind could flow at the south of Landmark North along San Wan Road and enter the site from south-southeast. As the existing conditions of the PSWR Site is an open space for bus depot, the prevailing wind may skim over the existing low-rise development and reattach at PSWR Site. It is expected to flow across the southern part of the PSWR Site along San Wan Road towards the SS Site 2.

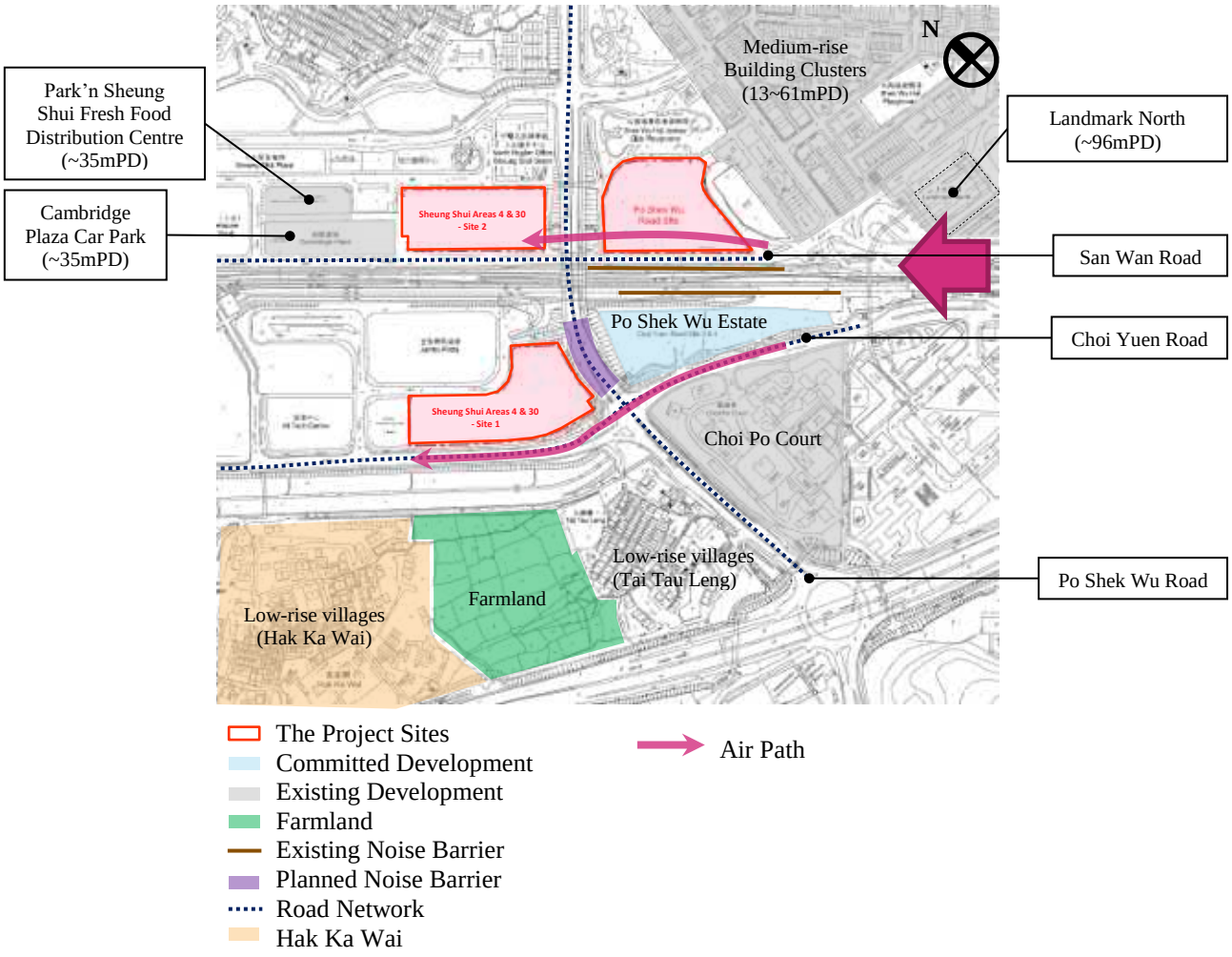


Figure 11 Wind Environment under SE Wind

4.1.5 SSE Prevailing Wind Direction

The built environment at southerly quadrant of the Project Sites is generally low-rise villages and farmland to the southwest, including Tai Tau Leng and Hak Ka Wai, and high-rise residential developments to the southeast, including the existing Choi Po Court and the Po Shek Wu Estate. The wind environment is generally better at the SS Sites 1 & 2 as compared to the PSWR Site. Po Shek Wu Road would also act as an air path to allow the prevailing wind travelling towards the SS Site 2 as well as the surrounding industry buildings.

SS Site 1

The prevailing wind mainly enters the Project Site from the low-rise villages of Tai Tau Leng and Tai Tau Leng Playground. As the existing condition of the SS Site 1 is an open car park, large amount of wind can flow through the SS Site 1, enhancing the ventilation of Choi Fai Street and the adjacent industrial building clusters.

SS Site 2

The prevailing wind generally would flow along Po Shek Wu Road, through the separation between the Po Shek Wu Estate and Jumbo Plaza, and enter the SS Site 2 from San Wan Road. As the existing condition of the SS Site 2 is an open car park, large amount of wind can flow through the SS Site 2, enhancing the ventilation of Ka Fu Close and to reach further downstream. Nevertheless, due to the wind blockage of the Po Shek Wu Estate at the upwind side, it is expected the eastern part of the SS Site 2 would have less amount of wind.

PSWR Site

The built environment at the southerly quadrant of the PSWR Site is some high-rise residential developments, including the Po Shek Wu Estate and the existing Choi Po Court. These developments would block the incoming wind and the Po Shek Wu Estate may cast a wind shadow at the immediate part of the PSWR Site. However, SSE wind would reattach to the pedestrian level in the further downstream around the north-eastern part of PSWR Site.

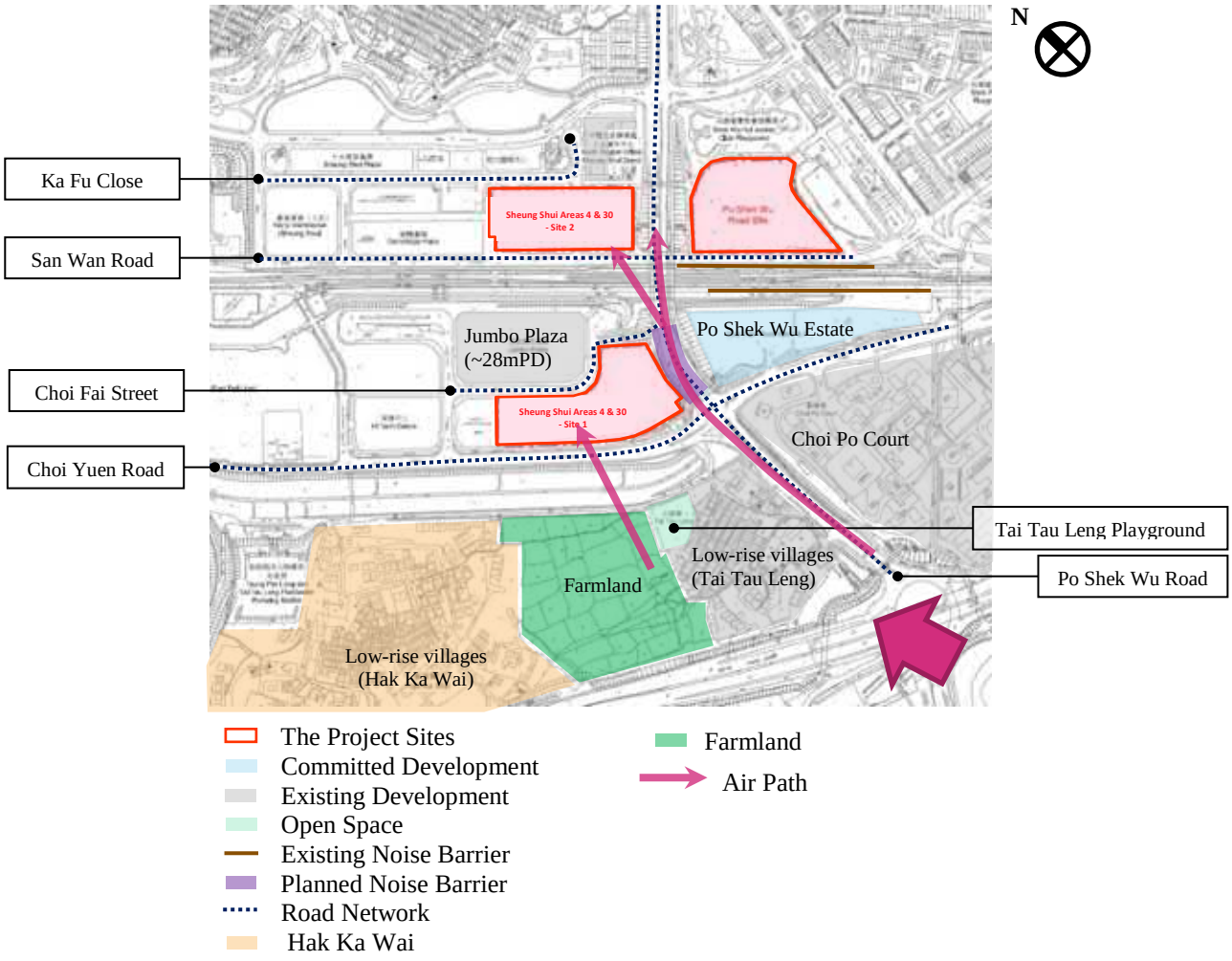


Figure 12 Wind Environment under SSE Wind

4.1.6 SSW Prevailing Wind Direction

Similar to SSE wind, the low-rise built environment at the upwind side would allow the SS Sites 1 & 2 to enjoy a good wind environment, while the PSWR Site would be shielded by the Po Shek Wu Estate and the existing Choi Po Court.

SS Site 1

The prevailing wind mainly enters the SS Site 1 from low-rise village of Tai Tau Leng and Tai Tau Leng Playground as well as some farmland. As the existing condition of the SS Site 1 is an open car park, large amount of wind can flow through the site, enhancing the ventilation of Choi Fai Street and the adjacent industrial building clusters and then to reach SS Site 2 and further downstream.

SS Site 2

The prevailing wind generally would flow along Po Shek Wu Road and across the SS Site 1, and enter the SS Site 2 from San Wan Road. As the existing condition of the site is an open car park, large amount of wind could flow through the SS Site 2, enhancing the ventilation of Ka Fu Close.

PSWR Site

Similar to SSE wind condition, the Project Site would have a calm wind environment due to the wind blockage of the Po Shek Wu Estate and the existing Choi Po Court at the upwind side. SSW wind would also reattach to the pedestrian level in the further downstream around the north-eastern part of PSWR Site.

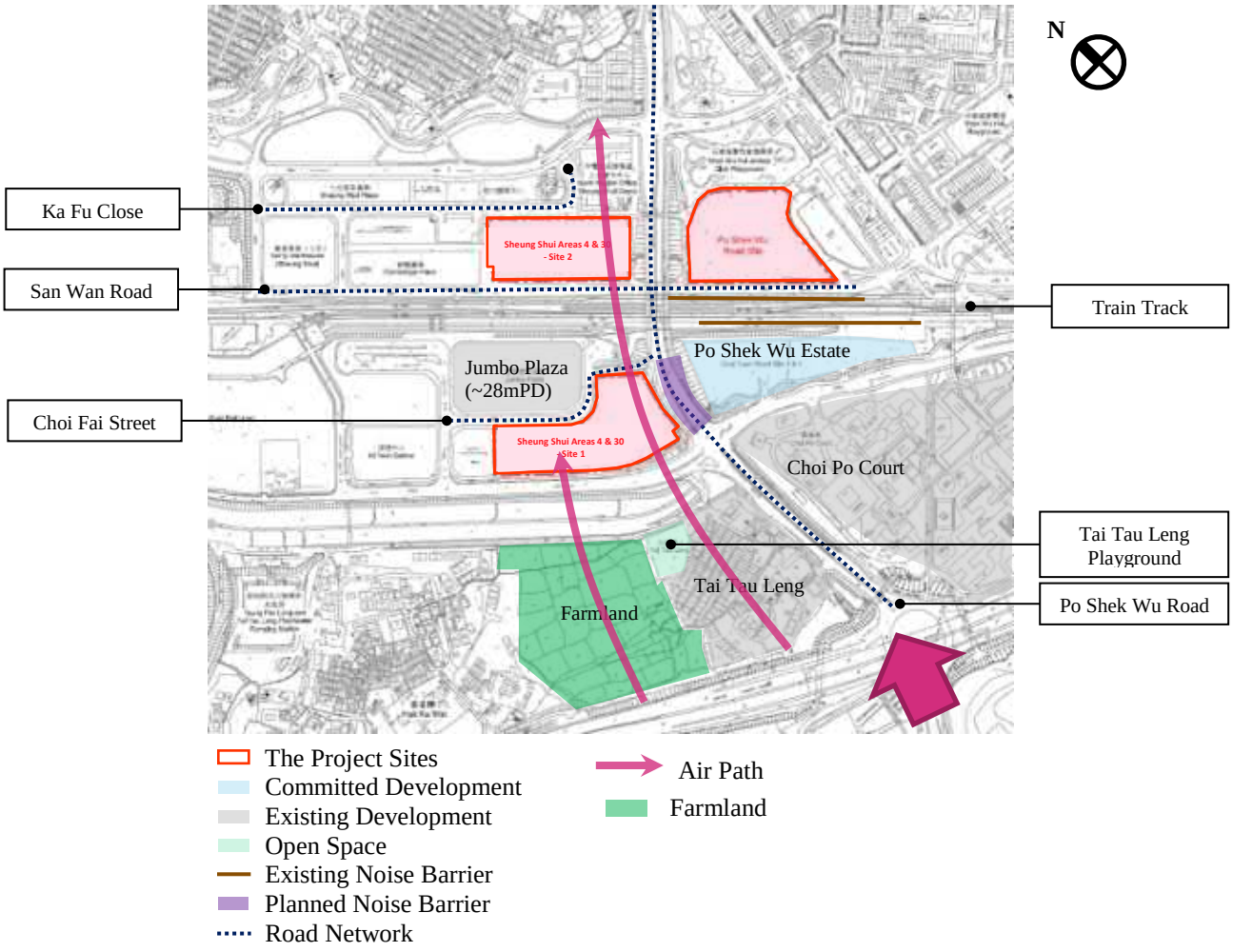


Figure 13 Wind Environment under SSW Wind

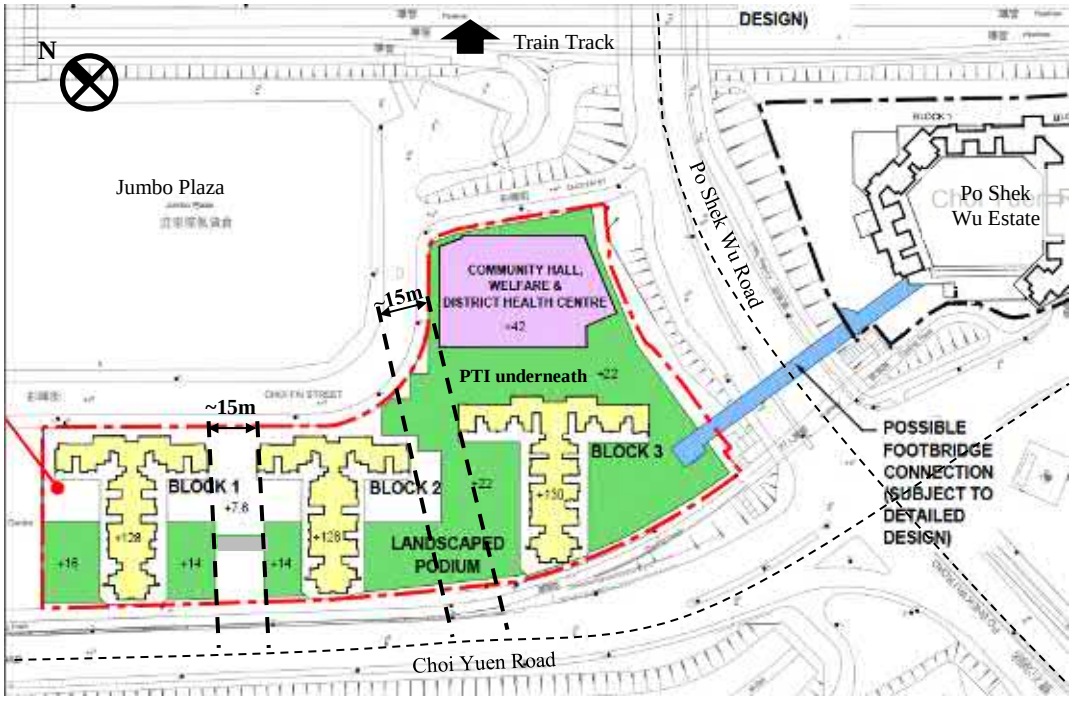
5 Preliminary Plan

5.1 Sheung Shui Areas 4 & 30 Site 1 (SS Site 1)

SS Site 1 consists of three nos. of domestic blocks with maximum building height of 130mPD and a 5-storey Community Hall & Welfare & District Health Centre Block on the podium level. A Public Transport Interchange (PTI) is provided on ground level under Block 3 and the Community Hall & Welfare & District Health Centre Block. The covered and partly open-sided PTI allow good wind permeability at pedestrian level (Shown in Figure 15).

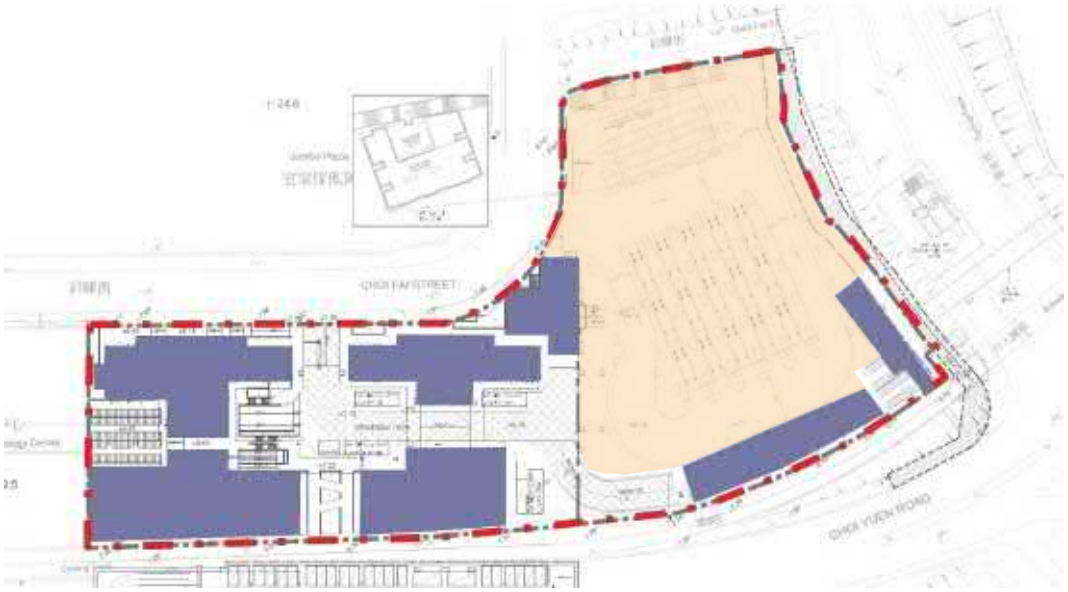
The landscape podium is covering the majority of the site. In order to reduce the ventilation impacts of the extensive landscape podium, the proposed development has provided one ~15m building separations between Block 1 and Block 2 (from ground level) and another ~15m tower separation between Block 2 and Block 3 (from podium level).

The landscaped podium is linked to the committed residential development Po Shek Wu Estate by a footbridge across Po Shek Wu Road. The layout plan of the Proposed Development at Site 1 is shown in Figure 14.



Site Boundary
Link Bridge
Podium Massing

Figure 14 Master Layout Plan of Proposed Development at SS Site 1



Site Boundary
G/F Massing
covered and partly open-sided PTI Area

Figure 15 G/F Massing of Proposed Development at SS Site 1

5.2 Sheung Shui Areas 4 & 30 Site 2 (SS Site 2)

SS Site 2 comprises of three nos. of domestic blocks with maximum building height of 130mPD and one 8.5 storeys (including G/F) carpark block. It is noted that the proposed development has suffered from heavy railway noise from W to S along the East Rail Line. Thus, the proposed development has single aspect design for Block 1 and 3. In order to reduce the ventilation impacts, the proposed development has provided a 15m tower separation between Block 1 and Block 3 at above podium level as well as a large site opening between Block 1 and Block 2 from above ground level. The 15m separation would serve as local breezeway to facilitate the wind penetration along NE/SW directions. The podium is provided at level ~14mPD, the podium massing and landscape areas are shown in Figure 17. The podium massing are reserved for the future plant rooms allocation. The podium is covered by the transfer structure above as shown in Figure 16.

SS Site 2 is linked to the PSWR Site by a lift tower and a footbridge across Po Shek Wu Road. The footbridge is of permeable design with railing handles as shown in Figure 18. The layout plan of the Proposed Development at SS Site 2 is shown in Figure 16.

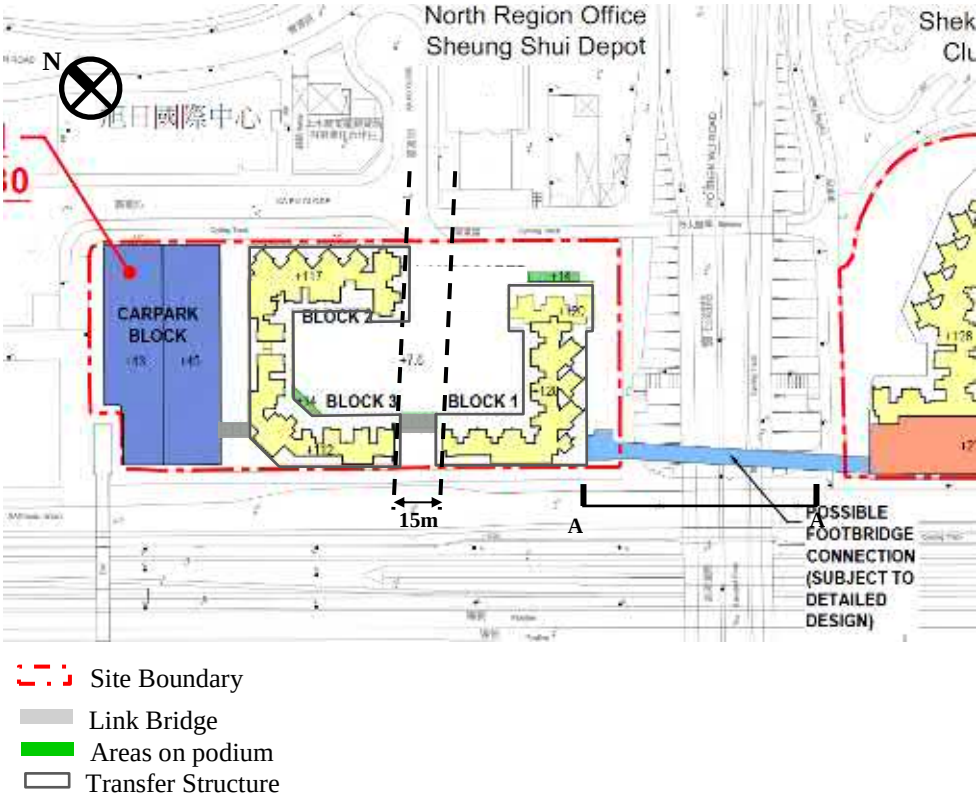


Figure 16 Master Layout Plan of Proposed Development at SS Site 2



P/F Block Massing

Podium Area of ~14mPD

Figure 17 P/F Massing

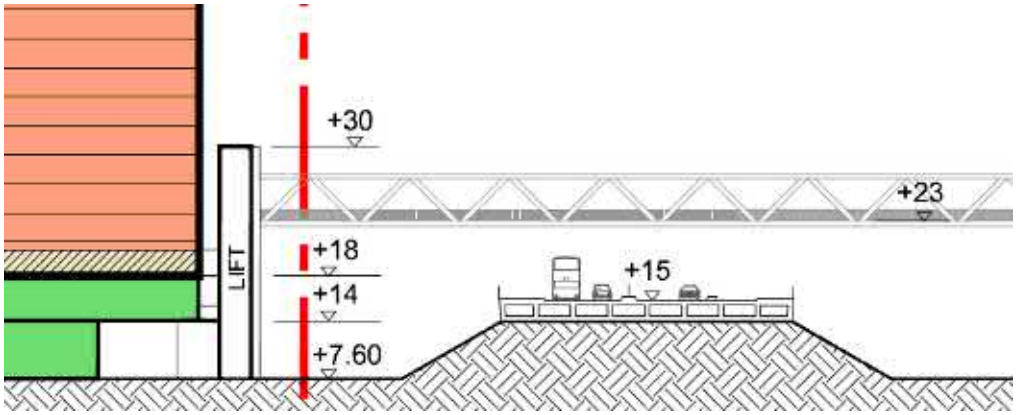


Figure 18 Section Detail of the Proposed Lift Tower and Footbridge connecting SS Site 2 and PSWR Site

5.3 Po Shek Wu Road Site (PSWR Site)

For PSWR Site, two nos. of domestic blocks with maximum building height of 130mPD and a 4-storey retail block up to ~27mPD are proposed. In order to enhance the connectivity between the two portions of the retail block and the podium floors under the residential towers, covered walkways are incorporated at each floor between the two retail blocks as shown in Figure 20. The covered walkways are of permeable design.

The proposed development would suffered from heavy railway noise from W to S along the East Rail Line. Thus, the proposed development has single aspect design for Block A and B.

The proposed development has provided a 15m building separation (above ground level) between Block A and Block B to allow the wind penetration across the site. The Development has also provided a ~15m building setbacks from the northern site boundary and a ~17m air path along E/W direction (above podium level) between Block B and the lift tower is provided near the southern corner of PSWR Site. Details of the lift tower at the southern corner are shown in Figure 20.

PSWR Site is linked to the SS Site 2 by footbridge across Po Shek Wu Road and linked to Po Shek Wu Estate by another footbridge across San Wan Road and the East Rail train track as shown in Figure 19. Also, another footbridge is connected from PSWR Site to existing footbridge to railway station as shown in Figure 20. The three footbridges are designed to be permeable with railings handles.

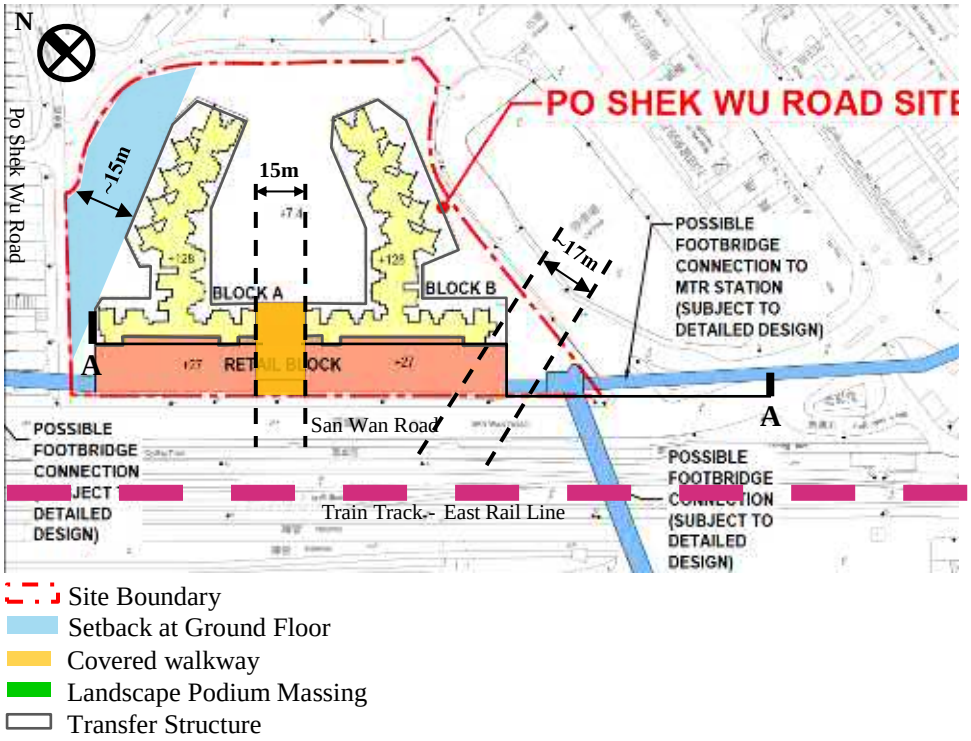


Figure 19 Master Layout Plan of Proposed Development at PSWR Site

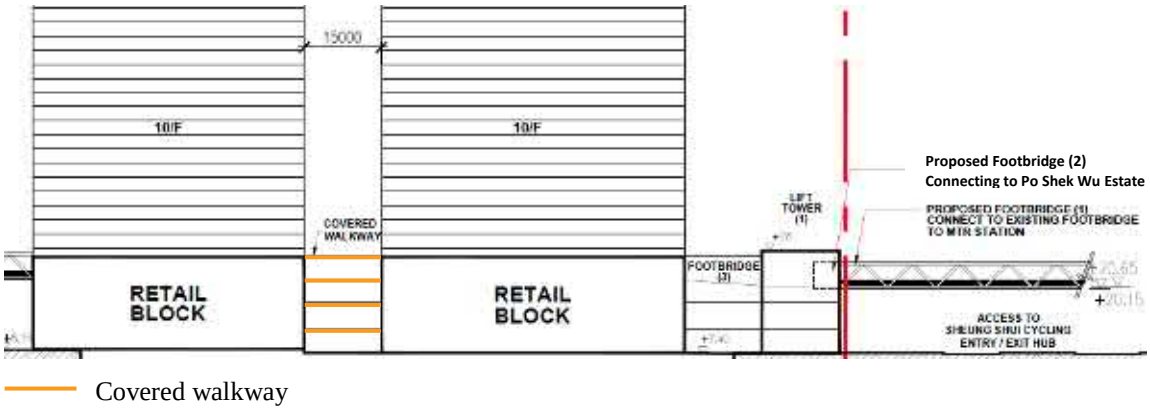


Figure 20 Section A-A Detail of the Proposed Development at PSWR Site

6 Ventilation Performance of the Proposed Developments

6.1 Preliminary Assessment on the Proposed Developments

This section explains how the annual and summer prevailing wind access to the Proposed Developments at SS Site 1, SS Site 2 and PSWR Site, and the ventilation impact to the surroundings by the Proposed Developments.

6.1.1 NNE Prevailing Wind Direction

SS Site 1

A portion of prevailing wind would come from SS Site 2. It is found that most of the air paths overlap with low-rise developments and their effectiveness to alleviate the potential impact on the pedestrian wind environment may be reduced.

The buildings of SS Site 1 and Site 2 would cast wind shadow to the leeward region and reduce the wind availability to Tai Tau Leng Playground and the low-rise villages of Tai Tau Leng. The provision of tower separation between Block 2 and 3 of SS Site 1 (at above podium level) (Orange Arrows in Figure 21) would allow some prevailing wind penetrating across the sites at mid and high level.

Another portion of prevailing wind would skim over atop of Jumbo Plaza and enter the SS Site 1 from Choi Fai Street (Green Arrows in Figure 21). The height difference between the Jumbo Plaza and Block 1 and 2 would create a stepping building height profile and facilitate the downwash of the high level wind to Choi Fai Street at pedestrian level, thus enhancing the ventilation of the street.

At low zone, the podium structure of SS Site 1 would shield the prevailing wind and induce wind shadow along the Choi Yuen Road, as well as further leeward area of Tai Tau Leng Village and Playground.

SS Site 2

The prevailing wind would enter SS Site 2 through the building separations between the CLP North Region Office Sheung Shui Depot and the Early Light International Centre. The Block 1 and 3 are situated vicinity to San Wan Road, which would inevitably induce wind shadows from the road towards the pedestrian areas around Jumbo Plaza.

The provision of the 15m building separation between Block 1 and Block 2-3 would allow the wind penetration and reduce the ventilation impact along San Wan Road. The building separation also allow the prevailing wind to flow across the train track continuously towards Choi Fai Street and the SS Site 1 (Orange Arrows in Figure 21).

A portion of prevailing wind would skim over atop of Early Light International Centre and enter the SS Site 2 from Ka Fu Close (Purple Arrow in Figure 21). The height difference between the Early Light International Centre and Block 2 would

create a stepping building height profile and facilitate to downwash the high level wind to Ka Fu Close (~10m width) at pedestrian level, thus enhancing the ventilation of the street.

PSWR Site

The prevailing wind would enter the PSWR Site from an open space, namely, Shek Wu Hui Jockey Club Playground. The PSWR Site is situated at the existing air path, it would inevitably resulting adverse impact to the air ventilation in its downstream. For example, the Proposed Development is expected to induce wind shadows at immediate downwind side along the San Wan Road and reduce the amount of wind flowing towards the Po Shek Wu Estate.

The provision of 15m building separation (at above ground level) between Block A and B (Red Arrow in Figure 21) and the ~17m air path between Block B and the lift tower at southern corner (Pink Arrow in Figure 21) could allow the NNE wind to penetrate through and mitigate the ventilation impact to the downstream San Wan Road and Po Shek Wu Estate.

The covered walkways connecting the retail blocks are expected to have minimal effect to the NNE wind penetrating through the 15m building separation between Block A and B (Red Arrow in Figure 21) due to its permeable design as shown in Figure 20, the NNE wind could penetrate through the slabs.

The proposed footbridge connecting PSWR Site and SS Site 2 across Po Shek Wu Road is expected to have minimal effect to the NNE wind traveling along Po Shek Wu Road (Blue Arrow in Figure 21) due to its permeable design.

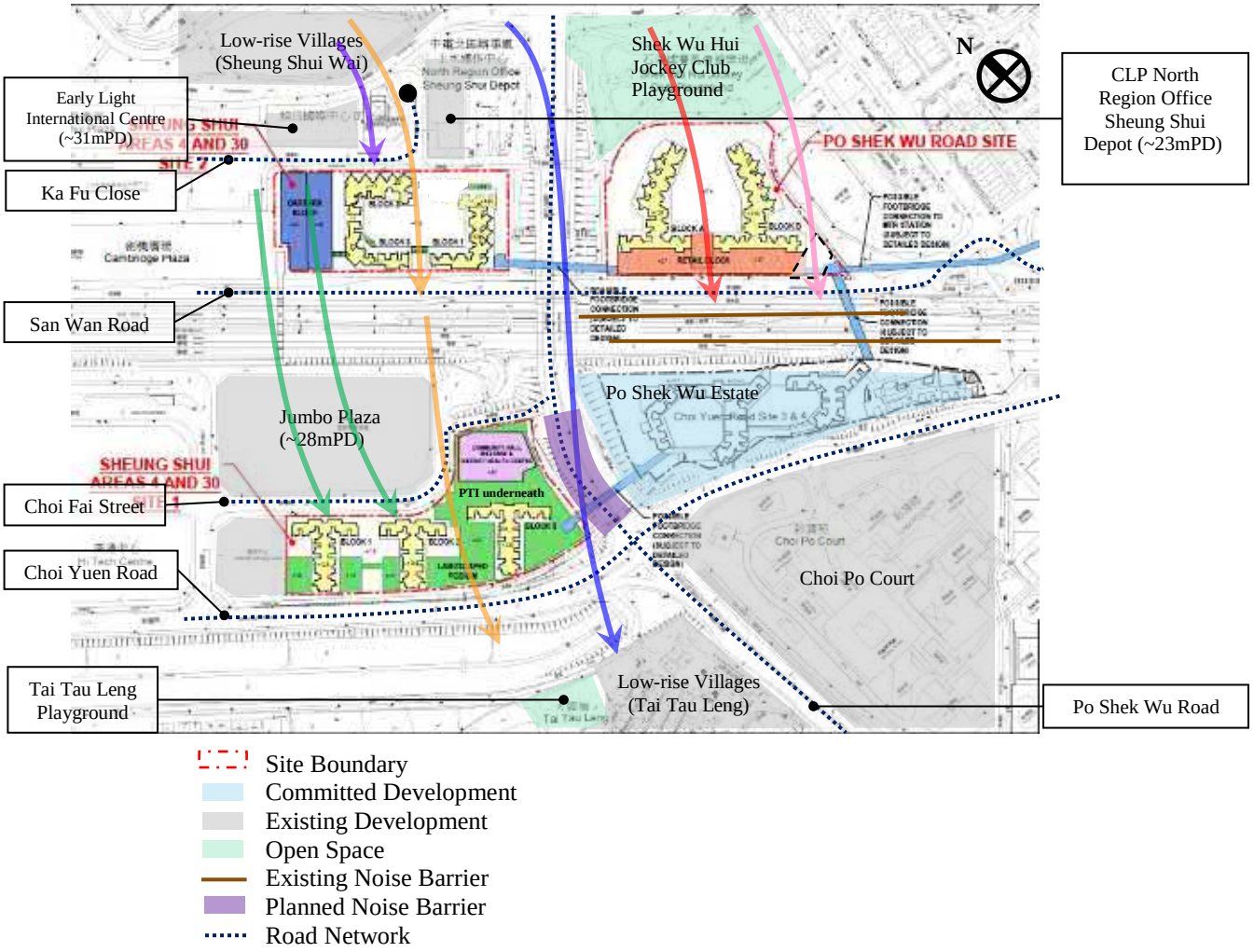


Figure 21 Wind Environment under NNE Wind

6.1.2 E Prevailing Wind Direction

SS Site 1

The Po Shek Wu Estate and the existing Choi Po Court are located at the upwind side of SS Site 1, which would reduce the amount of wind come towards the SS Site 1. Meanwhile, the planned noise barrier located along Po Shek Wu Road would further reduce the incoming wind speed at the pedestrian level. The prevailing wind is expected to flow along the Choi Yuen Road, and enter the SS Site 1 at the landscape podium under Block 3 (Red Arrow in Figure 22) Due to the blockage of high-rise tower of the Proposed Development, it is expected SS Site 1 would induce wind shadow along Choi Yuen Road at the downstream areas of the project site. The covered and partly open-sided PTI at ground level would enhance the site permeability at pedestrian level and slightly mitigate the ventilation impact in the downstream areas.

SS Site 2

The prevailing wind would mainly come from Shek Wu Hui Jockey Club Playground. The large building separation between Block 1 and 2 would act as a wind entrance and allow the prevailing wind penetrating into the centre part of the SS Site 2 (Blue Arrow in Figure 22). The presence of Block 3 at SS Site 2 would induce wind shadow to San Wan Road which affect the wind environment at the west portion of the road.

PSWR Site

The E wind would come from atop of the medium-rise building clusters at the east. The provision of the ~15 building setbacks at the northern boundary would allow the wind penetration towards Po Shek Wu Road (Yellow Arrows in Figure 22). The height difference between the medium-rise building clusters along San Fun Avenue, such as Shek Wu Hui Post Office, Lung Ha Building, Moon Wah Building, is large as compared to the residential Block B (max. building height 130mPD). It could create an effective stepping building height profile and facilitate to downwash the high level wind towards Sheung Shui Cycling Entry/ Exit Hub at pedestrian level, thus enhancing the ventilation of the street (Green Arrow in Figure 22).

The building massing of PSWR Site would induce localized wind shadows to Po Shek Wu Road, San Wan Road and Po Shek Wu Estate located at the immediate downstream areas. The provision of the ~15 building setbacks at the northern boundary and ~17m building separation at the southern corner of the PSWR Site would allow portions of prevailing wind and downwash wind to reach Po Shek Wu Road (Yellow Arrows in Figure 22), San Wan Road and Po Shek Wu Estate (Orange Arrows in Figure 22).

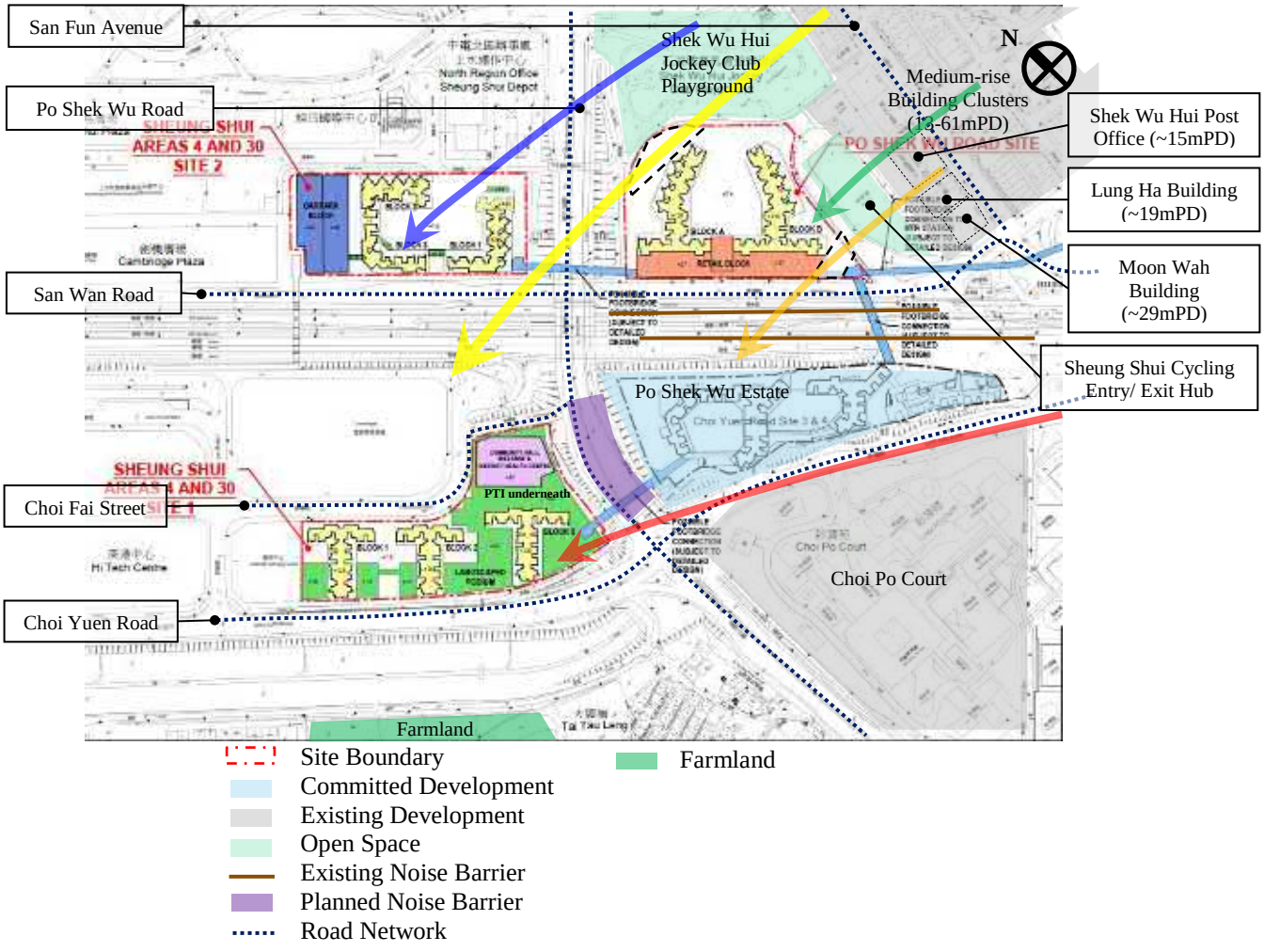


Figure 22 Wind Environment under E Wind

6.1.3 ESE Prevailing Wind Direction

SS Site 1

Similar to ESE prevailing wind, the Po Shek Wu Estate, planned noise barrier along Po Shek Wu Road and the existing Choi Po Court are located at the upwind side of SS Site 1. This would block a portion of incoming wind flow towards SS Site 1. The wind speed at pedestrian level of Site 1 would further reduced.

The prevailing wind is expected to flow along the Choi Yuen Road, and enter the SS Site 1 at the landscape podium under Block 3 (Red Arrow in Figure 23). Due to the blockage of high-rise towers from the Proposed Development, it is expected SS Site 1 would induce wind shadow along Choi Yuen Road at the downstream areas of the project site.

SS Site 2

The prevailing wind would mainly come from Shek Wu Hui Jockey Club Playground. The large building separation between Block 1 and 2 would act as a wind entrance and allow the prevailing wind penetrating into the centre part of the SS Site 2 (Blue Arrow in Figure 23). The presence of Block 3 at SS Site 2 would induce wind shadow to San Wan Road which affect the wind environment at the west portion of the road.

PSWR Site

The ESE wind would come from atop of the medium-rise building clusters at the east. The PSWR Site is situated at the upwind of Po Shek Wu Road and SS Site 2. Thus it is expected to induce localized wind shadows to the road and SS Site 2. The provision of the ~15m building setbacks at the northern boundary of the PSWR Site would allow the wind penetration towards Po Shek Wu Road and SS Site 2 (Yellow Arrow in Figure 23).

The height difference between the medium-rise building clusters along San Fun Avenue, such as Shek Wu Hui Post Office, Lung Ha Building, Moon Wah Building, is large as compared to the residential Block B (max. building height 130mPD). It could create an effective stepping building height profile and facilitate to downwash the high level wind. With the buffer zone of Sheung Shui Cycling Entry/ Exit Hub at the upwind side, the wind can reattach to the pedestrian level and enhancing the ventilation of the street, as well as the project site. (Green Arrow in Figure 23).

The ESE prevailing wind and downwash wind by Block B could penetrate towards the downstream San Wan Road and Po Shek Wu Estate through the ~17m air path between Block B and the lift tower at the southern corner of the site (Orange Arrows in Figure 23).

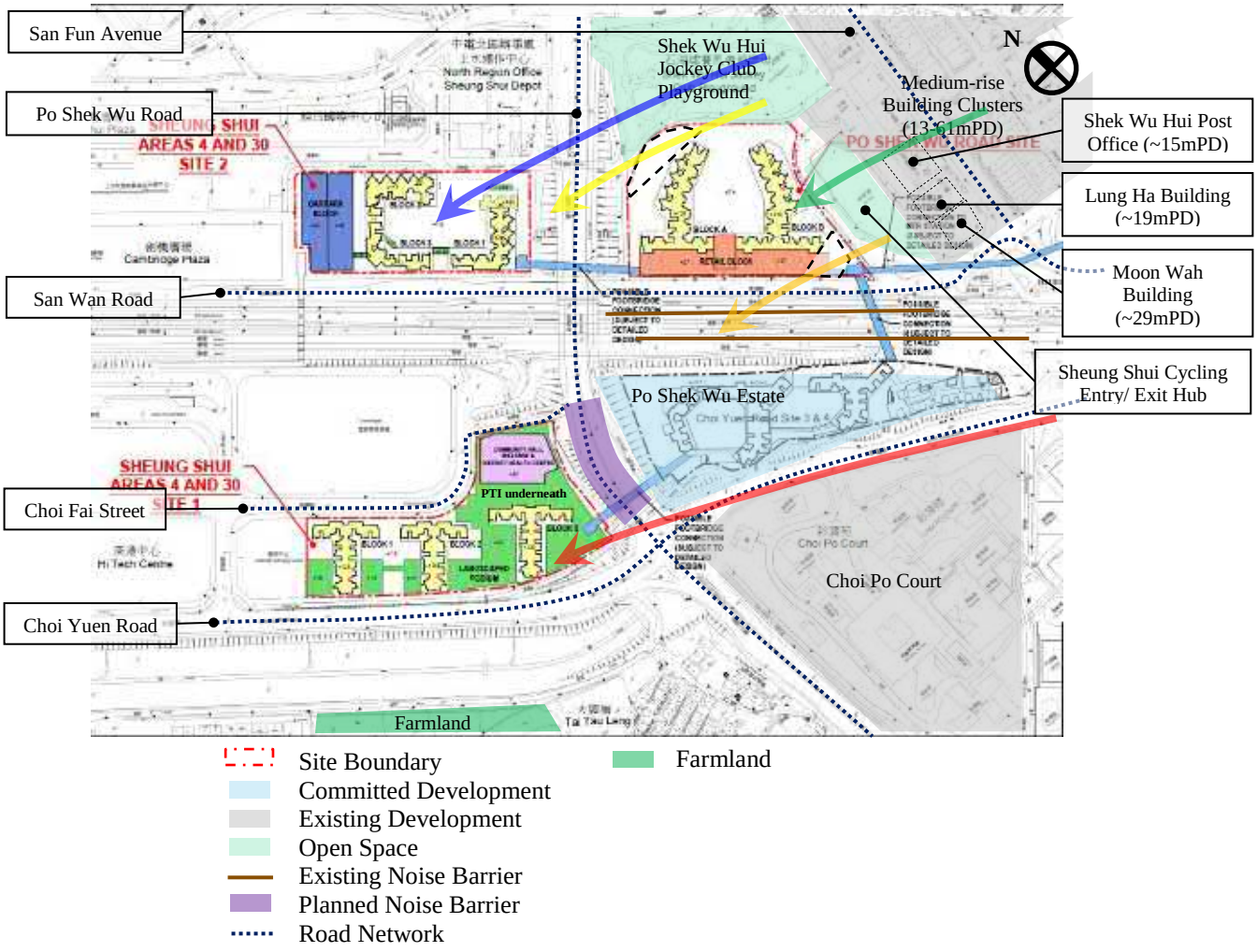


Figure 23 Wind Environment under ESE Wind

6.1.4 SE Prevailing Wind Direction

SS Site 1

Similar to E wind, the Po Shek Wu Estate, the existing Choi Po Court and the planned noise barrier which would reduce the amount of wind coming towards the SS Site 1. The prevailing wind is expected to flow along the Choi Yuen Road, and enter the SS Site 1 at the landscape podium under Block 3 (Red Arrow in Figure 24). Due to the blockage of high-rise towers from the Proposed Development, it is expected SS Site 1 would induce wind shadow along Choi Yuen Road at the downstream areas of the project site.

SS Site 2

Since the upwind built environment of the SS Site 2 is mainly dominated by the PSWR Site, it is expected that the wind availability of SS Site 2 would be limited. The prevailing wind would mainly come from the southeast of the PSWR Site and San Wan Road. At the immediate downstream areas, such as Ka Fu Close and Carpark would have certain ventilation impact due to the blockage effect induced by SS Site 2. Also, wind shadow is expected at further downstream area of industrial developments of Park'n Sheung Shui Fresh Food Distribution Centre (Refers to Figure 11). A portion of prevailing wind would still able to enter Ka Fu Close through the building separation between the proposed development and CLP North Region Office Sheung Shui Depot (Orange Arrow in Figure 24).

The Block 1 of SS Site 2 could help to capture the wind and downwash towards Po Shek Wu Road at pedestrian level (Blue Arrow in Figure 24). Furthermore, SS Site 2 is generally aligned along San Wan Road, it is expected the SS Site 2 would not induce significant impact to the air flow along San Wan Road (Green Arrow in Figure 24).

PSWR Site

The clusters of mid-rise developments at the upwind side would reduce the amount of wind that can enter the PSWR Site. Thus, the prevailing wind would mainly flow along San Wan Road and enter the PSWR Site from SE direction. As the PSWR Site is situated at the upwind of Po Shek Wu Road and SS Site 2, it would inevitably induce localized wind shadow at the road and block the prevailing wind reaching SS Site 2.

The tower setback (above podium and lift tower level) from the south-western boundary along the San Wan Road would enhance the wind permeability and allow the incoming wind to skim over the top of retail blocks (up to ~27m height) to join the air flow along San Wan Road to reach the SS Site 2 (Blue Arrow in Figure 24).

Part of Shek Wu Hui Jockey Club Playground is located at the downwind of PSWR Site. Thus, it is expected that the PSWR Site would induce wind shadow to the playground. The building massing of PSWR Site is setback from the north-eastern site boundary, which would allow a portion of the SE wind to reach the part of the playground (Pink Arrow in Figure 24) and mitigate the ventilation impact to the playground.

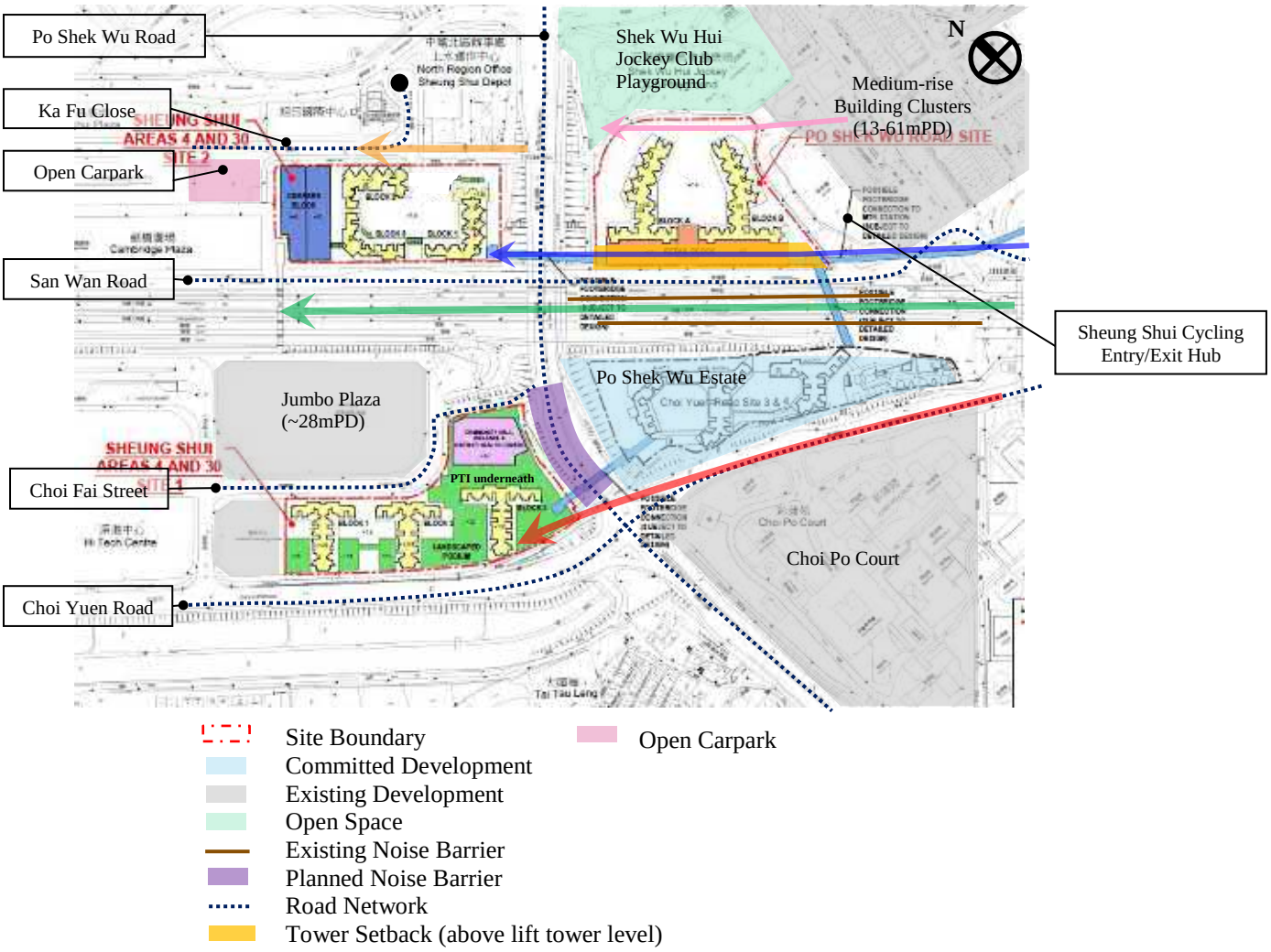


Figure 24 Wind Environment under SE Wind

6.1.5 SSE Prevailing Wind Direction

SS Site 1

Since the high-rise existing development Choi Po Court is located at the upwind position of the area, the prevailing wind would travel along Po Shek Wu Road and also skim over the villages to reach SS Site 1. Due to the wind blockage effect induced by the building towers at SS Site 1, the wind environment of the localized area along Choi Fai Street is expected to be relatively calm. Since SS Site 2 is located at the further downwind of SS Site 1, the wind availability at SS Site 2 would be lower by the proposed development at SS Site 1, even with the provision of tower separation at SS Site 1.

SS Site 2

The prevailing wind would mainly come from Choi Fai Street Po Shek Wu Road (Blue Arrow in Figure 25). There is a link bridge with cover within the project site. As the footbridge is an open footbridge, thus it is not expected to induce significant blockage expect to the air flow.

The wind environment in the downwind area of SS Site 2, i.e. Sheung Shui Wai villages, would inevitably affected by SS Site 1. For prevailing wind coming from Po Shek Wu Road (Blue Arrow in Figure 25), the Block 1 of SS Site 2 would help to downwash the incoming wind towards San Wan Road at pedestrian level and enhancing the ventilation at that area.

PSWR Site

The presence of the existing Choi Po Court and the Po Shek Wu Estate would evidently shield the SSE wind towards the PSWR Site. Therefore, the wind environment of PSWR Site and its leeward side would be generally calm. The PSWR Site itself would further shield the wind towards Shek Wu Hui Jockey Club Playground and resulting ventilation impact to the area.

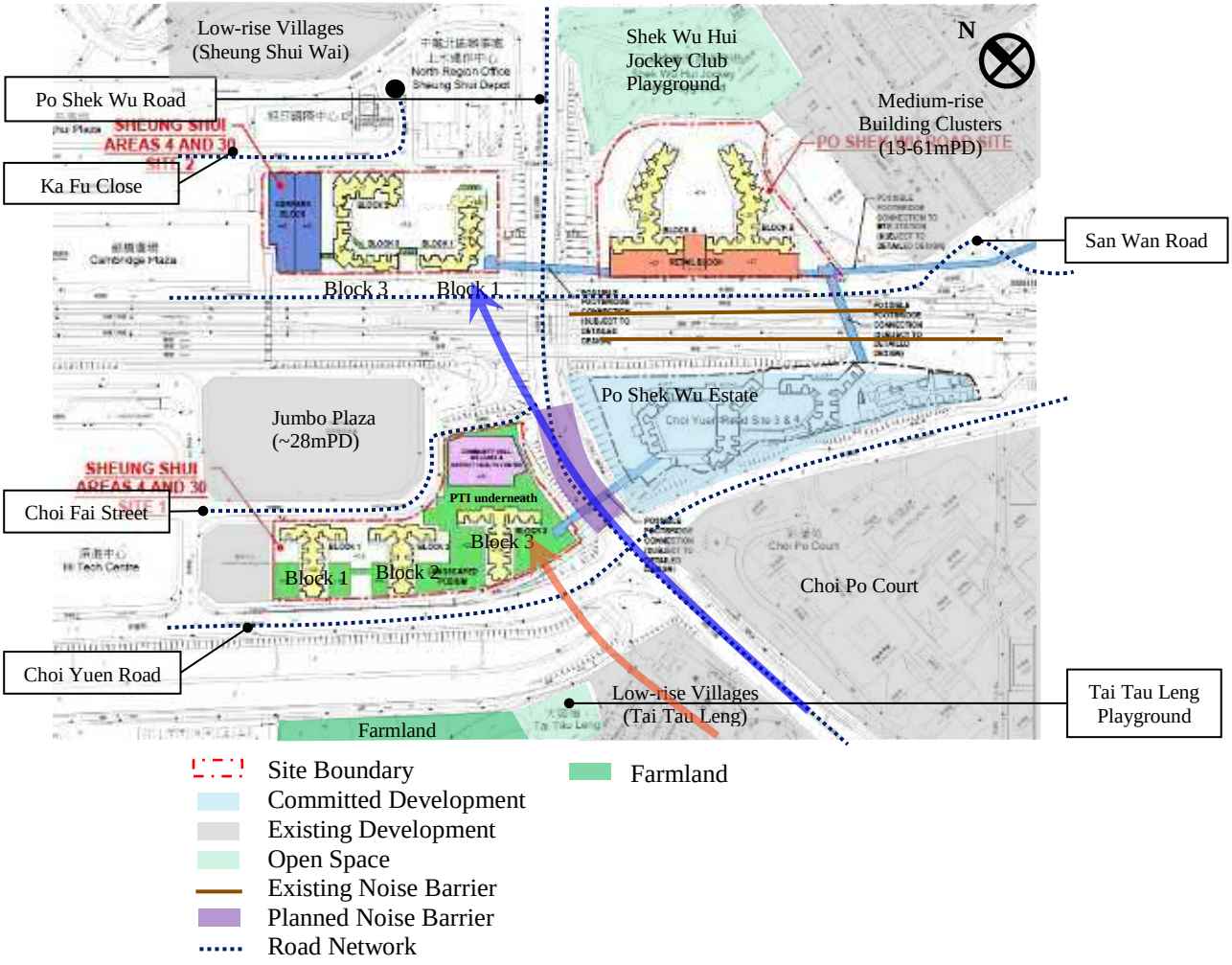


Figure 25 Wind Environment under SSE Wind

6.1.6 SSW Prevailing Wind Direction

SS Site 1

The prevailing wind would enter SS Site 1 mainly from the farmland. The wind environment of the localized area along Choi Fai Street would be expected to be relatively calm due to the wind blockage effect induced by the building towers at SS Site 1. The provision of two 15m building/tower separations between the building blocks would help to reduce the ventilation impact along part of Choi Fai Street (Red Arrows in Figure 26).

Since SS Site 2 is located at the further downwind of SS Site 1, the wind availability at SS Site 2 would be lowered by the proposed development at SS Site 1, even with the provision of building separation at SS Site 1 compared with existing condition.

SS Site 2

The SS Site 2 is generally shielded by the SS Site 1, while a portion of prevailing wind would enter the SS Site 2 from Choi Fai Street (Orange Arrow in Figure 26). The Block 2 of SS Site 2 is expected to induce localized wind shadow to the Ka Fu Close, as well as part of the Sheung Shui Wai villages.

Since the building separation of Block 1 and 3 are generally aligned with Choi Fai Street, that facilitate a portion of incoming wind further flow across the site and reach the part of the existing villages Sheung Shui Wai (Purple Arrow in Figure 26) and slightly reduce the ventilation impact.

PSWR Site

The existing wind path from SSW direction would flow along Po Shek Wu Road towards the leeward regions. The two proposed footbridges across Po Shek Wu Road (one connecting SS Site 1 and Po Shek Wu Estate, one connecting SS Site 2 and PSWR Site) are of permeable design and located far above the ground level (~ 15m above). Thus, it is expected the proposed footbridges would not induce significant ventilation impact at pedestrian level along Po Shek Wu Road.

Similar to SSE wind, the presence of the existing Choi Po Court and Po Shek Wu Estate would evidently shield the incoming wind towards PSWR Site. The PSWR Site itself would further shield the wind towards Shek Wu Hui Jockey Club Playground and resulting ventilation impact to the area.

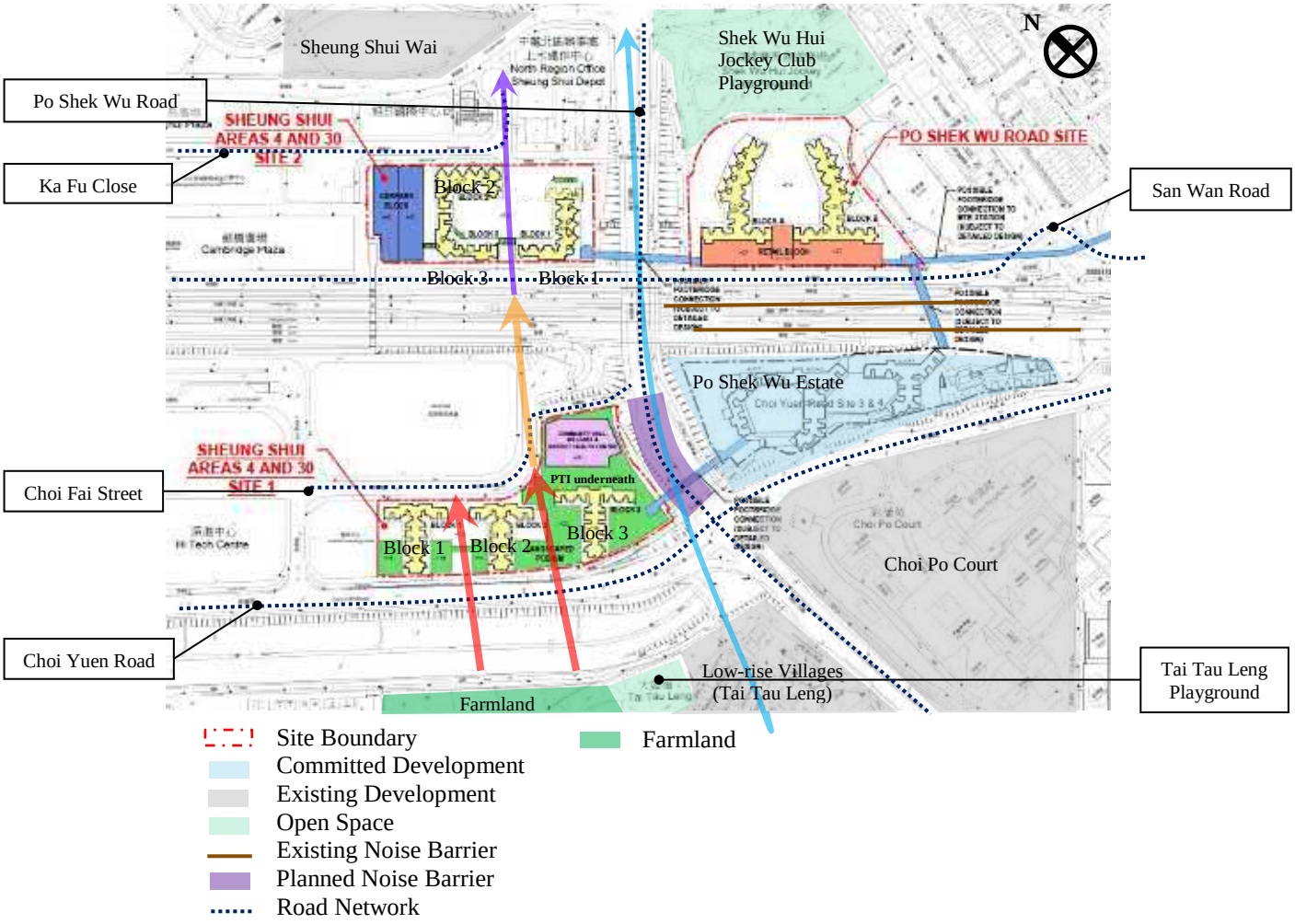


Figure 26 Wind Environment under SSW Wind

7 Wind Enhancement Features and Recommendation

To enhance the wind performance of the Proposed Developments and minimize localized ventilation impact of the surroundings, the following wind enhancement feature are recommended.

SS Site 1

The provision of covered and partly open-sided PTI under Block 3 and the Community Hall & Welfare & District Health Centre Block is expected to allow the wind penetration across the development site at mid and high-level. To further enhance the wind environment along Choi Fai Street and Choi Yuen Road at pedestrian level under prevailing winds, it is recommended to provide three wind enhancement features to enhance the low to high zone wind permeability:

- To preserve the 15m building separation between Block 1 and Block 2 from above ground level. (Podium connected by permeable link bridge with covers)
- To preserve 15m tower separation between Block 2 and Block 3 from above podium level.
- To provide a min. 7.5m width 2-storey empty bay at podium level underneath Block 3 to enhance wind permeability at the podium.

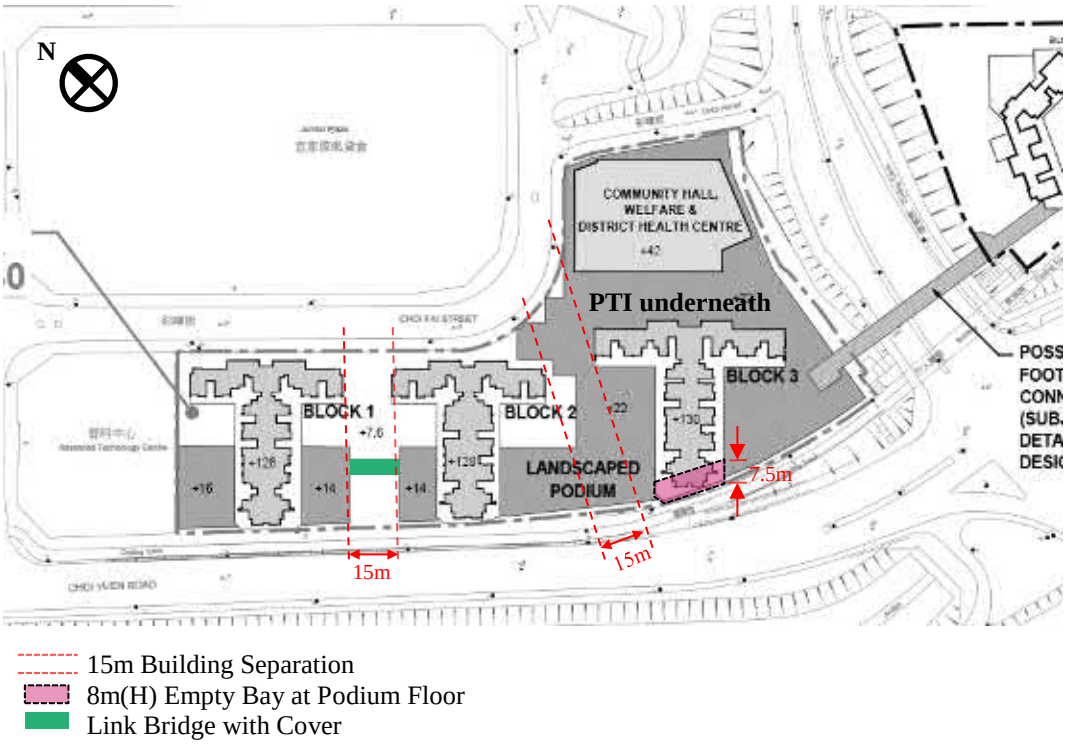


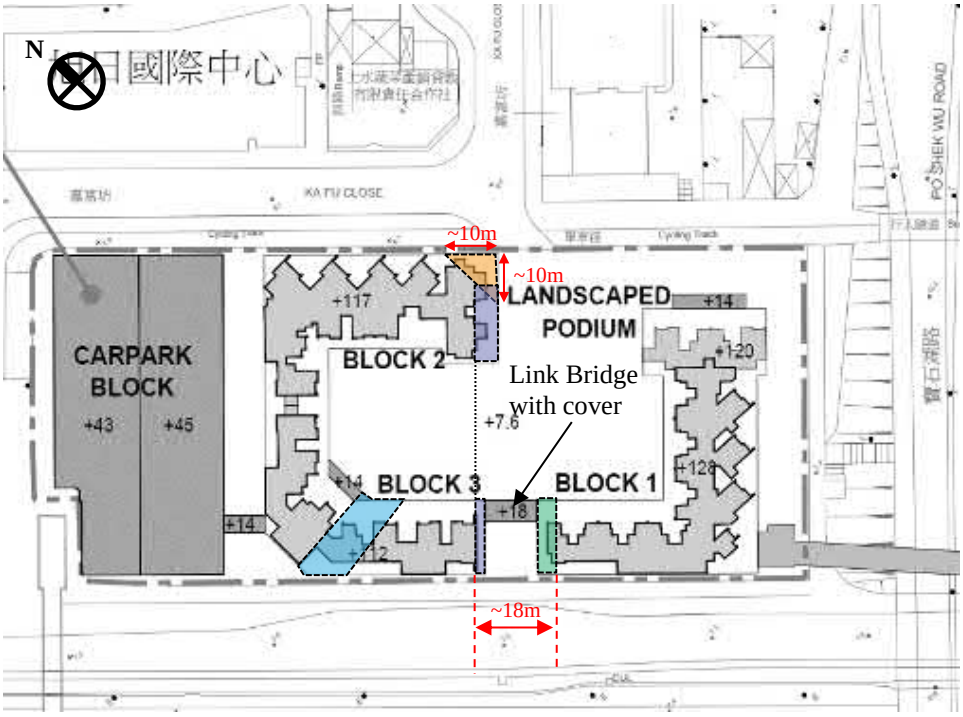
Figure 27 Wind Enhancement Features for Proposed Development at SS Site 1

SS Site 2

To further enhance the wind environment along San Wan Road , Po Shek Wu Road, Choi Fai Street and Sheung Shui Wai, it is recommended to provide the following wind enhancement features:

- To reduce the ventilation impact along San Wan Road, it is recommended to provide a ground floor empty bay with a width of about 8m at Block 3 to facilitate wind penetration from E and ESE wind.
- It is recommended to provide a ground floor empty bay at the corner of Block 2 to create a larger separation between proposed development and CLP North Region Office Sheung Shui Depot. This design feature would allow more amount of SE and E wind flow into the Ka Fu Close and reduce the ventilation impact.
- To increase the wind penetrate across the site from NNE, SSE and SSW winds, it is recommended to provide ground empty bays at Block 1 and Block 3 to increase the building separation to 18m at ground level, another ground empty bays at Block 2 is also recommended to align with the building separation to continue penetration effect.

The link footbridge between Block 1 and 3 serve as circulation for podium level, it is still expected the structure would only slightly reduce the air flow between Block 1 and 3.



8m(W) x 3.5m(H) Empty Bay at Ground Floor
3.5m(H) Empty Bay at Ground Floor
1m(W) x 3.5m(H) Empty Bay at Ground Floor
2m(W) x 3.5m(H) Empty Bay at Ground Floor

Figure 28 Wind Enhancement Features for Proposed Development at SS Site 2

As Po Shek Wo Road level (~12.4mPD) is similar to the podium level of SS Site 2 (~14mPD), the podium level empty is expected to allow the pedestrian wind from Po Shek Wo Road to flow through effectively.

- For podium level, it is recommended to provide some podium floor empty bays at Block 1 and the corner of Block 2 to allow more amount of SE wind flow into the Ka Fu Close and reduce the ventilation impact.
- For tower level, it is recommended to preserve the ~15m tower separation between Block 1 and Block 3 from above podium level to facilitate the wind penetration along NE/SW directions

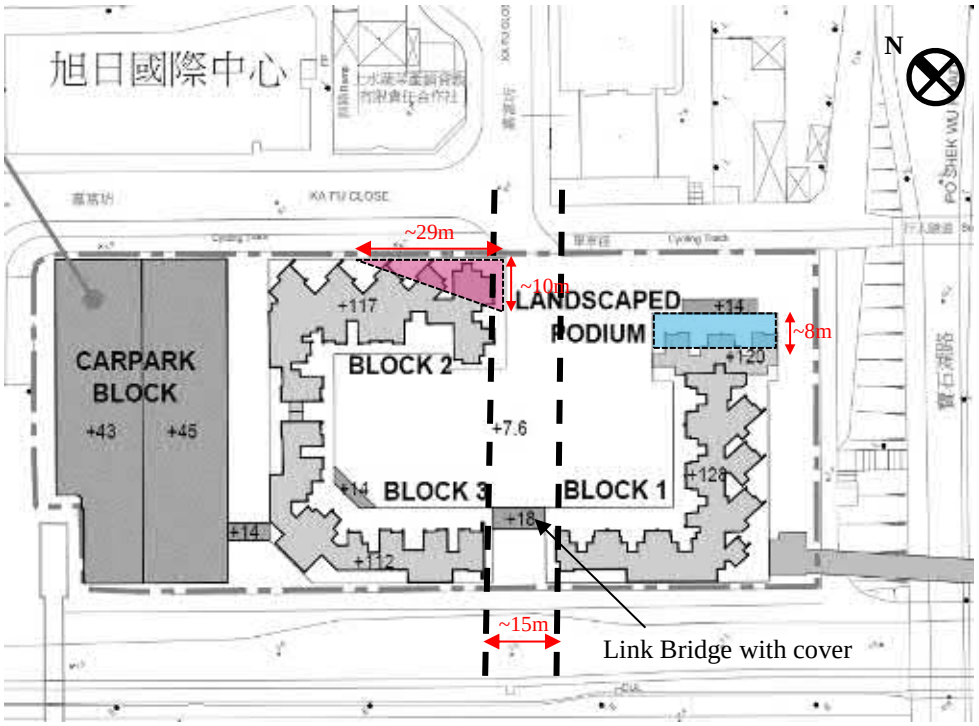


Figure 29 Wind Enhancement Features for Proposed Development at SS Site 2

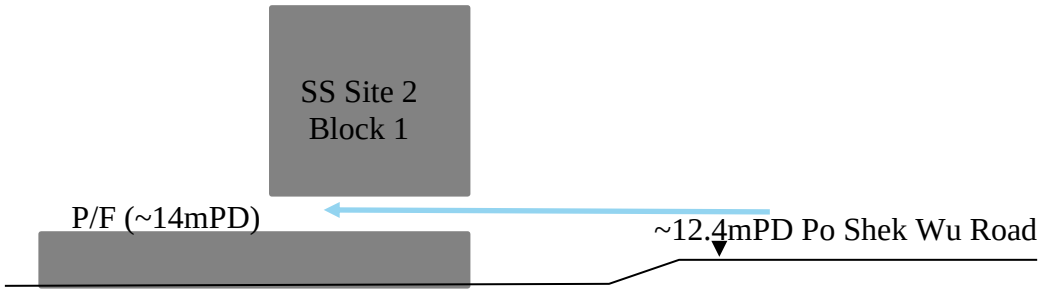


Figure 30 Indicative Section for SS Site 2

PSWR Site

In order to increase wind permeability through PSWR Site and to facilitate wind penetration along the prevailing wind, the wind enhancement feature for the proposed development at PSWR Site are as below:

- A min. 15m widen building separation (at above ground level) between Block A and Block B is recommended to enhance the wind permeability across the site.
- To provide min. 14m width 1-storey ground floor empty bay at Block A to facilitate wind penetrate complementary with the 15m building separation to facilitate NNE wind to channel across the Po Shek Wu Road and San Wan Road.
- The ~15m building setback from the northern corner in preliminary scheme is good wind enhancement feature and it is recommended to preserve.
- The ~17m air path between Block B and the lift tower in the preliminary scheme is a good wind enhancement feature and recommended to preserve.

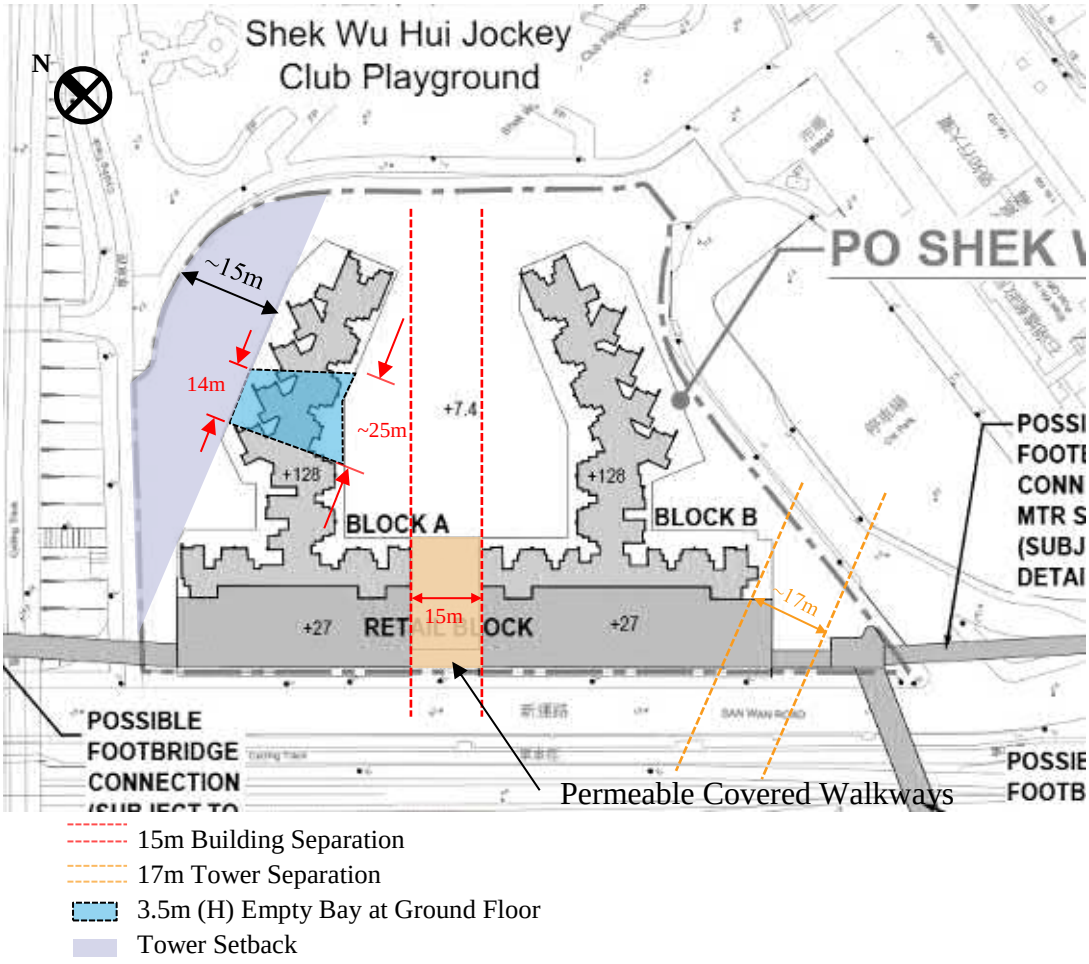


Figure 31 Wind Enhancement Feature for Proposed Development at PSWR Site

For improvement in urban climate, the following design principles should be considered as far as practicable:

- Adopt building permeability equivalent to 20% to 33.3% with reference to PNAP APP-152;
- Minimize podium bulk with ground coverage of no more than 65% where feasible;
- Adopt building setback with reference to PNAP APP-152;
- Incorporate green coverage not less than 20%, targeting 30% wherever practicable;
- Avoid long continuous façades; and
- Make reference to the recommendations of design measures in the Hong Kong Planning Standards and Guidelines.

8 Further Quantitative Study

Since the ventilation impact of the Developments at SS Site 1, SS Site 2 and PSWR Site would subject to the detailed building design of the Developments at SS Site 1, SS Site 2 and PSWR Site, it is recommended to proceed with the AVA Initial Study to investigate the wind performance quantitatively with considerations of the proposed wind enhancement features, which shall follow the guideline given in "*HOUSING, PLANNING AND LANDS BUREAU TECHNICAL CIRCULAR NO. 1/06 ENVIRONMENT, TRANSPORT AND WORKS BUREAU TECHNICAL CIRCULAR NO. 1/06, Technical Guide for Air Ventilation Assessment for Developments in Hong Kong*". AVA Initial Study shall be conducted in the detail design stage to assess the above recommended mitigation measures in Section 7 and for scheme optimization.

9 Conclusion

Qualitative assessment of the wind environment of the developments at SS Site 1, SS Site 2 and PSWR Site was conducted in this study. The air ventilation impacts of the building design for these three developments were studied. It is noted that the proposed developments suffer from heavy railway noise from the East Rail Line. Thus, these proposed developments have adopted single aspect design, facing the railway to reduce the noise impact.

According to the analysis, the annual prevailing wind comes from NNE, E and ESE directions while the summer prevailing wind is from ESE, SE, SSE and SSW directions. The ventilation performance of the Proposed Developments has been analysed and given in Section 6. The problematic areas are summarized at below:

Under annual wind condition, SS Site 1 and SS Site 2 would induce wind shadow at Tai Tau Leng Playground and the low-rise villages of Tai Tau Leng under NNE Wind. SS Site 1 would inevitably induce wind shadow along Choi Yuen Road under Easterly quadrant wind direction, the covered and partly open-sided PTI at ground level would allow wind penetration at the pedestrian level to mitigate the ventilation impact. Block 1 and 3 of SS Site 2 would induce wind shadow towards the pedestrian areas around Jumbo Plaza under NNE wind. The presence of SS Site 2 Block 3 and PSWR Site would induce small wind shadow at San Wan Road. The ventilation impact at San Wan Road will in turn affect the ventilation performance of Po Shek Wu Estate and part of Po Shek Wu Road as well.

Under summer wind condition, the presence of SS Site 1 would induce wind blockage effect along Choi Fai Street. As SS Site 2 is located at the downstream area of SS Site 1 and PSWR Site, SS Site 2 would have lower wind availability and localized wind shadow. The wind shielding effect of upstream development such as SS Site 2 and PSWR Site would cause localized wind shadows at Shek Wu Hui Jockey Club Playground. The presence SS Site 2 would also causing certain ventilation impact at Ka Fu Close, carpark and Sheung Shui Wai villages.

To further enhance the wind environment surrounded the Project Sites at pedestrian level, it is recommended to provide several wind enhancement features to increase the wind permeability:

SS Site 1

- To preserve the 15m building separation between Block 1 and Block 2 from above ground level;
- To preserve 15m tower separation between Block 2 and Block 3 from above podium level; and
- To provide a min. 7.5m width 2-storey empty bay at podium level underneath Block 3.

SS Site 2

- To provide a ground floor empty bay with about 8m in width at Block 3;
- To provide a ground floor empty bay at the corner of Block 2;

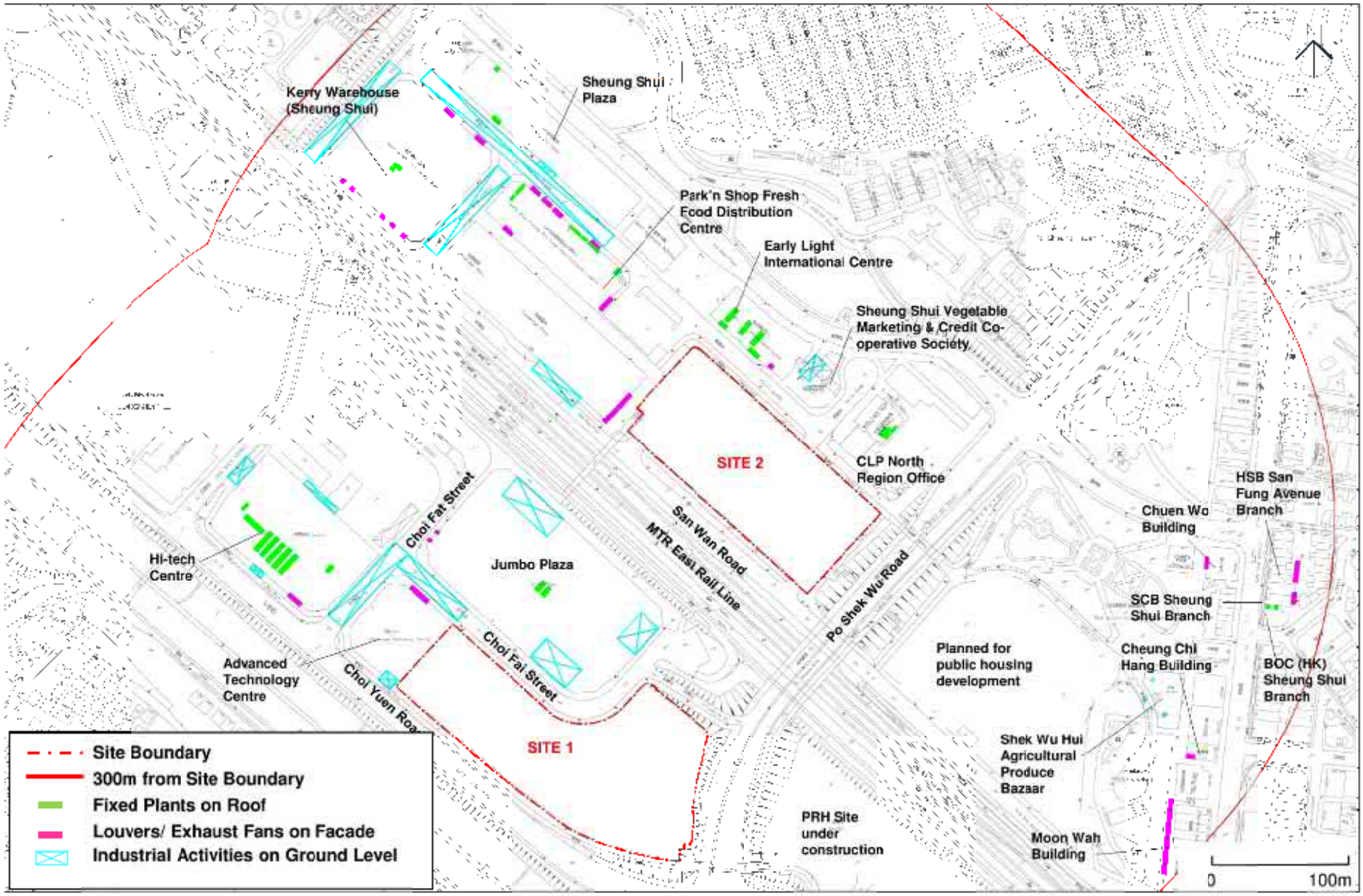
- To provide ground empty bays at Block 1 and Block 3 to increase the building separation to 18m at ground level, another ground empty bays at Block 2 is also recommended to align with building separation;
- To provide some podium floor empty bays at Block 1 and the corner of Block 2; and
- To preserve the ~15m tower separation between Block 1 and Block 3 from above podium level.

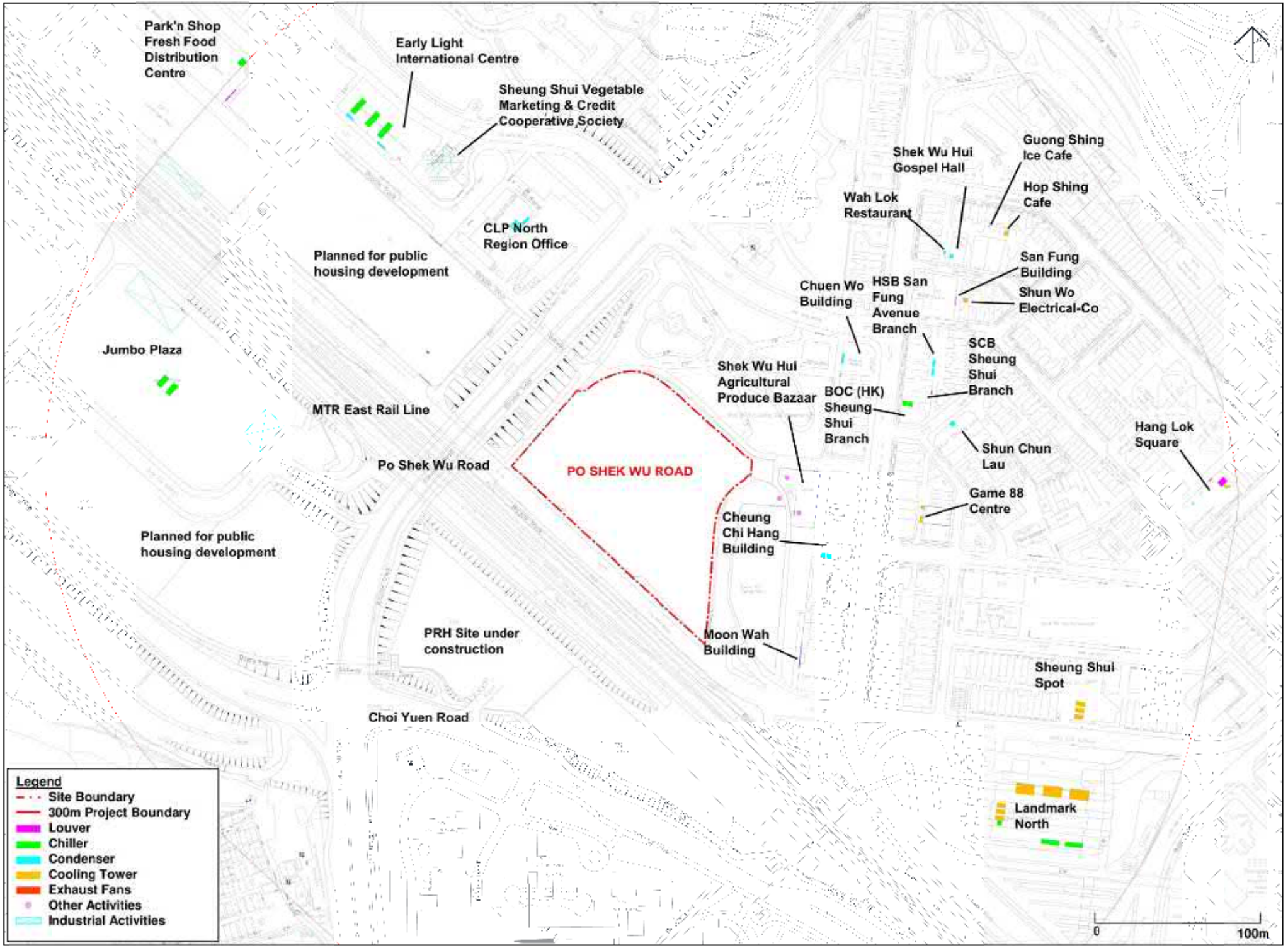
PSWR Site

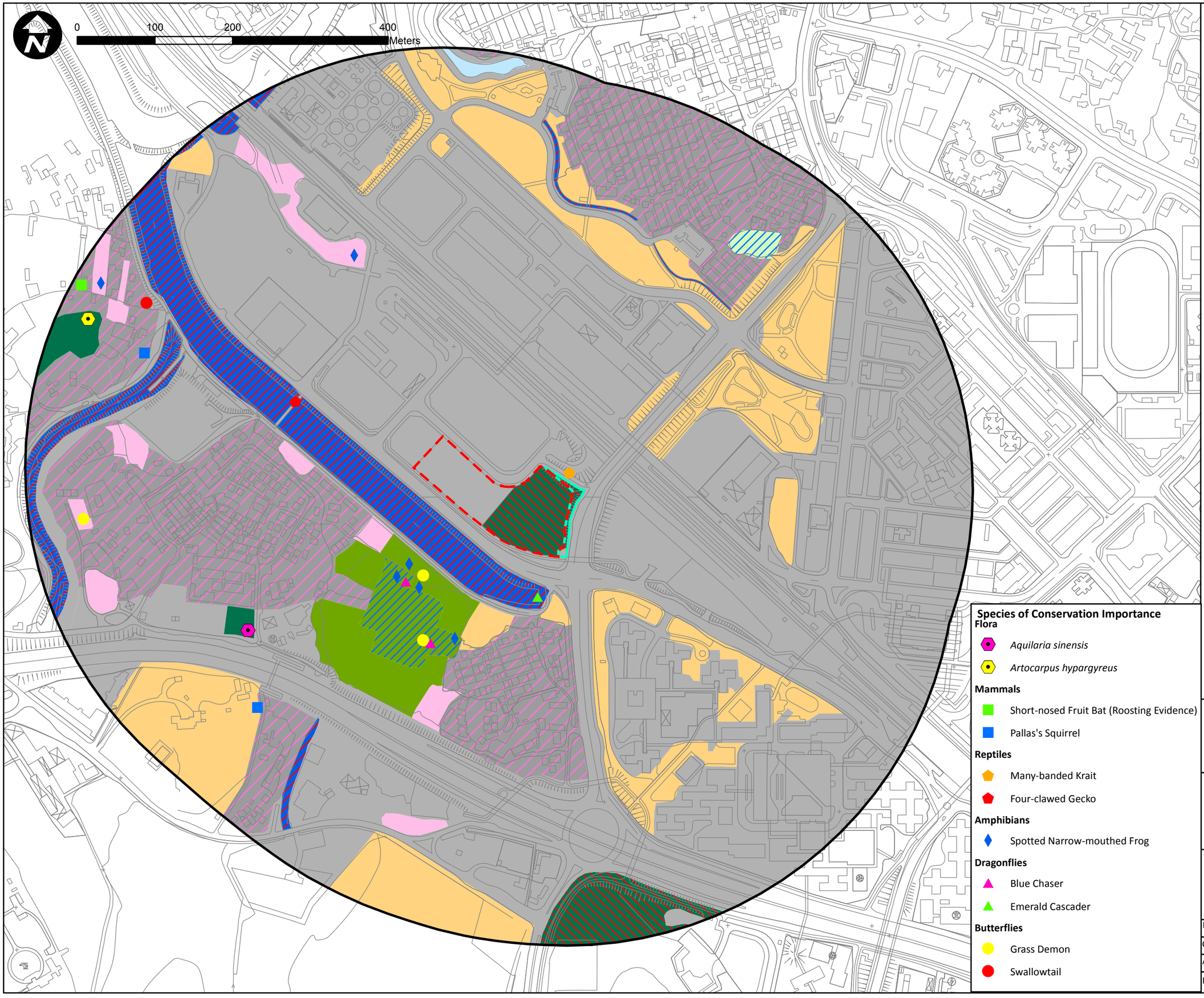
- To provide the min. 15m building separation (at above ground level) between Block A and Block B;
- To provide min. 14m width 1-storey ground floor empty bay at Block A;
- To preserve the ~15m building setback from the northern corner of the site; and
- To preserve the ~17m air path between Block B and the lift tower.

This Expert Evaluation provides qualitative analysis of wind performance of the Developments at SS Site 1, SS Site 2 and PSWR Site. AVA Initial Study shall be conducted in the detail design stage to assess the above recommended mitigation measures in Section 7 and for scheme optimization.

Appendix 6


Kerry Warehouse (Sheung Shui)
Sheung Shui Plaza
Park'n Shop Fresh Food Distribution Centre
Early Light International Centre
Sheung Shui Vegetable Marketing & Credit Co-operative Society
SITE 2
CLP North Region Office
HSB San Fung Avenue Branch
Chuen Wo Building
Choi Fat Street
San Wan Road
MTR East Rail Line
Po Shek Wu Road
Hi-tech Centre
Jumbo Plaza
SCB Sheung Shui Branch
Planned for public housing development
Cheung Chi Hang Building
BOC (HK) Sheung Shui Branch
Advanced Technology Centre
Choi Yuen Road
Choi Fai Street
SITE 1
Shek Wu Hui Agricultural Produce Bazaar
PRH Site under construction
Moon Wah Building
Site Boundary
300m from Site Boundary
Fixed Plants on Roof
Louvers/ Exhaust Fans on Facade
Industrial Activities on Ground Level
0
100m


Park'n Shop Fresh Food Distribution Centre
Early Light International Centre
Sheung Shui Vegetable Marketing & Credit Cooperative Society
CLP North Region Office
Planned for public housing development
Jumbo Plaza
MTR East Rail Line
Po Shek Wu Road
PO SHEK WU ROAD
Planned for public housing development
PRH Site under construction
Choi Yuen Road
Shek Wu Hui Gospel Hall
Guong Shing Ice Cafe
Wah Lok Restaurant
Hop Shing Cafe
San Fung Building
Chuen Wo Building
HSB San Fung Avenue Branch
Shun Wo Electrical-Co
SCB Sheung Shui Branch
Shek Wu Hui Agricultural Produce Bazaar
BOC (HK) Sheung Shui Branch
Shun Chun Lau
Hang Lok Square
Game 88 Centre
Cheung Chi Hang Building
Moon Wah Building
Sheung Shui Spot
Landmark North
Legend
Site Boundary
300m Project Boundary
Louver
Chiller
Condenser
Cooling Tower
Exhaust Fans
Other Activities
Industrial Activities
0
100m



Proposed Works Area

- Proposed Site Boundary
- Associated Slope Works Area
- Study Area
- Dry Agricultural Land
- Wet Agricultural Land
- Pond
- Channelised Watercourse
- Seasonally Wet Grassland
- Secondary Woodland
- Plantation
- Landscaped Area
- Village Area
- Wasteland
- Urban/ Residential Area

Species of Conservation Importance

Flora

- *Aquilaria sinensis*
- *Artocarpus hypargyreus*

Mammals

- Short-nosed Fruit Bat (Roosting Evidence)
- Pallas's Squirrel

Reptiles

- Many-banded Krait
- Four-clawed Gecko

Amphibians

- Spotted Narrow-mouthed Frog

Dragonflies

- Blue Chaser
- Emerald Cascader

Butterflies

- Grass Demon
- Swallowtail

ecology arboriculture landscape aec

Project Title:

Agreement No. CB20160204
Consultancy Service for Ecological Assessment for Sheung Shui Areas 4 and 30 Site 1

Figure Title:

Habitat Map with Locations of Floral and Non-avian Faunal Species of Conservation Importance Recorded within the Proposed Works Area and the Study Area

Drawn by:	JH	Scale:	1:4,500 on A3
Checked By:	BH	Date:	21 Jul 2017
Approved by:	GL		
Figure Number:		Revision:	0

Preliminary Tree Survey
(as at August 2018)

Sheung Shui Areas 4 and 30 Site 1

1.0 Preliminary Tree Survey

1.1 A preliminary tree survey for the captioned project was carried out in August 2018. The survey consist of a preliminary assessment of existing trees on site in groups of different girth size, with respect to their species and approximate quantities of each group by observation.

1.2 There is no any rare or endangered species found during the preliminary tree survey. No Registered Old and Valuable Tree (OVT) and potentially registrable in accordance with the criteria as set out in ETWB TCW No. 29/2004 within the proposed site boundary. The existing trees are surveyed in groups with no particular assessment made to health, structural condition and amenity value on individual trees. Most tree species identified are commonly found in Hong Kong

1.3 There are no recommended treatments of tree (retain/ transplant/ fell) at this early stage as the recommendations are subjected to detailed tree survey and design development. As extensive site formation works expected, more than 90% of the existing trees are anticipated to be transplanted or felled. A detailed tree survey will be carried out at next stage to provide basis for tree treatment recommendations.

1.4 The subject site in Sheung Shui Areas 4 and 30 Site 1 is currently under STT and used an open carpark. As per our preliminary survey, approximately 680 trees are identified within the site boundary. About 100 trees are estimated with girth size over 1000mm. Existing trees surveyed are generally species commonly found in Hong Kong, with average health and amenity value. This plantation was planted mainly with exotic tree *Acacia confusa*, together with a small number of *Acacia auriculiformis*. Very few native tree seedlings and saplings were found in the woodland understory as the quick establishment of the highly invasive tree *Leucaena leucocephala* has outcompeted most native vegetation. Most of the existing trees observed with cracked trunks, over dense and pest inflections, resulting in poor structural and health conditions.

