METRO PLANNING COMMITTEE
OF THE TOWN PLANNING BOARD

MPC Paper No. 11/15

For Consideration by
the Metro Planning Committee on 9.10.2015

PROPOSED AMENDMENTS TO THE
APPROVED WONG NAI CHUNG OUTLINE ZONING PLAN NO. S/H7/17

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1. Introduction

This paper is to seek Members' agreement that:

(a) the proposed amendments to the approved Wong Nai Chung Outline Zoning Plan (OZP) No. S/H7/17 as shown on the draft OZP No. S/H7/17A (**Attachment II(A)**) and its Notes (**Attachment II(B)**) are suitable for exhibition for public inspection under section 5 of the Town Planning Ordinance (the Ordinance); and

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

2. Status of the Current OZP

On 8.7.2014, the Chief Executive in Council (CE in C), under section 9(1)(a) of the Ordinance, approved the draft Wong Nai Chung OZP No. S/H7/16A. Upon approval, it was renumbered as S/H7/17 (**Attachment I**) and was exhibited for public inspection under section 9(5) of the Ordinance on 18.7.2014. On 13.7.2015, the CE in C referred the approved OZP to the Board for amendment under section 12(1)(b)(ii) of the Ordinance.

3. Proposed Amendments to the OZP

3.1 In general, in formulating the building height restrictions (BHRs) for the "Government, Institution or Community" ("G/IC") sites, due regard is given to, among other considerations, the nature of the existing facilities/uses on the sites, the existing building heights, the development restrictions on the land allocation/lease (if any), and the need to maintain compatible building mass in the local setting. Unless there are committed proposals or known developments or to meet the minimum height requirement, the existing "G/IC" sites will broadly be kept to their existing heights to serve as breathing spaces and visual/spatial relief of the area. The BHRs for the two subject "G/IC" sites (namely Man Lam Christian Church at Village Road and Po Leung Kuk Headquarters at Leighton Road) were therefore imposed to reflect their existing building height when the OZP was amended for incorporation of BHRs in 2008.

3.2 The proposed amendments are mainly related to revision of the BHRs for the two subject "G/IC" sites in order to facilitate their respective extension/redevelopment proposals (i.e. **Amendment Items A & B** on **Attachment II(A)**). Opportunity has also been taken to update the Notes and ES of the OZP to reflect the latest planning circumstances.

4. <u>Amendment Item A: Revision to the stipulated Maximum Building Height from 5 Storeys to 11 Storeys for the "G/IC" Site at 9 Village Road</u>

<u>Background</u>

4.1 The site (about $331m^2$) located at the junction of Village Road and Wang Tak Street is currently occupied by the Church of Christ in China – Man Lam Christian Church (MLCC), a 5-storey building (about 34mPD) for the church and its ancillary facilities including offices, pastor's quarters and classroom. It is subject to a BHR of 5 storeys, or the height of the existing building, whichever is the greater (**Plans 1 to 3**).

4.2 A BHR of 4 storeys was first imposed for the MLCC site on the draft OZP No. S/H7/14 exhibited on 18.1.2008. During the exhibition period, the MLCC submitted a representation (Representation No. R47) against the imposition of BHR for their site. On 14.11.2008, after hearing the representations and related comments, the Board decided to partially uphold the MLCC's representation by amending the BHR for the zone covering the MLCC site from 4 storeys to 5 storeys to duly reflect the building height of the existing development. The Board also advised that should there be any specific scheme for redevelopment which involved major increase in building height, MLCC could submit a section 12A application for the Board's consideration and proper assistance and guidance should be provided to MLCC in respect of the planning permission process.

4.3 Later for the draft OZP No. S/H7/15 incorporating amendments to the BHRs for the "G/IC" zone covering the Hong Kong Sanatorium & Hospital site, the MLCC submitted a representation (Representation No. R1025) providing comments and proposal to relax the BHR on the MLCC site to 115mPD. There was another representation submitted by a member of the public (Representation No. R1024) which also proposed to relax the BHR on the MLCC site. On 8.4.2011, after hearing the representations and related comments, the Board decided that the part of the two representations related to the BHR on the MLCC site was invalid and decided not to propose amendment to meet the representations. The Board also advised that if there was an intention to amend the BHR for the MLCC site for redevelopment and expansion of the existing facilities and if such proposal was well justified and supported by the relevant Government bureaux/departments, Planning Department (PlanD) might recommend to the Board to amend the BHR of the MLCC site as appropriate.

4.4 Since then, the OZP had been amended once (i.e. draft OZP No. S/H7/16) in August 2011. The "G/IC" zoning and BHR for the MLCC site remain unchanged on the draft OZP. The five draft OZPs (No. S/H7/12 to S/H7/16) and all the representations and comments were submitted to CE in C for approval in January 2013. However, due to a petition to CE in C submitted by a representer in relation to the draft OZP No. S/H7/12 in April 2013, the draft OZP was not approved by the CE in C until July 2014.

4.5 In October 2014, after the OZP has been approved, the MLCC confirmed its extension proposal and submitted an updated survey on the transportation means adopted by their church members in support of their extension proposal.

Extension Proposal

4.6 The MLCC's extension proposal (**Attachment III**) involves erection of 6 additional floors on top of part of the existing church building, resulting in a total building height of 11 storeys (i.e. 55mPD). With the proposed extension in place, the total Gross Floor Area (GFA) of the church building will be increased from 1,147m^2 (Plot Ratio (PR) of 3.465) to 2,179m^2 (PR of 6.583). Schematic section and photomontage of the extension proposal are at **Drawing 1** and **Plan 4**, respectively. Major development parameters of the proposal are set out in the table below and a comparison with the existing parameters is at **Attachment V-a**.