Preliminary Tree Survey
(as at August 2018)

1.5 Summary of general tree species and estimated quantities:

	Estimated Nos. of Trees	Tree Species
Tree with girth ≧1000mm	100	*Acacia auriculiformis* 大葉相思, *Acacia confusa* 台灣相思, *Melia azedarach* 苦楝
Tree with girth ≧600mm and <1000mm	150	*Acacia auriculiformis* 大葉相思, *Acacia confusa* 台灣相思, *Melia azedarach* 苦楝
Tree with girth ≧300mm and <600mm	380	*Acacia auriculiformis* 大葉相思, *Acacia confusa* 台灣相思, *Celtis sinesis* 朴樹, *Lagerstroemia speciosa* 大葉紫薇, *Leucaena leucocephala* 銀合歡, *Melaleuca cajuputi subsp. cumingiana* 白千層, *Melia azedarach* 苦楝
Tree with girth ＜300mm	50	*Acacia auriculiformis* 大葉相思, *Acacia confusa* 台灣相思, *Lagerstroemia speciosa* 大葉紫薇, *Leucaena leucocephala* 銀合歡
Total nos. of trees	680	

Sheung Shui Areas 4 and 30 Site 2

2.0 Preliminary Tree Survey

2.1 A preliminary tree survey for the captioned project was carried out in August 2018. The survey consist of a preliminary assessment of existing trees on site in groups of different girth size, with respect to their species and approximate quantities of each group by observation.

2.2 There is no any rare or endangered species found during the preliminary tree survey. No Registered Old and Valuable Tree (OVT) and potentially registrable in accordance with the criteria as set out in ETWB TCW No. 29/2004 within the proposed site boundary. The existing trees are surveyed in groups with no particular assessment made to health, structural condition and amenity value on individual trees. Most tree species identified are commonly found in Hong Kong

2.3 There are no recommended treatments of tree (retain/ transplant/ fell) at this early stage as the recommendations are subjected to detailed tree survey and design development. As extensive site formation works expected, more than 90% of the existing trees are anticipated to be transplanted or felled. A detailed tree survey will be carried out at next stage to provide basis for tree treatment recommendations.

2.4 The subject site in Sheung Shui Areas 4 and 30 Site 2 is partially used as an open space carpark under STT and partially as WSD depot. As per our preliminary survey, approximately 45 nos. of trees are identified within the site boundary. 2 nos. of trees are estimated with girth size between 600mm and 1000mm. Existing trees surveyed are generally species commonly found in Hong Kong with average health and amenity value. Several severe leaning *Acacia confusa* growing along the slope near the site boundary have been identified.

Preliminary Tree Survey
(as at August 2018)

2.5 Summary of general tree species and estimated quantities:

	Estimated Nos. of Trees	Tree Species
Tree with girth ≧600mm and <1000mm	2	*Ficus virens* 大葉榕, *Ficus microcarpa* 細葉榕
Tree with girth ≧300mm and <600mm	40	*Acacia auriculiformis* 大葉相思, *Acacia confusa* 台灣相思, *Bischofia javanica* 秋楓, *Bombax ceiba* 木棉, *Leucaena leucocephala* 銀合歡, *Macaranga tanarius* 血桐, *Melia azedarach* 苦楝
Tree with girth ＜300mm	3	*Leucaena leucocephala* 銀合歡
Total nos. of trees	45	

Preliminary Tree Survey
(as at August 2018)

Po Shek Wu Road Site

3.0 Preliminary Tree Survey

3.1 A preliminary tree survey for the captioned project was carried out in August 2018. The survey consist of a preliminary assessment of existing trees on site in groups of different girth size, with respect to their species and approximate quantities of each group by observation.

3.2 There is no any rare or endangered species found during the preliminary tree survey. No Registered Old and Valuable Tree (OVT) and potentially registrable in accordance with the criteria as set out in ETWB TCW No. 29/2004 within the proposed site boundary. The existing trees are surveyed in groups with no particular assessment made to health, structural condition and amenity value on individual trees. Most tree species identified are commonly found in Hong Kong

3.3 There are no recommended treatments of tree (retain/ transplant/ fell) at this early stage as the recommendations are subjected to detailed tree survey and design development. As extensive site formation works expected, more than 90% of the existing trees are anticipated to be transplanted or felled. A detailed tree survey will be carried out at next stage to provide basis for tree treatment recommendations.

3.4 The subject site in Po Shek Wu Road is currently used as a bus depot under STT. As per our preliminary survey, approximately 30 trees are identified within or close to the site boundary. Approximate 15 trees are estimated with girth size over 1000mm. Existing trees surveyed are generally species commonly found in Hong Kong, with average health and amenity value. Some existing trees observed on site growing in congested planters with limited root growth, resulting in poor structural and health conditions.

Preliminary Tree Survey
(as at August 2018)

3.5 Summary of general tree species and estimated quantities:

	Estimated Nos. of Trees	Tree Species
Tree with girth ≧1000mm	15	*Bombax ceiba* 木棉, *Melia azedarach* 苦楝
Tree with girth ≧600mm and <1000mm	15	*Acacia auriculiformis* 大葉相思,, *Bombax ceiba* 木棉, *Cascabela thevetia* 黃花夾竹桃, *Celtis sinesis* 朴樹, *Ficus virens* 大葉榕, *Leucaena leucocephala* 銀合歡, *Melia azedarach* 苦楝
Tree with girth ≧300mm and <600mm	0	
Tree with girth ＜300mm	0	
Total nos. of trees	30	





Existing Tree Groups Conditions:
Lots of Leucaena leucocephala were found within site. Most of the existing trees observed with cracked trunks, over dense and pest inflections, resulting in poor structural and health conditions.

LEGEND

PROPOSED SITE BOUNDARY

EXISTING TREE GROUP OVERLAY



KEY PLAN 1:7000

彩暉街

CHOI FAI STREET

CHOI FAI ST

晉科中心
Advanced Technology Centre

32.5

RAMP UP 1:12

CHOI YUEN ROAD

單車徑 Cycling Track

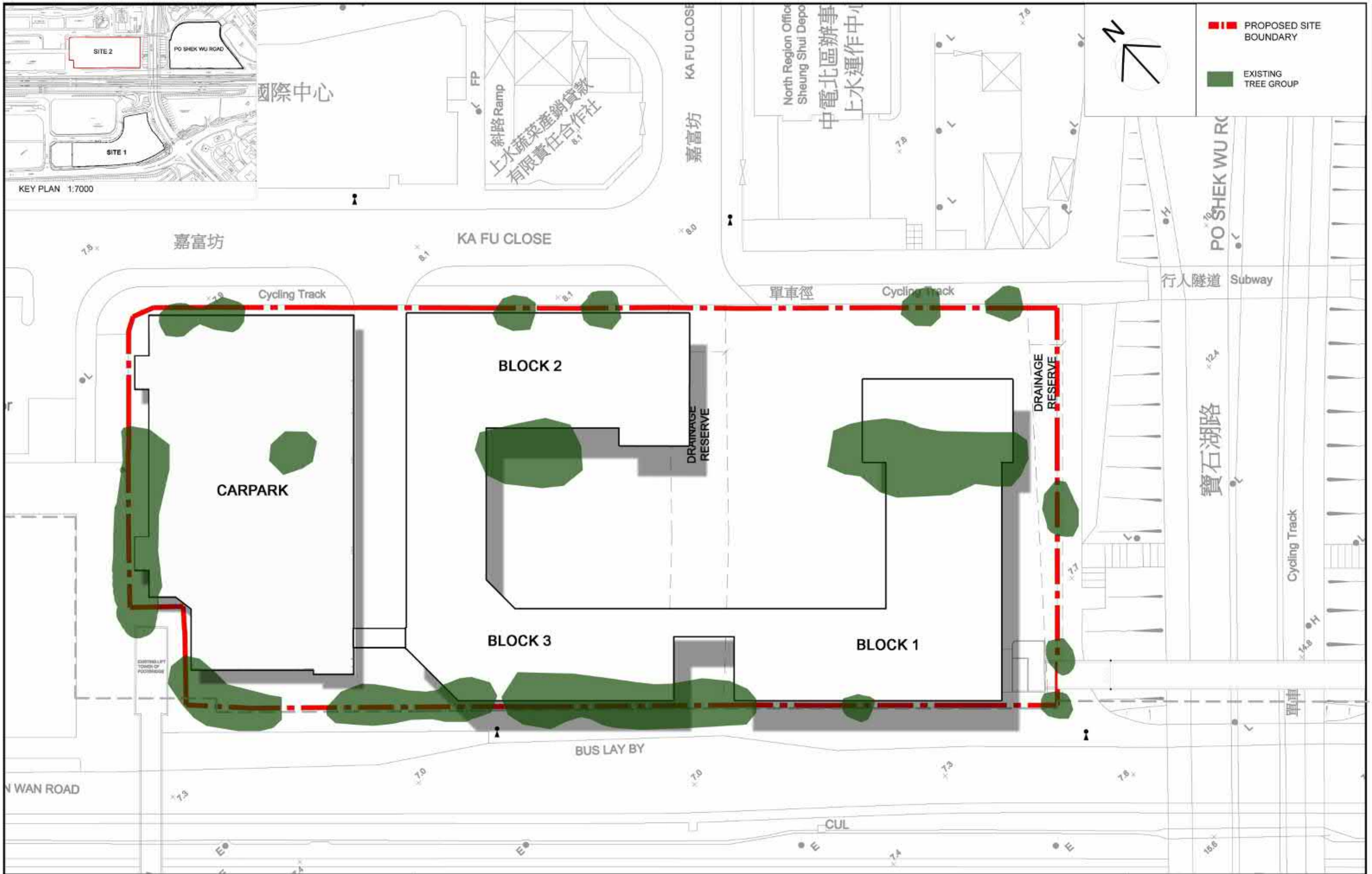
Subway

Nullah

渠

Ramp

PROJECT	DRAWING TITLE		
SHEUNG SHUI AREAS 4 AND 30 SITE 1	**BROADBRUSH TREE SURVEY** (CONCEPTUAL LAYOUT PLAN FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)	SCALE : 1:800 (A3)	房屋署 HOUSING DEPARTMENT 編號 PLAN NO. SS30/SITE1/LMP/L/LO-02/D 日期 DATE: 20. 08. 2018



PROJECT

SHEUNG SHUI AREAS 4 AND 30 SITE 2

DRAWING TITLE

BROADBRUSH TREE SURVEY

(CONCEPTUAL LAYOUT PLAN FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

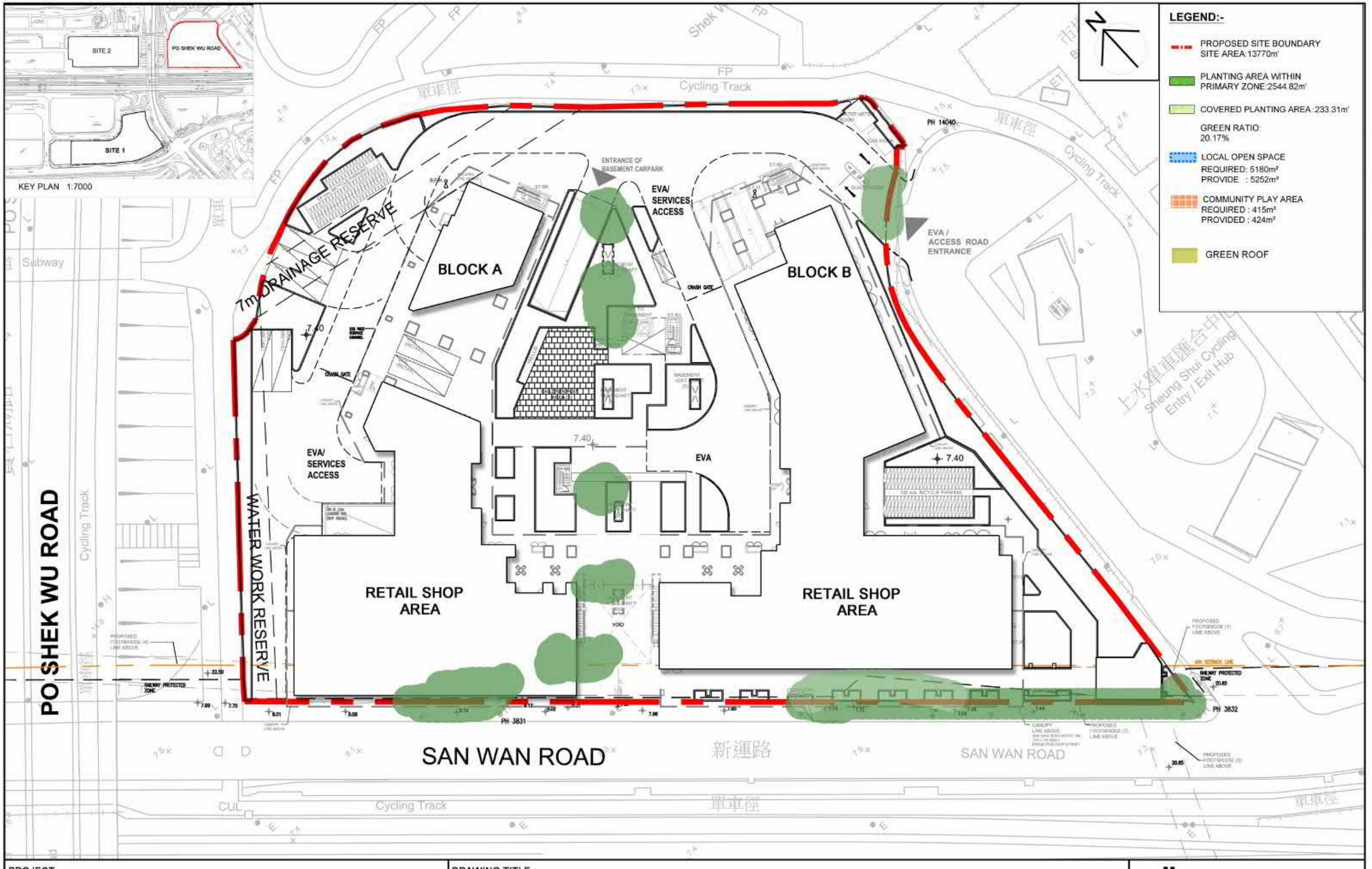
SCALE : 1:600 (A3)

房屋署 HOUSING DEPARTMENT

編號 PLAN NO. SS30/SITE2/LMP/L/LO-02/D

日期 DATE: 20.08. 2018

20180806



PROJECT

PO SHEK WU ROAD SHEUNG SHUI

DRAWING TITLE

BROADBRUSH TREE SURVEY

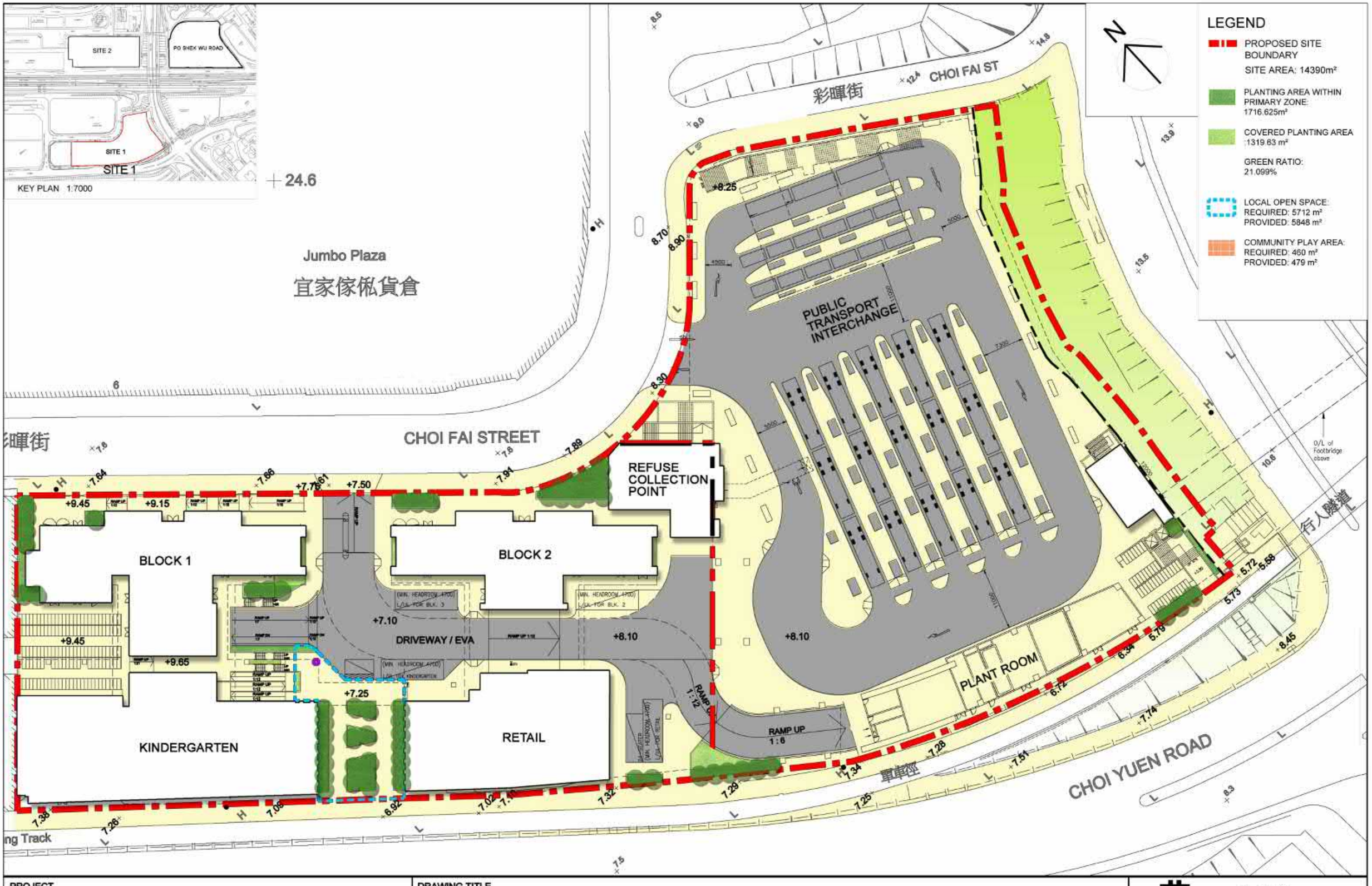
(CONCEPTUAL LAYOUT PLAN FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

SCALE 1 :600(A3)

房屋署
HOUSING DEPARTMENT

圖號 PLAN No. SS30/PSWR/LMP/L/LO-02/F

日期 DATE: 25.01.2019



PROJECT

SHEUNG SHUI AREAS 4 AND 30 SITE 1

DRAWING TITLE

CONCEPTUAL LANDSCAPE MASTER PLAN (GROUND FLOOR)

(CONCEPTUAL LAYOUT PLAN FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

SCALE : 1:600 (A3)

房屋署 HOUSING DEPARTMENT

圖號 PLAN NO. SS30/SITE1/LMP/L/LO-01/G

日期 DATE: 07. 09. 2018



KEY PLAN 1:7000

+24.6

Jumbo Plaza
宜家傢俬貨倉

彩暉街

CHOI FAI ST

CHOI FAI STREET

PUBLIC TRANSPORT INTERCHANGE

REFUSE COLLECTION POINT

BLOCK 1

BLOCK 2

DRIVEWAY / EVA

KINDERGARTEN

RETAIL

PLANT ROOM

RAMP UP 1:12

RAMP UP 1:6

CHOI YUEN ROAD

行人隧道

O/L of Footbridge above

ng Track

N

LEGEND

- PROPOSED SITE BOUNDARY
  SITE AREA: 14390m²
- PLANTING AREA WITHIN PRIMARY ZONE: 1716.625m²
- COVERED PLANTING AREA :1319.63 m²
- GREEN RATIO: 21.099%
- LOCAL OPEN SPACE: REQUIRED: 5712 m² PROVIDED: 5848 m²
- COMMUNITY PLAY AREA: REQUIRED: 460 m² PROVIDED: 479 m²

PROJECT

SHEUNG SHUI AREAS 4 AND 30 SITE 1

DRAWING TITLE

CONCEPTUAL LANDSCAPE MASTER PLAN (GROUND FLOOR)

(CONCEPTUAL LAYOUT PLAN FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

SCALE : 1:600 (A3)

房屋署
HOUSING DEPARTMENT

圖號 PLAN NO. SS30/SITE1/LMP/L/LO-01/G

日期 DATE: 07. 09. 2018



PROJECT

SHEUNG SHUI AREAS 4 AND 30 SITE 1

DRAWING TITLE

CONCEPTUAL LANDSCAPE MASTER PLAN (PODIUM FLOOR)

(CONCEPTUAL LAYOUT PLAN FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

SCALE : 1:800 (A3)

房屋署
HOUSING DEPARTMENT

編號 PLAN NO. SS30/SITE1/LMP/L/LO-01.1/A

日期 DATE: 07.08.2018



PROJECT

SHEUNG SHUI AREAS 4 AND 30 SITE 1

DRAWING TITLE

CONCEPTUAL LANDSCAPE MASTER PLAN (PODIUM FLOOR)

(CONCEPTUAL LAYOUT PLAN FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

SCALE : 1:800 (A3)

房屋署 HOUSING DEPARTMENT

編號 PLAN NO. SS30/SITE1/LMP/L/LO-01.1/A

日期 DATE: 07.08.2018



PROJECT

SHEUNG SHUI AREAS 4 AND 30 SITE 1

DRAWING TITLE

CONCEPTUAL LANDSCAPE PLAN (GREEN ROOF) (CONCEPTUAL LAYOUT PLAN FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

SCALE : 1:800 (A3)

房屋署 HOUSING DEPARTMENT

編號 PLAN NO. SS30/SITE1/LMP/L/LO-01.2/**B**

日期 DATE: **25.01.2018**



KEY PLAN 1:7000

LEGEND

PROPOSED SITE BOUNDARY
SITE AREA: 14390m²

PLANTING AREA WITHIN PRIMARY ZONE:
1716.625m²

COVERED PLANTING AREA
:1319.63 m²

GREEN RATIO:
21.099%

LOCAL OPEN SPACE:
REQUIRED: 5712 m²
PROVIDED: 5848 m²

COMMUNITY PLAY AREA:
REQUIRED: 460 m²
PROVIDED: 479 m²

GREEN ROOF

N

彩暉街 CHOI FAI ST

CHOI FAI STREET

Jumbo Plaza
宜家傢俬貨倉

24.6

+42.00

+42.00

+42.00

Cycling Track 單車徑

Cycling 單車徑

Subway 行人隧道

BLOCK 1

BLOCK 2

BLOCK 3

+13.3

+21.3

RAMP UP 1 : 12

晉科中心
Advanced Technology Centre

32.5

單車徑 Cycling Track

CHOI YUEN ROAD

Nullah 渠

Ramp

PROJECT SHEUNG SHUI AREAS 4 AND 30 SITE 1	DRAWING TITLE **CONCEPTUAL LANDSCAPE PLAN (GREEN ROOF)** (CONCEPTUAL LAYOUT PLAN FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW) SCALE : 1:800 (A3)	房屋署 HOUSING DEPARTMENT 編號 PLAN NO. SS30/SITE1/LMP/L/LO-01.2/**B** 日期 DATE: **25.01.2018**

KEY PLAN 1:7000

SITE 2

PO SHEK WU ROAD

SITE 1

SITE 1

際中心

FP

斜路 Ramp

上水蔬菜產銷實款有限責任合作社

KA FU CLOSE

嘉富坊

North Region Office, Sheung Shui Depot

中電北區辦事處上水運作中心

嘉富坊

KA FU CLOSE

Cycling Track

單車徑

Cycling Track

行人隧

CARPARK

BLOCK 2

CPA

DRAINAGE RESERVE

DRAINAGE RESERVE

BLOCK 1

STORE

PLANT STORAGE COMPOUND

COMMUNITY FARM

寶石湖路

Cycling Track

單車徑

Block 3

EXISTING LIFT TOWER OF FOOTBRIDGE

BUS LAY BY

WAN ROAD

CUL

LEGEND

- PROPOSED SITE BOUNDARY
  SITE AREA: 11310 m²
- PLANTING AREA WITHIN PRIMARY ZONE: 1762 m²
- COVERED PLANTING AREA : 560 m²
- GREEN RATIO: 20.54%
- LOCAL OPEN SPACE:
  REQUIRED: 4144 m²
  PROVIDED: 4420 m²
- COMMUNITY PLAY AREA:
  REQUIRED: 332 m²
  PROVIDED: 392 m²

PROJECT

SHEUNG SHUI AREAS 4 AND 30 SITE 2

DRAWING TITLE

CONCEPTUAL LANDSCAPE MASTER PLAN (GROUND FLOOR)

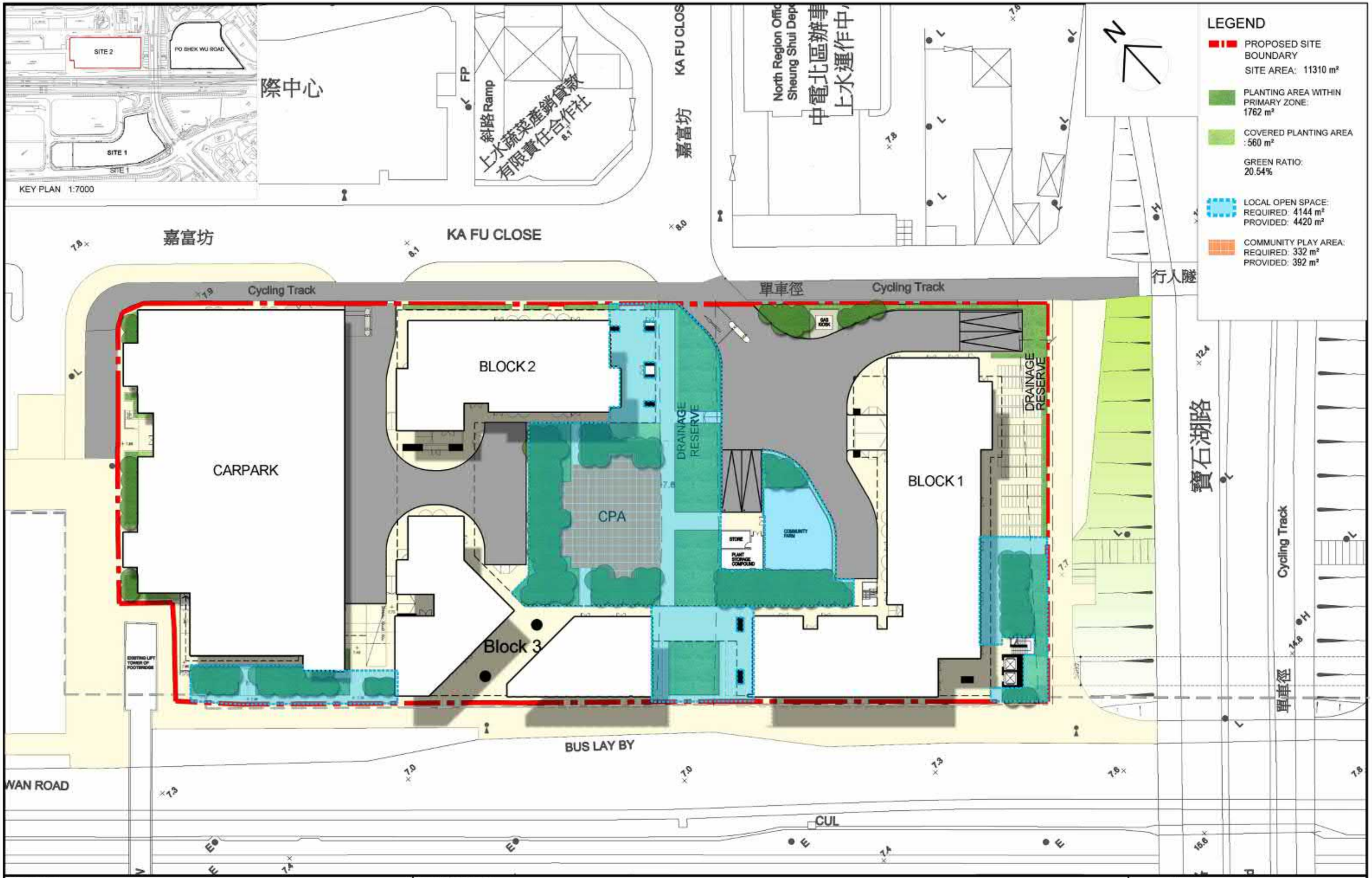
(CONCEPTUAL LAYOUT PLAN FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

SCALE :1:600 (A3)

房屋署 HOUSING DEPARTMENT

編號 PLAN NO. SS30/SITE2/LMP/L/LO-01/F

日期 DATE: 20. 08. 2018



PROJECT

SHEUNG SHUI AREAS 4 AND 30 SITE 2

DRAWING TITLE

CONCEPTUAL LANDSCAPE MASTER PLAN (GROUND FLOOR)

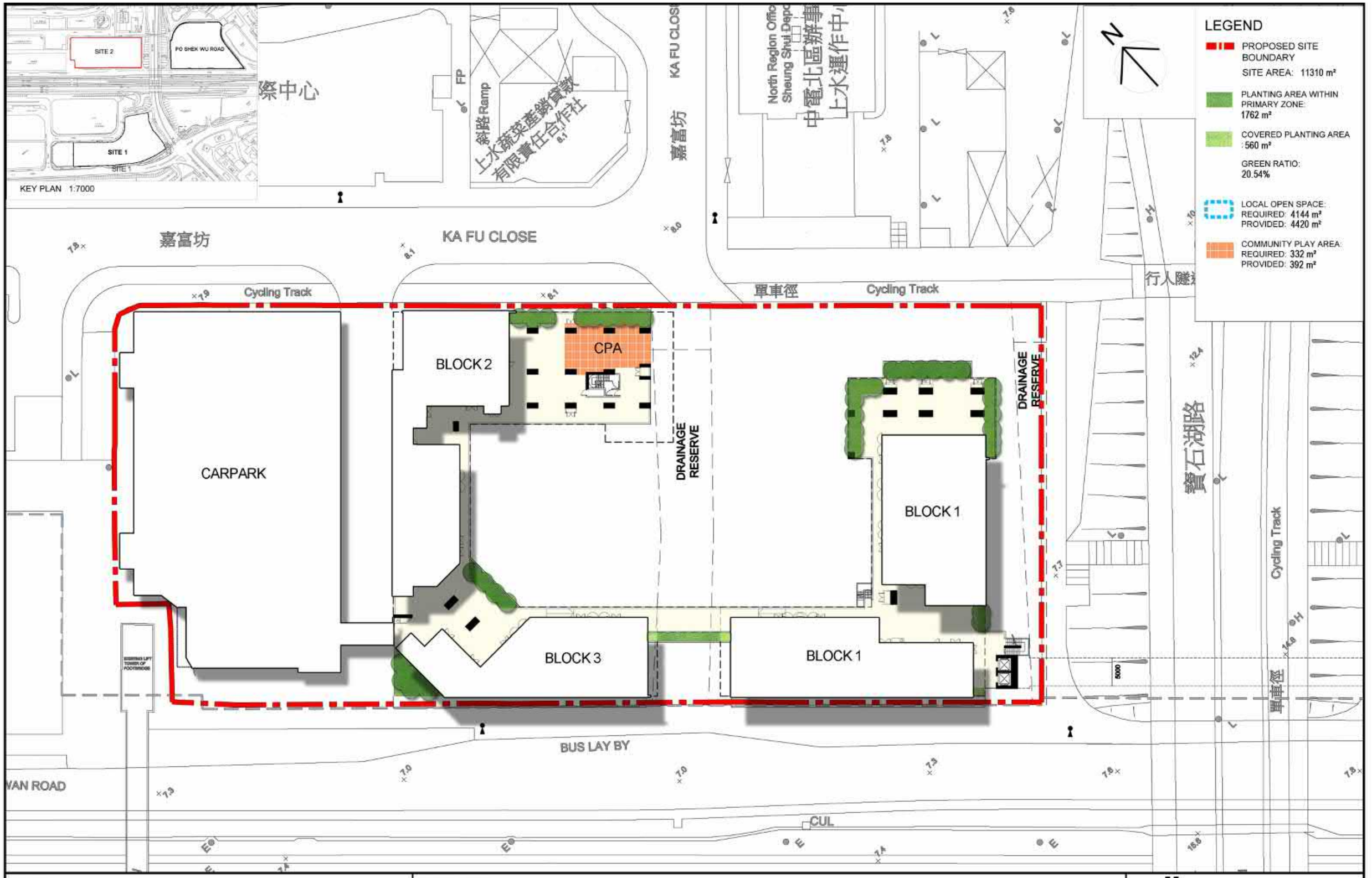
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SCALE :1:600 (A3)

房屋署 HOUSING DEPARTMENT

編號 PLAN NO. SS30/SITE2/LMP/L/LO-01/F

日期 DATE: 20. 08. 2018



PROJECT

SHEUNG SHUI AREAS 4 AND 30 SITE 2

DRAWING TITLE

CONCEPTUAL LANDSCAPE MASTER PLAN (PODIUM FLOOR)

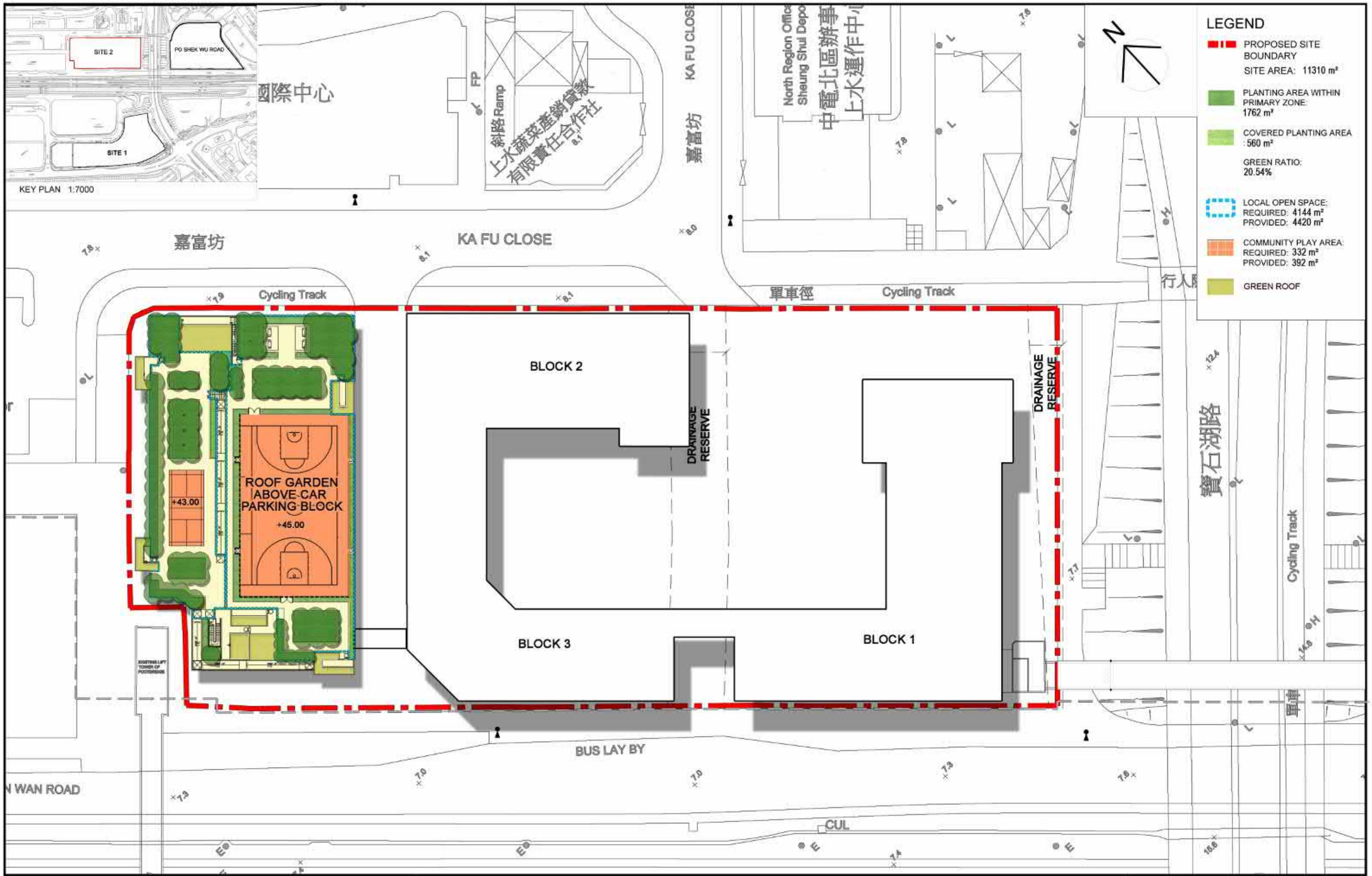
(CONCEPTUAL LAYOUT PLAN FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

SCALE :1:600 (A3)

房屋署 HOUSING DEPARTMENT

編號 PLAN NO. SS30/SITE/LMP/L/LO-01.1

日期 DATE: 20. 08. 2018



PROJECT

SHEUNG SHUI AREAS 4 AND 30 SITE 2

DRAWING TITLE

CONCEPTUAL LANDSCAPE MASTER PLAN (CARPARK ROOF)

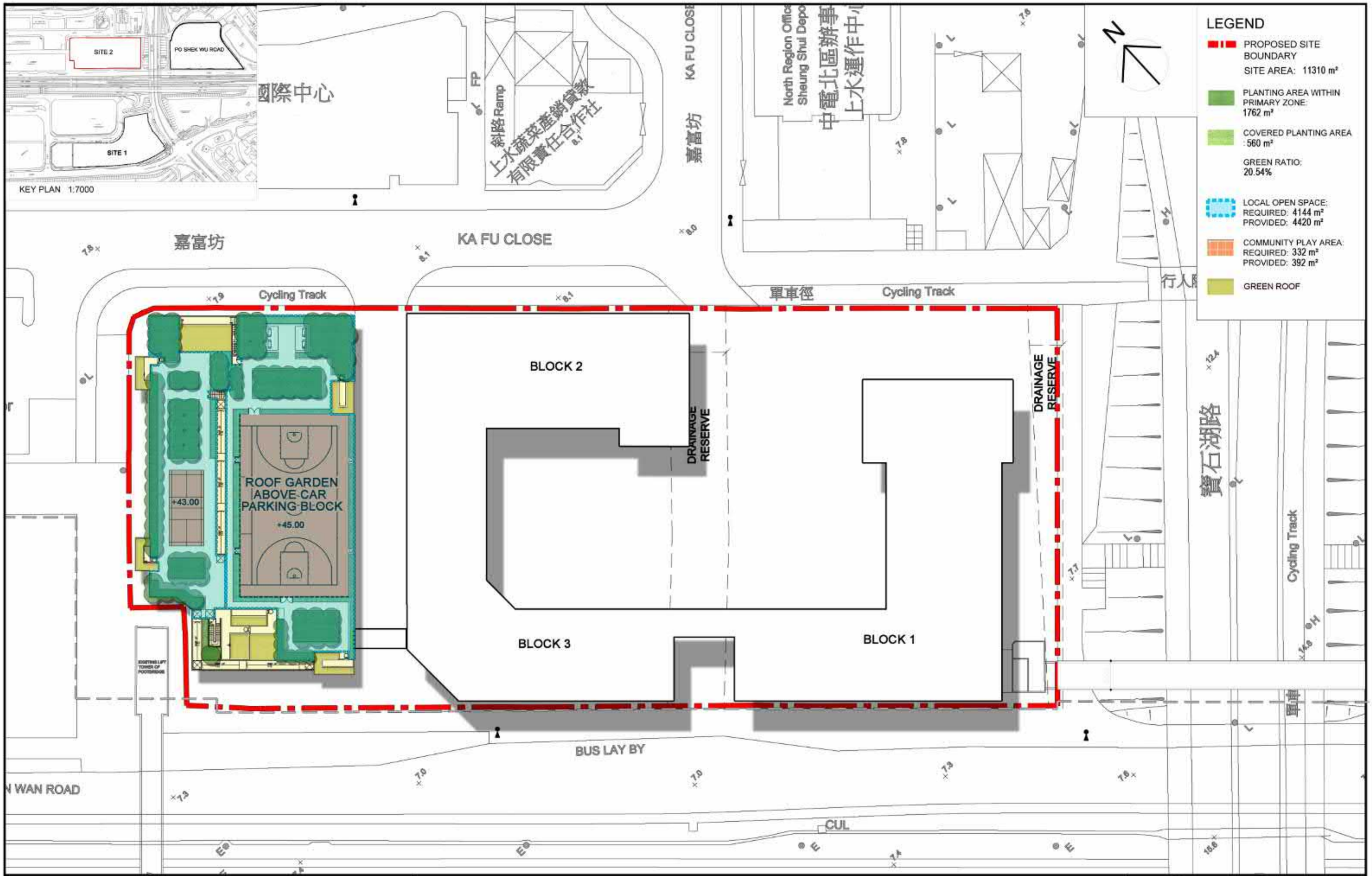
(CONCEPTUAL LAYOUT PLAN FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

SCALE : 1:600 (A3)

房屋署 HOUSING DEPARTMENT

圖號 PLAN NO. SS30/SIT/LMP/L/LO-01.2/A

日期 DATE: 25.01.2019



PROJECT

SHEUNG SHUI AREAS 4 AND 30 SITE 2

DRAWING TITLE

CONCEPTUAL LANDSCAPE MASTER PLAN (CARPARK ROOF)

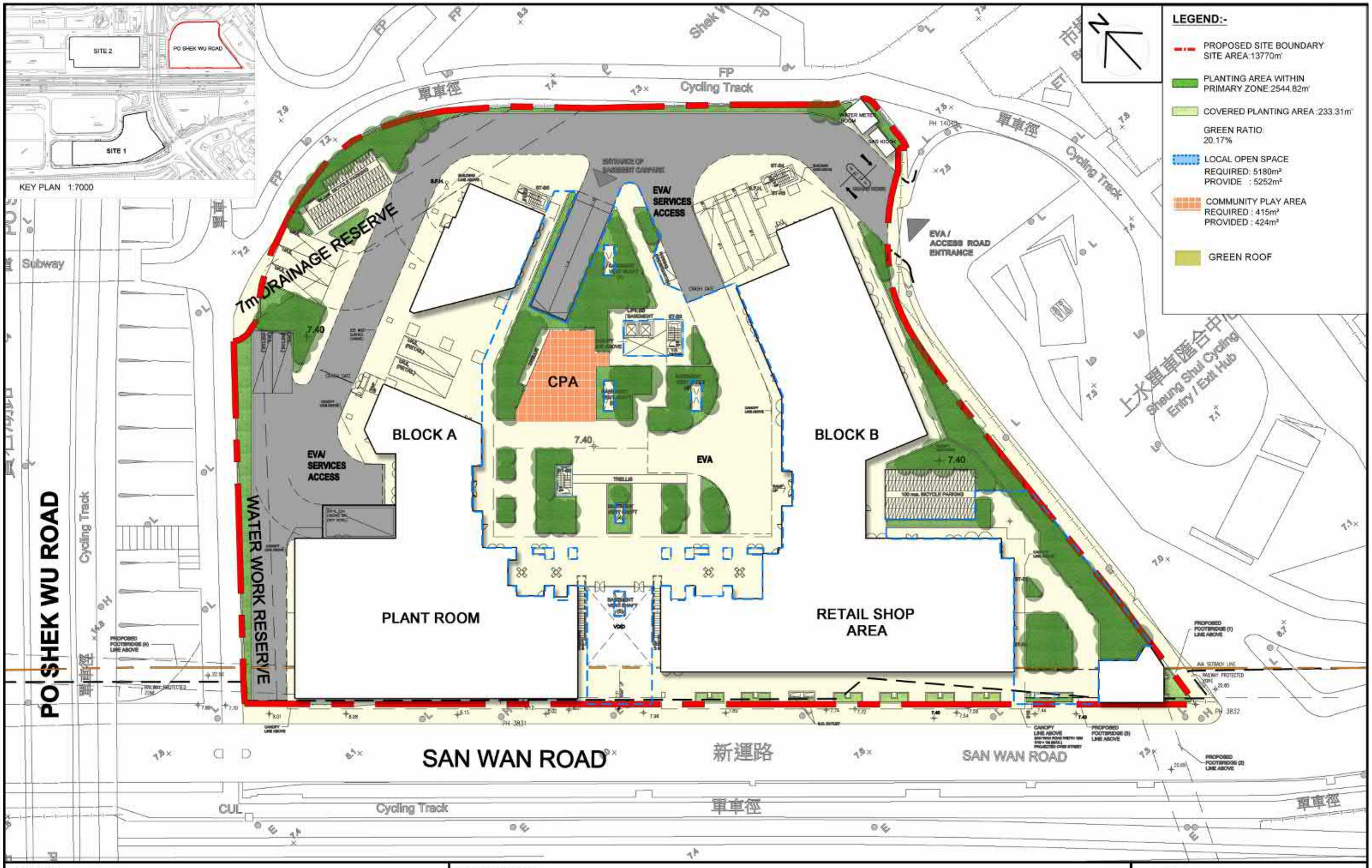
(CONCEPTUAL LAYOUT PLAN FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

SCALE : 1:600 (A3)

房屋署 HOUSING DEPARTMENT

圖號 PLAN NO. SS30/SIT/LMP/L/LO-01.2/A

日期 DATE: 25.01.2019



PROJECT

PO SHEK WU ROAD SHEUNG SHUI

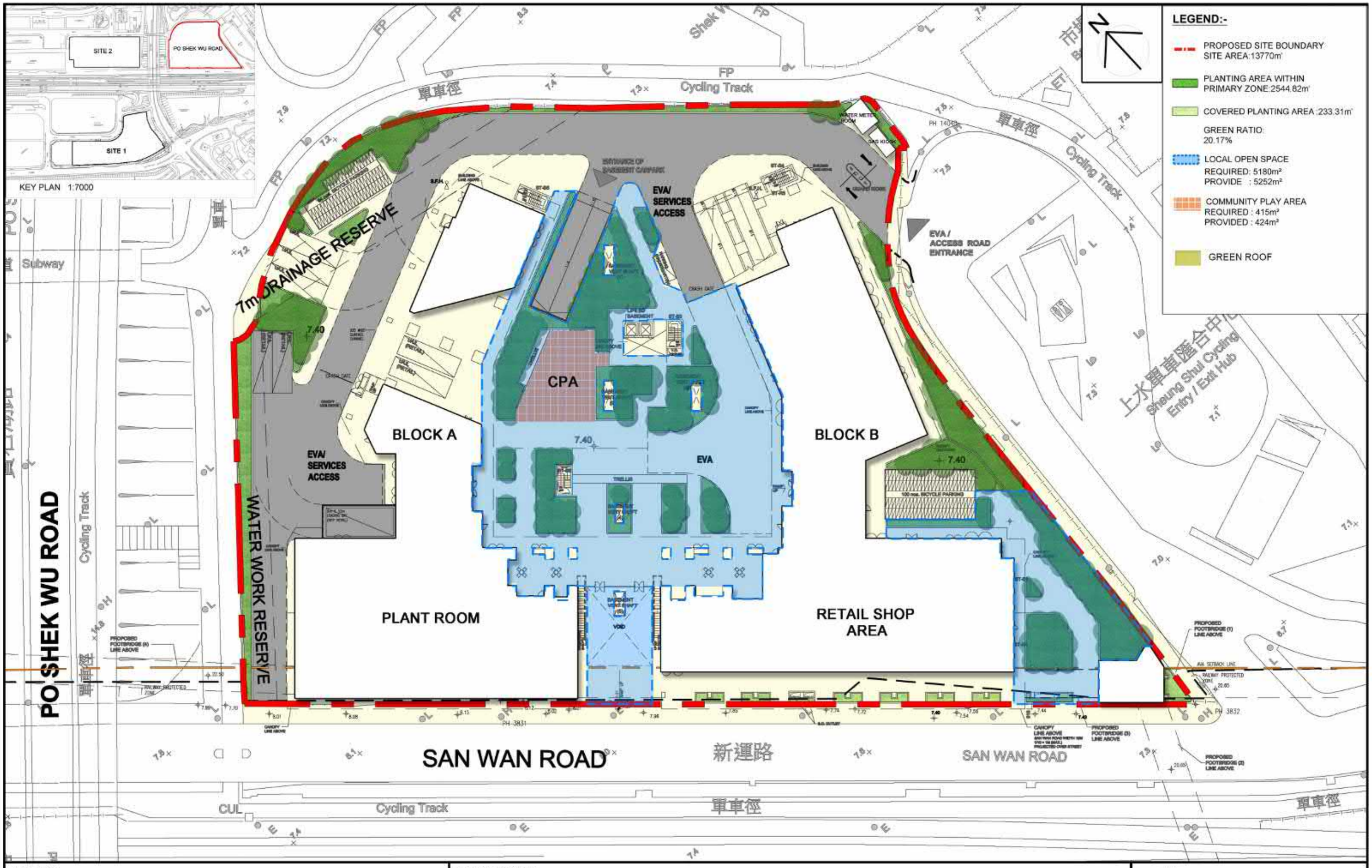
DRAWING TITLE

CONCEPTUAL LANDSCAPE MASTER PLAN
(GROUND FLOOR) (CONCEPTUAL LAYOUT PLAN FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

SCALE 1 :600(A3)

房屋署
HOUSING DEPARTMENT

編號 PLAN No.	日期 DATE:
SS30/PSWR/LMP/L/LO-01/H	25.01.2019



PROJECT

PO SHEK WU ROAD SHEUNG SHUI

DRAWING TITLE

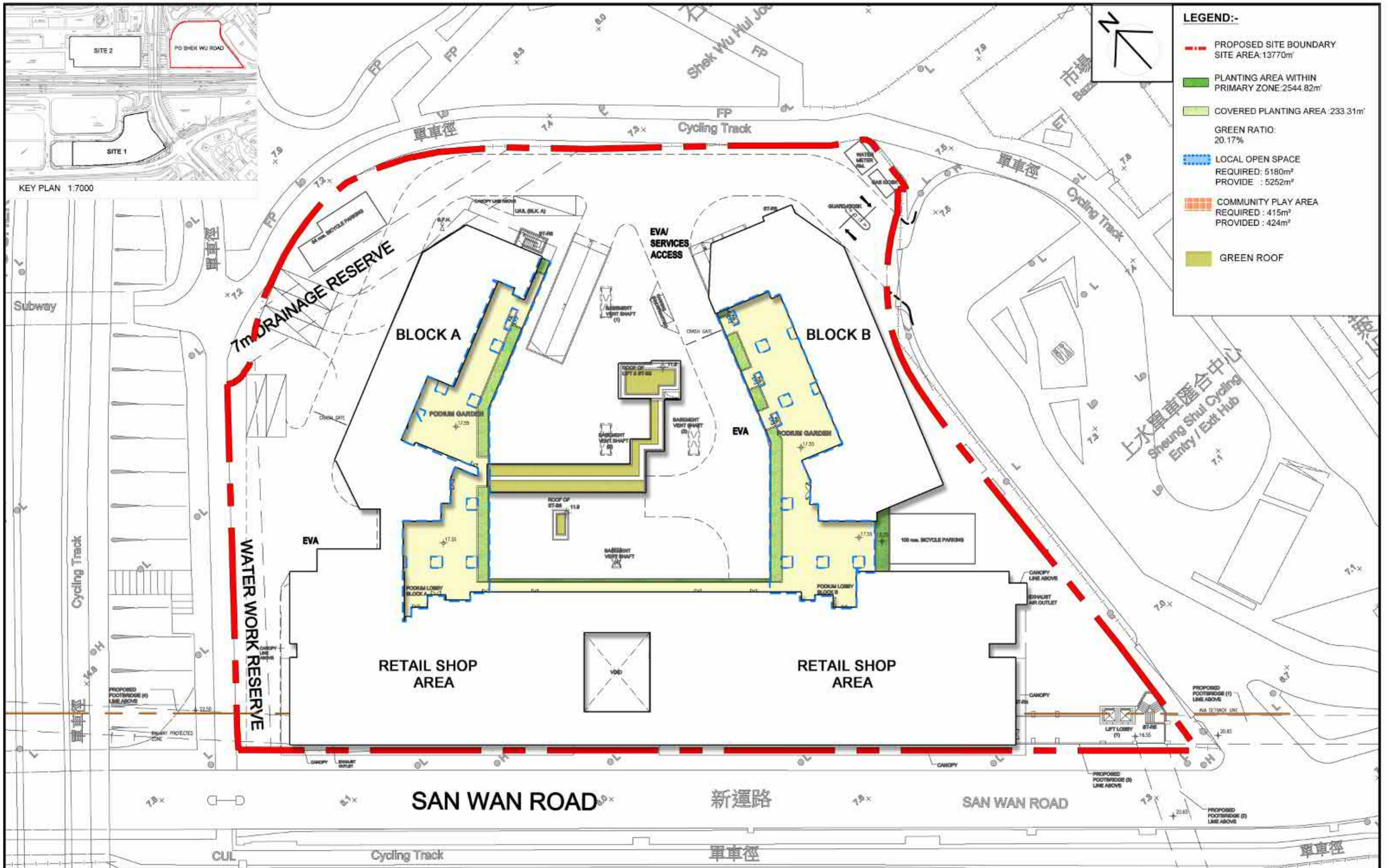
CONCEPTUAL LANDSCAPE MASTER PLAN (GROUND FLOOR)

(CONCEPTUAL LAYOUT PLAN FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

SCALE 1 :600(A3)

房屋署 HOUSING DEPARTMENT

編號 PLAN No.	日期 DATE:
SS30/PSWR/LMP/L/LO-01/H	25.01.2019



PROJECT

PO SHEK WU ROAD SHEUNG SHUI

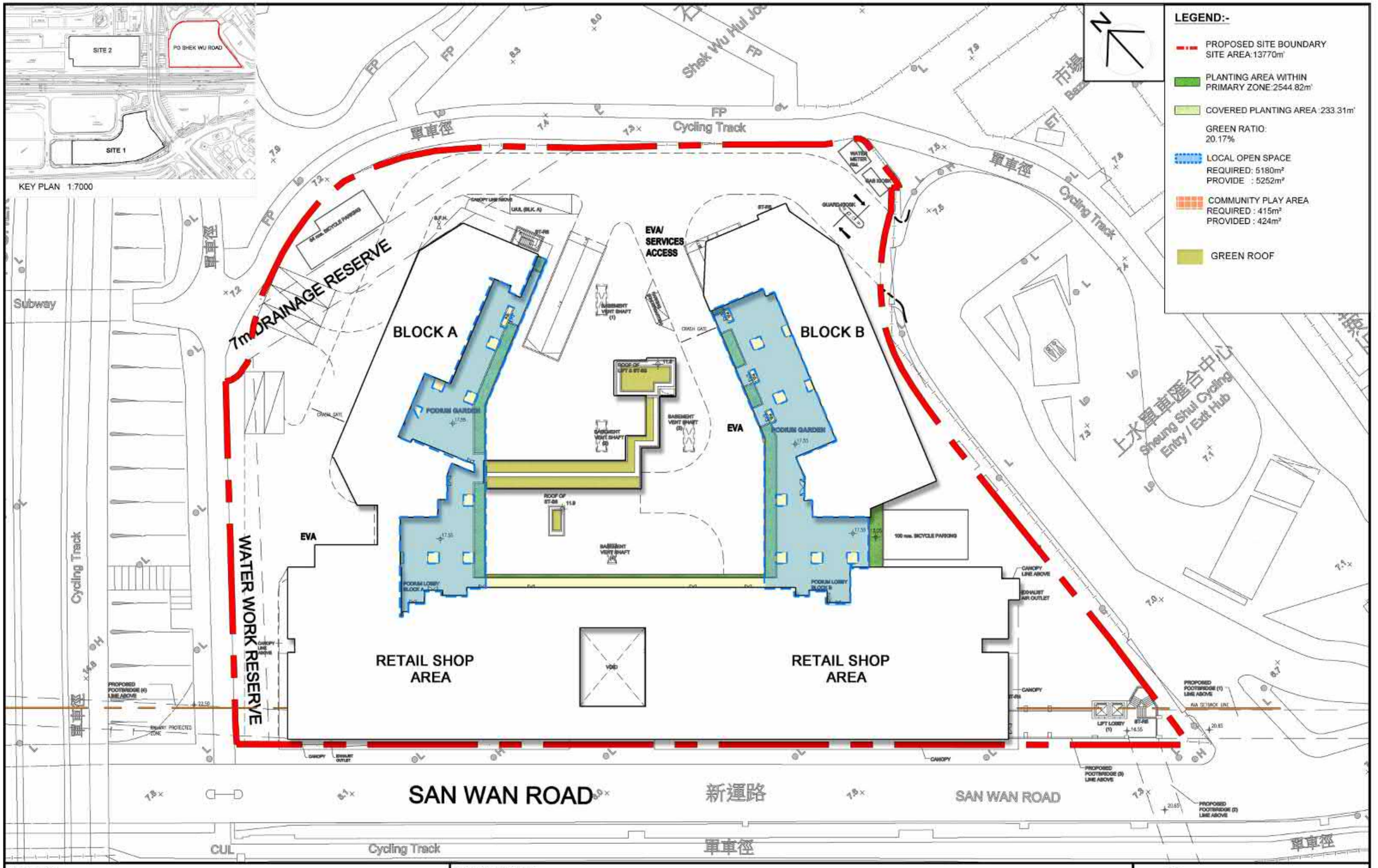
DRAWING TITLE

CONCEPTUAL LANDSCAPE MASTER PLAN
(PODIUM - LEVEL 2) (CONCEPTUAL LAYOUT PLAN FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

SCALE 1 :600(A3)

房屋署
HOUSING DEPARTMENT

編號 PLAN No.	日期 DATE:
SS30/PSWR/LMP/L/LO-01.1/B	25.01.2019



PROJECT

PO SHEK WU ROAD SHEUNG SHUI

DRAWING TITLE

CONCEPTUAL LANDSCAPE MASTER PLAN
(PODIUM - LEVEL 2) (CONCEPTUAL LAYOUT PLAN FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

SCALE 1 :600(A3)

房屋署
HOUSING DEPARTMENT

編號 PLAN No.	日期 DATE:
SS30/PSWR/LMP/L/LO-01.1/B	25.01.2019

KEY PLAN 1:7000

SITE 2

PO SHEK WU ROAD

SITE 1

LEGEND:-

- PROPOSED SITE BOUNDARY
  SITE AREA:13770m²
- PLANTING AREA WITHIN PRIMARY ZONE:2544.82m²
- COVERED PLANTING AREA :233.31m²
- GREEN RATIO:
  20.17%
- LOCAL OPEN SPACE
  REQUIRED: 5180m²
  PROVIDE : 5252m²
- COMMUNITY PLAY AREA
  REQUIRED : 415m²
  PROVIDED : 424m²
- GREEN ROOF

BLOCK A

BLOCK B

EVA/
SERVICES
ACCESS

EVA

EVA

RETAIL SHOP
AREA

RETAIL SHOP
AREA

CPA

7m DRAINAGE RESERVE

WATER WORK RESERVE

Cycling Track

單車徑

FP

Subway

SAN WAN ROAD

新運路

CUL

上水單車匯合中心
Sheung Shui Cycling
Entry / Exit Hub

PROJECT

PO SHEK WU ROAD SHEUNG SHUI

DRAWING TITLE

CONCEPTUAL LANDSCAPE MASTER PLAN
(PODIUM - LEVEL 3) (CONCEPTUAL LAYOUT PLAN FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

SCALE 1 :600(A3)

房屋署
HOUSING DEPARTMENT

編號 PLAN No. SS30/PSWR/LMP/L/LO-01.2

日期 DATE: 25.01.2019

KEY PLAN 1:7000

SITE 2

PO SHEK WU ROAD

SITE 1

LEGEND:-

- PROPOSED SITE BOUNDARY
  SITE AREA:13770m²
- PLANTING AREA WITHIN PRIMARY ZONE:2544.82m²
- COVERED PLANTING AREA :233.31m²
- GREEN RATIO:
  20.17%
- LOCAL OPEN SPACE
  REQUIRED: 5180m²
  PROVIDE : 5252m²
- COMMUNITY PLAY AREA
  REQUIRED : 415m²
  PROVIDED : 424m²
- GREEN ROOF

BLOCK A

BLOCK B

EVA/
SERVICES
ACCESS

EVA

EVA

RETAIL SHOP
AREA

RETAIL SHOP
AREA

CPA

7m DRAINAGE RESERVE

WATER WORK RESERVE

Cycling Track

單車徑

FP

Subway

SAN WAN ROAD

新運路

CANOPY

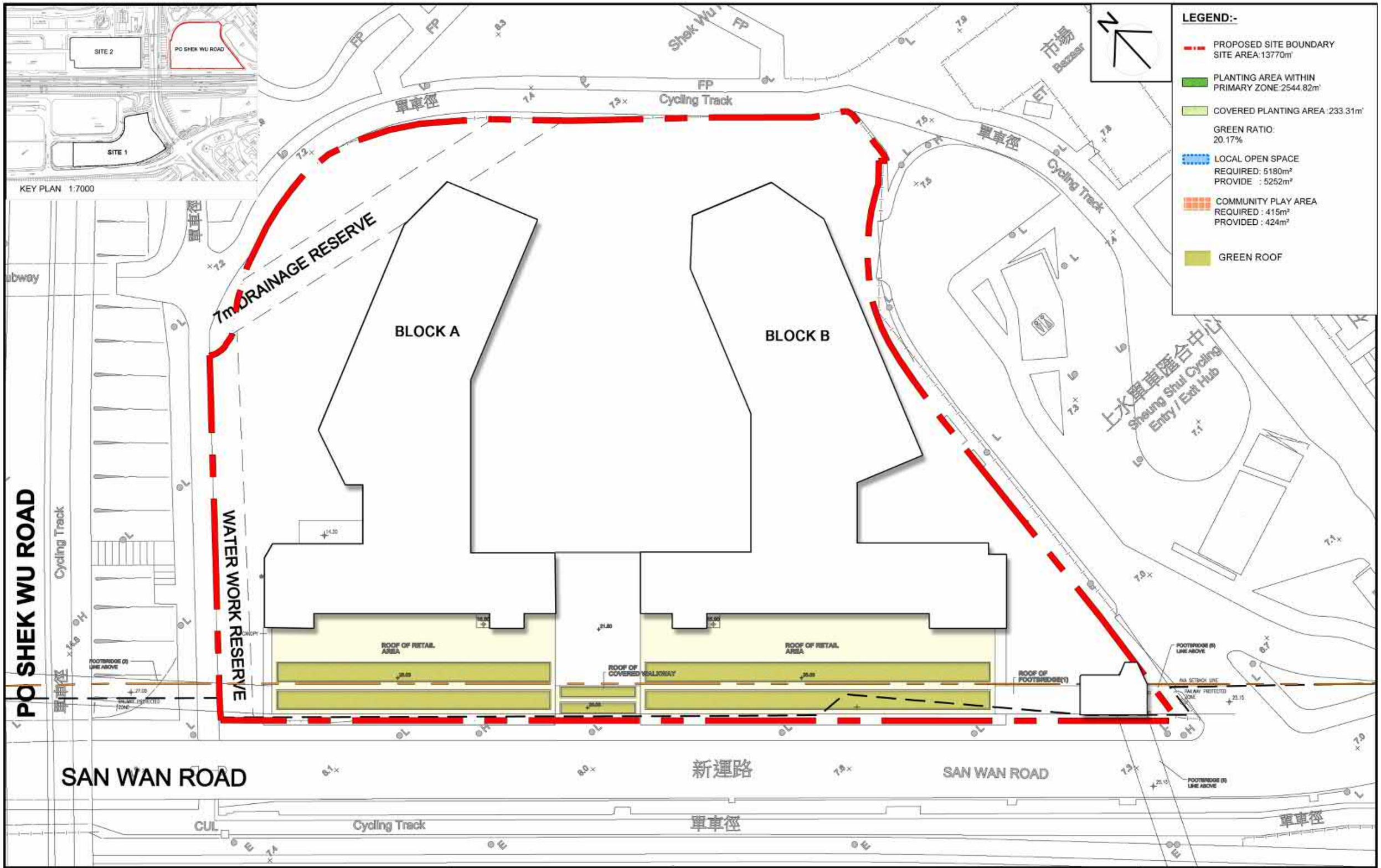
PROPOSED FOOTBRIDGE (I)
CONNECT TO
EXISTING
FOOTBRIDGE TO
MTR STATION

PROPOSED
FOOTBRIDGE (II)
CONNECT TO
CHOI YUEN ROAD SITE

PROPOSED FOOTBRIDGE (III)

上水單車匯合中心
Sheung Shui Cycling
Entry / Exit Hub

PROJECT PO SHEK WU ROAD SHEUNG SHUI	DRAWING TITLE CONCEPTUAL LANDSCAPE MASTER PLAN (PODIUM - LEVEL 3) (CONCEPTUAL LAYOUT PLAN FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW) SCALE 1 :600(A3)	房屋署 HOUSING DEPARTMENT 編號 PLAN No. SS30/PSWR/LMP/L/LO-01.2 日期 DATE: 25.01.2019



PROJECT

PO SHEK WU ROAD SHEUNG SHUI

DRAWING TITLE

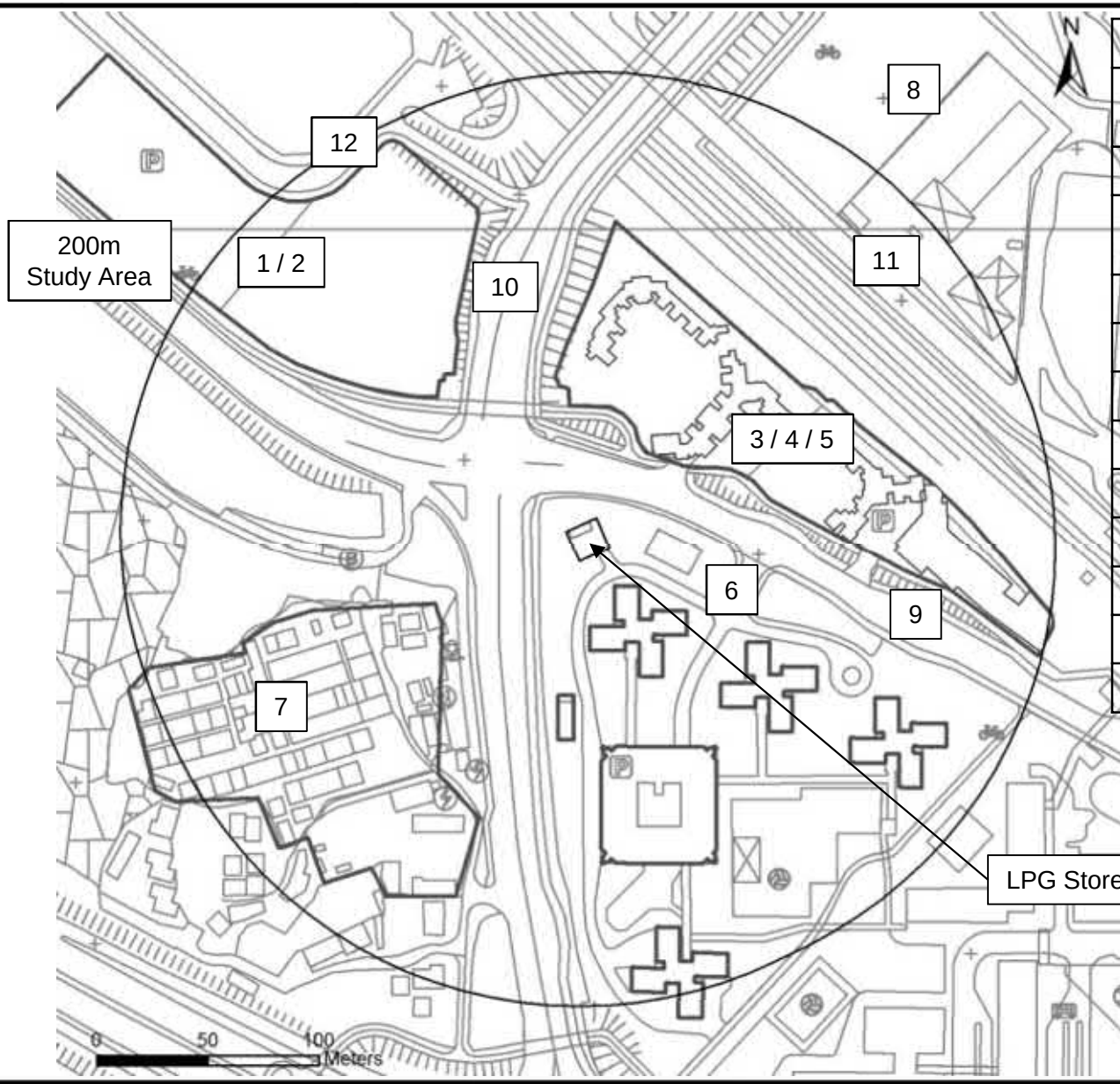
CONCEPTUAL LANDSCAPE MASTER PLAN (ROOF FLOOR)

(CONCEPTUAL LAYOUT PLAN FOR REFERENCE ONLY & SUBJECT TO DESIGN REVIEW)

SCALE 1 :600(A3)

房屋署
HOUSING DEPARTMENT

編號 PLAN No.	日期 DATE:
SS30/PSWR/LMP/L/LO-01.3	25.01.2019



ID	Description
1	Proposed Development at Sheung Shui Areas 4 and 30 Site 1
2	Project Site (Existing Land Use)
3	PRH Development in Choi Yuen Road Site 3 & 4 (named 'Po Shek Wu Estate')
4	Temporary Carpark
5	Construction Site
6	Choi Po Court
7	Tai Tau Leng Tsuen
8	Bus Depot
9	Choi Yuen Road
10	Po Shek Wu Road
11	San Wan Road
12	Choi Fai Street

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STUDY AREA

AECOM

Planning Consultancy for
Proposed Subsidized Housing Development at
Jockey Club Road, Fanling, New Territories

Technical Assessment Report

March 2019



HONG KONG HOUSING SOCIETY 香港房屋協會

AECOM

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1 INTRODUCTION

1.1 Background

1.1.1 To increase and expedite the supply of housing, the Government has identified sites with potential to be developed for residential uses in various districts. Among others, a site at Jockey Club Road, Fanling (the Subject Site) is proposed for subsidized housing development.

1.1.2 In August 2015, Hong Kong Housing Society (HKHS) appointed AECOM Asia Company Ltd to formulate a schematic design and carry out technical feasibility study (the Consultancy) for the proposed Subsidized Housing Development at Jockey Club Road, Fanling. The Consultancy examines and confirms the feasibility of the proposed development scheme by conducting various engineering assessments including traffic, environmental, air ventilation, visual and infrastructure to support the rezoning of the Subject Site.

1.2 Scope and Objective of this Report

1.2.1 The purpose of this Technical Assessment Report is to summarize the key findings, recommendations and conclusions of various preliminary technical assessments for the proposed Subsidized Housing Development at the Subject Site.

1.2.2 Apart from this introductory chapter, this report is structured as follows:

- Chapter 2: presents the existing conditions of the Subject Site and its surroundings;
- Chapter 3: presents the preliminary scheme of the proposed Subsidized Housing Development;
- Chapter 4 to 9: summarizes the findings and recommendations of the various technical assessments conducted for the proposed Subsidized Housing Development at the Subject Site based on the preliminary scheme; and,
- Chapter 10: provides a conclusion for this Technical Assessment Report.

2 SUBJECT SITE AND ITS SURROUNDING CONTEXT

2.1 Subject Site and Its Surrounding Area

Physical Context and Site Topography

2.1.1 The Subject Site, with a site area of about 5,187m^2, is located to the north of Fanling Town Centre, and the southwest of Luen Wo Hui. The Subject Site is bounded by Pik Fung Road to the northwest, Jockey Club Road to the northeast, the Former Fanling Magistracy to the southeast and Fanling Law Courts Building to the southwest (**Figure 2.1**).

2.1.2 At present, the northwestern portion of the Subject Site is occupied by the Fanling Temporary Tennis Court managed by Leisure and Cultural Services Department (LCSD). The remaining portion at the southeast of the site is mostly covered by vegetation and is fenced off from public access. The existing Fanling Magistracy Substation along Jockey Club Road is excluded from the development site boundary of the Subject Site. In terms of topography, the Subject Site is situated on relatively flat land with an average site level at +15.7mPD.

Surrounding Land Use and Built Context

2.1.3 The Site is surrounded by Government, Institution or Community (GIC) facilities and residential developments. To the southwest of the Subject Site is the 11-storey Fanling Law Court Building which was opened on January 2012. Located further southwest is the 6-storeys North District Government Offices accommodating different Government departments' offices including Home Affairs Department (HAD), Lands Department (LandsD) and Social Welfare Department (SWD), etc. The Fanling Recreation Ground, one of the largest open spaces in the area, and the Fanling Swimming Pool are located to the further southwest and northwest of North District Government Offices respectively.

2.1.4 To the immediate southeast of the Subject Site is the Former Fanling Magistracy. Completed in 1960, the Former Fanling Magistracy ceased operation in 2002 and was graded as Grade 3 historic building by the Antiquities and Monuments Office (AMO) in 2010. It was one of the revitalization projects under the "Revitalizing Historic Buildings through Partnership Scheme" by the Development Bureau (DevB). The Former Fanling Magistracy was re-launched in 2018 as the Hong Kong Federation of Youth Groups (HKFYG) Leadership Institute. To the immediate south of the Subject Site is a piece of vacant land partially occupied by an existing temporary open-air public carpark and is intended for the planned New Territories East Cultural Centre (NTECC). Opposite of the Former Fanling Magistracy and the temporary public carpark across the Sha Tau Kok Road (Lung Yeuk Tau) is the Fanling Fire Station and Ambulance Depot.

2.1.5 Further to the south and southeast of the Subject Site are some high-rise residential developments in the area, including the Fanling Town Centre, Fanling Centre and Cheung Wah Estate. Cheung Wah Estate is a public rental housing (PRH) development with 10 residential towers reaching 19-34 storeys. Fanling Town Centre and Fanling Centre are two private residential developments with 7 towers of 20-25 storeys and 11 towers of 25 storeys respectively. All three residential developments are accommodated

with shopping centres and are inter-connected to the Fanling MTR Station through a pedestrian footbridge network.

2.1.6 To the northwest of the Subject Site are predominantly low-rise residential developments and village houses at Fanling Wai and GIC facilities including various schools and the Fanling Health Centre. The North District Park is located to the further northeast.

2.1.7 Similar to its northwest, areas to the north and northeast of the Subject Site are also occupied by GIC facilities including the Hong Kong Customs and Excise Department Control Point Command Headquarters, Police Driving and Training Division, Fanling Baptist Church, Fanling Assembly of God Church and low rise residential developments including La Verte and Fanling Garden and the village houses at Fanling Lau. To the further northeast is the Luen Wo Hui area (a market town in Fanling) and various high-rise private residential developments including Regentville, Grand Regentville, Wing Fok Centre, Wing Fai Centre and Belair Monte with building height ranging from 28 to 34 storeys.

2.1.8 To the east of the Subject Site across the roundabout (J/O Jockey Club Road and Sha Tau Kok Road (Lung Yeuk Tau)) is the Sheung Shui Divisional Police Station. On Lok Tsuen, which is an industrial area of about 33 hectare, is located further east to the Subject Site mainly for light industry and godown uses in low to medium rise industrial buildings.

2.2 Statutory Planning Context

2.2.1 The Subject Site falls within an area zoned as "G/IC" on the approved Fanling/Sheung Shui Outline Zoning Plan No. S/FSS/22 (the OZP) (**Figure 2.2**). The planning intention of "G/IC" zone is *"primarily for provision of Government, institution or community facilities serving the needs of the local residents and/or a wider district, region or the territory.* It is also intended to provide land for uses directly related to or in support of the work of the Government, organizations providing social services to meet community needs, and other institutional establishments".

2.2.2 Despite that 'Flat' use is a Column 2 use under the "G/IC" zone which may be permitted by the Town Planning Board (TPB) upon planning application under section 16 of the Town Planning Ordinance (TPO), rezoning the Subject Site from "G/IC" to "Residential (Group A)" ("R(A)") would better reflect the planning intention of the proposed residential development.

2.2.3 The Subject Site, which is zoned "G/IC" under the OZP, was not the subject of any section16 planning applications. There is no known programme for the Subject Site to develop into any Government, institution or community facilities based on currently available information.

2.3 Site Accessibility

2.3.1 In terms of vehicular access, the site is served by Jockey Club Road and Pik Fung Road, of which Jockey Club Road is a District Distributor in the area. Upon future development, ingress/egress point of the Subject Site is proposed to be located at Pik Fung Road.

2.3.2 The site is well-served by public transportation including MTR, franchised bus and minibus (GMB) services (**Figure 2.3**). The Fanling MTR station is located within walking distance (about 500m) from the Subject Site. Multiple bus stops and minibus stops are also located in the vicinity of the Subject Site, offering connections within the district and to other parts of Hong Kong.

2.3.3 In terms of pedestrian connection, existing signalized crossing and cautionary crossing are available at Jockey Club Road and Pik Fung Road, adjacent to the Subject Site. To further enhance the connectivity of the Subject Site to the surrounding areas, a planned footbridge will be constructed between the proposed development and the future NTECC; which will be further connected to Fanling MTR Station via the existing footbridge system. Moreover, in response to the recent proposal of the North District Office (DO) to provide a new footbridge along Sha Tau Kok Road to connect Luen Wo Hui to Fanling MTR Station through the Subject Site; space has been reserved in the proposed development for the future landing of the proposed footbridge.

2.4 Surrounding Major GIC Facilities and Open Spaces

2.4.1 As mentioned in section 2.1, there are a number of GIC facilities within close proximity of the Subject Site serving the existing community, the wider district and the future residents of the proposed housing development. The key GIC facilities found within the vicinity of the Subject Site include the followings:

- North District Government Offices;
- Fanling Law Courts Building;
- Sheung Shui Divisional Police Station;
- Fanling Fire Station & Ambulance Depot;
- Fanling Health Centre;
- The Peaceful Elderly Home;
- Buddhist Po Ching Home For the Aged Women; and,
- Schools including Fanling Government Primary School, Caritas Fanling Chan Chun Ha Secondary School, TWGHs Li Ka Shing College, Fanling Rhenish Church Secondary School, Buddhist Ma Kam Chan Momorial English Secondary School, Fanling Public School and Fanling Lutheran Secondary School.

2.4.2 Major recreational and leisure facilities located in the proximity of the Subject Site include:

- Fanling Recreation Ground;
- Fanling Swimming Pool;
- Pak Fuk Tin Sum Playground;
- On Lok Tsuen Playground;
- Luen Wo Hui Playground;
- Luen Wo Hui Sports Centre; and,
- The planned NTECC (to be completed in first quarter of 2022) will be a cross-district cultural centre with multi-purpose facilities for performances and rehearsals in the New Territories East region to meet the needs of the public as well as the arts and community sectors[1].

2.4.3 The North District Park, Fan Leng Lau Pleasure Ground and Fanling Hong Lok Park are some major open spaces in the area.

2.5 Land Status

2.5.1 The Subject Site is a piece of Government land situated at Demarcation District (D.D.) 51 Lot. The northwest portion of the Subject Site, where the Fanling Temporary Tennis Court is situated, is under a Government Land Allocation (GLA) (Lot No.: GLA-TDN 137) and would need to be resumed for the proposed subsidized housing development.

[1] Legco (2018), "Legislative Council Panel on Home Affairs Major Cultural and Leisure Capital Works Projects (LC Paper No. CB(2)1083/17-18(03))

3 PROPOSED DEVELOPMENT PARAMETERS

3.1.1 The proposed development at the Subject Site will comprise two domestic blocks above podium, producing about 648 subsidized sales flats. The proposed building height is 100mPD with 24 storeys of residential units and 3 storeys of podium. Non-domestic facilities to be provided at the podium levels include recreational facilities for future residents of the development, a Residential Care Home for the Elderly (RCHE), retail facilities and loading/unloading spaces. Private car and motorcycle parking spaces will be provided at 2 basement levels. The conceptual layout plans and section diagram of the proposed development are presented in **Figure 3.1 – Figure 3.7**. The proposed development parameters are tabulated in **Table 3.1**. The proposed housing development is expected to be completed in year 2024.

Table 3.1 Proposed Development Parameters

Site Area (m^2)	about 5,187
Domestic GFA (m^2) [Plot Ratio (PR)]	about 31,124 [PR: about 6]
Non-Domestic GFA (m^2) [Plot Ratio (PR)]	about 6,032 [PR: about 1.2]
Number of Domestic Blocks	2
Number of Domestic Flats	648
Number of Storeys	27 storeys (including a 3-storey podium with 2 basement levels)
Proposed Building Height	Not more than 100mPD
Ancillary and GIC Facilities	- Recreational facilities for residents - RCHE - Retail Facilities
Car Parking Provision	Ancillary Car Park: - Private Car: 70 spaces - Motorcycle: 13 spaces - L/UL Bay: 6 Public Car Park: - Private Car: 130 spaces - LGV Parking Space: 5

* The development parameters and supporting facilities in the above Table 3.1 are subject to change in detailed design stage.

Open Space Provision

3.1.2 Open space shall be provided at a rate of at least 1m^2 per person in accordance with the Hong Kong Planning Standards and Guidelines (HKPSG). Landscape and green areas will be provided at podium and ground levels to enhance the amenity of the proposed development as well as for the enjoyment of the future residents.

Proposed Footbridge Connections

3.1.3 To better connect to the surrounding areas, a pedestrian footbridge is proposed between the proposed development and the future NTECC which will further connect to the existing footbridge network at the Fanling Town Centre and the Fanling MTR Station (see **Figure 2.3**). In view of the DO's proposal in extending the existing footbridge network further to Luen Wo Hui potentially through the Subject Site, space has been reserved on 1/F facing Jockey Club Road for the possible landing of the future footbridge subject to detail design and future liaison with relevant government departments.

Building Separation

3.1.4 As mentioned in the previous chapter, the adjoining Former Fanling Magistracy is a Grade 3 Historic Building. The design of the proposed development has paid due respect to the Main and Annex Buildings of the Former Fanling Magistracy. Adequate landscape buffer and building separation between the Annex Building and the proposed development are provided. Moreover, an open green deck is proposed on 1/F at the podium facing the Annex Building to further enhance visual amenity (see **Figure 3.1**).

4 TRAFFIC IMPACT ASSESSMENT

4.1 Introduction

4.1.1 This Traffic Impact Assessment (TIA) aims to review the existing road network and transport facilities in the vicinity of the Subject Site and to forecast the traffic generation of the proposed housing development and future traffic flows in the surrounding road network. Through appraising the potential traffic impact induced by the proposed housing development, road improvement proposals will be provided if required. Internal transport facilities for the proposed development will also be recommended.

4.2 Area of Influence (AOI)

4.2.1 The vehicular access point of the Subject Site is proposed to be at Pik Fung Road. Upon completion of the proposed development, the development traffic generation will either go east or west. As a result, the immediate junctions at the east and the west sides, until the traffic can be discharged to Fanling Highway, will be considered in the following assessment. **Figure 4.1** shows the AOI in this study.

4.3 Traffic Impact Assessment

4.3.1 Traffic survey was conducted to establish the existing traffic flows in the vicinity of the Subject Site. The morning and the evening peak hours were found to be 07:45 to 08:45 and 17:30 to 18:30 respectively.

4.3.2 The traffic impacts on key junctions and critical links in the vicinity of the Subject Site in Years 2017 and 2027 were assessed. The assessed key junctions and critical road links are shown in **Figure 4.1**. The results of the assessment on key junctions and critical links were summarized in **Table 4.1** and **Table 4.2** and the traffic flows under different scenarios are presented in **Figure 4.2** to **Figure 4.5.**

Table 4.1 Key Junctions Performance in Years 2017 and 2027

Ref.	Junction Location	Type/Index[1]	2017		2027 Reference Scenario[2]		2027 Design Scenario[3]	
			AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
J1	Jockey Club Road/ Pik Fung Road	Priority/DFC	0.31	0.11	0.36	0.13	0.37	0.14
J2	Jockey Club Road/ Sha Tau Kok Road	Roundabout/ DFC	0.64	0.55	0.71	0.64	0.75	0.66
J3	Jockey Club Road/ San Wan Road	Signalized/ RC	23%	33%	44%	57%	41%	52%
J4	San Wan Road/ Sha Tau Kok Road/ Fanling Station Road	Roundabout/ DFC	0.49	0.45	0.57	0.52	0.57	0.52
J5	San Wan Road/ Pik Fung Road	Priority/DFC	0.31	0.19	0.36	0.22	0.47	0.28
J6	San Wan Road/ Slip Roads to So Kwun Po Road	Signalized/ RC	28%	35%	13%	20%	12%	18%
J7	So Kwun Po Road Interchange[4][5]	Roundabout/ DFC	0.88	0.86	0.90	0.87	0.91	0.87
J8	Jockey Club Road/ So Kwun Po Road[6]	Signalized/ RC	20%	42%	21%	35%	21%	35%

Notes: (1) DFC = design flow to capacity ratio for priority junction/roundabout. RC = reserve capacity for signalized junction.

(2) 2027 Reference Flows = 2017 Observed Flows x $(1 + 1.2\%)^{10}$ + Traffic Generated from Planned Developments

(3) 2027 Design Flows = 2027 Reference Flows + Development Traffic Flows

(4) 350m vehicular traffic queue was observed at So Kwun Po Road southbound during both AM and PM peak hours.

(5) Junction capacity assessment taken into consideration of the impact of Fanling Bypass.

(6) Junction capacity assessment taken into consideration of the junction improvement scheme explored under Fanling North NDA.

Table 4.2 Critical Links Performance in Years 2017 and 2027

Ref.	Link	Bound	Capacity (pcu/hr)(1)	2017 Observed Flows (pcu/hr) [V/C Ratio]		2027 Reference Scenario(2) [V/C Ratio]		2027 Design Scenario(3) [V/C Ratio]	
				AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
L1	Jockey Club Road	E/B	3,120	618 [0.20]	704 [0.23]	610 [0.20]	509 [0.17]	610 [0.20]	509 [0.17]
		W/B	3,120	630 [0.21]	505 [0.17]	728 [0.24]	582 [0.19]	739 [0.24]	588 [0.19]
L2	San Wan Road	E/B	3,120	626 [0.27]	495 [0.21]	706 [0.30]	559 [0.24]	719 [0.30]	577 [0.25]
		W/B	3,120	580 [0.25]	571 [0.24]	654 [0.28]	645 [0.27]	665 [0.28]	651 [0.28]

Notes: (1) The capacity for primary distributor dual-2 lane carriageway is adopted for Jockey Club and the capacity for 4 lane carriageway for district distributor is adopted for San Wan Road. The capacity of road sections refer to Volume 2 of the TPDM and a factor of 1.2 is adopted to convert from veh/hr to pcu/hr.

(2) 2027 Reference Flows = 2017 Observed Flows x $(1 + 1.2\%)^{10}$ + Traffic Generated from Planned Developments

(3) 2027 Design Flows = 2027 Reference Flows + Development Traffic Flows

4.3.3 The proposed development would generate two-way traffic flows of 108 pcu/hr in the AM peak hour and 91 pcu/hr in the PM peak hour, which include the traffic generation of the public car park. It is noted from the above results that most junctions are calculated to have sufficient capacities to accommodate the future traffic growth and the traffic generated by the proposed development during the peak hours in 2027, except for (Junction No. J7) J/O So Kwun Po Road/Fanling Highway Slip Roads which will operate near capacity under the future scenarios.

4.3.4 It should be noted that the DFCs in Junction No. J7 for both reference and design scenarios in 2027 are almost identical with less than 20 pcu/hr which passing through So Kwun Po Road southbound (critical arm) during the peak hour. Therefore, the traffic impact generated by the proposed development is insignificant. More importantly, there will be various road improvement works implemented in the vicinity and it is anticipated that the overall traffic situations will be improved.

4.4 Public Transport Demand

4.4.1 The Subject Site is well served by many road-based public transport routes. Stops of these routes could be found along Jockey Club Road, San Wan Road, Sha Tau Kok Road and Fanling Station Road. The Fanling MTR Station and multiple bus and GMB stops are located within 500m from the Subject Site (see **Figure 2.3**).

4.4.2 The proposed housing development is estimated to generate 2-way pedestrian flows of 661 and 434 person/hr during the morning and the evening peak hours respectively. Located within 500m catchment area of the MTR Fanling Station (with a walking distance of about 500m) and being well connected by the existing footbridges near the roundabout of San Wan Road/Fanling Station Road/Sha Tau Kok Road – Lung Yeuk Tau, it is anticipated that the future residents of the proposed development would walk to the station. Hence, feeder services of bus or GMB to railway station would be unnecessary. The impact on railway services is also considered to be minimal. It is anticipated that the existing bus routes would have spare capacity to accommodate the additional passengers induced by the proposed development.

4.5 Proposed Transport Provision

4.5.1 The internal transport facilities of the proposed housing development will be provided in accordance with the recommendations outlined in the Hong Kong Planning Standards and Guidelines (HKPSG). It will provide a total of 70 private car parking spaces, 13 motorcycle parking spaces, 6 goods vehicle L/UL bays, 44 bicycle parking spaces, 1 ambulance/light bus lay-by (for RCHE use) and 2 PLB/maxicab parking spaces (for RCHE use). In addition, a public carpark with 130 car parking spaces and 5 light goods vehicle parking spaces are also provided.

4.6 Conclusion

4.6.1 From the assessment results, it can be concluded that the proposed housing development **will not induce significant traffic impact** on the surrounding road network and the development proposal is considered **acceptable** from traffic engineering point of view. Extracts from the TIA Report are enclosed in **Appendix 1** for reference.

5 ENVIRONMENTAL ASSESSMENT

5.1 Introduction

5.1.1 To support the proposed rezoning of the Subject Site, an Environmental Assessment (EA) has been conducted on noise and air quality aspects to ascertain the environmental acceptability of the proposed development.

5.2 Noise Impact

Road Traffic Noise Impact

5.2.1 The Subject Site is bounded by carriageways on 2 sides (i.e. Jockey Club Road to the northeast and Pik Fung Road to the northwest). In particular, it is anticipated that the major carriageways such as Sha Tau Kok Road – Lung Yeuk Tau and Jockey Club Road may impose considerable road traffic noise impact on the proposed housing development.

5.2.2 Noise standards are recommended in the HKPSG for planning against possible noise impact from road traffic. According to the guidelines, the maximum noise level from road traffic, measured in terms of $L_{10(1\text{-hr})}$ is recommended to be 70dB(A) at typical façades of new dwellings and 55dB(A) at the façade of sick bay in the proposed RCHE.

5.2.3 Road traffic noise on the noise sensitive receivers (NSRs) of the Subject Site was predicted based on the traffic flows for the year 2039 (i.e. 15 years from the completion year 2024), following strictly the procedures stipulated in the "Calculation of Road Traffic Noise" published by the U.K. Department of Transport. It was to predict the hourly L10 noise level generated from road traffic at selected noise representative façades (i.e. NSRs) of the proposed housing development. The predicted noise levels were then compared with the HKPSG noise criterion for assessing the impact.

5.2.4 Based on the schematic housing layouts, the majority of the predicted exceedances are located at noise sensitive façades of Tower 1 and Tower 2 fronting Jockey Club Road.

5.2.5 In order to minimize the road traffic noise impact on the proposed development, the following design principles have been adopted (see **Figure 3.7**):

- Position of Tower 1 is oriented perpendicular to Jockey Club Road to minimize direct facing of residential units towards Jockey Club Road, hence reducing the associated road traffic noise impact to the residential units;

- Majority of the residential units of Tower 1 and Tower 2 are facing towards the internal courtyard/open landscape so as to provide maximum shielding effect to protect the units from road traffic noise sources in the vicinity;

- Noise-tolerant uses such as kitchens and bathrooms will be positioned along facades fronting Jockey Club Road, which is the major road traffic noise source nearby; and,

- Additional noise mitigation measures will be provided to the residential units as necessary.

5.2.6 With the implementation of recommended mitigation measures (see **Table 5.1**), the noise compliance rate for the development is about 99%. A total of 9 residential units at Tower 1 and Tower 2 would still be exposed to noise level in excess of the 70dB(A). Full compliance with noise standard requirements could be achieved if Low Noise Road Surfacing (LNRS) can be applied on Jockey Club Road, subject to technical feasibility and the approval by Highways Department. In case LNRS cannot be applied on Jockey Club Road, gasketted window in the form of Single Frame Double Glazed Windows and air conditioning systems will be provided to those Subsidized Sales Flats with exceedance in this housing project.

5.2.7 The assessment results also indicated that the predicted noise level at all NSRs of the proposed RCHE comply with the noise criteria as stipulated in the HKPSG as mentioned in paragraph 5.2.2 above.

Table 5.1 Schedule of Recommended Mitigation Measures

Location	Mitigation Measure
RCHE	- 1.5m tall solid parapet wall on podium level (top level: 25.7mPD) - Fixed Glazing with Maintenance Window
Tower 1	- 5m tall barrier on podium level (from 27.9mPD) - 1.4m(L) Architectural Fin (Full Height) - Fixed Glazing - Acoustic Window (Baffle Type) - Acoustic Balcony (Baffle Type) - Acoustic Balcony
Tower 2	- 3.9m tall barrier on podium level (from 24.3mPD) - 1.2m(L) Architectural Fin (Full Height) - Acoustic Window (Baffle Type) - Acoustic Balcony (Baffle Type) - Acoustic Balcony - Enhanced Acoustic Window (Baffle Type) - Enhanced Acoustic Balcony (Baffle Type) o Type 1: Acoustic Balcony (Baffle Type) + MPA on the inner sliding panel + SAM on the frame of the sliding panel o Type 2: Enhanced Acoustic Balcony (Baffle Type) (Type1) + solid balustrade at balcony + SAM on the ceiling

5.2.8 The performance of the acoustic balcony, acoustic window/balcony (baffle type) and enhanced acoustic window/balcony (baffle type) for road traffic noise impact will be verified at a later stage if necessary. Contingency measures will be incorporated as necessary. Upon completion of the development, an onsite verification test will be conducted. The findings will be provided to Environmental Protection Department (EPD) in due course.

Railway Noise Impact

5.2.9 Since the nearest separation distance between the MTR East Rail Line and the Subject Site (beyond 300m) is more than the recommended buffer distance (85m) as stipulated in HKPSG, adverse rail noise impact on sensitive uses within the proposed housing development is not anticipated.

Industrial Noise Impact

5.2.10 Predicted industrial noise levels at sensitive receivers within the proposed housing development would comply with the statutory criteria during both daytime and night-time periods. As such, no mitigation measure would be required.

5.3 Air Quality

5.3.1 There is no chimney found within 500m of the Subject Site, such that only vehicular emissions have been assessed. Based on the assessment results, the air quality at each residential floor of the proposed development would comply with the Hong Kong Air Quality Objectives (AQOs). Therefore, no adverse air quality impacts on the proposed development would be anticipated.

5.4 Conclusion

5.4.1 It is concluded that there is **no adverse environmental impacts** on the proposed housing development.

6 AIR VENTILATION ASSESSMENT

6.1 Introduction

6.1.1 In order to demonstrate that the proposed development has considered various air ventilation aspects and that there is no adverse impact on the pedestrian level in the vicinity of the Subject Site, an Expert Evaluation on Air Ventilation (AVA) was conducted to support the rezoning proposal from air ventilating point of view.

6.2 Existing Conditions

6.2.1 The Subject Site is surrounded by mid- to low- rise development, i.e. the Former Fanling Magistracy to the southeast, Fanling Law Courts Building to the southwest, Fanling Health Centre to the north and La Verte to the northeast. On the other hand, there are several high-rise developments located to the further southeast of the Subject Site including Cheung Wah Estate and Fanling Town Centre, etc.

6.2.2 The annual prevailing wind directions for the area are from NNE, NE, ENE, E, ESE and SE, whereas the summer prevailing winds are from ESE, SE, SSE, S, SSW, SW and WSW directions. Summary of annual and summer prevailing winds at the Subject Site area is shown in **Figure 6.1**.

6.2.3 Due to the nearby building clusters and roadside barriers, it is anticipated that the existing site wind availability for the Subject Site would mainly rely on the local traffic network and open spaces, e.g. Sha Tau Kok Road – Lung Yeuk Tau (for wind from northeast and southwest portion), Jockey Club Road (for wind from southeast portion), San Wan Road (for wind from southeast portion) and spaces between Fan Leng Lau Pleasure Ground and Fanling Recreation Ground as indicated in **Figure 6.1**.

6.3 Air Ventilation Performance

6.3.1 The proposed development would create some potential adverse air ventilation impact on the pedestrian wind environment at Fanling Law Courts Building, North District Government Offices, some residential developments to the southwest, Sui Pak Villar, Pentecostal Gin Mao Sheng Primary School, Fanling Heath Centre, village houses to the northwest and Fanling Public School when compared with the existing condition.

6.3.2 To enhance air ventilation in the surrounding area, the following mitigation measures are adopted in the proposed development (see **Figure 6.2**) and the resultant wind flow from various directions are illustrated in **Figure 6.3** to **6.5**, :

- Building separation (~30m) between two residential towers;
- Building setback (i.e. around 11m setback distance at ground floor and around 18m setback distance at first floor);

- Alignment of building blocks in NE to SW direction; and,
- Design three-storey podium with stepped level to the southeast for facilitation of NE and SW wind penetration.

6.4 Conclusion

6.4.1 After considering the existing topography, the location of the existing built areas and provision of mitigation measures, it is considered that the proposed development **would not have significant adverse impact** to surrounding environment. The AVA report is enclosed in **Appendix 2** for reference.

7 VISUAL IMPACT ASSESSMENT

7.1 Introduction

7.1.1 A Visual Impact Assessment (VIA) has been conducted, in accordance with the "Town Planning Board Guideline No. 41 – Guideline on submission of VIA for Planning Application to the Town Planning Board", to investigate the potential visual impacts of the proposed housing development. .

7.1.2 As demonstrated in Chapter 3, the proposed housing development consists of two building towers of 100mPD high at the Subject Site. The massing and disposition of the building blocks have been carefully considered not to create significant visual blockage to the surroundings. A 34.5m wide visual corridor is proposed to reduce the visual impact especially along the northeast/southwest visual axis (**Figure 7.1**).

7.2 Visual Envelope & Viewing Points

7.2.1 The visual envelope covers the fields of views from all sensitive viewers in direct sight of the proposed development. As shown in **Figure 7.2**, the visual envelope extends to include Cheung Wah Estate, Fanling Town Centre and Sheung Shui Divisional Police Station to the east, and extends to the hiking trail of Wu Tip Shan to the south, a portion of On Kui Road and Ma Sik Road to the north. The west extend of the assessment area covers the local residential area of Ling Shan Tsuen and North District Park along So Kwun Po Road. The visual envelope also covers immediate surroundings of the proposed development.

7.2.2 The visual envelope is predominantly occupied by developed areas which include residential and working population. The closest residential developments to the Subject Site are La Verte, Fan Leng Lau and Cheung Wah Estate and some low-rise residential buildings at the northwest of the Subject Site. Public open spaces including Fanling Recreation Ground, Luen Wo Hui Playground and North District Park are surrounding the proposed development.

7.2.3 Representative viewing points (VPs) from key public viewers are selected for making photomontages to illustrate the visual impact of the proposed housing development. The locations of the VPs and the respective photomontages are shown in **Figure 7.3 – Figure 7.11.**

7.3 Appraisal of Visual Changes

VP1 – Cheung Wah Estate

7.3.1 VP1 represents potential visual impacts on local residents living around Cheung Wah Estate. The VP is about 200m to the southeast of the Subject Site. The general view of this VP consists of Former Fanling Magistracy in the foreground and the Fanling Law Courts Buildings in the background. The visual sensitivity of the public viewers from this VP is graded as **medium**. The current visual composition of this VP is dominated by road side planting and the Former Fanling Magistracy in which sky view can be seen along Sha Tau Kok Road – Lung Yeuk Tau above the Former Fanling Magistracy. The proposed development will have **slightly obstructions** of the prominent visual resources/elements of this view. As such, it is unlikely that the proposed development will degrade the visual amenity that is enjoyed from the VP. Therefore, **no unacceptable visual impact** is anticipated.

VP2 – Fanling Recreation Ground

7.3.2 VP2 represents potential visual impacts on public users of the Fanling Recreation Ground and the public pass by San Wan Road. The VP is about 220m to the southeast of the Subject Site. The general view of this VP consists of North District Government Offices as foreground and Fanling Law Court Buildings as background. The visual sensitivity of the public views from this VP is graded as **low**. This VP has an open view to the sky view even there are existing buildings dominating the view. The roadside planting along San Wan Road and the greenery in the Fanling Recreation Ground provided visual comfort to the composition. Although, the proposed development partially obstruct the sky view and reduce the openness of the VP, the proposed visual corridor between the two building towers will allow partial open up to the sky view. The obstruction of the proposed development will have limited effect to this VP. Given the proposed development will not sufficiently degrade the visual composition of this VP, the effect of visual changes on public views from this VP is qualitatively graded as **moderate**. In viewing that the proposed development is of similar building height to the existing Cheung Wah Estate and is built close to the existing buildings and visually intact with them, it is **compatible** to the surrounding environment.

VP3 – Residential Area at Fan Leng Lau

7.3.3 VP3 represents potential visual impacts on residents of Fan Leng Lau. The VP is about 220m to the north of the Subject Site. The general view of this VP consists of short buildings as the foreground and open sky view as the background. The visual sensitivity of the public views from this VP is graded as **medium**. This VP has a partial sky view above the low-rise village houses dominated in the Fan Leng Lau. The disposition of the proposed buildings allow a visual corridor to maintain a certain sky view from this VP. The proposed development will have slight obstructions to the prominent visual resources/elements of this view. Therefore, it is unlikely that the proposed development will degrade the visual amenity that is enjoyed from this VP. **No unacceptable visual impact** is anticipated. In viewing that only the top portion of the proposed development can be seen from this VP and it is visually intact to the existing buildings in the foreground, the proposed development is **compatible** to the surrounding environment.

VP4 – Fanling Town Centre

7.3.4 VP4 represents potential visual impacts on the travelers to and from the Fanling MTR Station. The VP is about 300m to the south of the Subject Site. The general view of this VP consists of carriageway and road side planting as the foreground and the Fanling Law Courts Building and Mount One as the background. The visual sensitivity of the public views from this VP is graded as **medium**. The view of this VP is dominated by roadside planting in the foreground and has limited view to the buildings in the background. Sky view can only be seen above the existing buildings and top of the existing trees at the junction of San Wan Road and Sha Tau Kok Road – Lung Yuek Tau. The proposed development will have obstructions to the visual resources/elements of this view and is not fully compatible with the surrounding environment given that its height is much higher than the surrounding developments However, in viewing that the proposed development is 300m away from this VP and only causes partial blockage to the sky view, it is unlikely that it will sufficiently degrade the visual amenity that is enjoyed from this VP. Therefore, **no unacceptable visual impact** is anticipated.