Site Area	331m^2
No. of Storeys	11
Building Height (main roof)	about 38m (about 55mPD)
Gross Floor Area	2,179m^2
Plot Ratio	6.583
Major Floor Uses	
G/F[(1)]	Entrance, Parish Hall
1/F[(1)]	Church Nave and Staff Office
2/F[(1)]	Upper Part of Church Nave and One Classroom cum Gown Room
3/F[(1)]	Upper Part of Church Nave, Gallery and Office
4/F	Administration Office, Pastor's Office, Flat Roof and E&M facilities
5/F	Choir/Music Room and Roof
6/F	Childcare Room / Classrooms
7/F	Conference Room / Classroom
8/F	Counselling Room / Prayer Room
9/F	Library and Study Room
10/F[(2)]	Pastor's Quarters, Prayer Room and Store

[(1)] In the extension proposal, floor uses from G/F to 3/F of the existing 5-storey church building will remain unchanged. No on-site car parking and loading/unloading facilities will be provided

[(2)] The existing Pastor's Quarters will be relocated from 4/F to 10/F

4.7 According to the MLCC, the extension proposal is primarily to provide diversified community services in Happy Valley. It would not involve additional religious worship space. The number of visitors upon extension would be similar to the existing situation with most of them visiting the church on foot. As such, adverse traffic, environmental and infrastructural impacts on the surrounding area are not envisaged.

Policy Support

4.8 Noting the proposed facilities under the extension proposal are prima facie for religious and ancillary use in the majority and the MLCC is a charitable religious organization, the Home Affairs Bureau (HAB) tendered policy support to the religious facilities in the extension proposal. Other relevant Government departments consulted have no objection to or adverse comments on the extension proposal.

Land Administration

4.9 The Government lease of the subject lot as varied and modified by a modification letter dated 22.11.1952 contains, *inter alias*, non-offensive trade clause and erection of a Church of a design to be approved by the Director of Public Works with a tower not exceeding 56 feet high (about 17m). The extension proposal does not comply with the prevailing lease condition. If the proposed extension is accepted by the Board and amendment to the OZP is approved, subject to policy support given by the HAB and/or other relevant bureaux/departments, the owner of the subject lot shall apply to the District Lands Office/Hong Kong East (DLO/HKE) of Lands Department (LandsD) for a modification of the lease conditions of the lot to effect the proposed extension. However, there is no guarantee that such lease modification will be approved and if approved by the LandsD acting in its capacity as the landlord at its discretion, it will be subject to such terms and conditions, including payment of premium and fees, as imposed by the LandsD.

4.10 Regarding Director of Environmental Protection (DEP)'s requirement for a sewerage impact assessment (SIA) to address the sewerage impact due to the increase of sewage flow and recommend mitigation measures/upgrading works, DLO/HKE has no in-principle objection to include the submission of SIA as a condition in the future lease modification.

Technical Aspects

Planning Intention/Land Use

4.11 The extension proposal will involve provision of additional church-related ancillary facilities, administration office and reprovisioning of existing pastor's quarters for MLCC. These facilities are regarded as 'Religious Institution' which is always permitted in the "G/IC" zone.

Visual and Landscape Impacts

4.12 The site is located within a residential neighbourhood in the lower part of Happy Valley area (**Plan 1**). Except for The Emperor (Happy Valley) Hotel (about 92mPD), the site is immediately surrounded by residential developments of various intensity and heights (**Plans 2 and 3**). To the east and south of the site is mainly medium to high-rise residential developments, which are zoned "Residential (Group B) ("R(B)") with BHR of 100mPD on the OZP. In particular, the existing building heights of the two residential developments abutting the southern boundary of the site are about 53mPD and 77mPD. To the west of the site across Village Road are low-rise residential developments zoned "R(B)3" and "R(B)4" with BHRs of 5 storeys including carports and 5 storeys in addition to 1 storey of carports, respectively. Hong Kong Sanatorium and Hospital with BHRs ranging from 2 storeys to 148mPD is located to the further north of the site along Village Road.

4.13 While the site is surrounded by existing private developments, public views towards the site are confined mainly to the close-range views from Shan Kwong Road, Village Road and Wang Tak Street (**Plan 2**). A public viewing point at the junction of Shan Kwong Road and Village Road, an area which is relatively frequented by locals in vicinity, is taken to illustrate the visual change upon the implementation of MLCC's extension proposal (viewing point A at **Plan 2**). As illustrated in **Plan 4**, the increase in building height from 5 to 11 storeys (i.e. 55mPD) for the church building will be commensurate with the building height profile of the surroundings. Coupled with the fact that there are no prominent visual amenities or landscape features within and in vicinity of the site, significant adverse visual and landscape impacts on the surrounding due to the proposed BHR amendment are not envisaged. Chief Town Planner/Urban Design and Landscape (CTP/UD&L) of PlanD has no adverse comments on the extension proposal from urban design and landscape planning point of view.

Air Ventilation Impact

4.14 According to the Air Ventilation Assessment – Expert Evaluation (AVA-EE) on Wong Nai Chung Area, the MLCC site does not fall within any air path in the area. Given the scale of the proposed extension is relatively small within the urban context, significant air ventilation impact due to the proposed extension is not anticipated. CTP/UD&L has no adverse comments on the extension proposal from air ventilation perspective.