VP5 – Luen Wo Hui Playground

7.3.5 VP5 represents potential visual impacts on the users of the Luen Wo Hui Playground and the local residents. The VP is about 350m to the northeast of the Subject Site. The general view of this VP consists of Fanling Rhenish Church Secondary School and the ball court of Luen Wo Hui Playground as the foreground and the open sky view as the background. The visual sensitivity of the public views from this VP is graded as **medium**. This VP has an open view of the sky with the existing Fanling Rhenish Church Secondary School as background. The ball court of the Luen Wo Hui Playground dominated the visual composition of the VP. The proposed development will not degrade the visual composition of this VP as the major parts of it are blocked by the existing buildings block. Hence, the effect of visual changes on public viewers from this VP is qualitatively graded as **slight**. As the proposed development is visually intact with the existing school buildings, it is **compatible** to the surrounding environment.

VP6 – North District Park

7.3.6 VP6 represents potential visual impacts on the visitors of the North District Park and the local residents. The VP is about 600m to the northwest of the Subject Site. The general view of this VP consists of village houses of one to three storeys high at Fanling Wai as the foreground and the Fanling Law Courts Building, Cheung Wah Estate and the open sky view as the background. The visual sensitivity of the public views from this VP is graded as **high**. This VP is dominated by the open area and the low-rise village houses of Fanling Wai. Since the proposed development is far away from this VP, only little part of the building massing can be seen. It creates **very minor impact** to the existing visual composition or **slight** visual change to this VP. As the proposed development intact with the existing buildings and only small portion of it is being visible from this VP, it is **compatible** to the surrounding environment. The proposed development will have slightly obstructions of the prominent visual resources/elements of this view. As such, it is **unlikely** that the proposed development will degrade the visual amenity that is enjoyed from this VP. Therefore, **no unacceptable** visual impact is anticipated.

VP7 – Ling Hill

7.3.7 VP7 represents potential visual impacts on the travelers along Jockey Club Road east bound and the local residents of Ling Shan Tsuen. The VP is about 450m to the northwest of the Subject Site. The general view of this VP consists of the carriageway of Jockey Club Road and the roadside planting as the foreground and the open sky view as the background. The visual sensitivity of the public views from this VP is graded as **low**. This VP is dominated by the carriageway of Jockey Club road and their roadside planting with part of the Cheung Wah Estate being visible. The proposed development basically create **no effect** to the existing visual composition as it almost merges with the existing visual composition of this VP. Given the proposed development has very limited effect to the visual composition of this VP, the effect of visual changes on public viewers from this VP is qualitatively grades as **slight**. As the proposed development is in front of Cheung Wah Estate with similar building height and only occupies a small portion of the sky view of this VP, the proposed development is **compatible** to the surrounding environment. The proposed development will have slightly obstructions of the prominent visual resources/elements of this view. As such, it is **unlikely** that the proposed development will degrade the visual amenity that is enjoyed from this VP. Therefore, **no unacceptable** visual impact is anticipated.

VP8 – Wu Tip Shan

7.3.8 VP8 represents potential visual impacts on the travelers along hiking trail of Wu Tip Shan. The VP is at 200mPD at about 1,000m to the southeast of the Subject Site. The general view of this VP the woodland of Wu Tip Shan as the foreground and Fanling MTR Station, Fanling Town Centre, Cheung Wah Estate, Mount One and the residential buildings of Fanling dominated the overall view and mountain view to the north as the background. The visual sensitivity of the public views from this VP is graded as **low**. This VP is dominated by buildings and surrounded mountain woodland. The proposed development **totally merged** with the adjacent building developments. There is **no major visual obstruction** by the proposed development to this VP. Given that the proposed development will not higher than the existing buildings at the back and is blended in with the surrounding built environment, it is **compatible** to the surrounding environment. The effect of visual changes on public viewers from this VP is qualitatively graded as **negligible.** As such, it is **unlikely** that the proposed development will degrade the visual amenity that is enjoyed from this VP. Therefore, **no unacceptable** visual impact is anticipated.

7.4 Evaluation of Overall Visual Impact

7.4.1 It is concluded that the visual changes caused by the proposed development is **not significant** when viewed from the identified VPs. It will not detract the visual value attached to the views or have a significant impact to the visual accessibility to the existing visual amenity and resources nearby. Urban design such as creation of visual corridor and disposition of buildings proposed as part of the propose development will serve to improve the overall quality and help alleviate some degree of the potential visual impact arose from the new development. Mitigation measures such as greening measures and façade treatments may be explored in subsequent architectural design stage to further improve the overall aesthetics and visual interests of the proposed development.

7.4.2 In overall terms, the proposed development will induce **no significant negative visual impact**. Efforts have been made to ameliorate the potential visual impact of the proposed development as far as possible. Whilst some degree of visual obstruction will occur, they are generally insignificant. In return, the proposed development will make a positive contribution to the supply of housing units and optimize land utilization. The resultant overall impact is therefore concluded as **slightly adverse**. The VIA report is enclosed in **Appendix 3** for reference.

8 TREE ASSESSMENT

8.1 Introduction

8.1.1 A Tree Assessment (TRA) (extracts from the TRA report are enclosed in **Appendix 4** for reference) has been conducted in order to support the future tree preservation and tree removal application for the proposed subsidized housing development at the Subject Site.

8.2 Existing Condition of the Trees

8.2.1 A total of 46 no. of trees has been identified within the Subject Site. 17 different tree species are identified with *Delonix regia* as the most abundant species (9 nos.). All trees within the Subject Site are common species in Hong Kong. Furthermore, no old and valuables trees (OVTs) are identified. A summary of the quantities and species of the identified trees is provided in **Table 8.1**.

8.2.2 Results from the tree survey indicated that the majority of the trees are in Fair to Poor form and health condition, with Low to Medium amenity value and Low to Medium survival rate after transplanting. It was also noted that decayed wounds/cavities were found among the surveyed trees due to poor maintenance or inclement weather.

8.3 Proposed Treatment to the Existing Trees

8.3.1 3 no. of trees are proposed to be retained on site and 43 no. of trees (including 3 no. of missing trees) are proposed to be felled due to conflict with future construction works. No trees are recommended for transplanting due to their fair to poor health condition and low to medium amenity value. Findings and recommended treatments to existing trees are summarized in **Table 8.2**.

Table 8.1 Summary of Quantities, Species and Recommended Treatments of Trees

Scientific Name	Chinese Name	Trees to be Retained	Trees to be Felled/Removed	Missing Tree	Total
Bauhinia spp.	羊蹄甲	0	3	1	4
Bridelia tomentosa	土蜜樹	0	0	1	1
Casuarina equisetifolia	木麻黃	0	2	0	2
Celtis sinensis	朴	1	3	0	4
Delonix regia	鳳凰木	0	8	1	9
Dimocarpus longan	龍眼	0	3	0	3
Eucalyptus citriodora	檸檬桉	0	1	0	1
Ficus elastica	印度橡	0	1	0	1
Ficus microcarpa	細葉榕	0	1	0	1
Koelreuteria bipinnata	複羽葉欒樹	1	0	0	1
Lagerstroemia indica	紫薇	0	1	0	1
Lophostemon confertus	紅膠木	0	3	0	3
Macaranga tanarius	血桐	0	3	0	3
Melaleuca cajuputi	白千層	0	6	0	6
Morus alba	桑	0	1	0	1
Syzygium jambos	蒲桃	0	2	0	2
Toona sinensis	香椿	1	2	0	3
Total no. of trees		**3**	**40**	**3**	**46**

Table 8.2 Summary of Tree Survey and Treatment Recommendations

Total Trees Surveyed	Trees to be Retained	Trees to be Felled (including missing tree)	Trees to be Transplanted
46	3	43	0

8.4 Tree Compensation Proposal

8.4.1 To compensate the trees proposed to be felled, a total of 109 no. of new Heavy Standard trees would be planted (including 27 nos. on G/F, 47 nos. on 1/F and 35 nos. on 2/F) with an approximate 3.5m spacing between each tree (see Proposed Compensatory Planting Plans in **Figure 8.2 – Figure 8.4**). The compensatory tree planting ratio will be **1:2.63** (in terms of Quantity) or **1:1** (in terms of Quality) which satisfies the requirements of providing at least 1:1 in terms of quantity and quality (total girth removal).

8.4.2 For a healthy development of tree in future, most of the trees will be planted in planting area at grade, except for those being planted on podium. The planting area to receive the compensation trees shall have a sufficient soil depth excluding drainage layer. Area surrounding the compensatory trees will be planted with turf, shrub or groundcover. Area surrounding the tree root collar at a diameter of 300-500mm would be kept clear of vegetation. The proposed compensation tree species are summarized in **Table 8.3**.

Table 8.3 The Proposed Tree Species to be Compensated

Proposed Tree Species Botanical Name	*Chinese Name*	*Size*	*Live Crown Ratio*	*DBH*	*Crown Spread (m)*	*Overall height (m)*
Bischofia javanica	秋楓	Heavy Standard	40	150	3.0-4.0	4.0-5.0
*Cinnamomum burmannii**	陰香	Heavy Standard	40	150	3.0-4.0	3.0-4.5
Elaeocarpus apiculatus	尖葉杜英	Heavy Standard	40	150	3.0-4.5	5.0-6.0
Ficus altissima 'Golden Edged'	班葉高山榕	Heavy Standard	40	150	3.0-4.0	4.0-5.0
Jacaranda mimosifolia	藍花楹	Heavy Standard	40	150	3.0-4.0	4.0-5.0
*Liquidambar formosana**	楓香	Heavy Standard	40	150	3.0-4.5	4.0-5.0
Magnolia grandiflora	荷花玉蘭	Heavy Standard	40	150	3.0-4.5	4.0-5.0
Plumeria rubra	紅雞蛋花	Heavy Standard	40	150	3.0-4.5	2.0-3.0

8.5 Soft Landscape Work Maintenance

8.5.1 Maintenance of landscape areas will be carried out by a qualified Landscape Contractor for a period of 12 months after the completion of the construction works and will be managed by the estate management team afterwards. Tree risk assessment would be done once a year by qualified tree arborist.

9 INFRASTRUCTURE

9.1 Water Supply Impact Assessment (WSIA)

Existing Water Facilities

9.1.1 Fresh water supply in the vicinity of the Subject Site is provided by the Sheung Shui Water Treatment Works (SSWTW) with a normal capacity of about 200MLD. The fresh water supplied by SSWTW is pumped to the Tong Han Fresh Water Service Reservoir (THFWSR) and Tong Hang No. 2 Fresh Water Service Reservoir (THFWSR No. 2) via the existing water mains with diameter of ranging from DN600 to DN 1400. The total capacity of THFWSR and THFWSR No. 2 is 37,214m^3 with top water level of 85.34mPD and invert level of 79.2mPD. The fresh water distribution mains in vicinity of the Subject Site is ranging from DN150 to DN450. The existing fresh water system layouts are shown in **Figure 9.1** and **Figure 9.2**.

9.1.2 There is no salt/reclaimed water supply in the Subject Site area. The Temporary Mains-water for Flushing (TMF) is currently adopted as an alternative method for toilet flushing using fresh water supplied from THFWSR and THFWSR No. 2 until salt/reclaimed water is available in the future. Thus, it is anticipated that TMF will be applied to the proposed development.

9.1.3 The main fresh water distribution system with fire-fighting provision in the vicinity of the Subject Site is DN150 and DN450 watermains.

Water Demand Estimate

9.1.4 The main fresh water distribution system with fire-fighting provision in the vicinity of the Subject Site is DN150 and DN450 watermains. In case of emergency, the fresh water demand for fire-fighting approximately 6,000m^3/day.

9.1.5 Based on the population, the proposed development will require a total water demand of 637.3m^3/day and 1,762.2m^3/day under the condition of Mean Daily Demand (MDD) and Peak Water Demand (PWD) respectively. It is equivalent to 0.32% (MDD) or 0.88% (PWD) of the nominal capacity of SSWTW. Hence, impact to the current water supply system should be minimal.

Potential Impacts to Waterworks Facilities

9.1.6 As mentioned, the additional water demand from the proposed development is relatively small and would likely have minimal impact to the existing waterworks installations. A short section of existing DN50GI and DN150SV distribution mains (for providing water supply to the existing tennis court) falling at the corner of the Subject Site may require to be disconnected or diverted. Any diversion or removal schemes shall further consult with Water Supplies Department (WSD) and other relevant government departments before the commencement of site clearance.

9.1.7 An extension of the existing DN450DI fresh water distribution system (along the northern bound of Jockey Club Road outside the Subject Site) is proposed. Approval from WSD will be seek for the proposed connection point at the existing DN450 freshwater mains.

Conclusion and Recommendations

9.1.8 The fresh water supply to the Subject Site is considered **adequate**. As salt/reclaimed water supply to Fanling area is not available, TMF is recommended for toilet flushing use until the salt/reclaimed water supply to the Subject Site is available. According to the currently policy of WSD, salt/reclaimed water for flushing is a long term strategy. However, the materials for interior services including the communal system and pumping installations shall be catered for the salt/reclaimed water supply. Detailed arrangement for flushing supply system should be carried out in the detailed design stage.

9.2 Sewerage Impact Assessment (SIA)

Existing Catchment and Drainage System

9.2.1 Based on the latest Drainage Services Department (DSD) Record Plans and on-site investigation, there is no existing sewerage manhole inside the Subject Site boundary. The nearest sewerage discharge point to the Subject Site is a 225mm diameter sewerage reserve tee (FTH1000640) located at the Fanling Law Courts Building, which subsequently connects to the 225mm diameter sewer along Pik Fung Road. Another existing sewerage manhole (FMH1003263) connecting 1200mm diameter sewer is located in the south-east of the Subject Site, near to the roundabout at Sha Tau Kok Road – Leung Yeuk Tau. The existing sewerage arrangement is illustrated in **Figure 9.3**.

9.2.2 The sewerage catchment is served by the Shek Wu Hui Sewerage Treatment Works (SWHSTW) located at Chuk Wan Street in Sheung Shui. Then, the treated effluent from SWHSTW will be discharged to Ng Tung River. The design capacity of the existing SWHSTW is 93,000m^3/day. The expansion (advance works) of SWHSTW to increase its capacity to 105,000m^3/day is in progress, and targeted to be completed by 2019. The future expansion (main works) to 190,000m^3/d will be implemented in stages for completion in 2034 tentatively.

Sewerage Flow Projection

9.2.3 Based on the proposed development parameters, the estimated sewage flow generated from the proposed development at the Subject Site will be 407m^3/day (ADWF) or 28.26 l/s (PWWF).

Potential Impacts to Sewerage Facilities

9.2.4 There is no existing sewerage manhole inside the Subject Site. New terminal manhole and new sewer along Jockey Club Road is proposed to be installed in order to convey the sewage discharge to the existing sewerage manhole (FMH1003263) at Sha Tau Kok Road – Leung Yeuk Tau and subsequently discharge into the sewerage network at Sha Tau Kok Road – Leung Yeuk Tau, San Wan Road and finally leading to the SWHSTW. The hydraulic capacity of the proposed new sewer and existing downstream sewer network is checked against the additional sewage arising from the propose development and other nearby proposed development covered by the approved s.16 town planning application A/FSS/222 and Environmental Protection Department (EPD)'s prediction flow in concerned existing sewer sections. It indicates that the proposed new 300mm diameter sewer and the downstream 1200mm diameter sewer have sufficient capacity for the flow conveyance. The proposed sewage terminal manhole and all its upstream internal sewers will be maintained by the project proponent.

9.2.5 The first population intake from the proposed housing development at the Subject Site will not be earlier than 2022 and the arising sewage would be accommodated by SWHSTW under expansion (main works) stages. EPD also confirmed the possibility of re-allocating the previously reserved capacity for the housing site at Ching Hiu Road to the Subject Site. As the projected design flow from the proposed development at the Subject Site is lesser than that from Ching Hiu Road's housing development, it could

conclude that there is no adverse sewerage impact on the performance of the SWHSTW due to the proposed housing development at the Subject Site.

Proposed Sewerage Arrangement

9.2.6 Sewage collected from the Subject Site will be discharge through the sewage terminal manhole in the south-eastern site boundary, adjacent to the Former Fanling Magistracy. New sewer of 300mm diameter will be constructed along Jockey Club Road to convey sewage flow from the Subject Site to the existing sewerage manhole (FMH1003263) at Sha Tau Kok Road – Lung Yeuk Tau and subsequently discharge into the sewerage network at Sha Tau Kok Road – Lung Yeuk Tau, San Wan Road and finally to the SWHSTW. The proposed sewerage arrangement can be referred to **Figure 9.4**.

Temporary Sewerage Arrangements during Construction

9.2.7 No temporary sewerage arrangement is anticipated for the proposed development. In case temporary sewerage arraignment is required, contractor shall prepare the temporary sewerage design, vetted to the satisfaction of the AP/RSE prior to submission to DSD for approval.

Conclusion and Recommendations

9.2.8 From the above assessment, it can be concluded that the proposed housing development at the Subject Site **will not cause any adverse sewerage impact** to its downstream sewerage system.

9.3 Drainage Impact Assessment (DIA)

Existing Catchment and Drainage System

9.3.1 In accordance with DSD record plan and recent site survey, runoffs from the proposed development and the nearby areas are collected by series of stormwater pipes with sizes ranging from 450mm to 1050mm diameter located at Pik Fung Road. The site is bound by an existing 1050mm diameter storm drain in Pik Fung Raod and Jockey Club Road. Flow from the 1050mm diameter storm drains will be conveyed to an existing 1350mm diameter stormwater drains running from south to north along Jockey Club Road. Its downstream end is eventually connected to a 1-cell 2300x2300 box culvert near So Kwun Po Road. The outlet of the box culvert discharges flow to Shek Sheung River.

9.3.2 The Subject Site is located within eight drainage catchments, namely catchments A, B, C, D, E, F, G (Pik Fung Road) and H (Jockey Club Road). **Figure 9.5** indicates the characteristics of the drainage catchments.

Changes to Drainage Characteristics

9.3.3 The existing land uses have been changed after the proposed development with an increase in paved area. Based on the change in paved/unpaved area ratio of the proposed development, the total runoff generated from the proposed development will be slightly increased by 0.051m^3/s under 1 in 50 years rainfall event.

Proposed Drainage Connections

9.3.4 Two existing 450mm diameter pipes between existing manhole SMH1003809, SMH1003808 and SMH1001216 will be upgraded to 600mm to provide adequate capacities for the proposed development. Existing manhole SMH1003809 within site boundary and its connecting pipe sections will be demolished and replaced by terminal manhole after the completion of drainage upgrading works.

Potential Impacts to Drainage System

9.3.5 Total runoffs from catchment (A, B, C, D, E) as well as surface runoffs from part of Pik Fung Road and Jockey Club Road are considered for the capacity review of existing stormwater pipe along Pik Fung Road and Jockey Club Road. The results show that the drainage system along Pik Fung Road and Jockey Club Road will have spare capacity to take up the additional stormwater arising from the proposed development. Minimum factor of safety of 1.05 can be maintained.

Conclusion

9.3.6 Apart from the proposed upgrades as mentioned in para. 9.3.4, it can conclude that the proposed development **will not pose any adverse drainage impact** in areas within, upstream or downstream of the Subject Site.

10 CONCLUSION

10.1.1 The proposed subsidized housing development at the Subject Site at Jockey Club Road is demonstrated to be feasible and sustainable in terms of traffic and transport, environment, air ventilation, visual and infrastructure. Subject to implementation of the identified mitigation measures and improvement works, the proposed development will not have insurmountable impact on the community, environment and existing infrastructure.

Figures



1 Fanling Magistracy Substation



2 Fanling Maternal and Child Health Centre



3 Fanling Law Courts Building



4 Former Fanling Magistracy



5 North District Government Offices

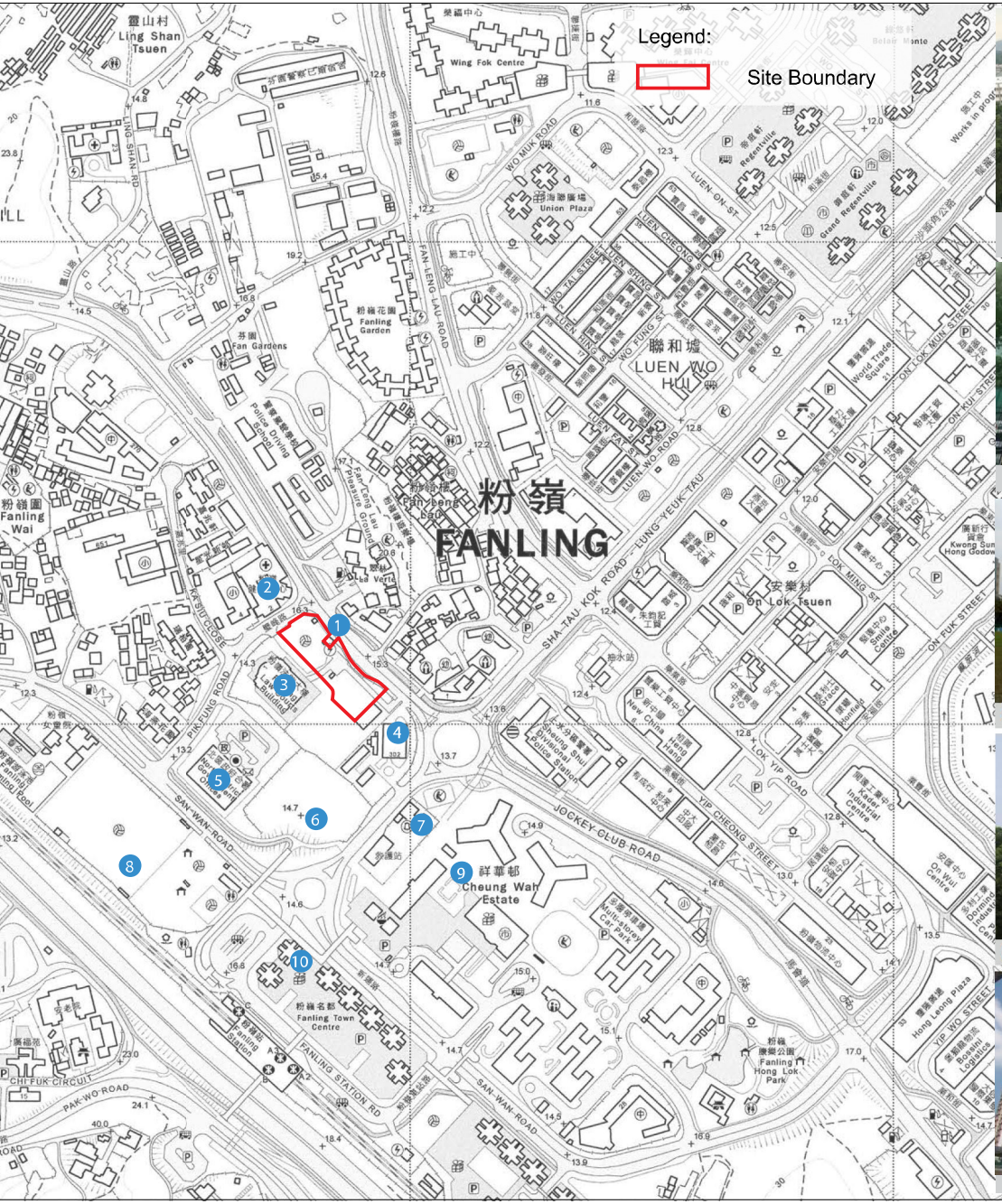
1 Fanling Magistracy Substation

2 Fanling Maternal and Child Health Centre

3 Fanling Law Courts Building

4 Former Fanling Magistracy

5 North District Government Offices



6 Temporary Public Carpark (intended for the New Territories East Cultural Centre)



7 Fanling Fire Station



8 Fanling Recreation Ground



9 Cheung Wah Estate



10 Fanling Town Centre

HONG KONG HOUSING SOCIETY 香港房屋協會

AECOM in association with DLN, LLA, Ramboll and WSP

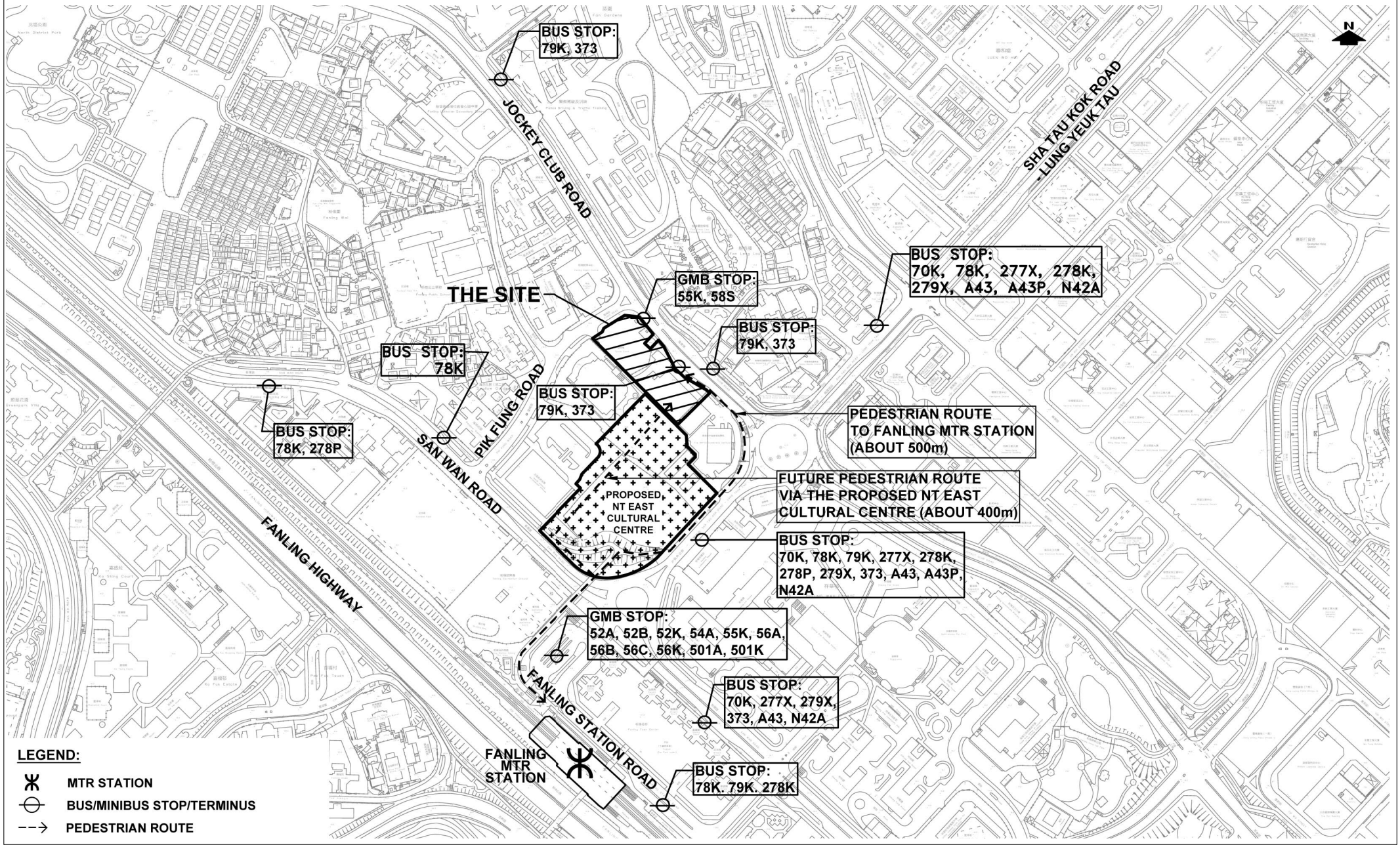
Project Title:
Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories

Figure Title:
Subject Site and its Surrounding Areas

Figure: 2.1
Date: Mar 2019
Scale: N/A



HONG KONG HOUSING SOCIETY 香港房屋協會	AECOM in association with DLN, LLA, Ramboll and WSP	Project Title: Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories	Figure Title: Site Zoning (extracted from OZP No. S/FSS/22)	Figure: 2.2 Date: Mar 2019 Scale: N/A



HONG KONG HOUSING SOCIETY
香港房屋協會

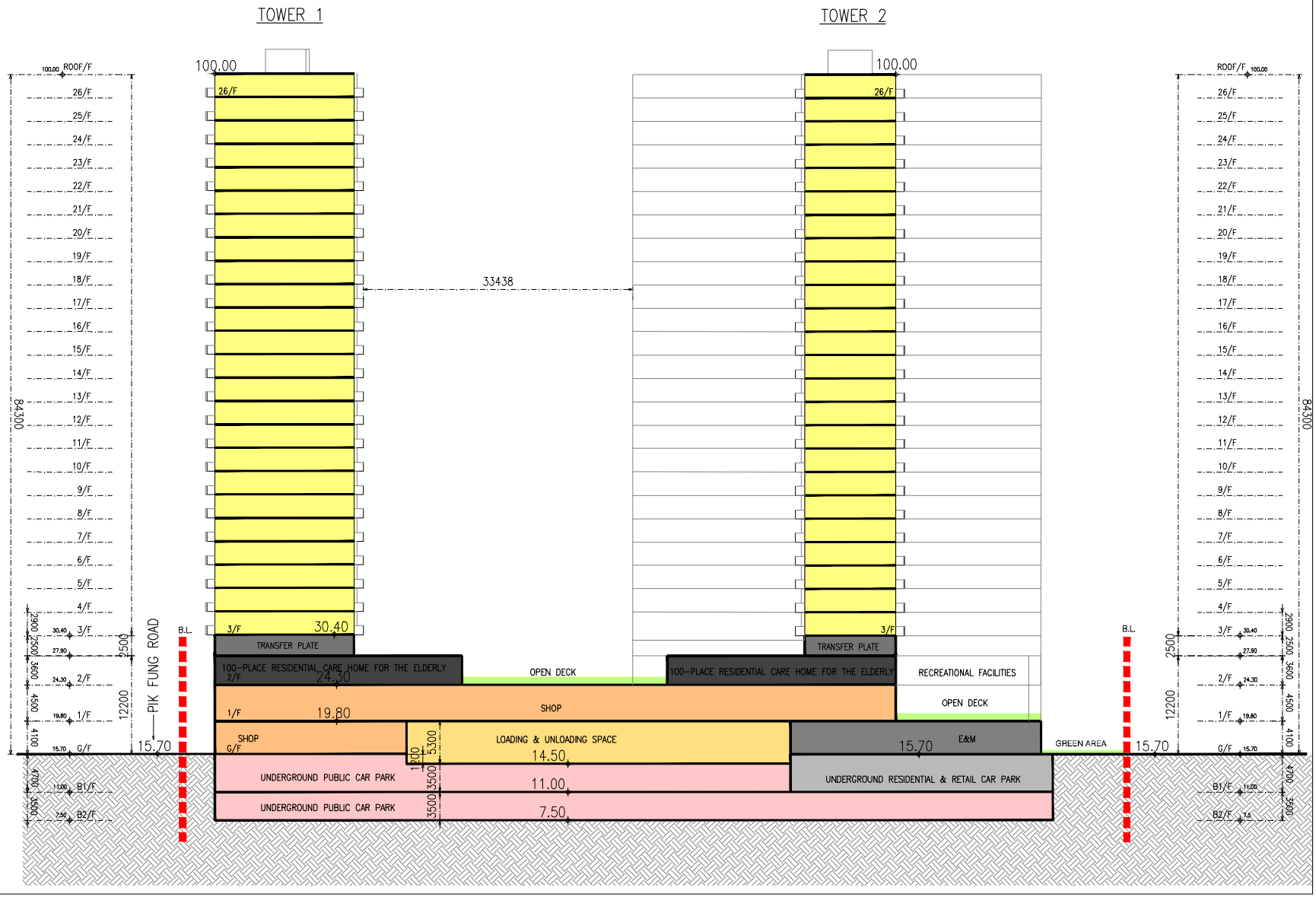
AECOM in association with
DLN, LLA, Ramboll and WSP

Project Title:
Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories

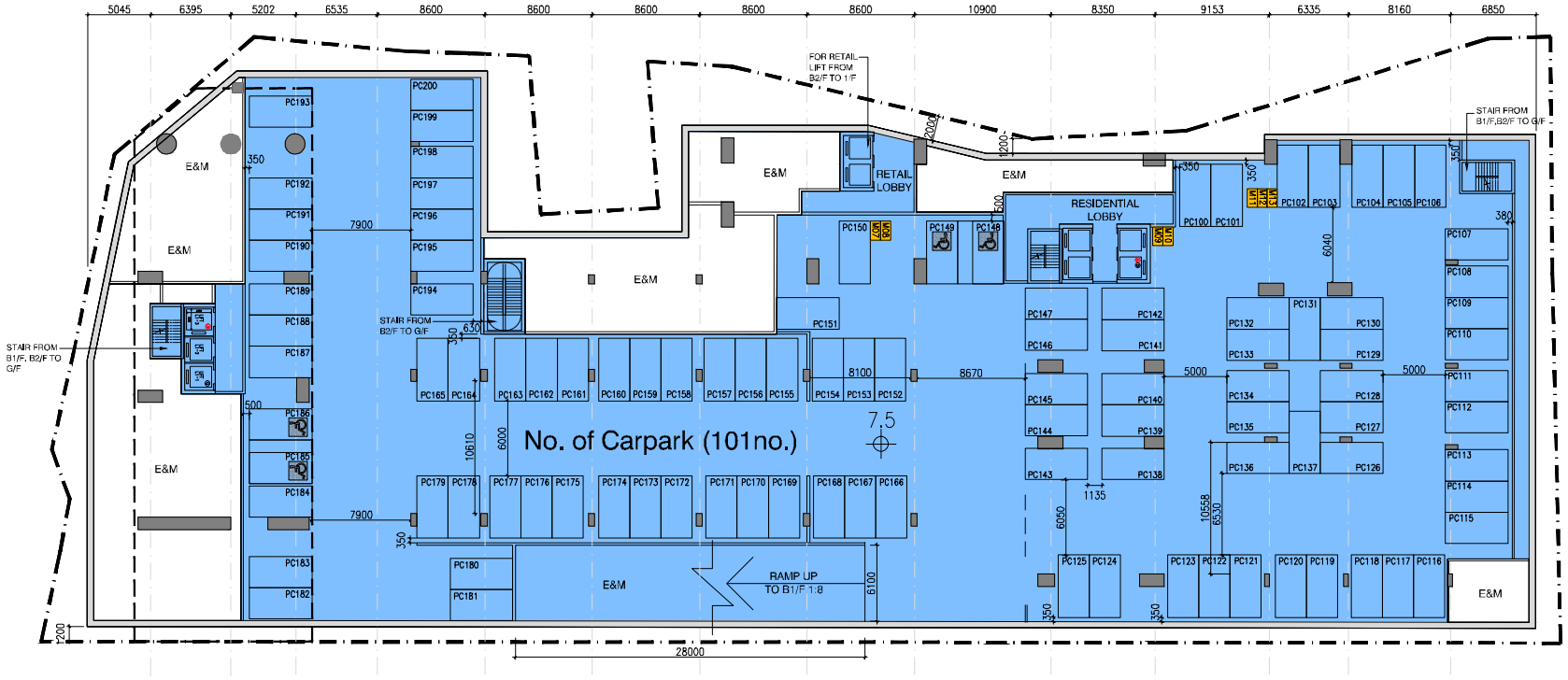
Figure Title:
Public Transport Facilities & Pedestrian Connections to MTR Station

Figure: 2.3
Date: Mar 2019
Scale: N/A

SECTION A–A



HONG KONG HOUSING SOCIETY 香港房屋協會	AECOM in association with DLN, LLA, Ramboll and WSP	Project Title: Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories	Figure Title: Section Diagram	Figure: 3.1 Date: Mar 2019 Scale: N/A



TYPE OF CARPARK	NO OF CARPARK (REQUIRMENT UNDER HKPSG)	PROPOSED PROVISION			CARPARK NO.
		FLOOR	NO.	TOTAL.	
PRIVATE	45 (RESIDENTIAL) 13 (RETAIL) 10 (VISITOR)	B1	70	70	PC001- PC070
PUBLIC	83	B1	29	130	PC071- PC200
		B2	101		
MOTORCYCLE	6 (RESIDENTIAL) 2 (RETAIL)	B1	6	13	M01 to M13
		B2	7		

NOTES: All plant room provisions subject to confirmation by E&M consultant

HONG KONG HOUSING SOCIETY 香港房屋協會

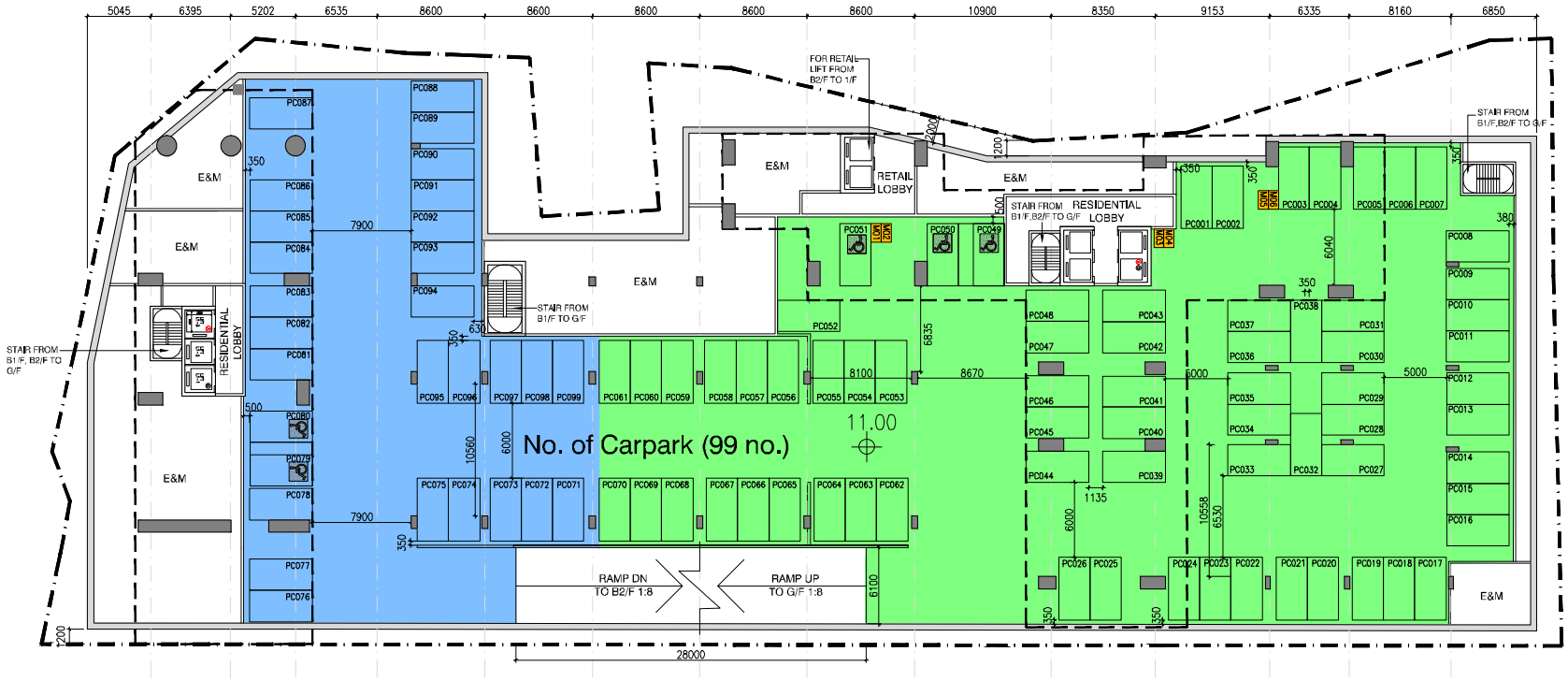
AECOM in association with DLN, LLA, Ramboll and WSP

Project Title:
Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories

Figure Title:
Schematic Layout Plan - B2/F

Figure: 3.2
Date: Mar 2019
Scale: N/A

ion



TYPE OF CARPARK	NO OF CARPARK (REQUIRMENT UNDER HKPSG)	PROPOSED PROVISION			CARPARK NO.
		FLOOR	NO.	TOTAL.	
PRIVATE	45 (RESIDENTIAL) 13 (RETAIL) 10 (VISITOR)	B1	70	70	PC001- PC070
PUBLIC	83	B1	29	130	PC071- PC200
		B2	101		
MOTORCYCLE	6 (RESIDENTIAL) 2 (RETAIL)	B1	6	13	M01 to M13
		B2	7		

NOTES: All plant room provisions subject to confirmation by E&M consultant

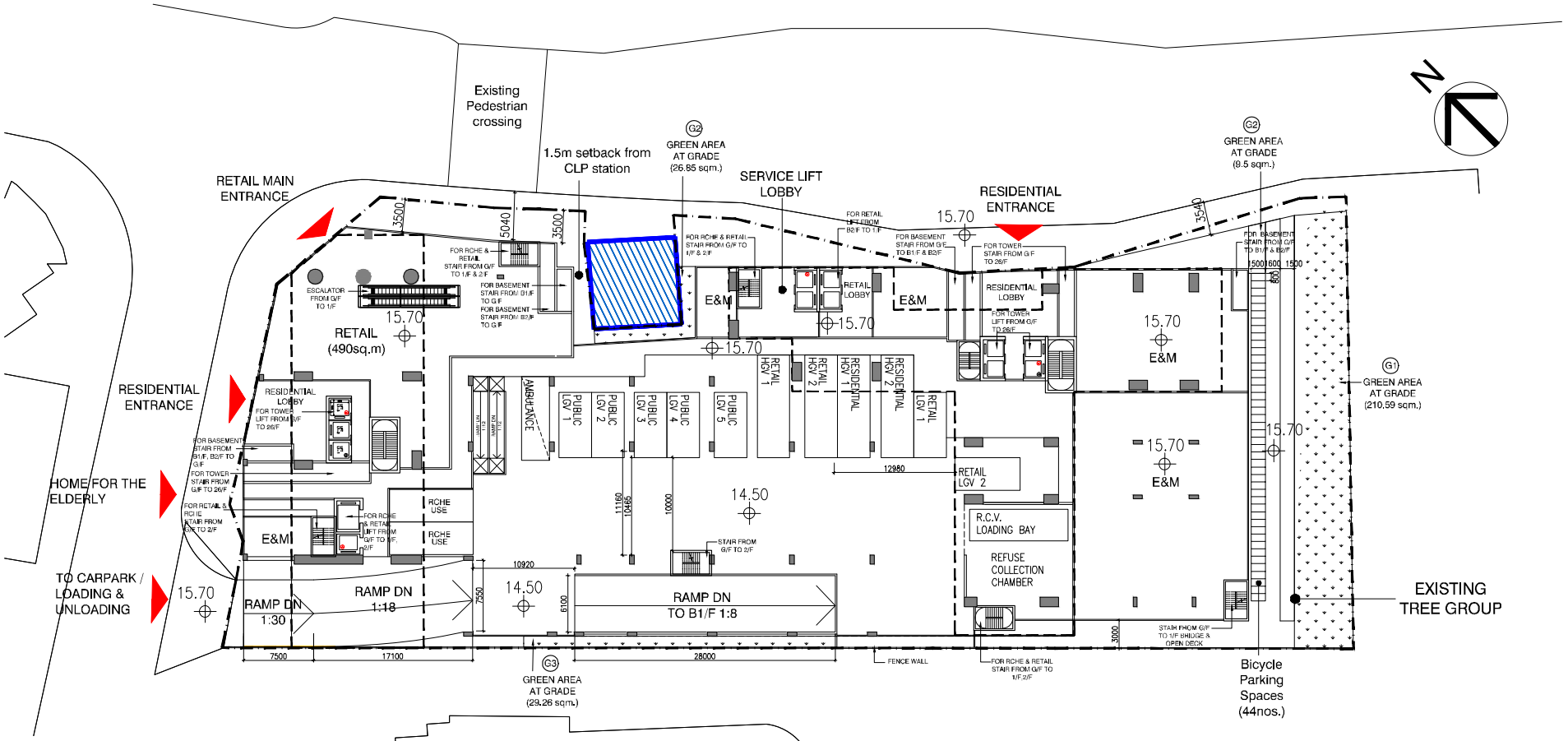
HONG KONG HOUSING SOCIETY 香港房屋協會

AECOM in association with DLN, LLA, Ramboll and WSP

Project Title:
Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories

Figure Title:
Schematic Layout Plan - B1/F

Figure: 3.3
Date: Mar 2019
Scale: N/A



TYPE OF CARPARK	NO OF CARPARK (REQUIREMENT UNDER HKPSG)	PROPOSED PROVISION	
		FLOOR	NO.
HGV	2 (RESIDENTIAL) 2 (RETAIL)	G/F	4
LGV	2 (RETAIL) 5 (PUBLIC)	G/F	7

NOTES: All plant room provisions subject to confirmation by E&M consultant

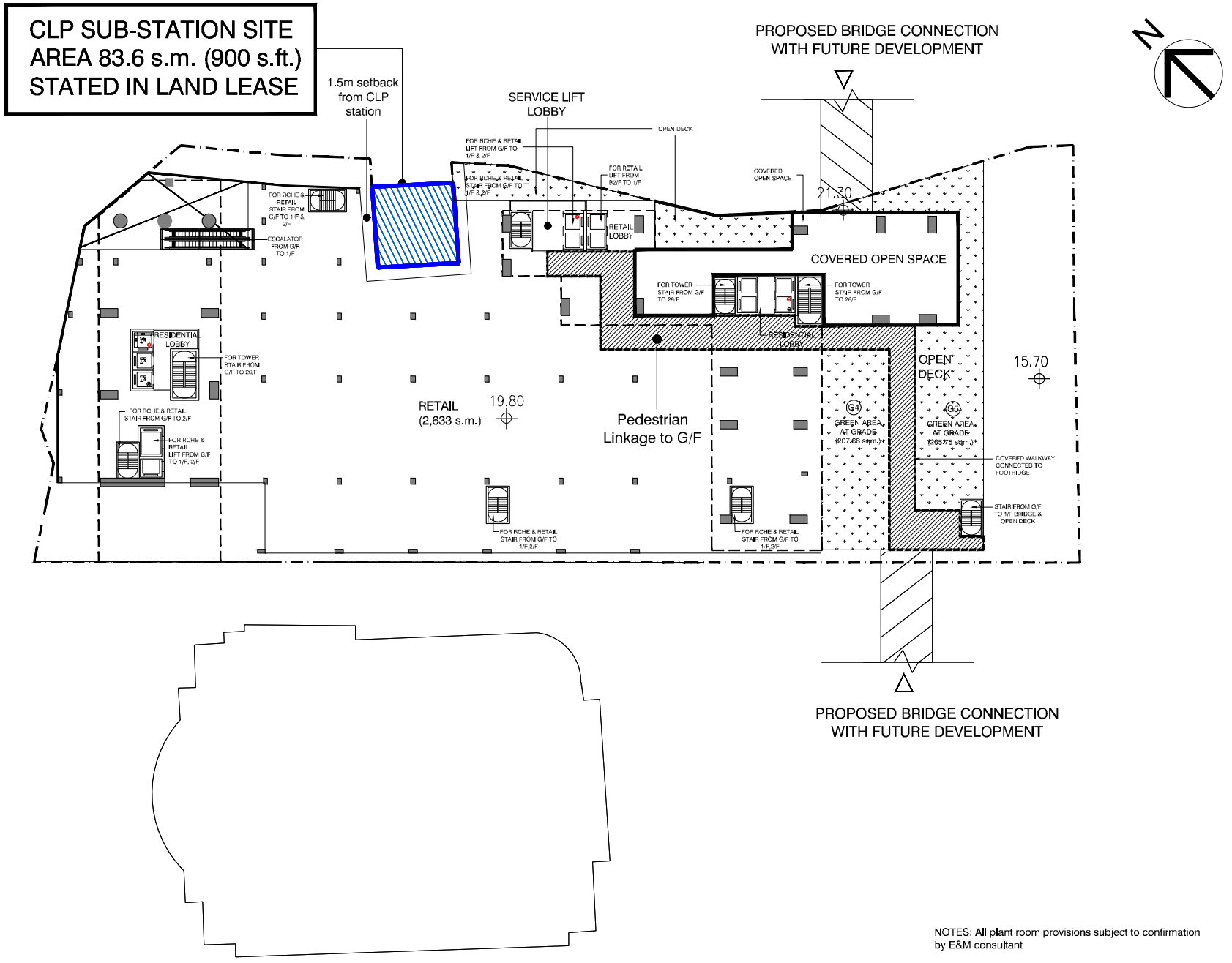
HONG KONG HOUSING SOCIETY 香港房屋協會

AECOM in association with
DLN, LLA, Ramboll and WSP

Project Title:
Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories

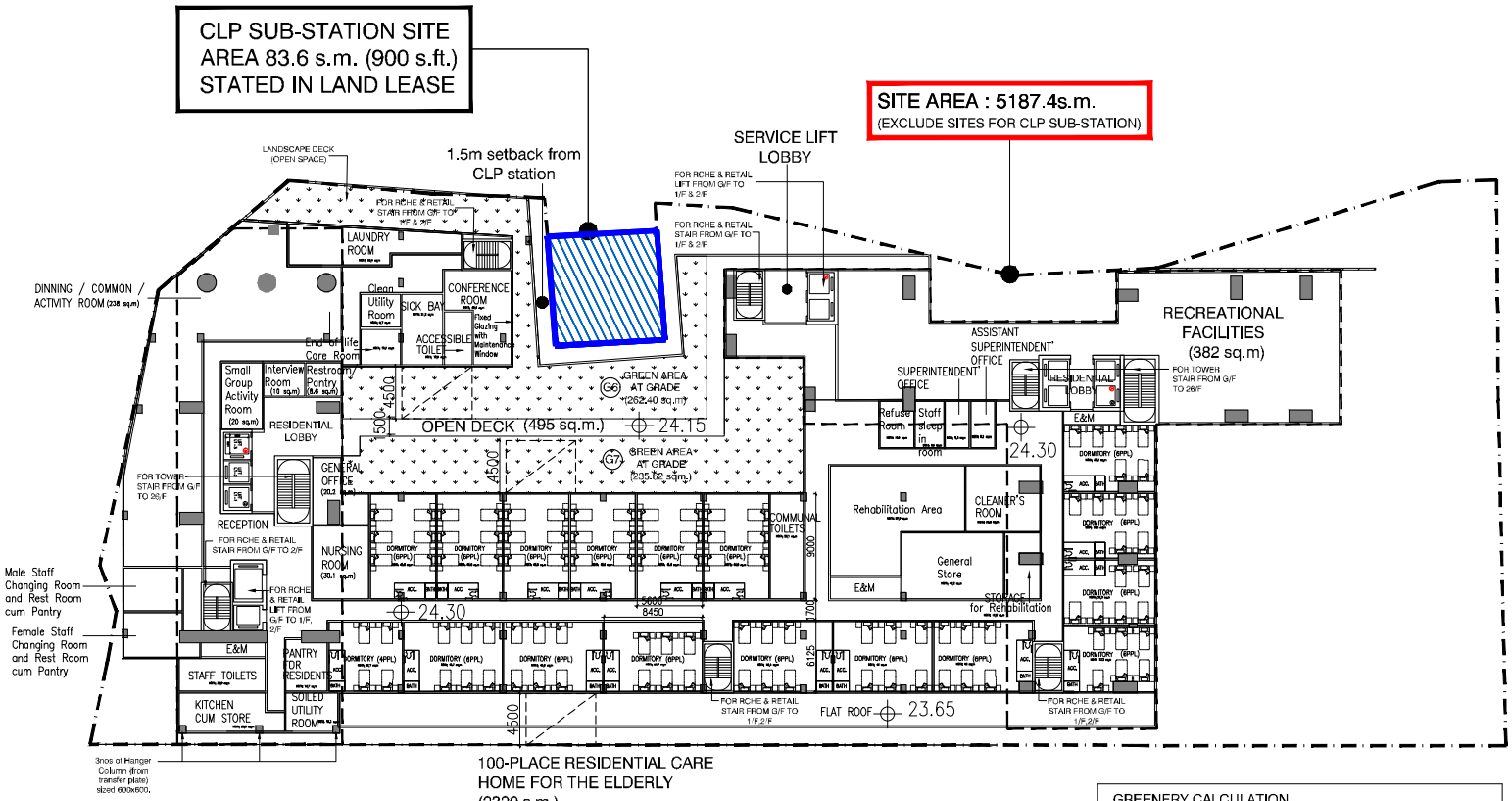
Figure Title:
Schematic Layout Plan - G/F

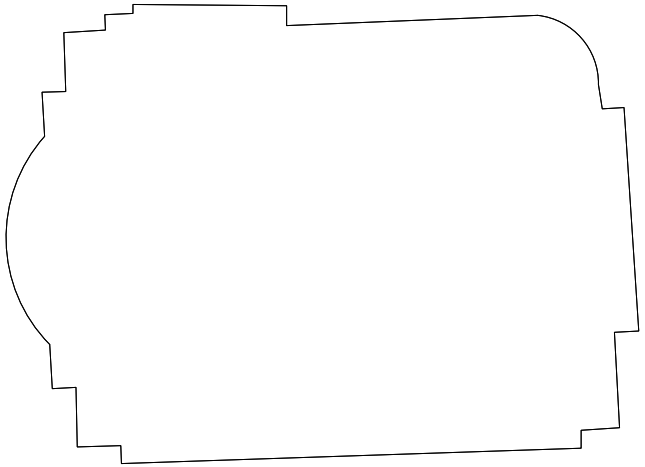
Figure: 3.4
Date: Mar 2019
Scale: N/A



NOTES: All plant room provisions subject to confirmation by E&M consultant

HONG KONG HOUSING SOCIETY 香港房屋協會	AECOM in association with DLN, LLA, Ramboll and WSP	Project Title: Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories	Figure Title: Schematic Layout Plan - 1/F	Figure: 3.5 Date: Mar 2019 Scale: N/A



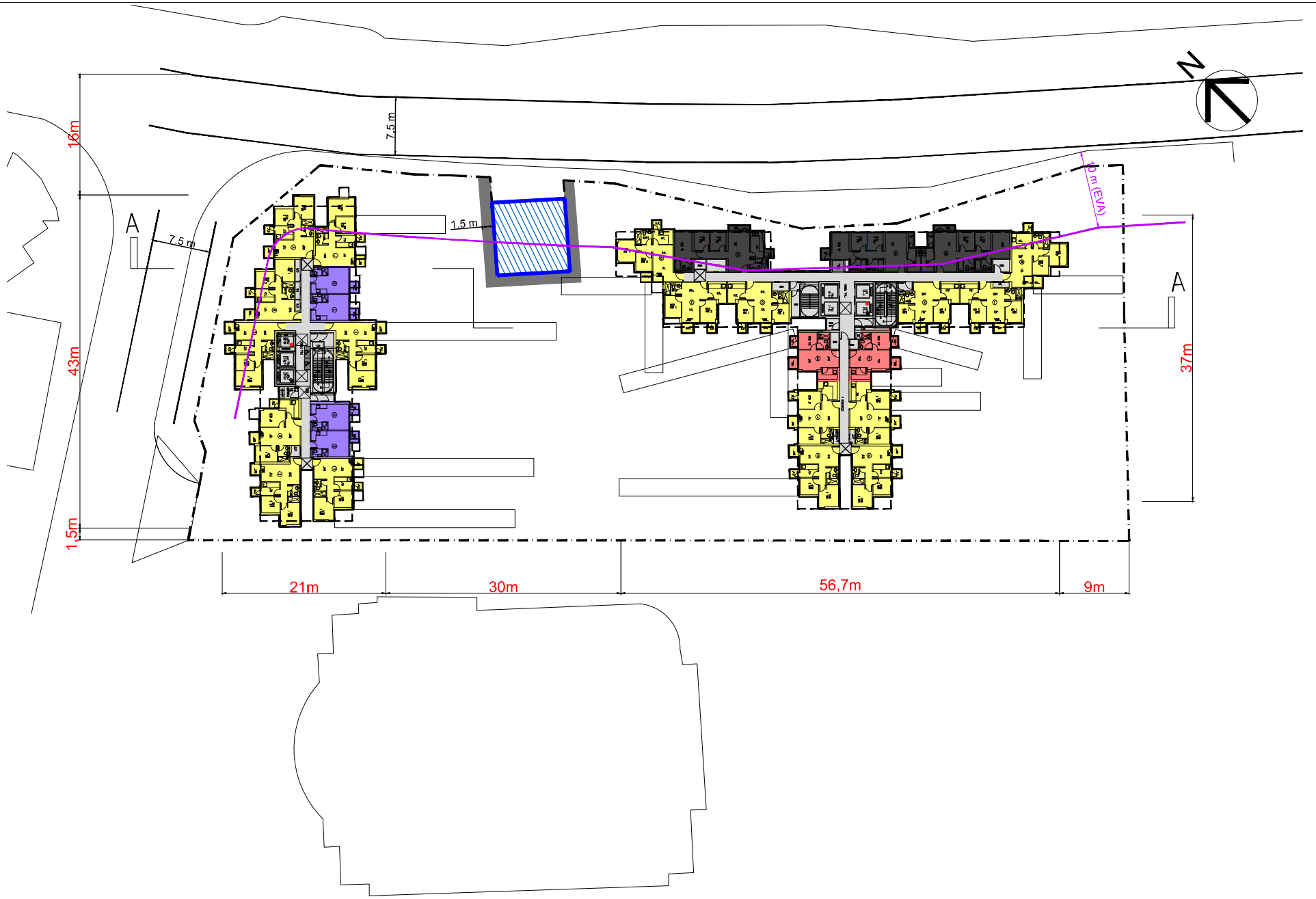


GREENERY CALCULATION		
REQUIRED	PROVIDED	
	FLOOR	AREA (sq.m)
5187.4 sq.m (Site area) x 20%	G/F	(G1) = 210.59
		(G2) = 9.5
		(G3) = 29.26
	1/F	(G4) = 207.68
		(G5) = 265.75
	2/F	(G6) = 262.40
		(G7) = 235.62
= 1037.48 sq.m	TOTAL	= 1221 (> REQUIRED)

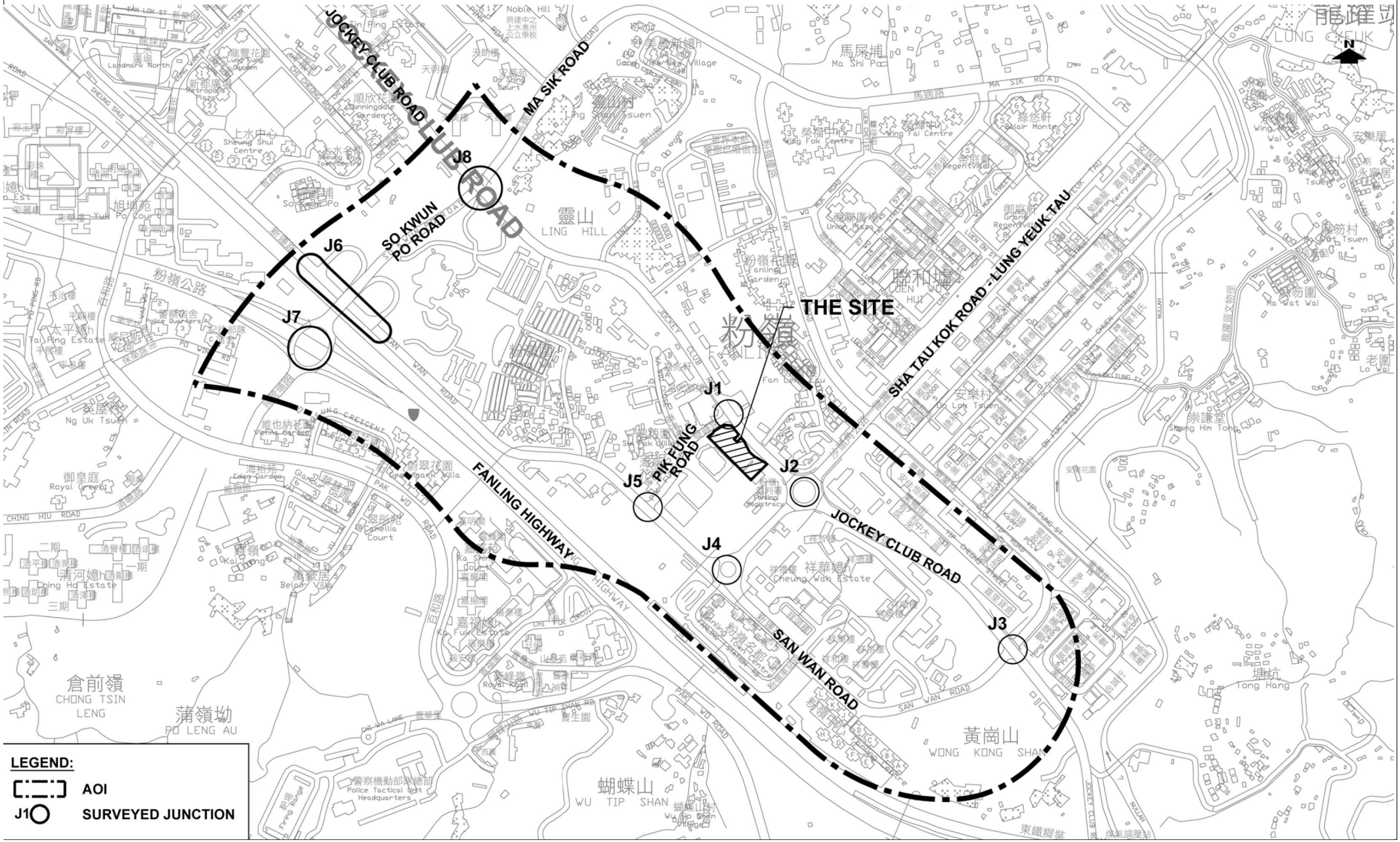
NOTES: DETAIL LANDSCAPE LAYOUT AND CALCULATION TO BE CONFIRMED BY LANDSCAPE ARCHITECT.

NOTES: All plant room provisions subject to confirmation by E&M consultant

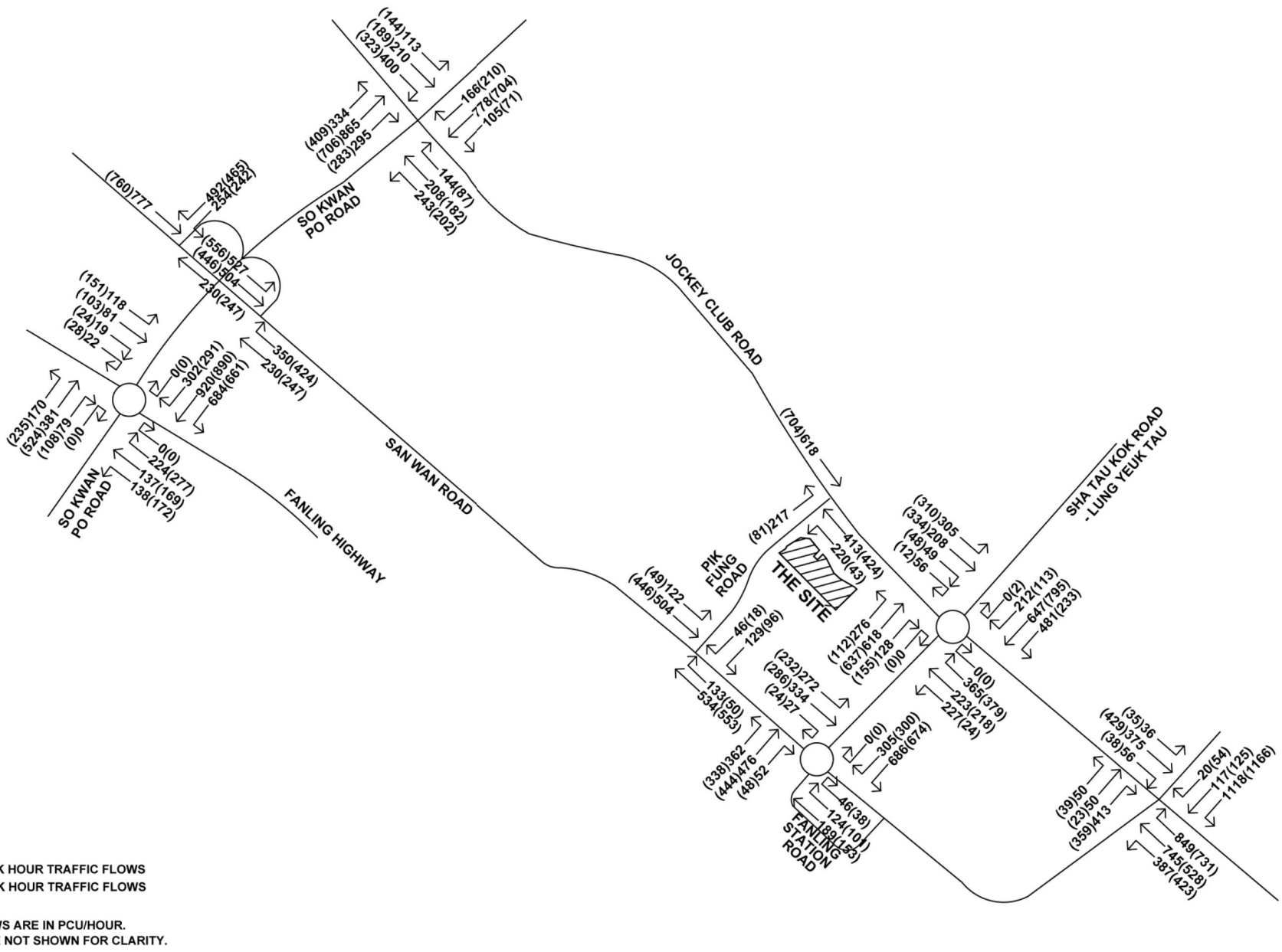
HONG KONG HOUSING SOCIETY 香港房屋協會	AECOM in association with DLN, LLA, Ramboll and WSP	Project Title: Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories	Figure Title: Schematic Layout Plan - 2/F	Figure: 3.6 Date: Mar 2019 Scale: N/A



HONG KONG HOUSING SOCIETY 香港房屋協會	AECOM in association with DLN, LLA, Ramboll and WSP	Project Title: Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories	Figure Title: Schematic Layout Plan - Typical Floor	Figure: 3.7 Date: Mar 2019 Scale: N/A



HONG KONG HOUSING SOCIETY 香港房屋協會	AECOM in association with DLN, LLA, Ramboll and WSP	Project Title: Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories	Figure Title: TIA - Area of Influence (AOI) & Location of Surveyed Junctions	Figure: 4.1 Date: Mar 2019 Scale: N/A



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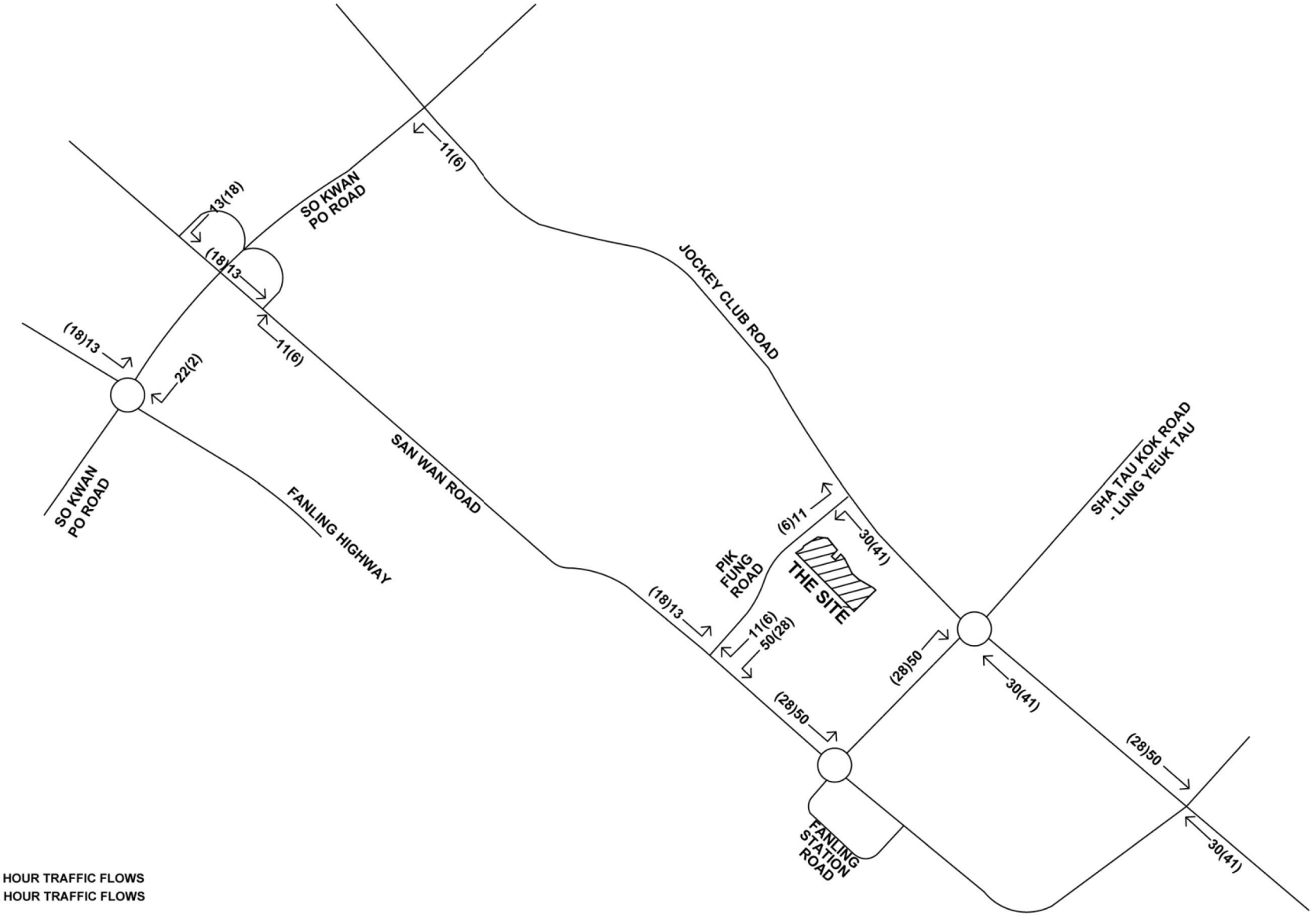
123(456) ← PM PEAK HOUR TRAFFIC FLOWS

↑ AM PEAK HOUR TRAFFIC FLOWS

NOTES:

1. ALL TRAFFIC FLOWS ARE IN PCU/HOUR.
2. MINOR ROADS ARE NOT SHOWN FOR CLARITY.

HONG KONG HOUSING SOCIETY 香港房屋協會	AECOM in association with DLN, LLA, Ramboll and WSP	Project Title: Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories	Figure Title: TIA - Existing Traffic Flows	Figure: 4.2 Date: Mar 2019 Scale: N/A



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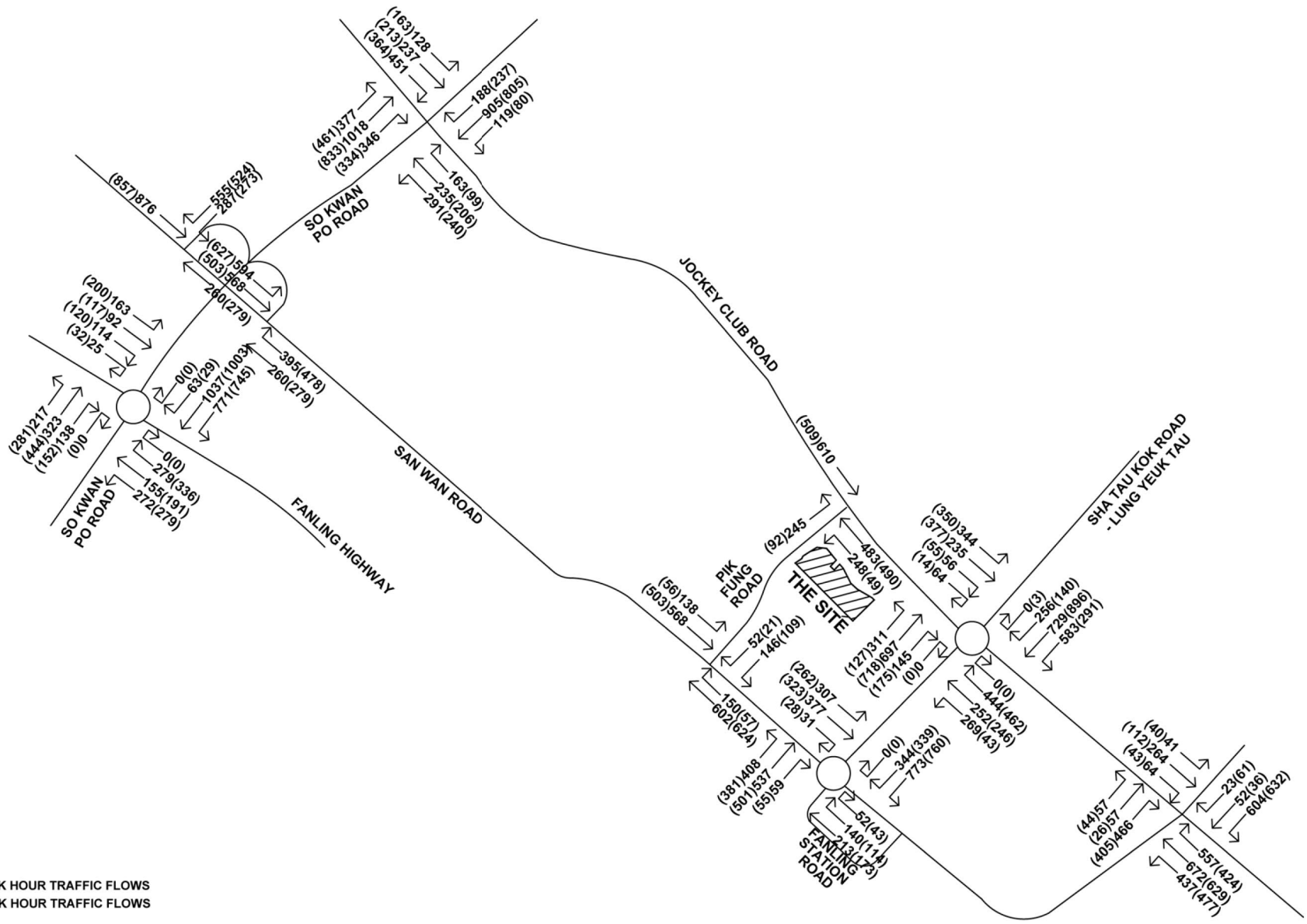
123(456) ← PM PEAK HOUR TRAFFIC FLOWS

↑ AM PEAK HOUR TRAFFIC FLOWS

NOTES:

1. ALL TRAFFIC FLOWS ARE IN PCU/HOUR.
2. MINOR ROADS ARE NOT SHOWN FOR CLARITY.

HONG KONG HOUSING SOCIETY 香港房屋協會	AECOM in association with DLN, LLA, Ramboll and WSP	Project Title: Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories	Figure Title: TIA - Development Traffic Flows	Figure: 4.3 Date: Mar 2019 Scale: N/A



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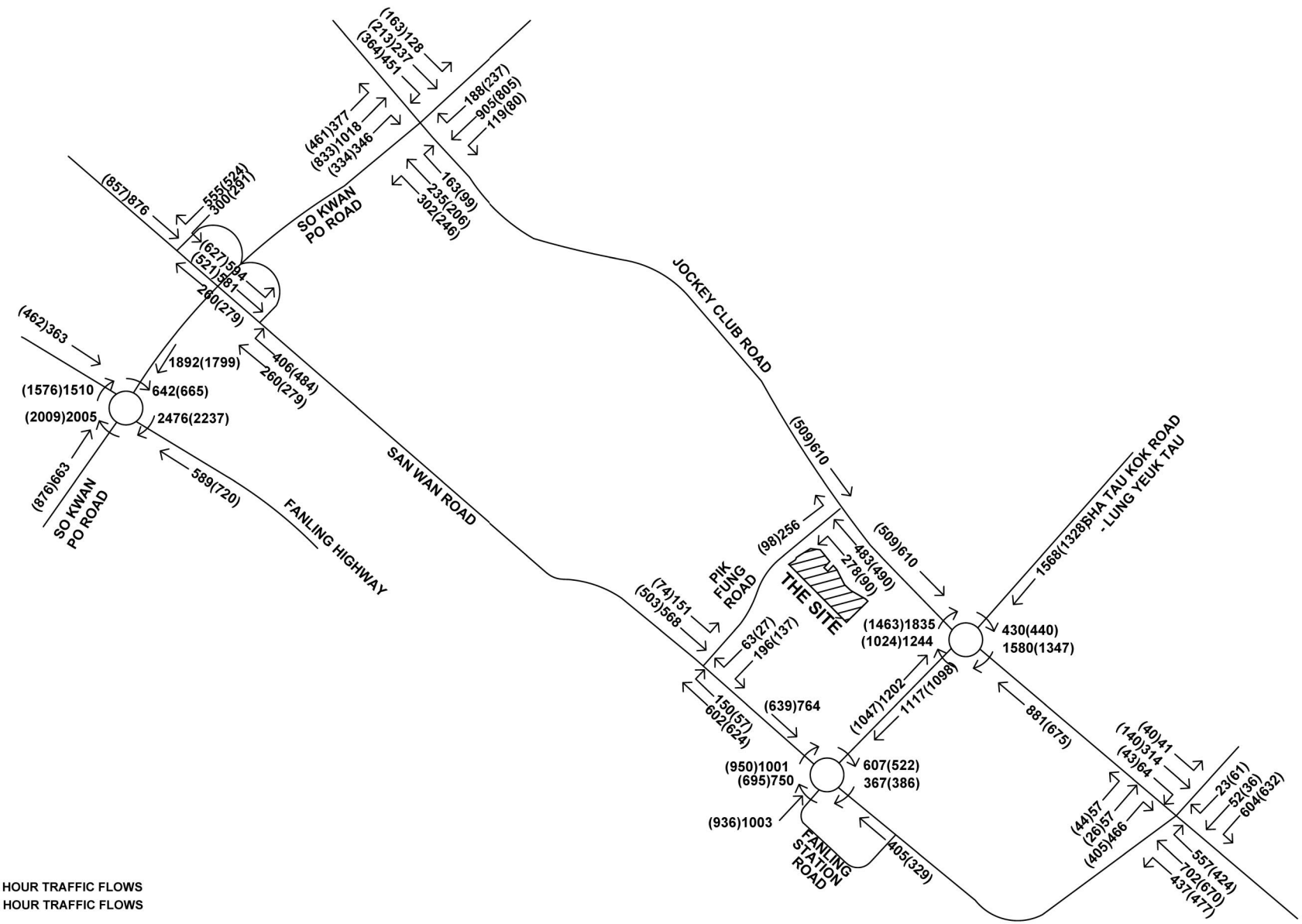
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↑ AM PEAK HOUR TRAFFIC FLOWS

NOTES:

1. ALL TRAFFIC FLOWS ARE IN PCU/HOUR.
2. MINOR ROADS ARE NOT SHOWN FOR CLARITY.

HONG KONG HOUSING SOCIETY 香港房屋協會	AECOM in association with DLN, LLA, Ramboll and WSP	Project Title: Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories	Figure Title: TIA - 2027 Reference Traffic Flows	Figure: 4.4 Date: Mar 2019 Scale: N/A



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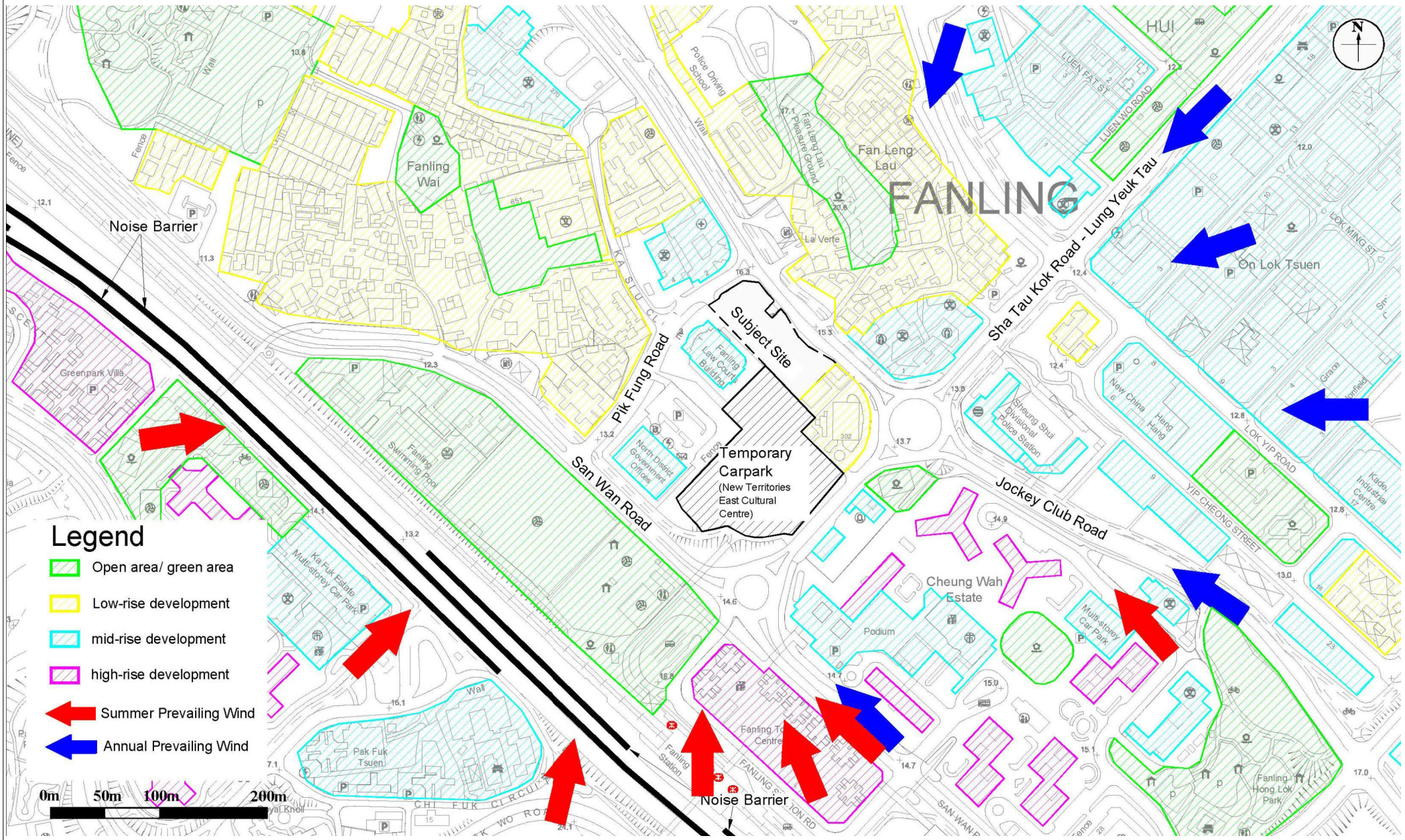
123(456) ← PM PEAK HOUR TRAFFIC FLOWS

↑ AM PEAK HOUR TRAFFIC FLOWS

NOTES:

1. ALL TRAFFIC FLOWS ARE IN PCU/HOUR.
2. MINOR ROADS ARE NOT SHOWN FOR CLARITY.

HONG KONG HOUSING SOCIETY 香港房屋協會	AECOM in association with DLN, LLA, Ramboll and WSP	Project Title: Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories	Figure Title: TIA - 2027 Design Traffic Flows	Figure: 4.5 Date: Mar 2019 Scale: N/A



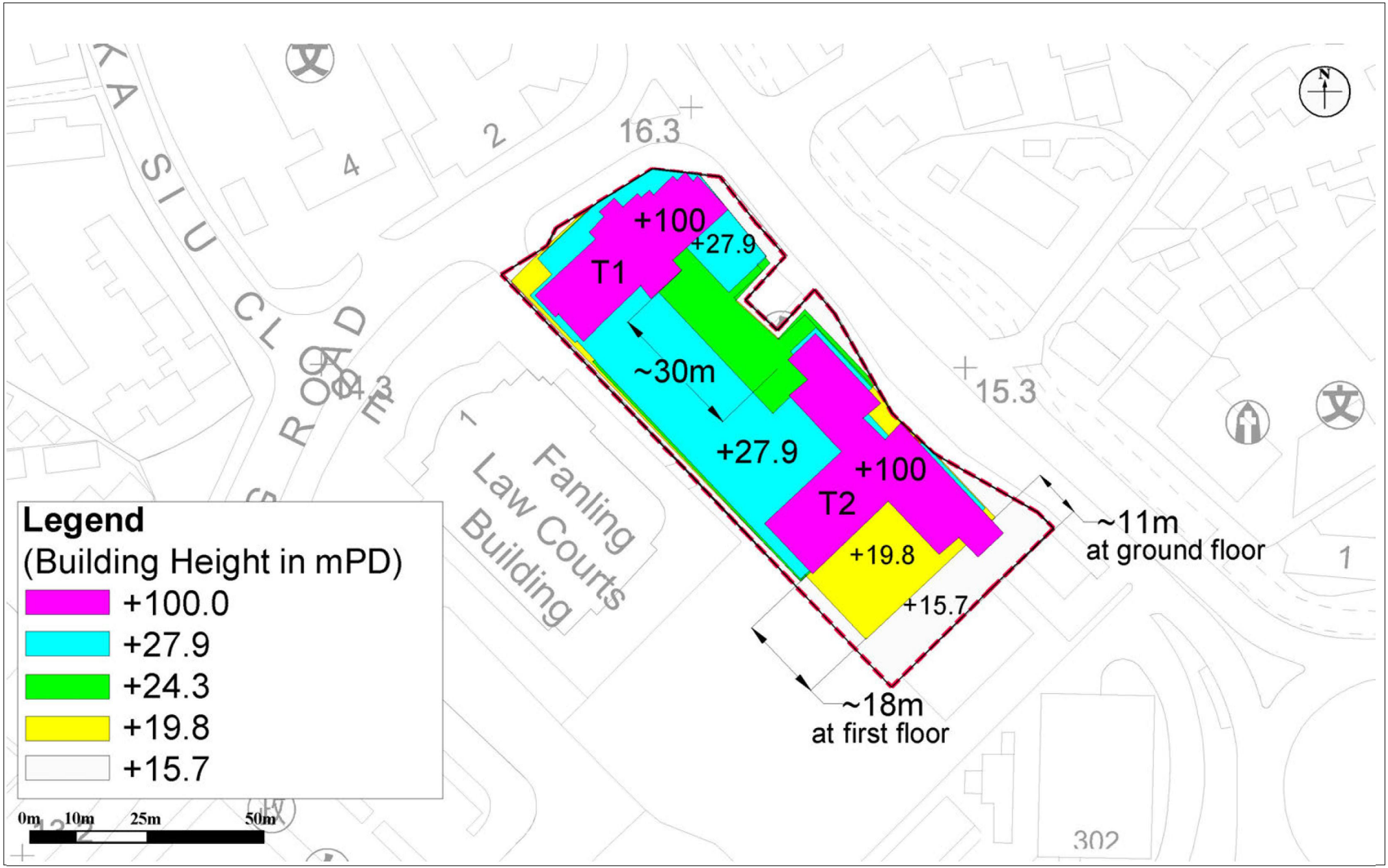
HONG KONG HOUSING SOCIETY 香港房屋協會

AECOM in association with
DLN, LLA, Ramboll and WSP

Project Title:
Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories

Figure Title:
AVA - Surrounding Development & Pedestrian Wind Flow

Figure: 6.1
Date: Mar 2019
Scale: N/A



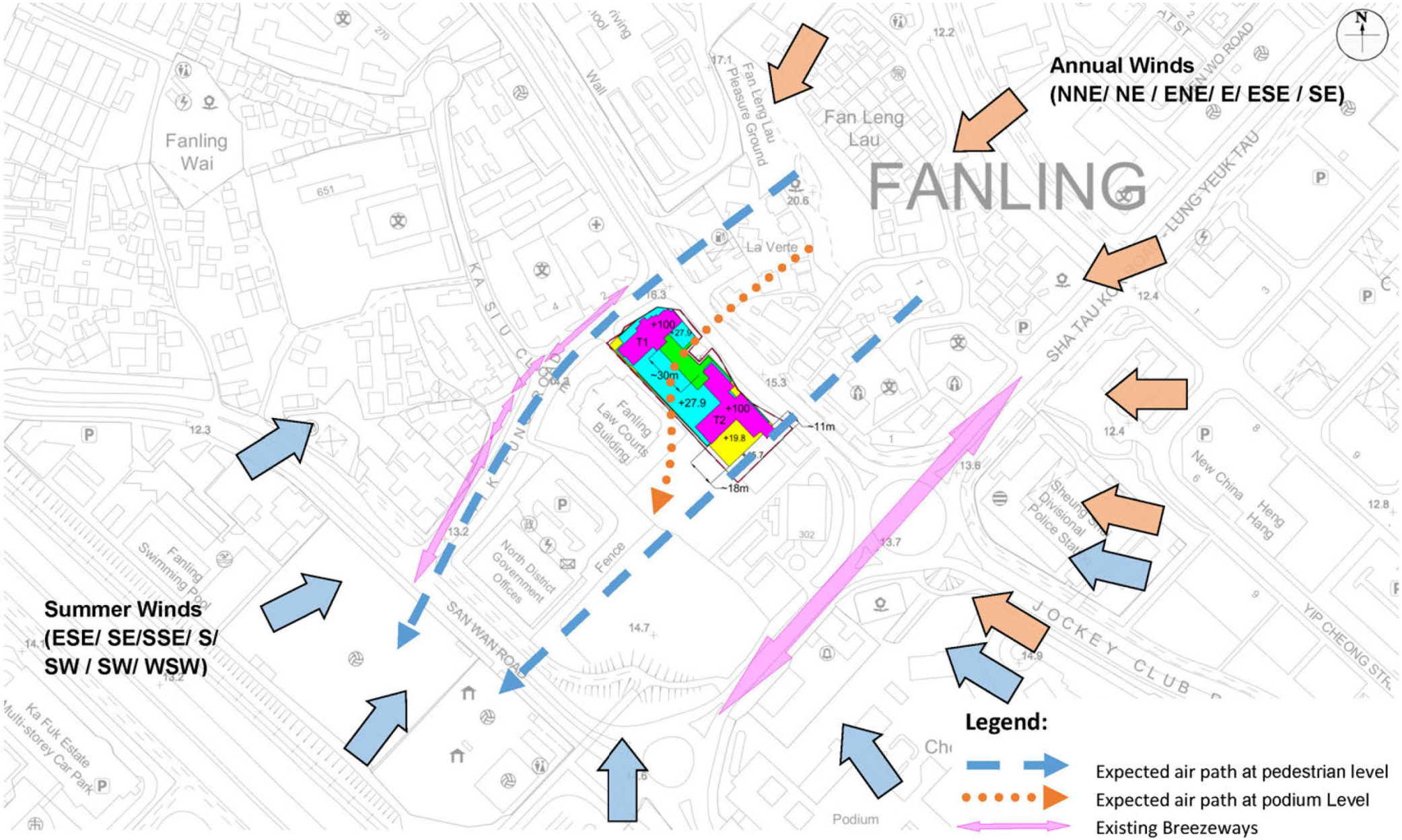
HONG KONG HOUSING SOCIETY 香港房屋協會

AECOM in association with
DLN, LLA, Ramboll and WSP

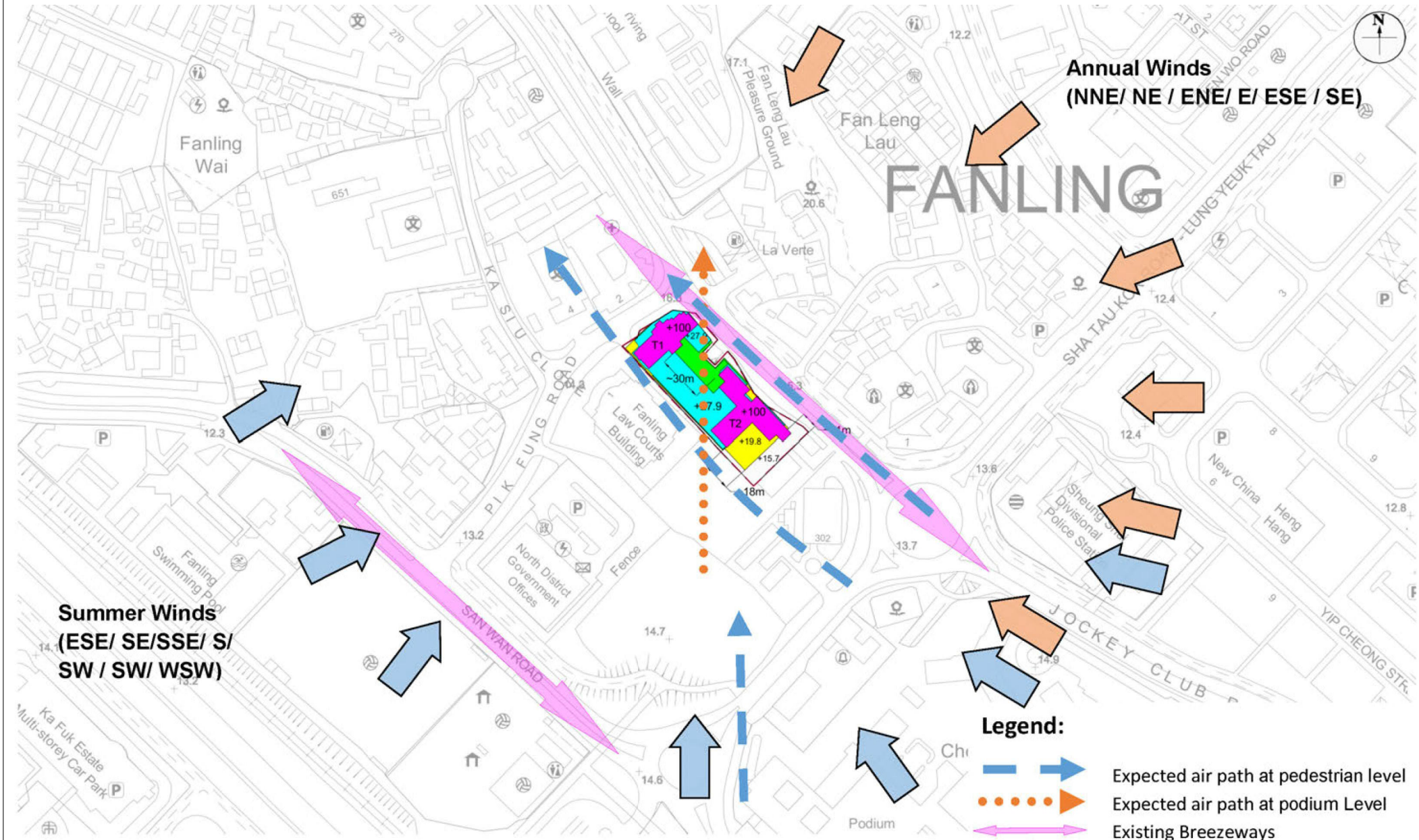
Project Title:
Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories

Figure Title:
AVA - Propsed Mitigation Measures

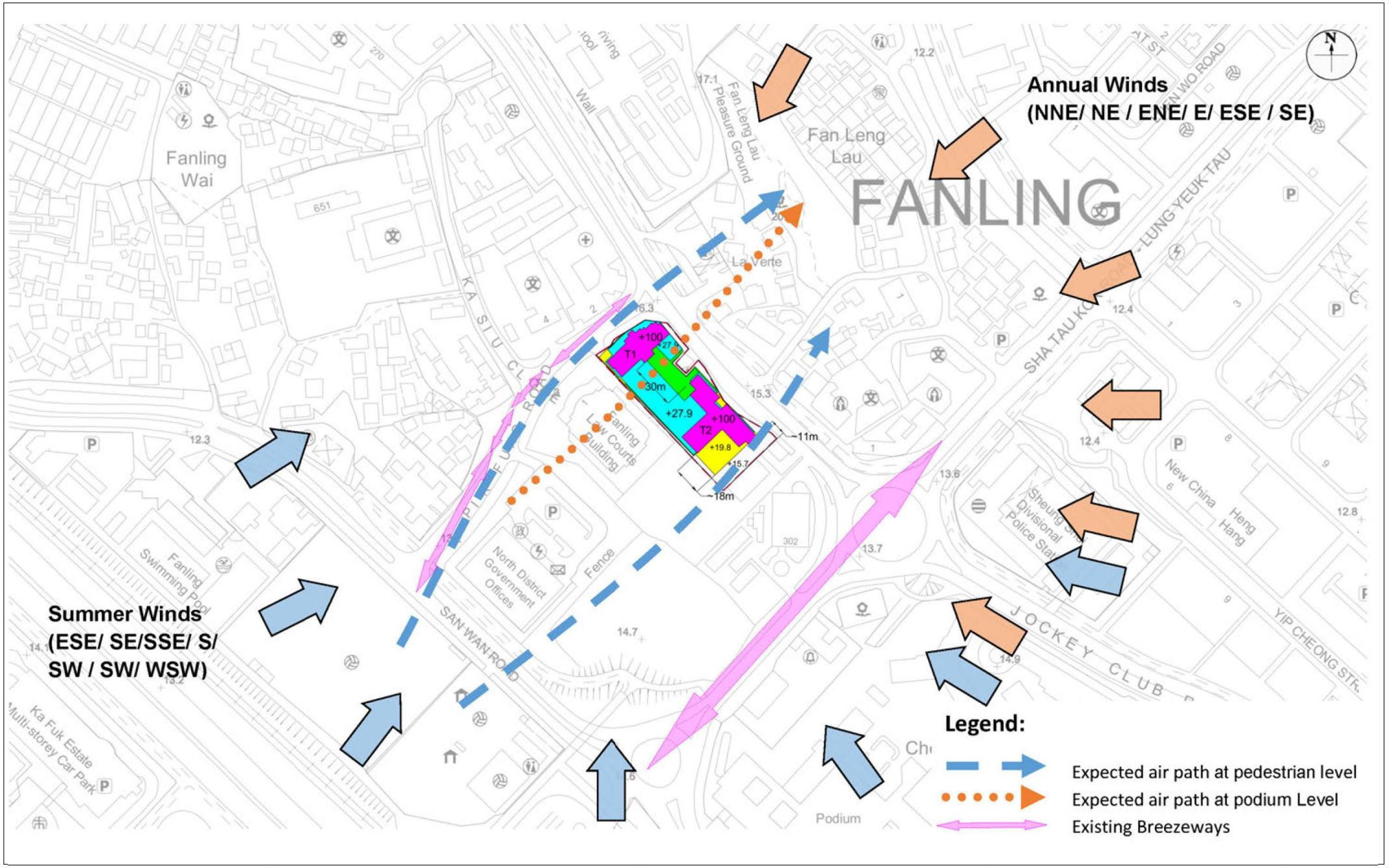
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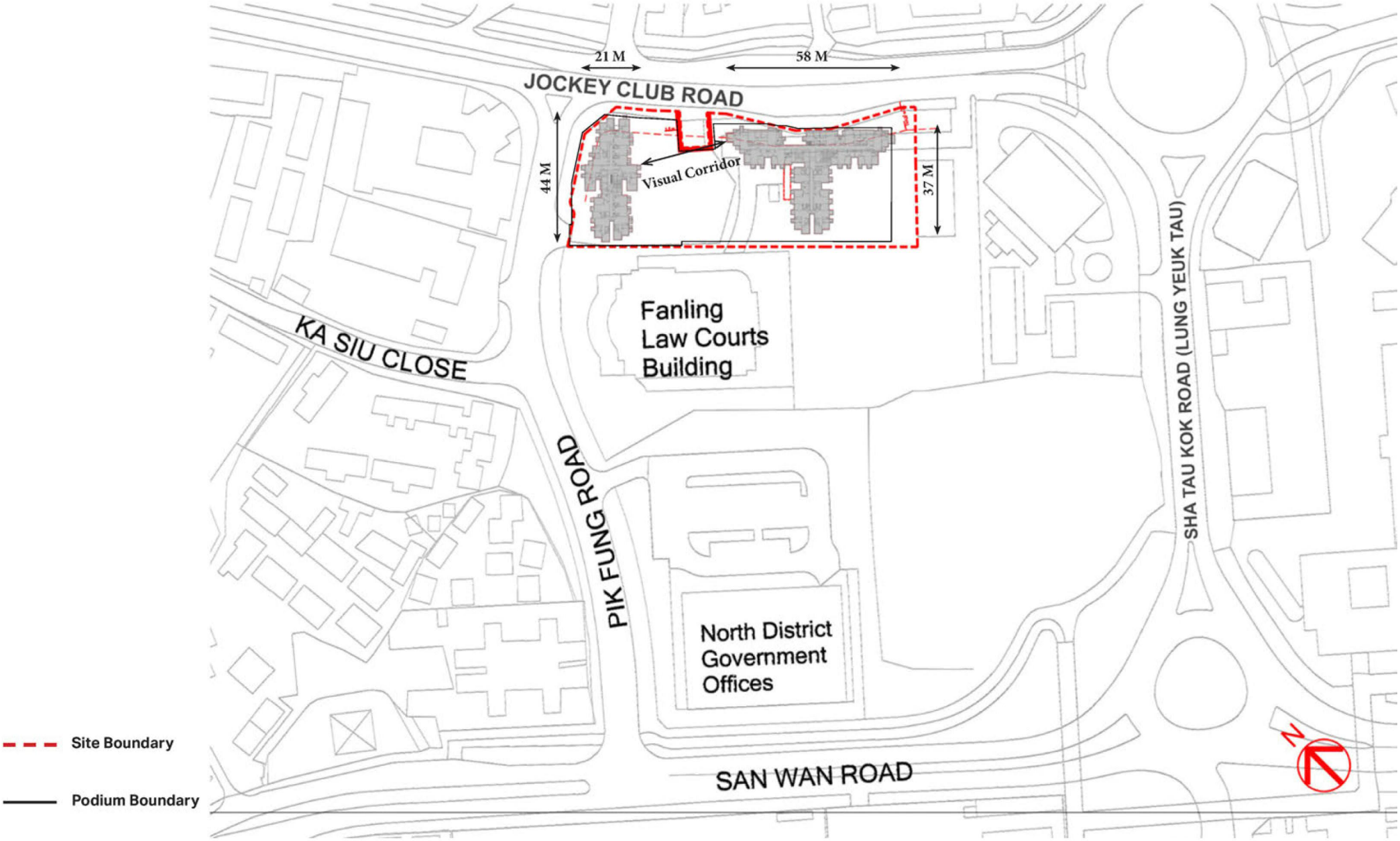
HONG KONG HOUSING SOCIETY 香港房屋協會	AECOM in association with DLN, LLA, Ramboll and WSP	Project Title: Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories	Figure Title: AVA - Illustration of Wind Flow from Northeast Portion	Figure: 6.3 Date: Mar 2019 Scale: N/A



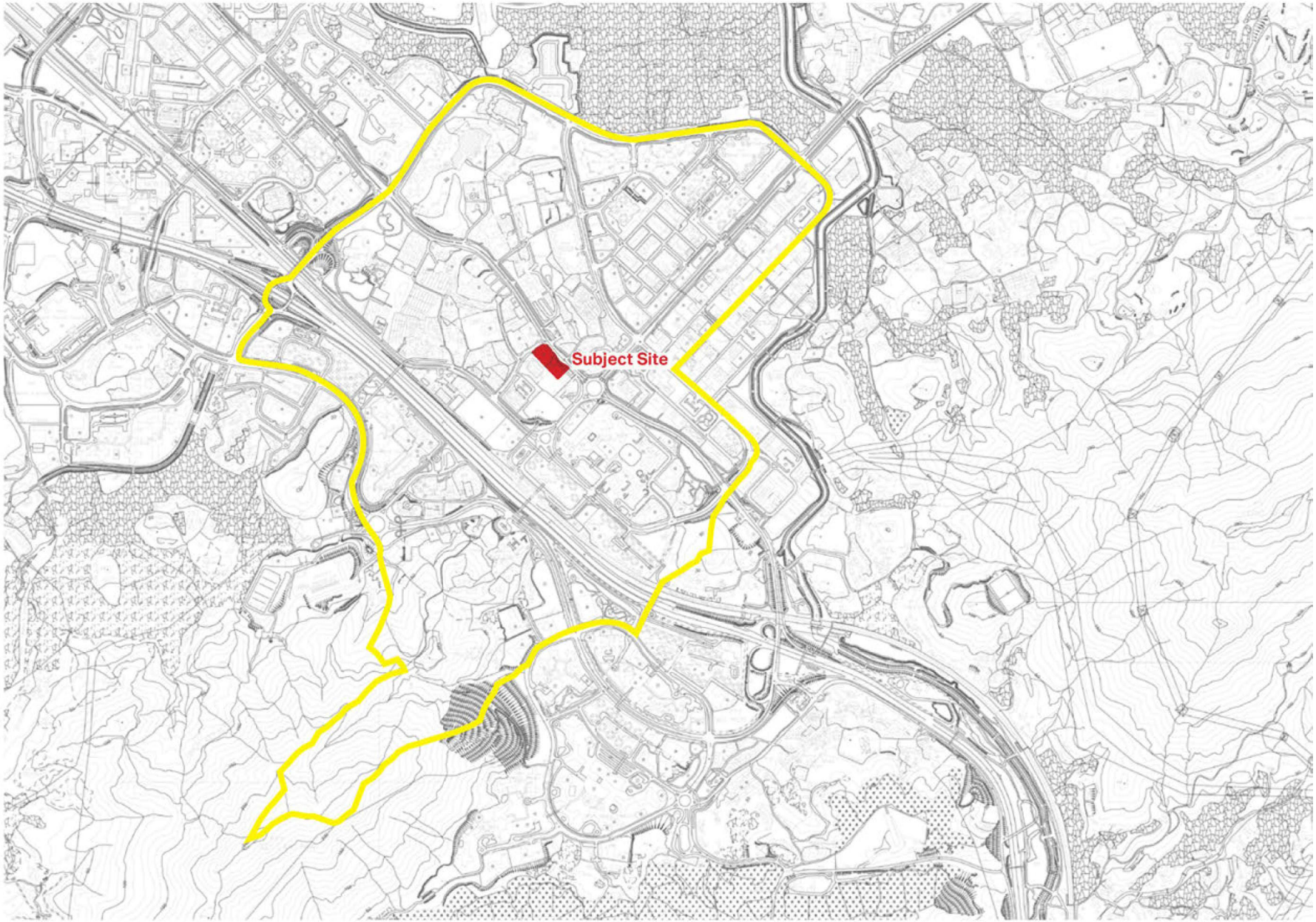
HONG KONG HOUSING SOCIETY 香港房屋協會	AECOM in association with DLN, LLA, Ramboll and WSP	Project Title: Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories	Figure Title: AVA - Illustration of Wind Flow from Southeast Portion	Figure: 6.4 Date: Mar 2019 Scale: N/A



HONG KONG HOUSING SOCIETY 香港房屋協會	AECOM in association with DLN, LLA, Ramboll and WSP	Project Title: Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories	Figure Title: AVA - Illustration of Wind Flow from Southwest Portion	Figure: 6.5 Date: Mar 2019 Scale: N/A



HONG KONG HOUSING SOCIETY 香港房屋協會	AECOM in association with DLN, LLA, Ramboll and WSP	Project Title: Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories	Figure Title: VIA - Building Mass & Building Disposition	Figure: 7.1 Date: Mar 2019 Scale: N/A



Subject Site

Visual Envelope

HONG KONG HOUSING SOCIETY 香港房屋協會

AECOM in association with

DLN, LLA, Ramboll and WSP

Project Title:

Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories

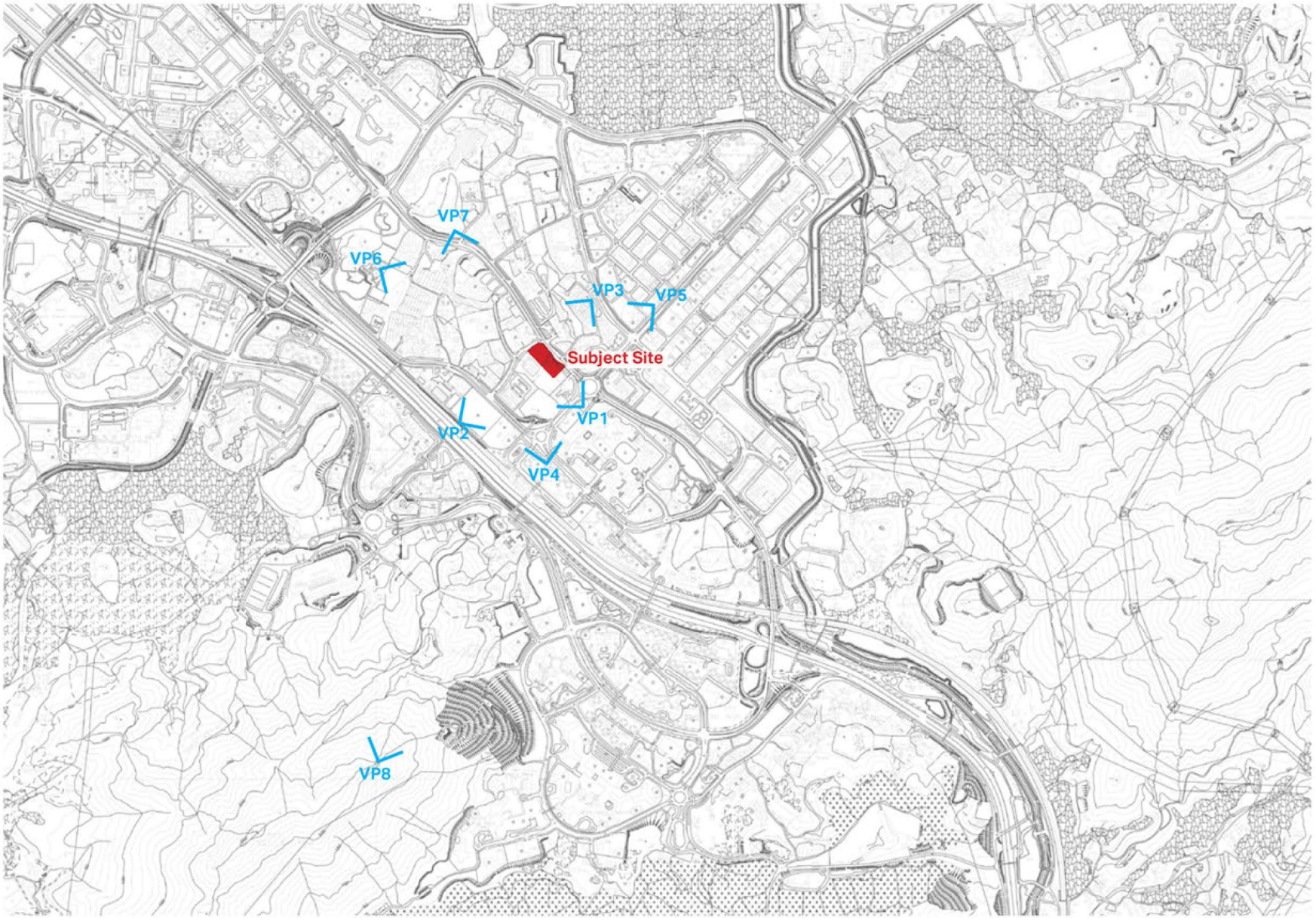
Figure Title:

VIA - Subject Site & Visual Envelope

Figure: 7.2

Date: Mar 2019

Scale: N/A



Subject Site

HONG KONG HOUSING SOCIETY 香港房屋協會

AECOM in association with DLN, LLA, Ramboll and WSP

Project Title:
Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories

Figure Title:
VIA - Locations of View Points (VPs)

Figure: 7.3
Date: Mar 2019
Scale: N/A



Existing VP 1 - Cheung Wah Estate



After VP 1 - Cheung Wah Estate

HONG KONG HOUSING SOCIETY 香港房屋協會

AECOM in association with
DLN, LLA, Ramboll and WSP

Project Title:
Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories

Figure Title:
VIA - Photomontage of VP1 (Cheung Wah Estate)

Figure: 7.4
Date: Mar 2019
Scale: N/A



Existing VP 2 - Fanling Recreation Ground



After VP 2 - Fanling Recreation Ground

HONG KONG HOUSING SOCIETY 香港房屋協會	AECOM in association with DLN, LLA, Ramboll and WSP	Project Title: Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories	Figure Title: VIA - Photomontage of VP2 (Fanling Recreation Ground)	Figure: 7.5 Date: Mar 2019 Scale: N/A



Existing VP 3 - Residential Area at Fan Leng Lau



After VP 3 - Residential Area at Fan Leng Lau

HONG KONG HOUSING SOCIETY 香港房屋協會	AECOM in association with DLN, LLA, Ramboll and WSP	Project Title: Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories	Figure Title: VIA - Photomontage of VP3 (Residential Area at Fan Leng Lau)	Figure: 7.6 Date: Mar 2019 Scale: N/A



Existing VP 4 - Fanling Town Centre



After VP 4 - Fanling Town Centre

HONG KONG HOUSING SOCIETY 香港房屋協會

AECOM in association with DLN, LLA, Ramboll and WSP

Project Title:
Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories

Figure Title:
VIA - Photomontage of VP4 (Fanling Town Centre)

Figure: 7.7
Date: Mar 2019
Scale: N/A



Existing VP 5 - Luen Wo Hui Playground



After VP 5 - Luen Wo Hui Playground

HONG KONG HOUSING SOCIETY 香港房屋協會

AECOM in association with DLN, LLA, Ramboll and WSP

Project Title:
Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories

Figure Title:
VIA - Photomontage of VP5 (Luen Wo Hui Playground)

Figure: 7.8
Date: Mar 2019
Scale: N/A



Existing VP 6 - North District Park



After VP 6 - North District Park

HONG KONG HOUSING SOCIETY 香港房屋協會

AECOM in association with DLN, LLA, Ramboll and WSP

Project Title:
Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories

Figure Title:
VIA - Photomontage of VP6 (North District Park)

Figure: 7.9
Date: Mar 2019
Scale: N/A



Existing VP 7 - Ling Hill



After VP 7 - Ling Hill

HONG KONG HOUSING SOCIETY 香港房屋協會

AECOM in association with DLN, LLA, Ramboll and WSP

Project Title:
Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories

Figure Title:
VIA - Photomontage of VP7 (Ling Hill)

Figure: 7.10
Date: Mar 2019
Scale: N/A



Existing VP 8 - Wu Tip Shan



After VP 8 - Wu Tip Shan

HONG KONG HOUSING SOCIETY 香港房屋協會

AECOM in association with DLN, LLA, Ramboll and WSP

Project Title:
Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories

Figure Title:
VIA - Photomontage of VP8 (Wu Tip Shan)

Figure: 7.11
Date: Mar 2019
Scale: N/A



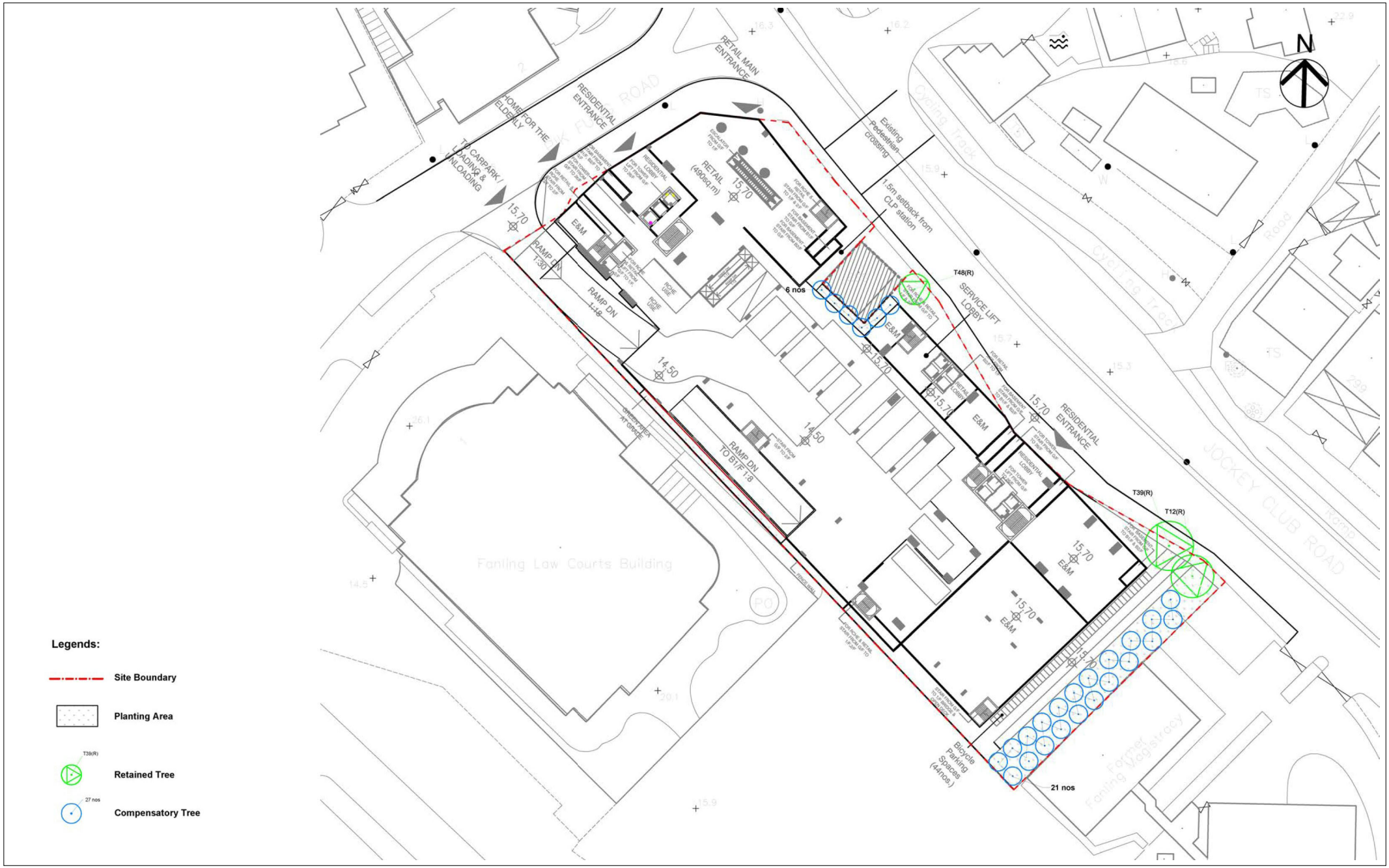
HONG KONG HOUSING SOCIETY 香港房屋協會

AECOM in association with
DLN, LLA, Ramboll and WSP

Project Title:
Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories

Figure Title:
TRA - Tree Survey & Recommendation Plan

Figure: 8.1
Date: Mar 2019
Scale: N/A



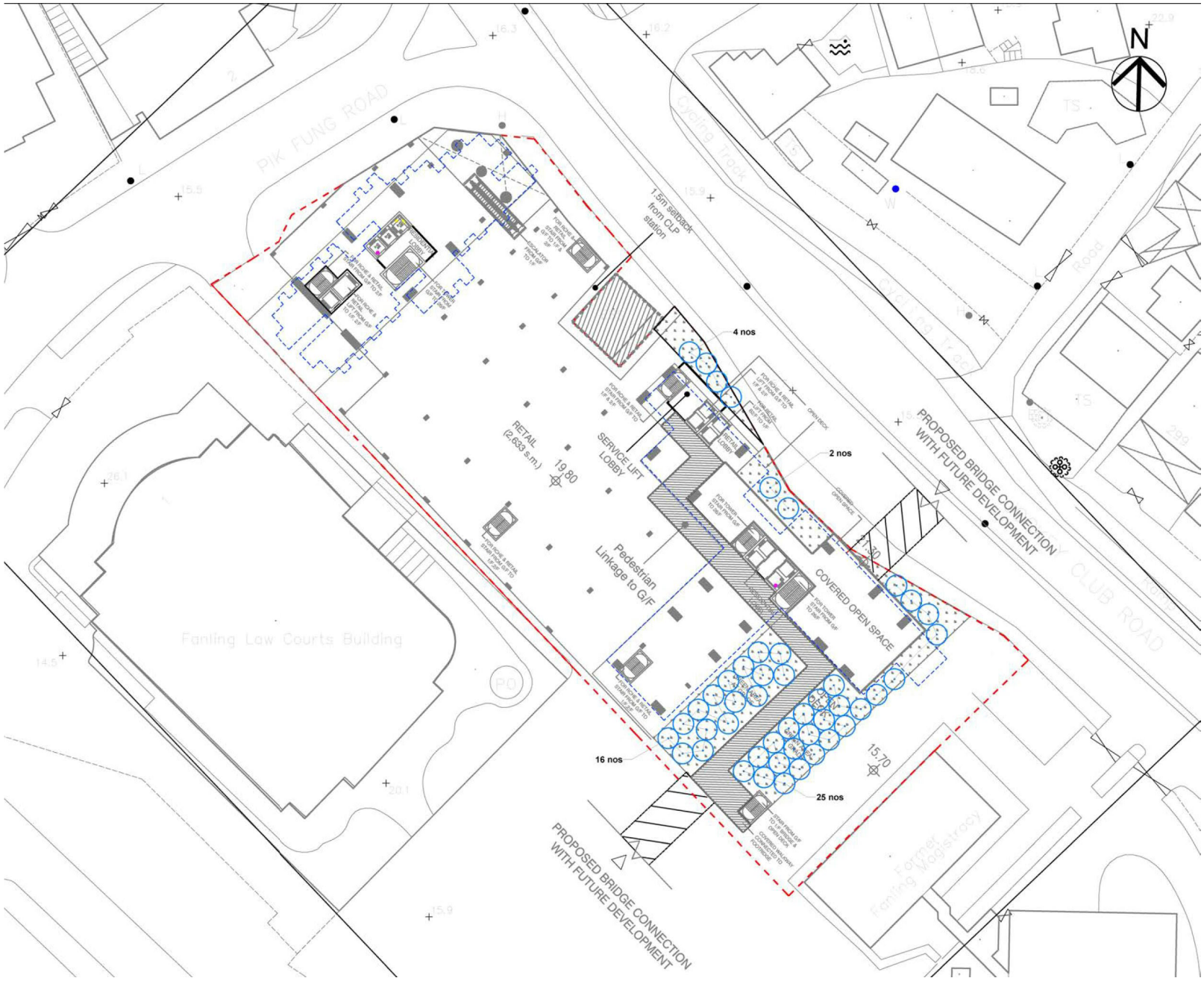
HONG KONG HOUSING SOCIETY 香港房屋協會

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Project Title:
Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories

Figure Title:
TRA - Compensatory Planting Plan (G/F)

Figure: 8.2
Date: Mar 2019
Scale: N/A



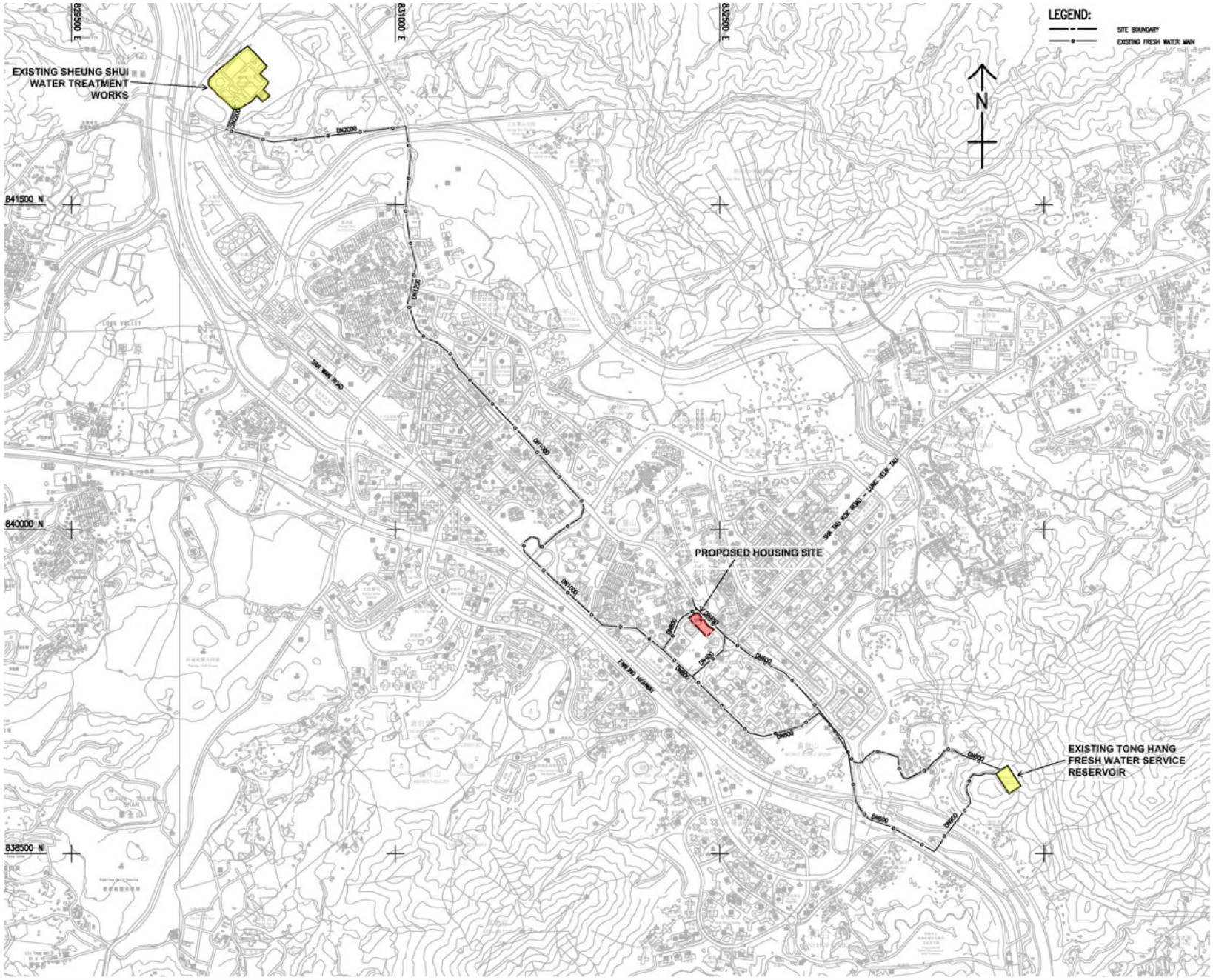
Legends:

- Site Boundary
- Planting Area
- Building Line Above
- 27 nos — Compensatory Tree

HONG KONG HOUSING SOCIETY 香港房屋協會	AECOM in association with DLN, LLA, Ramboll and WSP	Project Title: Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories	Figure Title: TRA - Compensatory Planting Plan (1/F)	Figure: 8.3 Date: Mar 2019 Scale: N/A



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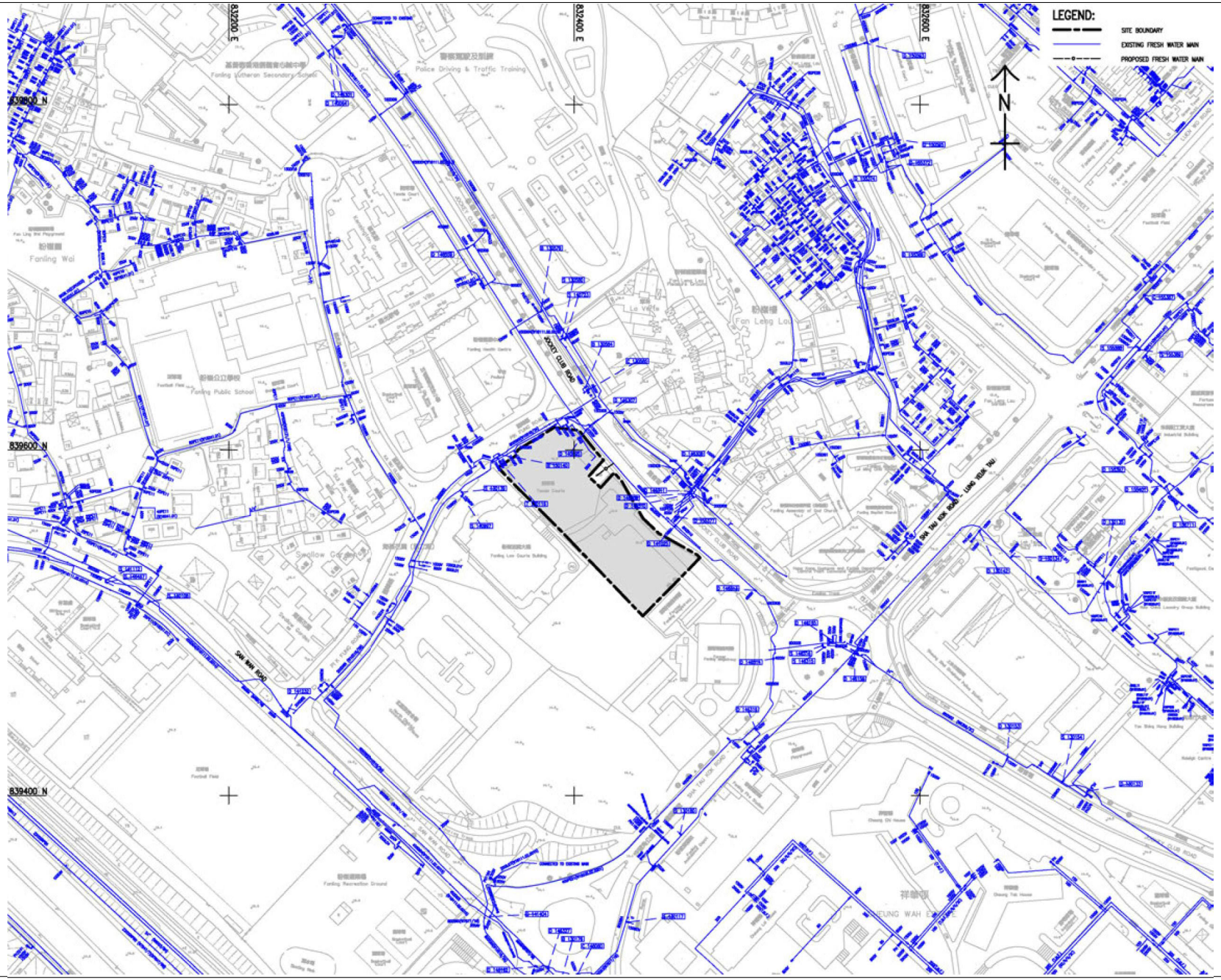
HONG KONG HOUSING SOCIETY 香港房屋協會

AECOM in association with
DLN, LLA, Ramboll and WSP

Project Title:
Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories

Figure Title:
WSIA - Existing Major Fresh Water System Layout Plan

Figure: 9.1
Date: Mar 2019
Scale: N/A



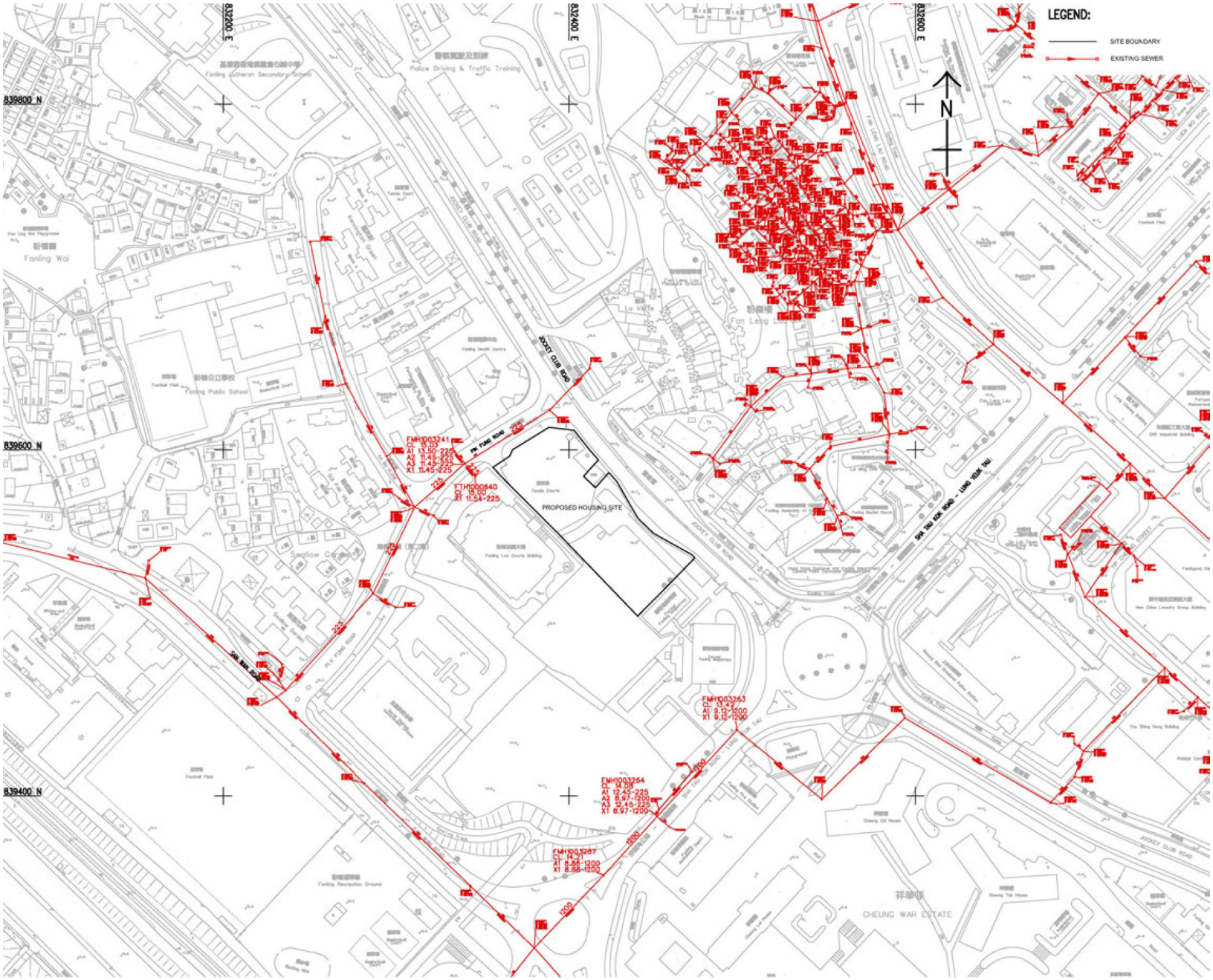
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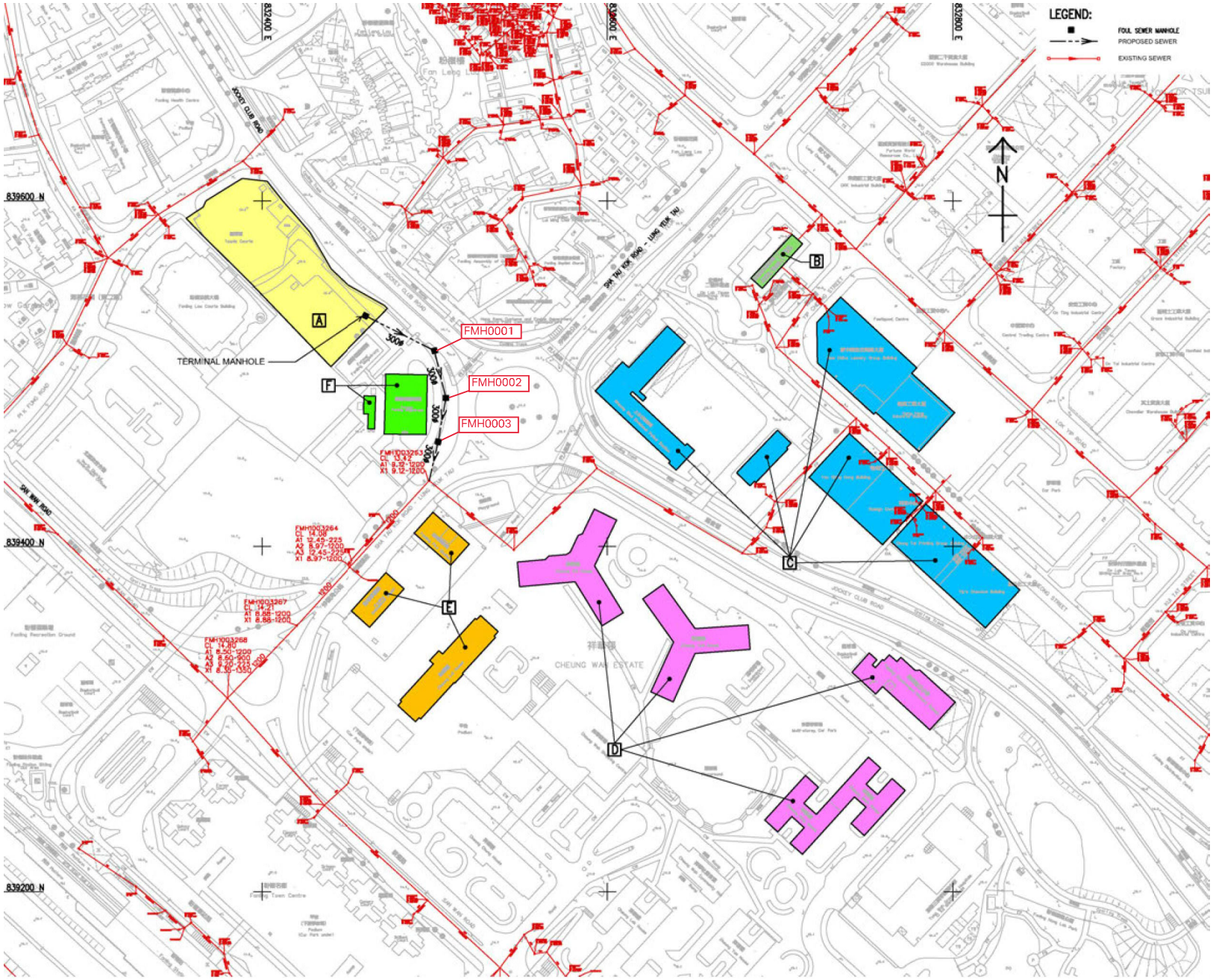
Project Title:
Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories

Figure Title:
WSIA - Existing Major Fresh Water System Layout Plan

Figure: 9.2
Date: Mar 2019
Scale: N/A



HONG KONG HOUSING SOCIETY 香港房屋協會	AECOM in association with DLN, LLA, Ramboll and WSP	Project Title: Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories	Figure Title: SIA - Existing Sewerage Arrangement	Figure: 9.3 Date: Mar 2019 Scale: N/A



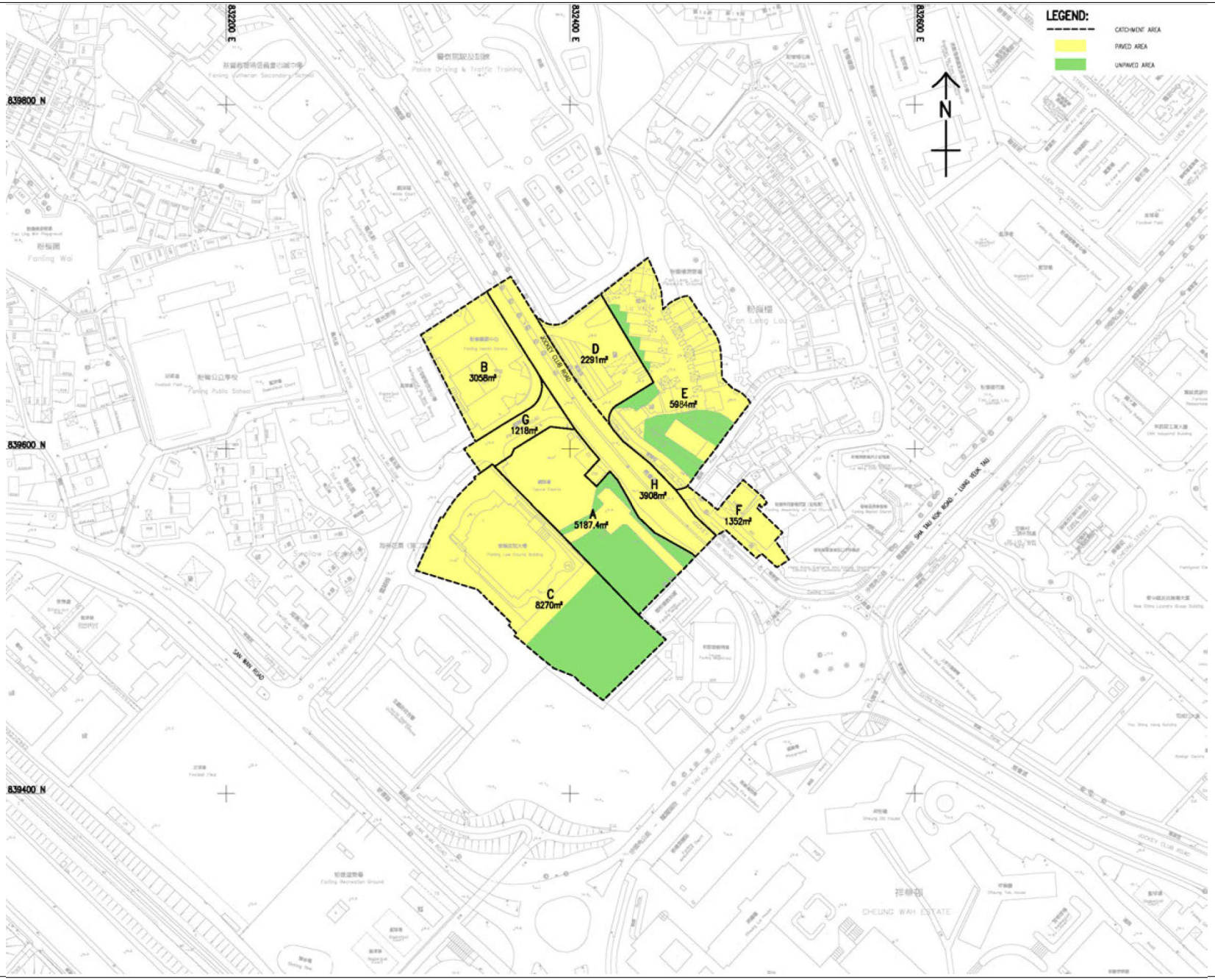
HONG KONG HOUSING SOCIETY 香港房屋協會

AECOM in association with
DLN, LLA, Ramboll and WSP

Project Title:
Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories

Figure Title:
SIA - Proposed Sewerage Arrangement

Figure: 9.4
Date: Mar 2019
Scale: N/A



HONG KONG HOUSING SOCIETY
香港房屋協會

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Project Title:
Planning Consultancy for Proposed Subsidized Housing Development at Jockey Club Road, Fanling, New Territories

Figure Title:
DIA - Drainage Catachment Plan (Existing)

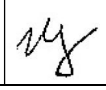
Figure: 9.5
Date: Mar 2019
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Appendix 1 – Extracts from Traffic Impact Assessment Report

Document Status Control Record

Proposed Hong Kong Housing Society
Subsidized Housing Development
at Jockey Club Road, Fanling

Traffic Impact Assessment Report

Originating Organisation : LLA Consultancy Limited Unit 610, 6/F Island Place Tower 510 King's Road North Point, Hong Kong	Prepared by: GWL		Date: 28 February 2019
	Approved by: SLN		Date: 28 February 2019
	Revision No.: F		Date of Issue: 28 February 2019

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1 INTRODUCTION

1.1 Background

1.1.1 The subject site (hereinafter referred to the "Site") is located at Jockey Club Road near Pik Fung Road. Hong Kong Housing Society (HKHS) intends to develop the Site into a subsidized housing development. The location of the Site is shown in **Figure 1.1.**

1.1.2 LLA Consultancy Limited was commissioned to undertake a traffic impact assessment study for the above proposal. This report presents the findings of the study.

1.2 Objectives

1.2.1 The objectives of the study are as follows:

- to review the existing traffic conditions in the vicinity of the Site;
- to estimate the traffic generation of the proposed development;
- to project the future traffic flows in the surrounding road network;
- to appraise the potential traffic impact of the proposed development; and to propose road improvement proposals, if required;
- to recommend the internal transport facilities for the proposed development.

2 THE PROPOSED DEVELOPMENT

2.1 The Site

2.1.1 The Site is bounded by Jockey Club Road to the northeast, and Pik Fung Road to the northwest. Fanling Law Courts Building is located to the southwest of the Site. The Site covers a site area of about 5187.4 m^2.

2.2 Development Schedule

2.2.1 The development scheme will consist of residential units, retail shops, a centre of Residential Care Home for the Elderly (RCHE) and a public car park.

Table 2.1 Proposed Development Schedule

Item	Parameter
Site Area	5187.4 m^2
Domestic Use	
1. Domestic GFA	31,124 m^2
2. Plot Ratio	6.0
3. Number of Residential Blocks	2 blocks
4. Number of Residential Units	flat size ≤ 40 m^2 = 144 flats 40 m^2 < flat size ≤ 70 m^2 = 504 flats Total = 648 flats
Non-Domestic Use	
5. Retail GFA	About 3,123 m^2
6. RCHE	100 places
7. Public Car Park	130 car parking spaces 5 LGV spaces

2.3 Area of Influence (AOI)

2.3.1 The vehicular access point of the Site is proposed to be at Pik Fung Road. Upon completion of the proposed development, the development traffic generation will either go east or west. As a result, the immediate junctions at the east and the west sides, until the traffic can be discharged to Fanling Highway, will be considered in the following assessment. **Figure 2.1** shows the AOI in this study.

3 EXISTING TRAFFIC SITUATION

3.1 Existing Road Network

3.1.1 Pik Fung Road is a single 2-lane carriageway linking Jockey Club Road to the northern end and San Wan Road to the southern end. It mainly serves the North District Government Offices, the Fanling Law Courts Building, few residential developments and few schools. It forms a left-in/ left-out priority junction with Jockey Club Road northbound and a all-movements priority junction with San Wan Road.

3.1.2 Jockey Club Road is dual 2-lane primary distributor connecting with Man Kam To Road to the north and Fanling Highway to the south. Running parallel with Jockey Club Road, both roads are the two major corridors running through Fanling and Sheung Shui districts.

3.1.3 Two roundabouts are located in the vicinity of the Site, namely junction of Jockey Club Road / Sha Tau Kok Road and junction of San Wan Road / Sha Tau Kok Road / Fanling Station Road.

3.2 Traffic Count Surveys

3.2.1 In order to appraise the existing traffic conditions, classified vehicle count survey was carried out on 11 December 2017 (Monday) for the time periods of 07:00 to 09:00 and 17:00 to 19:00 at the following key junctions in vicinity of the Site, as shown in **Figure 3.1**:

J1 – Jockey Club Road / Pik Fung Road;

J2 – Jockey Club Road / Sha Tau Kok Road;

J3 – Jockey Club Road / San Wan Road;

J4 – San Wan Road / Sha Tau Kok Road / Fanling Station Road;

J5 – San Wan Road / Pik Fung Road;

J6 – San Wan Road / Slip Roads to So Kwun Po Road;

J7 – So Kwun Po Road / Fanling Highway Slip Roads; and

J8 – Jockey Club Road / So Kwun Po Road.

3.2.2 The morning and the evening peak hours are identified to be 07:45 to 08:45 and 17:30 to 18:30 respectively. The observed traffic flows are presented in **Figure 3.2**.

3.3 Existing Junction/Link Capacity Assessment

3.3.1 Based on the observed traffic flows, the performances of the adjacent key junctions were assessed. The results are summarized and presented in **Table 3.1** and the detailed calculation sheets are attached in **Appendix A.**

Table 3.1 Existing Junction Capacity Assessment

Ref.	Junction Location	Type / Index(1)	AM Peak	PM Peak
J1	Jockey Club Road / Pik Fung Road	Priority/DFC	0.31	0.11
J2	Jockey Club Road / Sha Tau Kok Road	Roundabout/DFC	0.64	0.55
J3	Jockey Club Road / San Wan Road	Signalized/RC	23%	33%
J4	San Wan Road / Sha Tau Kok Road / Fanling Station Road	Roundabout/DFC	0.49	0.45
J5	San Wan Road / Pik Fung Road	Priority/DFC	0.31	0.19
J6	San Wan Road / Slip Roads to So Kwun Po Road	Signalized/RC	28%	35%
J7	So Kwun Po Road Interchange(2)	Roundabout/DFC	0.88	0.86
J8	Jockey Club Road / So Kwun Po Road	Signalized/RC	20%	42%

Notes: (1) DFC = design flow to capacity ratio for priority junction/roundabout. RC = reserve capacity for signalized junction.
(2) 350m vehicular traffic queue was observed at So Kwun Po Road southbound during both AM and PM peak hours.

3.3.2 It can be seen from **Table 3.1** that most of the key junctions performed satisfactorily during the peak hours, except for J/O So Kwun Po Road / Fanling Highway Slip Roads (Junction No. J7) which is operating near capacity under the existing scenario.

3.3.3 Existing road link performances of critical links are summarized in below **Table 3.2**.

Table 3.2 Existing Link Capacity Assessment

Ref.	Link	Bound	Capacity (pcu/hour)(1)	2017 Observed Flows (pcu/hour)		V/C Ratio	
				AM Peak	PM Peak	AM Peak	PM Peak
L1	Jockey Club Road	E/B	3,120	618	704	0.20	0.23
		W/B	3,120	630	505	0.21	0.17
L2	San Wan Road	E/B	2,400	626	495	0.27	0.21
		W/B	2,400	580	571	0.25	0.24

Note: (1) The capacity for primary distributor dual-2 lane carriageway is adopted for Jockey Club Road and the capacity for 4 lane carriageway for district distributor is adopted for San Wan Road. The capacity of road sections refer to Volume 2 of the TPDM and a factor of 1.2 is adopted to convert the capacity from veh/hr to pcu /hr.

3.4 Existing Public Transport Facilities

3.4.1 MTR Fanling Station is located within 500m from the Site; while the walking distance is about 500m as shown in **Figure 3.3**. Various franchised bus and scheduled minibus (GMB) services operate in the vicinity of the Site along Jockey Club Road, San Wan Road, Sha Tau Kok Road, and Fanling Station Road. Hence, the Site is well-served by public transport facilities. **Table 3.3** and **Figure 3.3** show the existing franchised bus / scheduled minibus routes serving in the vicinity of the Site.

Table 3.3 Existing Road-Based Public Transport Services

Route No.	Terminal Points
Franchised Bus	
70K	Wah Ming B/T – Ching Ho
78K	Sheung Shui B/T – Sha Tau Kok B/T

Route No.	Terminal Points
79K	Sheung Shui B/T – Ta Kwu Ling
270C	Luen Wo Hui B/T – Tsim Sha Tsui East (Mody Road)
277X	Luen Wo Hui B/T – Lam Tin Railway Station B/T
278K	Luen Wo Hui B/T – Fanling Railway Station (Circular)
278P	Luen Wo Hui B/T – Tsuen Wan (Nina Tower)
279X	Luen Wo Hui B/T – Tsing Yi Station
373	Sheung Shui B/T – Sheung Wan
673	Sheung Shui B/T – Central (Hong Kong Station)
A43	Luen Wo Hui B/T – Airport (Ground Transportation Centre)
A43P	Luen Wo Hui B/T – Airport (Ground Transportation Centre)
T270	Cheung Wah B/T – Tsim Sha Tsui East (Mody Road)
N42A	Luen Wo Hui B/T – Tung Chung Railway Station
NA43	Luen Wo Hui B/T – Airport (Ground Transportation Centre)
Scheduled Mini Bus (GMB)	
52A	Fanling Station – Wo Mun Street PLB Terminus
52B	Fanling Station – Hok Tau
52K	Fanling Station – Ping Che
54A	Fanling Station – Wing Fuk Centre
54K	Fanling Station – Lung Yeuk Tau
55K	Sheung Shui Station – Sha Tau Kok (Shun Lung Street)
56A	Fanling Station – Wo Mun Street PLB Terminus
56B	Fanling Station – Tan Chuk Hang
56C	Fanling Station – Siu Hang Tsuen
56K	Fanling Station – Luk Keng
58S	Mong Kok Station – Sheung Shui Station
501A	Yung Shing Court – Luen Wo Hui
501K	Fanling Station – Yan Shing Court

3.5 Pedestrian Crossing Facilities

3.5.1 At-grade pedestrian crossings across Jockey Club Road and Pik Fung Road are provided adjacent to the Site while footbridges and subways are found at key junctions in the vicinity of the Site.

4 FUTURE TRAFFIC SITUATION

4.1 Future Road Improvements

Fanling Bypass

4.1.1 Under the North East New Territories New Development Areas Planning and Engineering Study, Fanling Bypass is proposed as a regional highway linking Fanling North and Fanling Highway to alleviate the anticipated traffic congestion in Fanling and Sheung Shui districts. The proposed Fanling Bypass will give access to Fanling North NDA from the strategic road network, prevent overloading of Fanling Highway Sheung Shui Section and its interchanges (So Kwun Po Interchange and Po Shek Wu Interchange); and allow traffic from Fanling North and Sha Tau Kok Road northeast of Lung Yeuk Tau to bypass Fanling town centre. In view of the above, it is estimated that the traffic flows on So Kwun Po Road will be reduced and the adjusted traffic flows will be adopted in the following assessments.

J/O Jockey Club Road / So Kwun Po Road (Junction No. J8) (**Figure 4.1**)

4.1.2 Under the Fanling North NDA project, junction improvement schemes is being proposed with the following features:

- Lane arrangement of Jockey Club Road northbound to be revised for allowing left-turn traffic to use two traffic lanes;
- Method of control (MOC to be revised for minimizing/optimizing the intergreen time)
- Lane arrangement of Ma Sik Road southbound to be revised for allowing three traffic lanes for vehicles to traffic straight ahead; and
- Local widening of So Kwun Po Road southbound from 2 to 3 lanes.

4.2 Traffic Generation of the Proposed Development

4.2.1 The traffic generations of residential use and retail use are estimated by making reference to the trip generation rates in the Transport Planning and Design Manual.

4.2.2 Residential Care Home for the Elderly (RCHE) aims to provide residential care and facilities for the elders who cannot adequately be taken care of at home. The daily activities of the elders are within the RCHE centre, and the centre provides hostel services. Hence, the traffic generation is negligible and a nominal traffic flow of 5 pcu/hr is adopted.

4.2.3 In order to establish the trip rates for public car park, traffic survey was conducted at the existing public car park at Yan Shing Lane. The obtained trip rates are adopted to estimate the traffic generation of the proposed public car park.

4.2.4 The trip generation rates and the traffic generation of the different uses in the proposed development are presented in **Table 4.1** and distributed onto the road network as shown in **Figure 4.2.**

Table 4.1 Traffic Generations of the Proposed Development

Use	Unit / Parameter	AM Peak Hour			PM Peak Hour		
		Gen.	Att.	Total	Gen.	Att.	Total
Adopted Trip Rates							
Subsidised Sale Flat	pcu/hr/flat	0.0622	0.0426	-	0.0297	0.0401	-
Retail	pcu/hr/100m^2	0.2296	0.2434	-	0.3100	0.3563	-
Public Car Park	pcu/hr/space	0.1275	0.0134	-	0.0336	0.1141	-
Estimated Traffic Generation (pcu/hr)							
Subsidised Sale Flat	648 flats	41	28	69	20	26	46
Retail	3,123 m^2	8	8	16	10	12	22
RCHE	100 places	5	5	10	5	5	10
Public Car Park	135 spaces$^{(1)}$	18	2	20	5	16	21
Total		72	43	115	40	59	99

Notes: (1) A total of 130 nos. private car parking spaces and 5 nos. of LGV spaces will be provided.

4.2.5 As shown in **Table 4.1**, the proposed development would generate two-way traffic flows of 115 pcu/hr in the AM peak hour and 99 pcu/hr in the PM peak hour.

4.3 Design Year for Traffic Forecast

4.3.1 The completion year of the proposed development is expected to be 2024. As a result, the design year of the traffic impact assessment should be three years after the completion year, i.e., 2027.

4.4 Future Traffic Flows

4.4.1 Future reference traffic flows were estimated with reference to the existing traffic flows and the data of the Annual Traffic Census (ATC) in the vicinity of the Site.

4.4.2 Some ATC stations are found in the vicinity of the Site. The historic Annual Average Daily Traffic (AADT) data was reviewed, and is presented in **Table 4.2.**

Table 4.2 ATC Stations Located in the Vicinity of the Site

Stn. No.	Road Section			Annual Average Daily Traffic (vehicles per day)					Average Annual Growth
	Road	From	To	2012	2013	2014	2015	2016	
5217	Jockey Club Rd	Sha Tau Kok Rd	So Kwun Po Rd	14,590 (0%)	11,870 (-18.6%)	11,320 (-4.6%)	11,840 (4.6%)	12,510 (5.7%)	-3.8%
5244	San Wan Rd	Sha Tau Kok Rd	So Kwun Po INT	11,570 (0%)	13,440 (16.2%)	12,690 (-5.6%)	12,580 (-0.9%)	13,110 (4.2%)	3.2%
5422	Jockey Club Rd	Sha Tau Kok Rd	Lok Yip Rd	11,470 (0%)	11,950 (4.2%)	11,480 (-3.9%)	11,800 (2.8%)	12,470 (5.7%)	2.1%
5453	Sha Tau Kok Rd	Jockey Club Rd	San Wan Rd	18,950 (0%)	19,110 (0.8%)	18,690 (-2.2%)	18,750 (0.3%)	19,530 (4.2%)	0.8%
5824	Sha Tau Kok Rd	Jockey Club Rd	Lok Yip Rd	26,990 (0%)	28,120 (4.2%)	27,940 (-0.6%)	29,240 (4.7%)	29,270 (0.1%)	2.0%
6041	San Wan Rd	Sha Tau Kok Rd	Jockey Club Rd	13,420 (0%)	14,160 (5.5%)	14,010 (-1.1%)	13,900 (-0.8%)	14,470 (4.1%)	1.9%
6069	Pik Fung Rd	Jockey Club Rd	San Wan Rd	3,040 (0%)	3,310 (8.9%)	3,270 (-1.2%)	3,240 (-0.9%)	3,380 (4.3%)	2.7%
Total				100,030 (0%)	101,960 (1.9%)	99,400 (-2.5%)	101,350 (2%)	104,740 (3.3%)	1.2%

4.4.3 **Table 4.2** shows that an overall average annual growth at the ATC stations has recorded 1.2% in the past few years. A traffic growth rate of 1.2% per annum, therefore, is used for the future traffic projection.

4.4.4 The traffic flows that would be generated by the planned developments in the vicinity of the Site have also been considered. The details are shown in **Table 4.3**.

Table 4.3 Traffic Generations of the Planned Developments

Ref	Planned Development	Completion Year	AM Peak			PM Peak		
			Gen.	Att.	Total	Gen.	Att.	Total
S1	Public Rental Housing Development Choi Yuen Road residential: 1,160 units	2019	50	38	88	27	35	62
S2	Public Rental Housing Development Fai Ming Road, Fanling Area 49 residential: 940 units	2018 / 2019	41	31	72	22	28	50
S3	Private Residential Development Wo Fung Street residential: 300 units retail: 6,737m^2	2018 / 2019	37	29	72	29	35	72
S4	Mixed Housing Development Pak Wo Road residential: 1,467 units RCHE: 206 beds retail: 6,500 m^2	2022	90	73	163	63	76	139
S5	Public Rental Housing Development Sheung Shui Areas 4 & 30 Sites 1 & 2 Residential: 2,257+1,595 units Retail: 994+1221 m2 GFA GIC: 5,459 m2 GFA Kindergarten: 6 classrooms	2020	190	153	343	119	132	251
S6	Public Rental Housing Development Po Shek Wu Road Residential: 2,033 units Retail: 960 m2 GFA Kindergarten: 6 classrooms	Not Available	145	110	255	81	91	172
S7	Public Rental Housing Development Ching Ho Extension Residential: 825 units Retail: 2,600	2023	42	34	76	29	35	64
S8	Land Exchange Site at Ma Sik Road Residential: about 1,000 units	Not Available	72	43	115	29	37	66
S9	Liantang Heung Yuen Wai Boundary Control Point[(1)]	2018/2019	1,140	1,090	2,230	1,090	1,140	2,230
S10	Kwu Tung North Fanling North NDA Advance Works Residential: about 16,000 units	2023	692	522	1,214	380	482	862
S11	Queen's Hill Residential: about 9,500 units	2020/2021	411	310	721	226	286	512
S12	Ching Ho Extension Residential: about 700 units	2019	31	23	54	17	22	39

Notes: (1) Estimated traffic flows obtained from EIA report of the project.

4.5 Reference and Design Traffic Flows

4.5.1 The future traffic flows, i.e. the traffic flows in the local road network without and with the proposed development, were estimated based on the following equations:

2027 Reference Flows (refer to **Figure 4.3**) = 2017 Observed Flows x $(1 + 1.2\%)^{10}$ + Traffic Generated from Planned Developments

2027 Design Flows (refer to **Figure 4.4**) = 2027 Reference Flows + Development Traffic Flows

4.6 Junction Capacity Assessment

4.6.1 Capacity assessment was carried out for the concerned junctions for design year 2027. The junction and link capacity assessment results are shown in **Table 4.4** and **Table 4.5**, and detailed junction calculation sheets are presented in **Appendix B**.

Table 4.4 Year 2027 Junction Capacity Assessment

Ref.	Junction	Type / Index[1]	2027 Reference Scenario		2027 Design Scenario	
			AM Peak	PM Peak	AM Peak	PM Peak
J1	Jockey Club Road / Pik Fung Road	Priority/DFC	0.36	0.13	0.37	0.14
J2	Jockey Club Road / Sha Tau Kok Rd	Roundabout/DFC	0.71	0.64	0.75	0.66
J3	Jockey Club Road / San Wan Road	Signalized/RC	44%	57%	41%	52%
J4	San Wan Road / Sha Tau Kok Road / Fanling Station Road	Roundabout/DFC	0.57	0.52	0.57	0.52
J5	San Wan Road / Pik Fung Road	Priority/DFC	0.36	0.22	0.47	0.28
J6	San Wan Road / Slip Roads to So Kwun Po Road	Signalized/RC	13%	20%	12%	18%
J7	So Kwun Po Road Interchange[2]	Roundabout/DFC	0.90	0.87	0.91	0.87
J8	Jockey Club Road / So Kwun Po Rd[3]	Signalized/RC	21%	35%	21%	35%

Notes: (1) DFC = design flow to capacity ratio for priority junction/roundabout. RC = reserve capacity for signalized junction.
(2) Junction capacity assessment taken into consideration of the impact of Fanling Bypass.
(3) Junction capacity assessment taken into consideration of the junction improvement scheme explored under Fanling North NDA.

Table 4.5 Year 2027 Link Capacity Assessment

Ref.	Link	Bound	Capacity (pcu/hour) [1]	Traffic Flows [V/C Ratio]			
				2027 Reference Scenario		2027 Design Scenario	
				AM Peak	PM Peak	AM Peak	PM Peak
L1	Jockey Club Road	E/B	3,120	610 [0.20]	509 [0.17]	610 [0.20]	509 [0.17]
		W/B	3,120	728 [0.24]	582 [0.19]	739 [0.24]	588 [0.19]
L2	San Wan Road	E/B	2,400	706 [0.30]	559 [0.24]	719 [0.30]	577 [0.25]
		W/B	2,400	654 [0.28]	645 [0.27]	665 [0.28]	651 [0.28]

Note: (1) The capacity for primary distributor dual-2 lane carriageway is adopted for Jockey Club Road and the capacity for 4 lane carriageway for district distributor is adopted for San Wan Road. The capacity of road sections refer to Volume 2 of the TPDM and a factor of 1.2 is adopted to convert the capacity from veh/hr to pcu /hr.

4.6.2 The results in **Table 4.4** show that most junctions are calculated to have sufficient capacities to accommodate the future traffic growth and the traffic generated by the proposed development during the peak hours in 2027, except for (Junction No. J7) J/O So Kwun Po Road / Fanling Highway Slip Roads which will operate near capacity under the future scenarios.

4.6.3 For the DFCs in Junction No. J7, it should be noted that the DFC for both reference and design scenarios are almost identical under the reference and design scenarios and there will be less than 20 pcu/hour which passes through So Kwun Po Road southbound (critical arm) during the peak hour. Therefore, the traffic impact generated by the proposed development is insignificant. More importantly, there will be various road improvement works implemented in the vicinity and it is anticipated that the overall traffic situations will be improved.

4.7 Sensitivity Analysis of Fanling Bypass

4.7.1 Currently, traffic queue were observed at So Kwun Po Road southbound. If Fanling Bypass cannot be completed before the design 2027, there will be no reduction of traffic flows along So Kwun Po Road. The additional traffic along So Kwun Po Road, as compared with the existing flows, will be added to the traffic queue. Based on the estimation, an additional 169 pcu/hour and 138 pcu/hour will be added to So Kwun Po Road southbound during AM and PM peak hour, respectively. By converting the additional traffic into a traffic queue, So Kwun Po Road southbound (with 2 traffic lanes), an additional traffic queue of about 507m and 414m will be resulted. Since the end of existing traffic queue was observed near Jockey Club Road at J/O Jockey Club Road/So Kwun Po Road, it is expected that future traffic queue will be extended over the junction to Ma Sik Road southbound and Jockey Club Road by about 155m and 125m during AM and PM peak hour, respectively.

4.8 Sensitivity Analysis of North-South Link(s)

4.8.1 The feasibility study of North-South Link(s) as alternative to So Kwun Po (Kai Leng) Roundabout in North District is also carried out and it is anticipated the traffic on So Kwun Po Road, both bounds, will be further reduced if North-South Link(s) is to be in place. Although the proposed North-South Link(s) is still under government's study, as a sensitivity test, a reduction of 10% traffic flows is assumed for So Kwun Po Road both bounds. The junction capacity assessment results for So Kwun Po Road Interchange are shown in **Table 4.6** and detailed junction calculation sheets are presented in **Appendix C.** The results showed that the junction performance and the continual queuing at the critical lane will be improved when North-South Link(s) is completed.

Table 4.6 Junction Capacity Assessment (2027 Design Scenario) – With & Without North-South Link(s)

Ref.	Junction	Type / Index[1]	Without North-South Link(s)		With North-South Link(s)	
			AM Peak	PM Peak	AM Peak	PM Peak
J7	So Kwun Po Road Interchange[2]	Roundabout/DFC	0.91	0.87	0.81	0.77

4.9 Public Transport Demand

4.9.1 The pedestrian generation of the proposed residential development (excluding those persons using private vehicles to leave the Site) on the surrounding footpaths is estimated by adopting the in-house pedestrian trip rates for residential use as shown in **Table 4.7**.

Table 4.7 Estimated Pedestrian Generation

Use	Unit / Parameter	AM Peak			PM Peak		
		Gen.	Att.	Total	Gen.	Att.	Total
Adopted Trip Rates							
Residential	person/hr/flat	0.80	0.22	-	0.17	0.50	-
Estimated Pedestrian Generation (person/hr)							
Proposed Residential Development	648 units	518	143	661	110	324	434

4.9.2 The proposed residential development is estimated to generate 2-way flows of 661 and 434 person/hour during the morning and the evening peak hours respectively. Since the AM situation is more critical, the AM scenario is used for analysis purpose.

4.9.3 To estimate the pedestrian flows to / from the major public transport facilities, it is assumed that all the above pedestrian flows would take the public transport services.

4.9.4 In order to establish the pedestrian flow pattern to the different public transport facilities, reference was made to the number of passenger journeys by public transport operators recorded in the Monthly Traffic and Transport Digest (MTTD) January 2017. The modal split of the public transport for the proposed development was estimated as shown in **Table 4.8**.

Table 4.8 Estimated Modal Split for the Proposed Development

Mode	Distribution of Average Daily Public Transport Passenger Journeys by Mode (1)	Adjusted Modal Split for the Proposed Development
Rail-based PT	43.5%	43.9%
Road-based PT (excluding Taxi)	48.1%	48.6%
Taxi	7.4%	7.5%
Total	99.0% (2)	100.0%

Note: (1) Source: Chart 2.7 in Monthly Traffic and Transport Digest (Jan 2017).
(2) Marine transport is omitted.

4.9.5 The Site is within 500m radius of MTR Fanling Station; while the walking distance is about 500m. Also, public transport services are abundant in the vicinity of the Site.

4.9.6 The passenger generation to / from the MTR Fanling Station, the bus / mini-bus stops and the taxi stands / the roadside available for taxi passenger pick-up & drop-off in the vicinity of the proposed development in the AM peak hour is estimated in **Table 4.9**.

Table 4.9 Estimated Pedestrian Generation to the Public Transport Facilities in the AM Peak Hour

Public Transport Facilities	Modal Split (for the Proposed Development)	Estimated Pedestrian Generation (person / hr)	Estimated Pedestrian Attraction (person / hr)	Total Estimated Pedestrian (person / hr)
MTR Fanling Station	43.9%	227	63	290
Bus / Mini-bus Stops	48.6%	252	69	321
Taxi Stand / Roadside	7.5%	39	11	50
Total	100.0%	518	143	661

4.9.7 As shown in **Table 4.9**, 290 person/hour will be induced by the proposed development or which 227 person/hour is generated from the Site and 63 person/hour is attracted to the Site. According to Legislative Council Paper No. CB(4)854/15-16(08)MTR, the passenger throughput of East Rail Line per hour per direction in 2014 is 58,700 person/hour. The passenger demand on MTR East Rail Line generated from the Site will be only 0.3% (227/58,700 = 0.3%) of the total passenger throughput. The impact on railway services is considered minimal.

4.9.8 The proposed development is located within 500m catchment area of the MTR Fanling Station. The existing footbridges near the roundabout of San Wan Road / Fanling Station Road / Sha Tau Kok Road - Lung Yeuk Tau provide a good connection to the railway station. It is anticipated that the residents of the proposed development would walk to the station. Hence, feeder services of bus or GMB to railway station would be unnecessary.

4.9.9 Moreover, under the proposed New Territories East Cultural Centre (NTECC), a pedestrian connection will be provided for connection to the existing footbridge across San Wan Road to the MTR Fanling Station, and passage to site boundary of other nearby buildings (as indicated in **Figure 3.3**). NTECC is targeting for completion in 2022. The anticipated completion of NTECC will be earlier than that of the proposed development, which is expected to be 2024. The walking distance to MTR Fanling Station will become less than 500m upon the completion of the pedestrian connection via NTECC. It is expected that the residents would not rely on feeder public transport services connecting to the MTR station. Moreover, HKHS will further coordinate with the NTECC project to develop the future pedestrian connection network such that the overall pedestrian connectivity in the area can be further improved.

4.10 Walkway Serviceability Assessment

4.10.1 With the walkway width along the pedestrian route to Fanling Station ranges from 2.0m to 8.0m, few locations along the route to the MTR station and the nearby bus stops were identified (as shown in **Figure 4.5**) and the Level of Service (LOS) were assessed. The results are summarized in **Table 4.10**.

Table 4.10 Walkway Serviceability Assessment

Walkway Location		Actual Width (m)	Effective Width (m)[1]	Peak Hour Two-way Pedestrian Flows (ped/hour)		Flow Rate (ped/min/m) & [LOS][2]	
				AM	PM	AM	PM
Existing Scenario							
W1	Southern kerbside of Jockey Club Road outside the Site	2.0	1.0	127	155	2.1 [A]	2.6 [A]
W2	Southern kerbside of Jockey Club Road outside the Site near the existing crossing	1.8	0.8	142	167	3.0 [A]	3.5 [A]
W3	Western kerbside of Sha Tau Kok Road	3.5	2.5	265	282	1.8 [A]	1.9 [A]
Future With Development Scenario							
W1	Southern kerbside of Jockey Club Road outside the Site	2.0	1.0	193	198	3.2 [A]	3.3 [A]
W2	Southern kerbside of Jockey Club Road outside the Site near the existing crossing	1.8	0.8	737	558	15.4 [A]	11.6 [A]
W3	Western kerbside of Sha Tau Kok Road	3.5	2.5	860	673	5.7 [A]	4.5 [A]

4.10.2 The walkway serviceability assessment indicated that the concern walkway will perform satisfactorily with LOS level "A".

4.11 Observed Bus Occupancy

4.11.1 Observation was made for the bus routes at the bus stops in the vicinity of the Site during 0700 – 0830 hours. During the observation time period, the occupancy of the observed bus routes was not full and no passengers were left behind when the buses departed the bus stops. The results of the observation are summarised in **Appendix D**.

4.11.2 To estimate the expected bus occupancy due to the proposed development, the AM pedestrian generation of the proposed development is assigned to the bus routes according to the number of boarding passengers of each observed bus route. The average bus occupancy of each observed route in the AM peak hour is summarised in **Table 4.11.** The bus routes would have spare capacity to accommodate the additional passengers induced by the proposed development.

Table 4.11 Existing and Projected Average Bus Occupancy in the AM Peak Hour

Route No.	Destination	Number of Passengers of the Proposed Development Assigned to Each Route	Existing Average Bus Occupancy	Projected Average Bus Occupancy (with the Proposed Development)
70K	Ching Ho	4	50%	50%
70K	Wah Ming	0	40%	40%
78K	Sha Tau Kok	7	55%	55%
79K	Sheung Shui	7	20%	20%
79K	Ta Kwu Ling	0	40%	40%
270C	Tsim Sha Tsui East	4	10%	10%
277X	Luen Wo Hui	0	30%	30%
277X	Lam Tin	184	60%	70%
278K	Luen Wo Hui	7	40%	40%
278P	Tsuen Wan	4	15%	15%
279X	Tsing Yi	7	10%	10%
279X	Luen Wo Hui	0	10%	10%
373	Central	0	10%	10%
673	Central	25	60%	65%
A43	Airport	4	10%	10%
A43	Luen Wo Hui	0	10%	10%
A43P	Airport	0	10%	10%
	Total	252	-	-

5 PROPOSED TRANSPORT PROVISION

5.1 Internal Transport Facilities

5.1.1 The internal transport facilities for the proposed development will be provided in accordance with the Hong Kong Planning Standards and Guidelines (HKPSG). The required and the proposed provisions for the proposed development are shown in **Tables 5.1 - 5.3**. The proposed parking floor layouts are shown in **Appendix E**.

Table 5.1 Parking Requirement for Residential

Type	HKPSG's Requirements (144 flats @ size ≤ 40 m^2, 504 flats @ 40 m^2 < size ≤ 70 m^2, 2 towers, plot ratio of 6.0)						Proposed Provision
	Standard						Required Provision
Car Parking Space	For Residents Parking Requirements = GPS x R1 x R2 x R3 where						
	Unit Size	No. of Unit	GPS	R1	R2	R3	
	size ≤ 40m^2	144	1 space per 6 - 9 units	0.4	0.75	0.90	5 – 7 / 7
	40m^2 < size ≤ 70m^2	504	1 space per 6 - 9 units	0.7	0.75	0.90	27 – 40 / 40
	For Visitors 1 to 5 visitor car parking spaces per block with more than 75 units						2 – 10 / 10
	Total						34 – 57 / 57 (1)
Motorcycle Parking Space	1 space per 100 - 150 flats						4 – 7 / 7
Goods Vehicle Loading / Unloading Bay	1 bay per residential block						2 / 2
Bicycle Parking	1 per 15 flats with flat size smaller than 70m^2.						44 / 44

Note: (1) including 2 accessible car parking spaces for 51 – 150 car parking spaces.

Table 5.2 Parking Requirement for Retail

Type	HKPSG's Requirements (3,123 m^2, Zone 1)		Proposed Provision
	Standard	Required Provision	
Car Parking Space	1 space per 200 – 300m^2 GFA	10 – 15	13 (1)
Motorcycle Parking Space	5% to 10% of the provision of car parking space	1 – 2	6
Goods Vehicle Loading / Unloading Bay	1 bay per 800 – 1,200 m^2 or part thereof	3 – 4 (2)	4

Note: (1) including 1 accessible car parking space for 1 – 50 car parking spaces.
(2) 65% for LGV (2 nos.) and 35% for HGV (2 nos.).

Table 5.3 HKPSG's Parking Requirements for RCHE

Type	HKPSG's Requirements (100 places)		Proposed Provision
	Standard	Required Provision	
Ambulance Lay-by	No standards specified in the HKPSG. Reference was made to the requirements of Social Welfare Department.	-	1
PLB / Maxicab Parking Space	No standards specified in the HKPSG.	-	2

5.1.2 Apart from the above transport provision, the proposed development will have a public car park to provide 130 private car parking spaces and 5 LGV parking spaces. The provision of public car parks are summarized in **Table 5.4**.

Table 5.4 Provision of Public Car Park

Type	Proposed Provision
Car Parking Space	130
Light Goods Vehicle Parking Space	5

Note: (1) including 2 accessible car parking space for 51 – 150 car parking spaces.

5.1.3 The proposed development (excluding the proposed public car park) will provide a total of 70 car parking spaces for cars, 13 motorcycle parking spaces, 6 goods vehicle loading / unloading bays, 1 ambulance / light bus lay-by and 2 PLB/ maxicab parking spaces. The proposed provision of the internal transport facilities for the proposed development satisfies the HKPSG's requirements.

5.1.4 All the above internal transport facilities will be provided in the ground floor and the basement floors.

5.1.5 Swept-path analyses for the maneuvering of vehicles entering/exiting the parking area are shown in **Appendix F**.

6 SUMMARY AND CONCLUSION

6.1 Summary

6.1.1 Hong Kong Housing Society intends to develop a subsidized housing development at Jockey Club Road near Pik Fung Road in Fanling. The proposed development will be comprised of 2 residential blocks, retail shops, a centre of Residential Care Home for the Elderly (RCHE) and a public car park. The proposed development is expected to be completed in 2024.

6.1.2 Traffic survey was conducted to establish the existing traffic flows in the vicinity of the Site. The morning and the evening peak hours were found to be 07:45 to 08:45 and 17:30 to 18:30 respectively. The capacity of the key junctions in the vicinity of the Site was analysed and the junctions are now operate in good conditions, except for J/O So Kwun Po Road / Fanling Highway Slip Roads (Junction No. J7) which is operating near capacity under the existing scenario with traffic queue observed.

6.1.3 The Site is well served by many road-based public transport routes. Stops of these routes could be found in Jockey Club Road, San Wan Road, Sha Tau Kok Road, and Fanling Station Road. MTR Fanling Station is located within 500m from the Site.

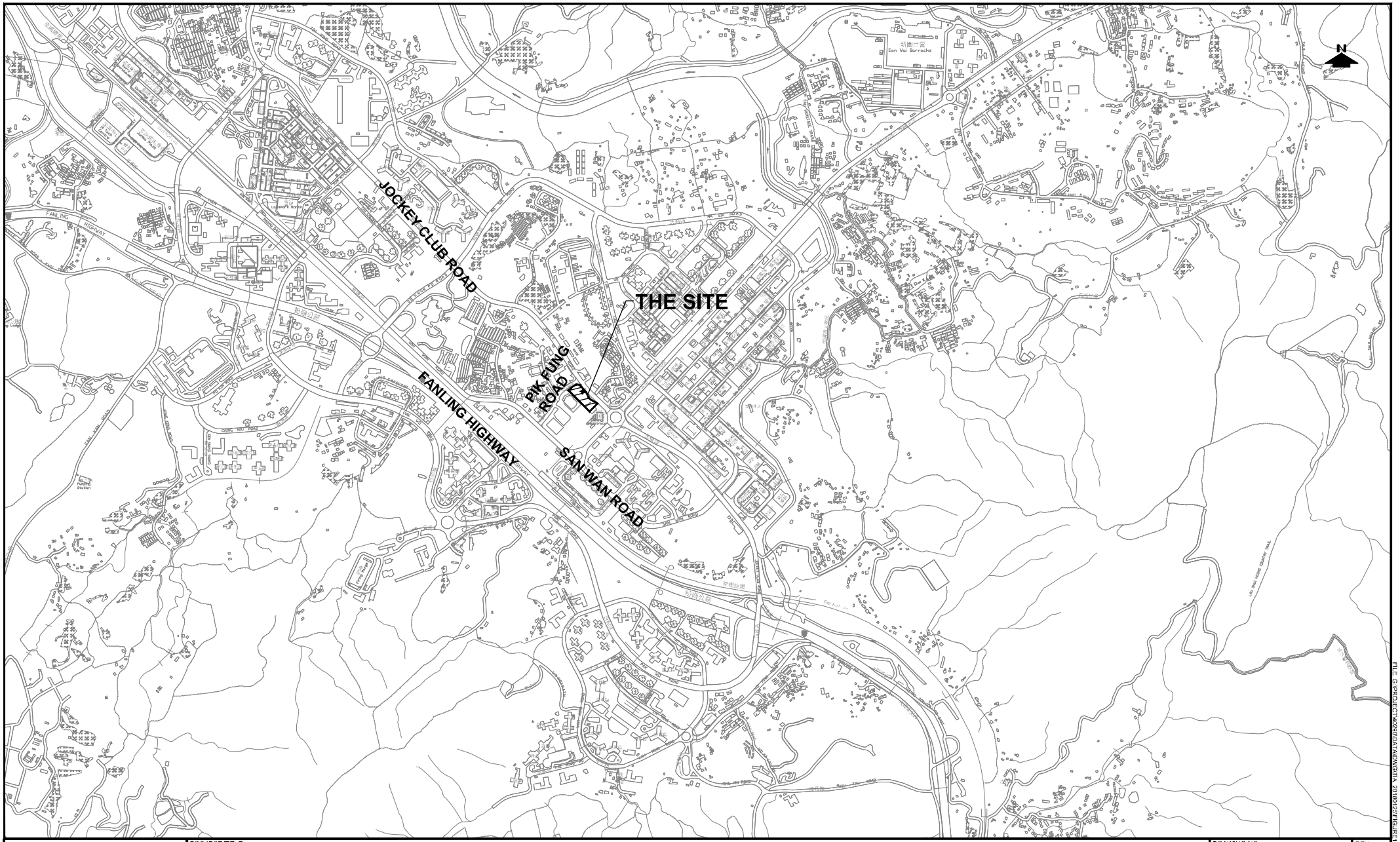
6.1.4 The proposed development would generate two-way traffic flows of 108 pcu/hr in the AM peak hour and 91 pcu/hr in the PM peak hour, which include the traffic generation of the public car park. In 2027, most junctions are calculated to have sufficient capacities to accommodate the future traffic growth and the traffic generated by the proposed development during the peak hours, except for (Junction No. J7) J/O So Kwun Po Road / Fanling Highway Slip Roads which will operate near capacity under the future scenarios.

6.1.5 For the DFCs in Junction No. J7, it should be noted that the DFC for both reference and design scenarios are identical under the reference and design scenarios and there will be less than 20 pcu/hour which passes through So Kwun Po Road southbound (critical arm) during the peak hour. Therefore, the traffic impact generated by the proposed development is insignificant.

6.1.6 The internal transport facilities of the proposed development will be provided in accordance with the recommendations outlined in the Hong Kong Planning Standards and Guidelines. The proposed development (excluding the proposed public car park) will provide a total of 70 car parking spaces for cars, 13 motorcycle parking spaces, 6 goods vehicle loading / unloading bays, 1 ambulance / light bus lay-by and 2 PLB/ maxicab parking spaces. In addition, 130 private car parking spaces and 5 light goods vehicle loading / unloading bays are provided in the public car park.

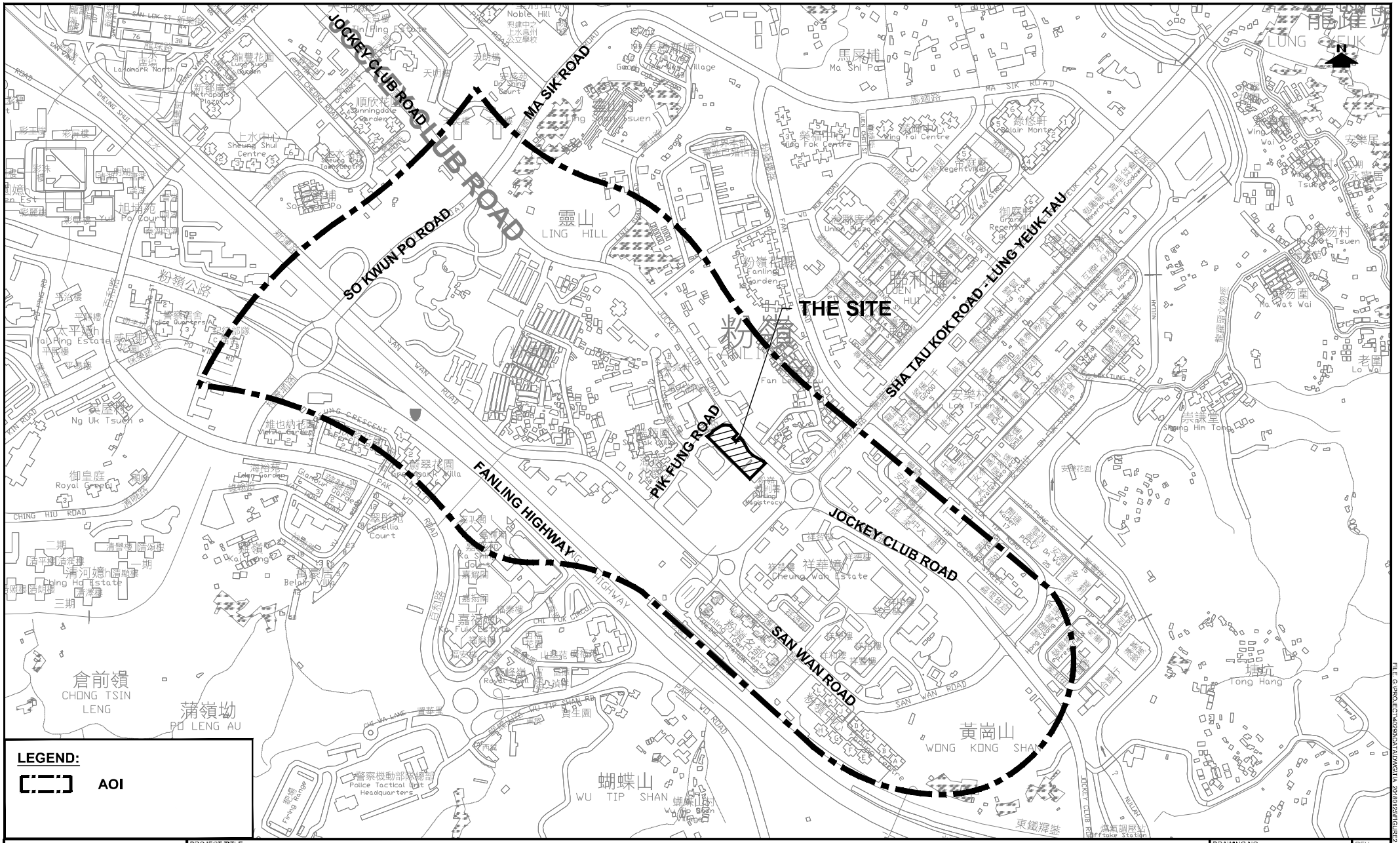
6.2 Conclusion

6.2.1 From the assessment results, it can be concluded that the proposed development will not induce significant traffic impact on the surrounding road network and the development proposal is considered acceptable from traffic engineering point of view.



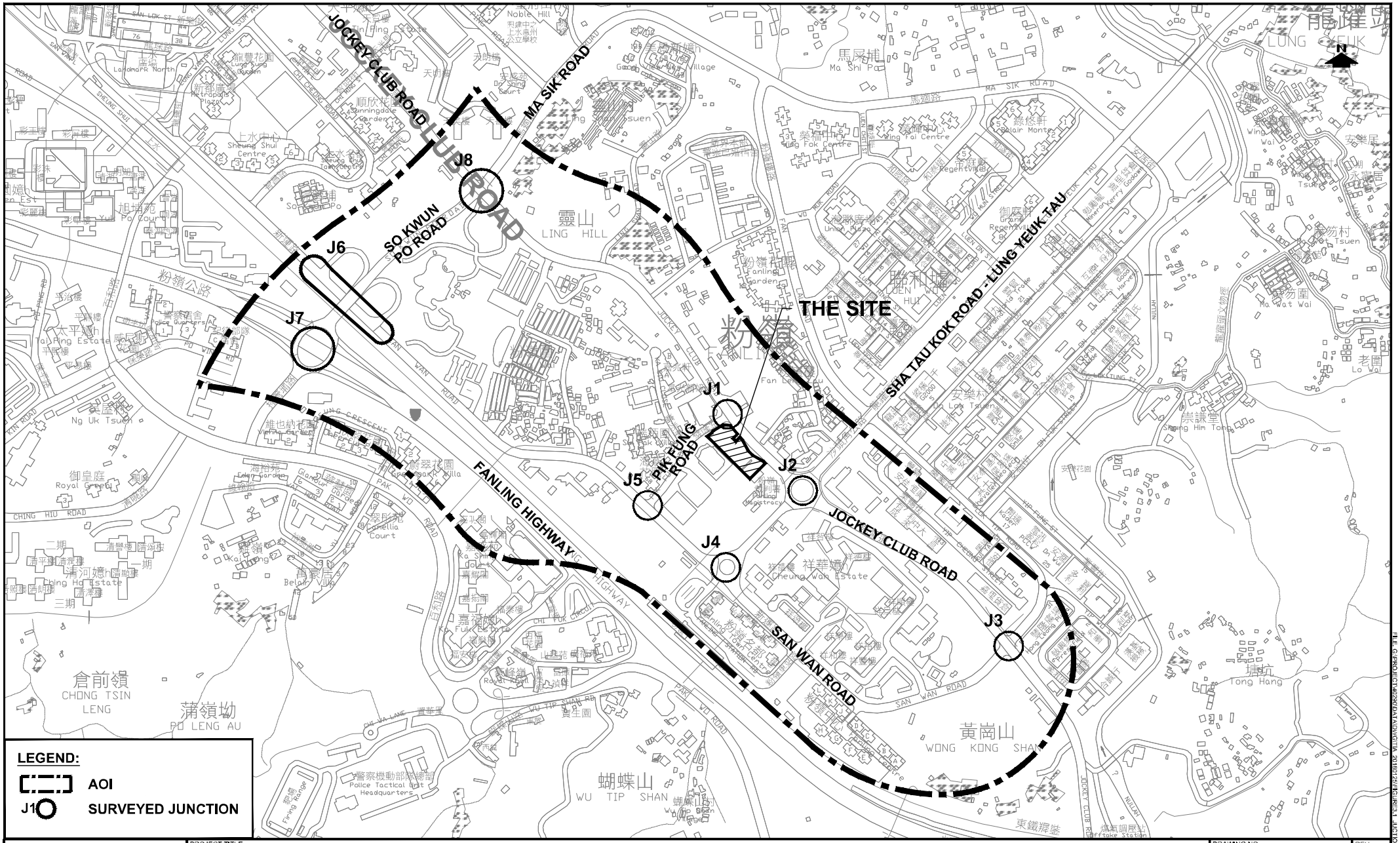
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DESIGNED GWL / DATE JAN 2018 / DRAWN JHC / CHECKED SLN / SCALE 1:20000	DRAWING TITLE: LOCATION PLAN	LLA 顧問有限公司 Consultancy Limited	

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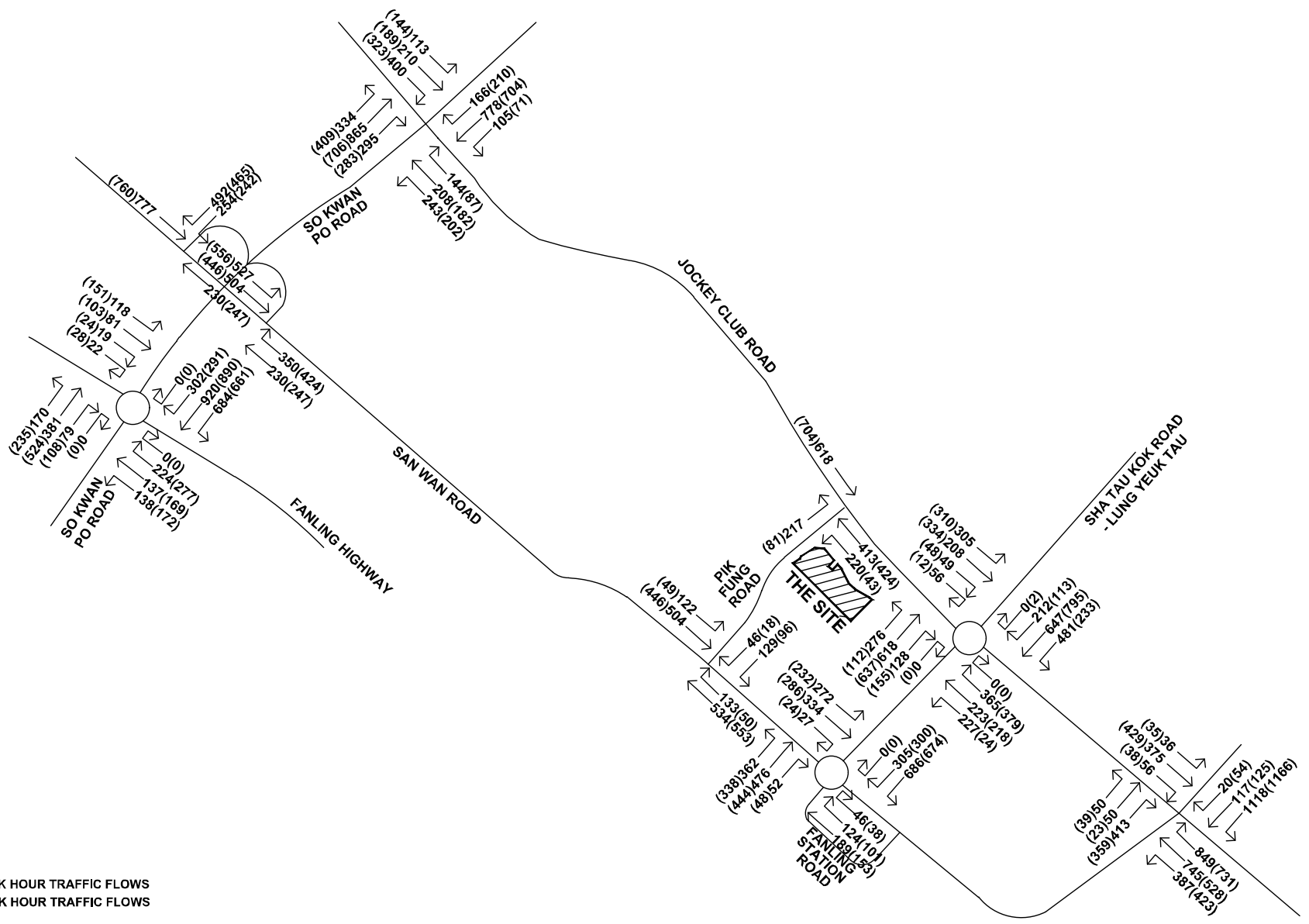
PROJECT NO. 40290	PROJECT TITLE: PROPOSED HONG KONG HOUSING SOCIETY SUBSIDIZED HOUSING DEVELOPMENT AT JOCKEY CLUB ROAD, FANLING	DRAWING NO. FIGURE 2.1	REV. -
DESIGNED GWL / DATE JAN 2018	DRAWING TITLE: AREA OF INFLUENCE	LLA 顧問有限公司 Consultancy Limited	
DRAWN JHC / SCALE 1:10000			
CHECKED SLN			

FILE: G:\PROJECT-40290\DATA\DWG\TIA 20180125\FIGURE2.1.DWG PLOT SCALE : 1 = 1



PROJECT NO. 40290	PROJECT TITLE: PROPOSED HONG KONG HOUSING SOCIETY SUBSIDIZED HOUSING DEVELOPMENT AT JOCKEY CLUB ROAD, FANLING		DRAWING NO. FIGURE 3.1 / REV. -
DESIGNED GWL / DATE JAN 2018	DRAWING TITLE: LOCATION OF SURVEYED JUNCTIONS		LLA 顧問有限公司 Consultancy Limited
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FILE: G:\PROJECT\40290\DATA\DWG\TIA 20180125\FIGURE3.1 JUCTION.DWG PLOT SCALE : 1 = 1



LEGEND:

123(456) ← PM PEAK HOUR TRAFFIC FLOWS

↑ AM PEAK HOUR TRAFFIC FLOWS

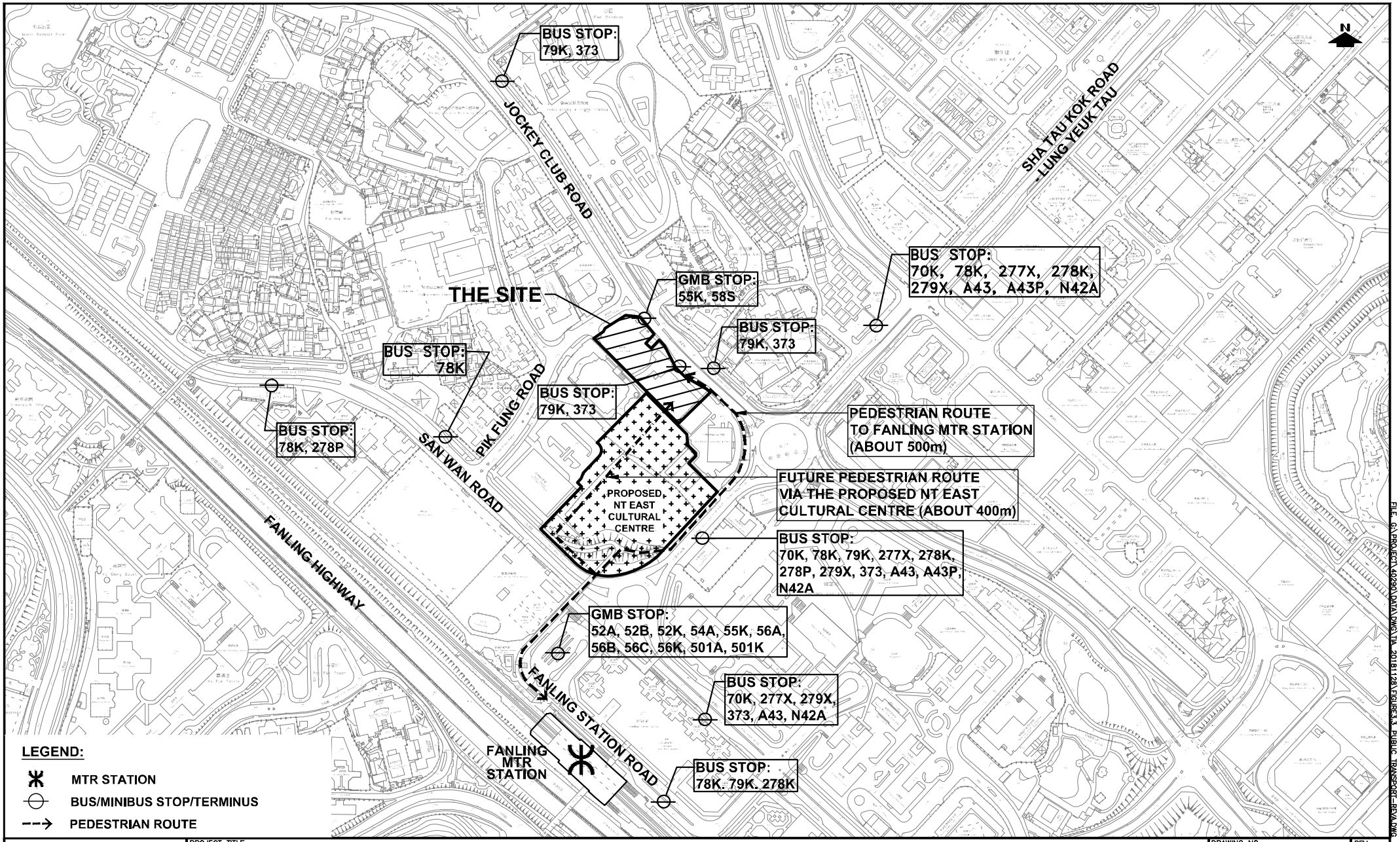
NOTES:

1. ALL TRAFFIC FLOWS ARE IN PCU/HOUR.
2. MINOR ROADS ARE NOT SHOWN FOR CLARITY.

PROJECT NO. 40290	PROJECT TITLE: PROPOSED HONG KONG HOUSING SOCIETY SUBSIDIZED HOUSING DEVELOPMENT AT JOCKEY CLUB ROAD, FANLING	DRAWING NO. FIGURE 3.2	REV. B
DESIGNED GWL / DATE JAN 2019 / DRAWN JHC / CHECKED SLN / SCALE N.T.S.	DRAWING TITLE: EXISTING TRAFFIC FLOWS	LLA 顧問有限公司 Consultancy Limited	