Traffic, Environmental and Infrastructural Impact

4.15 As mentioned in paragraph 4.7 above, MLCC claimed that the extension proposal would not involve additional religious worship space. The number of visitors upon extension would be similar to the existing situation with most of them visiting the church on foot. Based on the updated survey on transportation means adopted by their church members submitted by MLCC in October 2014, about 75% of the respondents visit the church either on foot or using public transport on Sunday. Concerning DEP's requirement of a SIA, as mentioned in paragraph 4.10 above, the submission of SIA could be included as a condition in the future lease modification. Relevant Government departments consulted have no objection to the extension proposal in respect of traffic, environmental and infrastructural impacts on the surrounding area.

Proposed Revision to BHR

4.16 In view of the policy support given by HAB to the proposed religious facilities in the extension proposal and that the proposal would not induce any significant adverse impacts, it is recommended to amend the BHR for the MLCC site from 5 storeys to 11 storeys (**Plan 2**).

5. Amendment Item B: Revision to the stipulated Maximum Building Height from 3 to 13 Storeys to 80mPD for part of the "G/IC" Site at 66 Leighton Road

Background

5.1 The "G/IC" site at 66 Leighton Road is currently occupied by Po Leung Kuk (PLK) headquarters and its social welfare and educational facilities. It is subject to BHRs ranging from 3 storeys to 19 storeys and 90mPD, or the height of the existing building, whichever is the greater (**Plan 5**). The BHRs for PLK were first imposed under the draft OZP No. S/H7/14 exhibited on 18.1.2008 and remain unchanged on the extant OZP. Since September 2010, PLK has expressed their intention to redevelop part of the PLK site into a new complex to cater for the growing demand for community and social welfare services. Apart from the reprovisioning of the existing facilities, PLK considers that there is a strong need to extend services to youngsters and elderly.

5.2 The existing PLK development with a total site area of 12,272m^2 comprises the Hong Kong University Space PLK Community College (BHR of 90mPD and 19 storeys), the Main Building (a 2-storey Grade 2 historic building with BHR of 4 storeys), the Extension Wing of the Main Building (i.e. the Chu Lee Yuet Wah Kindergarden cum Nursery Building with BHR of 4 storeys), the PLK Kwok Law Kwai Chun Children Services Building (BHR of 8 storeys), the PLK Vicwood K.T. Chong Building (BHR of 13 storeys) and the PLK Vicwood K.T. Chong Kindergarten cum Nursery Building (with a transformer and switch room) (BHR of 3 storeys) (**Plan 6**). The current vehicular access to the site is at Caroline Hill Road.

<u>Redevelopment Proposal</u>

5.3 According to PLK's redevelopment proposal provided in September 2015 (**Attachment IV**), the Community College and the Main Building will remain intact whereas the remaining land area in the southern portion of the site (i.e. the redevelopment site shown on **Plan 6**) with a net site area (excluding slope) of about 3,765m^2 will be redeveloped into a new complex for provision of educational facilities (including kindergarten cum nursery, language centre and school hall), social welfare facilities (including residential care and day care services for children, special child care services, residential care home and day care services for the elderly, children development centre and youth services), administration offices and supporting facilities. As advised by Director of Social Welfare (DSW), they are in continued liaison with PLK on the service mix and floor area requirement.

5.4 The new complex will have a GFA of 18,780m^2 and a maximum building height of 80mPD (21 storeys including 2 basement floors). With the redevelopment proposal in place, the total GFA and PR for the PLK development as a whole will be increased from 30,016m^2 to 37,725m^2 and 2.45 to 3.07, respectively. Schematic drawings and photomontages for the proposed new complex at the redevelopment site are at **Drawings 2 to 5**. Major development parameters of the proposal are set out in the table below and a comparison with the existing parameters is at **Attachment V-b**.

Whole PLK Site Area	12,272m^2
Overall Gross Floor Area	37,725m^2
Overall Plot Ratio	3.07
Redevelopment Site Area	3,765m^2
Gross Floor Area (Redevelopment Site Only)	18,780m^2 (1)
Plot Ratio (Redevelopment Site Only) (2)	4.988
No. of Storeys (Redevelopment Site Only)	9 to 21 (including 2 basement floors)

Building Height (main roof) (Redevelopment Site Only)	42mPD to 80mPD
Overall Parking and Servicing Provision	10 car parking spaces [(3)] 1 loading/unloading bay [(3)] 1 new rehabilitation bus lay-by
Major Floor Uses (Redevelopment Site Only)	
LG2/F	Supporting facilities
LG1/F	Supporting facilities and car parking spaces
G/F-3/F (below 12m)	Social welfare facilities (children care services)
2/F (part) to 7/F (part) (12m – 24m)	Educational facilities (incl. kindergarten cum nursery and school hall, etc.) Social welfare facilities (incl. children care services, elderly care/day care centre and children development centre, etc.)
6/F (part) to 18/F (24m – 80m)	Social welfare facilities (incl. centre for child with special needs, youth services and student support service, etc.) Educational facilities (incl. learning centre, etc.) Administration offices and supporting facilities

(1) GFA consists of Educational Facilities of 2,030m^2; Institutional Use (administration office and supporting facilities) of 6,300m^2 and Social Welfare Facilities of 10,450m^2, in which includes re-provisioning of existing educational facilities (2,030m^2), administration offices and supporting facilities (5,250m^2) and social welfare facilities (6,606m^2 out of which 2,815m^2 is to be relocated from the Main Building)

(2) Based on the net redevelopment site area of 3,765m^2

(3) For re-provisioning of existing car parking and loading/unloading facilities

5.5 In PLK's proposal, stepped building height with various levels ranging from 42mPD to 80mPD is adopted and roof gardens and vertical greenings are proposed at different levels to enhance the visual amenity of the new complex. While the Main Building, which is a Grade 2 historic building, will remain intact, its Extension Wing will be demolished. To respect the context of the historic building, a full-height separation of at least 10m in width between the Main Building and the new complex is proposed and the area will be formed into a landscaped area with tree plantings. The new complex will also be set back from Link Road for about 9.5m to create a buffer (**Drawings 2 and 3**).

5.6 On internal transport facilities, an additional vehicular access is proposed in the southern part of the site at Link Road and an internal road will be provided to link up the new access with the existing access at Caroline Hill Road. In addition, 10 car parking spaces and 1 loading/unloading bay will be provided for the reprovisioning of the existing facilities and 1 new rehabilitation bus lay-by for the proposed elderly care and day care centre at LG1/F (**Drawing 2**).

5.7 Technical assessments conducted by PLK for the redevelopment proposal concluded that no significant adverse traffic, environmental, sewerage, air ventilation and visual impacts on the surrounding area are envisaged.

<u>Policy Support</u>

5.8 The Labour and Welfare Bureau (LWB) has in general offered in-principle policy support to the proposed social welfare facilities and the Education Bureau (EDB) has no objection to the reprovisioning of the existing educational facilities in the redevelopment proposal on condition that the usable area of the outdoor playground would not be less than $400m^2$. Other relevant Government departments consulted have no objection to or adverse comments on the redevelopment proposal.

Land Administration

5.9 The redevelopment site, as part of the PLK lot, is governed by the lease of I.L.9011. It is restricted for (i) non-profit making kindergartens and schools; (ii) child care centres, residential homes for children and such other welfare facilities; (iii) the headquarters of PLK together with ancillary facilities; and (iv) other uses as may be approved by the Director of Lands. There is no restriction on PR, site coverage and height under the lease, but a portion of the lot, which is mainly the slope at the back of the existing Vicwood K. T. Chong Building, is designated as non-building area (NBA). While the NBA will not be affected by the proposed redevelopment, prior approvals under lease would be required for the proposed new social welfare services/uses subject to policy support from DSW, and felling of existing trees within the subject lot.

Technical Aspects

Planning Intention/Land use

5.10 The redevelopment proposal will involve educational facilities, social welfare facilities and the administration office and supporting facilities for PLK. These facilities are regarded as ‘School’, ‘Social Welfare Facility’ and ‘Institutional Use’ which are always permitted in the “G/IC” zone.

Visual and Landscape Impacts

5.11 The redevelopment site is immediately surrounded by residential and G/IC developments (**Plans 6 and 7**). Abutting the southern boundary of the redevelopment site is the PLK Gold & Silver Exchange Society Pershing Tsang School, which is zoned “G/IC” with a BHR of 8 storeys. To the west of the site is Leighton Hill, a high-rise residential development zoned “R(B)” with a BHR of 170mPD situated on top of a vegetated slope with site levels ranging from about 37mPD to 50mPD. Area to the south and east of the site across Link Road is occupied by high-rise residential developments zoned “R(B)” with a BHR of 100mPD. To the further east across Caroline Hill Road are the EMSD ex-workshop and recreational clubs zoned “G/IC” and “Other Specified Use (Sports and Recreational Club)”, respectively, with BHRs of 2 to 7 storeys. To the further north of the site is the commercial area of Causeway Bay predominated by high-rise commercial developments zoned “Commercial” with BHRs of 130mPD and 200mPD.

5.12 The PLK has submitted a visual appraisal to demonstrate the visual impact of the proposed redevelopment (Appendix III of **Attachment IV**). Given the existing built-up context around the redevelopment site, public views towards the proposed redevelopment are confined to the close-range views from the northeast at the junction of Link Road/Caroline Hill Road and from the south at the junction of Link Road/Broadwood Road. For the views from the northeast, the scale of the proposed redevelopment would be in keeping with the existing neighbourhood and would not unduly affect the visual setting of the adjacent historic building **(Drawing 4**). As for the views from the south, significant adverse visual impacts will not be resulted since the southern portion of the new complex will have a building height of 65mPD, which is comparable to the building height of about 62mPD for the existing Vicwood K.T. Chong Building **(Drawing 5**). CTP/UD&L, PlanD considered that with the proposed mitigated measures in place, *inter alia*, the extensive vertical/exterior soft landscaping, the ground floor landscape buffer, stepped height profile and setback from the historic building, the proposed redevelopment is not considered visually incompatible with the surroundings.

5.13 According to the Tree Survey provided by PLK (Appendix IV of **Attachment IV**), there are 34 trees within the redevelopment site. To allow for the proposed redevelopment, four of the existing trees (including 2 dead trees), which are common species, will be felled. PLK proposed to compensate the loss with **7** new trees which will be planted at the landscaped area between the new complex and the Main Building and the outdoor playground. Also, landscaping and greening will be provided at different levels of the new complex, offering greenery and visual relief to the surrounding areas. As such, significant landscape impact is not envisaged. CTP/UD&L has no adverse comments on the redevelopment proposal from urban design and landscape planning point of view.