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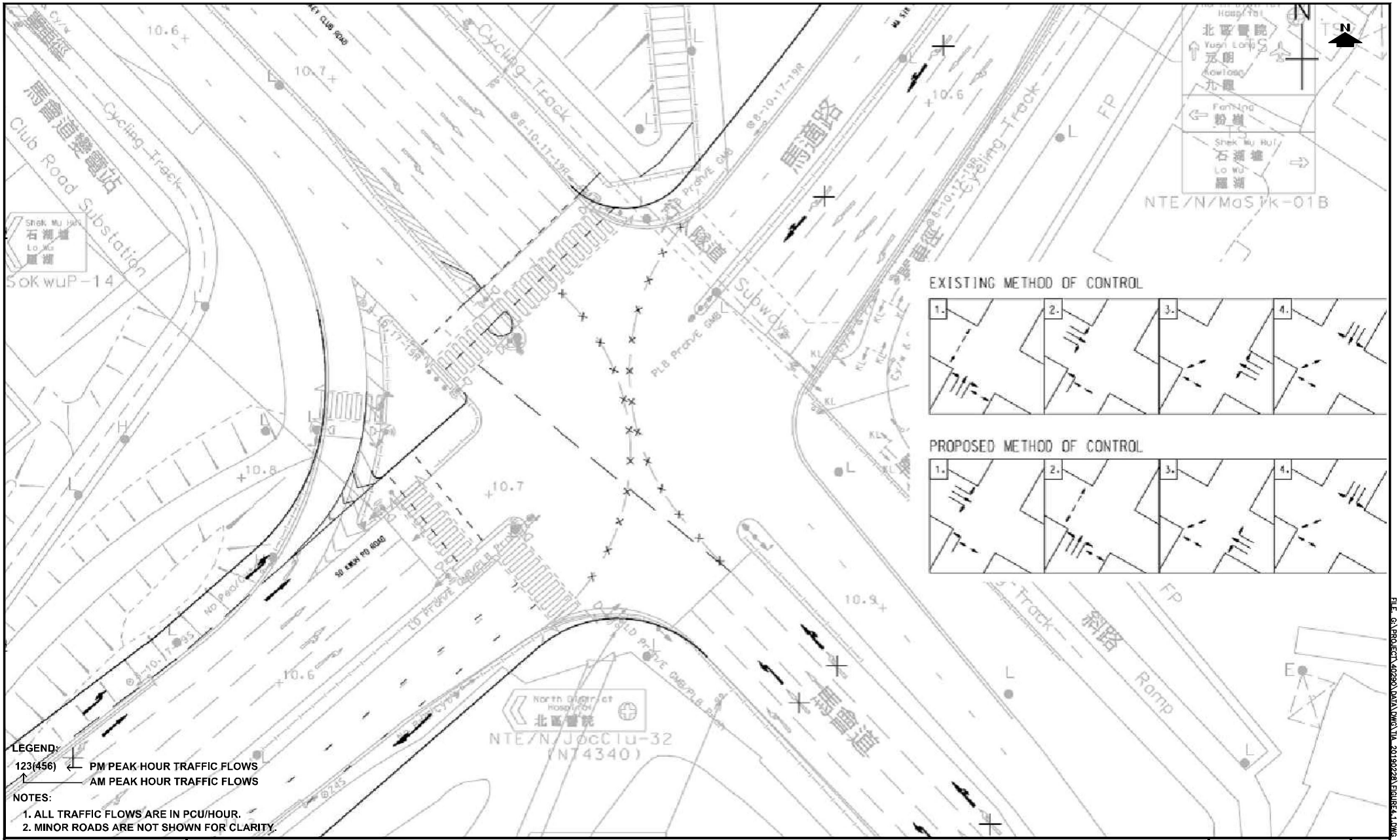
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PROJECT NO. 40290	PROJECT TITLE: HONG KONG HOUSING SOCIETY – PROPOSED SUBSIDIZED HOUSING DEVELOPMENT AT JOCKEY CLUB ROAD, FANLING	DRAWING NO. FIGURE 3.3	REV. C
DESIGNED CKI / DATE FEB 2019	DRAWING TITLE: PUBLIC TRANSPORT SERVICES	LLA 顧問有限公司 Consultancy Limited	
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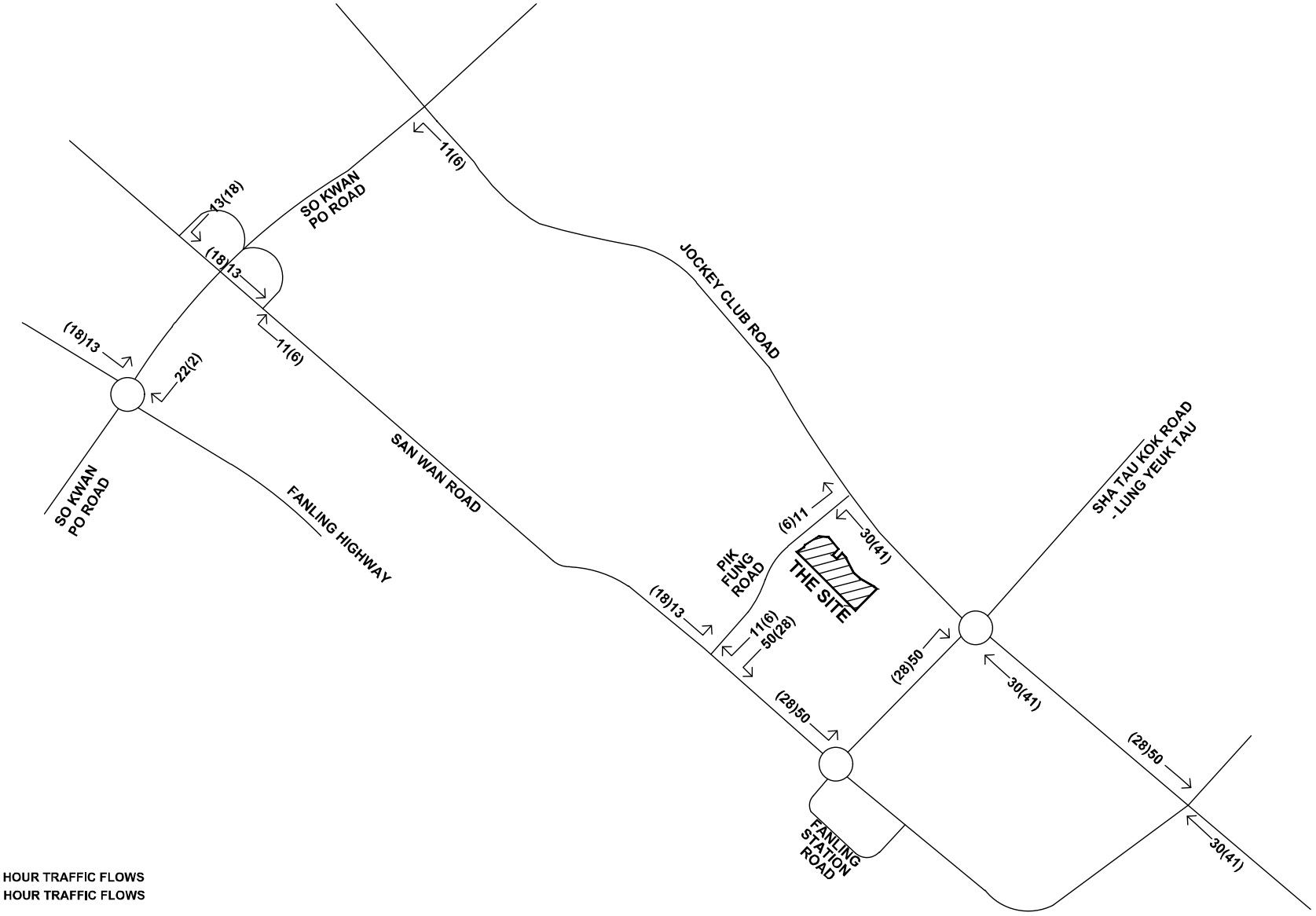
FILE: G:\PROJECT\40290\DATA\DWG\TIA_20181128\FIGURE3.3_PUBLIC TRANSPORT-REVA.DWG PLOT SCALE : 1 = 1

FILE: G:\PROJECT\40290\DATA\DWG\TIA_20181128\FIGURE3.3_PUBLIC TRANSPORT-REVA.DWG PLOT SCALE : 1 = 1



PROJECT NO. 40290	PROJECT TITLE: PROPOSED HONG KONG HOUSING SOCIETY SUBSIDIZED HOUSING DEVELOPMENT AT JOCKEY CLUB ROAD, FANLING	DRAWING NO. FIGURE 4.1	REV. B
DESIGNED GWL / DATE FEB 2019	DRAWING TITLE: JUNCTION IMPROVEMENT OF J/O JOCKEY CLUB ROAD / SO KWUN PO ROAD	LLA 顧問有限公司 Consultancy Limited	
DRAWN JHC / SCALE N.T.S.			
CHECKED SLN			

FILE: G:\PROJECT\40290\DATA\DWG\TIA_20190228\FIGURE4.1.DWG PLOT SCALE : 1 = 1



LEGEND:

123(456) ← PM PEAK HOUR TRAFFIC FLOWS

→ AM PEAK HOUR TRAFFIC FLOWS

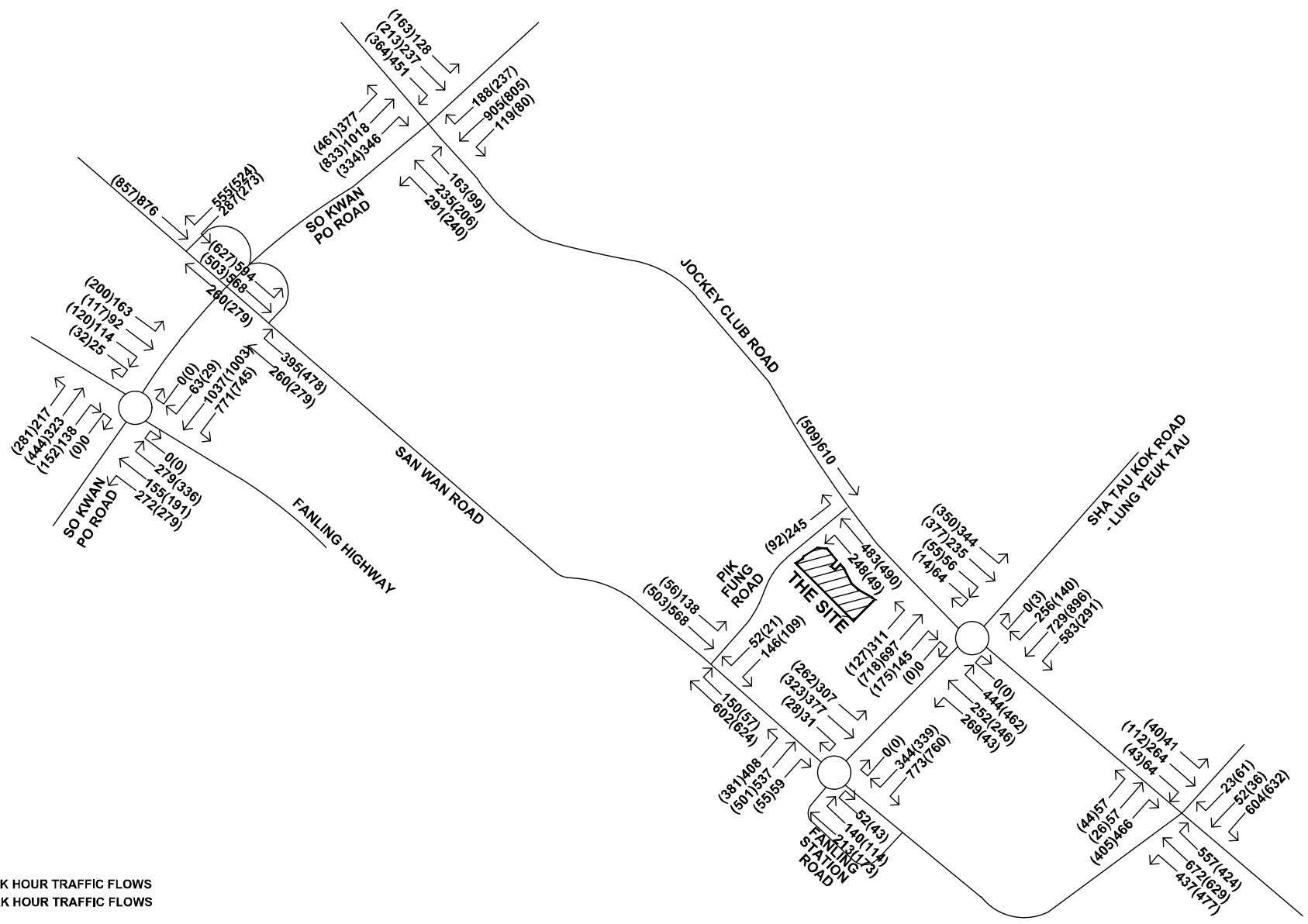
NOTES:

1. ALL TRAFFIC FLOWS ARE IN PCU/HOUR.
2. MINOR ROADS ARE NOT SHOWN FOR CLARITY.

PROJECT NO. 40290	PROJECT TITLE: PROPOSED HONG KONG HOUSING SOCIETY SUBSIDIZED HOUSING DEVELOPMENT AT JOCKEY CLUB ROAD, FANLING	DRAWING NO. FIGURE 4.2	REV. B
DESIGNED GWL / DATE JAN 2019	DRAWING TITLE: DEVELOPMENT TRAFFIC FLOWS	LLA 顧問有限公司 Consultancy Limited	
DRAWN JHC / SCALE N.T.S.			
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FILE: G:\PROJECT\40290\DATA\DWG\TIA_20190228\FIGURE4.2.DWG PLOT SCALE : 1 = 1

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LEGEND:

123(456) ← PM PEAK HOUR TRAFFIC FLOWS

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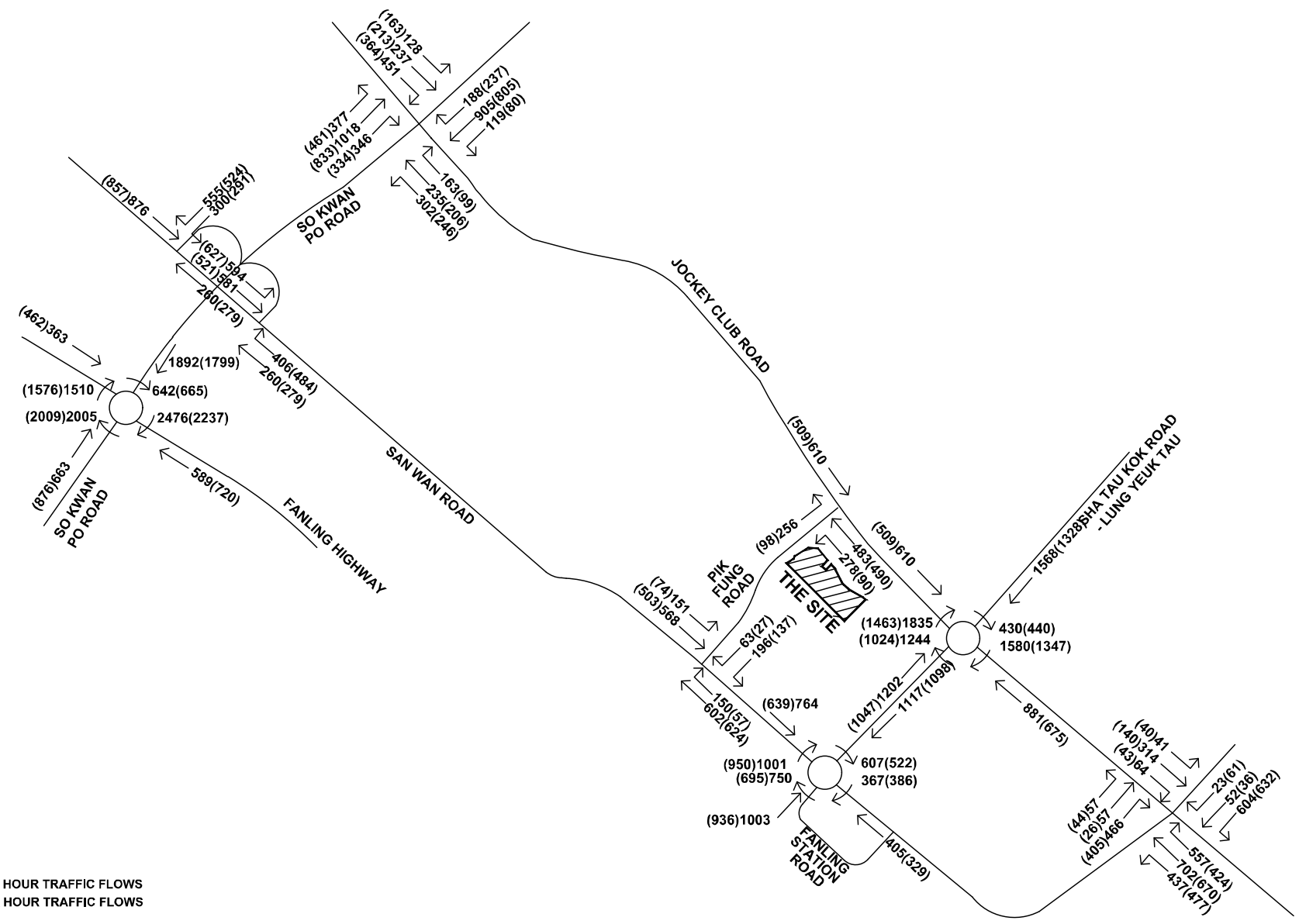
NOTES:

1. ALL TRAFFIC FLOWS ARE IN PCU/HOUR.
2. MINOR ROADS ARE NOT SHOWN FOR CLARITY.

PROJECT NO. 40290	PROJECT TITLE: PROPOSED HONG KONG HOUSING SOCIETY SUBSIDIZED HOUSING DEVELOPMENT AT JOCKEY CLUB ROAD, FANLING	DRAWING NO. FIGURE 4.3	REV. A
DESIGNED GWL / DATE JAN 2019	DRAWING TITLE: 2027 REFERENCE TRAFFIC FLOWS	LLA 顧問有限公司 Consultancy Limited	
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LEGEND:

123(456) ← PM PEAK HOUR TRAFFIC FLOWS

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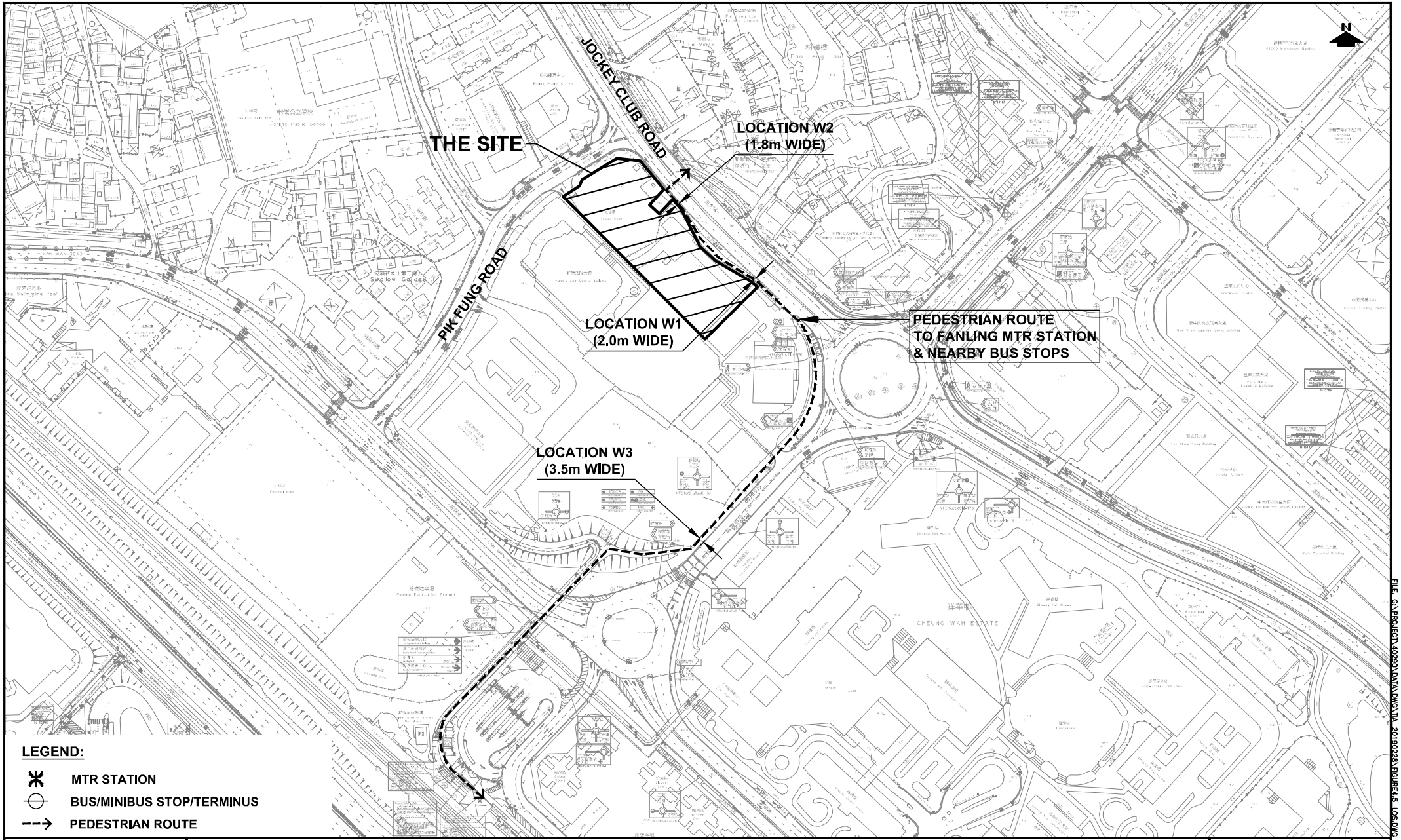
NOTES:

1. ALL TRAFFIC FLOWS ARE IN PCU/HOUR.
2. MINOR ROADS ARE NOT SHOWN FOR CLARITY.

PROJECT NO. 40290	PROJECT TITLE: PROPOSED HONG KONG HOUSING SOCIETY SUBSIDIZED HOUSING DEVELOPMENT AT JOCKEY CLUB ROAD, FANLING	DRAWING NO. FIGURE 4.4	REV. B
DESIGNED GWL / DATE OCT 2018	DRAWING TITLE: 2027 DESIGN TRAFFIC FLOWS	LLA 顧問有限公司 Consultancy Limited	
DRAWN JHC / SCALE N.T.S.			
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FILE: G:\PROJECT\40290\DATA\DWG\TIA_20190228\FIGURE4.4_DESIGN.DWG PLOT SCALE : 1 = 1

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PROJECT NO. 40290	PROJECT TITLE: HONG KONG HOUSING SOCIETY – PROPOSED SUBSIDIZED HOUSING DEVELOPMENT AT JOCKEY CLUB ROAD, FANLING	DRAWING NO. FIGURE 4.5	REV. B
DESIGNED CKI / DATE FEB 2019	DRAWING TITLE: PEDESTRIAN ROUTES AND ASSESSED WALKWAY SECTIONS	LLA 顧問有限公司 Consultancy Limited	
DRAWN JHC / SCALE 1:5000			
CHECKED SLN			

FILE: G:\PROJECT\40290\DATA\DWG\TIA_20190228\FIGURE4.5_LOS.DWG PLOT SCALE : 1 = 1

FILE: G:\PROJECT\40290\DATA\DWG\TIA_20190228\FIGURE4.5_LOS.DWG PLOT SCALE : 1 = 1

APPENDIX D

OBSERVATION OF THE BUS OCCUPANCY

AT THE BUS STOPS IN THE VICINITY OF THE SITE

1. Bus Stop at Sha Tau Kok Road SB outside Fanling Fire Station				
Observed Time	**Route No.**	**Destination**	**Approximate Bus Occupancy on Departure**	**Passenger Left Behind The Stop**
07:04	70K	Wah Ming	5%	0
07:31	70K	Wah Ming	80%	0
07:44	70K	Wah Ming	20%	0
07:49	70K	Wah Ming	10%	0
08:05	70K	Wah Ming	40%	0
08:25	70K	Wah Ming	20%	0
07:17	79K	Sheung Shui	10%	0
07:41	79K	Sheung Shui	40%	0
08:03	79K	Sheung Shui	20%	0
08:18	79K	Sheung Shui	45%	0
07:38	270C	Tsim Sha Tsui East (Mody Road)	10%	0
07:06	277X	Lam Tin Railway Station	60%	0
07:15	277X	Lam Tin Railway Station	60%	0
07:19	277X	Lam Tin Railway Station	20%	0
07:26	277X	Lam Tin Railway Station	60%	0
07:32	277X	Lam Tin Railway Station	60%	0
07:38	277X	Lam Tin Railway Station	60%	0
07:43	277X	Lam Tin Railway Station	60%	0
07:51	277X	Lam Tin Railway Station	60%	0
07:58	277X	Lam Tin Railway Station	80%	0
08:05	277X	Lam Tin Railway Station	75%	0
08:14	277X	Lam Tin Railway Station	60%	0
08:22	277X	Lam Tin Railway Station	40%	0
07:10	278P	Tsuen Wan (Nina Tower)	10%	0
07:25	278P	Tsuen Wan (Nina Tower)	20%	0
07:46	278P	Tsuen Wan (Nina Tower)	10%	0
07:08	279X	Tsing Yi Railway Station	10%	0
07:17	279X	Tsing Yi Railway Station	10%	0
07:24	279X	Tsing Yi Railway Station	10%	0
07:34	279X	Tsing Yi Railway Station	20%	0
07:44	279X	Tsing Yi Railway Station	10%	0
07:54	279X	Tsing Yi Railway Station	10%	0
08:03	279X	Tsing Yi Railway Station	10%	0
08:17	279X	Tsing Yi Railway Station	10%	0

1. Bus Stop at Sha Tau Kok Road SB outside Fanling Fire Station				
Observed Time	**Route No.**	**Destination**	**Approximate Bus Occupancy on Departure**	**Passenger Left Behind The Stop**
08:22	279X	Tsing Yi Railway Station	10%	0
07:02	373	Central	40%	0
07:12	373	Central	10%	0
07:29	373	Central	20%	0
07:44	373	Central	10%	0
07:19	673	Central	60%	0
07:52	673	Central	60%	0
08:25	673	Central	60%	0
07:14	A43	Airport	10%	0
07:26	A43	Airport	10%	0
07:39	A43	Airport	10%	0
07:51	A43	Airport	10%	0
08:01	A43	Airport	10%	0
08:29	A43	Airport	10%	0
07:28	A43P	Airport	10%	0
08:00	A43P	Airport	10%	0
08:27	A43P	Airport	20%	0

2. Bus Stop at Jockey Club Road WB outside Ex Fanling Magistracy				
Observed Time	**Route No.**	**Destination**	**Approximate Bus Occupancy on Departure**	**Passenger Left Behind The Stop**
07:18	79K	Sheung Shui	10%	0
07:43	79K	Sheung Shui	20%	0
08:06	79K	Sheung Shui	20%	0
08:22	79K	Sheung Shui	10%	0

3. Bus Stop at Jockey Club Road EB opposite Ex Fanling Magistracy				
Observed Time	**Route No.**	**Destination**	**Approximate Bus Occupancy on Departure**	**Passenger Left Behind The Stop**
07:31	79K	Ta Kwu Ling	60%	0
08:01	79K	Ta Kwu Ling	10%	0
07:05	373	Central	10%	0
07:19	373	Central	10%	0
07:32	373	Central	10%	0

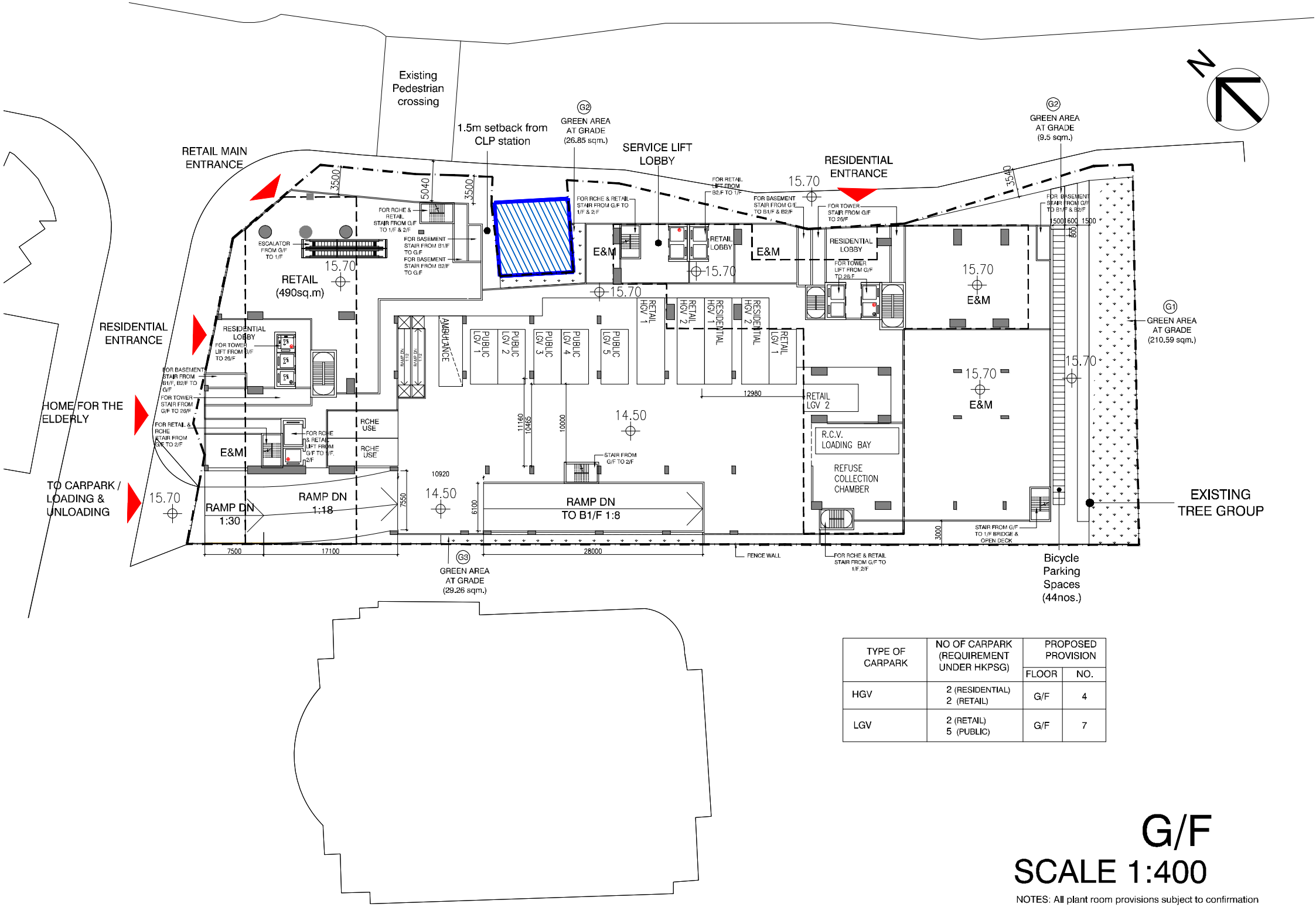
4. Bus Stop at Sha Tau Kok Road NB outside Fanling Baptist Church				
Observed Time	**Route No.**	**Destination**	**Approximate Bus Occupancy on Departure**	**Passenger Left Behind The Stop**
07:12	70K	Ching Ho	60%	0
07:26	70K	Ching Ho	10%	0
07:45	70K	Ching Ho	100%	0
08:03	70K	Ching Ho	55%	0
08:13	70K	Ching Ho	20%	0
07:10	78K	Sha Tau Kok	40%	0
07:32	78K	Sha Tau Kok	80%	0
07:53	78K	Sha Tau Kok	40%	0
08:12	78K	Sha Tau Kok	40%	0
08:28	78K	Sha Tau Kok	40%	0
07:00	277X	Luen Wo Hui	20%	0
07:09	277X	Luen Wo Hui	10%	0
07:20	277X	Luen Wo Hui	20%	0
07:39	277X	Luen Wo Hui	40%	0
08:00	277X	Luen Wo Hui	40%	0
08:15	277X	Luen Wo Hui	20%	0
08:29	277X	Luen Wo Hui	40%	0
07:00	278K	Luen Wo Hui	5%	0
07:14	278K	Luen Wo Hui	10%	0
07:17	278K	Luen Wo Hui	10%	0
07:24	278K	Luen Wo Hui	25%	0
07:31	278K	Luen Wo Hui	45%	0
07:39	278K	Luen Wo Hui	55%	0

4. Bus Stop at Sha Tau Kok Road NB outside Fanling Baptist Church				
Observed Time	**Route No.**	**Destination**	**Approximate Bus Occupancy on Departure**	**Passenger Left Behind The Stop**
07:43	278K	Luen Wo Hui	55%	0
07:47	278K	Luen Wo Hui	45%	0
07:54	278K	Luen Wo Hui	75%	0
08:05	278K	Luen Wo Hui	55%	0
08:08	278K	Luen Wo Hui	10%	0
08:11	278K	Luen Wo Hui	10%	0
08:17	278K	Luen Wo Hui	35%	0
07:18	279X	Luen Wo Hui	10%	0
07:27	279X	Luen Wo Hui	0%	0
07:36	279X	Luen Wo Hui	20%	0
08:03	279X	Luen Wo Hui	20%	0
08:04	279X	Luen Wo Hui	10%	0
08:17	279X	Luen Wo Hui	10%	0
08:25	279X	Luen Wo Hui	20%	0
08:14	A43	Luen Wo Hui	10%	0

5. Bus Stop at Sha Tau Kok Road NB opposite Fanling Fire Station				
Observed Time	**Route No.**	**Destination**	**Approximate Bus Occupancy on Departure**	**Passenger Left Behind The Stop**
07:12	70K	Ching Ho	40%	0
07:25	70K	Ching Ho	55%	0
07:44	70K	Ching Ho	100%	0
08:02	70K	Ching Ho	45%	0
08:12	70K	Ching Ho	40%	0
08:29	70K	Ching Ho	55%	0

APPENDIX E

PROPOSED CAR PARK LAYOUT

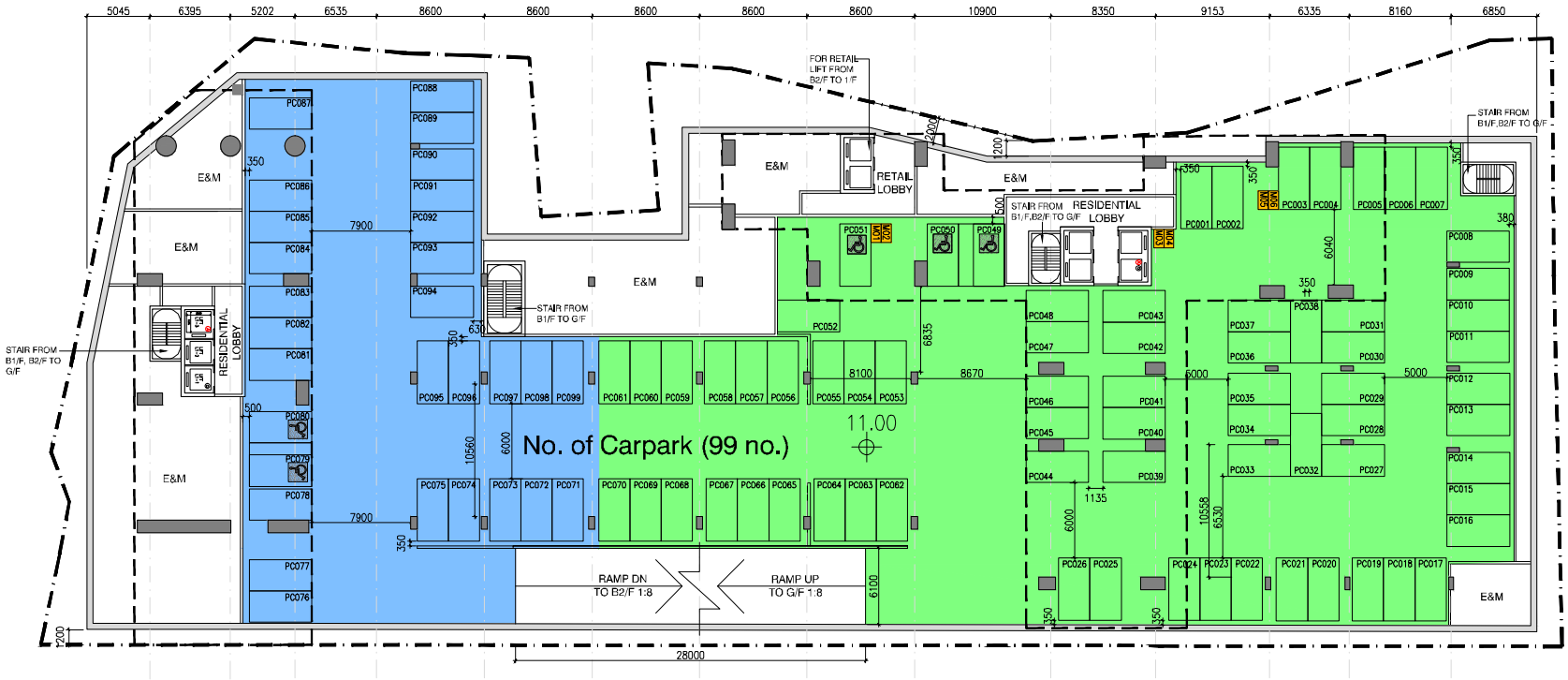


TYPE OF CARPARK	NO OF CARPARK (REQUIREMENT UNDER HKPSG)	PROPOSED PROVISION	
		FLOOR	NO.
HGV	2 (RESIDENTIAL) 2 (RETAIL)	G/F	4
LGV	2 (RETAIL) 5 (PUBLIC)	G/F	7

G/F

SCALE 1:400

NOTES: All plant room provisions subject to confirmation by E&M consultant

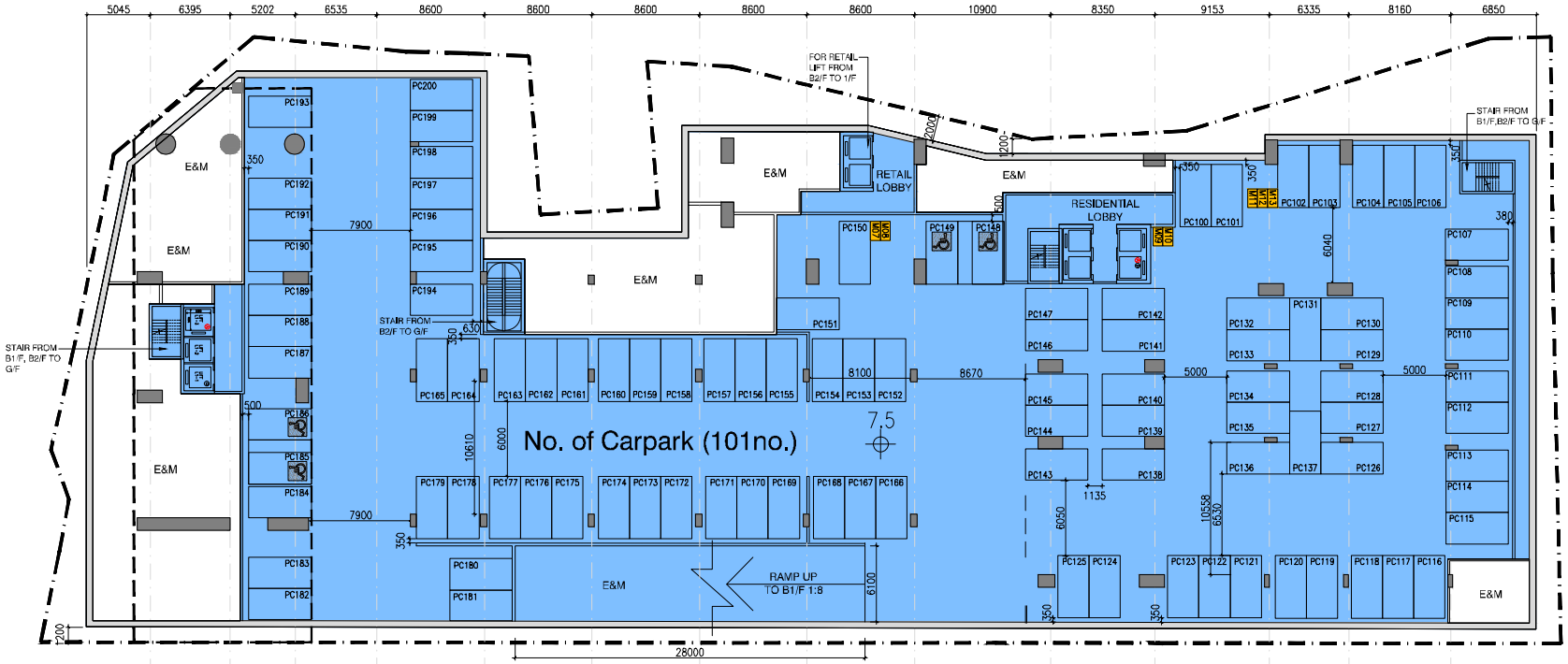


TYPE OF CARPARK	NO OF CARPARK (REQUIRMENT UNDER HKPSG)	PROPOSED PROVISION			CARPARK NO.
		FLOOR	NO.	TOTAL.	
PRIVATE	45 (RESIDENTIAL) 13 (RETAIL) 10 (VISITOR)	B1	70	70	PC001- PC070
PUBLIC	83	B1	29	130	PC071- PC200
		B2	101		
MOTORCYCLE	6 (RESIDENTIAL) 2 (RETAIL)	B1	6	13	M01 to M13
		B2	7		

B1

SCALE 1:400

NOTES: All plant room provisions subject to confirmation by E&M consultant



TYPE OF CARPARK	NO OF CARPARK (REQUIRMENT UNDER HKPSG)	PROPOSED PROVISION			CARPARK NO.
		FLOOR	NO.	TOTAL.	
PRIVATE	45 (RESIDENTIAL) 13 (RETAIL) 10 (VISITOR)	B1	70	70	PC001- PC070
PUBLIC	83	B1	29	130	PC071- PC200
		B2	101		
MOTORCYCLE	6 (RESIDENTIAL) 2 (RETAIL)	B1	6	13	M01 to M13
		B2	7		

B2

SCALE 1:400

NOTES: All plant room provisions subject to confirmation by E&M consultant

Appendix 2 – Expert Evaluation on Air Ventilation Report



Expert Evaluation on Air Ventilation for Proposed Subsidized Housing Development At Jockey Club Road, Fanling

Prepared by:
Ramboll Environ Hong Kong Limited

Date:
Nov 2018

Reference Number:
R5096_V1.8

Expert Evaluation on Air Ventilation for Proposed Subsidized Housing Development At Jockey Club Road, Fanling

Prepared by:

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Annex A Master Layout Plan

1. Introduction

1.1 Project Location

The Project is to develop the Subject Site at Jockey Club Road, Fanling into housing development including subsidized sales flats, Residential Care Home for Elderly (RCHE), shopping centre and public carpark. The Subject Site is approximately 5,187sq.m and it is located to the immediate southwest of Jockey Club Road, to the northeast of the Fanling Law Courts Building, to the southeast of Pik Fung Road and Fanling Health Centre and to the northwest of Fanling Fire Station. It is currently partly used as Fanling Temporary Tennis Court. The amendment of zoning of the Subject Site is "Government, Institution or Community" ("G/IC") under the approved Fanling/Sheung Shui Outline Zoning Plan No. S/FSS/22 gazetted on 13 January 2017.

1.2 Objectives

Ramboll Hong Kong Limited (the Consultant) has been commissioned by the Applicant to conduct this AVA – Expert Evaluation for the proposed development. Architectural drawings of the proposed development were provided by the Project Architect.

In order to demonstrate that the proposed development has considered various air ventilation aspects and that there is no adverse impact on the pedestrian level in the vicinity of the Subject Site, an AVA will be required to support the planning application from air ventilation point of view.

1.3 Subject Site and its Environs

Figure 1 shows the location of the Subject Site and its environs. The Subject Site is located at Jockey Club Road, Fanling; where it is bounded by Jockey Club Road to the northeast and Pik Fung Road to the northwest of the site. The Fanling Highway is located further southwest of the Subject Site with an open space located in between. The nearest buffer distance between the Subject Site and the Fanling Highway is about 340m. The MTR East Rail is also located southwest of the subject site with the nearest buffer distance of about 320m.

The Subject Site is surrounded by mid- to low- rise development, i.e. Ex Fanling Magistracy to the southeast, Fanling Law Courts Building to the southwest, Fanling Maternal and Child Health Centre to the north and La Verte to the northeast. On the other hand, there are several high-rise developments located to the further southeast of the Subject Site, e.g. Cheung Wah Estate, Fanling Town Centre, etc.

There are two open spaces to the southwest of Subject Site, i.e. Fanling Recreation Ground and a temporary carpark to between North District Government Office and Cheung Wah Estate.

1.4 Proposed Development

The area of the Subject Site is ~0.52 ha (5,187m^2). The proposed development at the Subject Site consists of two residential blocks with building height at 100mPD on the top of a 3-storeys podium (+30.4mPD). Building form of Tower 1 is in rectangle shape and aligned to northeast direction, where building form of Tower 2 is in T-shape and major building frontage aligned with Jockey Club Road. According to SBD Guidelines, it realized that the

site coverage of podium would be reduced to allow more open space on grade and for street activities. Under the proposed development, minimization of podium size is not feasible. As the 3-story of podium with considerable size and extent of the podium bulk is necessary to accommodate the required floor space for the RCHE, shopping arcade, public car park to accommodate the required number of parking spaces, it is advised that further reduction in the podium size is not practicable. Schematic layout plans and section of the proposed development is shown in and **Figure 3** and **Annex A.**

1.5 Subject Constraint

Jockey Club Road runs along from northwest to the southeast of the east side of the Subject Site. Due to close proximity to Jockey Club Road, it has been checked that the proposed residential blocks would be subject to high traffic noise.

Development of the Layout for mitigating Road Traffic Noise

As mentioned in Section 4 (Noise) of Chapter 9 of the Hong Kong Planning Standards and Guidelines (HKPSG), there are four methods recommended to mitigate the road traffic noise impact if adequate separations between sensitive use and noise emitters cannot be provided; and they are: 1) self-protecting building design and arrangement; 2) integrated building and noise source design; 3) purpose-built noise barriers and 4) acoustic insulation of buildings.

The Subject Site is next to a District Distributor, Jockey Club Road to the east and northeast. Some other roads are located further within 300m from the subject site with buildings located in between. Among those roads, Jockey Club Road at the northeast are the largest road, and the major noise emitters of the area.

In order to minimize the road traffic noise impact, position of Tower 1 is set perpendicular to Jockey Club Road. This can minimize direct facing of residential units towards facing Jockey Club Road and can reduce the noise impact to the residential units effectively;

Compliance to SBD Building Separation Requirement under APP 152

Under Sustainable Building Design Guidelines (APP 152), buildings having a continuous projected façade length (Lp) of 60m or above shall be provided with a 15m separating distance. The continuous projected façade length of Tower 2 is therefore maximized to keep it below 60m.

Compliance to Building Planning Regulation (BPR) section 30 and 31

Under Building Planning Regulation (Regulation 30 and Regulation 31), a habitable space shall be provided with natural lighting and ventilation. A minimum distance shall be maintained between the prescribed window of a unit and the adjoining lot boundary as well. Building orientation has been optimized to ensure prescribed window requirement complies with Building Planning Regulation.

Based on the above information, It is believed that there is high restriction to provide additional mitigation measure for this proposed development.

2. Site Wind Availability

2.1 Site Wind Availability Data

This expert evaluation is supposingly not a detailed study of the air ventilation performance. It is therefore considered acceptable to use the Regional Atmospheric Modeling System (RAMS) data for Site Wind Availability initially as a starting point. Based on the RAMS data of the grid (073,081) of the RAMS data extracted from the Site Wind Availability Data of Planning Department's web site where the subject site is located.

Figure 2 shows the relevant windrose diagram representing the frequency and wind speed distribution at 500m of the district concerned under the annual condition and summer condition (Jun – Aug). According to the windroses, the annual prevailing wind directions for the site are from NNE to SE; where summer prevailing wind directions are from ESE to WSW. In general, annual prevailing wind is come from northeast to southeast quarter and summer prevailing wind is come from southeast to southwest quarter. The wind frequency data under the annual and summer condition is shown in **Table 1** below.

Table 1 Summary of RAMS Data and Wind Direction under Annual and Summer Condition

Wind Direction	Probability for Annual Condition	Probability for Summer Condition
N	2.9%	1.5%
NNE	**6.8%**	1.6%
NE	**8.4%**	1.4%
ENE	**9.3%**	2.5%
E	**16.4%**	6.8%
ESE	**13.8%**	**9.8%**
SE	**9.8%**	**9.2%**
SSE	5.1%	**8.9%**
S	5.0%	**10.4%**
SSW	6.4%	**13.7%**
SW	5.5%	**12.8%**
WSW	3.6%	**9.1%**
W	2.7%	5.8%
WNW	1.3%	2.4%
NW	1.3%	2.0%
NNW	1.6%	1.8%

2.2 Topography and Building Morphology

Topography

The topography is generally flat near Subject Site (around 15mPD). The proposed development is located to the west of Fanling Highway (around 18mPD). Wu Tip Shan is located about 670m to the south of the Subject Site with hill top at 88mPD level, and Lung Shan located about 2.2km to the east of the Subject Site with hill top at 360mPD level. **Figure 1** indicated the location of Wu Tip Shan and Lung Shan. With large separation, it is anticipated that winds from east/ southeast would not significantly affected by Lung Shan/ Wu Tip Shan .

Building Morphology

As mentioned in Section 1.3, there are mainly low-rise villages to the northeast and east of the Subject Site. Mid-rise building clusters, i.e. Luen Wo Hui (around 23 to 32mPD) and Fanling Industrial Area (around 20 - 38mPD) are located to the further northeast of the Subject Site.

There are some low to mid-rise developments to the southeast of the Subject Site, e.g. Ex Fanling Magistracy (~28mPD), Hong Kong Custom and Excise Department Control Point Command Headquarters (~20mPD), Sheung Shui Divisional Police Station (~30mPD), Fanling Fire Station (~47mPD), etc.

Cheung Wah Estate (~110mPD) and Fanling Town Centre (~88 to ~103mPD) are the high-rise developments located to further southeast of the Subject Site. From south to northwest portion, there are mainly low to mid-rise developments and Schools, e.g. Fanling Law Courts Building (~63mPD), Pentecostal Gin Mao Sheng Primary School (~40mPD) and Fanling Public School (~40mPD) to the southwest, North District Government Offices (~40mPD) to the further southwest, Fanling maternal and Child Health Centre (~55mPD) to the northwest, etc.

According to approved planning application (Application No. A/FSS/222), the Ex Fanling Magistracy will be revitalize to training centre with residential institution and eating place. With reference to the application document, it is understood there will be two storeys building and the building bulk remain similar to existing condition.

Furthermore, it also noted that there are several noise barrier (around 5m in height) constructed along Fanling Highway. As the noise barrier along Fanling Highways are quite far away from the Subject Site, it is anticipated that such noise barriers would not significantly affect the pedestrian wind environment around the Subject Site and its surroundings.

There are two open spaces to the southwest of Subject Site, i.e. Fanling Recreation Ground and a temporary carpark between North District Government Office and Cheung Wah Estate. According to the OZP (Approved Fanling/ Sheung Shui Outline Zoning Plan No. S/FSS/22), the planning intention of Subject Site and the temporary carpark to the southeast are to provide a government, institution or community facilities serving the needs of local residents and/ or a wider district, region or the territory. It also intended to provide land for uses directly related to or in support of work of the government organization providing social service to meet community needs, and other institutional establishments. In currently, the temporary car park is intended for the New Territories East Cultural Centre. Therefore, it is anticipated that the summer SW wind flow may reduce by the New Territories East Cultural Centre.

2.3 Summary of Existing Site Wind Availability

Figure 4 indicates the surrounding developments and the pedestrian wind flow under annual and summer condition after considering the existing and future building in the area.

Annual Condition

It is noted that the annual prevailing wind directions for the area are from NNE, NE, ENE, E, ESE and SE. As mentioned in section 2.2, there are no high topography, or high-rise building to the northeast and east portion of the Subject Site. Low-rise village house are located to the northeast of the Subject Site, it is anticipated that the village would not create significant blockage effect. Thus, the NNE and NE prevailing winds penetrate the Subject Site and its downstream areas such as Fanling Law Courts Building, North District Government office and Fanling Recreation Ground. Generally, it is anticipated that the site wind availability is considered average at the area under annual NNE and NE conditions.

ESE and SE winds would be obstructed by some mid to high-rise developments to the southeast (e.g. Cheung Wah Estate and Fanling Town Centre). Thus, local wind penetration would mainly

rely on the traffic network and open spaces, i.e. Sha Tau Kok Road – Lung Yeuk Tau (for winds from northeast portion), Jockey Club Road (for winds from southeast portion), San Wan Road (for winds from southeast portion) and spaces between Fan Leng Lau Park and Fanling Recreation Ground (for wind from northeast portion) would be the major air corridor under annual condition.

Under E winds, the prevailing winds would block by the low to mid-rise developments (i.e Hong Kong Custom and Excise Department Control Point Command Headquarters, Sheung Shui Divisional Police Station) to penetrate into Subject Site and its downstream area. As E wind does not follow the existing roads and open spaces to reach the subject site, thus it is expected that wind availability of the Subject Site and downwind regions would be obstructed under E wind condition.

Summer Condition

The summer prevailing wind directions for the area are from ESE, SE, SSE, S, SSW, SW and WSW. As mentioned above, ESE and SE winds would be slightly obstructed by the mid to high-rise development to the southeast portion.

On the other hand, wind from southwest is considered to be good and Fanling Recreation Ground provide a large open area to enhance the incoming wind availability. However, it is noted that there are several noise barrier (around 5m in height) constructed along Fanling Highway, which is not anticipated to block the pedestrian SW wind flow to reach Subject Site.

Also, there are various low-rise and mid-rise development (Including Fanling Law Courts Building and North District Government Offices) are located to the southwest of the Subject Site, it may reduce the SW wind flow to leeward area. Thus, Sha Tau Kok Road – Lung Yeuk Tau, Pik Fung Road (for wind from southwest portion) and open spaces between Fan Leng Lau park and Fanling Recreation Ground would be the major air corridor under summer condition.

To conclude, due to the nearby building clusters and roadside barriers, it is anticipated that the existing site wind availability would mainly rely on the local traffic network and open spaces, e.g. Sha Tau Kok Road – Lung Yeuk Tau (for wind from northeast and southwest portion), Jockey Club Road (for wind from southeast portion), San Wan Road (for wind from southeast portion) and spaces between Fan Leng Lau park and Fanling Recreation Ground as indicated in **Figure 4**.

3. Discussion on Important Pedestrian Areas, Focus Area and Good Building Layout Design

3.1 Important Pedestrian Areas

There are a few recreation areas, low-rise education institutions and residential development near Subject Site should be considered as important pedestrian areas, e.g. Fanling Recreation Ground to the southwest, Pentecostal Gin Mao Sheng Primary School and Fanling Public School to the northwest, La Verte to the northeast, etc. **Figure 1** indicates the surrounding import pedestrian areas for easy reference

3.2 Problem Areas

As mentioned in section 2.3, the existing wind availability of the area considered to be average under both annual condition and summer condition, thus there is no significant problem area. On the other hand, Fanling Law Courts Building, North District Government and Cheung Wah Estate with a larger building bulk may reduce the summer winds from the southeast and southwest to reach Subject Site.

3.3 Good Building Layout Design Features

Chapter 11 of HKPSG on Air Ventilation has been referenced in order to determine the good features and problem area from air ventilation standpoint. Building disposition and building height have been considered for this proposed development.

3.3.1 Building Height

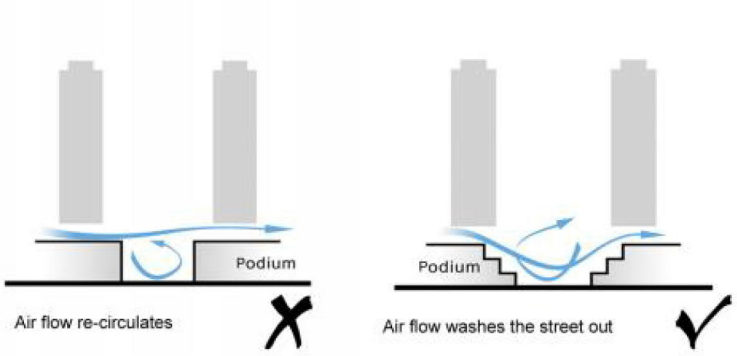
The Proposed Development comprises 2 high-rise towers (with building height at 100mPD), on top of three storeys podium. The podium is designed with stepped level, it would enhance the prevailing winds reach to the surrounding areas. **Figure 3** shows the proposed master layout plan of the proposed development.

The Subject Site is currently vacant and therefore the proposed high-rise buildings would partially obstruct existing wind flows under both annual and summer condition.

3.3.2 Building Disposition and Setback

As mentioned in section 1.5, the proposed building design need to provide building separation according to SBD Guidelines. However, the proposed design incorporates a setback toward southeast site boundary, in order to enhance both annual prevailing winds (e.g. ENE or NE) and summer prevailing winds (e.g. SW wind) pass through the Subject Site and benefit leeward areas.

Terraced podium design toward southeast boundary was provided in the proposed development, i.e. ~11m setback at ground floor and ~18m further setback at first floor (detail of setback distance is shown in **Figure 3**). As recommended in the Chapter 11 of Urban Design Guidelines of the HKPSG on Air Ventilation regarding podium structure, structure adopting a terraced podium design would direct downward air flow to the pedestrian level.



However, it is observed that there are not much setback provided along the northeast and northwest site boundary. According to SBD Guidelines, it realized that the minimization of podium bulk is one of design features that enhance the wind penetration. However, it is noted that the 3-story of podium with considerable size and extent of the podium bulk is necessary to accommodate the required floor space for the RCHE (subsidized and non-subsidized), public car park, shopping arcade to accommodate the required number of parking spaces and further reduction in the podium size is not feasible.

Based on the above information, it is considered that building setback from Jockey Club Road under the current proposed scheme has been maximized. Further building setback will render the proposal infeasible to comply with such fundamental aspect of Building regulations.

3.3.3 Building Orientation

In reviewing the traffic data of the road networks in the vicinity, the Jockey Club Road has the largest traffic flow. In order to minimize the potential impact from Jockey Club, orientated building design with openable windows of the habitable rooms facing away Jockey Road is proposed. The 90° orientation at Tower 1 aims to minimize traffic noise nuisance at lower floors by reducing their view angle to Jockey Club Road. Tower 2 provides some shielding effect for which the noise sensitive façade at Tower 1 and Tower 2.

According to the MLP, it is observed that the building orientation of Tower 1 aligned with the prevailing annual wind directions, i.e. NE winds, which allow wind penetration and enhance the building permeability. As the Tower 1 aligned with the prevailing annual wind direction, the annual NE and SW prevailing winds pass through the proposed development and reach to the downstream areas. It is noted that the Proposed Scheme could alleviate the potential adverse air ventilation impact on the pedestrian wind environment around the surroundings of the Subject Site under the prevailing wind directions. However, the building orientation of Tower 2 would significantly obstruct the wind flow under annual condition, i.e. NE winds. Moreover, as the building orientation of the proposed development, it observed that the development would narrow the wind entrance of Pik Fung Road.

3.3.4 Landscaping and Use of Materials

While it may not help in enhancing wind flow, provision of greening and use of cool materials can help in reducing heat island effect. Cool materials including water features or materials with high emissivity should also be employed where possible.

4. Expert Evaluation of Air Ventilation Performance of the Proposed Development

4.1 Assessment Methodology

Section 3 describes the good features in the design of the Proposed Development. Section 2 describes the wind availability at the Subject Site; and the dominate wind flow during annual and summer condition. It is noted that the annual prevailing wind directions for the area are from NNE to SE; where summer prevailing wind directions are from ESE to WSW. The Proposed Development design will be evaluated against the dominate wind directions identified, i.e. northeast portion, southwest portion and southwest portion.

4.2 Wind Flow from Northeast Portion

It is noted that the annual prevailing wind directions for the area are from NNE to SE. **Figure 5** Illustrates the Wind Flow from northeast portion.

As discussed in section 2.3, winds from northeast direction is the main annual prevailing wind. There are numerous low-rise village houses located to the upwind area; where Fanling Law Courts Building, North District Government Office and Fanling Recreation Ground are located at the downwind area. It is noted that the existing Fanling Law Courts Building and North District Governments Office have already obstructed the wind flow from northeast portion to reach Fanling Recreation Ground, due to the large building bulk of these two buildings. It is noted from **Figure 5** that the proposed building of Subject Site is sitting at the windward of these bulky building. Therefore, Pik Fung Road and the building setback to the southeast would be two major air corridors under northeasterly wind for wind penetration.

With the podium footprint of the proposed development, it is noted that the proposed podium would create adverse air ventilation impact under the NNE and NE prevailing wind directions. Also, the proposed development with a maximum building height of 100mPD is much taller than the existing Fanling Law Courts Building at 62.5mPD and the frontage of the proposed development facing the prevailing from NE quarters is much longer than that of the Fanling Law Courts Building, it expected that the proposed development would create a large wake regions with additional impact on the downstream areas. However, it also believed that the Fanling Recreation Ground has part of the wake areas induced by the North District Government Office and Fanling Law Courts Building in current condition. Since the proposed development will build on an open area, it is anticipated that the proposed development would reduce the wind penetration at leeward area, i.e. Fanling Law Courts Building, North District Government Offices and some residential developments to the southwest. **Figure 5** Illustrates the wind flow from the northeast portion. It is expected that the northeasterly wind flow will penetrate along Pik Fung Road, and the setback to the southeast of Subject Site.

Under E winds, the prevailing winds may be slightly blocked by the low to mid-rise existing developments (i.e Hong Kong Custom and Excise Department Control Point Command Headquarters, Sheung Shui Divisional Police Station) to reach the Subject Site and reattach to its further downstream areas. For the proposed development, high building height would create larger wakes on its downstream (i.e. Sui Pak Villa, Pentecostal Gin Mao Sheng Primary School and Fanling Maternal and Child Health Centre) when compared with the existing scenario under E wind.

In order to mitigate the air ventilation impact to the leeward area, stepping podium and setback to the southeast boundary are provided to enhance wind penetration to the south of Subject Site and benefit Jockey Club Road. Also as the adequate building separation between two residential towers (~ 30m), some downwash wind would pass through the building separation and further reach to the downstream areas at pedestrian level. Furthermore, Pik Fung Road is the major breezeway for northeasterly winds, the annual prevailing winds can along the Pik Fung Road near the proposed development and further reach to the downstream areas.

As discussed in section 2.3, existing wind penetration mainly rely on the traffic network as well as open space in the study area. Since there are 11m setback distance at ground level from the southeast of the boundary and adequate wide gaps between Towers, the prevailing winds pass through the spaces within the proposed development and reach to its downstream areas such as Fanling Recreation Ground. Therefore, unfavourable impact in terms of wind environment on the surrounding areas is expected to be minimal.

4.3 Wind Flow from Southeast Portion

It is noted that the annual prevailing wind directions for the area are from NNE to SE, where summer prevailing wind direction for the site are from ESE to WSW. **Figure 6** Illustrates the Wind Flow from southeast portion.

Both annual and summer prevailing induce wind from southeast portion. As mentioned in section 2.3, there are low- to high-rise developments to the upwind location (e.g. Cheung Wah Estate, Ex Fanling Magistracy, etc); where some school developments, residential development and Fanling Health Centre located to the downwind area. As the existing building clusters windward located already obstruct the wind from southeast. The prevailing winds would along the Jockey Club Road and San Wan Road which are acting as NW to SE wind corridors under wind from southeast portion. Furthermore, considering the low-rise nature of the Ex Fanling Magistracy and the openness of Fanling Recreation Ground, it is expected the SE winds would flow atop the building towards the Subject Site and its downstream areas.

Under SE wind, the prevailing winds would be partially blocked by the proposed development with podium, it would create wakes on Sui Pak Villa, Pentecostal Gin Mao Sheng Primary School and Fanling Maternal and Child Health Centre. Since Jockey Club Road and San Wan Road are acting as two major air corridors under southeasterly, the effective width of the air paths along the roads plus the space within the Subject Site may be reduced. For the San Wan Road, the Subject Site is located far away; and its effective width of the air paths would not be affected. While that for the Jockey Club Road, the effective width of the air paths would be slightly reduced as the Subject Site is currently an open space. However, it is expected that the performance of the Jockey Club Road air path would not be significantly reduced, since the Jockey Club road is about 20m wide which is considered to be sufficient for the wind passing through along. It is expected that the southeasterly wind flow will still penetrate along Jockey Club Road and San Wan Road. On the other hand, it is believed that the proposed building design should not have any implication Fanling Recreation Ground under southeast wind, since it is not located to the downwind of the Subject Site.

For ESE wind, the podium footprint of the proposed development would create adverse air ventilation impact. Since the proposed development will build on an open area, with existing building clusters (e.g. Cheung Wah Estate) windward located already lower the wind from southeast quadrant, it is anticipated that the proposed development would reduce the wind penetration at leeward area, i.e. Fanling Maternal and Child health Centre and Pentecostal Gin Mao Sheng Primary School. Furthermore, high building height (around +100mPD) of the proposed development is expected to have downwash effect which would introduce the upper wind down to the pedestrian level and reach the surrounding areas. Therefore, it is expected that the proposed development would not have any significant impact on the surrounding areas.

As discussed in section 2.3, existing wind penetration mainly rely on the traffic network and existing open space in the study area. Since the future low-rise development at the site of the temporary car park is located at the south of the proposed development, it observed that the SE wind skim over the future 6-storey "G/IC' development and reach to the Subject Site and its downstream areas.

4.4 Wind Flow from Southwest Portion

It is noted that the summer prevailing wind directions for the area are from ESE to WSW. **Figure 7** Illustrates the Wind Flow from southwest portion.

As discussed in section 2.3, wind from southwest direction are mainly summer prevailing wind. Fanling Law Courts Building, North District Government Office are located at the upwind area; where there are numerous low-rise village house located to the downwind area. It is noted that the existing Fanling Law Courts Building and North District Governments Office already obstructed the wind flow from southwest portion to reach Subject Site, due to the large building bulk for these two buildings. The proposed building design is sitting on the wake area induced by the existing Fanling Law Courts Building and North District Governments Office. Therefore, Pik Fung Road and the setback to southeast would be two major air corridors under southwesterly wind.

Under SW and SSW winds, Similar to the NE quadrant wind condition, as the proposed development with a maximum building height of 100mPD is much taller than the existing Fanling Law Courts Building at 62.5mPD and also the frontage of the proposed development facing the prevailing from SW quarters is much longer than that of the Fanling Law Courts Building, it anticipated that the proposed development would create a large wake regions with additional impact on the downstream areas such as La Verte. With the larger podium footprint of the proposed development, it is also noted that the proposed podium would create adverse air ventilation impact under the SW prevailing wind directions.

However, as existing Fanling Law Courts Building located at the southwest side of the Subject Site, it would diverts air path to the proposed development. Moreover, as high building height of proposed development. It is more effective on capturing the high level wind and downwash towards to the pedestrian level. Therefore, the unfavourable ventilation impact is expected to be reduced.

Considering the low rise nature of Ex-Fanling Magistracy and the openness of Fanling Recreation Ground, it is expected that the SW wind is able to reattach to the pedestrian

level after skimming over the existing high-rise developments (e.g. Kai Shing Court, Kai Fuk Estate and Royal Knoll, etc.) located to the further south-west of the Subject Site.

Although the proposed development will build on an open site, it is anticipated that the proposed development is site on the wake area induced by the Fanling Law Courts Building. Therefore, the wind flow within the Subject Site would partially obstructed by the buildings at upwind area. It is anticipated that the proposed development would slightly reduce the wind penetration at leeward area, i.e. village houses to the northeast. **Figure 7** Illustrates the wind flow from the southwest portion. It is expected that the southwesterly wind will penetrate along Pik Fung Road and setback to the southeast of Subject Site.

However, apart from the villages to the northeast, the proposed building design should not have any implication to other surrounding important pedestrian areas, e.g. Pentecostal Gin Mao Sheng Primary School and Fanling Public School to the northwest, Fanling Recreation Ground to the southwest, etc. It is because these areas are not located to the downwind of the Subject Site.

In order to mitigate the air ventilation impact to the leeward area under SW quadrant wind direction, stepping podium and setback to the southeast boundary are provided to enhance wind penetration to the south of Subject Site. Since there are 11m setback distance at ground level from the southeast of the boundary and adequate wide gaps between Towers, the prevailing winds pass through the spaces within the proposed development and reach to the downstream areas.

For S wind, wind availability of the Subject Site relies mainly on wind flow from the temporary carpark. With the podium footprint and high building height of the proposed development, it is noted that the proposed podium and the building would produce a larger wake area in the downstream area, which create adverse air ventilation impact under the S prevailing wind direction. It is expected that these surrounding development having low wind availability when compared with the existing ventilation condition. However, as existing Fanling Law Courts Building located at the southwest side of the Subject Site, it would diverts air path to the proposed development. Moreover, as high building height of proposed development. Thus, it is more effective on capturing the high level wind and downwash towards to the pedestrian level.

4.5 Summary of Air Ventilation Performance

There is no building structure in current condition of the Subject Site. It is believed that the new high-rise development might obstruct wind flow to downwind areas under both annual and summer condition. Especially building orientation of Tower 2 would significantly obstruct the wind flow under annual condition.

Under NE quadrant wind direction, it expected that the proposed development would create a large wake regions with additional impact on the downstream areas such as Fanling Law Courts Building, North District Government Offices and some residential developments to the southwest. However, stepping podium and setback to the southeast boundary are provided to enhance wind penetration to the south of Subject Site and benefit Jockey Club Road. Thus, the unfavourable impact in terms of wind environment on the surrounding areas is expected to be minimal. Under SE and ESE wind, the prevailing winds would be partially blocked by the proposed development with podium, it would create wakes on Sui Pak Villa,

Pentecostal Gin Mao Sheng Primary School and Fanling Maternal and Child Health Centre. Under SW quadrant wind, it anticipated that the proposed development would create a large wake regions with additional impact on the downstream areas such as La Verts and village houses to the northeast. With the larger podium footprint of the proposed development, it is also noted that the proposed podium would create adverse air ventilation impact under the SW prevailing wind directions.

However, there are existing mid- to high-rise development at the upwind areas that the wind would mainly flow along the road networks, such as Jockey Club Road, San Wan Road, etc. As the terraced podium design and adequate building separation between towers have been incorporated into the proposed development, it is anticipated that the proposed development would not have any significant impact on air ventilation of the leeward areas at pedestrian level. Nevertheless, there are some good building permeability designs are incorporated into the proposed development to minimize the potential impact on air ventilation, with considering various site constraints as discussed in section 1.5.

5. Conclusions

After considering the potential environmental impacts upon the Subject Site, the layout of the proposed development has carefully considered the good design in air ventilation aspect.

The Proposed Development would create some potential adverse air ventilation impact on the pedestrian wind environment at Fanling Law Courts Building, North District Government Offices, some residential developments to the southwest, Sui Pak Villa, Pentecostal Gin Mao Sheng Primary School, Fanling Maternal and Child Health Centre, village houses to the northwest and Fanling Public School when compared with the existing condition. Thus, a further quantitative AVA study should be conducted for scheme design optimization during the detailed design stage.

After considering the existing topography, the location of the existing built areas and provision of mitigation measures, it is considered that the Proposed Development would not have significant adverse impact to surrounding environment.

As discussed in above section, following mitigation measure were adopted in the proposed development in order to enhance air ventilation to surrounding areas:

- Building Separation (~30m) between two residential towers:
- Building setback (i.e around 11m setback distance at ground floor and around 18m setback distance at first floor); and
- Alignment of building block in NE to SW direction.
- Three-storey podium designed with stepped level to the southeast for facilitating NE and SW wind penetration

These mitigation measures are essential in ensuring the Proposed Scheme will enhance the wind flow nearby and effectivity enhance the wind flow in surrounding area. However, it is recommended that should the enhancement measures proposed above not implemented in

accordance with the current proposed development for the future, quantitative Air Ventilation Assessment will be conducted to ascertain that the future development will not perform worse than the current proposed development design.

Figures

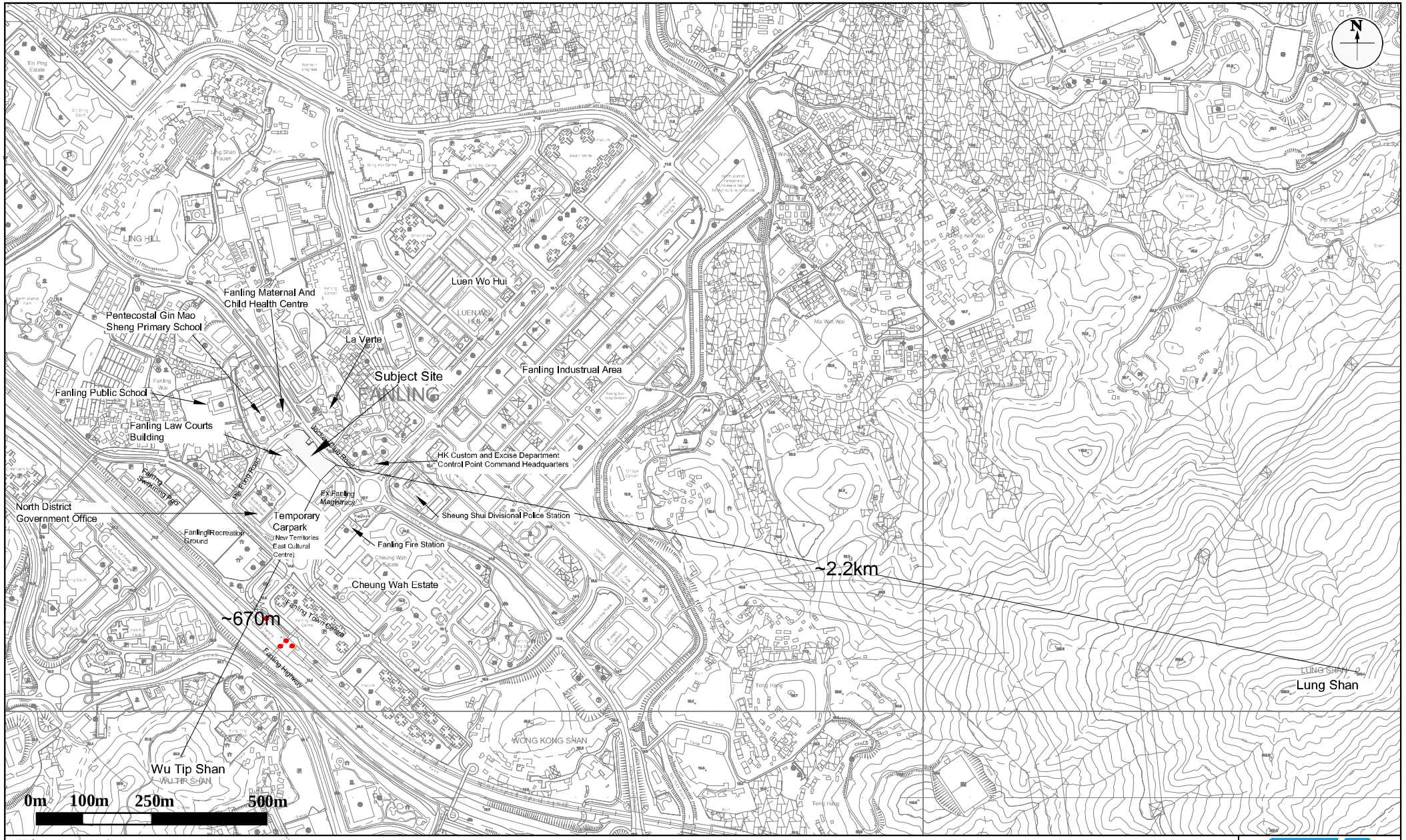


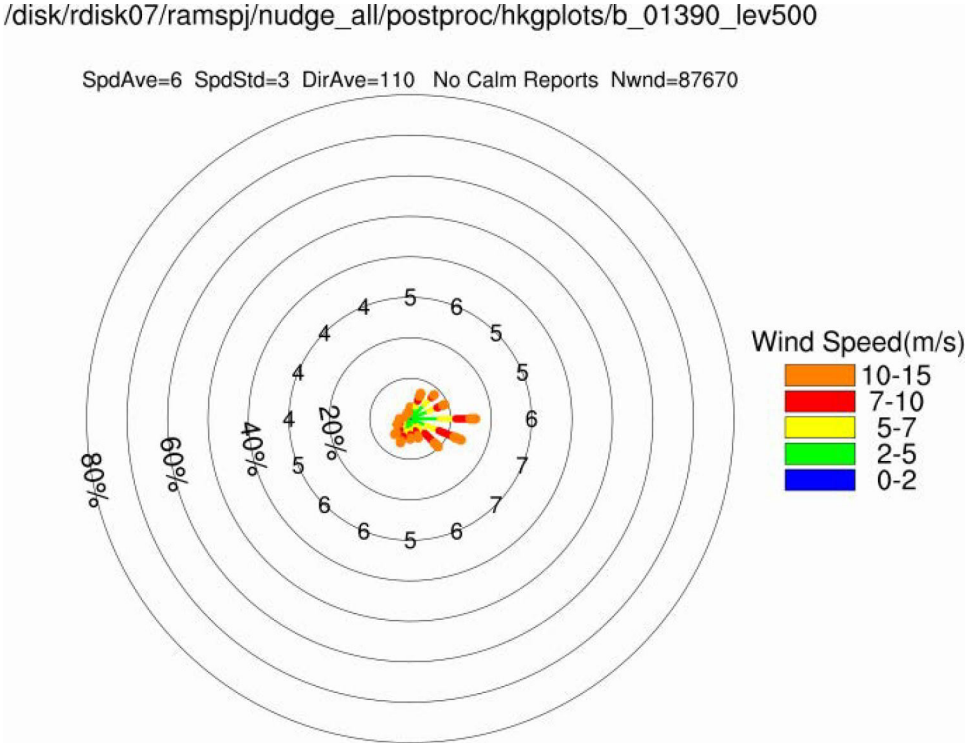
Figure: 1

Title: Location of the Subject Site and its Environs

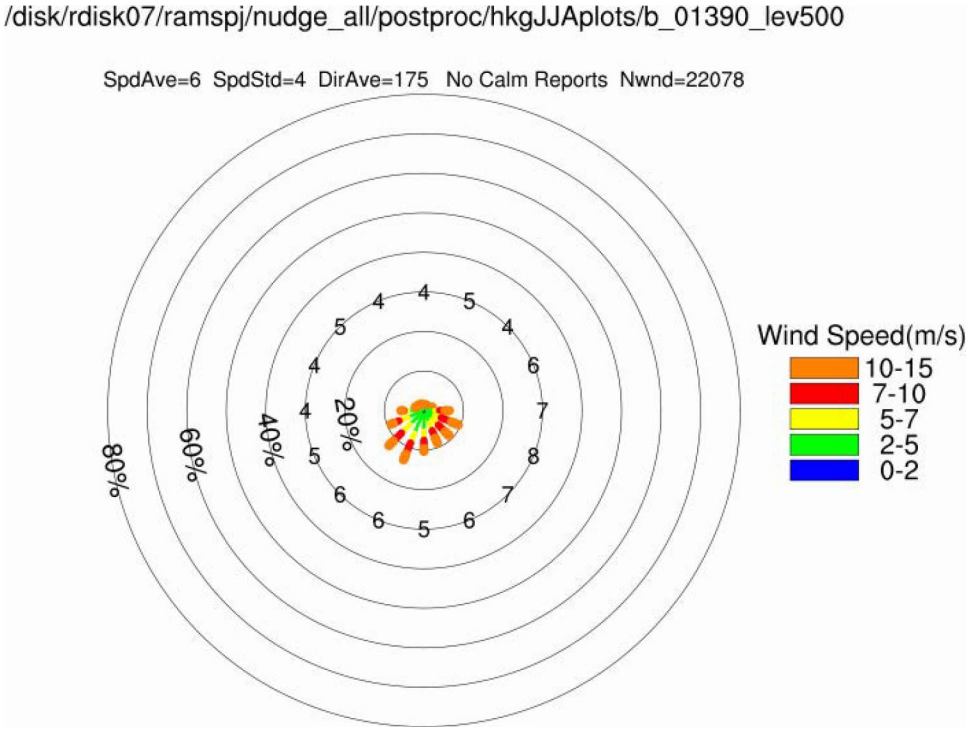
Project: Proposed Subsidized Housing Development at Jockey Club Road, Fanling

RAMBOLL

Drawn by:	CC
Checked by:	TC
Rev.:	1.8
Date:	Nov 2018



Annual Wind Rose (at 500m)



Summer Wind Rose (at 500m)

Figure: 2	RAMBOLL
Title: Windrose representing V∞ of the Area under Concern	Drawn by: CC
	Checked by: TC
Project: Proposed Housing Development at Jockey Club Road, Fanling	Rev.: 1.7
	Date: Oct 2018

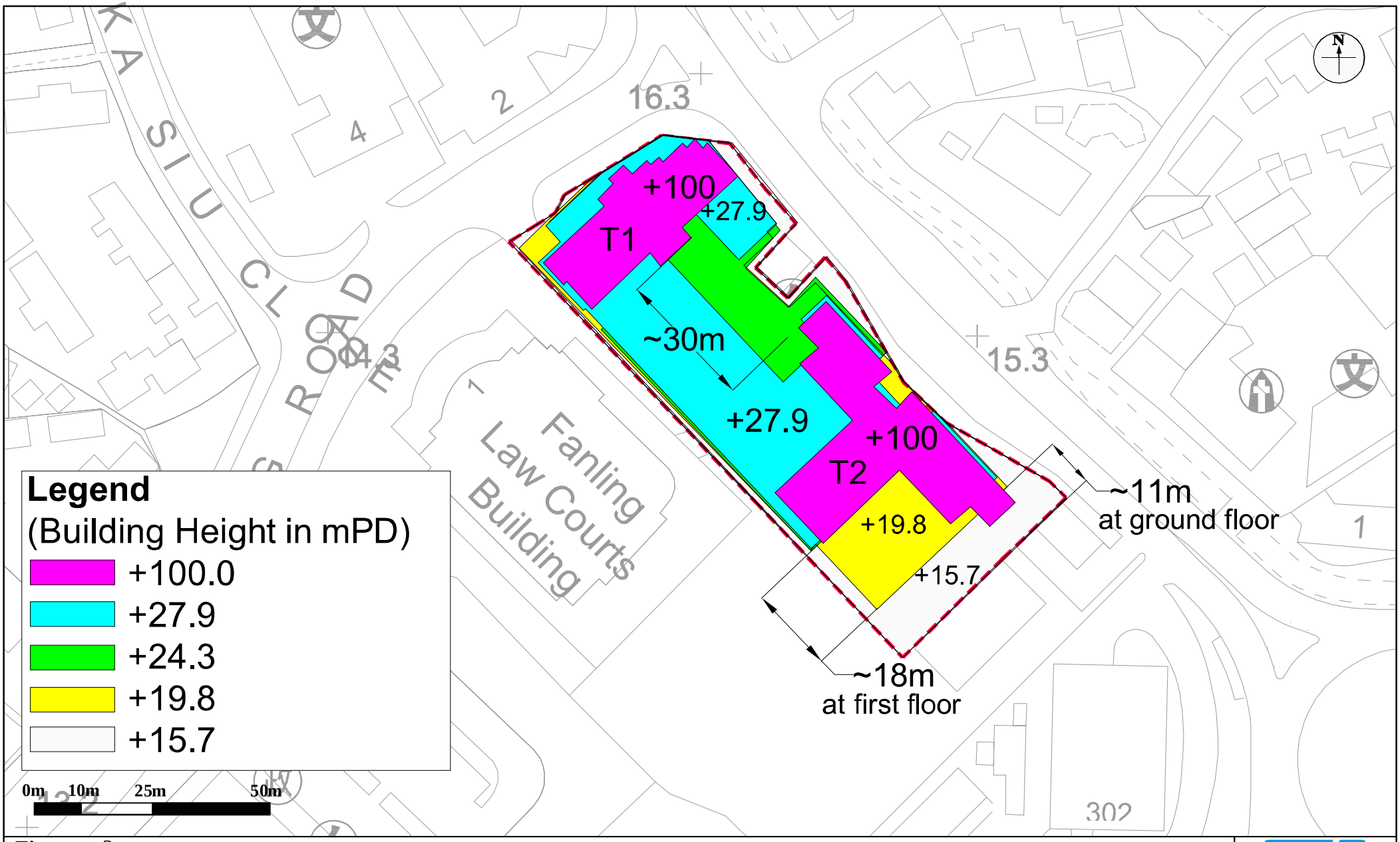


Figure: 3

Title: Master Layout Plan of the Proposed Development

Project: Environmental Assessment for Proposed Subsidized Housing Development at Jockey Club Road, Fanling

RAMBOLL

Drawn by:	CC
Checked by:	TC
Rev.:	1.7
Date:	Oct 2018

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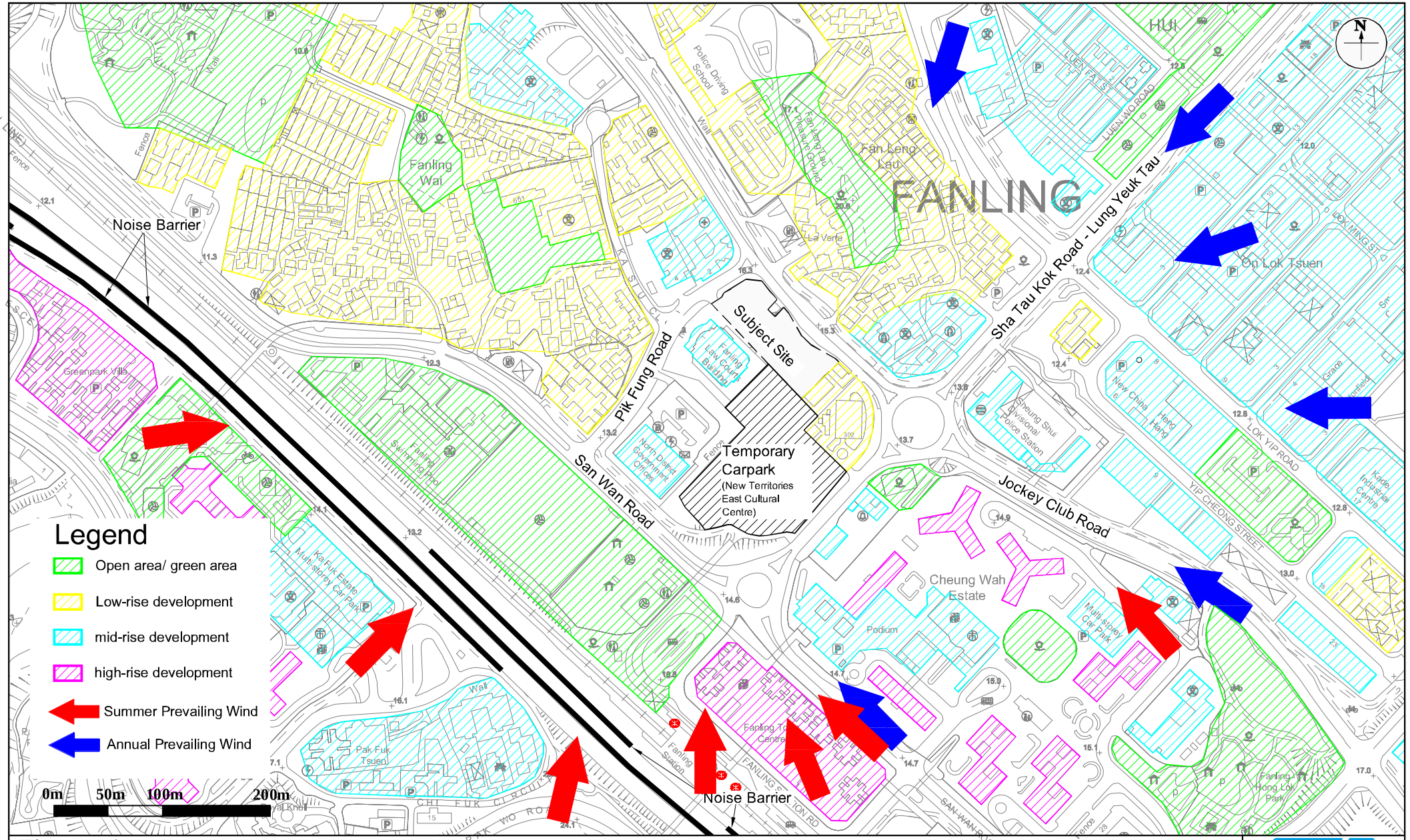


Figure: 4	RAMBOLL
Title: Surrounding Development and Pedestrian Wind Flow	Drawn by: CC Checked by: TC
Project: Proposed Subsidized Housing Development at Jockey Club Road, Fanling	Rev.: 1.8 Date: Nov 2018

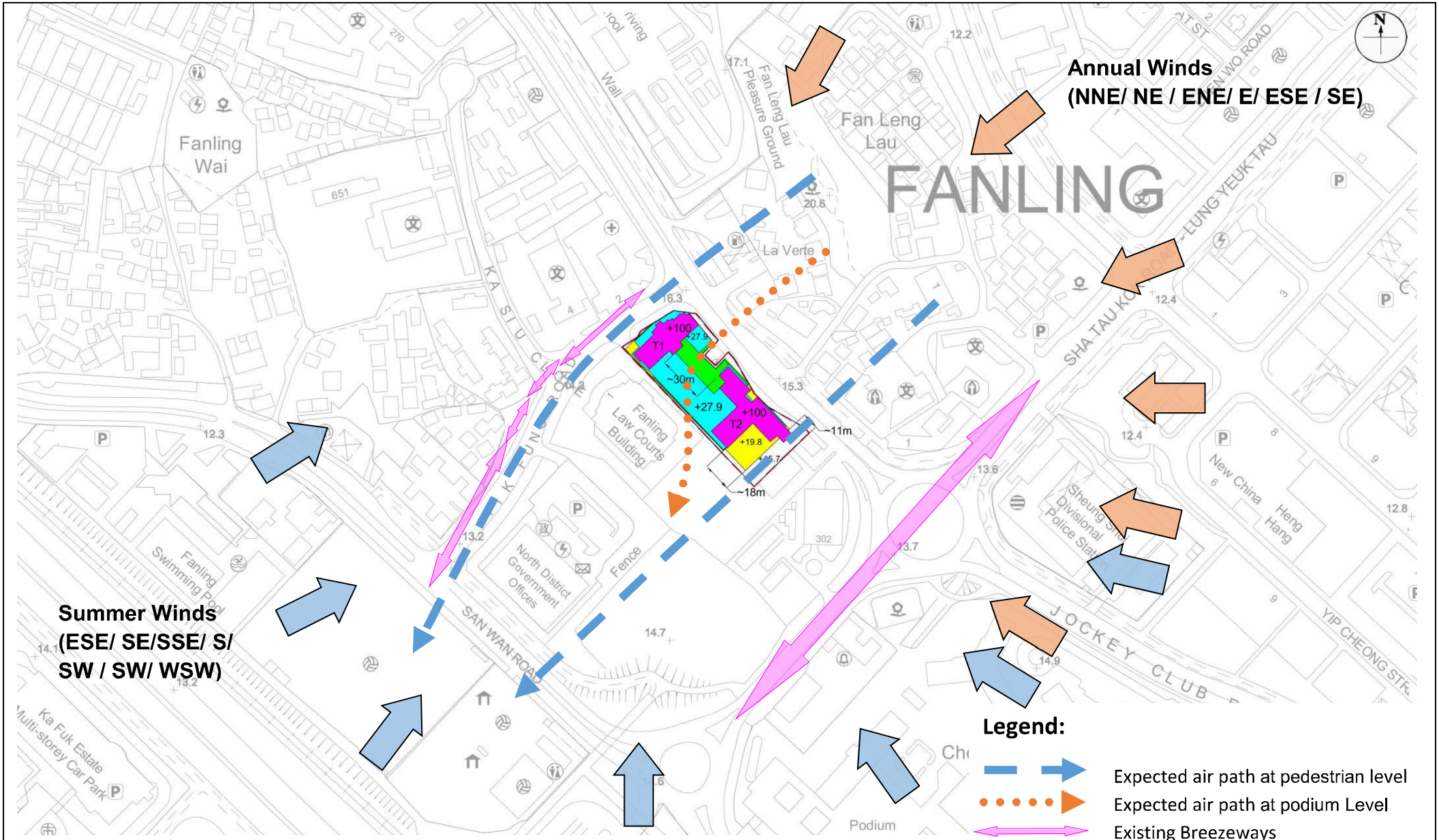


Figure: 5	RAMBOLL
Title: Illustration of Wind Flow from Northeast Portion	Drawn by: CC
	Checked by: TC
Project: Proposed Subsidized Housing Development at Jockey Club Road, Fanling	Rev.: 1.7
	Date: Oct 2018

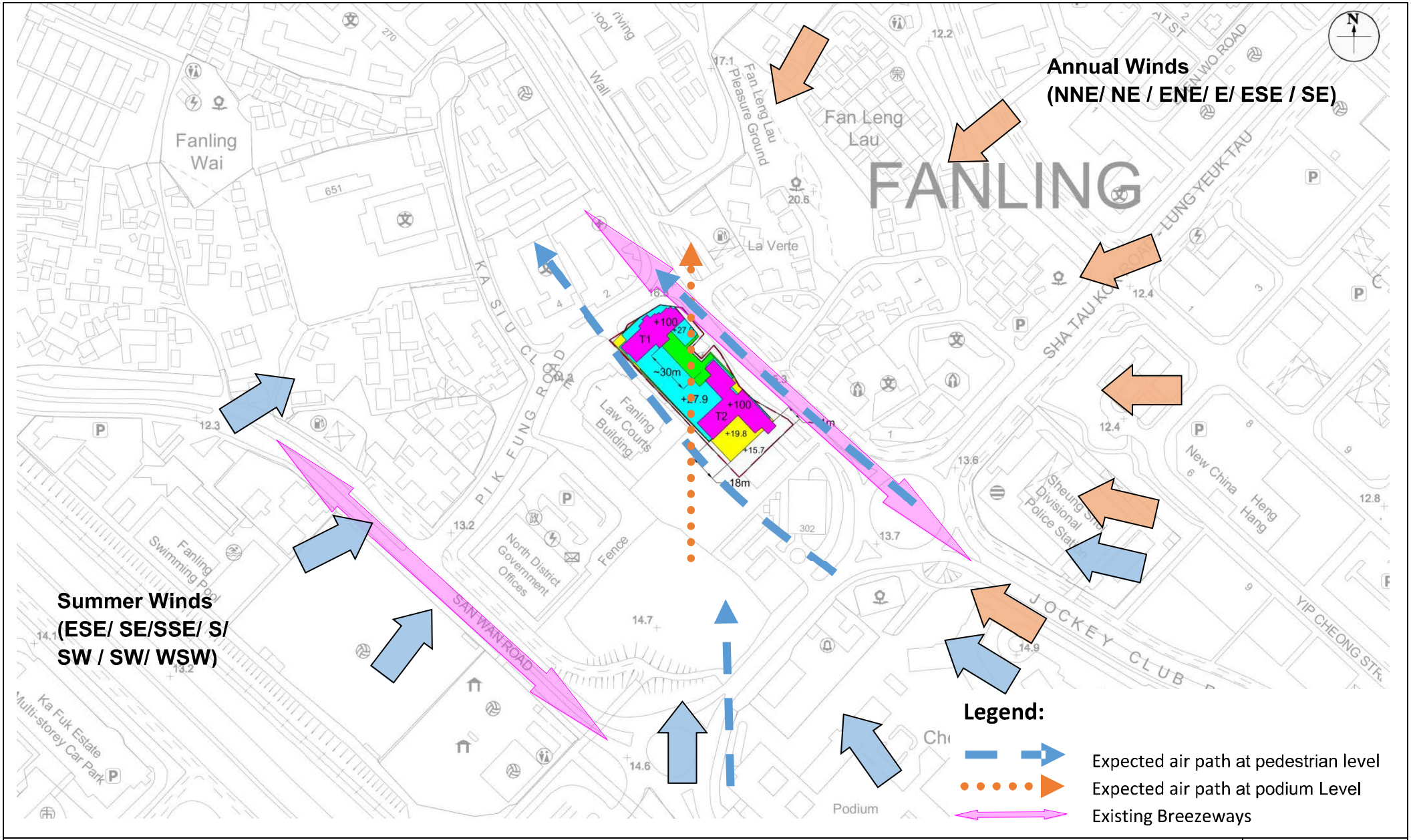


Figure: 6	RAMBOLL
Title: Illustration of Wind Flow from Southeast Portion	Drawn by: CC
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Project: Proposed Subsidized Housing Development at Jockey Club Road, Fanling	Rev.: 1.7
	Date: Oct 2018

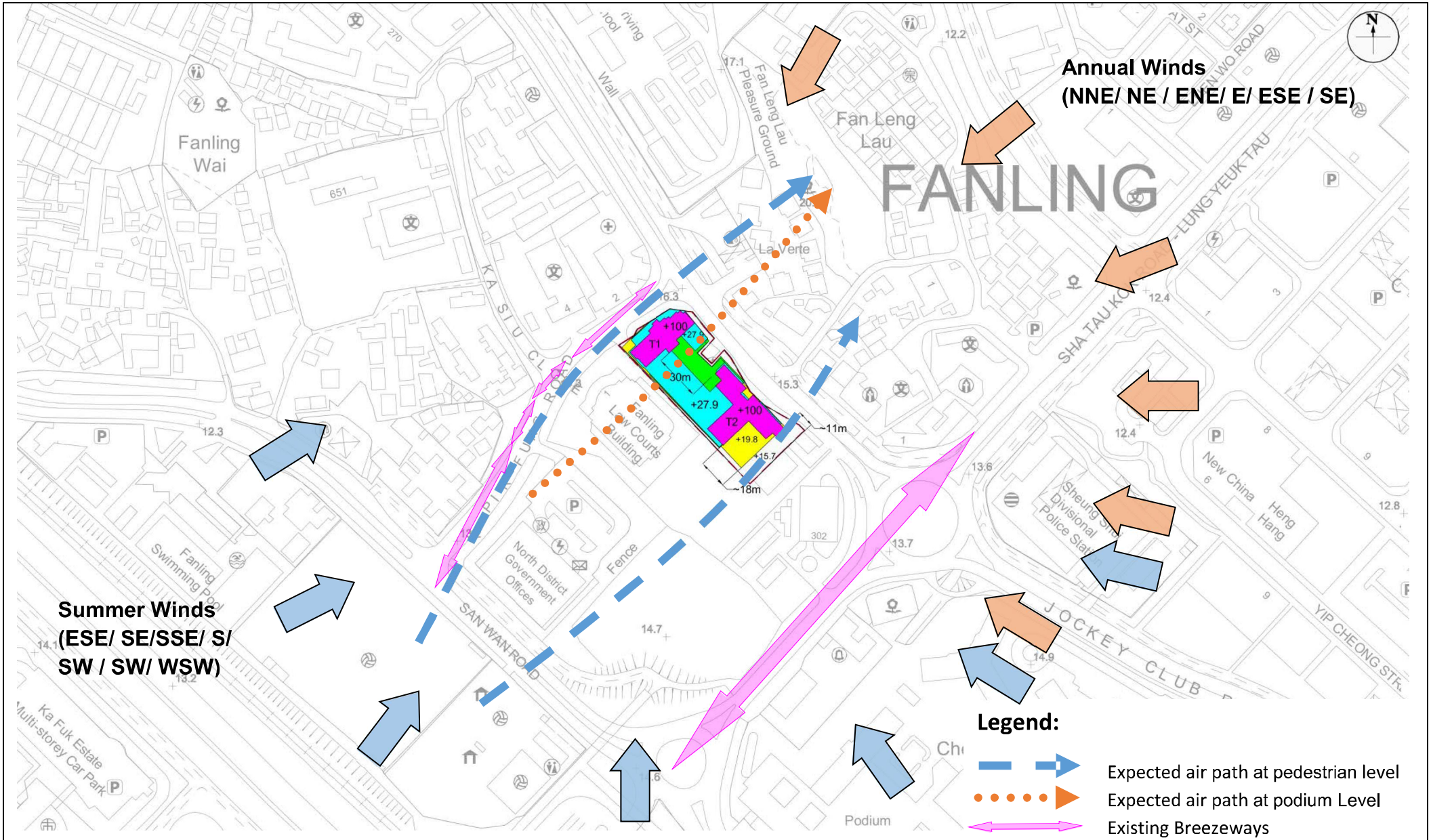
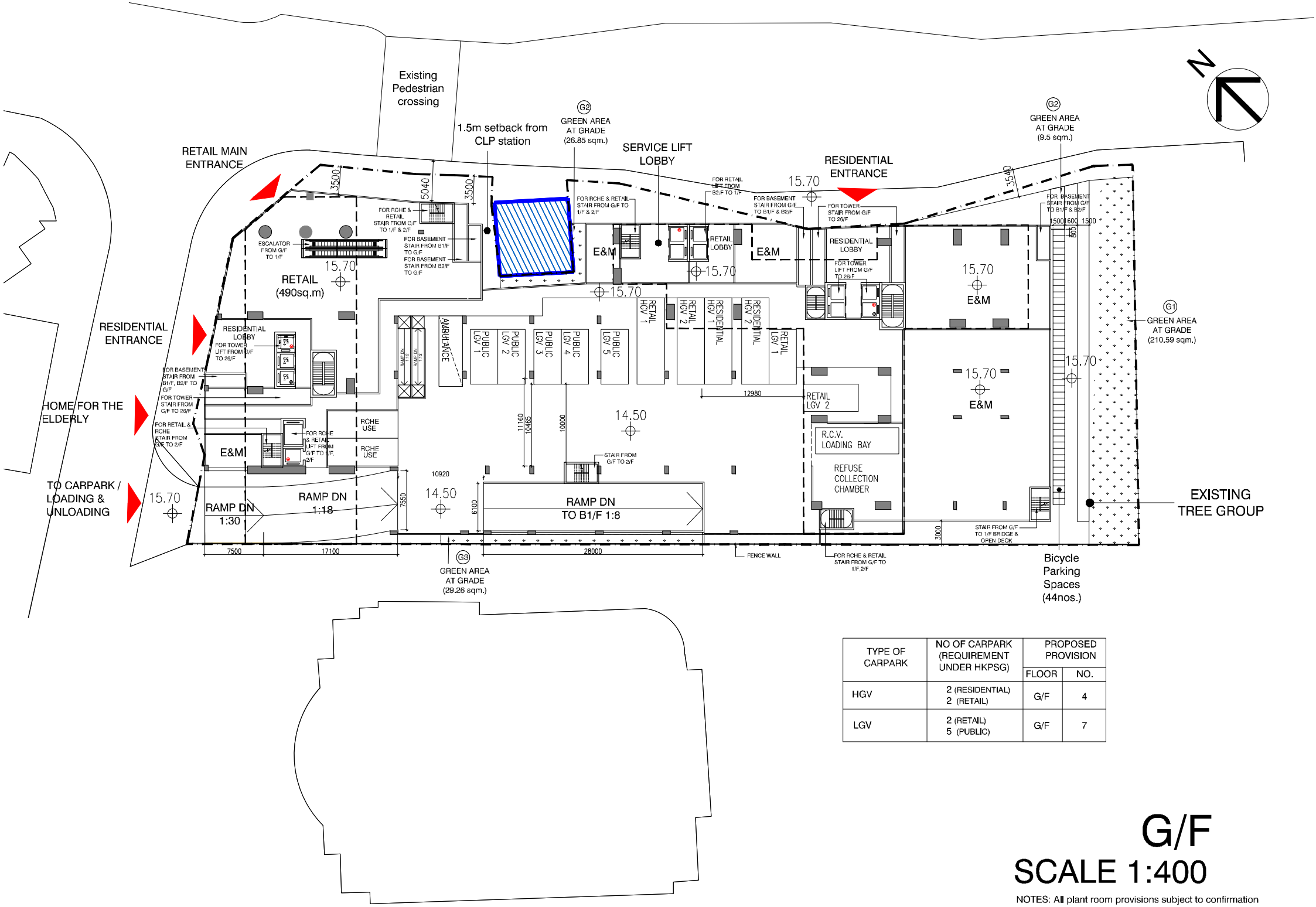


Figure: 7	RAMBOLL
Title: Illustration of Wind Flow from Southwest Portion	Drawn by: CC
	Checked by: TC
Project: Proposed Subsidized Housing Development at Jockey Club Road, Fanling	Rev.: 1.7
	Date: Oct 2018

Annex A:

Master Layout Plan



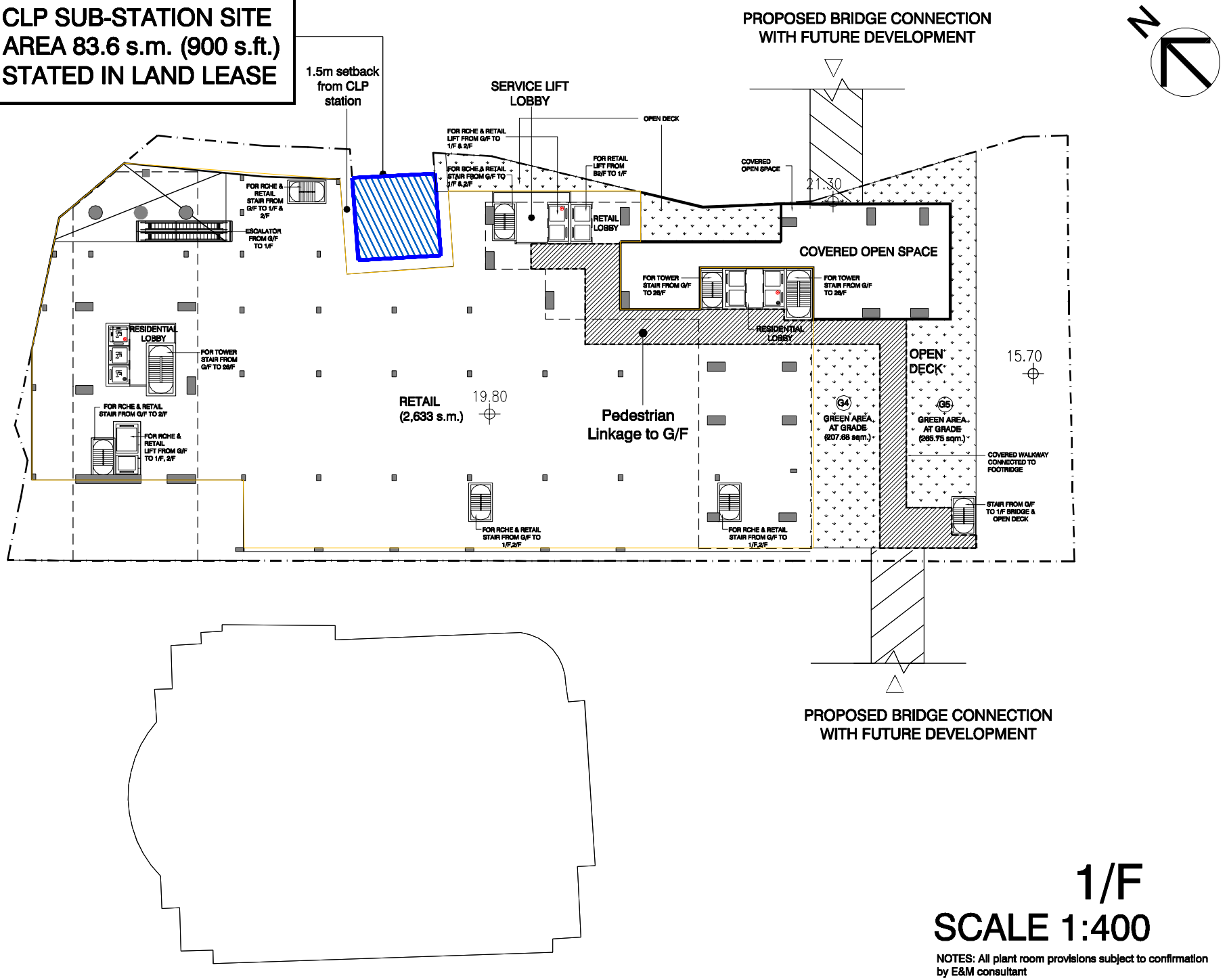
TYPE OF CARPARK	NO OF CARPARK (REQUIREMENT UNDER HKPSG)	PROPOSED PROVISION	
		FLOOR	NO.
HGV	2 (RESIDENTIAL) 2 (RETAIL)	G/F	4
LGV	2 (RETAIL) 5 (PUBLIC)	G/F	7

G/F

SCALE 1:400

NOTES: All plant room provisions subject to confirmation by E&M consultant

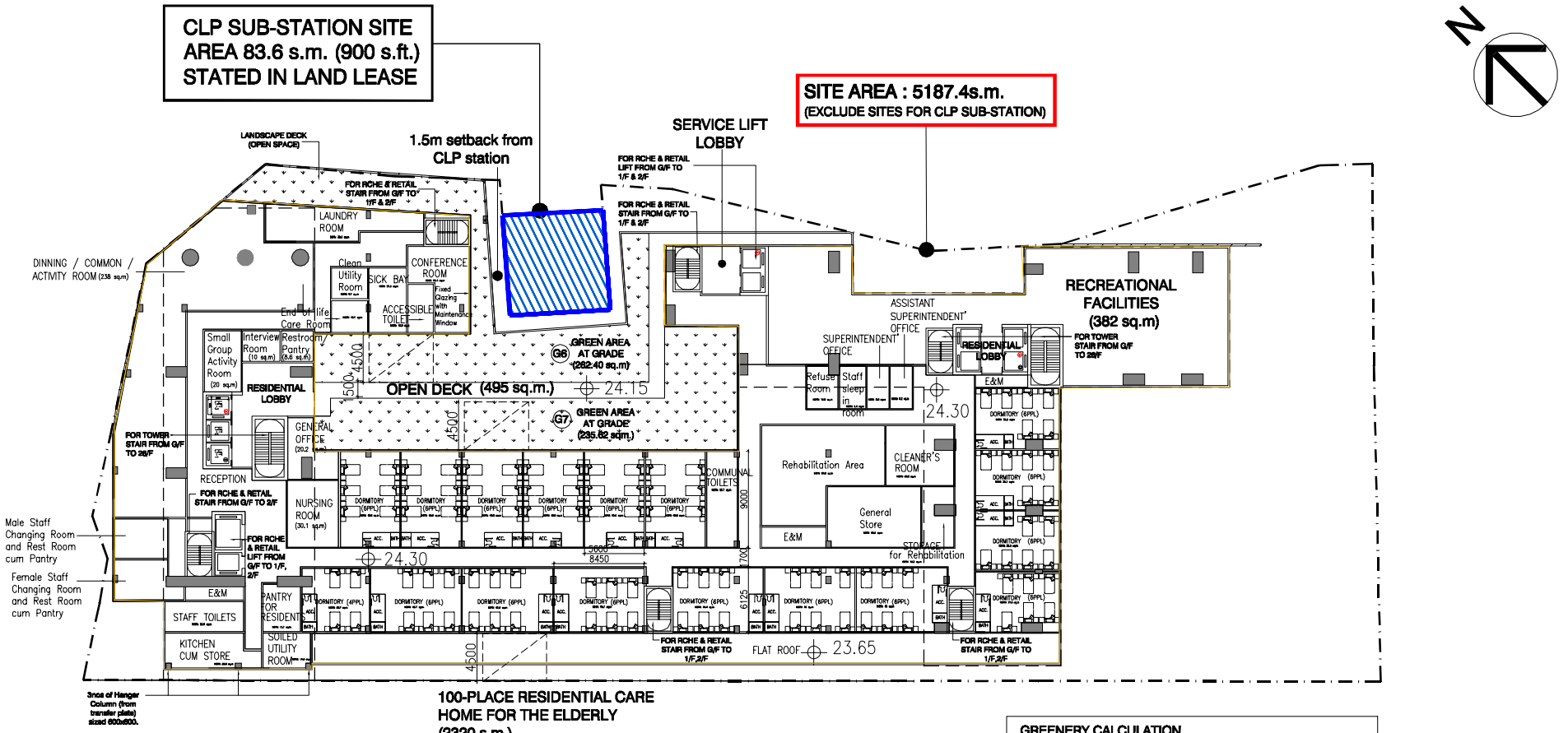
CLP SUB-STATION SITE
AREA 83.6 s.m. (900 s.ft.)
STATED IN LAND LEASE



1/F

SCALE 1:400

NOTES: All plant room provisions subject to confirmation by E&M consultant



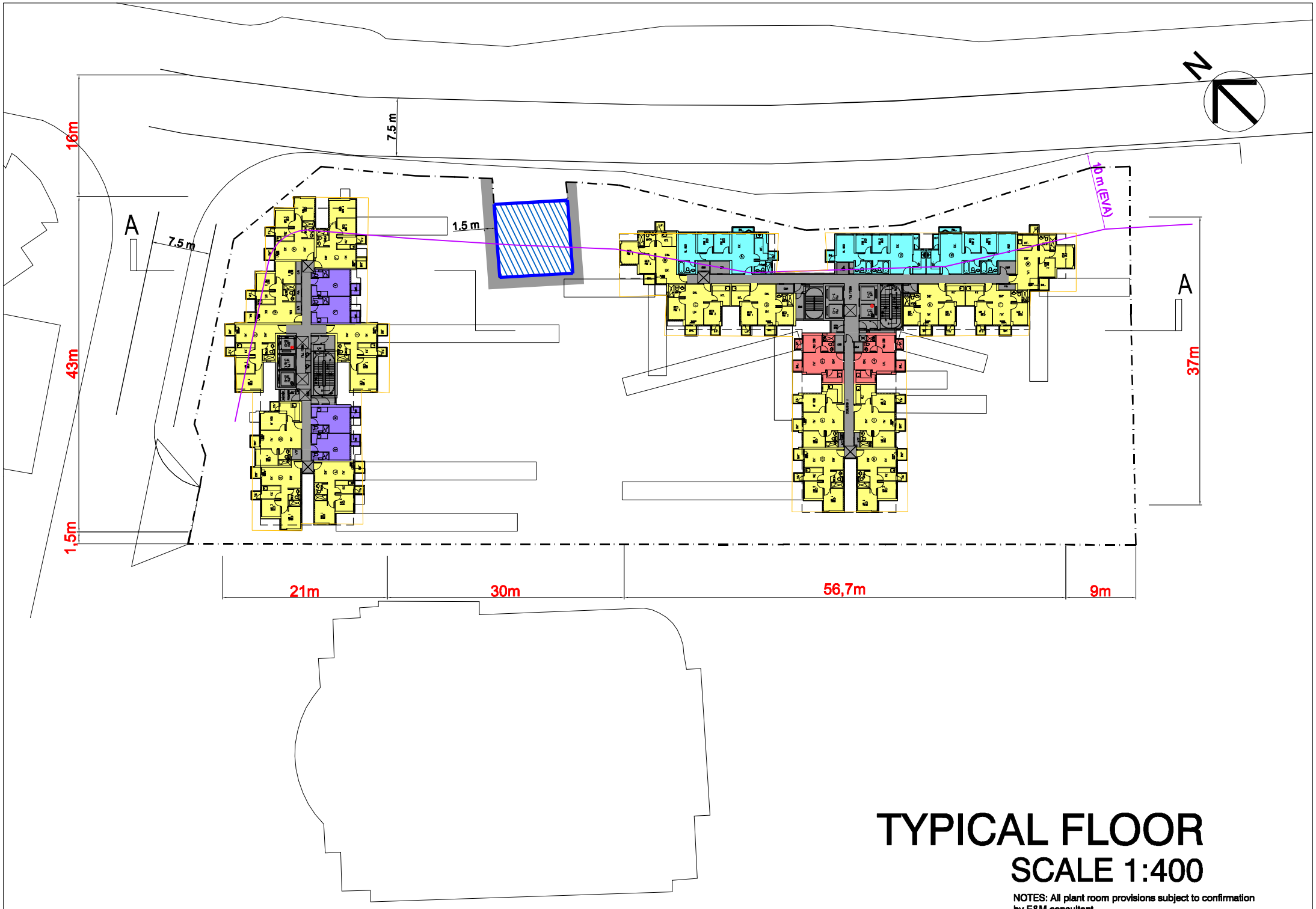
GREENERY CALCULATION		
REQUIRED	PROVIDED	
	FLOOR	AREA (sq.m)
5187.4 sq.m (Site area) x 20%	G/F	(G1) = 210.59
		(G2) = 9.5
		(G3) = 29.26
	1/F	(G4) = 207.68
		(G5) = 265.75
	2/F	(G6) = 262.40
		(G7) = 235.62
= 1037.48 sq.m	TOTAL	= 1221 (> REQUIRED)

NOTES: DETAIL LANDSCAPE LAYOUT AND CALCULATION TO BE CONFIRMED BY LANDSCAPE ARCHITECT.