Air Ventilation Impact

5.14 According to the AVA-EE on Wong Nai Chung Area, the PLK site does not fall within any major air path of the Area. PLK has submitted an AVA-EE Report (Appendix VIII of **Attachment IV**) to assess the potential impacts on the air ventilation of the locality due to the redevelopment proposal, taking into account the building heights of surrounding developments and the existing wind environment of Wong Nai Chung and Causeway Bay areas. It is concluded that given the redevelopment site is surrounded by high-rise developments and is located at the downwind area of the prevailing winds from the northern and eastern quadrants and from the south and southwest directions, significant blockage of air flow due to the new complex is not envisaged. Beside, PLK has proposed design measures, including setback along Link Road, building separations in the northern and southern part of the redevelopment site as well as the stepped height profile with a lower roof garden in the middle portion of the new complex, to promote building permeability and air ventilation. Hence, it is considered that the proposed redevelopment will unlikely cause unacceptable adverse air ventilation impacts on the surroundings. CTP/UD&L has no adverse comments on the redevelopment proposal from air ventilation perspective.

Heritage Impact

5.15 The Main Building, i.e. the Grade 2 historic building, will not be affected by the proposed redevelopment. To respect the setting for the historic building, PLK proposed a full-height separation ranging from 10m to 21m from the new complex and the area between the two buildings will be dedicated as a landscaped area (**Drawing 2**). Stepped height profile with landscaped terraces/roof garden will also be adopted. Commissioner for Heritage and Director of Leisure and Cultural Services Department have no adverse comments on the redevelopment proposal. In addition, PLK agreed that a condition survey for the Main Building will be conducted and works proposal which may affect the Main Building will be submitted to Antiquities and Monuments Office for comments prior to commencement of construction works. Hence, significant adverse impact on the value of the historic building is not anticipated.

Traffic, Environmental and Infrastructural Impact

5.16 PLK has submitted a traffic impact assessment (TIA) and updated junction analysis (Appendices V and VI of **Attachment IV**), which demonstrated that the redevelopment proposal with an additional vehicular access at Link Road and additional traffic generation (due to the increase in office area and social welfare services) would not have adverse traffic impact on Link Road and the nearby road network. Commissioner for Transport has no adverse comment on the TIA and the updated junction analysis submitted.

5.17 PLK has also submitted a sewerage impact assessment (SIA) (Appendix VII of **Attachment IV**) to demonstrate that the potential sewage impact of the redevelopment proposal would be minimal. To minimize the potential noise impact, educational facilities, child care centre, elderly care/day care centre and offices are to be centrally ventilated and installed with suitable window type. Fresh air intake is planned at roof top of the new complex and 9.5m buffer distance from Link Road is also proposed (**Drawing 2**). PLK has confirmed that a Preliminary Environmental Review (PER) will be prepared in the course of application to Lotteries Fund for construction cost at a later stage so as to further address the environmental issues in detail. DEP, Chief Engineer/Hong Kong & Islands of Drainage Services Department (CE/HK&I, DSD) and other relevant Government departments consulted have no objection to the redevelopment proposal at this stage.

Public Consultation

5.18 On 6.1.2015, PLK has consulted the Wan Chai District Council (WCDC) on their redevelopment proposal. The WCDC expressed a general support to the redevelopment proposal and provided comments on various issues including traffic and transport arrangement, visual impact of the redevelopment on the surrounding landscape as well as the natural lighting and air ventilation impacts on the neighbourhood. PLK has also consulted the local residents, including Silverwood, Caroline Height, Jade Terrace, Greenway Terrace and Leighton Hill. The locals consulted expressed concerns on the potential traffic, visual and air ventilation impacts, as well as the possible impacts during the construction stage.

Proposed Revision to BHR

5.19 In view of the policy support given by LWB to the proposed social welfare facilities and EDB's no objection to the reprovisioning of the existing educational facilities in the redevelopment proposal and the redevelopment proposal would not have any significant adverse impacts, it is recommended to amend the BHRs for the southern part of the PLK site with an area of about 3,489m^2, which comprises the redevelopment site (excluding the building separation area between the new complex and the Main Building) and part of the abutting slope from 3, 4, 8 and 13 storeys to 80mPD (**Plan 6**).

6. Proposed Amendments to Matters shown on the Plan

The proposed amendments as shown on the draft Wong Nai Chung OZP No. S/H7/17A (**Attachment II(A)**) are as follows:

(a) Item A (Site Area: about 331m^2) (**Plans 1 and 2**)
Amendment of the stipulated maximum building height for the "G/IC" site from 5 storeys to 11 storeys.

(b) Item B (Site Area: about 3,489m^2) (**Plans 5 and 6**)
Amendment of the stipulated maximum building heights for southern part of the "G/IC" site covering the PLK Kwok Law Kwai Chun Children Services Building, the PLK Vicwood K.T. Chong Building, and the Vicwood K.T. Chong Kindergarten cum Nursery Building from 3, 4, 8 and 13 storeys to 80mPD.

7. Proposed Amendments to the Notes of the OZP

7.1 Amendments to the Notes of the OZP (Attachment II(B)) are proposed as follows:

(a) Amendments to the exemption clause on maximum PR/GFA in the remarks for "Residential (Group B)" ("R(B)") zone and on maximum PR and site coverage for "R(C)" zone to clarify that exemption of caretaker's quarters and recreational facilities are only applicable to those facilities for the use and benefit of all the owners or occupiers of the domestic building or domestic part of the building; and

(b) Other minor textual amendments.

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

8. Revision to the ES of the OZP (Attachment II(C))

The Explanatory Statement (ES) of the OZP is proposed to be revised to take into account the proposed amendments as mentioned in paragraph 7 above. Opportunity has also been taken to update the general information for various land use zones to reflect the latest status and planning circumstances of the OZP. The proposed amendments to the ES of the OZP (with additions in ***bold and italics*** and deletions in '~~crossed out~~') are at **Attachment II(C)** for Members' consideration.

9. Plan Number

Upon exhibition for public inspection, the OZP will be renumbered as S/H7/18.

10. Consultation

Departmental Circulation

10.1 As mentioned in paragraphs 4.8 and 5.8 above, the HAB has tendered policy support to the religious facilities in the MLCC's extension proposal, and the LWB has in general offered in-principle policy support to the proposed social welfare facilities and the EDB has no objection to the reprovisioning of the existing educational facilities in the redevelopment proposal of PLK. Other relevant Government departments had no objection to or adverse comments on the two proposals.

10.2 The proposed amendments mentioned in paragraphs 6 to 8 above have been circulated to the following bureaux/departments. All of them have no objection to or adverse comment on the proposed amendments:

(a) Secretary for Education;
(b) Secretary for Home Affairs;
(c) Secretary for Labour and Welfare;
(d) Commissioner for Heritage, Development Bureau;
(e) Chief Architect/Central Management Division 2, Architectural Services Department;
(f) Chief Building Surveyor/Hong Kong East & Heritage, Buildings Department;
(g) Project Manager (Hong Kong Island & Islands), Civil Engineering and Development Department;
(h) Head of Geotechnical Engineering Office, Civil Engineering and Development Department;
(i) Chief Engineer/Hong Kong & Islands, Drainage Services Department;
(j) Director of Environmental Protection;
(k) Director of Fire Services;
(l) Chief Highway Engineer/Hong Kong, Highways Department;
(m) District Officer (Wan Chai), Home Affairs Department;
(n) District Lands Officer/Hong Kong East, Lands Department;
(o) Antiques and Monument Office, Leisure and Cultural Services Department;
(p) Chief Town Planner/Urban Design & Landscape Section, Planning Department;
(q) Commissioner of Police;
(r) Director of Social Welfare;
(s) Commissioner for Transport; and
(t) Chief Engineer/Construction, Water Supplies Department.

Consultation with Wan Chai District Council (WCDC)

10.3 On 15.9.2015, PlanD consulted the WCDC on the proposed amendments to the OZP. The WCDC expressed in-principle support to the proposed amendments to the OZP and provided comments on various issues including controlling the building height of MLCC Site in terms of mPD instead of number of storeys, potential traffic impacts of MLCC's and PLK's proposals, access arrangement for PLK's redevelopment, the interface between PLK's redevelopment and the proposed redevelopment of the EMSD ex-workshop at Caroline Hill Road, and promoting the use of public transport upon completion of the two proposals.

11. Decision Sought

Members are invited to:

(a) agree to the proposed amendments to the approved Wong Nai Chung OZP No. S/H7/17 and that the Amendment Plan No. S/H7/17A at **Attachment II(A)** (to be renumbered to S/H7/18 upon exhibition) and its Notes at **Attachment II(B)** are suitable for exhibition under section 5 of the Ordinance; and

(b) adopt the revised ES at **Attachment II(C)** for the draft Wong Nai Chung OZP No. S/H7/17A 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.

12. Attachments

Attachment I	Approved Wong Nai Chung OZP No. S/H7/17 (reduced to A3 size)
Attachment II(A)	Draft Wong Nai Chung OZP No. S/H7/17A
Attachment II(B)	Revised Notes of Draft Wong Nai Chung OZP No. S/H7/17A
Attachment II(C)	Revised ES of Draft Wong Nai Chung OZP No. S/H7/17A
Attachment III	Extension Proposal submitted by MLCC
Attachment IV	Redevelopment Proposal submitted by PLK
Attachments V-a & V-b	Comparison of the Existing and Proposed Development Parameters of the Proposals
Drawing 1	Schematic Drawing submitted by MLCC
Drawings 2 to 5	Schematic Drawings and Photomontages submitted by PLK
Plan 1	Location Plan for MLCC Site (Amendment Item A)
Plan 2	Site Plan for MLCC Site (Amendment Item A)
Plan 3	Site Photo for MLCC Site (Amendment Item A)
Plan 4	Photomontage of the MLCC's Extension Proposal
Plan 5	Location Plan for PLK Redevelopment Site (Amendment Item B)
Plan 6	Site Plan for PLK Redevelopment Site (Amendment Item B)
Plan 7	Site Photos for PLK Redevelopment Site (Amendment Item B)

PLANNING DEPARTMENT
OCTOBER 2015

Attachment I of
MPC Paper No.11/15

圖例
NOTATION

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

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

MISCELLANEOUS		其他
BOUNDARY OF PLANNING SCHEME		規劃範圍界線
BUILDING HEIGHT CONTROL ZONE BOUNDARY		建築物高度管制區界線
MAXIMUM BUILDING HEIGHT (IN METRES ABOVE PRINCIPAL DATUM)	100	最高建築物高度（在主水平基準上若干米）
MAXIMUM BUILDING HEIGHT (IN NUMBER OF STOREYS)	2	最高建築物高度（層數數目）
PETROL FILLING STATION	P F S	加油站
NON-BUILDING AREA	NBA	非建築用地