2/F

SCALE 1:400

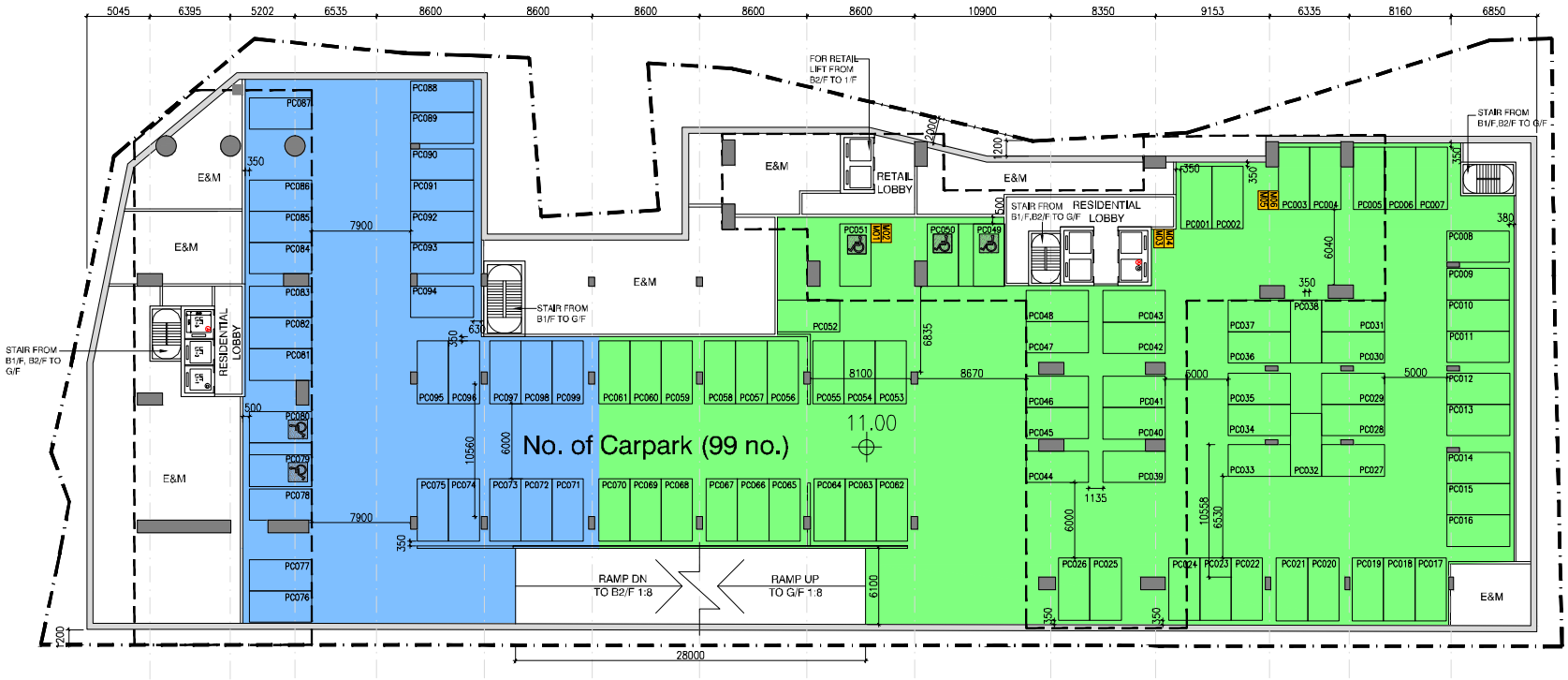
NOTES: All plant room provisions subject to confirmation by E&M consultant



TYPICAL FLOOR

SCALE 1:400

NOTES: All plant room provisions subject to confirmation by E&M consultant

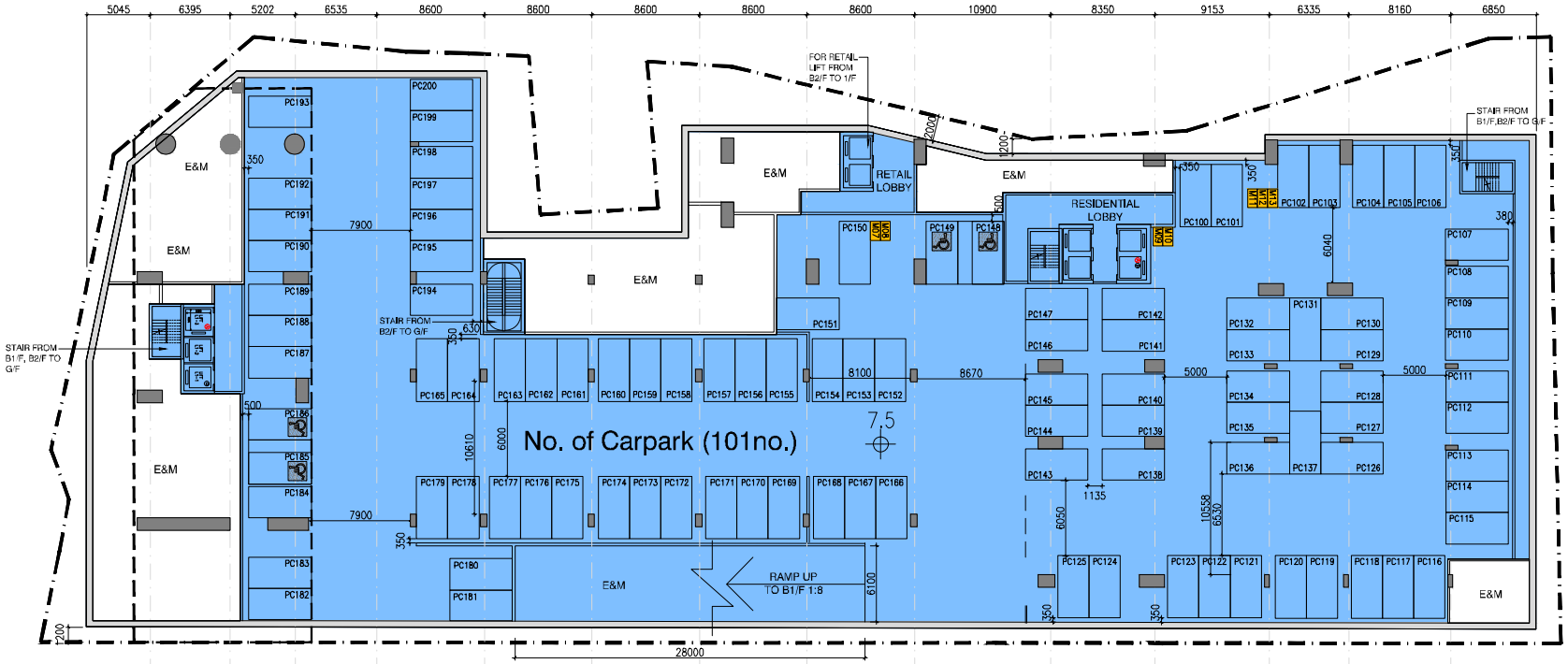


TYPE OF CARPARK	NO OF CARPARK (REQUIRMENT UNDER HKPSG)	PROPOSED PROVISION			CARPARK NO.
		FLOOR	NO.	TOTAL.	
PRIVATE	45 (RESIDENTIAL) 13 (RETAIL) 10 (VISITOR)	B1	70	70	PC001- PC070
PUBLIC	83	B1	29	130	PC071- PC200
		B2	101		
MOTORCYCLE	6 (RESIDENTIAL) 2 (RETAIL)	B1	6	13	M01 to M13
		B2	7		

B1

SCALE 1:400

NOTES: All plant room provisions subject to confirmation by E&M consultant



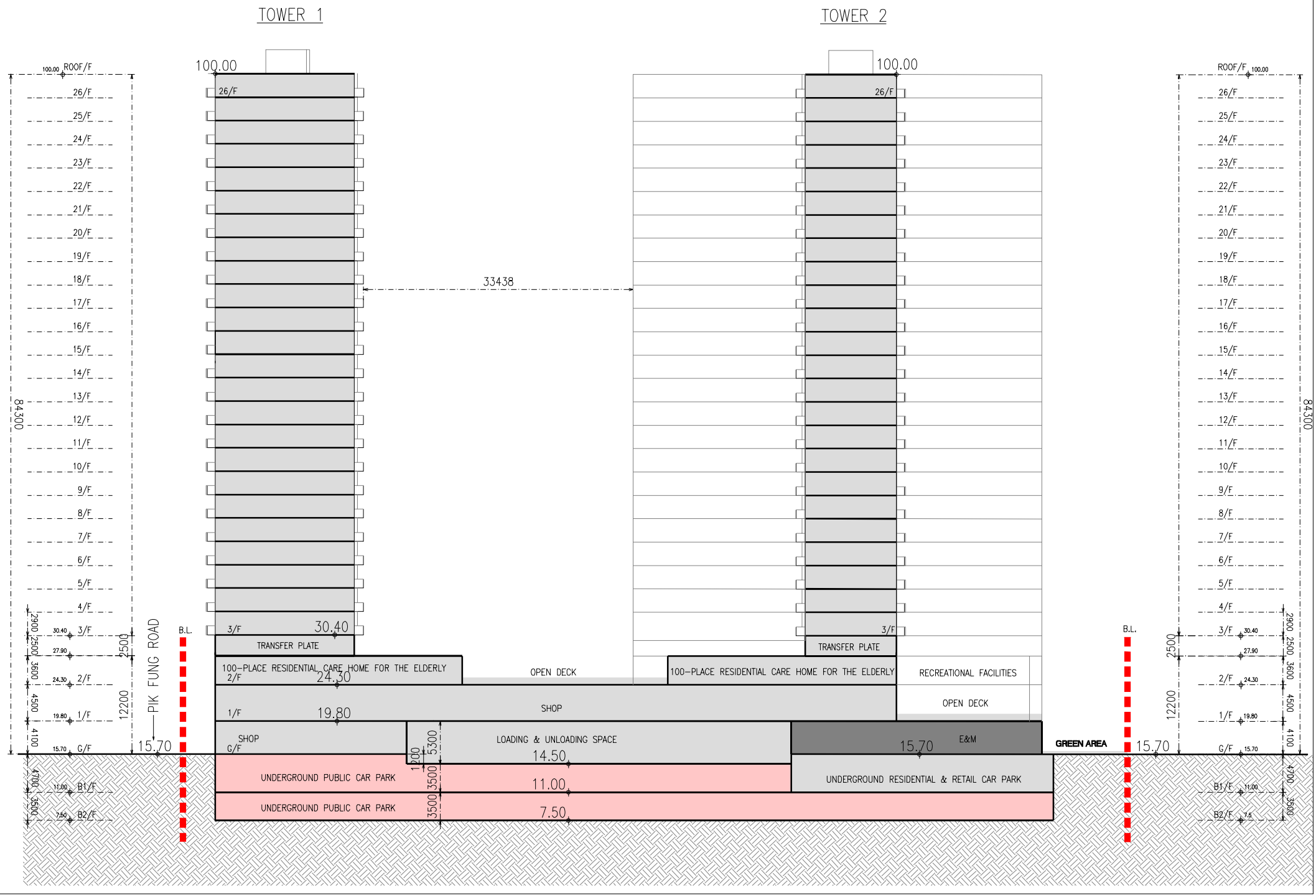
TYPE OF CARPARK	NO OF CARPARK (REQUIRMENT UNDER HKPSG)	PROPOSED PROVISION			CARPARK NO.
		FLOOR	NO.	TOTAL.	
PRIVATE	45 (RESIDENTIAL) 13 (RETAIL) 10 (VISITOR)	B1	70	70	PC001- PC070
PUBLIC	83	B1	29	130	PC071- PC200
		B2	101		
MOTORCYCLE	6 (RESIDENTIAL) 2 (RETAIL)	B1	6	13	M01 to M13
		B2	7		

B2

SCALE 1:400

NOTES: All plant room provisions subject to confirmation by E&M consultant

SECTION A–A


TOWER 1
TOWER 2
100.00
ROOF/F
26/F
25/F
24/F
23/F
22/F
21/F
20/F
19/F
18/F
17/F
16/F
15/F
14/F
13/F
12/F
11/F
10/F
9/F
8/F
7/F
6/F
5/F
4/F
3/F
2/F
1/F
G/F
B1/F
B2/F
84300
33438
30.40
24.30
19.80
15.70
14.50
11.00
7.50
2900
2500
3600
4500
4100
5300
1200
3500
4700
12200
B.L.
PIK FUNG ROAD
TRANSFER PLATE
100–PLACE RESIDENTIAL CARE HOME FOR THE ELDERLY
OPEN DECK
SHOP
LOADING & UNLOADING SPACE
RECREATIONAL FACILITIES
E&M
GREEN AREA
UNDERGROUND PUBLIC CAR PARK
UNDERGROUND RESIDENTIAL & RETAIL CAR PARK

Appendix 3 – Visual Impact Assessment Report

Hong Kong Housing Society

Proposed Subsidized Housing Development at Jockey Club Road, Fanling

Visual Impact Assessment Report – Rev. I

October 2018

AECOM ASIA COMPANY LIMITED

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Figure 11 Photomontage of VP6 North District Park
Figure 12 Photomontage of VP7 Ling Hill
Figure 13 Photomontage of VP8 Wu Tip Shan

APPENDIX

SK-15 Master Layout Plan

1 INTRODUCTION

1.1 The VIA study will investigate the visual impacts of the proposed subsidized Housing Development at Jockey Club Road, Fanling (Proposed Development). The residual impacts, if any, would be confined with the allowable limits. This VIA report is prepared in accordance with the Town Planning Board Guideline No. 41 – Guideline on submission of Visual Impact Assessment for Planning Application to the Town Planning Board.

2 LEGISLATION, STANDARDS AND GUIDELINES

2.1 The following legislation, standards and guidelines are applicable to the visual impact assessment associated with the proposed subsidized Housing Development at Jockey Club Road, Fanling:

(1) Town Planning Board Guideline No. 41 – Guideline on submissions of Visual Impact Assessment for Planning Applications to the Town Planning Board;

(2) Town Planning Ordinance (Cap 131);

(3) Hong Kong Planning Standards and Guidelines Chapters 4, 10 and 11;

3 ASSESSMENT METHODOLOGY

General

3.1 The Assessment Area for the visual impact assessment is defined by the visual envelope of the Proposed Development. The visual impact study boundaries are shown in **Figure 1.**

3.2 The assessment of visual impacts has involved the following procedures.

- ***Identification of the Visual Envelopes of the project.*** This is achieved by site visit and desktop study of topographic maps and photographs. Distance and other factors will be considered, to determine the zone of visual influence and the visibility of the Project from various locations. The Zone of Visual Influence /Visual Envelope is that area from which any part of the proposed Project can be seen; usually defined by natural ridgeline, man-made features, road infrastructures, etc.

3.3 The Assessment Area for the VIA is defined by the visual envelope of the Proposed Development and the Zone of Visual Influence (ZVI) is determined. The VIA will include:

(1) Identification of View Points (VPs) within the ZVI and;
(2) Assessment of the visual sensitivity of the public viewer from the VPs;

3.4 These various elements of the VIA are detailed below.

- ***Identification of the VPs within the Visual Envelopes*** These VPs are where members of the public or tourists can assess or view the site easily.

- ***Assessment of the degree of sensitivity to change of the VPs.*** Factors considered include:

  - the impact on sensitive public viewers from the most affected viewing points, include key pedestrian nodes, popular areas used by the public or tourists for outdoor activities, recreation, rest, sitting-out, leisure, walking, sight-seeing, and prominent travel routes where travelers' visual attention may be caught by the Proposed Development;

  - People engaged in working activities are regarded as less sensitive to the visual changes;

  - Viewing point should be at human eye level for a realistic presentation of the views;

  - Key public viewing points may refer to Chapter 11 on Urban design Guidelines in the Hong Kong Planning Standards and Guidelines (HKPSG), the Explanatory Statement of the relevant statutory plans, adopted outline development plans and layout plans, and completed planning studies available for public reference;

  - Local viewpoints should be determined with reference to the setting of the project and views of local significance;

3.5 The sensitivity of VPs is classified as follows:

High:	The VP is highly sensitive to any change in their viewing experience.
Medium:	The VP is moderately sensitive to any change in their viewing experience.
Low:	The VP is only slightly sensitive to any change in their viewing experience.

- ***Visual elements.***

  - This includes major physical structures, visual resources or attractors, and/ or visual eyesores or detractors that currently exist or area known to be planned within the assessment area. Different visual elements may enhance, degrade or neutralize the overall visual impact of the development being assessed;
  - This VIA will demonstrate whether and how the Proposed Development would cause impact on the views to ridgelines and harbour if the site location is within the assessment area where views to ridgelines and the harbour may be reduced or blocked.

- ***Appraisal of visual changes.*** *Visual changes may be positive or negative and they are not necessarily mutually exclusive:*

  - Visual Composition: the total visual effects of all the visual elements due to their variation in locations, massing, heights, dispositions, scales, forms, proportions and characters vis-a-viz the overall visual backdrop. It may result in visual balance, compatibility, harmony, unity or contrast. This appraisal should have due regard to the overall visual context and character within the wider and local contexts;

- Visual Obstruction: this appraisal should assess the degree of visual obstruction and loss of views or visual openness due to the Proposed Development from all key public viewing points within the assessment area. Blockage or partial blockage of views which substantially reduce visual permeability, existing panorama, vistas, visual resources or visual amenities should be avoided or minimized, in particular with regard to impact on prominent ridgelines, the harbour, natural coastlines, open sea horizon, skyline, scenic areas, valued landscape, special landmark, heritage features to be preserved, etc.
- Effect on public viewers: this VIA will assess and demonstrate the effects of visual changes from key public viewing points with direct sightlines to the Proposed Development.
- Effect on Visual Resources: this VIA will appraise if the condition, quality and character of the assessment area is changed positively or negatively as a result of the development, and any on-site, off-site visual impact related to the development.

3.6 The resultant overall impact may be concluded and classified within a range of threshold:

Enhanced:	If the Proposed Development in overall term will improve the visual quality and complement the visual character of its setting from most of the identified key public viewing point.
Partly Enhanced/ Partly Adverse:	If the Proposed Development will exhibit enhanced visual effect to some of the identified key public viewing points and at the same time, with or without mitigation measures, exhibit adverse visual effects to some other key public viewing points.
Negligible:	If the Proposed Development will, with or without mitigation measures, in overall term have insignificant visual effects to most of the identified key public viewing points, or the visual effects would be screened or filtered by other distracting visual elements in the assessment area.
Slightly Adverse:	If the Proposed Development will, with or without mitigation measures, result in overall term some negative visual effects to most of the identified key public viewing points.
Moderately Adverse:	If the Proposed Development will, with or without mitigation measures, result in overall term negative visual effects to most of the key identified key public viewing points.
Significantly Adverse:	If the Proposed Development will in overall term cause serious and detrimental visual effects to most of the identified key public viewing points even with mitigation measures.

4 PROPOSED DEVELOPMENT

4.1 The Subject Site, with a site area of about 5,187m^2 (subject to further confirmation), is located to the northwest of Fanling Town Centre, and the southwest of Luen Wo Hui. The Subject Site is bounded by Pik Fung Road to the northwest, Jockey Club Road to the northeast, ex-Fanling Magistracy to the southeast and Fanling Law Courts Building to the southwest.

4.2 The Subject Site is a piece of Government land situated at Demarcation District (D.D.) 51 Lot. The northwest portion of the site where the temporary tennis court is located is under Government Land Allocation (GLA). Upon future development of the site into proposed subsidized housing, the land allocated under GLA would require to be resumed by the Government.

4.3 The proposed development at the subject site consists of two residential blocks with about 648 units. Under the current scheme, the details of the development are tabulated as follows:-

Total Residential GFA (Plot Ratio):	About 31,124m^2 (about 6.00)
Total Non-Residential GFA:	about 6,032m^2 (about 1.2) (Public & private car park GFA not included)
Basement Floors	Public and private car park
Ground Floor	Retail, residential shuttle lift lobby, RCHE entrance, public & private loading and unloading space for goods vehicles and refuse collection chamber.
1/F	Retail and open deck
2/F	Recreational facilities, RCHE and open deck
3/F to 26/F	Residential floors for both Tower 1 and Tower 2
Building height	100mPD

The proposed development please refers to Figure 2

5 ASSESSMENT AREA

5.1 The assessment area for the visual impact assessment is defined by the visual envelope of the Proposed Development. The visual envelope covers the fields of views from all sensitive viewers in direct sight of the Proposed Development.

5.2 As seen in Figure 1.1, the assessment area extends to include Cheung Wah Estate, Fanling Town Centre and Sheung Shui Divisional Police Station to the east, and extends to the hiking trail of Wu Tip Shan to the south , a portion of On Kui Road and Ma Sik Road to the north. The west extend of the assessment area covers the local residential area of Ling Shan Tsuen and North District Park along S Kwun Po Road. The assessment area also covers the immediate surroundings of the Proposed Development.

5.3 The assessment area is predominantly occupied by developed areas which included residential and working population. The closest residential developments to the Subject Site are La Verte, Fan Leng Lau and Cheung Wah Estate and some low-rise residential buildings at the northwest end of the Subject Site. Public open spaces including Fanling Recreation Ground, Luen Wo Hui Playground and North District Park are located surrounding the Proposed Development.

5.4 The extent of the assessment area is delineated in Figure 1.

6 VIEWING POINTS

6.1 Within the Visual Envelope, the following View Points are identified:

(1) VP1: Cheung Wah Estate;
(2) VP2: Fanling Recreation Ground;
(3) VP3: Residential Area at Fan Leng Lau;
(4) VP4: Fanling Town Centre;
(5) VP5: Luen Wo Hui Playground;
(6) VP6: North District Park;
(7) VP7: Ling Hill;
(8) VP8: Wu Tip Shan

6.2 The location of all VPs is shown in Figure 3.

6.3 VP 1 – Cheung Wah Estate:

VP1 located around 200m away to the proposed development and mainly are local residents. The general view of this VP consist of Former Fanling Magistracy in the foreground and the Fanling Law Courts Buildings in the background. The key public viewers of this VP are mainly the local residents living around Cheung Wah Estate. The visual sensitivity of the public viewers from this VP is graded as *medium*. Existing photo of VP1 is shown in Figure 4.

6.4 VP 2 –Fanling Recreation Ground:

Fanling Recreation Ground located to the southwest of the Proposed Development at around 220m from the closest site boundary. The selected VP is the open space of the Fanling Recreation Ground. The general view of this VP consists of North District Government Offices as foreground and Fanling Law Court Buildings as background. The key public viewers of this VP are mainly the public using the facilities of the Fanling Recreation Ground and the public pass by San Wan Road. The visual sensitivity of the public viewers from this VP is graded as *low*. Existing photo of VP2 is shown in Figure 4.

6.5 VP 3 – Residential Area at Fan Leng Lau:

The Residential Area at Fan Leng Lau located to the north of the Proposed Development at around 230m from the closest site boundary. The residential area mainly consisting one to three storey high village houses for residential uses. The general view of this VP consists of short buildings as the foreground and open sky view as the background. The key public viewers of this VP are mainly the residents of Fan Leng Lau. The visual sensitivity of the public viewers from this VP is graded as *medium*. Existing photo of VP3 is shown in Figure 4.

6.6 VP 4 –Fanling Town Centre:

Fanling Town Centre located at around 300m to the south of the Proposed Development. The general view of this VP consists of carriageway and road side planting as the foreground and the Fanling Law Courts Building and Mount One as the background. The key public viewers of this VP are the travelers to and from the MTRC Fanling Station. The visual sensitivity of the public viewers from this VP is graded as *medium*. Existing photo of VP4 is shown in Figure 4.

6.7 VP 5 – Luen Wo Hui Playground:

Luen Wo Hui Playground located at around 350m to the northeast of the Proposed Development. The general view of this VP consists Fanling Rhenish Church Secondary School and the ball court Leun Wo Hui Playground as the foreground and the open sky view as the background. The key public viewers of this VP are the users of the Luen Wo Hui Playground and the local residents. The visual sensitivity of the public viewers from this VP is graded as *medium*. Existing photo of VP5 is shown in Figure 5.

6.8 VP 6 – North District Park:

North District Park is a district open space for the use of locals and visitors which located at around 600m to the northwest of the Proposed Development. The general view of this VP consists one to three storey high residential buildings of Fanling Ching Wai as the foreground and the Fanling Law Courts Building, Cheung Wah Estate and the open sky view as the background. The key public viewers of this VP are the visitors of the North District Park and the local residents. The visual sensitivity of the public viewers from this VP is graded as *high*. Existing photo of VP6 is shown in Figure 5.

6.9 VP 7 – Ling Hill:

Ling Hill located at around 450m to the northwest of the Proposed Development. The general view of this VP consists the carriageway of Jockey Club Road and the roadside planting as the foreground and Cheung Wah Estate and the open sky view as the background. The key public viewers of this VP are the travelers along Jockey Club road east bound and the local residents of Ling Shan Tsuen. The visual sensitivity of the public viewers from this VP is graded as *low*. Existing photo of VP7 is shown in Figure 5.

6.10 VP 8 – Wu Tip Shan:

The viewing point of Wu Tip Shan located at 200mPD at around 1,000m to the southeast of the Proposed Development. The general view of this VP consists the woodland of Wu Tip Shan as the foreground; MTR Fanling Station, Fanling Town Centre, Cheung Wah Estate, Mount One and the residential buildings of Fanling dominated the overall view and mountain view to the north as the background. The key public viewers of this VP are the travelers along hiking trail of Wu Tip Shan. The visual sensitivity of the public viewers from this VP is graded as *low*. Existing photo of VP8 is shown in Figure 5.

7 VISUAL ELEMENTS

7.1 The visual outlook is shaped by the combined composition of all the visual elements which come into sight of the viewers. Presently the assessment area is dominated by following visual elements:

- The southeast extent of the assessment area is dominated by residential developments, Cheung Wah Estate and Fanling Town Centre, which consists of high-rise residential buildings and shopping complex. Former Fanling Magistracy adjoining to the Proposed Development which is a Grade 3 historic building is a dominated the visual elements of the assessment area.

- The northern extent of the assessment area is dominated by low-rise buildings such as the La Verte, Fan Leng Lau and Fan Gardens which are the local village in the assessment area. Further north extent is Luen Wo Hui which is an old local town consisting low-rise residential buildings and marketplace.

- The northwest extent of the assessment area is dominated by the low-rise residential buildings of Fanling Wai and further northwest is the woodland at Ling Hill and the open space of North District Park.

- Apart from the major visual elements discussed above, there are some recreation ground, open spaces within the assessment area such as Fanling Playground, Fan Leug Lau Pleasure Ground and Fung Ying Seen Koon at the south of the assessment area.

8 APPRAISAL OF VISUAL CHANGES

8.1 VP1 –Cheung Wah Estate

Visual Composition

- As shown in Figure 6, the view from VP1 is dominated by the road side planting and the Former Fanling Magistracy.
- Sky view can be seen above the Former Fanling Magistracy along Sha Tau Kok Road – Lung Yeuk Tau.
- The height and the massing of the Proposed Development will becoming dominant to this VP compare to the height of the existing buildings.
- The Proposed Development is located at the back of the Former Fanling Magistracy and to the right of the Fanling Law Courts Buildings. Although the proposed development consists of two building blocks with 100mPD high, the Former Fanling Magistracy and the roadside planting at the foreground screened off most of the building of the Proposed Development.

Visual Obstruction

- The Proposed Development will have limited obstruction to the previously stated visual elements. The Proposed Development partially block the sky view but the majority still remain visible.

Effect on Public Viewers

- The Proposed Development is located about 200m from Cheung Wah Estate and the view to the Proposed Development is partly intercepted by the roadside planting and the Former Fanling Magistracy.
- The value of this view is primarily attached to the visual amenity of the Former Fanling Magistracy in the foreground and the roadside planting. Given the Proposed Development has limited effect to the visual composition of this VP, thus the effect of visual changes on public viewers from this VP is qualitatively graded as *moderate*.

Effect on Visual Resources

- The building blocks (100mPD) of the Proposed Development create visual change to this VP. The massing of the Proposed Development partially occupied the view of this VP. However, the roadside tree planting at the foreground of this VP partially screen off the building blocks of the Proposed Development.
- As stated above, the Proposed Development will have slightly obstructions of the prominent visual resources / elements of this view. As such, it is unlikely that the Proposed Development will degrade the visual amenity that is enjoyed from the VP. Therefore, no unacceptable visual impact is anticipated from the Proposed Development.

8.2 VP2 –Fanling Recreation Ground

Visual Composition

- As shown in Figure 7, the view from Fanling Recreation Ground has an open view to the sky view even there are existing buildings dominated the view. The roadside planting along San Wan Road and the greenery in the Fanling Recreation Ground provided visual comfort to the composition.

- The Fanling Law Courts Building, North District Government Offices and the partial sky view form the visual background of this VP.

- The massing, disposition of the Proposed Development will create a new visual composition to this VP. The visual corridor between two buildings maintained a sky view.

- The Proposed Development located at the back of the Fanling Law Courts Building and North District Government Offices. The massing of the Proposed Development dominated the visual composition of this VP. However, the lower portion of the Proposed Development is blocked by the existing buildings in the foreground and the proposed building height and mass are similar to the adjacent Cheung Wah Estate. As such, the Proposed Development is considered not incompatible with the existing developments.

Visual Obstruction

- The Proposed Development will create massive backdrop to this VP which partially obstruct the sky view and reduce the openness of the VP.

- The proposed building height of the Proposed Development is 100mPD which is similar to the height of the adjacent Cheung Wah Estate.

- A visual corridor is maintained between 2 building blocks of the Proposed Development to allow partial open up the sky view.

- The obstruction of the Proposed Development will have limited effect to this VP and reduces the openness of the VP.

Effect on Public Viewers

- The viewpoint is located about 220m from the Proposed Development and the view is partly intercepted by the existing buildings and facilities of the Park.

- The value of this view is primarily attached to the visual amenity of the roadside planting and the open lawn of the Fanling Recreation Ground in the foreground and the buildings in the background. Given the Proposed Development will not sufficiently degrade the visual composition of this VP, thus the effect of visual changes on public viewers from this VP is qualitatively graded as *moderate*.

Effect on Visual Resources

- The building blocks (100mPD) of the Proposed Development create visual change to this VP. The two building blocks of the Proposed Development partially occupied the sky view of this VP behind the existing buildings. As the Proposed Development is built close the existing buildings and visually intact with them. In addition, the height of the Proposed Development is similar to the building height of the existing Cheung Wah Estate. The Proposed Development is compatible to the surrounding environment.

- The view from this VP is largely characterized by the roadside planting and facilities of the Fanling Recreation Ground in the foreground and the buildings in the background. The Proposed Development is only partially visible from this VP. It will visually blend in with other buildings of Cheung Wah Estate at the right side of the background.

8.3 VP3 – Residential Area at Fan Feng Lau

Visual Composition

- As shown in Figure 8, the view from the residential area at Fan Feng Lau is dominated by the low-rise buildings and partial sky view can be seen above the low-rise buildings.

- There is 220m distance between the Proposed Development and the Fan Feng Lau, the disposition of the proposed buildings allow a visual corridor to maintain a certain sky view from this VP.

- Only the upper part of the Proposed Development is seen from this VP due the angle of elevation. The low-rise buildings of Fan Feng Lau still dominated.

Visual Obstruction

- The Proposed Development will have limited obstruction to the previously stated visual elements. The Proposed Development will partially blocked the sky view. Only small portion of the Proposed Development can be seen from this VP.

Effect on Public Viewers

- The Proposed Development is partly blocked by the existing low-rise residential buildings of Fan Leng Lau, the visual corridor between 2 building blocks can maintain the sky view to the public. Thus, the effect of visual changes on public viewers from this VP is qualitatively graded as *moderate*.

Effect on Visual Resources

- The building blocks (100mPD) of the Proposed Development create visual change to this VP. The two building blocks of the Proposed Development partially occupied the sky view of this VP behind the existing low-rise buildings. Only the top portion of the Proposed Development can be seen from this VP and it is visually intact to the existing buildings in the foreground. Thus, the Proposed Development is compatible to the surrounding environment.

- As stated above, the Proposed Development will have slight obstructions to the prominent visual resources / elements of this view. Therefore, it is unlikely that the Proposed Development will degrade the visual amenity that is enjoyed from the VP. Therefore, no unacceptable visual impact is anticipated from the Proposed Development.

8.4 VP4 –Fanling Town Centre

Visual Composition

- As shown in Figure 9, the view from Fanling Town Centre is dominated by roadside planting in the foreground and has limited view to the buildings in the background.

- Sky view can only by seen above the existing buildings and top of the existing trees at the junction of San Wan Road and Sha Tau Kok Road – Lung Yeuk Tau.

- The Proposed Development located in between Fanling Law Courts Building and Mount One which fill in the building space of these buildings and becoming a major visual composition of this VP.

- The Proposed Development largely reduce the visual openness of the locality and resulted large obstruction to this VP.

Visual Obstruction

- The Proposed Development will have large obstruction to the previously stated visual elements. Most of the sky view in the centre of this VP is blocked by the Proposed Development.

Effect on Public Viewers

- Although the building height of the Proposed Development is higher than that of the adjacent Fanling Health Centre, The Proposed Development is 300m away from this VP. The effect on public viewers is not sufficient.

- The value of this view is primarily attached to the visual amenity offered by the existing roadside planting in the foreground. Given the Proposed Development will only partially intercept the sky view from this VP, the effect of visual changes on public viewers from this VP is qualitatively graded as *moderate*.

Effect on Visual Resources

- The building blocks (100mPD) of the Proposed Development create visual change to this VP. The building blocks of the Proposed Development partially occupied the sky view of this VP between two existing buildings. The height of the Proposed Development is much higher than the surrounding developments. Which result the Proposed Development is not fully compatible to the surrounding environment.

- As stated above, the Proposed Development has obstructions of the visual resources /

elements of this view. However, the Proposed Development is 300m away from this VP and only causes partial blockage the sky view. As such, it is unlikely that the Proposed Development will sufficiently degrade the visual amenity that is enjoyed from the VP. Therefore, no unacceptable visual impact is anticipated from the Proposed Development.

8.5 VP5 –Luen Wo Hui Playground

Visual Composition

- As shown in Figure 10, the view from Luen Wo Hui Playground has an open view of the sky and the existing Fanling Rhenish Church Secondary School as background of this VP.
- The ball court of Luen Wo Hui Playground dominated the visual composition of the VP.
- The location and height of the Proposed Development create minor visual impact to the existing visual composition. Most of the existing visual composition are maintained.
- The Proposed Development located behind the Fanling Rhenish Church Secondary School. Upper part of the Proposed Development can be seen from this VP and occupied part of the sky view.
- The upper part of the Proposed Development visually merged to the existing buildings in the foreground to become a united visual composition to this VP.

Visual Obstruction

- The visual openness of this VP is slightly obstructed and the visual composition of the open sky view of this VP is also obstructed by the Proposed Development.
- The obstruction of the Proposed Development will have limited effect to this VP.

Effect on Public Viewers

- The Proposed Development is located about 350m from Luen Wo Hui Playground and the view to the Proposed Development is partly intercepted by the existing school.
- The visual composition mainly the recreational facilities of the Luen Wo Hui Playground and the adjacent buildings. The Proposed Development will not degrade the visual composition of this VP as the existing buildings block the major parts of the Proposed Development, thus the effect of visual changes on public viewers from this VP is qualitatively graded as *slight*.

Effect on Visual Resources

- The building blocks (100mPD) of the Proposed Development create visual change to this VP. The two building blocks of the Proposed Development slightly occupied the

sky view of this VP behind the existing school buildings. As the Proposed Development is visually intact with them. The Proposed Development is compatible to the surrounding environment.

- The view from this VP is largely characterized by the recreational facilities of the Luen Wo Hui Playground in the foreground and the school buildings in the background. The Proposed Development is only partially visible from this VP.

8.6 VP6 –North District Park

Visual Composition

- As shown in Figure 11, the view from this VP is dominated by the open area and the low-rise building of Fanling Wai.
- The upper parts of Fanling Law Courts Buildings and residential blocks of Cheung Wah Estate can be seen above the low-rise buildings.
- Since the Proposed Development is far away from this VP, only little part of the building massing can be seen and create very minor impact to the existing visual composition.
- The Proposed Development is located between Cheung Wah Estate and Fanling Law Courts Building. The Proposed Development is slight higher than the buildings of Cheung Wah Estate.
- The overall building height is slightly higher than the surrounding buildings and the small portion of the Proposed Development visually merged to the adjacent existing buildings to become a united building mass to this VP.

Visual Obstruction

- As the Proposed Development is slightly higher than the buildings of Cheung Wah Estate, thus the visual obstruction by the Proposed Development is blocking the residential buildings behind and partially the sky view.

Effect on Public Viewers

- The Proposed Development is located about 600m from North District Park and the view to the Proposed Development is largely intercepted by the buildings in the front.
- The value of this view is primarily attached to the visual amenity of the low-rise buildings and the open area at the foreground. Given the Proposed Development has limited effect to the visual composition of this VP, thus the effect of visual changes on public viewers from this VP is qualitatively graded as *slight*.

Effect on Visual Resources

- The building blocks (100mPD) of the Proposed Development create slight visual

change to this VP. The building blocks of the Proposed Development slightly occupied the sky view of this VP behind the existing buildings. As the Proposed Development intact with them and only small portion of the Proposed Development can be seen from this VP. The Proposed Development is compatible to the surrounding environment.

- As stated above, the Proposed Development will have slightly obstructions of the prominent visual resources / elements of this view. As such, it is unlikely that the Proposed Development will degrade the visual amenity that is enjoyed from the VP. Therefore, no unacceptable visual impact is anticipated from the Proposed Development.

8.7 VP7 –Ling Hill

Visual Composition

- As shown in Figure 12, the view from this VP is dominated by the carriageway of Jockey Club road and their roadside planting.
- Parts of the Cheng Wah Estate is visible from the VP.
- The location, height and massing of the Proposed Development basically create no effect to the existing visual composition. It's almost merged with the existing visual composition when viewing from this VP.
- The Proposed Development is located in front of Cheung Wah Estate and only partial view of the Proposed Development can be seen from this VP.
- The whole massing of the Proposed Development is merged with the adjacent buildings and visual elements and will not cause obstruction to the sky view.

Visual Obstruction

- Although the height of the Proposed Development is 100mPD which is slightly higher than the buildings of Cheung Wah Estate, most of the Proposed Development is block by the structure along to the Jockey Road thus the Proposed Development will not cause major visual obstruction to this VP.

Effect on Public Viewers

- The Proposed Development is located about 450m from Ling Hill and the view to the Proposed Development is largely intercepted by the adjacent building and structure.
- The value of this view is primarily attached to the visual amenity of the roadside planting of Jockey Club Road and the sky view. Given the Proposed Development has very limited effect to the visual composition of this VP, thus the effect of visual changes on public viewers from this VP is qualitatively graded as *slight*.

Effect on Visual Resources

- The building blocks (100mPD) of the Proposed Development create slight visual change to this VP. The building blocks of the Proposed Development only occupied small portion of the sky view of this VP. As the Proposed Development is in front of Cheung Wah Estate with similar building height. The Proposed Development is compatible to the surrounding environment.

- As stated above, the Proposed Development will have slightly obstructions of the prominent visual resources / elements of this view. As such, it is unlikely that the Proposed Development will degrade the visual amenity that is enjoyed from the VP. Therefore, no unacceptable visual impact is anticipated from the Proposed Development.

8.8 VP8 – Wu Tip Shan

Visual Composition

- As shown in Figure 13, the view from the viewing point of Wu Tip Shan is dominated by buildings and the mountain woodland surround.

- The location, disposition, height and massing of the Proposed Development create no effect to the existing visual composition. Since the Proposed Development located in the middle of developed area which surrounded by existing buildings.

- Natural mountain and sky view can be seen above the existing buildings from this VP.

- The Proposed Development located in the existing building group.

- The Proposed Development totally merged with the adjacent building developments. No major obstruction to the surrounding visual element.

Visual Obstruction

- The height of the Proposed Development is similar to the surrounding buildings and blended into the visual element of the VP. No major visual obstruction by the Proposed Development to this VP.

Effect on Public Viewers

- As the VP is located 200mPD and 1,000m away from the Proposed Development and the massing of the Proposed Development is blended in with the surrounding buildings. The effect on public viewers is not sufficient.

- The value of this view is primarily attached to the visual amenity offered by the natural woodland at the back. Given the Proposed Development will not higher than the buildings at the back and blend in with the surrounding built environment, the effect of visual changes on public viewers from this VP is qualitatively graded as *negligible*.

Effect on Visual Resources

- The Proposed Development create almost no visual change to this VP. The Proposed Development located in the existing building groups with similar building height as view from this VP. The Proposed Development is totally compatible to the surrounding environment.

- As stated above, the Proposed Development will have no major obstructions of the prominent visual resources / elements of this view and blend in with the surrounding built environment. As such, it is unlikely that the Proposed Development will degrade the visual amenity that is enjoyed from the VP. Therefore, no unacceptable visual impact is anticipated from the Proposed Development.

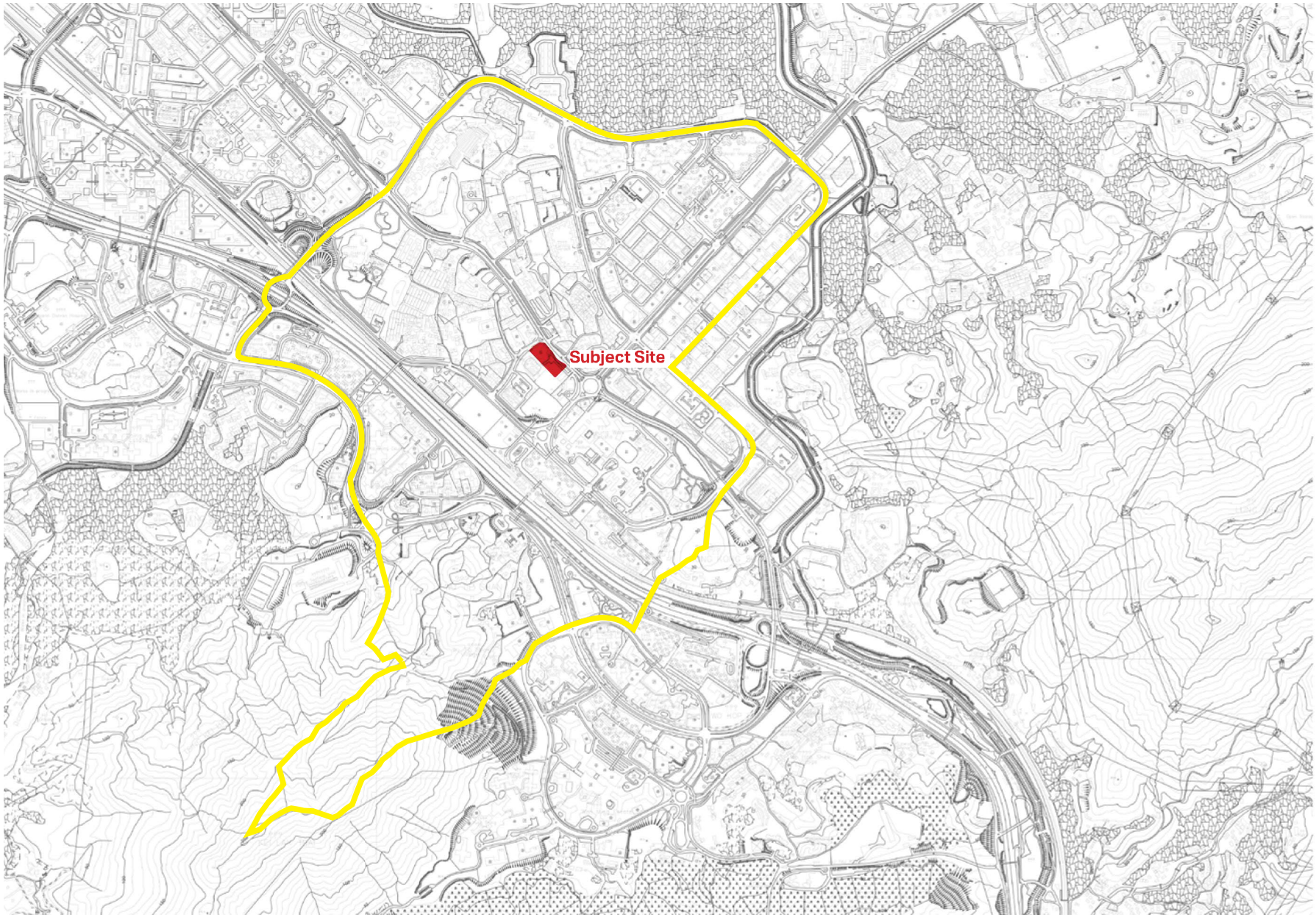
9 EVALUATION OF OVERALL VISUAL IMPACT

9.1 The design and layout of the Proposed Development has carefully considered the surrounding contexts and key public viewers located within the assessment area. The Proposed Development consists of two building towers. The massing and disposition of the building blocks have been carefully considered not to create sufficient visual blockage and create a 34.5m wide visual corridor to reduce the visual impact to the surrounding especially along the northeast / southwest visual axis. Refer to Figure 2 for the massing and disposition of the building blocks and visual corridor. As shown on the photomontages of VP2, VP3, VP5 and VP8, the visual corridor allows visual transparency from the viewpoints although the Proposed Development obstructed part of the open view.

9.2 The introduction of the Proposed Development, having considered the sensitivity of public viewers, the visual composition, the visual resources, the effects on public viewers and the effects visual resources, will not generate significant adverse visual impact. The visual change caused by the Proposed Development is not significant when viewed from the identified VPs. It will not detract the visual value attached to the views or have a significant impact to the visual accessibility to the existing visual amenity and resources nearby. Urban design such as creation of visual corridors and disposition of buildings proposed as part of the Proposed Development would serve to improve the overall quality and help alleviate to some degree the potential visual impact arising from the new developments. Mitigation measures such as greening measures and facade treatments may be explored in subsequent architectural design stage to further improve the overall aesthetics and visual interests of the proposed development.

9.3 To this end, the Proposed Development has, in overall terms, no significant negative visual impact. Efforts have been made to ameliorate the potential visual impact of the Proposed Development as far as possible. Whilst some degree of visual obstruction will occur, they are generally insignificant. In return, the Proposed Development will make a positive contribution to the supply of housing units and optimize land utilization. The resultant overall impact is therefore concluded as **slightly adverse**.

Figure 1 - Subject Site and Visual Envelope



Subject Site
Visual Envelope

Figure 2 - Proposed Development

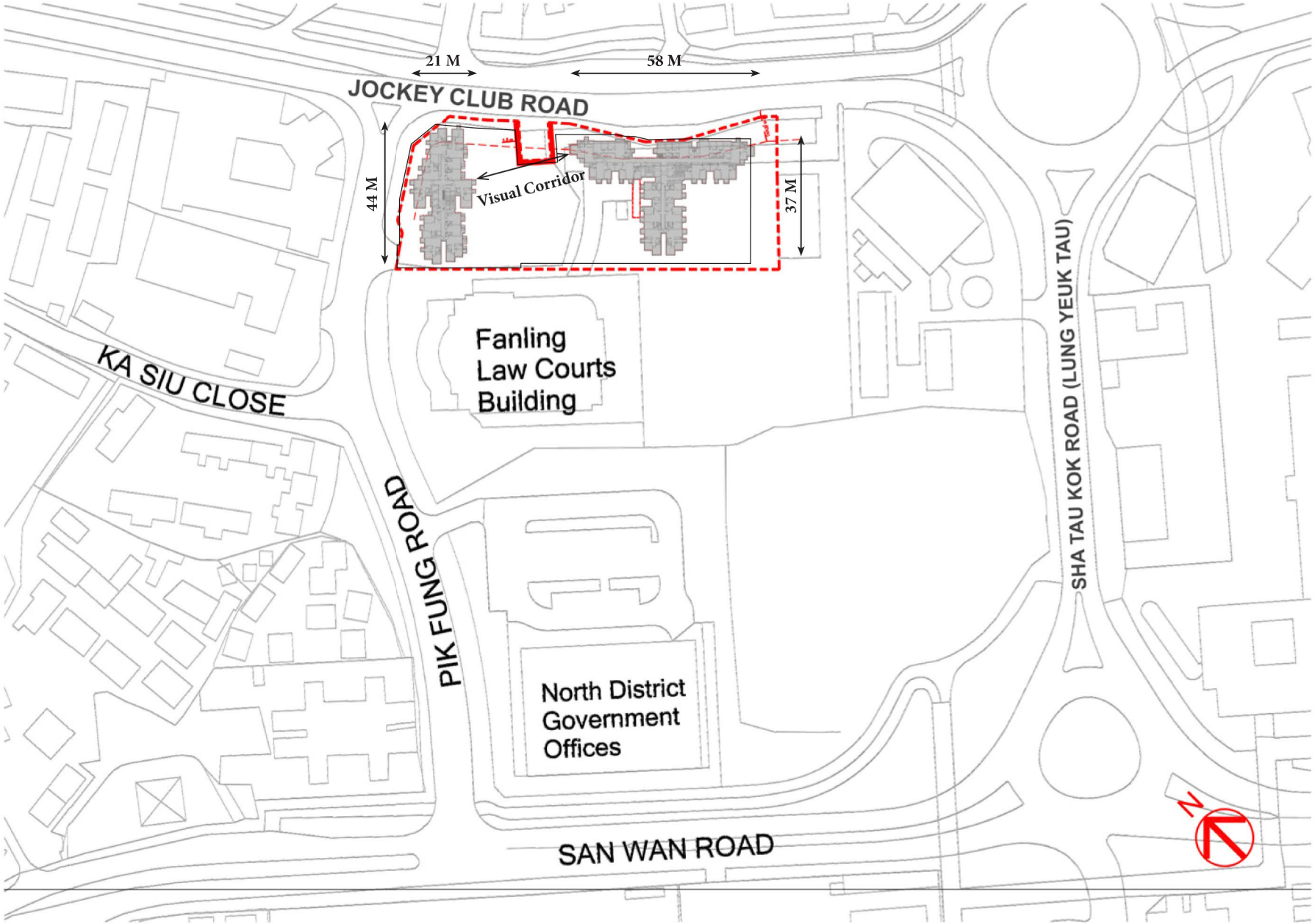
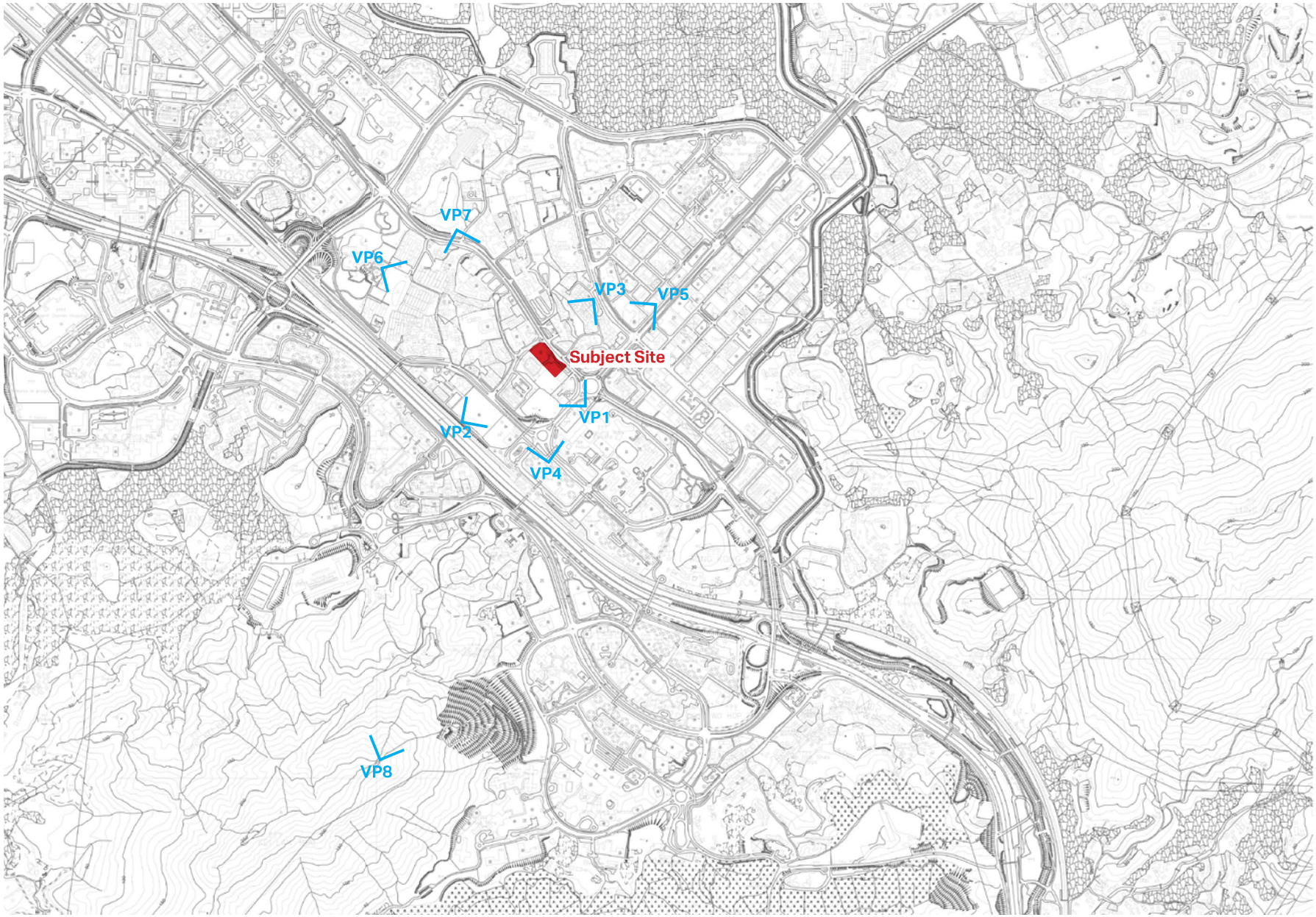


Figure 3 - Location of View Points



Subject Site

Figure 4 - Existing Photos of View Points (VP1 - VP4)



VP 1 - Cheung Wah Estate



VP 2 - Fanling Recreation Ground



VP 3 - Residential Area at Fan Leng Lau



VP 4 - Fanling Town Centre

Figure 5 - Existing Photos of View Points (VP5 - VP8)



VP 5 - Luen Wo Hui Playground



VP 6 - North District Park



VP 7 - Ling Hill



VP 8 - Wu Tip Shan

Figure 6 - Photomontage of VP1 Cheung Wah Estate



Existing VP 1 - Cheung Wah Estate

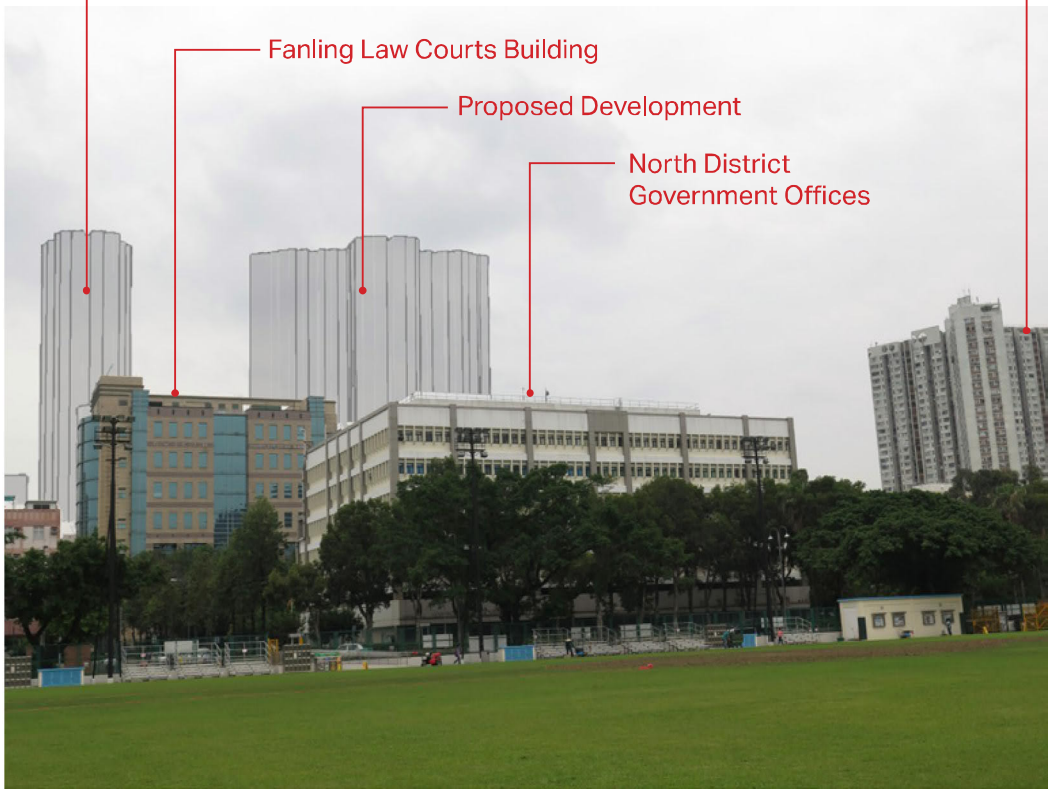


After VP 1 - Cheung Wah Estate

Figure 7 - Photomontage of VP2 Fanling Recreation Ground



Existing VP 2 - Fanling Recreation Ground



After VP 2 - Fanling Recreation Ground

Figure 8 - Photomontage of VP3 Residential Area at Fan Leng Lau



Existing VP 3 - Residential Area at Fan Leng Lau



After VP 3 - Residential Area at Fan Leng Lau

Figure 9 - Photomontage of VP4 Fanling Town Centre



Existing VP 4 - Fanling Town Centre



After VP 4 - Fanling Town Centre

Figure 10 - Photomontage of VP5 Luen Wo Hui Playground



Existing VP 5 - Luen Wo Hui Playground

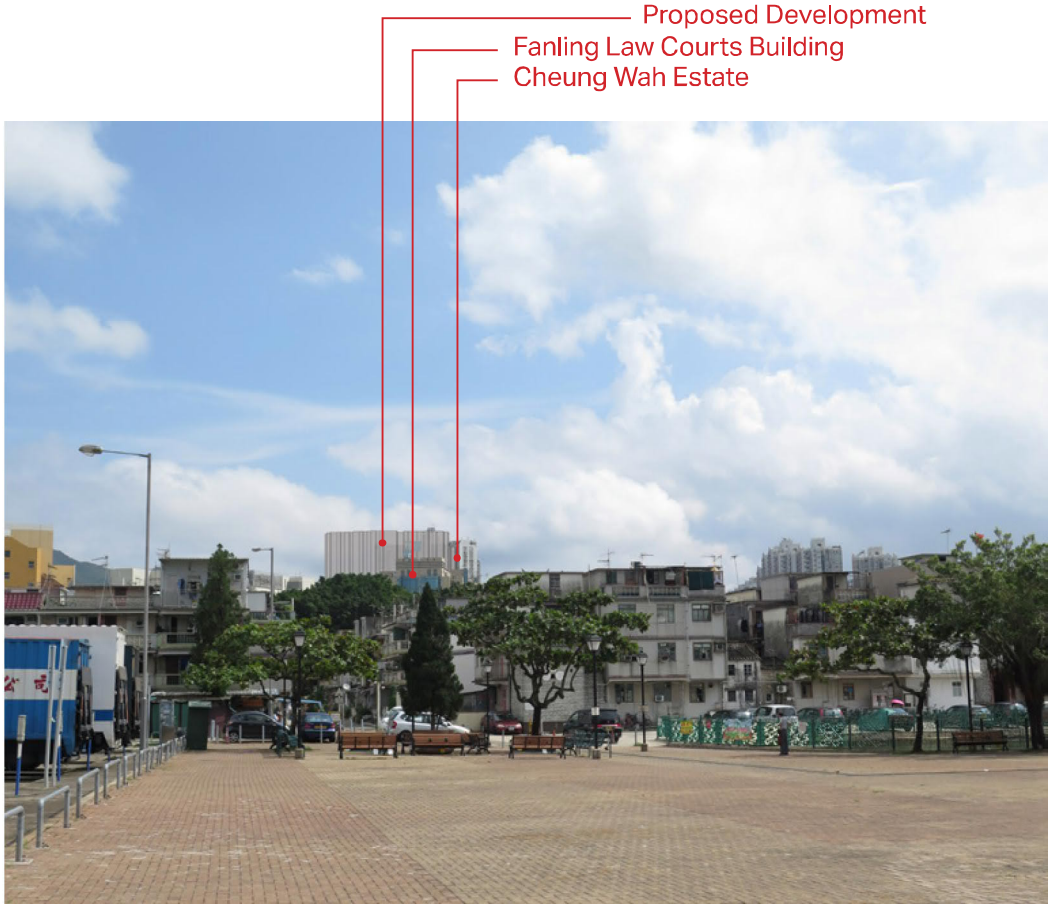


After VP 5 - Luen Wo Hui Playground

Figure 11 - Photomontage of VP6 North District Park



Existing VP 6 - North District Park



After VP 6 - North District Park

Figure 12 - Photomontage of VP7 Ling Hill



Existing VP 7 - Ling Hill



After VP 7 - Ling Hill

Figure 13 - Photomontage of VP8 Wu Tip Shan



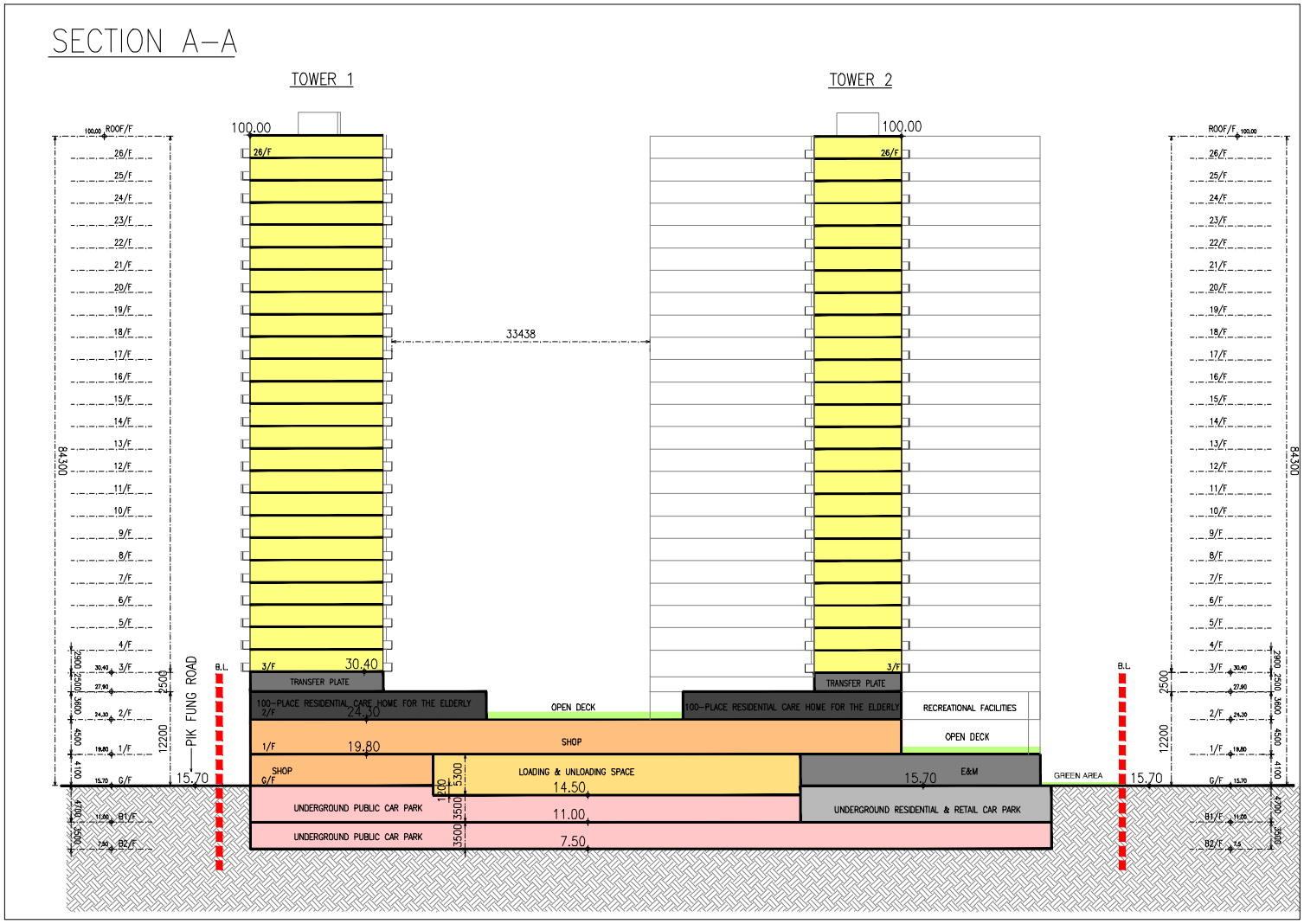
Existing VP 8 - Wu Tip Shan



After VP 8 - Wu Tip Shan

JOCKEY CLUB ROAD
SK-15

SECTION A–A



B.D. REFERENCE	屋宇署檔案
F.S.D. REFERENCE	消防處檔案
W.W.O. REFERENCE	水務署檔案
CAD FILE NAME	檔案編號
NOTES	注釋

NO. 修定號	REVISIONS 修定內容	DATE 日期	BY 經手人

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HKIA, AP(Architect), Registered Architect

ALL MEASUREMENTS MUST BE CHECKED AT THE WORK BY THE CONTRACTOR
所有尺寸應由承建商於工地核實
DO NOT SCALE FROM DRAWINGS 尺寸不應由圖紙直接量度
ALL PRINTS, SPECIFICATIONS AND THEIR COPYRIGHT ARE THE PROPERTY OF THE ARCHITECT AND SHALL BE RETURNED AT THE COMPLETION OF THE WORK
所有印刷、規格說明及所有的版權屬於建築師及應在工程完成後歸還建築師

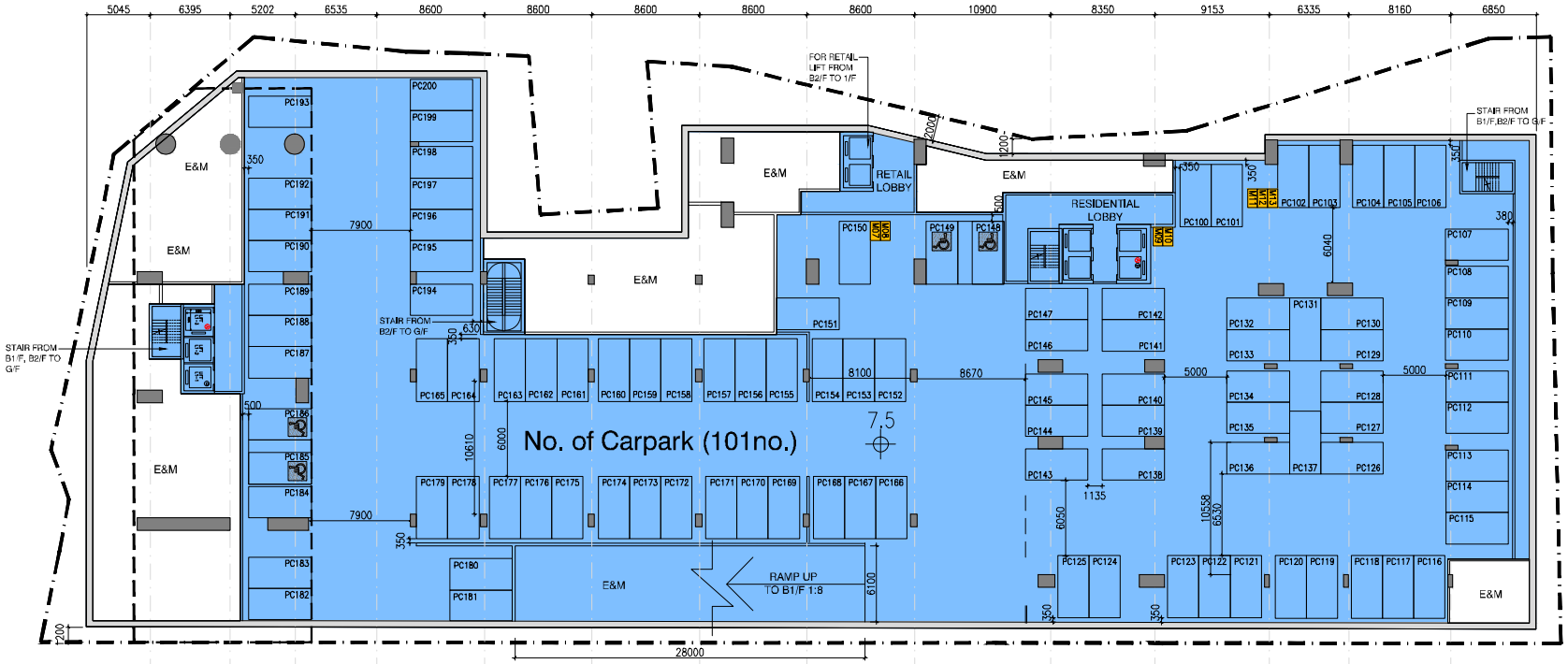
PROJECT 項目名稱

JOCKEY CLUB ROAD, FANLING

TITLE 標題

SECTION A–A

SCALE 比例	DATE 日期
1:600 (A3)	FEB 2016
DRAWN BY 製作人	CHECKED BY 檢查
HYC	MC
JOB NO. 工程項目	DRAWING NO. 圖號
N1989–H	SK–15

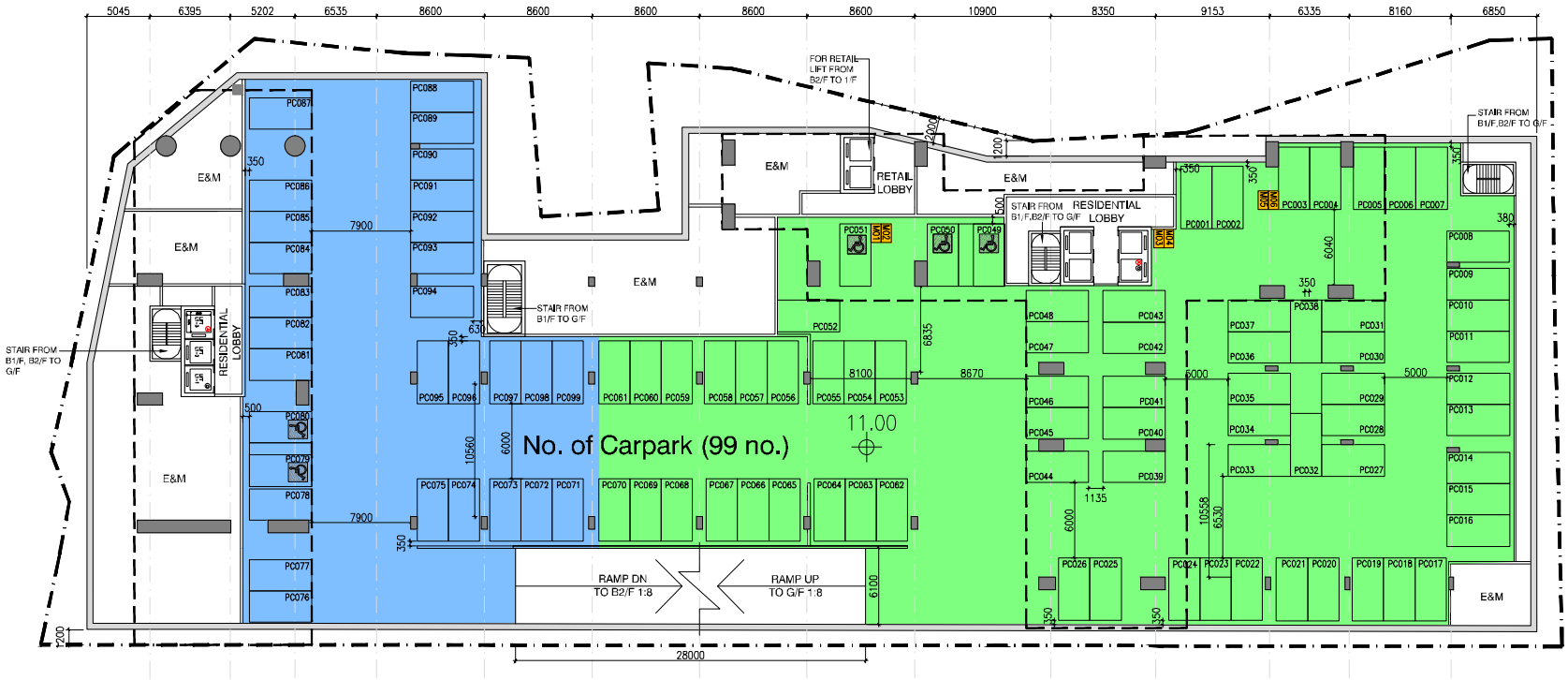


TYPE OF CARPARK	NO OF CARPARK (REQUIRMENT UNDER HKPSG)	PROPOSED PROVISION			CARPARK NO.
		FLOOR	NO.	TOTAL.	
PRIVATE	45 (RESIDENTIAL) 13 (RETAIL) 10 (VISITOR)	B1	70	70	PC001- PC070
PUBLIC	83	B1	29	130	PC071- PC200
		B2	101		
MOTORCYCLE	6 (RESIDENTIAL) 2 (RETAIL)	B1	6	13	M01 to M13
		B2	7		

B2

SCALE 1:400

NOTES: All plant room provisions subject to confirmation by E&M consultant

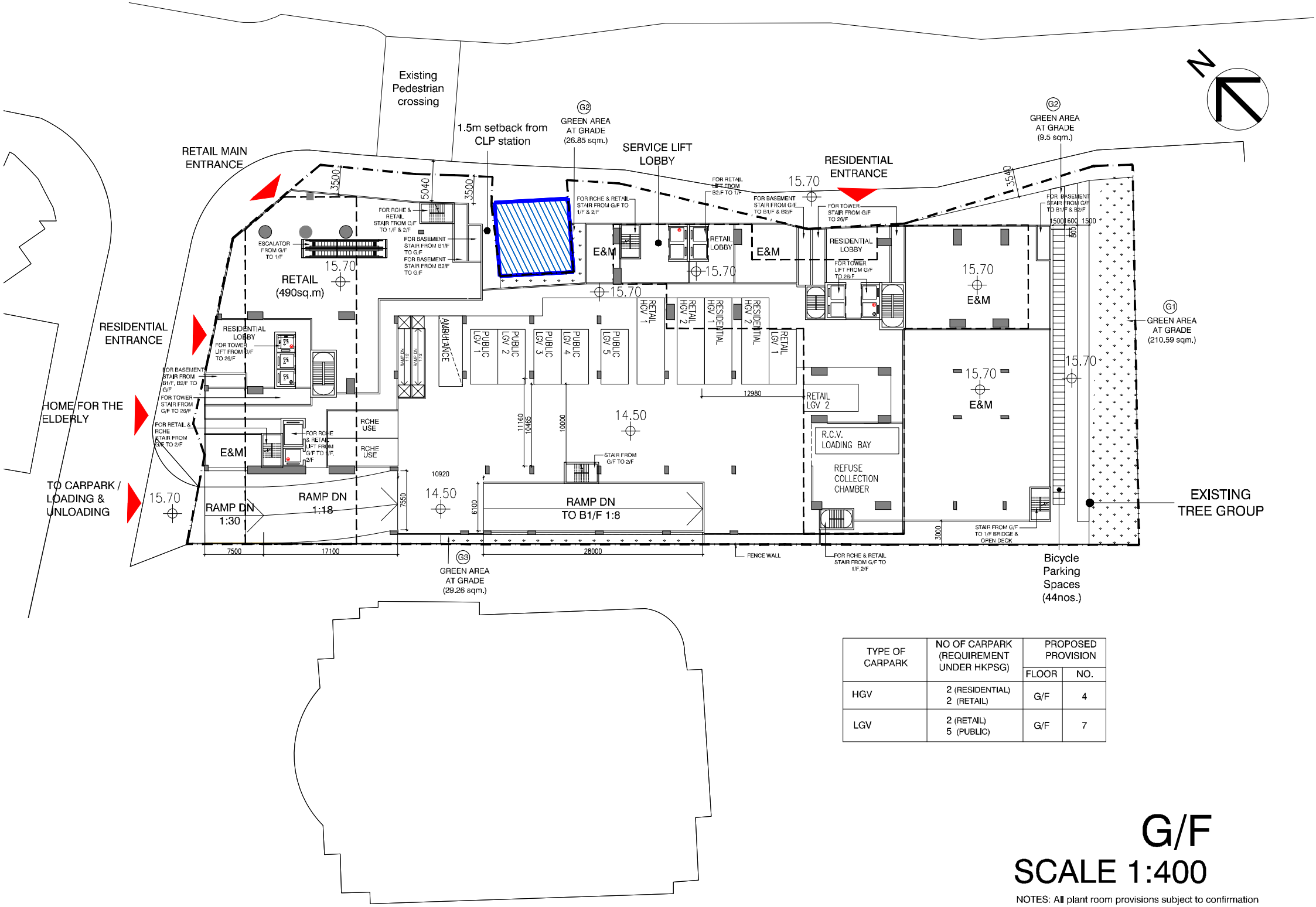


TYPE OF CARPARK	NO OF CARPARK (REQUIRMENT UNDER HKPSG)	PROPOSED PROVISION			CARPARK NO.
		FLOOR	NO.	TOTAL.	
PRIVATE	45 (RESIDENTIAL) 13 (RETAIL) 10 (VISITOR)	B1	70	70	PC001- PC070
PUBLIC	83	B1	29	130	PC071- PC200
		B2	101		
MOTORCYCLE	6 (RESIDENTIAL) 2 (RETAIL)	B1	6	13	M01 to M13
		B2	7		

B1

SCALE 1:400

NOTES: All plant room provisions subject to confirmation by E&M consultant



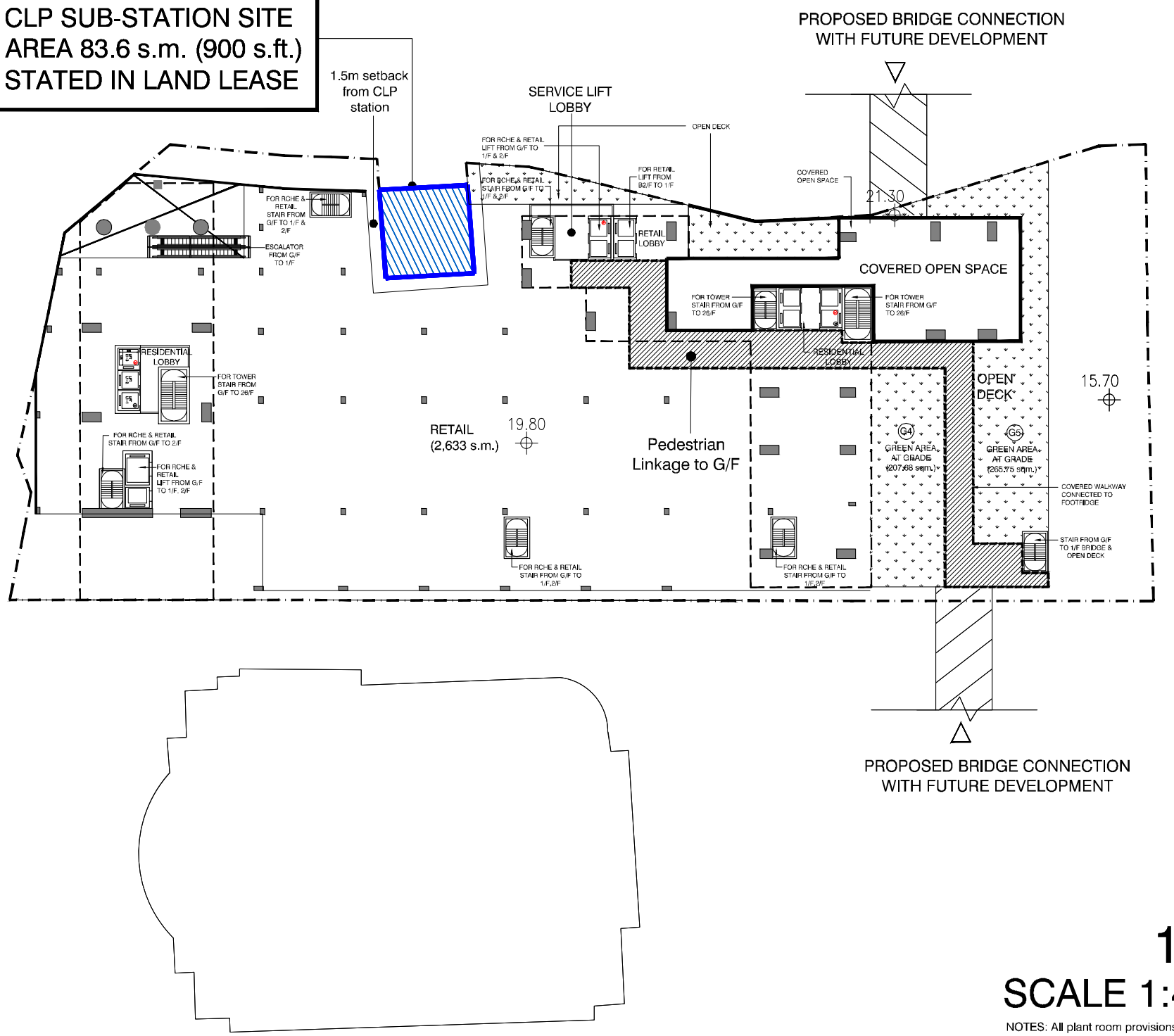
TYPE OF CARPARK	NO OF CARPARK (REQUIREMENT UNDER HKPSG)	PROPOSED PROVISION	
		FLOOR	NO.
HGV	2 (RESIDENTIAL) 2 (RETAIL)	G/F	4
LGV	2 (RETAIL) 5 (PUBLIC)	G/F	7

G/F

SCALE 1:400

NOTES: All plant room provisions subject to confirmation by E&M consultant

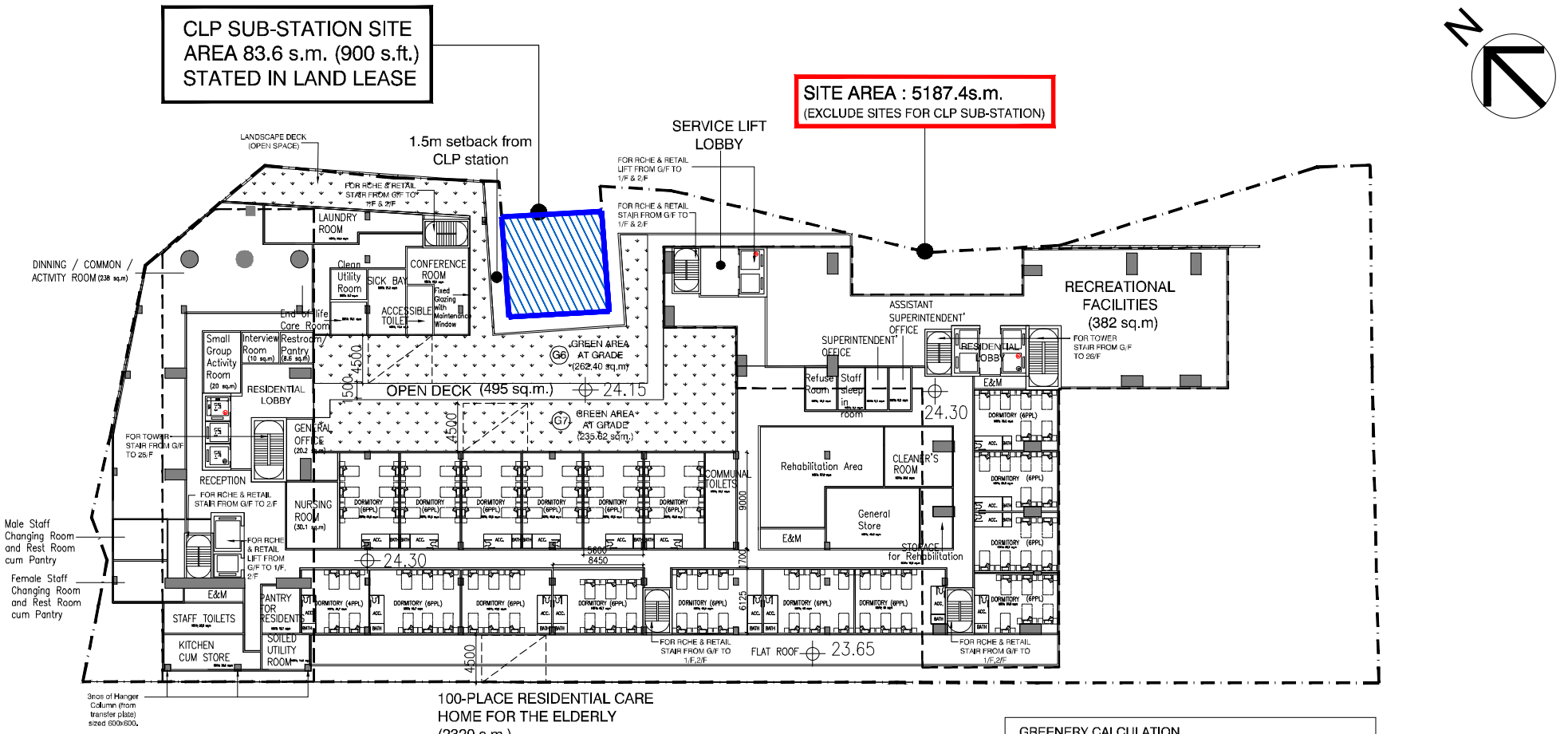
CLP SUB-STATION SITE
AREA 83.6 s.m. (900 s.ft.)
STATED IN LAND LEASE



1/F

SCALE 1:400

NOTES: All plant room provisions subject to confirmation by E&M consultant



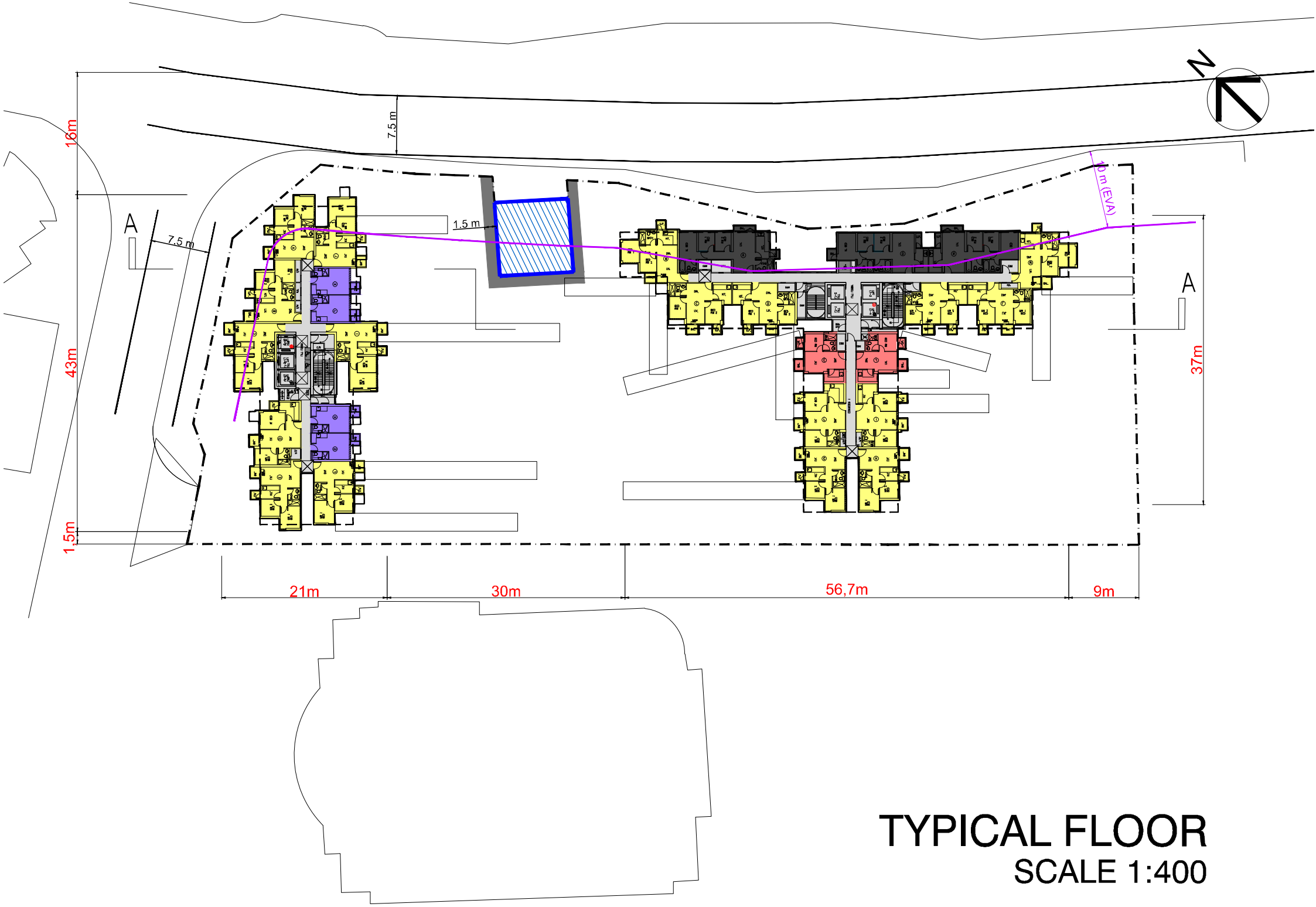
GREENERY CALCULATION		
REQUIRED	PROVIDED	
	FLOOR	AREA (sq.m)
5187.4 sq.m (Site area) x 20%	G/F	(G1) = 210.59
		(G2) = 9.5
		(G3) = 29.26
	1/F	(G4) = 207.68
		(G5) = 265.75
	2/F	(G6) = 262.40
		(G7) = 235.62
= 1037.48 sq.m	TOTAL	= 1221 (> REQUIRED)

NOTES: DETAIL LANDSCAPE LAYOUT AND CALCULATION TO BE CONFIRMED BY LANDSCAPE ARCHITECT.

2/F

SCALE 1:400

NOTES: All plant room provisions subject to confirmation by E&M consultant



TYPICAL FLOOR

SCALE 1:400

Appendix 4 – Extracts from Tree Assessment Report

Hong Kong Housing Society

Proposed Subsidized Housing Development at Jockey Club Road, Fanling

Tree Assessment Report

November 2018

AECOM

Proposed Subsidized Housing Development at Jockey Club Road, Fanling

Content

1. Objectives
2. Methodology
3. Legislation, Standards and Guidelines
4. Existing Condition Of The Trees
5. Proposed Development
6. Proposed Treatment To The Existing Trees
7. Tree Compensation Proposal
8. Soft Landscape Work Maintenance
9. Appendix
    - Appendix 1 – Tree Survey and Recommendation Plan
    - Appendix 2 – Tree Assessment Schedule
    - Appendix 3 – Existing Tree Photo Record
    - Appendix 4 – Compensatory Planting Plan
    - Appendix 5 – Typical Sections/ Details of Planting Area
    - Appendix 6 – Specification for Tree preservation, felling, transplanting

Proposed Subsidized Housing Development at Jockey Club Road, Fanling
Tree Assessment Report

1. OBJECTIVES

1.1 The aim of this application is to submit tree preservation and tree removal application for proposing subsidized Housing Development at Jockey Club Road, Fanling (Proposed Development).

2. METHODOLOGY

In accordance with Lands Administration Office Practice Note (LAO PN) No. 7/2007, all existing individual trees with a trunk diameter larger than 95mm (300mm girth) measured at 1300mm above ground level are surveyed and identified with the following information recorded and presented in the Tree Schedule in the **Appendix 2 - Tree Assessment Schedule**:

1. Tree/ Photo No.: Individual tree is being number labelled and marked on site and denoted correspondingly on the plan.

2. Species : Botanical and Chinese names of the trees surveyed.

3. Top of Soil : Level of root collar

4. Tree size :
   - Overall Height : Height measured from ground level to the top branch;
   - Trunk Diameter: Diameter of the main trunk measured at 1.3m high above ground level;
   - Average Crown Spread: Average diameter of the foliage canopy.

5. Top of soil level above root collar:
   - Level of the individual trees is being measured at root collar.

6. Form:
   - Good (G): Well-balanced crown and straight strong trunk(s);
   - Fair (F): Slightly unbalanced crown and non-straight trunk(s);
   - Poor (P): Misshapen or awkwardly-forked trunk and/or unbalanced crown.

7. Health:
   - Good (G): Sound and healthy trees;
   - Fair (F): Trees which are with few or no visible defects or health problem;
   - Poor (P): Rot and/or cavities in the main trunk and/or crown die back, severely infected with disease.

8. Structural Condition:
   - Good (G): Trees with no or little sign of structural defect and would have low risk level of potential failure;
   - Fair (F): Trees with moderate sign of structural defect and would have medium risk level of potential failure;
   - Poor (P): Trees with significant and obvious sign of structural defect and would have high risk level of potential failure.

9. Amenity Value: Assessed according to form, size, age, condition and situation of the tree:
    - High: Specimen or rare trees to be retained if at all possible;
    - Medium: Trees which individually or collectively make a useful but not vital contribution to the local environment;
    - Low: Dying, dangerous and unhealthy trees and trees of generally poor form and shape.

10. Survival rate after transplanting: The probability of the trees surviving after transplanting.
    - High: Trees are high survival rate after transplanting.
    - Medium: Trees are moderate survival rate after transplanting.
    - Low: Trees are less chance to survive after transplanting.

11. Suitability for Transplanting: Assess the suitability of affected trees to be transplanted taken into account the following factors: -
    - conditions of the tree to be transplanted (including form, health and structure which will affect success of the proposed transplanting);
    - size, species, and conservation status of the tree to be transplanted;
    - availability and suitability of a permanent receptor site, both within and outside the site;
    - adequate time for preparation of transplanting operation;
    - access to the existing location and transportation to the receptor site (including availability of access to accommodate the tree, topography of the proposed route, engineering limitations, etc.); and
    - cost-effectiveness

      Trees with the following features should not be considered suitable for transplanting under normal circumstances:
    - low amenity value;
    - irrecoverable form after transplanting (e.g. if substantial crown and root pruning are necessary to facilitate the transplanting);
    - low survival rate after transplanting;
    - very large size (unless the feasibility to transplant has been considered financially reasonable and technically feasible during the feasibility stage);
    - with evidence of over-maturity and onset of senescence;
    - with poor health, structure or form (e.g. imbalanced form, leaning, with major cavity/cracks/splits); or
    - undesirable species (e.g. Leucaena leucocephala which is an invasive exotic tree)
    - On steep slope or area where formation of a root ball of reasonable size is not practicable.
    - low cost effectiveness

    Having considered the above factors and features of the trees, suitability for Transplanting is assessed as follows: -
    - High: Trees are highly suitable for transplanting.
    - Medium: Trees are moderately suitable for transplanting.
    - Low: Trees are not suitable for transplanting.

12. Conservation Status:
    State the rarity and protection status of the species under relevant ordinances in Hong Kong. References such as Rare and Precious Plants of Hong Kong, the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species, and the Forests and Countryside Ordinance (Chapter 96) are used.

13. Recommendation: Proposed action for individual species which fall into the following three categories:

- (R) - Retain
- (T) - Transplant
- (F) - Fell

14. Justification: Statement justifying the recommendation.

15. Additional Remarks: Supplementary notes towards the assessment.

3. LEGISLATION, STANDARDS AND GUIDELINES

3.1 Government Publications, Guidelines and Reports

- Agriculture, Fisheries and Conservation Department (AFCD) Nature Conservation Practice Note (NCPN) No. 02 - Measurement of Diameter at Breast Height (DBH);
- AFCD NCPN No. 03 - The Use of Plant Names
- Civil Engineering and Development Department Technical Circular (TC) No. 09/2009 - Vetting Committee on Slope Appearance
- Highways Department (HyD) TC No. 3/2008 – Independent Vetting of Tree Works under the Maintenance of HyD;
- Works Bureau Technical Circular (WBTC) No. 17/2000 - Improvement to the Appearance of Slopes
- Environment, Transport & Works Bureau (ETWB) Technical Circular (Works) (TCW) No. 34/2003 - Community Involvement in Greening Works;
- WBTC No. 7/2002 - Tree Planting in Public Works;
- ETWB TCW No. 11/2004 - Cyber Manual for Greening;
- ETWB TCW No. 29/2004 - Registration of Old and Valuable Trees, and Guidelines for their Preservation;
- ETWB TCW No. 2/2004 - Maintenance of Vegetation and Hard Landscape Features;
- Development Bureau (DEVB) Technical Circular (Works) (TCW) No. 2/2012 - Allocation of Space for Quality Greening on Roads;
- DEVB TCW No. 2/2013 - Greening on Footbridges and Flyovers
- DEVB TC(W) No 10/2013 – Tree Preservation
- DEVB TC(W) No 7/2015 – Tree Preservation
- Latest Guidelines for Tree Risk Assessment and Management Arrangement on an Area Basis and on a Tree Basis issued by Greening, Landscape and Tree Management Section (GLTM)/DEVB ;
- Geotechnical Engineering Office Publication No. 1/2011 - Technical Guidelines on Landscape Treatment for Slopes;
- Latest Proper Planting Practices issued by GLTM/DEVB; and
- Guidelines on Tree Transplanting issued by GLTM Section of DevB
- Lands Administration Office Practice Note Issue No. 7/2007.
- Lands Administration Office Practice Note Issue No. 7/2007A.

4. EXISTING CONDITION OF THE TREES

4.1 46 nos. of trees had been identified on site. There are in total 17 tree species found within the site boundary, the most abundant species is *Delonix regia* (9 nos.) that mature in size. Majority of them are found in Fair to Poor condition and the survival rate after transplanting are Low.

4.2 There are other species within the site, *Bauhinia spp.* (4 nos.), *Bridelia tomentosa* (1 nos.), *Casuarina equisetifolia* (3 nos.), *Celtis sinensis* (4 nos.), *Dimocarpus longan* (3 nos.), *Eucalyptus citriodora* (1 nos.), *Ficus elastica* (1 nos.), *Ficus microcarpa* (1 nos.), *Koelreuteria bipinnata* (1 nos.), *Lagerstroemia indica* (1 nos.), *Lophostemon confertus* (3 nos.), *Macaranga tanarius* (3 nos.), *Melaleuca cajuputi* (6 nos.), *Morus alba* (1 nos.), *Syzygium jambos* (2 nos.) and *Toona sinensis* (3 nos.).

4.3 Trees surveyed have Fair to Poor form and health condition with Low to Medium amenity value and Low to Medium survival rate after transplanting.

4.4 Majority of surveyed trees are old and mature trees from 300mm – 1000mm DBH planting in sufficient spacing. They are mostly restricted by concrete or fencing. Some of them are experienced root girdling.

4.5 It is also noted decayed wounds/ cavities are found due to poor maintenance or inclement weather.

4.6 The trees surveyed are all common species and no rare species included. No OVTs are identified within the submission boundary.

5. PROPOSED DEVELOPMENT

5.1 The Subject Site, with a site area of about 5,187m^2 (subject to further confirmation), is located to the northwest of Fanling Town Centre, and the southwest of Luen Wo Hui. The Subject Site is bounded by Pik Fung Road to the northwest, Jockey Club Road to the northeast, ex-Fanling Magistracy to the southeast and Fanling Law Courts Building to the southwest.

5.2 The Subject Site is a piece of Government land situated at Demarcation District (D.D.) 51 Lot. The northwest portion of the site where the temporary tennis court is located is under Government Land Allocation (GLA). Upon future development of the site into proposed subsidized housing, the land allocated under GLA would require to be resumed by the Government.

6 PROPOSED TREATMENT TO THE EXISTING TREES

6.1 Recommendations for all existing trees are provided in **Appendix 1 - Tree Survey and Recommendation Plan** and **Appendix 2 - Tree Assessment Schedule**. Their general view recorded on tree photographs is presented as **Appendix 3 - Existing Tree Photo Record**.

6.2 For the trees proposed to be retained, felled and transplanted during site clearance works, the recommendation shall be carried out in accordance to **Appendix 6 - Specification for Tree preservation, felling, transplanting**.

6.3 There are 40 trees are conflicted to construction works. Those trees will consider to be felled.

6.4 To strike a balance between cost and benefit, only trees with medium amenity value and "transplantable" trees (i.e. trees that have a very good chance of recovering to its normal form) should be considered for transplanting.

6.5 A summary of quantities, species and recommended treatments of trees is provided as below:

Table 6.5: Summary of Quantities, Species and Recommended Treatments of Trees

Scientific Name	Chinese Name	Trees to be Retained	Trees to be Felled/Removed	Missing Tree	Total
Bauhinia spp.	羊蹄甲	0	3	1	4
Bridelia tomentosa	土蜜樹	0	0	1	1
Casuarina equisetifolia	木麻黃	0	2	0	2
Celtis sinensis	朴	1	3	0	4
Delonix regia	鳳凰木	0	8	1	9
Dimocarpus longan	龍眼	0	3	0	3
Eucalyptus citriodora	檸檬桉	0	1	0	1
Ficus elastica	印度橡	0	1	0	1
Ficus microcarpa	細葉榕	0	1	0	1
Koelreuteria bipinnata	複羽葉欒樹	1	0	0	1
Lagerstroemia indica	紫薇	0	1	0	1
Lophostemon confertus	紅膠木	0	3	0	3
Macaranga tanarius	血桐	0	3	0	3
Melaleuca cajuputi	白千層	0	6	0	6
Morus alba	桑	0	1	0	1
Syzygium jambos	蒲桃	0	2	0	2
Toona sinensis	香椿	1	2	0	3
Total no. of trees		**3**	**40**	**3**	**46**

6.6 Findings and recommended treatments to existing trees are summarized in **Table 6.6.**

Table 6.6: Summary of Tree Survey and Treatment Recommendations

Total Trees Surveyed	Trees to be Retained	Trees to be Felled (including missing tree)	Trees to be Transplanted
46	3	43	0

6.7 In summary, 43 no. of trees are proposed to be felled. 3 nos. of trees are proposed to be retained on site.

7. TREE COMPENSATION PROPOSAL

7.1 For the proposed development, 43 nos. of trees were proposed to be felled. In order to compensate the trees to be felled, a total number of 109 nos. of Heavy Standard trees would be compensated (27 nos. of trees planted at G/F, 47 nos. of trees planted at 1/F and 35 nos. of trees planted at 2/F) with an approximate of 3.5m spacing for each trees.

7.2 Please find the summary of the compensatory planting proposal as below and the Compensatory Planting Proposal can be referred to **Appendix 4 - Compensatory Planting Plan.**

Table 7.2: Summary of Compensation Planting Proposal

Proposed to be Felled		**Compensatory Trees**	
Quantity	*Aggregated DBH*	*Quantity*	*Aggregated DBH*
43	16,206mm	109	16,350mm

7.3 The implementation of compensatory tree planting of a ratio in terms of Quantity is **1:2.63**; and in terms of Quality is **1:1**. Thus Compensatory Planting Proposal satisfies the requirements mentioned in guideline in terms of quantity and quality (total girth removal) of providing at least 1:1.

Table 7.3: Tree Compensatory Ratio

	Felled : Compensated	**Ratio**
Quality (Girth)	16206 : 16350	1: 1
Quantity (nos.)	43 : 109	1: 2.53

7.4 For a healthy development of tree in future, most of the trees will be planted in planting area on grade, except those planted on podium. The planting area to receive the compensation trees shall have a sufficient soil depth excluding drainage layer.

7.5 Area surrounding the compensatory trees will be planted with turf, shrub or groundcover. Area surrounding the tree root collar at a diameter of 300-500mm would keep clear of vegetation.

7.6 The proposed compensation tree species are summarizes at Table 7.6.

Table 7.6 The Proposed Tree Species to be compensated

Proposed Tree Species Botanical Name	***Chinese Name***	***Size***	***Live Crown Ratio***	***DBH***	***Crown Spread (m)***	***Overall height (m)***
Bischofia javanica	秋楓	Heavy Standard	40	150	3.0-4.0	4.0-5.0
*Cinnamomum burmannii**	陰香	Heavy Standard	40	150	3.0-4.0	3.0-4.5
Elaeocarpus apiculatus	尖葉杜英	Heavy Standard	40	150	3.0-4.5	5.0-6.0
Ficus altissima 'Golden Edged'	班葉高山榕	Heavy Standard	40	150	3.0-4.0	4.0-5.0
Jacaranda mimosifolia	藍花楹	Heavy Standard	40	150	3.0-4.0	4.0-5.0
*Liquidambar formosana**	楓香	Heavy Standard	40	150	3.0-4.5	4.0-5.0
Magnolia grandiflora	荷花玉蘭	Heavy Standard	40	150	3.0-4.5	4.0-5.0
Plumeria rubra	紅雞蛋花	Heavy Standard	40	150	3.0-4.5	2.0-3.0

8. SOFT LANDSCAPE WORK MAINTENANCE

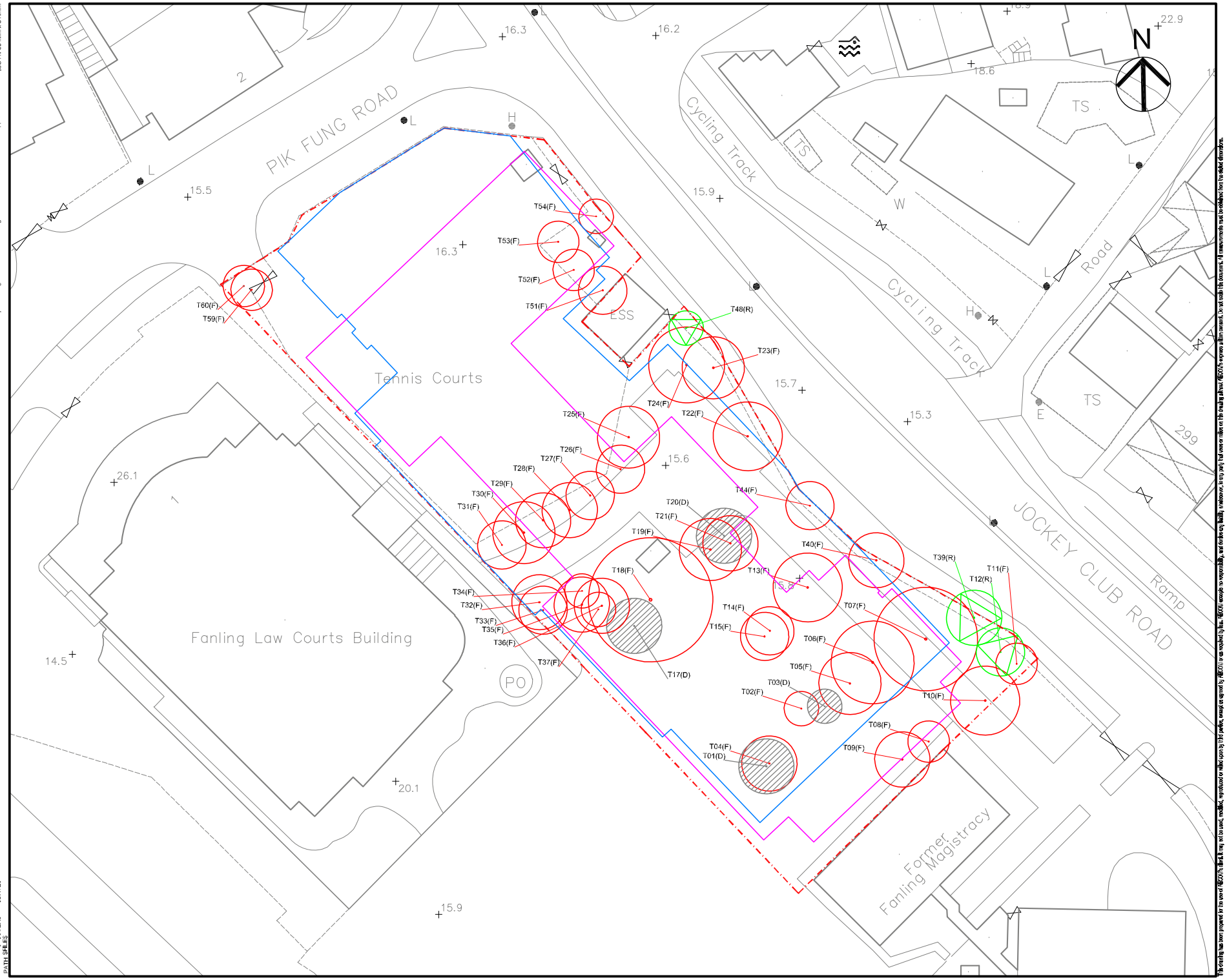
8.1 Maintenance of landscape areas will be carried out by a qualified Landscape Contractor for a period of 12 months after the completion of the construction works and will be managed by the estate management team afterwards.

8.2 Maintenance will include the following regular operations: Watering, weeding, firming up of plants, pruning/thinning, securing of protective fencing, grass cutting, fertilizing, forking over, applying insecticide/ fungicide, replanting/ replacing of damaged/ dead plants, aeration and mulching.

8.3 Tree risk assessment would be done once a year by qualified tree arborist.

Appendix 1

Tree Survey and Recommendation Plan



AECOM

PROJECT

Proposed Subsidized Housing Development at Jockey Club Road, Fanling

CLIENT

Hong Kong Housing Society

CONSULTANT

AECOM Asia Company Ltd.
www.aecom.com

Legends:

- Site Boundary
- Existing Chain Fence and Gate
- Propose Podium Layout
- Proposed Basement Layout
- Trees to be Retained
- Trees to be Felled
- Dead Tree to be Removed

ISSUE/REVISION

I/R	DATE	DESCRIPTION	CHK
B	11/2018	Tree Updated	
A	10/2018	Layout Updated	

STATUS

Submission

SCALE 1:500 (@A3)

DIMENSION UNIT

KEY PLAN

PROJECT NO.

CONTRACT NO.

SHEET TITLE

Tree Survey and Recommendation Plan

SHEET NUMBER

TRA_01

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Plot File by: $USERS
PATH SPLES
$DATE$
Project Management Initials:
Designed:
Checked:
Approved:
ISO A1 594mm x 841mm

Appendix 2

Tree Assessment Schedule

Drawing	Tree #	Species		Top of Soil	Measurements			Amenity Value (High/ Medium/ Low)	Form Condition (Good/ Fair/ Poor)	Health Condition (Good/ Fair/ Poor)	Structural Condition (Good/ Fair/ Poor)	Conservation Status	Survival Rate after Transplant (High/ Medium/ Low)	Suitability for Transplanting		Recommendation (Retain/ Transplant/ Fell/ Remove)	Justification	Additional Remarks
		Scientific Name	Chinese Name		Trunk Diameter-DBH (mm)	Height (m)	Crown Spread (m)							High/ Medium/ Low	Remarks			
TRA_01	T1	*Delonix regia*	鳳凰木	15.58	271	8	4	L	P	P	P	N/A	L	Low	a, c, f, h, i	Remove	Poor tree condition, conflict with proposed layout	Close to T04, codominant branches with included bark, decayed cavity, imbalanced crown, climbers, Main trunk broken.
TRA_01	T2	*Dimocarpus longan*	龍眼	15.75	153	8	5	M	F	P	F	N/A	L	Low	b, c, f, h	Fell	Conflict with proposed layout	Decayed on root collar, climbers, growth next to concrete
TRA_01	T3	*Delonix regia*	鳳凰木	15.46	201	7	5	L	P	P	P	N/A	L	Low	a, c, f, i	Remove	Poor tree condition, conflict with proposed layout	Decayed cavities, imbalanced crown, Collasped.
TRA_01	T4	*Dimocarpus longan*	龍眼	15.84	312	11	8	M	P	F	F	N/A	L	Low	b, c, f, h	Fell	Conflict with proposed layout	Close to T01, codominant, leaning, imbalanced crown
TRA_01	T5	*Delonix regia*	鳳凰木	15.54	379	12	9	M	P	F	F	N/A	L	Low	b, c, f, h	Fell	Conflict with proposed layout	imbalanced crown, leaning, root restricted. Severe branched broken.
TRA_01	T6	*Delonix regia*	鳳凰木	15.58	465	14	12	M	F	F	F	N/A	M	Low	b, h	Fell	Conflict with proposed layout	Cross branches, codominant, root restricted. Severe branched broken.
TRA_01	T7	*Ficus elastica*	印度橡	15.64	1051	15	15	L	P	F	F	N/A	L	Low	b, c, d, e, h	Fell	Conflict with proposed layout	Growth next to concrete. Severe branched broken.
TRA_01	T8	*Bauhinia spp.*	羊蹄甲	15.52	312	9	6	M	F	F	F	N/A	M	Low	b, e	Missing		
TRA_01	T9	*Delonix regia*	鳳凰木	15.55	395	11	8	M	P	F	F	N/A	M	Low	b, f, h	Missing		
TRA_01	T10	*Eucalyptus citriodora*	檸檬桉	15.72	487	19	10	M	F	F	F	N/A	L	Low	b, c, d, h	Fell	Conflict with proposed layout	Leaning, root restricted, Collapsed.
TRA_01	T11	*Bridelia tomentosa*	土蜜樹	15.66	153	8	6	L	P	P	F	N/A	L	Low	a, c, f, h, i	Missing		
TRA_01	T12	*Koelreuteria bipinnata*	複羽葉欒樹	15.67	264	8	7	L	P	P	F	N/A	L	Low	a, c, f, h, i	Retain	No conflict to works	Restricted by fencing, leaning, imbalanced crown, codominant with included bark
TRA_01	T13	*Delonix regia*	鳳凰木	15.61	411	13	10	M	F	F	F	N/A	M	Low	b, h	Fell	Conflict with proposed layout	Codominant, root restricted
TRA_01	T14	*Syzygium jambos*	蒲桃	15.48	303	9	7	L	P	P	P	N/A	L	Low	a, c, f, i	Fell	Poor tree condition, conflict with proposed layout	Decayed cavities, low branching, codominant with included bark, broken limb, leaning, insect
TRA_01	T15	*Syzygium jambos*	蒲桃	15.60	395	8	7	L	P	P	P	N/A	L	Low	a, b, c, f, i	Fell	Poor tree condition, conflict with proposed layout	Leaning, decayed wounds, low branching, insects
TRA_01	T17	*Lagerstroemia indica*	紫薇	15.46	153	8	8	L	P	P	F	N/A	L	Low	a, c, f, i	Remove	Conflict with proposed layout	Heavily leaned, decayed cavities. Collapsed.
TRA_01	T18	*Dimocarpus longan*	龍眼	15.67	920	17	18	M	F	F	F	N/A	L	Low	b, c, d, e	Fell	Conflict with proposed layout	Old tree, low branching
TRA_01	T19	*Casuarina equisetifolia*	木麻黃	15.87	427	13	9	L	P	P	F	N/A	L	Low	a, b, c, f, h, i	Fell	Conflict with proposed layout	Decayed cavities, restricted by concrete, imbalanced crown, dieback
TRA_01	T20	*Casuarina equisetifolia*	木麻黃	15.78	283	9	8	L	P	F	P	N/A	L	Low	a, c, f, h, i	Remove	Poor tree condition, conflict with proposed layout	Heavily leaned, root restricted, codominant, crooked branches. Collapsed.
TRA_01	T21	*Delonix regia*	鳳凰木	15.58	328	12	8	M	F	F	F	N/A	M	Low	b, h	Fell	Conflict with proposed layout	Root restricted and girdling, codominant
TRA_01	T22	*Toona sinensis*	香椿	15.70	758	14	10	L	P	F	P	N/A	L	Low	a, b, c, f, h, i	Fell	Poor tree condition, conflict with proposed layout	Low branching, multiples branches, root restricted by concrete, crossing branches, termites, severe branches broken.
TRA_01	T23	*Lophostemon confertus*	紅膠木	15.83	414	11	9	M	F	F	F	N/A	L	Low	b, c, h	Fell	Conflict with proposed layout	Restricted by fencing, leaning, codominant, climbers, severe branches broken.
TRA_01	T24	*Lophostemon confertus*	紅膠木	15.93	487	14	11	M	P	F	F	N/A	L	Low	b, c, f, h	Fell	Conflict with proposed layout	Root restricted by concrete, leaning, codominant with included bark, multiple branches, imbalanced crown
TRA_01	T25	*Delonix regia*	鳳凰木	15.45	732	15	9	M	P	F	P	N/A	L	Low	b, c, d, f, h	Fell	Poor tree condition, conflict with proposed layout	Root restricted, low branching, codominant, dead branch, climbers
TRA_01	T26	*Delonix regia*	鳳凰木	15.58	296	12	7	L	F	P	F	N/A	L	Low	a, c, f, h, i	Fell	Conflict with proposed layout	Climbers on whole tree, root restricted
TRA_01	T27	*Melaleuca cajuputi*	白千層	16.09	379	14	7	M	F	F	F	N/A	M	Low	b, h	Fell	Conflict with proposed layout	Root restricted, codominant
TRA_01	T28	*Melaleuca cajuputi*	白千層	15.90	395	17	8	M	P	F	F	N/A	M	Low	b, d, f, h	Fell	Conflict with proposed layout	Root restricted, codominant, branches growth too close
TRA_01	T29	*Melaleuca cajuputi*	白千層	16.10	605	17	8	M	P	F	F	N/A	M	Low	b, d, f, h	Fell	Conflict with proposed layout	Root restricted, codominant, branches growth too close
TRA_01	T30	*Melaleuca cajuputi*	白千層	16.03	541	17	9	M	P	F	F	N/A	M	Low	b, d, f, h	Fell	Conflict with proposed layout	Root restricted, codominant, branches growth too close, crossing branches near branches union, multiole branches
TRA_01	T31	*Melaleuca cajuputi*	白千層	16.00	605	16	7	M	P	F	F	N/A	M	Low	b, d, f, h	Fell	Conflict with proposed layout	Root restricted, codominant with included bark, severe branches broken.
TRA_01	T32	*Melaleuca cajuputi*	白千層	16.09	420	14	8	M	P	F	F	N/A	M	Low	b, f, h	Fell	Conflict with proposed layout	Root restricted, crooked branch
TRA_01	T33	*Macaranga tanarius*	血桐	15.97	121	10	7	L	P	P	P	N/A	L	Low	a, c, f, h, i	Fell	Poor tree condition, conflict with proposed layout	Root restricted, low branching, codominant, imbalanced crown, leaning
TRA_01	T34	*Celtis sinensis*	朴	15.56	137	9	5	M	F	F	F	N/A	M	Low	b, i	Fell	Conflict with proposed layout	Suppressed by T35, codominant
TRA_01	T35	*Celtis sinensis*	朴	15.30	404	15	8	M	P	F	F	N/A	M	Low	b, d, f	Fell	Conflict with proposed layout	imbalanced crown, codominant
TRA_01	T36	*Celtis sinensis*	朴	15.57	331	16	8	M	P	F	F	N/A	M	Low	b, d, f, h	Fell	Conflict with proposed layout	Low live crown ratio, slightly leaned, exposed roots, close to T37
TRA_01	T37	*Morus alba*	桑	15.51	172	8	5	L	P	P	P	N/A	L	Low	a, c, f, i	Fell	Poor tree condition, conflict with proposed layout	Leaning, close to T36, broken branches

Drawing	Tree #	Species		Top of Soil	Measurements			Amenity Value (High/ Medium/ Low)	Form Condition (Good/ Fair/ Poor)	Health Condition (Good/ Fair/ Poor)	Structural Condition (Good/ Fair/ Poor)	Conservation Status	Survival Rate after Transplant (High/ Medium/ Low)	Suitability for Transplanting		Recommendation (Retain/ Transplant/ Fell/ Remove)	Justification	Additional Remarks
		Scientific Name	Chinese Name		Trunk Diameter-DBH (mm)	Height (m)	Crown Spread (m)							High/ Medium/ Low	Remarks			
TRA_01	T39	*Toona sinensis*	香椿	15.26	395	12	8	L	P	P	P	N/A	L	Low	a, b, c, f, h, i	Retain	No conflict to works	Codominant, root restricted, decayed cavity on root collar
TRA_01	T40	*Toona sinensis*	香椿	15.81	252	10	8	L	P	F	P	N/A	L	Low	a, c, f, h, i	Fell	Poor tree condition, conflict with proposed layout	Root restricted and girdling, leaning, imbalanced crown
TRA_01	T44	*Lophostemon confertus*	紅膠木	15.88	331	11	7	L	P	P	F	N/A	L	Low	a, b, c, f, h, i	Fell	Conflict with proposed layout	Dieback, root restricted, decayed cavity, termite. Main trunk broken.
TRA_01	T48	*Celtis sinensis*	朴	16.24	182	7	5	L	F	P	P	N/A	L	Low	a, c, f, h, i	Retain	No conflict to works	Root restricted, decayed cavity, broken branches Union
TRA_01	T51	*Bauhinia spp.*	羊蹄甲	15.35	283	11	7	L	P	P	F	N/A	L	Low	a, c, f, i	Fell	Conflict with proposed layout	Decayed, codominant trunks, leaning, dieback, root collar covered by soil
TRA_01	T52	*Ficus microcarpa*	細葉榕	16.27	248	8	6	M	F	F	F	N/A	L	Low	b, c, h	Fell	Conflict with proposed layout	Root restricted, leaning
TRA_01	T53	*Bauhinia spp.*	羊蹄甲	16.26	239	8	6	M	F	P	F	N/A	L	Low	b, c, f, h	Fell	Conflict with proposed layout	Root restricted, dieback
TRA_01	T54	*Bauhinia spp.*	羊蹄甲	16.62	268	8	5	L	P	P	F	N/A	L	Low	a, c, f, h, i	Fell	Conflict with proposed layout	Root restricted, leaning, dieback
TRA_01	T59	*Macaranga tanarius*	血桐	16.24	210	6	6	M	P	F	F	N/A	L	Low	b, c, f, h	Fell	Conflict with proposed layout	Root restricted, leaning, multiple branches
TRA_01	T60	*Macaranga tanarius*	血桐	16.25	178	6	6	M	P	F	F	N/A	L	Low	b, c, f	Fell	Conflict with proposed layout	leaning

Remarks for Suitability for Transplanting
(a) Low amenity value;
(b) Irrecoverable form after transplanting (e.g. if substantial crown and root pruning are necessary to facilitate the transplanting);
(c) Low survival rate after transplanting;
(d) Very large size (unless the feasibility to transplant has been considered financially reasonable and technically feasible during the feasibility stage
(e) With evidence of over-maturity and onset of senescence;
(f) With poor health, structure or form (e.g. imbalanced form, leaning , with majorcavity/cracks/splits); or cavity/cracks/splits); or
(g) Undesirable species (e.g. Leucaena leucocephala which is an invasive exotic tree)
(h) On steep slope or area where formation of a root ball of reasonable size is not practicable
(i) Low cost effectiveness

Provision of Open Space and Major Community Facilities in Fanling/Sheung Shui New Town

Type of Facilities	Hong Kong Planning Standards and Guidelines (HKPSG)	HKPSG Requirement (based on planned population[a])	Provision		Surplus/ Shortfall (against planned provision)
			Existing Provision	Planned Provision	
District Open Space	10 ha. per 100,000 persons	28.04 ha	19.48 ha	28.68 ha	+ 0.64 ha
Local Open Space	10 ha. per 100,000 persons	28.04 ha	48.94 ha	59.87 ha	+ 31.83 ha
Secondary School	1 whole-day classroom for 40 persons aged 12-17	340 classrooms	573 classrooms	573 classrooms	+ 233 classrooms
Primary School	1 whole-day classroom for 25.5 persons aged 6-11	454 classrooms	620 classrooms	734 classrooms	+ 280 classrooms
Kindergarten/ Nursery	34 classrooms for 1,000 children aged of 3 to under 6	153 classrooms	241 classrooms	254 classrooms	+ 101 classrooms
District Police Station	1 per 200,000-500,000 persons	0	0	0	0
Divisional Police Station	1 per 100,000-200,000 persons	1	1	1	0
Hospital	5.5 beds per 1,000 persons	1,587	623	2,123	+ 536[b]
Clinic/Health Centre	1 per 100,000 persons	2	2	3	+ 1

[a] The planned population of the Area would be about 288,600 persons.

[b] The provision of hospital beds would be monitored and addressed by the Hospital Authority on a regional basis, and there is a planned hospital in Kwu Tung North.

Type of Facilities	Hong Kong Planning Standards and Guidelines (HKPSG)	HKPSG Requirement (based on planned population[a])	Provision		Surplus/ Shortfall (against planned provision)
			Existing Provision	Planned Provision	
Magistracy (with 8 courtrooms)	1 per 660,000 persons	0	1	1	+ 1
Integrated Children and Youth Services Centre	1 for 12,000 persons aged 6-24	4	7	7	+ 3
District Elderly Community Centres	1 for 170,000 persons in each new development area	N.A.	1	1	N.A.[c]
Neighbourhood Elderly Centres	1 for 15,000 to 20,000 persons in a cluster of new and redeveloped housing areas	N.A.	5	5	N.A.[d]
Community Care Services Facilities	17.2 subsidised places per 1,000 elderly persons aged 65 or above	1,489	178	278	- 1,211[e]
Residential Care Homes for the Elderly	21.3 subsidised beds per 1,000 elderly persons aged 65 or above	1,844	1,102	1,312	- 532[e]
Integrated Family Services Centre	1 per 100,000 to 150,000 persons	2	3	3	+ 1
Library	1 district library for every 200,000 persons	1	3	3	+ 2

[c] Provision of District Elderly Community Centres is only applicable for new development area. The OZP area is not a new development area.

[d] Provision of Neighbourhood Elderly Centres is only applicable for clusters of new and redeveloped housing areas with 15,000 to 20,000 persons. No such new cluster in the OZP area.

[e] This is a long-term goal and the actual provision would be subject to the consideration of the Social Welfare Department in the planning and development process as appropriate.

Type of Facilities	**Hong Kong Planning Standards and Guidelines (HKPSG)**	**HKPSG Requirement (based on planned population[a])**	**Provision**		**Surplus/ Shortfall (against planned provision)**
			Existing Provision	**Planned Provision**	
Sports Centre	1 per 50,000 to 65,000 persons	4	5	5	+ 1
Sports Ground/ Sports Complex	1 per 200,000 to 250,000 persons	1	1	1	0
Swimming Pool Complex - standard	1 complex per 287,000 persons	1	1	1	0

北區區議會(2016-2019)
地區小型工程及環境改善委員會
第 19 次會議記錄草稿（節錄）

第 4 項——上水第 4 區及 30 區 1 號及 2 號用地、寶石湖路北面用地，和粉嶺馬會道用地公營房屋發展計劃及對《粉嶺／上水分區計劃大綱核准圖編號 S/FSS/22》的擬議修訂
(委員會文件第 5/2019 號)

2. 主席歡迎規劃署粉嶺、上水及元朗東規劃專員葉子季先生、房屋署高級規劃師(2)黎倩君女士、高級建築師(36)阮健昌先生、高級土木工程師(1)關大明先生、高級結構工程師(2)王偉洪先生、香港房屋協會(下稱「房協」)總經理(物業策劃及發展)曾德明先生、高級經理(物業策劃及發展)賴創志先生和運輸署高級工程師／北區許家駿先生參與這項議程的討論。

3. 葉子季先生以投影片介紹委員會文件第 5/2019 號有關上水第 4 區及 30 區 1 號及 2 號用地、寶石湖路北面用地(下稱「上水用地」)，和粉嶺馬會道用地(下稱「粉嶺用地」)公營房屋發展計劃(下稱「公營房屋計劃」)的背景和工程位置及對《粉嶺／上水分區計劃大綱核准圖編號 S/FSS/22》的擬議修訂(下稱「大綱圖擬議修訂」)。有關投影片載於附件三。

4. 黎倩君女士以投影片介紹委員會文件第 5/2019 號有關上水用地公營房屋計劃的初步規劃。有關投影片載於附件三。

5. 阮健昌先生以投影片介紹委員會文件第 5/2019 號有關上水用地公營房屋計劃之下的行人天橋連接安排。他續表示，直接連接港鐵上水站的行人天橋的設計及走線需得到運輸署和路政署的支持及渠務署和香港鐵路有限公司的配合，方能落實以行人天橋連接上水用地至上水港鐵站的安排。在施工期間，亦需移除相關行人路上現有的花糟及樹木，而受影響的路邊巴士站及單車徑亦需暫時停用，以保障公眾安全。有關投影片載於附件三。

6. 賴創志先生以投影片介紹委員會文件第 5/2019 號有關粉嶺

用地公營房屋發展計劃的規劃。有關投影片載於附件三。

7. 葉子季先生表示，香港房屋委員會(下稱「房委會」)和房協已就公營房屋計劃完成相關技術評估，有關技術評估報告提出了改善措施，以配合相關的公營房屋發展計劃。隨着公營房屋落成，人口雖會增加，但區內政府機構或社區設施仍大致能滿足社區需求。署方諮詢委員會後，會把公營房屋計劃的改劃建議提交城市規劃委員會(下稱「城規會」)審議。如獲得通過，大綱圖擬議修訂會按《城市規劃條例》公開展示 2 個月，任何人士可就有關修訂提出申述。

8. 劉國勳議員提出以下意見和問題：

(a) 有關公營房屋計劃涉及 4 幅用地，可興建接近約 6 000 個單位。香港整體房屋短缺，政府應該興建更多公營房屋，但他最關注北區交通能否吸納這些新增人口。即使這幾幅用地鄰近港鐵站，與較偏遠地區相比交通較為便利，但現時港鐵東鐵線客流量已經相當大，新增人口會令東鐵線更為擠迫；

(b) 建議政府考慮改劃上水 1 號用地旁一幅土地(現用作露天停車場)以興建多層停車場，再以行人天橋將上水 1 號和 2 號用地連接起來，並一併接通寶石湖路北面用地和寶石湖邨，達至人車分隔；

(c) 當天橋系統逐步完善，建議有關部門檢視並考慮減少石湖墟交通燈的數目；

(d) 歡迎在上水公營房屋計劃下興建新社區會堂；

(e) 上屆政府訂立政策以減少雙非兒童數目，令現時北區學童人數較之前減少，上水區更有幼稚園收生不足。因此政府

有必要檢視是否需要在上水公營房屋計劃之下增建 2 間幼稚園，避免區內幼稚園學位過多；

(f) 雖然有關部門表示公營房屋計劃不會對社區和交通造成不良的影響，但事實上多個政府工程項目落成後的實際情況與事前預計的數據均有偏差。他希望政府能於雞嶺迴旋處和寶石湖路的交通改善工程及粉嶺繞道工程完成後，才安排公營房屋計劃的單位入伙；

(g) 政府應考慮在北區興建一條新鐵路，因為隨着皇后山公營房屋落成和新界東北發展計劃開展，未來的新增人口皆會使用港鐵東鐵線；以及

(h) 一般工程的交通影響評估只着眼於工程項目對附近一帶交通的影響，沒有考慮為北區一些重要道路設施(如迴旋處)所帶來的壓力。因此政府必須確保北區交通能應付未來社區發展，他才會考慮支持相關計劃。

9. 陳旭明議員表示，這幾項房屋項目規模較大，他詢問政府是否已充分與各持份者討論。林卓廷議員在會前會議就相關項目提出了很多意見。由於他並不是委員會委員，未能參與有關討論。有關部門有否向各持份者反映林議員的意見並作充分溝通，然後才諮詢區議會。此外，他詢問連接港鐵粉嶺站與聯和墟的行人天橋會否落實興建，有關部門會否在公營房屋計劃為該天橋預留位置。

10. 張家峰先生提出的意見如下：

(a) 同意劉國勳議員以行人天橋系統連接上水 1 號和 2 號用地的建議。但由 2 號用地經寶石湖路北面用地前往 1 號用地，二者相距超過 600 米，路程比一個標準運動場還要長，因此行人天橋系統應加設自動行人道；

(b) 如大量車輛由 2 號用地近嘉富坊的車輛出入口駛出，或會令車輛由上水圍一帶堵塞至石湖墟；

(c) 上水用地公營房屋計劃將興建零售設施，商用車輛數目會因此增加，但當局並未計劃設置商用車輛停車位置；

(d) 粉嶺用地公營房屋計劃將興建老人服務設施，但並未在附近劃設復康車輛停車位置；

(e) 建議上水 2 號用地和寶石湖路北面用地增建道路，令車輛不需經過新運路、石湖墟和龍琛路一帶便可前往市區；以及

(f) 上水公營房屋計劃下擬興建的停車場應設有多個車輛出入口。

11. 劉其烽議員不支持公營房屋計劃，並認為當局沒有聽取議員在會前會議上提出改善北區交通的意見。他詢問有關部門有否考慮到新增人口對交通的影響。現時港鐵上水站已經非常擁擠，屆時新增人口遷入上水後擠迫情況將會惡化。北區交通負荷已經沉重，但政府仍然計劃讓這麼多人口遷入，令上水更為擁擠。他又以皇后山公營房屋發展計劃為例，指有關部門就同一區域內不同的發展計劃欠缺溝通，部門各自為政。現在有關部門提交公營房屋計劃諮詢區議會，他質疑政府承諾的各項改善措施到最後會否實現。假如屆時交通改善措施未完成，但公營房屋已建成，他相信政府仍會如期安排居民遷入，因為部門之間一向沒有適當溝通。就粉嶺用地而言，不少居民會使用該網球場，因此政府應三思而行，改劃該用地作其他北區現時缺乏的社區設施，而不應在面積這麼小的用地建屋。他表示北區已經缺乏社區設施，但政府仍要待興建更多公營房屋後才考慮增加社區設施。最後，他批評有關部門未有將關乎整個北區的發展計劃提交北區區議會大會，而是匆匆提交委員會審議。

12. 張京樑先生不支持改變土地用途建屋，並提出以下意見和問題：

(a) 根據文件和部門介紹，公營房屋計劃由規劃署、房屋署和房協提交。規劃署希望委員會支持更改大綱圖上 4 幅用地的用途，原因是要發展公營房屋。程序上，有關部門會將公營房屋計劃連同委員會的意見一併提交城規會，獲得通過後再諮詢公眾。有關部門會否將有關計劃再次提交北區區議會大會討論，因為並非所有民選區議員都是委員會委員；

(b) 根據委員會文件第 5/2019 號第 8 段，房委會和房協已聘請顧問公司進行相關技術評估。換言之，仍有評估尚未完成。有關部門應待相關評估完成後才諮詢區議會；

(c) 文件第 8 段提及，「如有需要，有關改善措施將於住宅單位入伙之前完成，以確保擬建的發展計劃將不會對現有基建設施包括道路網絡造成不良的影響」。事實上，北區道路網絡已經非常擠塞，有關交通改善措施理應一早進行。將來大量人口遷入北區，但其實北區交通已經負荷過重；

(d) 有關部門認為現時社區配套大致足夠，但評估報告尚未完成，部門其實並沒有充足證據支持上述說法。他舉例，在 2012 至 2015 年度期間，北區區議會社會服務、勞工及經濟事務委員會曾討論多個有關社區設施的議題，包括 2014-15 年度北區幼稚園及小一學位不足問題、要求在上水興建社區會堂、要求增加北區醫療設施及服務、重置小學、加強精神病患者復康支援等，這足以說明北區的社區配套設施並不足夠。他建議有關部門可參閱《第四屆北區區議會工作報告(2012-2015)》；

(e) 粉嶺用地現時是「政府、機構或社區」用地，更理想的做

法是在該用地興建社區綜合大樓或相關社區設施。有關部門在文件中刻畫的願景相當美好，並預留位置興建社區會堂、安老院舍、弱智人士宿舍等配套設施，證明社區的確有上述需求。既然如此，政府應維持現有土地用途，直接興建相關配套設施服務北區居民；以及

(f) 現時北區學額供應仍然緊張，將來有這麼多人遷入北區，政府會如何解決有關問題。

13. 曾玉安議員表示，粉嶺用地附近設有粉嶺法院大樓和粉嶺健康中心，屬於北區的行政中心。既然屬於政府的核心地帶，該用地應興建其他公用設施。北區將來有很多新發展，需要一個行政中心。現時由房協在粉嶺用地興建房屋，質素較高，相對較能配合該位置。他續稱，早前皇后山公營房屋發展計劃由一開始的低密度住宅、大學城，改為現時正在興建的高密度住宅區；希望政府推行房屋發展計劃時作更周詳的考慮，避免計劃一改再改。

14. 彭振聲議員支持政府興建公營房屋，並提出以下意見和問題：

(a) 「政府、機構或社區」用地應興建社區設施(如安老、教育等相關設施)，但政府卻計劃改變粉嶺用地為住宅用地，並興建出售居屋；

(b) 有關部門表示 24 層高的大樓不會影響附近景觀，但粉嶺用地附近就是前粉嶺裁判署、粉嶺健康中心、翠林別墅、粉嶺樓鄉村、粉嶺圍鄉村、星光新村、嘉兆軒、五旬節靳茂生小學、海燕花園和即將興建的新界東文化中心。這些全部是低密度建築，擬建的住宅大樓與周遭建築物格格不入。他詢問政府為何不在該位置興建社區設施如安老中心或幼稚園，偏要在面積這麼小的用地「插針式」興建兩棟住宅，而且其實北區還有很多可以興建住宅的用地，例如

打鼓嶺一帶。他質疑如私人發展商向城規會申請在上述用地興建兩座 24 層高的私人大廈，有關部門會否批准；

(c) 臨時網球場是粉嶺區唯一的露天網球場，公營房屋計劃將剝奪粉嶺市民使用康樂用地的權利；以及

(d) 連接港鐵上水站和上水廣場的行人天橋十分擠迫，希望政府興建多一條由新運路直接通往上水站而不經上水廣場的行人天橋。

15. 廖興洪議員表示，他曾在會前會議上提議在上水 2 號用地興建社區會堂，但有關意見不被接納。他亦曾向有關部門提議在 2 號用地興建行人天橋通往 1 號用地，政府卻以沒有上蓋的行人路作為代替方案。他認為有關部門不甚尊重區議員的意見。此外，現有的巴士廠用地將會改作興建房屋，屆時車輛會倒塞至上水鄉和寶石湖路，如進一步倒塞至新運路和雞嶺迴旋處，將會令交通更擠塞。北區交通問題已經嚴重影響上水鄉居民的生活，政府應改善整個交通網絡後才推展公營房屋計劃。如政府未能解決有關交通問題，他將反對公營房屋計劃。

16. 何樹光議員希望當局在公營房屋計劃下預留少量電單車車位。

17. 藍偉良議員詢問上水用地的地區康健中心的規模，以及康健中心是否田料米業商會公立學校原址的社區健康中心發展項目的替代方案。隨着彩園邨於多年前落成，北區的發展有目共睹，更解決了很多寮屋居民和急需住屋的市民的需要。儘管區內就業機會仍然不足，周邊的房屋發展亦令上水人口和商業活動增加，加上近年大量自由行旅客來港，令北區陷於一片煩囂之中，但他認為這些亂象並非源於上水的發展，而是由於出入境政策或當時香港因需要刺激經濟而推行的政策所致。因此，這些政策與社區發展不應混為一談。現時輪候公屋宗數達 28 萬宗，這些市民正處

於水深火熱之中。剛才委員提及的北區交通和道路擠塞情況屬實，但 2025 年至 2028 年期間新界東北發展計劃將會落實，粉嶺繞道亦會相繼落成，相信這些道路網絡和交通配套可配合公營房屋計劃。但他補充，萬一新界東北發展計劃不能如期完成，上述交通配套可能無法成事，只能成為空談。

18. 姚銘議員表示，由於公屋輪候人數眾多，政府要興建公營房屋無可厚非。他詢問公營房屋計劃擬建的行人天橋可否直接連接至港鐵上水站，達至人車分隔，紓緩擠迫問題。他期望房屋署、規劃署、路政署、渠務署等部門能積極回應和彼此配合，讓行人天橋得以落實興建，並希望政府在行人天橋落成後才安排住戶入伙。此外，現時粉嶺只有南行巴士轉乘站，運輸部門應積極研究加設北行轉乘站，讓市民可轉乘巴士往他區。此外，新增人口可能會帶來新選區，他希望公營房屋計劃能預留位置作區議員辦事處。

19. 曾勁聰議員提出以下意見和問題：

(a) 自從雙非兒童數目減少，北區對於幼稚園學額的需求已經相應下降，清河邨早前更有幼稚園停辦。他質疑上水公營房屋計劃是否需要增加 2 間幼稚園；

(b) 上水公營房屋計劃擬建的地區康健中心與在田料米業商會公立學校原址的社區健康中心發展項目如何互相配合或替補；以及

(c) 公營房屋計劃將加重寶石湖路和大頭嶺迴旋處的交通壓力。他希望粉嶺繞道西段近文錦渡路路段可藉是項計劃加快研究工作，並希望政府爭取時間進行寶石湖路擴建工程。

20. 蘇西智議員表示，香港房屋資源短缺，而北區空置土地相對較多，因此政府選擇在北區興建更多房屋乃順理成章，委員會

沒有理由反對。但他認為政府在建設之餘，應為北區建設更好的環境。很多委員提出了改善要求，包括興建行人天橋以連接巴士廠用地至港鐵上水站，希望政府能予以落實。根據現時資料，石湖墟 9 間幼稚園均收生不足，更有幼稚園校長表示擔心學校因收生不足而停辦，因此他認為再興建幼稚園並不合理。剛才有委員提及，2015 年幼稚園學額緊張，但現在情況已經不同。他詢問擬建幼稚園的位置可否改為讓對北區貢獻良多的地區團體(如北區體育會、北區花鳥蟲魚展覽會有限公司等)申請使用。至於建議的粉嶺行人天橋，應由粉嶺用地連接至港鐵粉嶺站、擬建的新界東文化中心、粉嶺健康中心及聯和墟，便利居民來往上述各地。當局甚至應預留位置將天橋延伸至芬園警察駕駛及交通訓練中心(假如該中心將來騰出的用地會用作興建房屋)。

21. 溫和達議員支持政府興建公營房屋，並原則上支持公營房屋計劃，但其中「插針式」的建屋方式令人有所保留。有議員曾建議不同的道路改善工程，以及興建地下停車場。向上發展會受地積比例所限制，但向下發展興建地下停車場理應不受限制，不影響環境之餘更可解決附近停車位不足的問題。此外，有很多北區居民因為受發展影響而需要搬遷，他詢問房屋署能否安排讓這些居民優先遷入北區即將建成的公營房屋，或遷入與家人同區的公屋單位。議員和居民一直爭取上述安排，希望不會被調遷至別區。

(李冠洪議員於此時離席。)

22. 葉子季先生就委員的問題和意見綜合回應如下：

(a) 根據過往做法，規劃署一般會把房屋用地計劃和大綱圖修訂提交委員會審議。署方在大綱圖修訂刊憲後會再次諮詢北區區議會，如屆時議員要求在區議會大會上討論相關事項，署方會作出安排及配合；

(b) 署方早前與各議員保持緊密聯繫，並得到很多寶貴意見，署方亦已相應修訂房屋發展規劃，盡量回應各議員的關注，包括增設行人天橋、社區設施、增加零售設施面積等；

(c) 署方已委託顧問進行交通影響評估，並盡量確保建議的一系列改善措施會在公營房屋計劃竣工前落實。其中幾項較重要的改善措施包括改善區內道路、在上水 1 號用地興建公共運輸交匯處，協助分流上水廣場運輸交匯處的車流，以減輕區內主要擠塞位置的交通流量。其他配合公營房屋發展計劃的重要基建工程亦已按計劃推展：龍山隧道即將竣工，而粉嶺繞道東段亦將在 2024 年落成以配合房屋發展入伙。署方會密切與區議員溝通，報告相關工程的進度；

(d) 現時房屋供應短缺，署方認為應善用土地，回應社會的訴求，因此建議改劃有關土地。署方發展房屋的同時會兼顧社區需要，並諮詢相關部門(如教育局和社會福利署)的意見，在房屋發展內提供區內所需的設施，如社區會堂、安老院舍、地區康健中心和公眾停車場；以及

(e) 擬議行人天橋系統包括 5 條天橋，連接房屋發展及上水港鐵站，以方便居民及減輕地面行人路壓力。如委員對天橋系統的設計有其他意見，署方樂意聆聽，並會盡量優化相關項目。

23. 黎倩君女士就委員的問題和意見綜合回應如下：

(a) 房委會在規劃公營房屋發展內的幼稚園設施時，會參考《香港規劃標準與準則》(下稱「《準則》」)的要求，並諮詢教育局、區議會及地區人士的意見，以制定合適的方案。在未來設計及工程階段，署方可因應實際情況檢討增設幼稚園的方案，如有需要會作彈性處理，將其改為其他合適用途；

(b) 房委會會按《準則》提供各項泊車設施，包括私家車、電單車和貨車泊車位，以及上落客貨區設施等；

(c) 就有關委員建議將上水 1 號和 2 號用地中間的土地(包括彩暉街)納入公營房屋計劃的建議，現時彩暉街位於該幅土地與 1 號用地之間，車輛可從彩暉街直接駛出寶石湖路，而無需掉頭經彩發街轉出彩園路。若把該段彩暉街納入 1 號地盤內一併發展，不但會增加彩發街及彩園路的交通負荷，改劃該段彩暉街的道路用途亦涉及頗長的法定程序，因而會推遲公屋入伙的日期。考慮到市民迫切的住屋需求，故暫不考慮此建議。如有需要，該幅彩暉街用地的用途可在日後檢討附近工業用地用途時一併研究；

(d) 於 1 號用地設立地區康健中心，是回應《行政長官 2018 年施政報告》中有關為加強基層醫療服務而推展各區設立地區康健中心的建議；以及

(e) 署方會積極研究及推展興建把上水用地與港鐵上水站直接連接的行人天橋系統。

(彭未齊先生於此時離席。)

24. 曾德明先生就委員的問題和意見綜合回應如下：

(a) 據他所知，連接港鐵粉嶺站和聯和墟的行人天橋仍需進行技術可行性研究。房協如獲民政事務總署知會落實興建上述行人天橋的建議，定會積極配合，並預留相關接駁位置。此外，房協亦會預留接駁位置以連接通往新界東文化中心的行人天橋；以及

(b) 房協會盡量預留位置劃設電單車車位。

25. 主席表示，委員已清楚表達各項訴求，並支持房委會興建公營房屋。現時有 60 多萬人輪候公屋，有些人居住在破落的棚屋，需要面對惡劣的生活環境。除非部門政策非常不恰當，否則地區人士和區議員應以民生為依歸，亦有責任配合政策。房委會和有關部門所推行的政策旨在服務廣大市民。部門已盡量滿足議員在會前提出的各項要求，即使興建行人天橋相當困難，部門亦作出承諾。十多年前政府曾推出興建 85 000 個公營房屋單位的政策，很多人提出反對意見；但現時有這麼多人排隊輪候公屋，可見受害的就是公屋輪候人士。他希望不要再拖延興建公屋。

26. 劉其烽議員建議將有關公營房屋計劃提交北區區議會大會討論。

27. 藍偉良議員表示，如委員會有權力就公營房屋計劃作表決，便應該在這次會議上作出決定。

28. 主席表示，委員會有權力就公營房屋計劃作討論和表決。

29. 溫和輝議員贊成在這次會議就公營房屋計劃作表決。輪候公屋的人士生活狀況困難，身為區議員應更有承擔。

30. 藍偉良議員表示，無論投票結果如何，希望房委會和房協日後如修改公營房屋計劃的內容，有關改動必須是進步而非退步。他希望主席運用所有的權力監察有關部門的相關工作。

31. 主席要求有關部門兌現承諾，確切落實提出的交通改善措施、興建行人天橋等事宜，為廣大香港市民服務及提供安樂窩。

32. 彭振聲議員建議委員會就議程第 4 項以兩輪投票作表決，分別就上水用地的公營房屋發展計劃和粉嶺用地的公營房屋發展計劃投票。

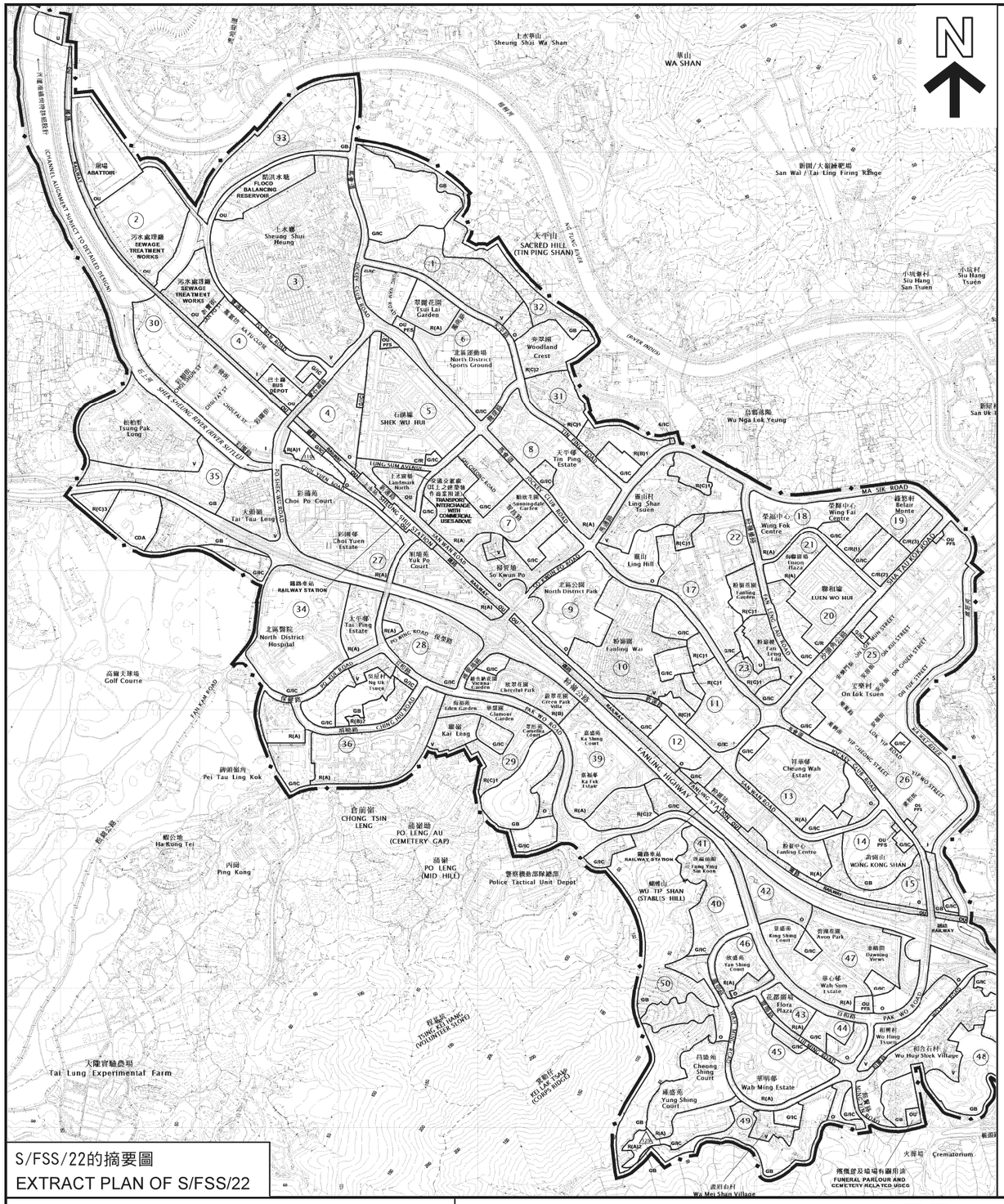
33. 廖興洪議員表示交通問題可以對民生帶來嚴重影響，正因如此，沙頭角公路附近居民強烈反對皇后山發展計劃。如部門未能落實公營房屋計劃下的交通改善措施，政府如何向當地居民交代。

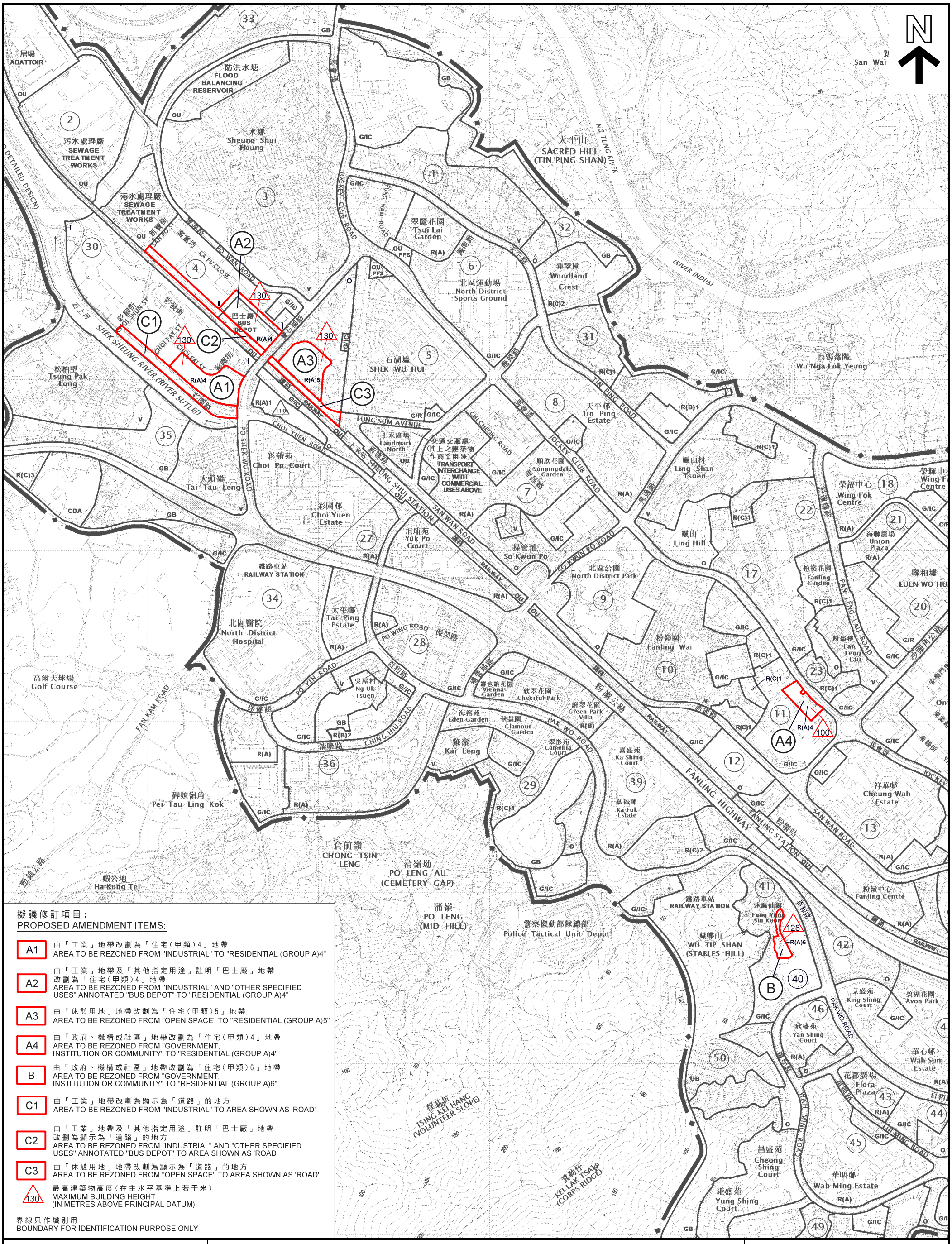
34. 主席續表示，委員會現就議程第 4 項以兩輪投票方式作出表決。

35. 就議程第 4 項有關上水用地的公營房屋發展計劃，表決的結果是 12 票支持(鄧根年議員、溫和輝議員、何樹光議員、姚銘議員、彭振聲議員、曾勁聰議員、溫和達議員、藍偉良議員、蘇西智議員、曾玉安先生、高維基先生和張家峰先生)，3 票反對(陳惠達議員、劉其烽議員和張京樑先生)，2 票棄權(廖興洪議員和廖志凌先生)。上水用地的公營房屋計劃得到絕對多數票的支持，獲得通過。

36. 就議程第 4 項有關粉嶺用地的公營房屋發展計劃，表決的結果是 9 票支持(鄧根年議員、溫和輝議員、姚銘議員、曾勁聰議員、溫和達議員、廖興洪議員、蘇西智議員、高維基先生和廖志凌先生)，7 票反對(何樹光議員、陳惠達議員、彭振聲議員、劉其烽議員、藍偉良議員、張京樑先生和張家峰先生)，1 票棄權(曾玉安先生)。粉嶺用地的公營房屋計劃得到絕對多數票的支持，獲得通過。

37. 主席總結表示，委員會支持上述發展計劃和相關大綱圖的擬議修訂，並希望各有關部門真正按議員的意見認真執行計劃及相關配套設施，不要好心做壞事。


N
上水華山
Sheung Shui Wa Shan
華山
WA SHAN
新圍/大嶺排靶場
San Wai / Tai Ling Firing Range
大平山
SACRED HILL
(TIN PING SHAN)
屠場
ABATTOR
防洪水塘
FLOOD BALANCING RESERVOIR
污水處理廠
SEWAGE TREATMENT WORKS
上水鄉
Sheung Shui Heung
小坑新村
Siu Hang San Tsuen
小坑村
Siu Hang Tsuen
翠麗花園
Tsui Lai Garden
北區運動場
North District Sports Ground
秀翠園
Woodland Crest
巴士總
BUS DEPOT
石湖墟
SHEK WU HUI
烏蛟騰
Wu Nga Lok Yeung
松柏塱
Tsung Pak Long
彩園邨
Choi Po Court
大新城
Tai Tau Leng
彩頤邨
Choi Yuen Estate
上水廣場
Landmark North
安達交滙處
TRANSPORT INTERCHANGE WITH COMMERCIAL USES ABOVE
太平邨
Tin Ping Estate
龍山村
Ling Shan Tsuen
龍山
Ling Hill
MA SIK ROAD
榮福中心
Wing Fai Centre
翠怡軒
Belair Monte
聯和墟
LUEN WO HUI
So Kwun Po
北區公園
North District Park
鐵路車站
RAILWAY STATION
北區醫院
North District Hospital
太平邨
Tai Ping Estate
粉嶺圍
Fanling Wai
高爾夫球場
Golf Course
FAN KAM ROAD
CHUNG UK TSUEN
CHUNG ON STREET
SAN WAN ROAD
FANLING HIGHWAY
SHEUNG WO HANG ROAD
LUEN WO ROAD
FAN LING LANE
MAN KAM TO ROAD
SHA TAU KOK ROAD
SHEUNG YUE RIVER TRAIL
SHEK SHEUNG RIVER (RIVER SUTLEJ)
NE TONG RIVER
RIVER INDUS
(CHANNEL ALIGNMENT SUBJECT TO DETAILED DESIGN)
新田村
San Tin
新田
SAN TIN
新田東
SAN TIN EAST
新田西
SAN TIN WEST
新田北
SAN TIN NORTH
新田南
SAN TIN SOUTH
新田中
SAN TIN CENTRAL
新田路
SAN TIN ROAD
新田公路
SAN TIN HIGHWAY



擬議修訂項目：
PROPOSED AMENDMENT ITEMS:

A1	由「工業」地帶改劃為「住宅(甲類)4」地帶 AREA TO BE REZONED FROM "INDUSTRIAL" TO "RESIDENTIAL (GROUP A)4"
A2	由「工業」地帶及「其他指定用途」註明「巴士廠」地帶 改劃為「住宅(甲類)4」地帶 AREA TO BE REZONED FROM "INDUSTRIAL" AND "OTHER SPECIFIED USES" ANNOTATED "BUS DEPOT" TO "RESIDENTIAL (GROUP A)4"
A3	由「休憩用地」地帶改劃為「住宅(甲類)5」地帶 AREA TO BE REZONED FROM "OPEN SPACE" TO "RESIDENTIAL (GROUP A)5"
A4	由「政府、機構或社區」地帶改劃為「住宅(甲類)4」地帶 AREA TO BE REZONED FROM "GOVERNMENT, INSTITUTION OR COMMUNITY" TO "RESIDENTIAL (GROUP A)4"
B	由「政府、機構或社區」地帶改劃為「住宅(甲類)6」地帶 AREA TO BE REZONED FROM "GOVERNMENT, INSTITUTION OR COMMUNITY" TO "RESIDENTIAL (GROUP A)6"
C1	由「工業」地帶改劃為顯示為「道路」的地方 AREA TO BE REZONED FROM "INDUSTRIAL" TO AREA SHOWN AS 'ROAD'
C2	由「工業」地帶及「其他指定用途」註明「巴士廠」地帶 改劃為顯示為「道路」的地方 AREA TO BE REZONED FROM "INDUSTRIAL" AND "OTHER SPECIFIED USES" ANNOTATED "BUS DEPOT" TO AREA SHOWN AS 'ROAD'
C3	由「休憩用地」地帶改劃為顯示為「道路」的地方 AREA TO BE REZONED FROM "OPEN SPACE" TO AREA SHOWN AS 'ROAD'
130	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)

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本摘要圖於2019年2月28日擬備，
所根據的資料為於2017年1月3日
核准的分區計劃大綱圖編號S/FSS/22
EXTRACT PLAN PREPARED ON 28.2.2019
BASED ON OUTLINE ZONING PLAN No.
S/FSS/22 APPROVED ON 3.1.2017

位置圖 LOCATION PLAN

在粉嶺/上水分區計劃大綱核准圖編號S/FSS/22
作出的擬議修訂項目A1、A2、A3、A4、B、C1、C2及C3
PROPOSED AMENDMENT ITEMS A1, A2, A3, A4, B, C1, C2 AND C3
TO THE APPROVED FANLING / SHEUNG SHUI
OUTLINE ZONING PLAN No. S/FSS/22

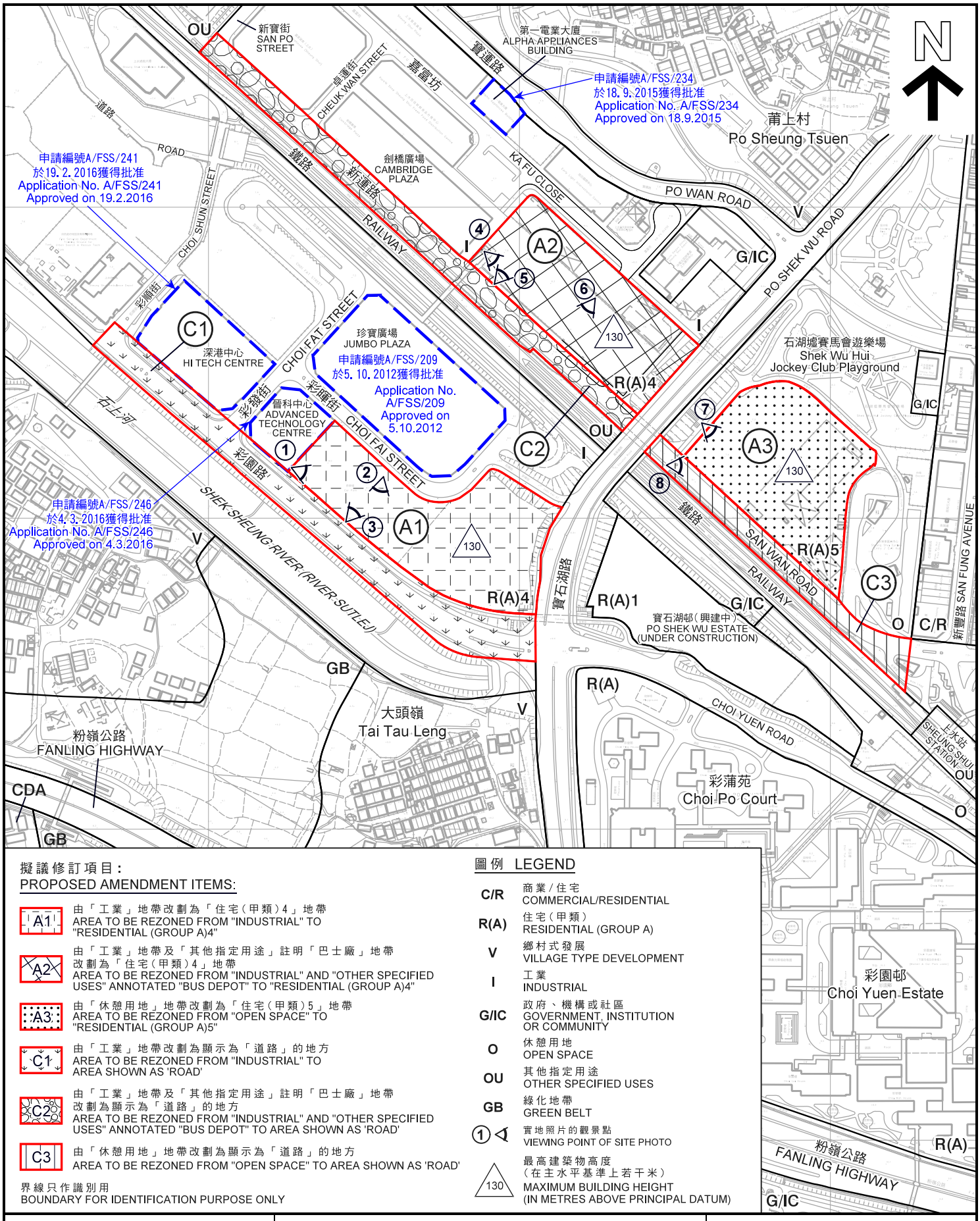
SCALE 1 : 10 000 比例尺

米 METRES 100 0 100 200 300 400 500 600 700 800 900 1 000 米 METRES

規劃署
PLANNING
DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
1b



擬議修訂項目：
PROPOSED AMENDMENT ITEMS:

- A1 由「工業」地帶改劃為「住宅（甲類）4」地帶
  AREA TO BE REZONED FROM "INDUSTRIAL" TO "RESIDENTIAL (GROUP A)4"
- A2 由「工業」地帶及「其他指定用途」註明「巴士廠」地帶改劃為「住宅（甲類）4」地帶
  AREA TO BE REZONED FROM "INDUSTRIAL" AND "OTHER SPECIFIED USES" ANNOTATED "BUS DEPOT" TO "RESIDENTIAL (GROUP A)4"
- A3 由「休憩用地」地帶改劃為「住宅（甲類）5」地帶
  AREA TO BE REZONED FROM "OPEN SPACE" TO "RESIDENTIAL (GROUP A)5"
- C1 由「工業」地帶改劃為顯示為「道路」的地方
  AREA TO BE REZONED FROM "INDUSTRIAL" TO AREA SHOWN AS 'ROAD'
- C2 由「工業」地帶及「其他指定用途」註明「巴士廠」地帶改劃為顯示為「道路」的地方
  AREA TO BE REZONED FROM "INDUSTRIAL" AND "OTHER SPECIFIED USES" ANNOTATED "BUS DEPOT" TO AREA SHOWN AS 'ROAD'
- C3 由「休憩用地」地帶改劃為顯示為「道路」的地方
  AREA TO BE REZONED FROM "OPEN SPACE" TO AREA SHOWN AS 'ROAD'

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圖例 LEGEND

C/R	商業／住宅 COMMERCIAL/RESIDENTIAL
R(A)	住宅（甲類） RESIDENTIAL (GROUP A)
V	鄉村式發展 VILLAGE TYPE DEVELOPMENT
I	工業 INDUSTRIAL
G/IC	政府、機構或社區 GOVERNMENT, INSTITUTION OR COMMUNITY
O	休憩用地 OPEN SPACE
OU	其他指定用途 OTHER SPECIFIED USES
GB	綠化地帶 GREEN BELT
①	實地照片的觀景點 VIEWING POINT OF SITE PHOTO
130	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)

本摘要圖於2019年2月18日擬備，
所根據的資料為測量圖編號
3-SW-1C、1D、6A、6B、6C及6D

EXTRACT PLAN PREPARED ON 18.2.2019
BASED ON SURVEY SHEETS No.
3-SW-1C, 1D, 6A, 6B, 6C AND 6D

平面圖 SITE PLAN

在粉嶺／上水分區計劃大綱核准圖編號S/FSS/22
作出的擬議修訂項目A1、A2、A3、C1、C2及C3

PROPOSED AMENDMENT ITEMS A1, A2, A3, C1, C2, AND C3
TO THE APPROVED FANLING / SHEUNG SHUI
OUTLINE ZONING PLAN No. S/FSS/22

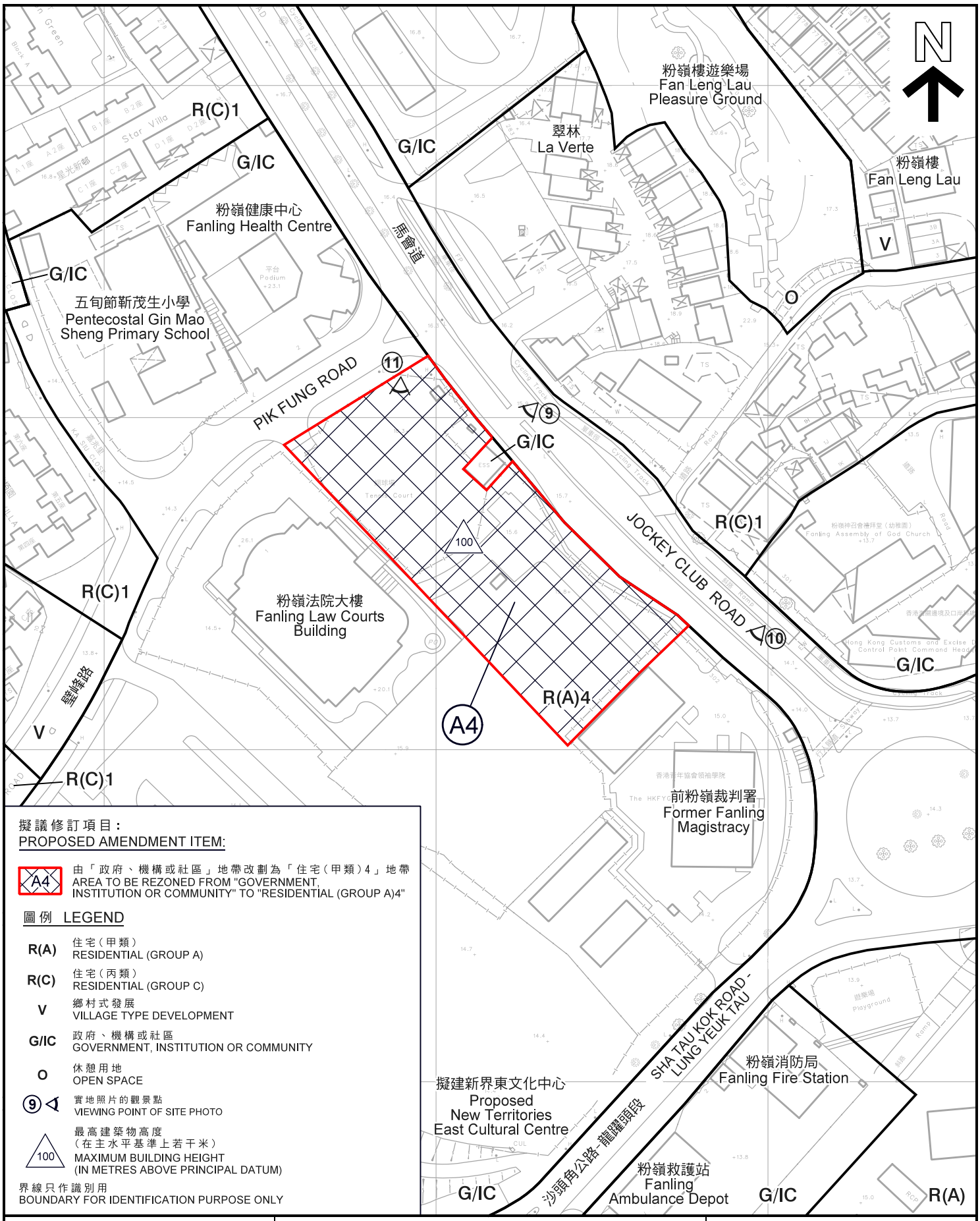
SCALE 1 : 4 000 比例尺

米 METRES 80 0 80 160 米 METRES

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
2a



擬議修訂項目：
PROPOSED AMENDMENT ITEM:

A4 由「政府、機構或社區」地帶改劃為「住宅(甲類)4」地帶
AREA TO BE REZONED FROM "GOVERNMENT, INSTITUTION OR COMMUNITY" TO "RESIDENTIAL (GROUP A)4"

圖例 LEGEND

R(A)	住宅(甲類) RESIDENTIAL (GROUP A)
R(C)	住宅(丙類) RESIDENTIAL (GROUP C)
V	鄉村式發展 VILLAGE TYPE DEVELOPMENT
G/IC	政府、機構或社區 GOVERNMENT, INSTITUTION OR COMMUNITY
O	休憩用地 OPEN SPACE
⑨	實地照片的觀景點 VIEWING POINT OF SITE PHOTO
100	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)

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本摘要圖於2019年2月18日擬備，所根據的資料為測量圖編號
3-SW-7D及12B

EXTRACT PLAN PREPARED ON 18.2.2019 BASED ON SURVEY SHEETS No. 3-SW-7D AND 12B

平面圖 SITE PLAN

在粉嶺/上水分區計劃大綱核准圖編號S/FSS/22作出的擬議修訂項目A4

PROPOSED AMENDMENT ITEM A4 TO THE APPROVED FANLING / SHEUNG SHUI OUTLINE ZONING PLAN No. S/FSS/22

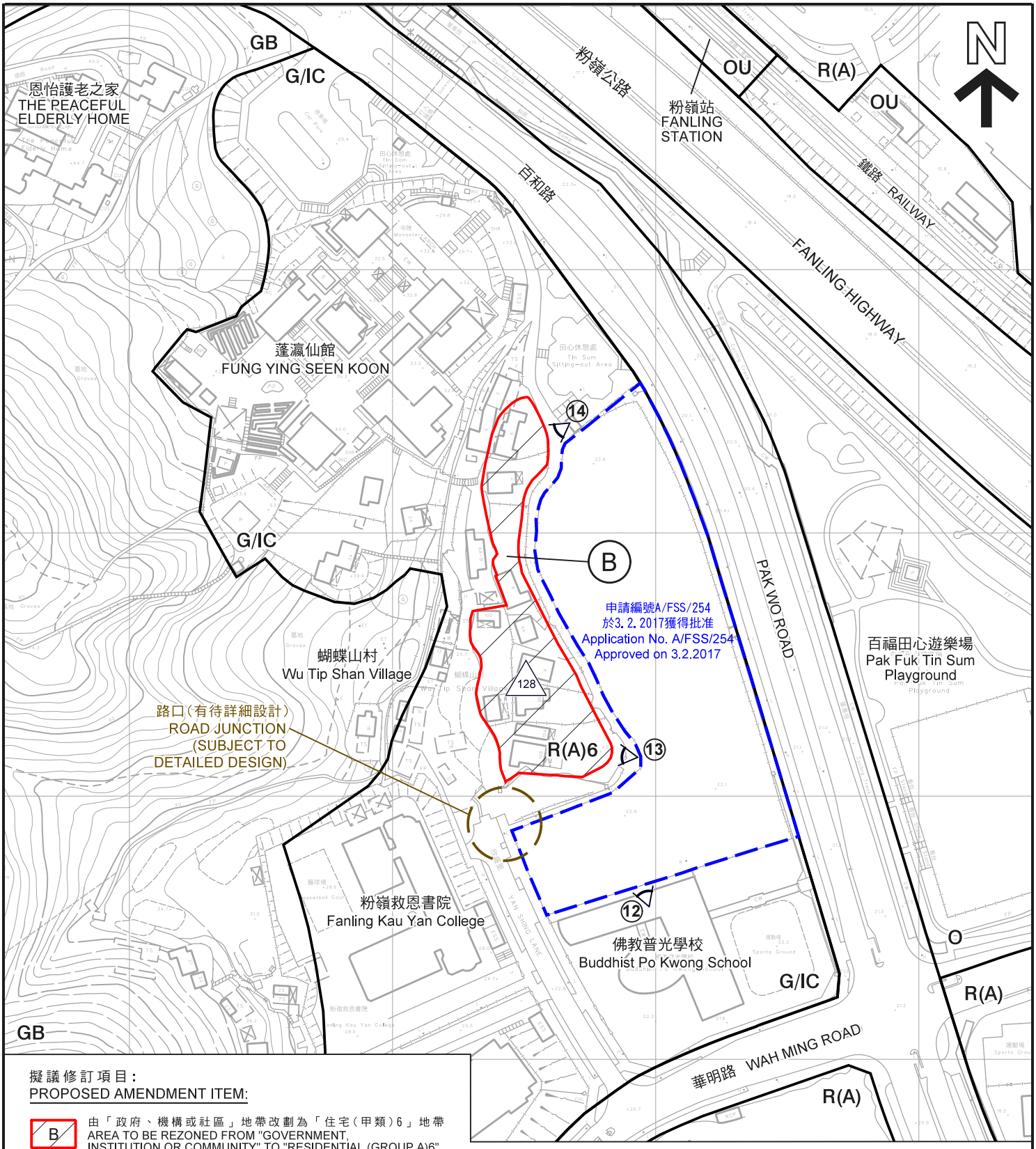
SCALE 1 : 1 500 比例尺

米 METRES 25 0 25 50 米 METRES

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
2b



擬議修訂項目：
PROPOSED AMENDMENT ITEM:

B 由「政府、機構或社區」地帶改劃為「住宅(甲類)6」地帶
AREA TO BE REZONED FROM "GOVERNMENT, INSTITUTION OR COMMUNITY" TO "RESIDENTIAL (GROUP A)6"

圖例 LEGEND

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

⑫ 實地照片的觀景點 VIEWING POINT OF SITE PHOTO

128 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)

界線只作識別用 BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

本摘要圖於2019年2月18日擬備，
所根據的資料為測量圖編號
3-SW-12A、12B、12C及12D

EXTRACT PLAN PREPARED ON 18.2.2019
BASED ON SURVEY SHEETS No.
3-SW-12A, 12B, 12C AND 12D

平面圖 SITE PLAN

在粉嶺/上水分區計劃大綱核准圖編號S/FSS/22
作出的擬議修訂項目B
PROPOSED AMENDMENT ITEM B
TO THE APPROVED FANLING / SHEUNG SHUI
OUTLINE ZONING PLAN No. S/FSS/22

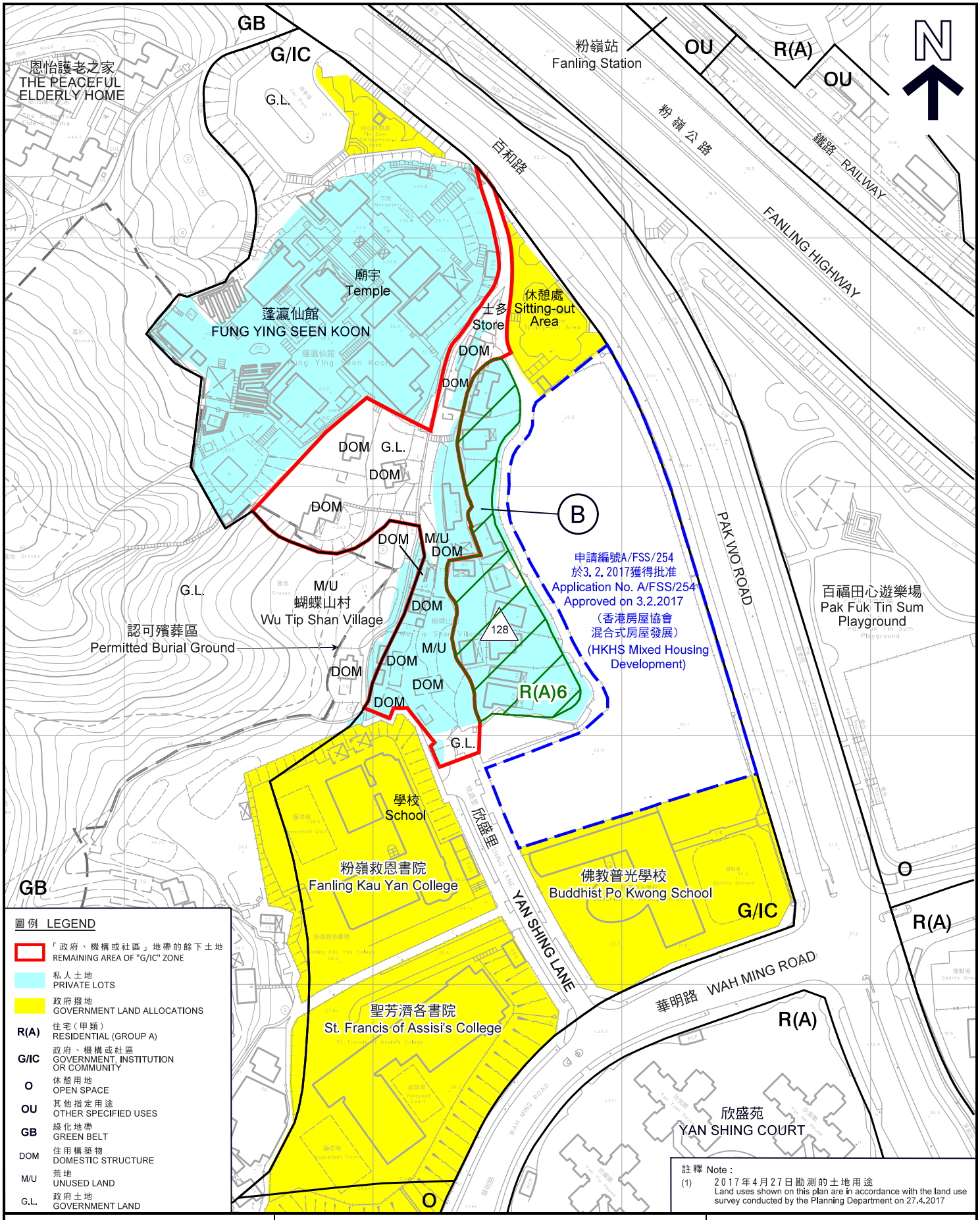
SCALE 1 : 2 000 比例尺

米 METRES 40 0 40 80 米 METRES

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
2c



圖例 LEGEND

	「政府、機構或社區」地帶的餘下土地 REMAINING AREA OF "G/IC" ZONE
	私人土地 PRIVATE LOTS
	政府撥地 GOVERNMENT LAND ALLOCATIONS
R(A)	住宅（甲類） RESIDENTIAL (GROUP A)
G/IC	政府、機構或社區 GOVERNMENT, INSTITUTION OR COMMUNITY
O	休憩用地 OPEN SPACE
OU	其他指定用途 OTHER SPECIFIED USES
GB	綠化地帶 GREEN BELT
DOM	住用構築物 DOMESTIC STRUCTURE
M/U	荒地 UNUSED LAND
G.L.	政府土地 GOVERNMENT LAND

註釋 Note :

(1) 2017年4月27日勘測的土地用途
Land uses shown on this plan are in accordance with the land use survey conducted by the Planning Department on 27.4.2017

本摘要圖於2019年3月4日擬備，
所根據的資料為測量圖編號
3-SW-12A、B、C及D

EXTRACT PLAN PREPARED ON 4.3.2019
BASED ON SURVEY SHEETS No.
3-SW-12A, B, C AND D

平面圖 SITE PLAN

粉嶺/上水分區計劃大綱核准圖編號S/FSS/22上
「政府、機構或社區」地帶的土地用途檢討
LAND USE REVIEW OF "GOVERNMENT, INSTITUTION OR COMMUNITY" ZONE
ON THE APPROVED FANLING / SHEUNG SHUI
OUTLINE ZONING PLAN No. S/FSS/22

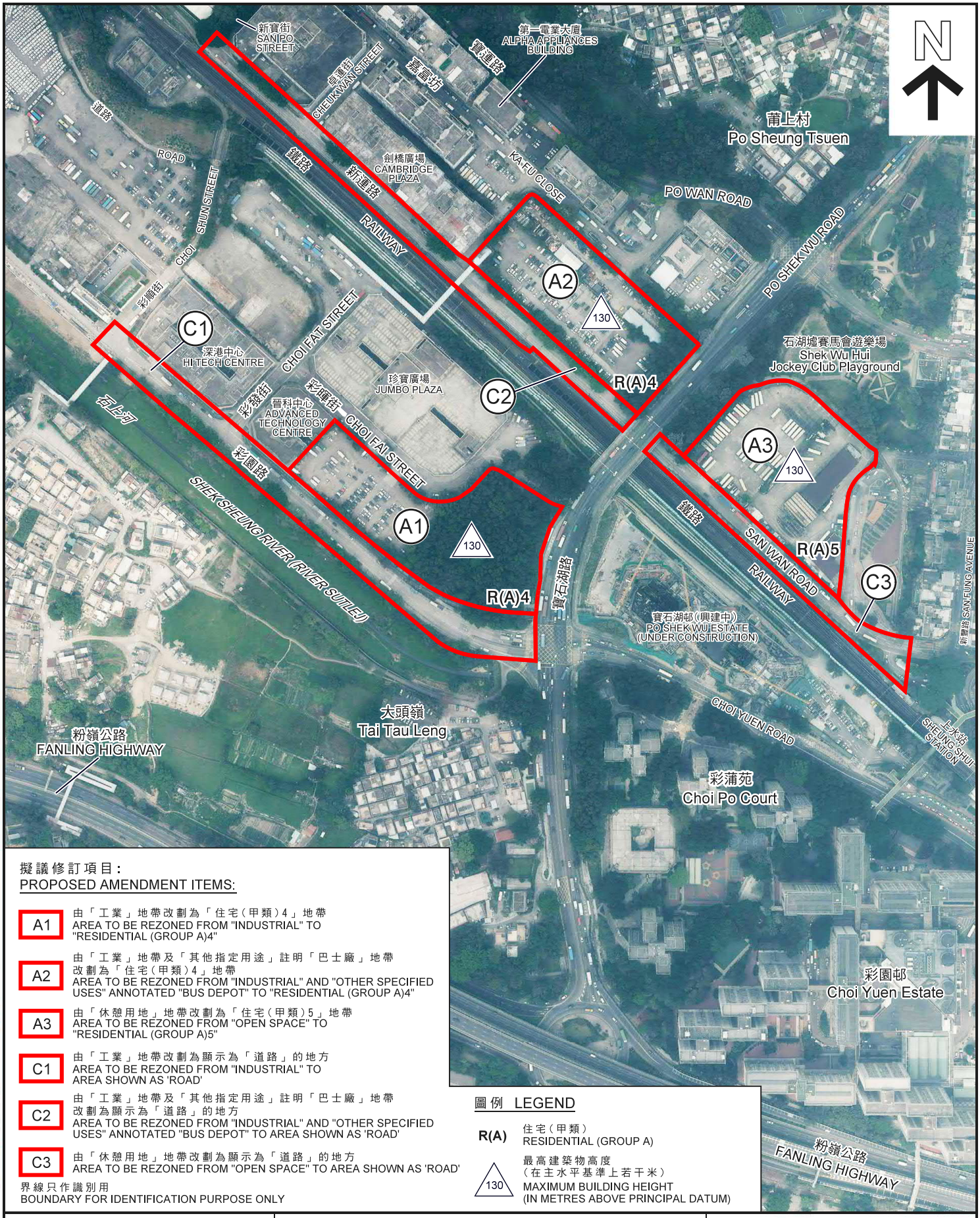
SCALE 1 : 2 000 比例尺

米 METRES 40 0 40 80 米 METRES

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
2d



擬議修訂項目：
PROPOSED AMENDMENT ITEMS:

A1	由「工業」地帶改劃為「住宅(甲類)4」地帶 AREA TO BE REZONED FROM "INDUSTRIAL" TO "RESIDENTIAL (GROUP A)4"
A2	由「工業」地帶及「其他指定用途」註明「巴士廠」地帶改劃為「住宅(甲類)4」地帶 AREA TO BE REZONED FROM "INDUSTRIAL" AND "OTHER SPECIFIED USES" ANNOTATED "BUS DEPOT" TO "RESIDENTIAL (GROUP A)4"
A3	由「休憩用地」地帶改劃為「住宅(甲類)5」地帶 AREA TO BE REZONED FROM "OPEN SPACE" TO "RESIDENTIAL (GROUP A)5"
C1	由「工業」地帶改劃為顯示為「道路」的地方 AREA TO BE REZONED FROM "INDUSTRIAL" TO AREA SHOWN AS 'ROAD'
C2	由「工業」地帶及「其他指定用途」註明「巴士廠」地帶改劃為顯示為「道路」的地方 AREA TO BE REZONED FROM "INDUSTRIAL" AND "OTHER SPECIFIED USES" ANNOTATED "BUS DEPOT" TO AREA SHOWN AS 'ROAD'
C3	由「休憩用地」地帶改劃為顯示為「道路」的地方 AREA TO BE REZONED FROM "OPEN SPACE" TO AREA SHOWN AS 'ROAD'

界線只作識別用
BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

圖例 LEGEND

R(A)	住宅(甲類) RESIDENTIAL (GROUP A)
130	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)

本摘要圖於2019年2月19日擬備，
所根據的資料為地政總署於
2018年3月27日拍得的航攝照片
編號E040026C及E040027C

PLAN PREPARED ON 19.2.2019
BASED ON AERIAL PHOTO Nos.E040026C
AND E040027C TAKEN ON 27.3.2018 BY
LANDS DEPARTMENT

航攝照片 AERIAL PHOTO

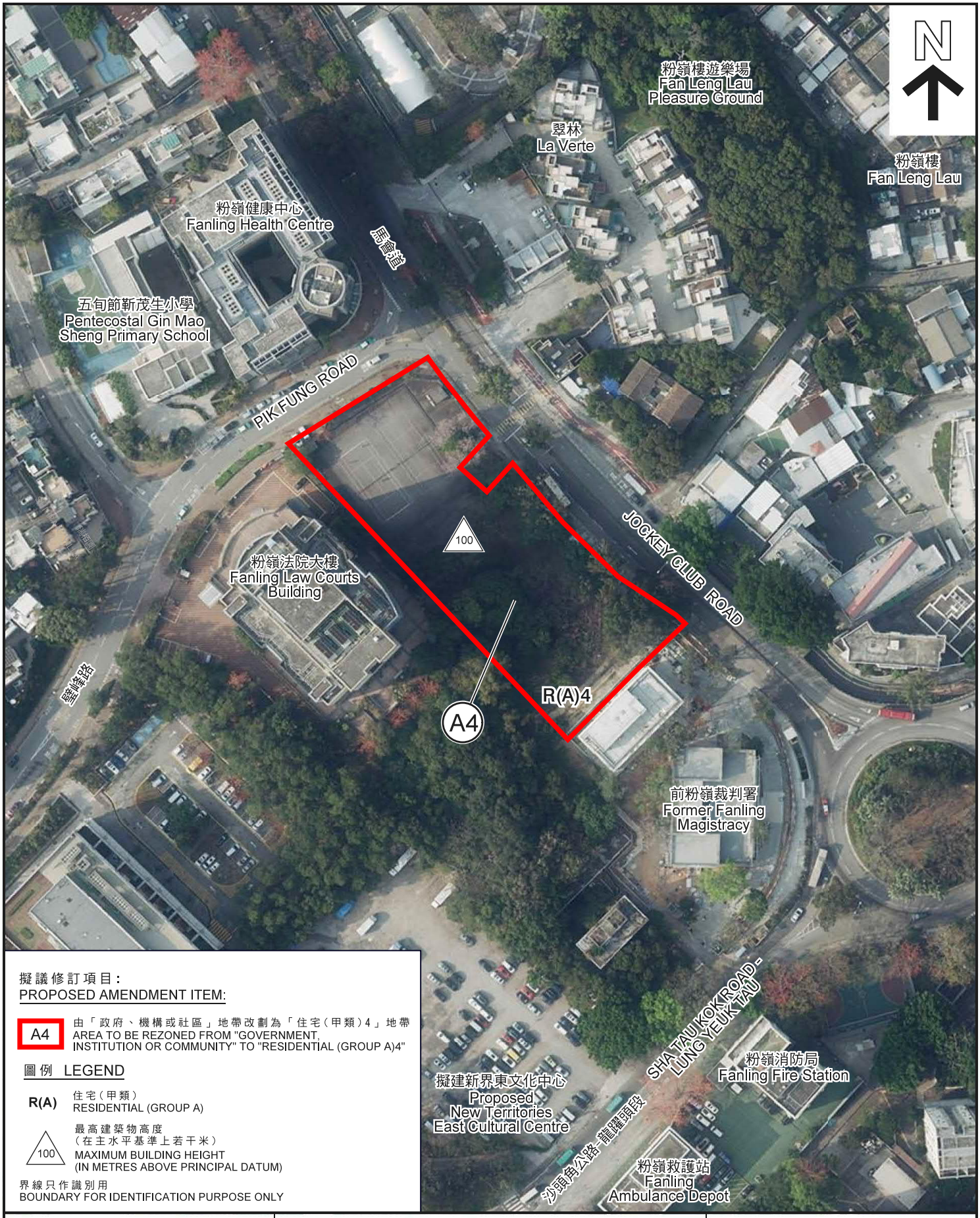
在粉嶺/上水分區計劃大綱核准圖編號S/FSS/22
作出的擬議修訂項目A1、A2、A3、C1、C2及C3