土地用途及面積一覽表
SCHEDULE OF USES AND AREAS

USES	大約面積及百分率 APPROXIMATE AREA & %		用途
	公頃 HECTARES	% 百分率	
COMMERCIAL	1.24	0.90	商業
RESIDENTIAL (GROUP A)	5.65	4.10	住宅（甲類）
RESIDENTIAL (GROUP B)	15.40	11.19	住宅（乙類）
RESIDENTIAL (GROUP C)	17.83	12.95	住宅（丙類）
GOVERNMENT, INSTITUTION OR COMMUNITY	14.32	10.40	政府、機構或社區
OPEN SPACE	9.34	6.78	休憩用地
OTHER SPECIFIED USES	35.50	25.78	其他指定用途
GREEN BELT	20.60	14.96	綠化地帶
MAJOR ROAD ETC.	17.80	12.94	主要道路等
TOTAL PLANNING SCHEME AREA	137.68	100.00	規劃範圍總面積

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

行政長官會同行政會議於2014年7月8日 根據城市規劃條例第9（1）（a）條核准的圖則
APPROVED BY THE CHIEF EXECUTIVE IN COUNCIL UNDER SECTION 9(1)(a) OF THE TOWN PLANNING ORDINANCE ON 8 JULY 2014

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

香港城市規劃委員會依據城市規劃條例擬備的黃泥涌（港島規劃區第7區）分區計劃大綱圖
TOWN PLANNING ORDINANCE, HONG KONG TOWN PLANNING BOARD
HONG KONG PLANNING AREA No. 7 - WONG NAI CHUNG - OUTLINE ZONING PLAN

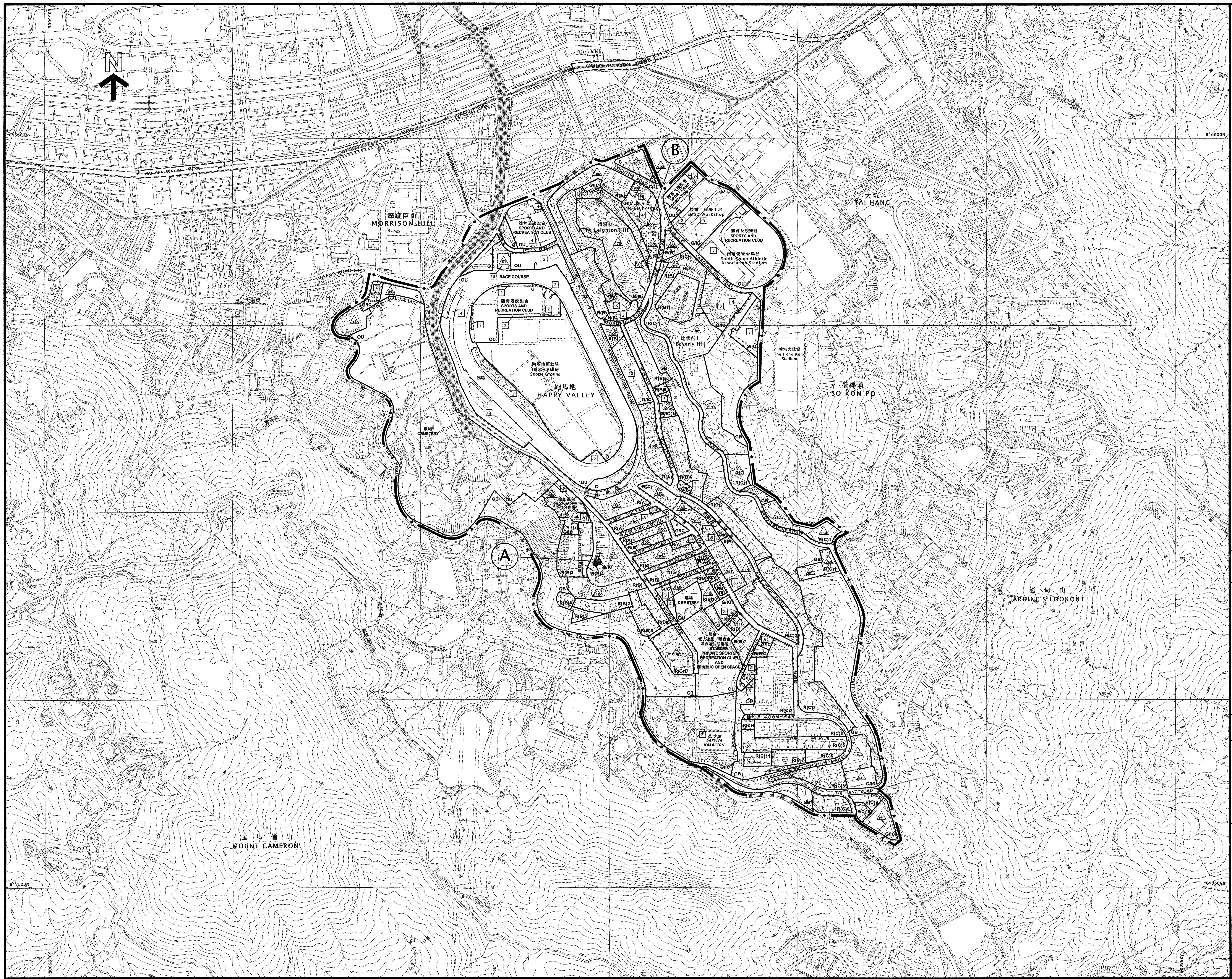
SCALE 1:5000 比例尺

米 METRES 100 0 200 400 600 800 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/H7/17