PROPOSED AMENDMENT ITEMS A1, A2, A3, C1, C2 AND C3
TO THE APPROVED FANLING / SHEUNG SHUI
OUTLINE ZONING PLAN No. S/FSS/22

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
3a



擬議修訂項目：
PROPOSED AMENDMENT ITEM:

A4 由「政府、機構或社區」地帶改劃為「住宅(甲類)4」地帶
AREA TO BE REZONED FROM "GOVERNMENT, INSTITUTION OR COMMUNITY" TO "RESIDENTIAL (GROUP A)4"

圖例 LEGEND

R(A) 住宅(甲類)
RESIDENTIAL (GROUP A)

100 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)

界線只作識別用
BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

本摘要圖於2019年2月19日擬備，
所根據的資料為地政總署於
2018年3月12日拍得的航攝照片
編號E034473C

PLAN PREPARED ON 19.2.2019
BASED ON AERIAL PHOTO No.E034473C
TAKEN ON 12.3.2018 BY
LANDS DEPARTMENT

航攝照片 AERIAL PHOTO

在粉嶺/上水分區計劃大綱核准圖編號S/FSS/22
作出的擬議修訂項目A4

PROPOSED AMENDMENT ITEM A4
TO THE APPROVED FANLING / SHEUNG SHUI
OUTLINE ZONING PLAN No. S/FSS/22

規劃署
PLANNING
DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
3b



擬議修訂項目：
PROPOSED AMENDMENT ITEMS:

B 由「政府、機構或社區」地帶改劃為「住宅（甲類）6」地帶
AREA TO BE REZONED FROM "GOVERNMENT, INSTITUTION OR COMMUNITY" TO "RESIDENTIAL (GROUP A)6"

圖例 LEGEND

R(A) 住宅（甲類）
RESIDENTIAL (GROUP A)

128 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)

界線只作識別用
BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

本摘要圖於2019年2月19日擬備，
所根據的資料為地政總署
於2018年3月12日拍得的航攝照片
編號E034526C

PLAN PREPARED ON 19.2.2019
BASED ON AERIAL PHOTO No.E034526C
TAKEN ON 12.3.2018 BY
LANDS DEPARTMENT

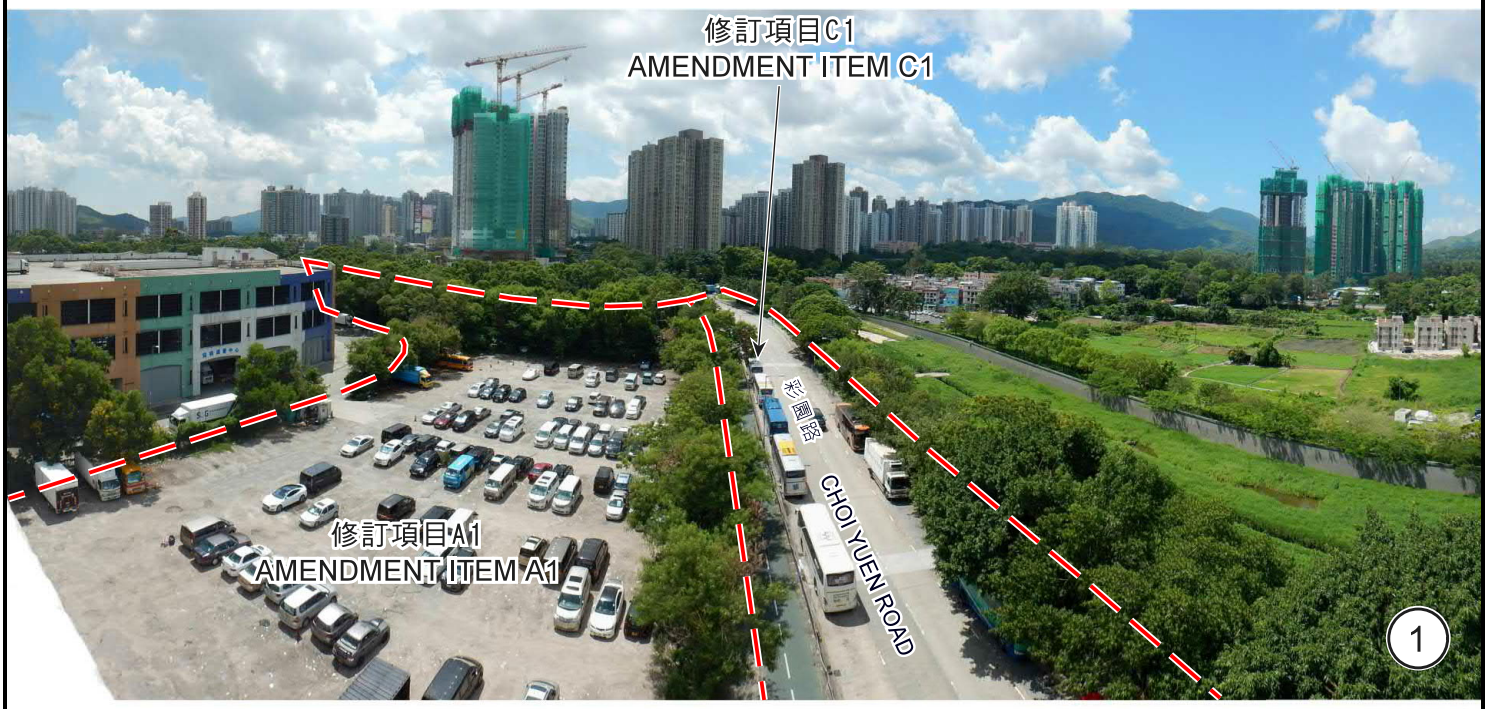
航攝照片 AERIAL PHOTO

在粉嶺/上水分區計劃大綱核准圖編號S/FSS/22
作出的擬議修訂項目B
PROPOSED AMENDMENT ITEM B
TO THE APPROVED FANLING / SHEUNG SHUI
OUTLINE ZONING PLAN No. S/FSS/22

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
3c







修訂項目界線只作識別用
AMENDMENT ITEM BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

本圖於2019年2月19日擬備，所根據的資料為攝於2018年7月27日及2018年7月31日的實地照片
PLAN PREPARED ON 19.2.2019 BASED ON SITE PHOTOS TAKEN ON 27.7.2018 AND 31.7.2018

實地照片 SITE PHOTOS

在粉嶺/上水分區計劃大綱核准圖編號S/FSS/22作出的擬議修訂項目A1及C1
PROPOSED AMENDMENT ITEMS A1 AND C1 TO THE APPROVED FANLING / SHEUNG SHUI OUTLINE ZONING PLAN No. S/FSS/22

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN 4a







修訂項目界線只作識別用
AMENDMENT ITEM BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

本圖於2019年2月19日擬備，所根據的資料為攝於2018年7月27日及2018年7月31日的實地照片
PLAN PREPARED ON 19.2.2019 BASED ON SITE PHOTOS TAKEN ON 27.7.2018 AND 31.7.2018

實地照片 SITE PHOTOS

在粉嶺/上水分區計劃大綱核准圖編號S/FSS/22作出的擬議修訂項目A2及C2
PROPOSED AMENDMENT ITEMS A2 AND C2 TO THE APPROVED FANLING / SHEUNG SHUI OUTLINE ZONING PLAN No. S/FSS/22

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
4b





修訂項目界線只作識別用
AMENDMENT ITEM BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

本圖於2019年2月19日擬備，所根據的資料為攝於2018年7月27日及2018年7月31日的實地照片
PLAN PREPARED ON 19.2.2019 BASED ON SITE PHOTOS TAKEN ON 27.7.2018 AND 31.7.2018

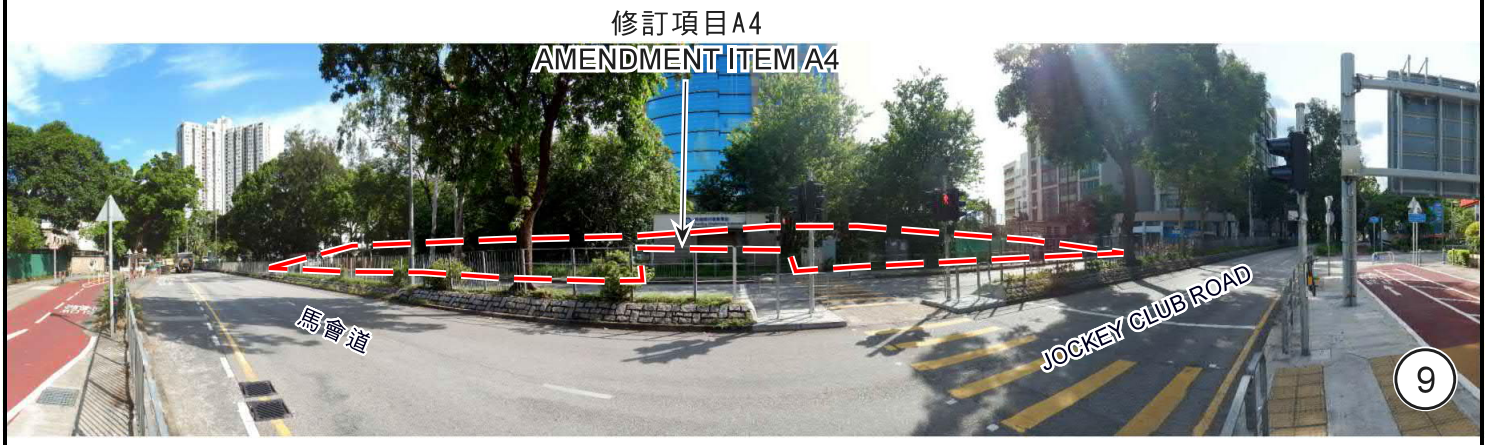
實地照片 SITE PHOTOS

在粉嶺/上水分區計劃大綱核准圖編號S/FSS/22作出的擬議修訂項目A3及C3
PROPOSED AMENDMENT ITEMS A3 AND C3 TO THE APPROVED FANLING / SHEUNG SHUI OUTLINE ZONING PLAN No. S/FSS/22

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN 4c







修訂項目界線只作識別用
AMENDMENT ITEM BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

本圖於2019年1月30日擬備，所根據的資料為攝於2018年7月27日及2018年7月31日的實地照片

PLAN PREPARED ON 30.1.2019 BASED ON SITE PHOTOS TAKEN ON 27.7.2018 AND 31.7.2018

實地照片 SITE PHOTOS

在粉嶺/上水分區計劃大綱核准圖編號S/FSS/22作出的擬議修訂項目A4

PROPOSED AMENDMENT ITEM A4
TO THE APPROVED FANLING / SHEUNG SHUI
OUTLINE ZONING PLAN No. S/FSS/22

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
4d







修訂項目界線只作識別用
AMENDMENT ITEM BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

本圖於2019年1月30日擬備，所根據的資料為攝於2018年7月27日及2018年7月31日的實地照片
PLAN PREPARED ON 30.1.2019 BASED ON SITE PHOTOS TAKEN ON 27.7.2018 AND 31.7.2018

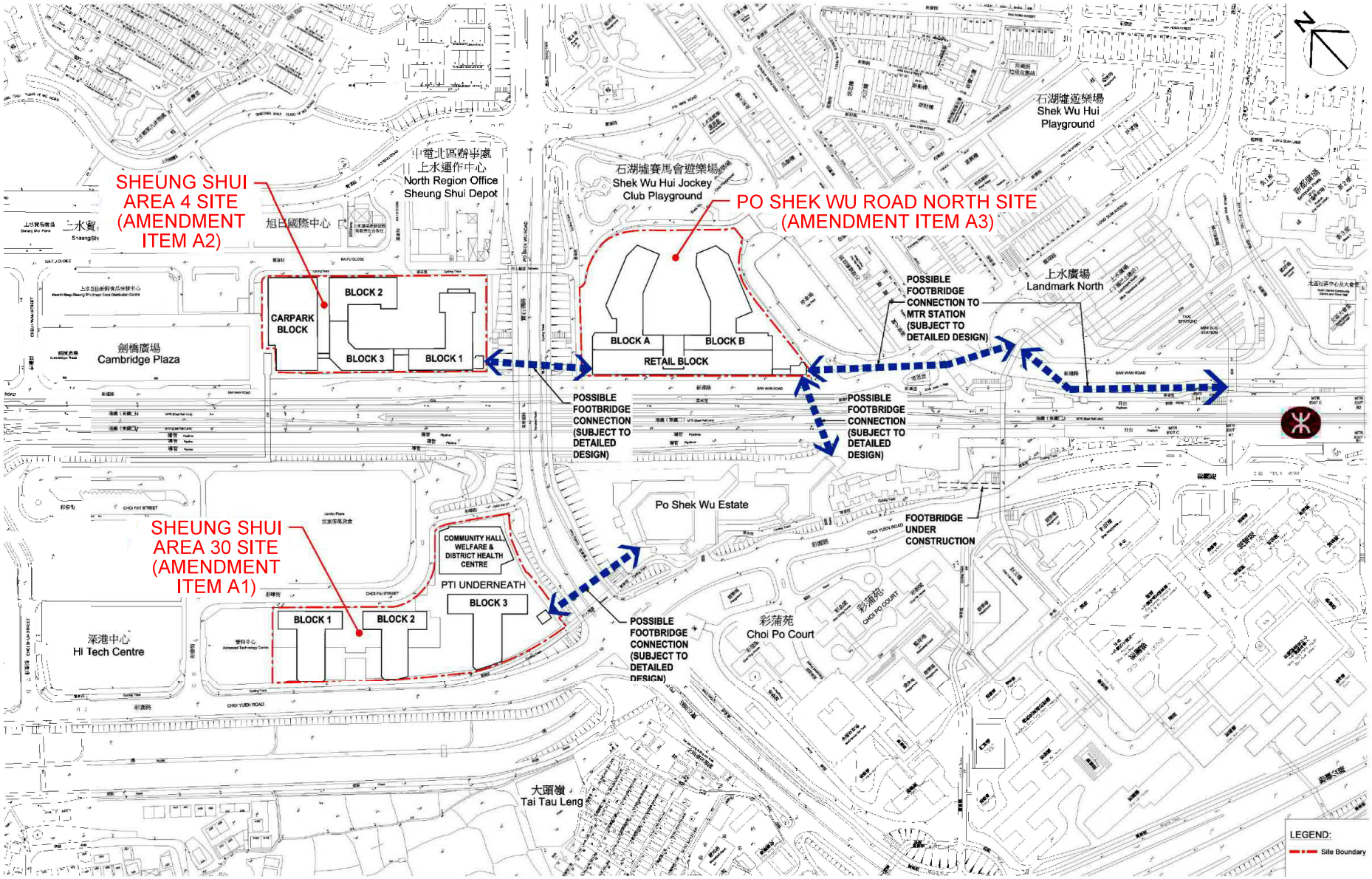
實地照片 SITE PHOTOS

在粉嶺/上水分區計劃大綱核准圖編號S/FSS/22作出的擬議修訂項目B
PROPOSED AMENDMENT ITEM B TO THE APPROVED FANLING / SHEUNG SHUI OUTLINE ZONING PLAN No. S/FSS/22

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN 4e



本摘要圖於2019年2月28日擬備
資料來源：由房屋署提供
EXTRACT PLAN PREPARED ON 28.2.2019
SOURCE : HOUSING DEPARTMENT

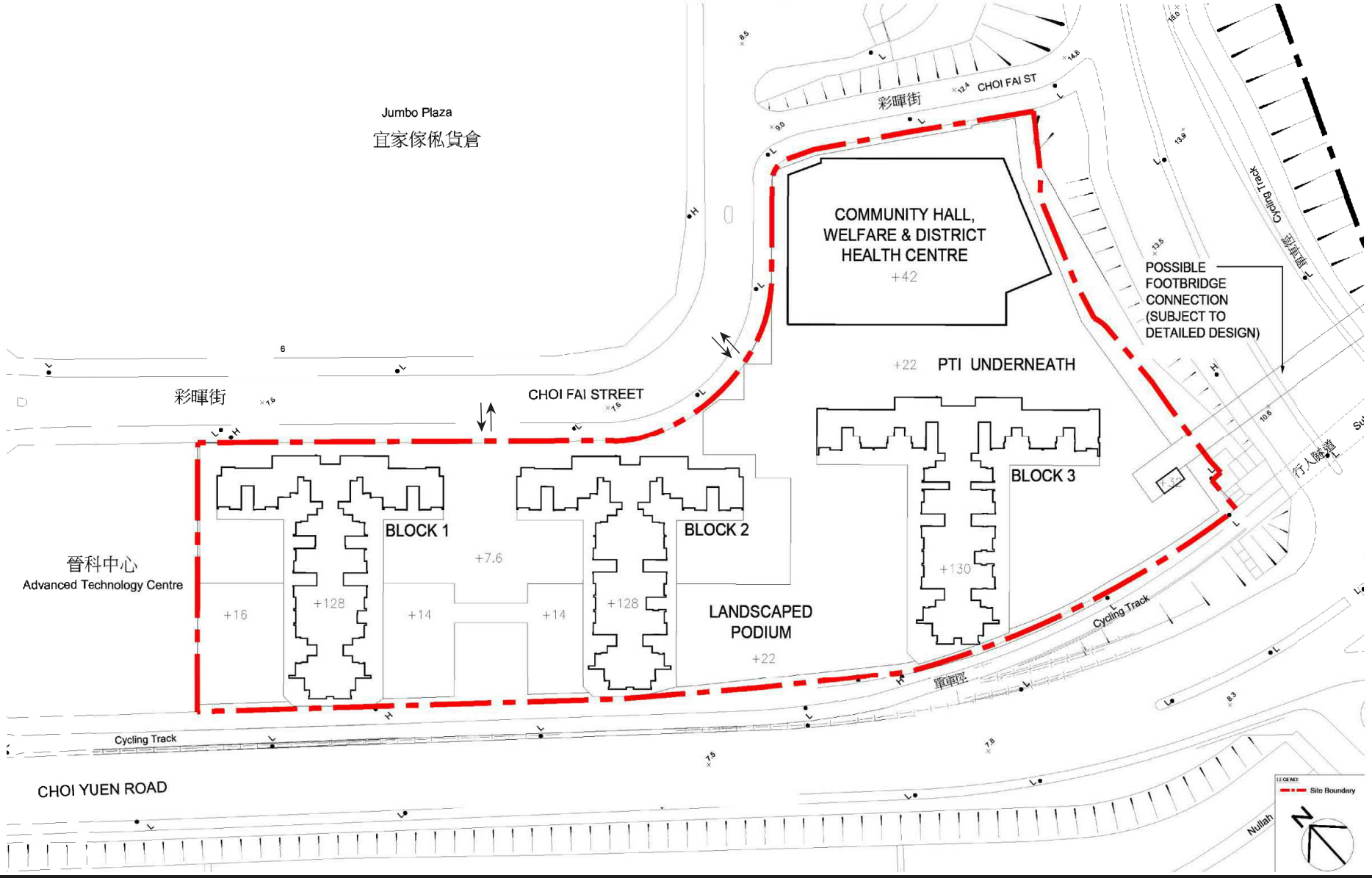
概念規劃圖 INDICATIVE LAYOUT

在粉嶺/上水分區計劃大綱核准圖編號S/FSS/22
作出的擬議修訂項目A1、A2及A3
PROPOSED AMENDMENT ITEMS A1, A2 AND A3
TO THE APPROVED FANLING / SHEUNG SHUI
OUTLINE ZONING PLAN No. S/FSS/22

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
5a



本摘要圖於2019年3月4日擬備
資料來源：由房屋署提供
EXTRACT PLAN PREPARED ON 4.3.2019
SOURCE : HOUSING DEPARTMENT

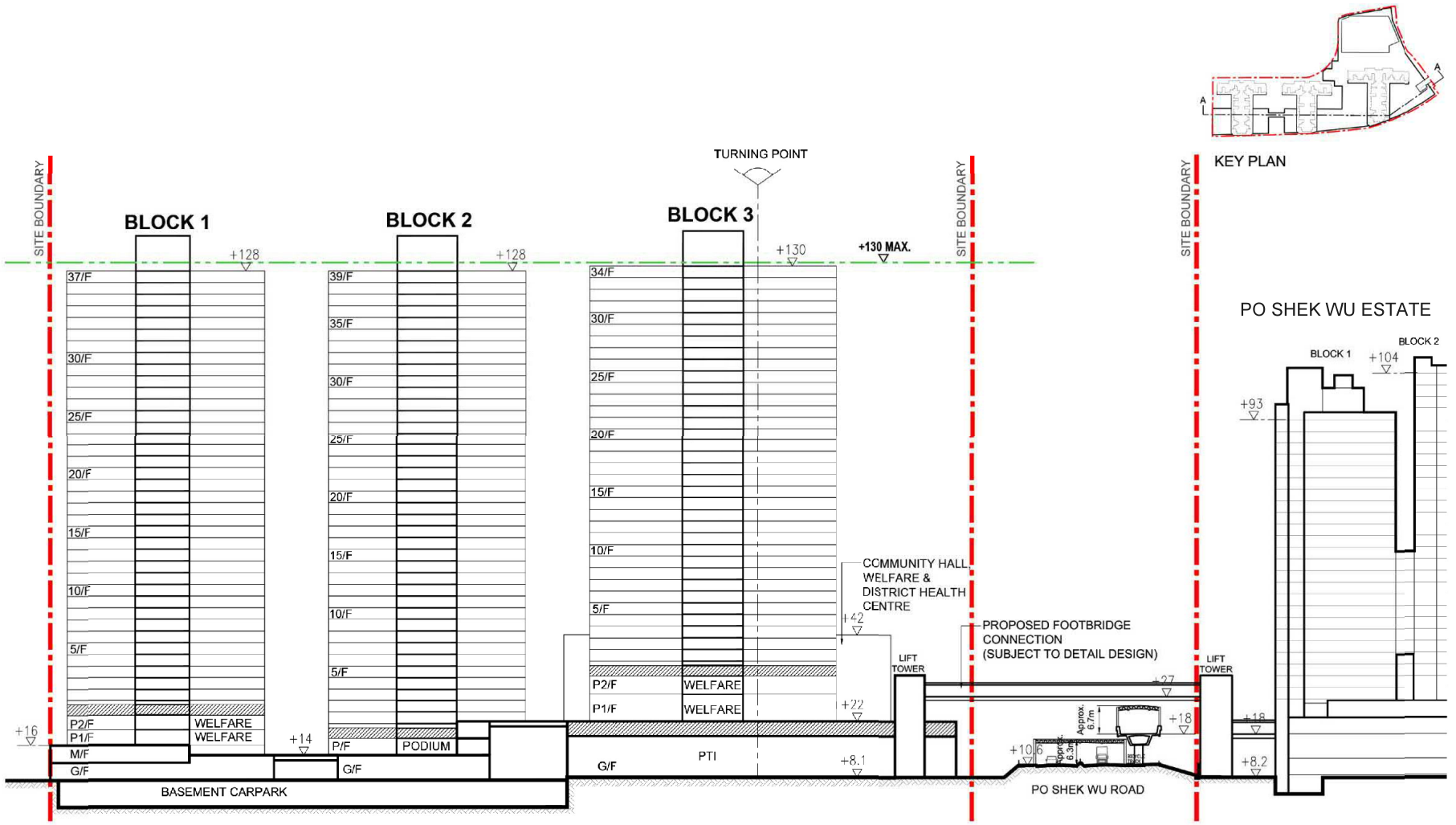
概念規劃圖 INDICATIVE LAYOUT

在粉嶺/上水分區計劃大綱核准圖編號S/FSS/22
作出的擬議修訂項目A1
PROPOSED AMENDMENT ITEM A1
TO THE APPROVED FANLING / SHEUNG SHUI
OUTLINE ZONING PLAN No. S/FSS/22

規劃署
PLANNING
DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
5b



SECTION A - A

本摘要圖於2019年3月4日擬備
資料來源:由香港房屋協會提供
EXTRACT PLAN PREPARED ON 4.3.2019
SOURCE : HONG KONG HOUSING SOCIETY

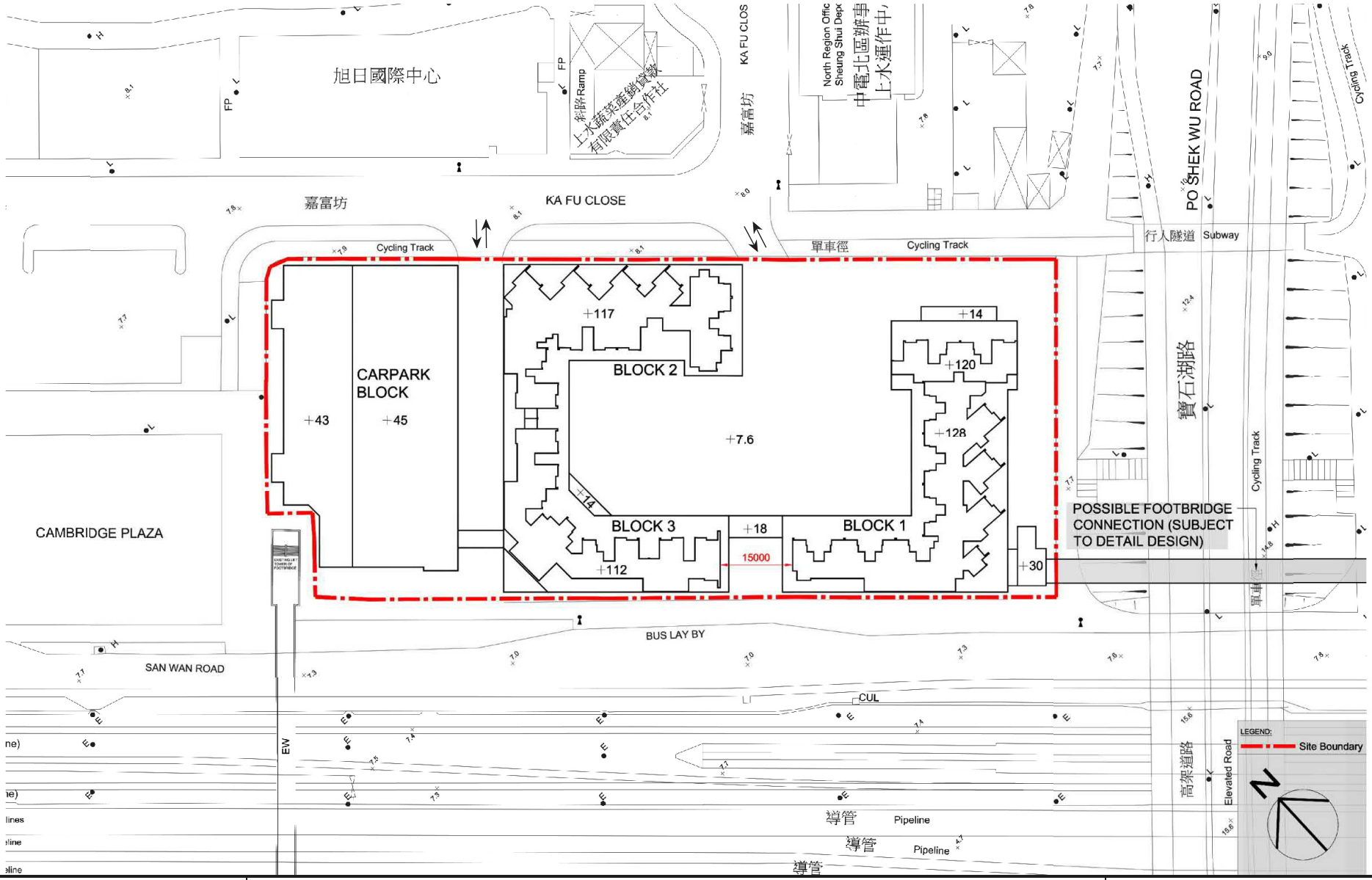
橫切面圖 SECTION DIAGRAM

在粉嶺/上水分區計劃大綱核准圖編號S/FSS/22
作出的擬議修訂項目A1
PROPOSED AMENDMENT ITEM A1
TO THE APPROVED FANLING / SHEUNG SHUI
OUTLINE ZONING PLAN No. S/FSS/22

規劃署
PLANNING
DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
5c



本摘要圖於2019年3月4日擬備
資料來源：由房屋署提供
EXTRACT PLAN PREPARED ON 4.3.2019
SOURCE : HOUSING DEPARTMENT

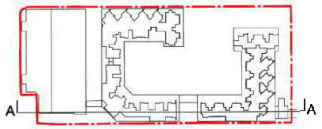
概念規劃圖 INDICATIVE LAYOUT

在粉嶺/上水分區計劃大綱核准圖編號S/FSS/22
作出的擬議修訂項目A2
PROPOSED AMENDMENT ITEM A2
TO THE APPROVED FANLING / SHEUNG SHUI
OUTLINE ZONING PLAN No. S/FSS/22

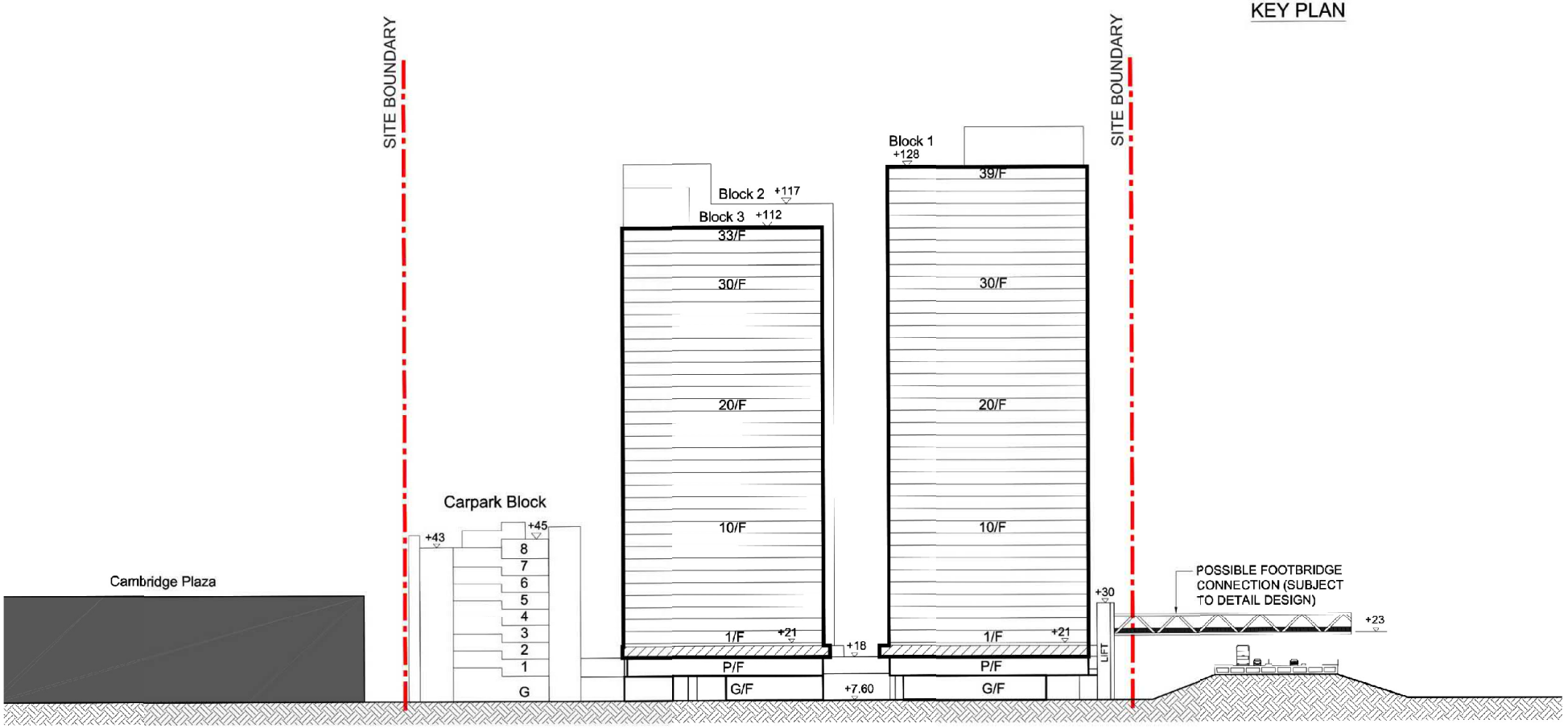
規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
5d



KEY PLAN



SECTION A-A

本摘要圖於2019年2月28日擬備
資料來源：由房屋署提供
EXTRACT PLAN PREPARED ON 28.2.2019
SOURCE : HOUSING DEPARTMENT

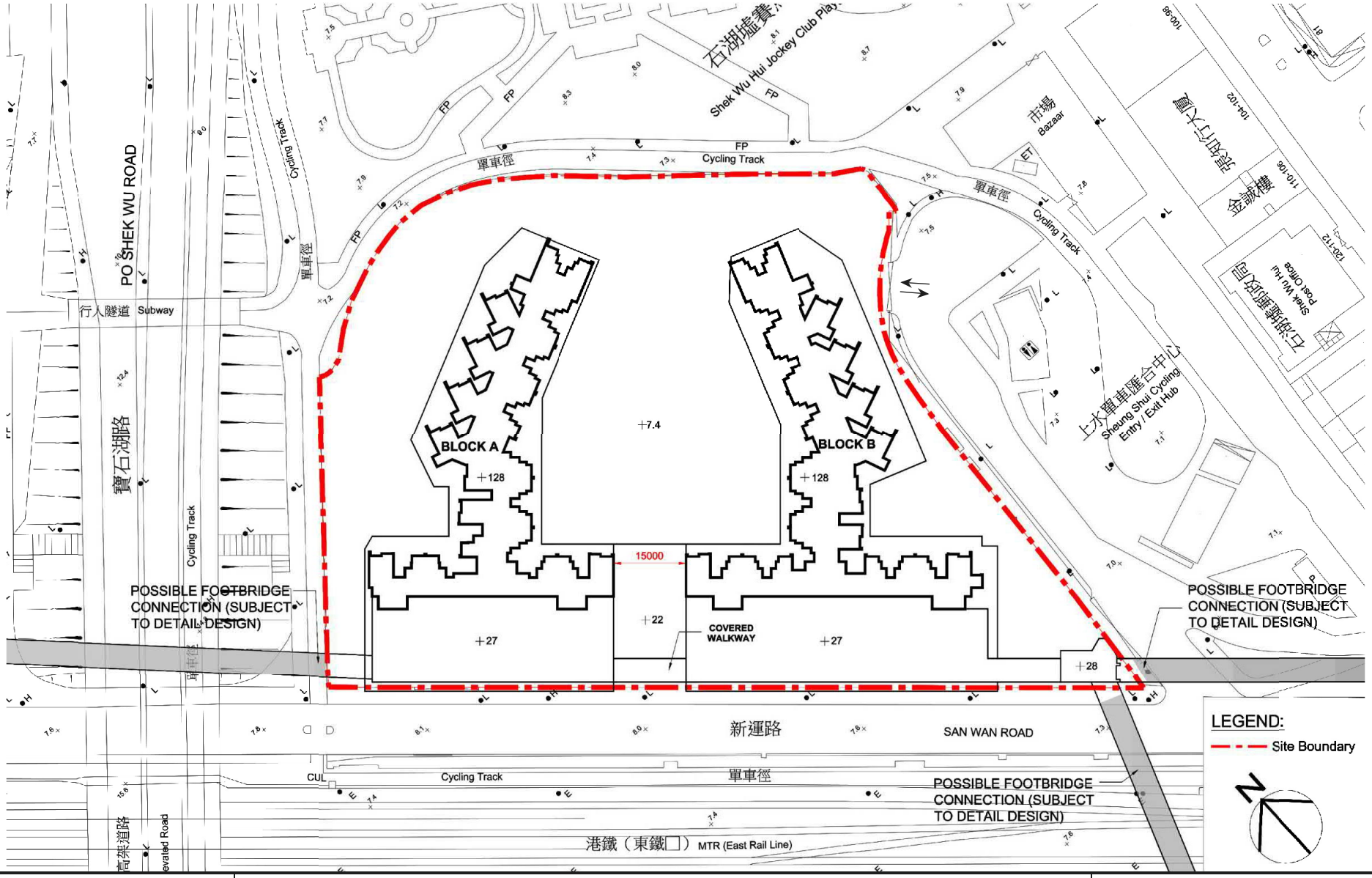
橫切面圖　SECTION DIAGRAM

在粉嶺 / 上水分區計劃大綱核准圖編號S/FSS/22
作出的擬議修訂項目A2
PROPOSED AMENDMENT ITEM A2
TO THE APPROVED FANLING / SHEUNG SHUI
OUTLINE ZONING PLAN No. S/FSS/22

規劃署
PLANNING
DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
5e



本摘要圖於2019年3月4日擬備
資料來源：由房屋署提供
EXTRACT PLAN PREPARED ON 4.3.2019
SOURCE : HOUSING DEPARTMENT

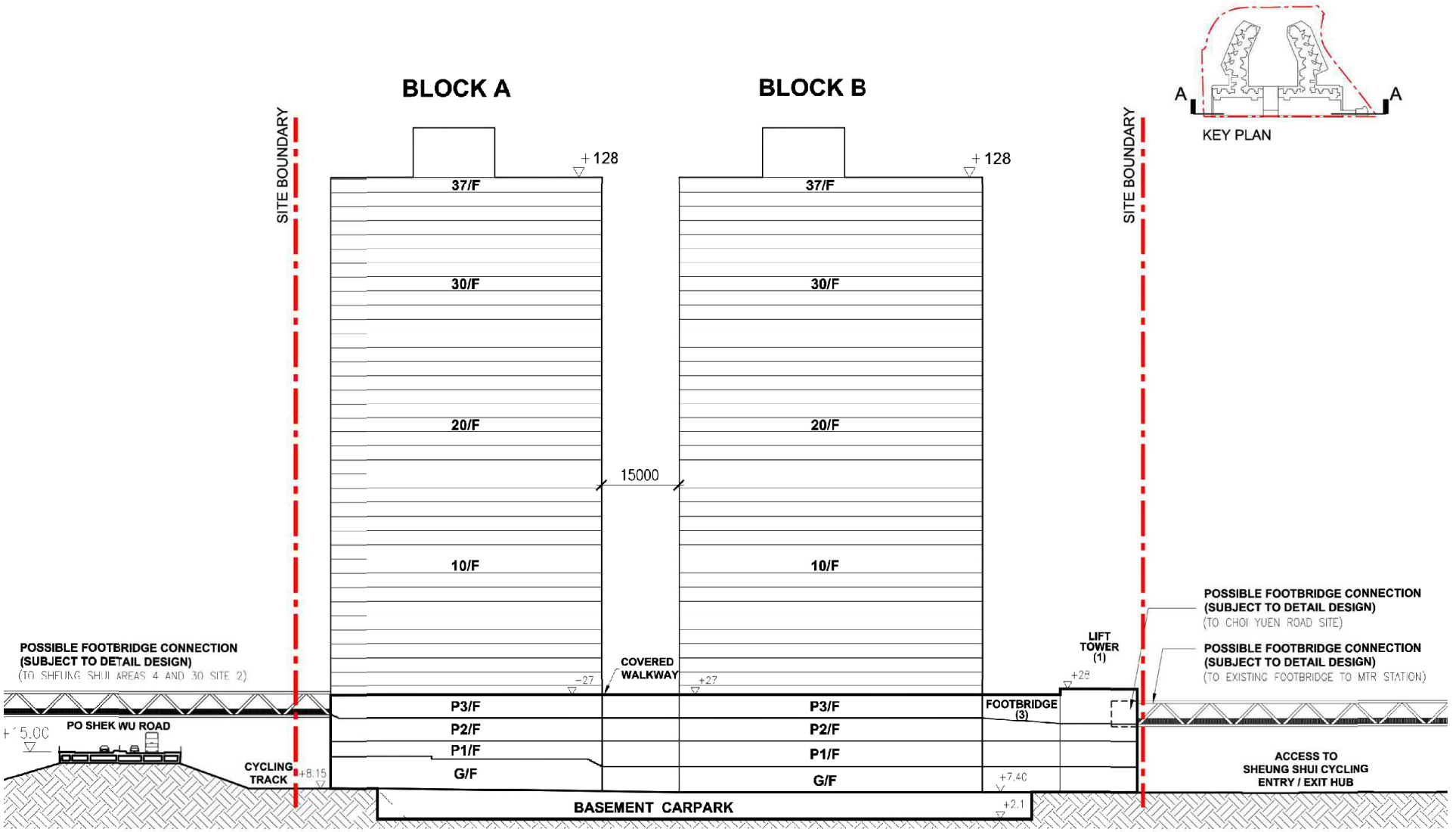
概念規劃圖 INDICATIVE LAYOUT

在粉嶺/上水分區計劃大綱核准圖編號S/FSS/22
作出的擬議修訂項目A3
PROPOSED AMENDMENT ITEM A3
TO THE APPROVED FANLING / SHEUNG SHUI
OUTLINE ZONING PLAN No. S/FSS/22

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
5f



SECTION A - A

本摘要圖於2019年2月28日擬備
資料來源：由房屋署提供
EXTRACT PLAN PREPARED ON 28.2.2019
SOURCE : HOUSING DEPARTMENT

橫切面圖　SECTION DIAGRAM

在粉嶺 / 上水分區計劃大綱核准圖編號S/FSS/22
作出的擬議修訂項目A3
PROPOSED AMENDMENT ITEM A3
TO THE APPROVED FANLING / SHEUNG SHUI
OUTLINE ZONING PLAN No. S/FSS/22

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
5g



本摘要圖於2019年3月4日擬備
資料來源：由香港房屋協會提供
EXTRACT PLAN PREPARED ON 4.3.2019
SOURCE : HONG KONG HOUSING SOCIETY

概念規劃圖 INDICATIVE LAYOUT

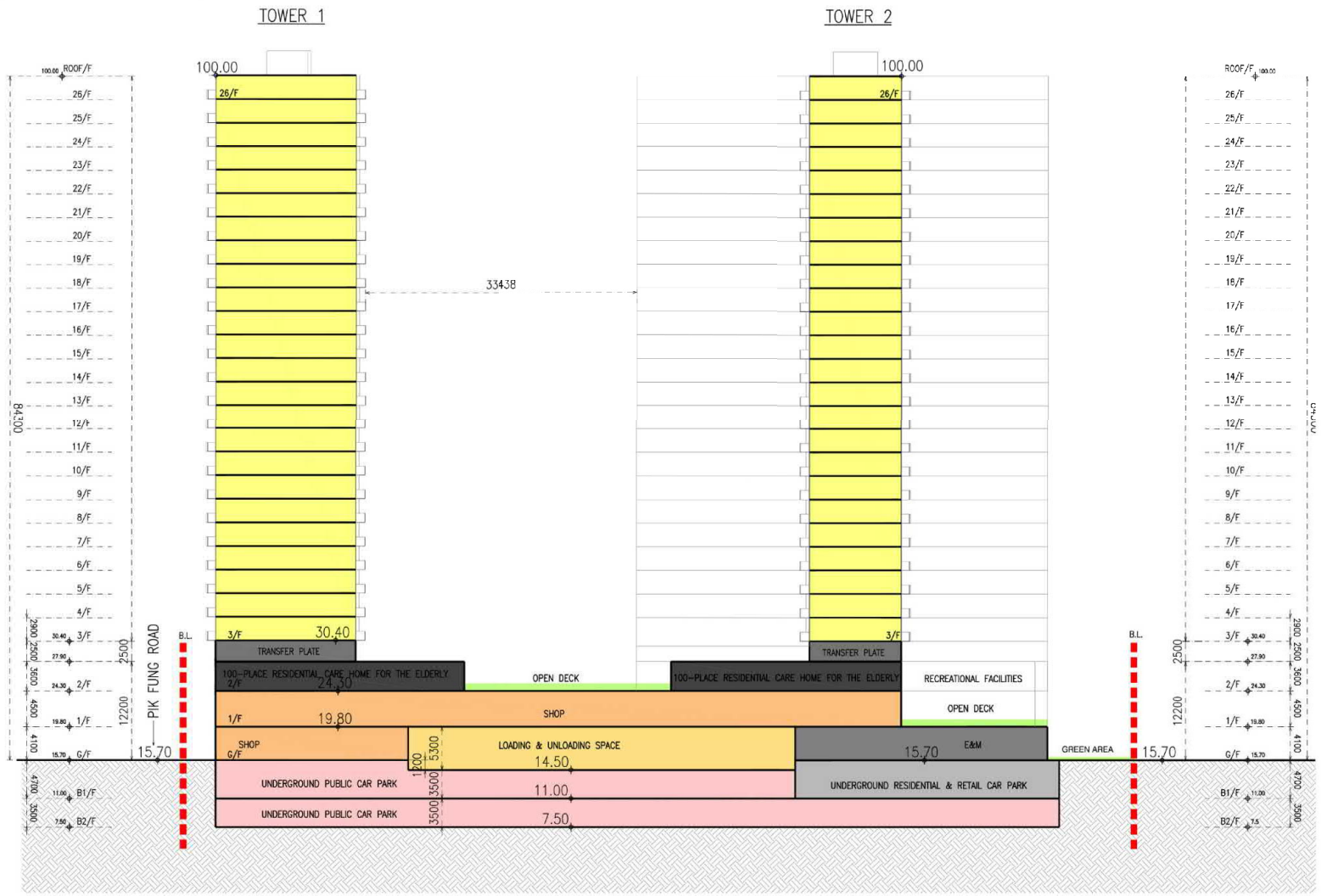
在粉嶺 / 上水分區計劃大綱核准圖編號S / FSS / 22
作出的擬議修訂項目A4
PROPOSED AMENDMENT ITEM A4
TO THE APPROVED FANLING / SHEUNG SHUI
OUTLINE ZONING PLAN No. S/FSS/22

規劃署
PLANNING
DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
5h

SECTION A–A



本摘要圖於2019年2月28日擬備
資料來源:由香港房屋協會提供
EXTRACT PLAN PREPARED ON 28.2.2019
SOURCE : HONG KONG HOUSING SOCIETY

橫切面圖 SECTION DIAGRAM

在粉嶺/上水分區計劃大綱核准圖編號S/FSS/22
作出的擬議修訂項目A4
PROPOSED AMENDMENT ITEM A4
TO THE APPROVED FANLING / SHEUNG SHUI
OUTLINE ZONING PLAN No. S/FSS/22

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

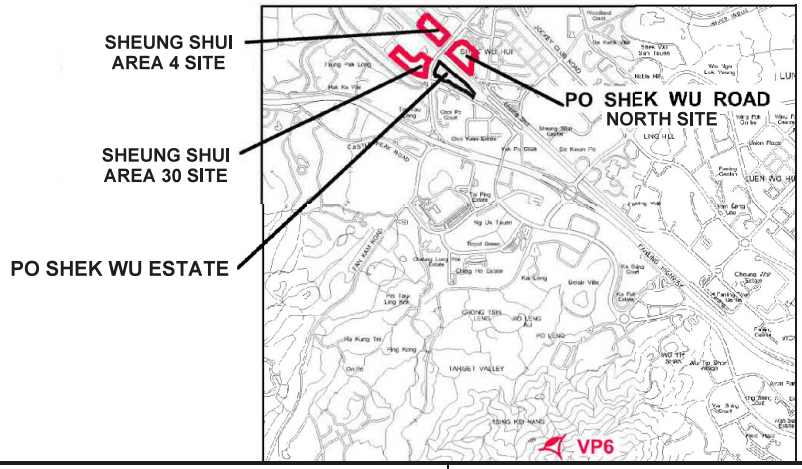
圖 PLAN
5i

Existing View



Photomontage





本摘要圖於2019年3月4日擬備
資料來源:由房屋署提供
EXTRACT PLAN PREPARED ON 4.3.2019
SOURCE : HOUSING DEPARTMENT

合成照片 PHOTOMONTAGE

在粉嶺/上水分區計劃大綱核准圖編號S/FSS/22作出的擬議修訂項目A1、A2及A3
PROPOSED AMENDMENT ITEMS A1, A2 AND A3 TO THE APPROVED FANLING / SHEUNG SHUI OUTLINE ZONING PLAN No. S/FSS/22

規劃署
PLANNING DEPARTMENT

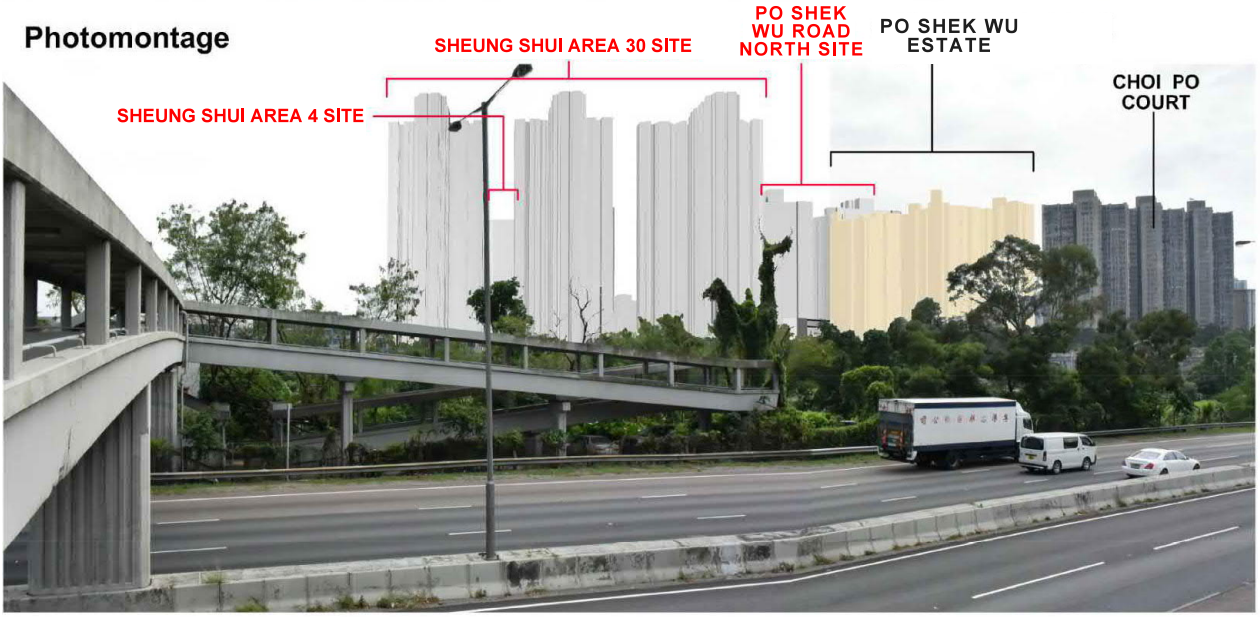
參考編號
REFERENCE No.
M/FS/19/11

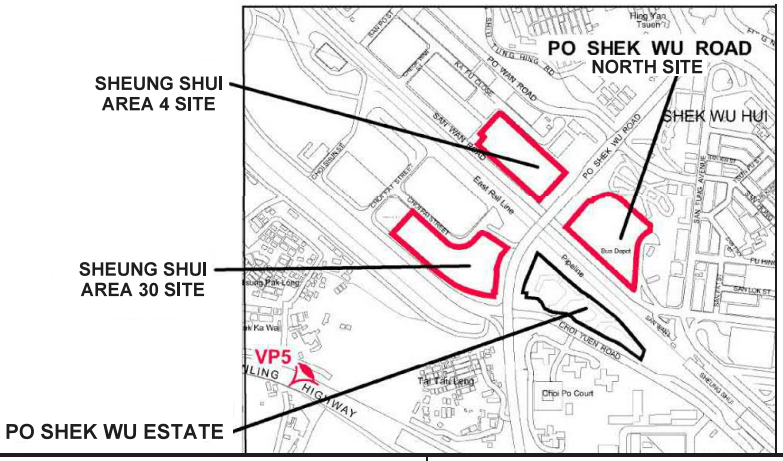
圖 PLAN
6a

Existing View



Photomontage





本摘要圖於2019年3月4日擬備
資料來源：由房屋署提供
EXTRACT PLAN PREPARED ON 4.3.2019
SOURCE : HOUSING DEPARTMENT

合成照片 PHOTOMONTAGE

在粉嶺／上水分區計劃大綱核准圖編號S／FSS／22作出的擬議修訂項目A1、A2及A3
PROPOSED AMENDMENT ITEMS A1, A2 AND A3 TO THE APPROVED FANLING / SHEUNG SHUI OUTLINE ZONING PLAN No. S/FSS/22

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

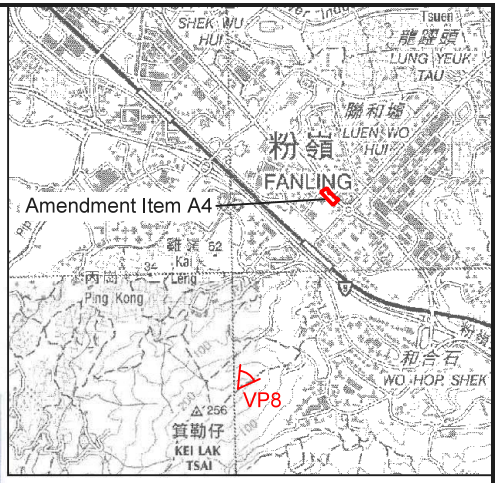
圖 PLAN
6b



Existing VP 8 - Wu Tip Shan



After VP 8 - Wu Tip Shan



本摘要圖於2019年2月22日擬備
資料來源：由香港房屋協會提供
EXTRACT PLAN PREPARED ON 22.2.2019
SOURCE : HONG KONG HOUSING SOCIETY

合成照片 PHOTOMONTAGE

在粉嶺/上水分區計劃大綱核准圖編號S/FSS/22
作出的擬議修訂項目A4
PROPOSED AMENDMENT ITEM A4
TO THE APPROVED FANLING / SHEUNG SHUI
OUTLINE ZONING PLAN No. S/FSS/22

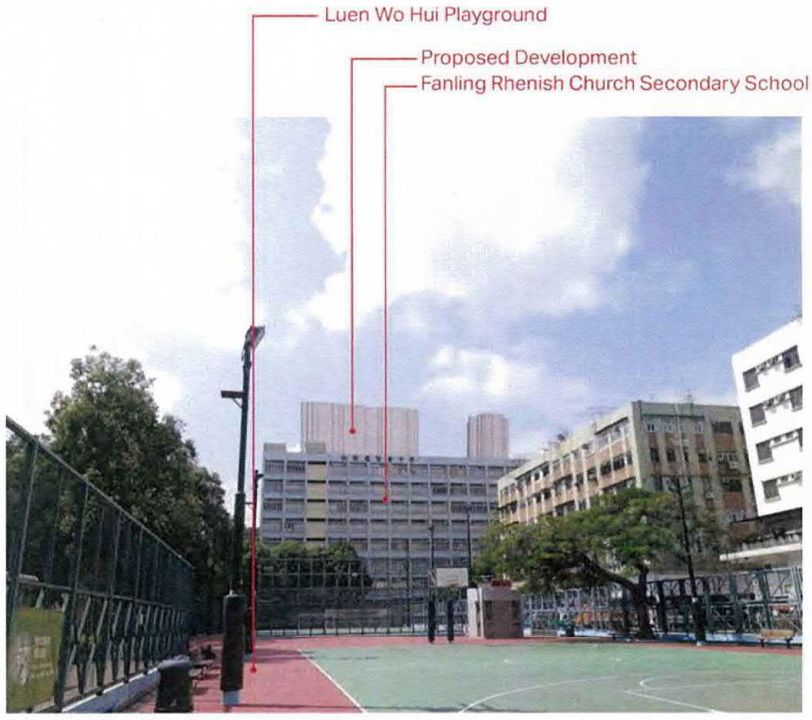
規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

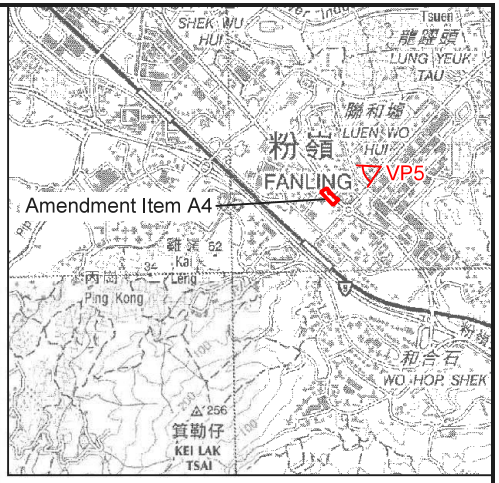
圖 PLAN
6c



Existing VP 5 - Luen Wo Hui Playground



After VP 5 - Luen Wo Hui Playground



本摘要圖於2019年2月22日擬備
資料來源：由香港房屋協會提供
EXTRACT PLAN PREPARED ON 22.2.2019
SOURCE : HONG KONG HOUSING SOCIETY

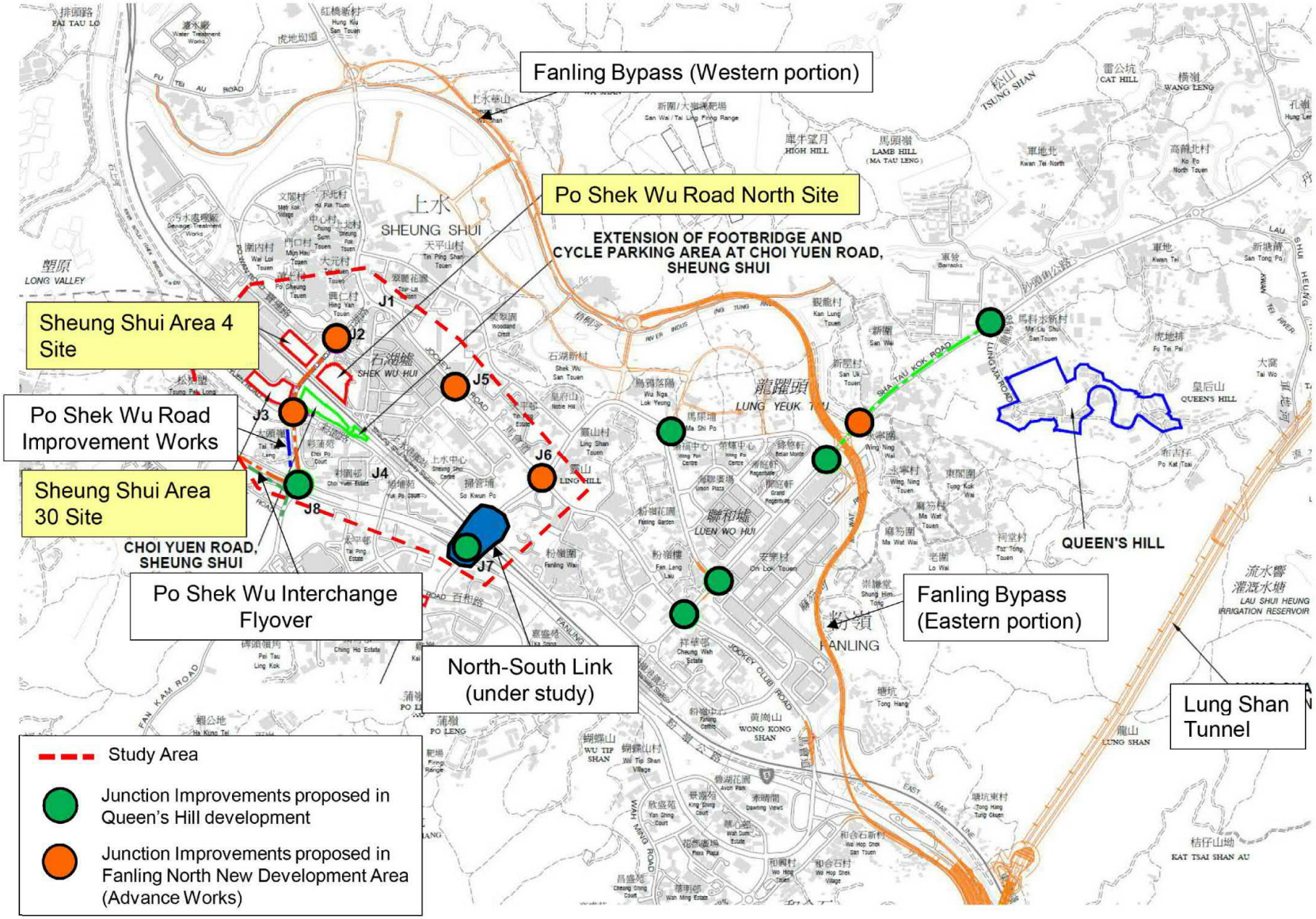
合成照片 PHOTOMONTAGE

在粉嶺 / 上水分區計劃大綱核准圖編號S / FSS / 22
作出的擬議修訂項目A4
PROPOSED AMENDMENT ITEM A4
TO THE APPROVED FANLING / SHEUNG SHUI
OUTLINE ZONING PLAN No. S/FSS/22

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
6d



本摘要圖於2019年3月1日擬備
EXTRACT PLAN PREPARED ON 1.3.2019

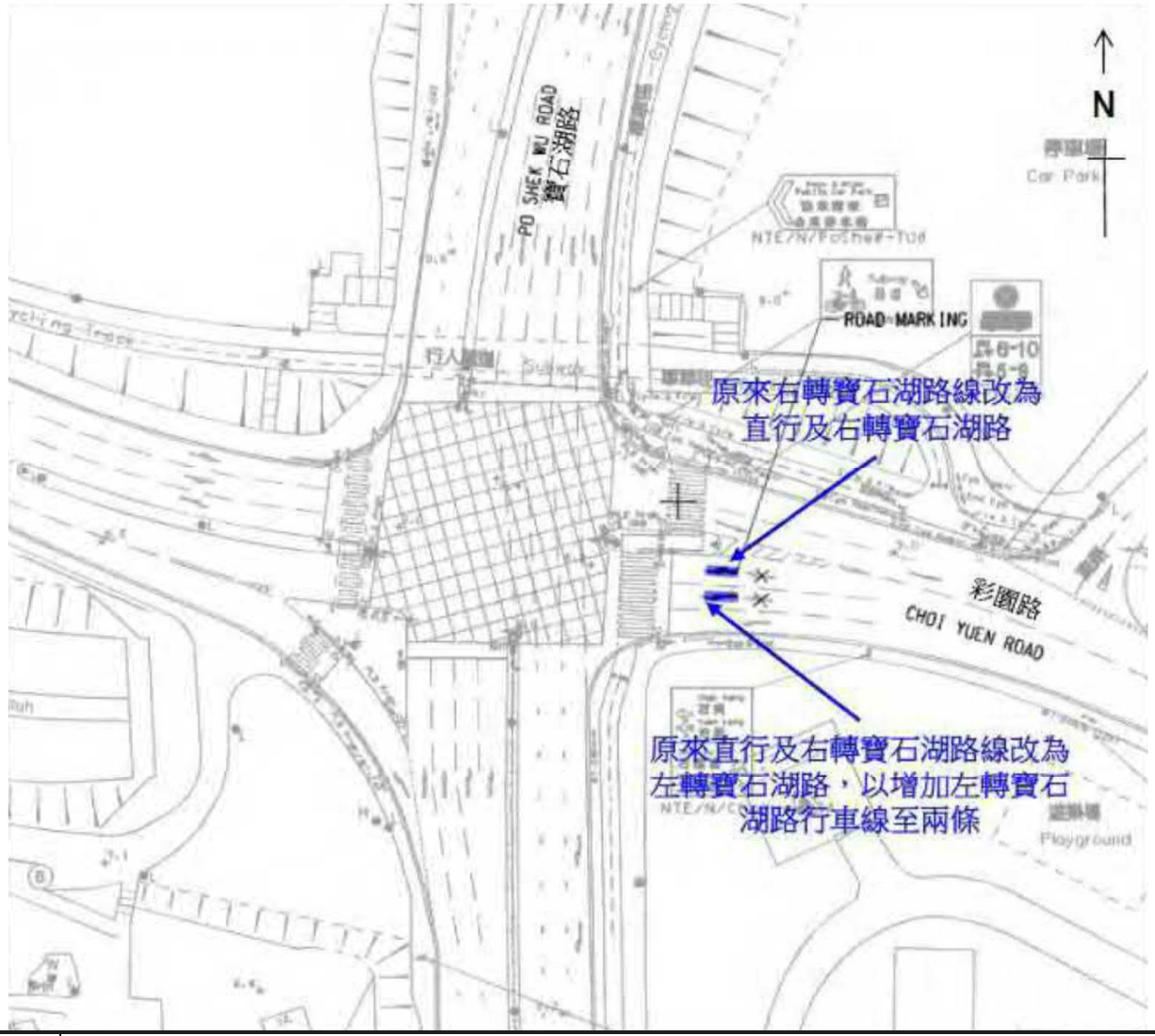
附近已承諾的交通改善措施及主要道路工程
Committed Traffic Improvement Measures And Major Road Works In The Vicinity

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
7a

J3 – Po Shek Wu Road / Choi Yuen Road



本摘要圖於2019年3月1日擬備
資料來源：由房屋署提供
EXTRACT PLAN PREPARED ON 1.3.2019
SOURCE : HOUSING DEPARTMENT

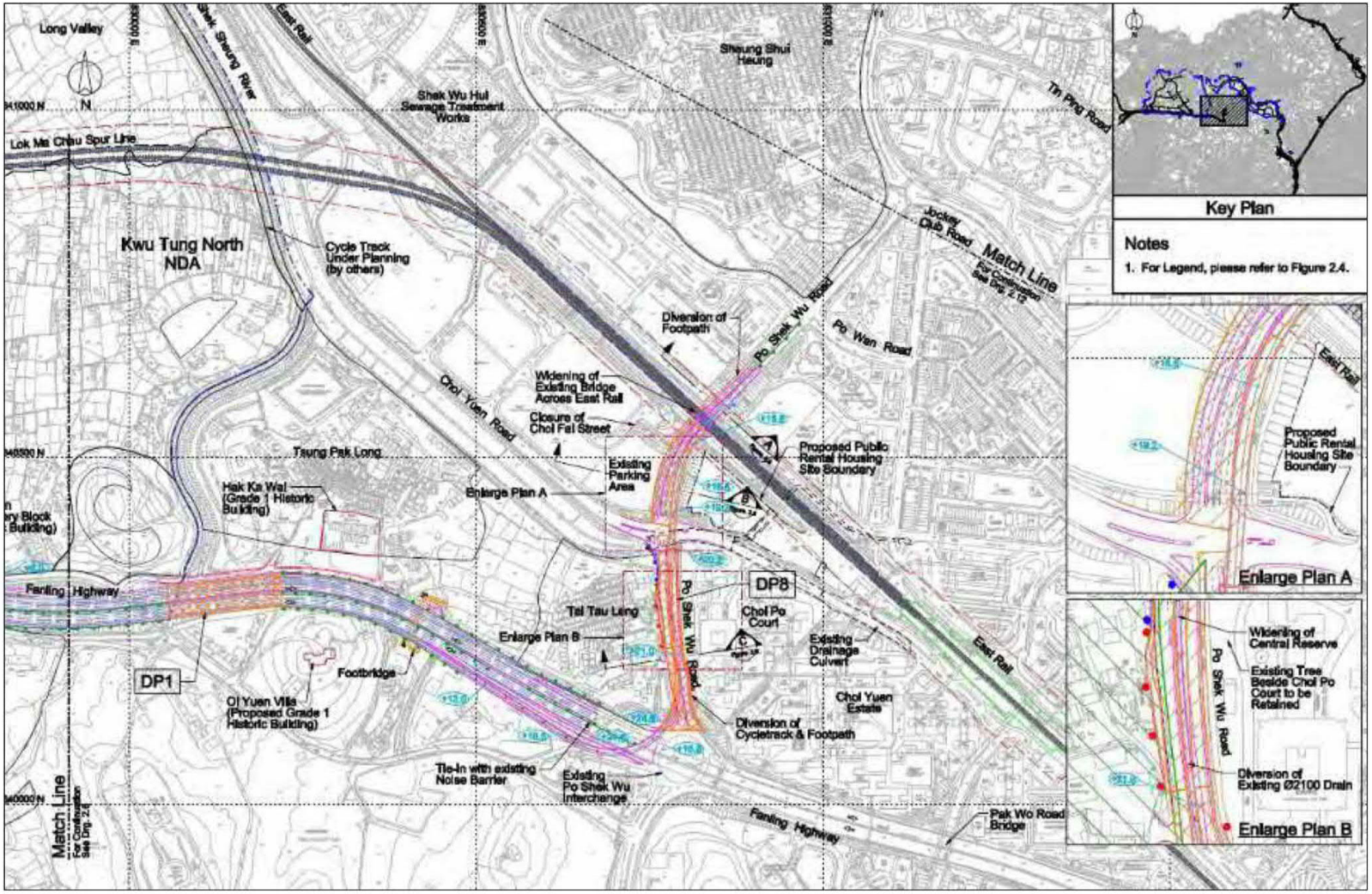
已承諾的交通改善措施（由其他項目建議）
Committed Traffic Improvement Measures (Proposed by Other Projects)

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
7b

J3 – Po Shek Wu Road / Choi Yuen Road
(Proposed Po Shek Wu Interchange Improvement)



本摘要圖於2019年3月1日擬備
資料來源：由房屋署提供
EXTRACT PLAN PREPARED ON 1.3.2019
SOURCE : HOUSING DEPARTMENT

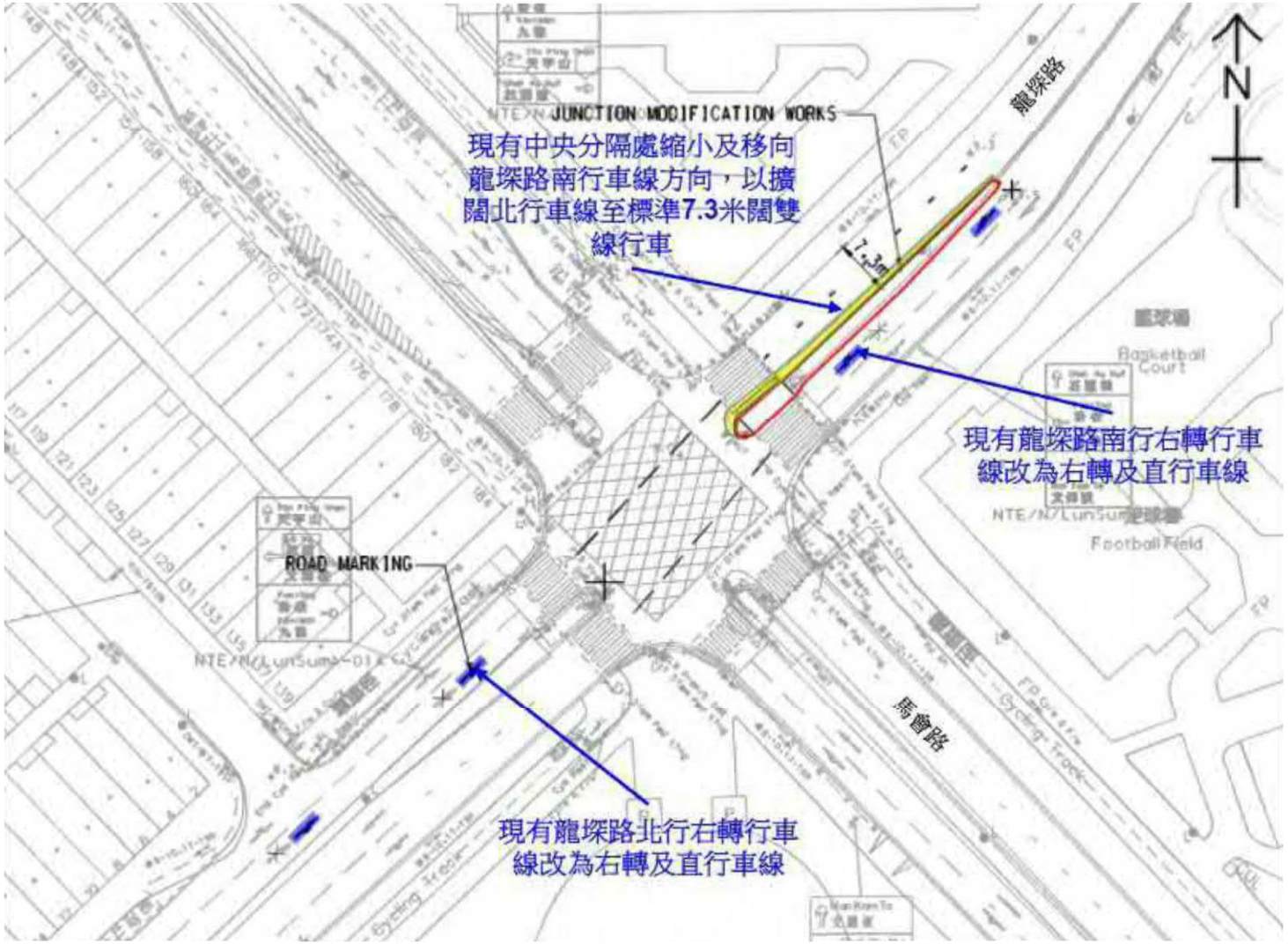
已承諾的交通改善措施（由其他項目建議）
Committed Traffic Improvement Measures (Proposed by Other Projects)

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
7c

J5 – Jockey Club Road / Lung Sum Avenue



本摘要圖於2019年3月1日擬備
資料來源：由房屋署提供
EXTRACT PLAN PREPARED ON 1.3.2019
SOURCE : HOUSING DEPARTMENT

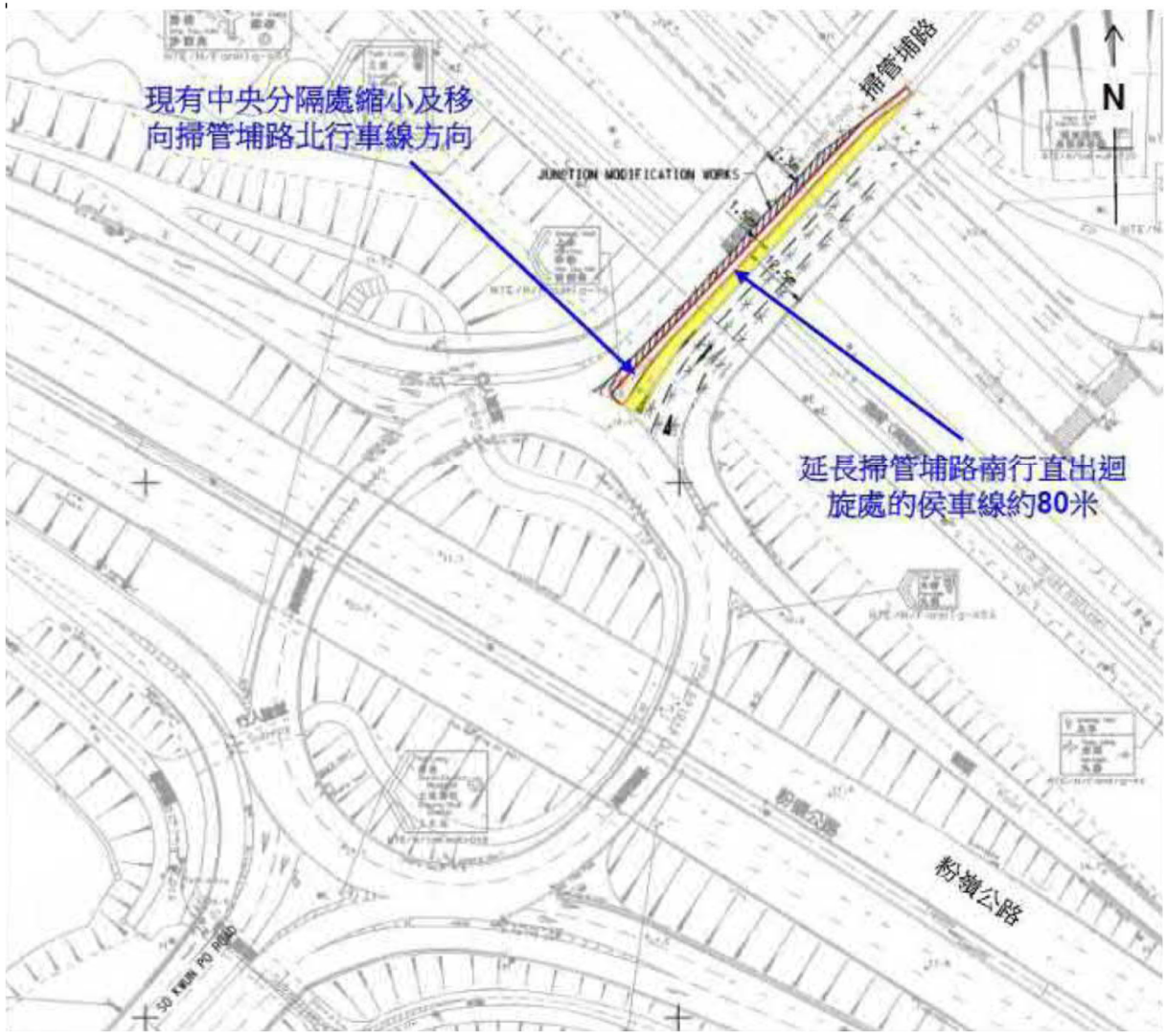
已承諾的交通改善措施（由其他項目建議）
Committed Traffic Improvement Measures (Proposed by Other Projects)

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
7d

J7 – So Kwun Po Road Interchange



本摘要圖於2019年3月1日擬備
資料來源：由房屋署提供
EXTRACT PLAN PREPARED ON 1.3.2019
SOURCE : HOUSING DEPARTMENT

已承諾的交通改善措施（由其他項目建議）
Committed Traffic Improvement Measures (Proposed by Other Projects)

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
7e

J8 – Po Shek Wu Road Interchange



本摘要圖於2019年3月1日擬備
資料來源：由房屋署提供
EXTRACT PLAN PREPARED ON 1.3.2019
SOURCE : HOUSING DEPARTMENT

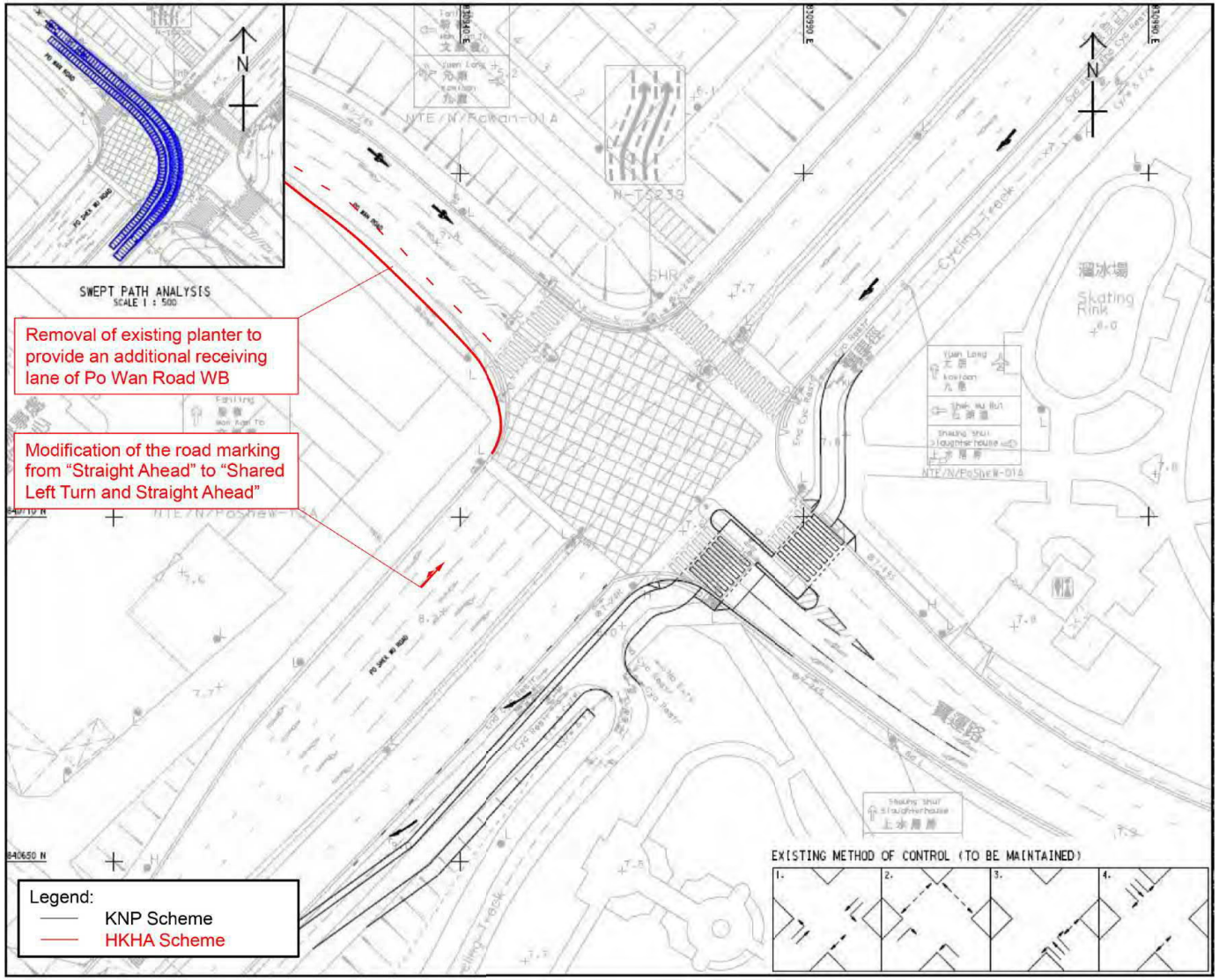
已承諾的交通改善措施（由其他項目建議）
Committed Traffic Improvement Measures (Proposed by Other Projects)

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
7f

J2 – Po Shek Wu Road / Po Wan Road (to be Completed by 2023)



本摘要圖於2019年3月1日擬備
資料來源:由房屋署提供
EXTRACT PLAN PREPARED ON 1.3.2019
SOURCE : HOUSING DEPARTMENT

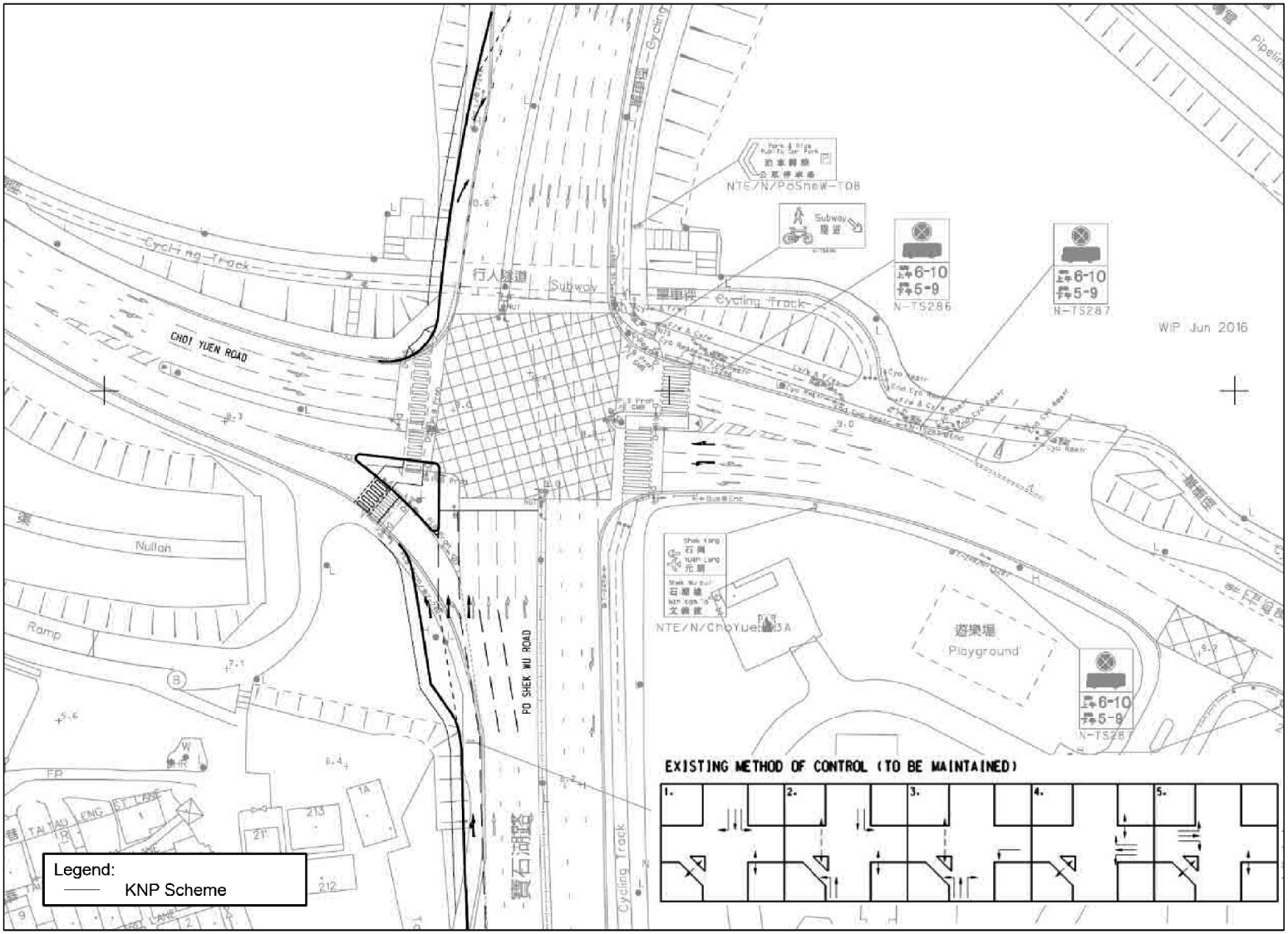
已承諾的交通改善措施(由其他項目建議)
Committed Traffic Improvement Measures (Proposed by Other Projects)

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
7g

J3 – Po Shek Wu Road / Choi Yuen Road (to be Completed by 2023)



本摘要圖於2019年3月1日擬備
資料來源:由房屋署提供
EXTRACT PLAN PREPARED ON 1.3.2019
SOURCE : HOUSING DEPARTMENT

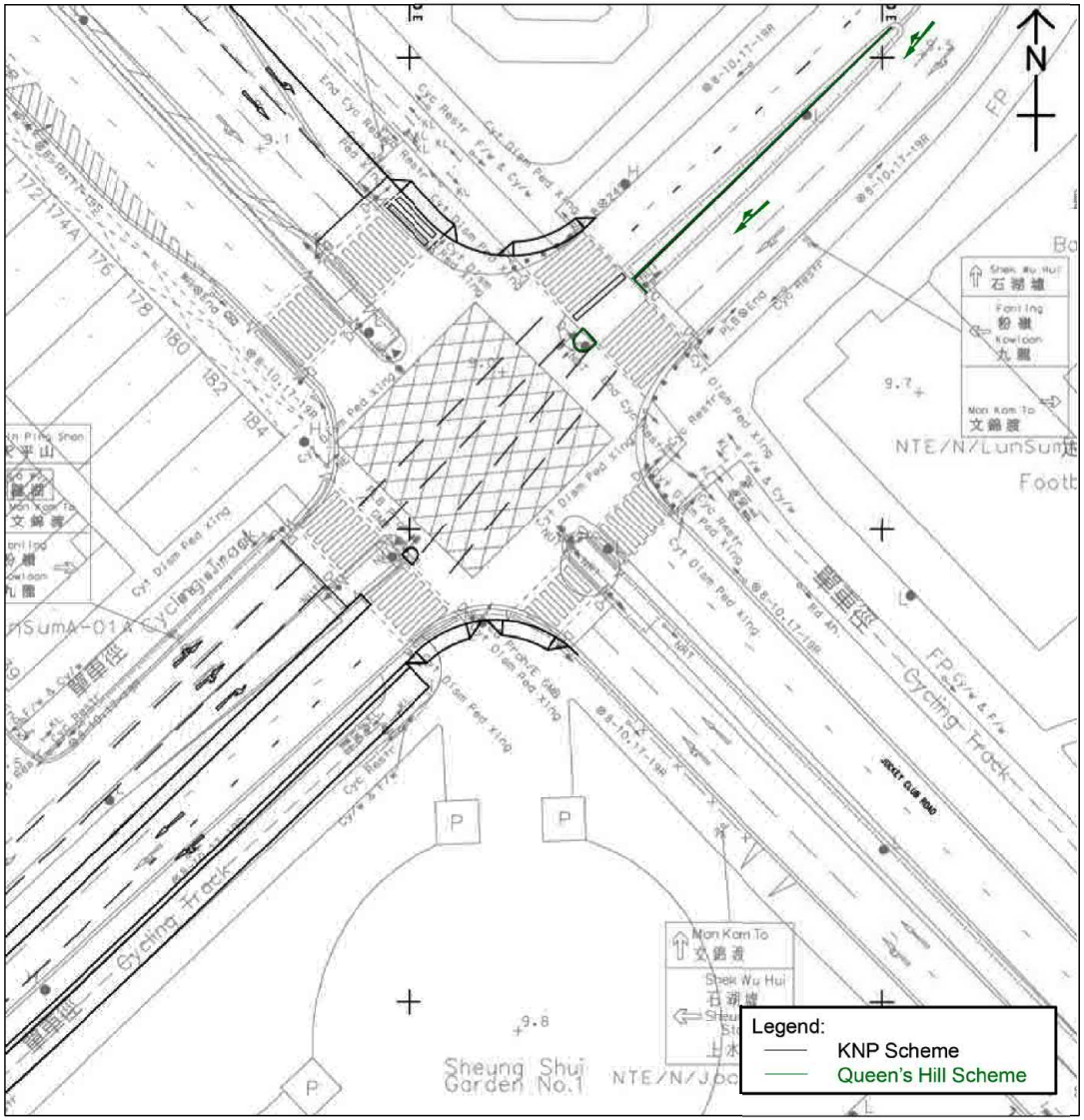
已承諾的交通改善措施(由其他項目建議)
Committed Traffic Improvement Measures (Proposed by Other Projects)

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
7h

J5 – Jockey Club Road / Lung Sum Avenue (to be Completed by 2023)



本摘要圖於2019年3月1日擬備
資料來源:由房屋署提供
EXTRACT PLAN PREPARED ON 1.3.2019
SOURCE : HOUSING DEPARTMENT

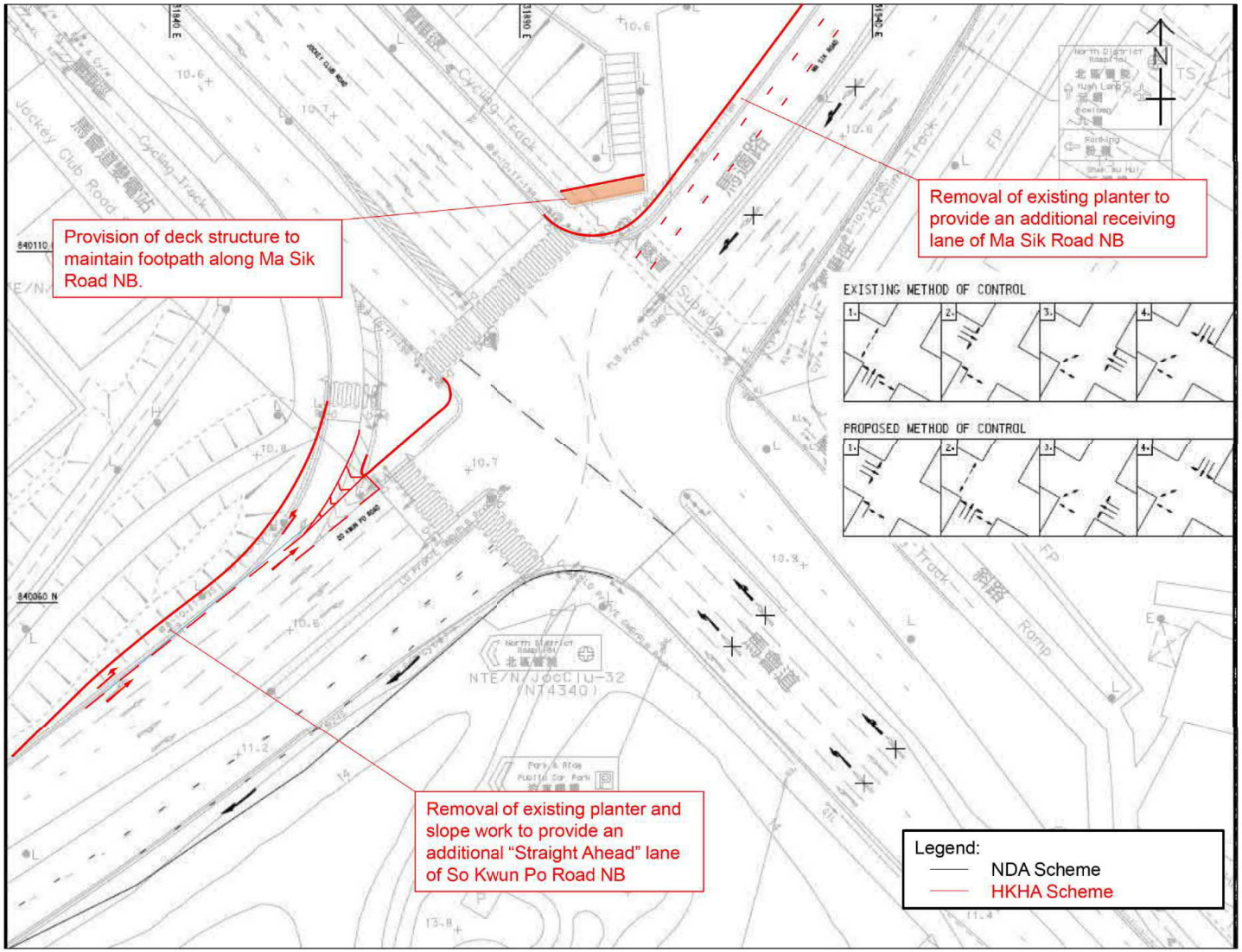
已承諾的交通改善措施(由其他項目建議)
Committed Traffic Improvement Measures (Proposed by Other Projects)

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
7i

J6 – Jockey Club Road / So Kwun Po Road (to be Completed by 2023)



本摘要圖於2019年3月1日擬備
資料來源:由房屋署提供
EXTRACT PLAN PREPARED ON 1.3.2019
SOURCE : HOUSING DEPARTMENT

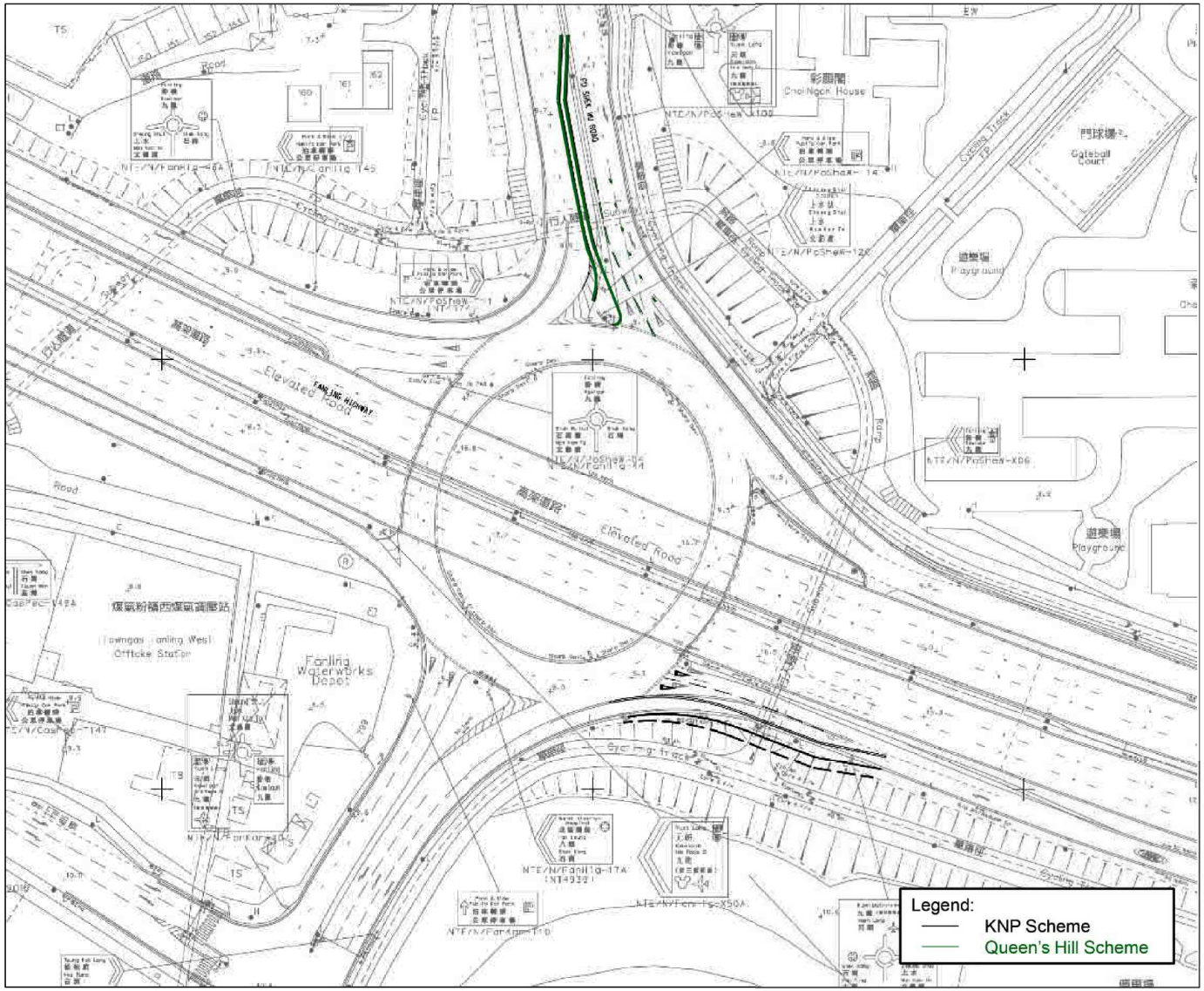
已承諾的交通改善措施(由其他項目建議)
Committed Traffic Improvement Measures (Proposed by Other Projects)

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
7j

J8 – Po Shek Wu Road Interchange (to be Completed by 2023)



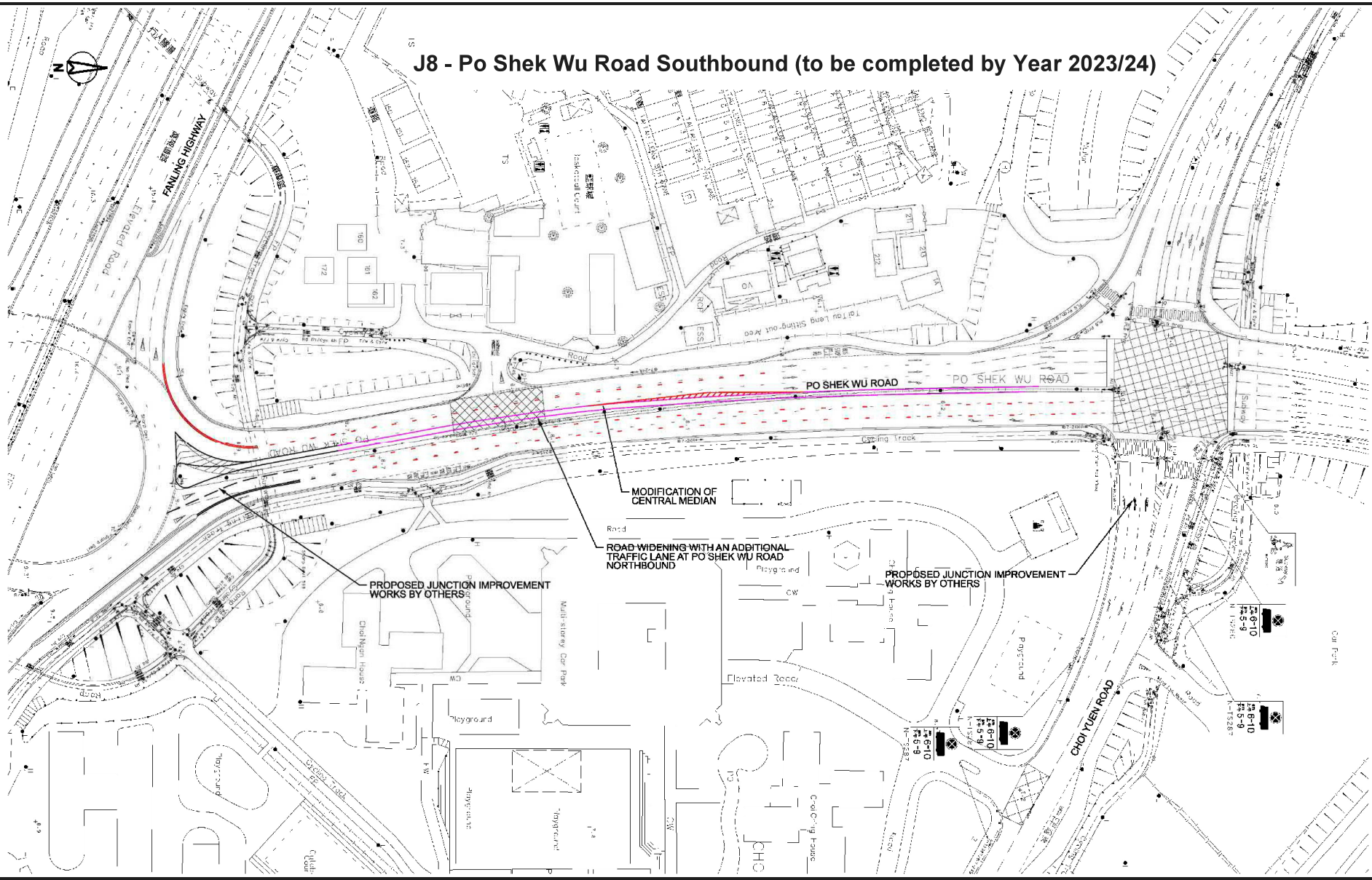
本摘要圖於2019年3月1日擬備
資料來源：由房屋署提供
EXTRACT PLAN PREPARED ON 1.3.2019
SOURCE : HOUSING DEPARTMENT

已承諾的交通改善措施（由其他項目建議）
Committed Traffic Improvement Measures (Proposed by Other Projects)

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
7k



本摘要圖於2019年3月1日擬備
資料來源:由房屋署提供
EXTRACT PLAN PREPARED ON 1.3.2019
SOURCE : HOUSING DEPARTMENT

建議的交通改善措施(由房委會公營房屋發展項目建議)
Proposed Traffic Improvement Measures
(Under HA's Proposed Public Housing Developments)

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/FS/19/11

圖 PLAN
7I