Attachment II(A) of
MPC Paper No.11/15



圖例
NOTATION

ZONES — **地帶**

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

COMMUNICATIONS — **交通**

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

MISCELLANEOUS — **其他**

BOUNDARY OF PLANNING SCHEME		規劃範圍界線
BUILDING HEIGHT CONTROL ZONE BOUNDARY		建築物高度管制區界線
MAXIMUM BUILDING HEIGHT (IN METRES ABOVE PRINCIPAL DATUM)	100	最高建築物高度（在主水平基準上若干米）
MAXIMUM BUILDING HEIGHT (IN NUMBER OF STOREYS)	2	最高建築物高度（樓層數目）
PETROL FILLING STATION	P F S	加油站
NON-BUILDING AREA	NBA	非建築用地

土地用途及面積一覽表
SCHEDULE OF USES AND AREAS

USES	大約面積及百分率 APPROXIMATE AREA & %		用途
	公頃 HECTARES	% 百分率	
COMMERCIAL	1.24	0.90	商業
RESIDENTIAL (GROUP A)	5.65	4.10	住宅（甲類）
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OTHER SPECIFIED USES	35.50	25.78	其他指定用途
GREEN BELT	20.60	14.96	綠化地帶
MAJOR ROAD ETC.	17.80	12.94	主要道路等
TOTAL PLANNING SCHEME AREA	137.68	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/H7/17 的修訂
AMENDMENTS TO APPROVED PLAN No. S/H7/17

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

（參看附表）
(SEE ATTACHED SCHEDULE)

香港城市規劃委員會依據城市規劃條例擬備的黃泥涌（港島規劃區第7區）分區計劃大綱圖
TOWN PLANNING ORDINANCE, HONG KONG TOWN PLANNING BOARD
HONG KONG PLANNING AREA No. 7 - WONG NAI CHUNG - OUTLINE ZONING PLAN

SCALE 1:5000 比例尺

米 METRES 100 0 200 400 600 800 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/H7/17A**

HONG KONG PLANNING AREA NO. 7

~~APPROVED~~ *DRAFT* WONG NAI CHUNG OUTLINE ZONING PLAN NO. S/H7/17*A*

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

NOTES

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

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

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

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

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

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

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

- a use in existence before the publication of the first plan which has continued since it came into existence; or

- a use or a change of use approved under the Buildings Ordinance which relates to an existing building; and

(ii) after the publication of the first plan,

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

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

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

(5) Road junctions, alignments of roads and railway/tram 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/tram/public light bus stop or lay-by, cycle track, Mass Transit Railway station entrance, Mass Transit Railway structure below ground level, taxi rank, nullah, public utility pipeline, electricity mast, lamp pole, telephone booth, telecommunications radio base station, automatic teller machine and shrine;

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

(c) maintenance or repair of watercourse and grave.

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

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

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

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

HONG KONG PLANNING AREA NO. 7

~~APPROVED~~ *DRAFT* WONG NAI CHUNG OUTLINE ZONING PLAN NO. S/H7/17*A*

Schedule of Uses

COMMERCIAL

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

Planning Intention

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

(Please see next page)

COMMERCIAL (Cont'd)

Remarks

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

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

(3) In addition, on land designated "Commercial(1)", a gross floor area of not less than 715m^2 for Government, institution or community facilities should be provided.

RESIDENTIAL (GROUP A)

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

(Please see next page)

RESIDENTIAL (GROUP A) (Cont'd)

Column 1 Uses always permitted
In addition, the following uses are always permitted (a) on the lowest three floors of a building, taken to include basements; or (b) in the purpose-designed non-residential portion of an existing building, both excluding floors containing wholly or mainly car parking, loading/unloading bays and/or plant room :
Eating Place Educational Institution Institutional Use (not elsewhere specified) Off-course Betting Centre Office Place of Entertainment Private Club Public Convenience Recyclable Collection Centre School Shop and Services Training Centre

Planning Intention

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

Remarks

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

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

RESIDENTIAL (GROUP B)

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

Planning Intention

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

(Please see next page)

RESIDENTIAL (GROUP B) (Cont'd)

Remarks

(1) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the maximum plot ratio/gross floor area and/or the building height specified below and/or the maximum building height as stipulated on the Plan, or the plot ratio/gross floor area and/or height of the existing building, whichever is the greater:

Sub-area	Restriction
R(B) 1	Maximum 3 storeys in addition to 1 storey of carports
R(B) 2	Maximum 4 storeys including carports
R(B) 3	Maximum 5 storeys including carports
R(B) 4	Maximum 5 storeys in addition to 1 storey of carports
R(B) 5	Maximum 8 storeys in addition to 1 storey of carports
R(B) 6	Maximum plot ratio of 5 and maximum building height of 115 metres above Principal Datum
R(B) 7	Maximum 14 storeys including carports
R(B) 8	Maximum plot ratio of 5 and maximum building height of 130 metres above Principal Datum
R(B) 9	Maximum building height of 115 metres above Principal Datum and maximum gross floor area of 2,985m^2
R(B) 10	Maximum building height of 115 metres above Principal Datum, maximum domestic gross floor area of 15,495m^2 and maximum non-domestic gross floor area of 8,687m^2 of which a gross floor area of not less than 2,251m^2 should be provided for Government, institution or community facilities. A public car park of not less than 200 parking spaces should be provided.

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

(3) 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 (1) 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 Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than Entrances 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 to 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 C) (Cont'd)

Remarks

(1) On land designated "R(C)1" to "R(C)10", no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the maximum plot ratio and/or building height specified below, or the plot ratio and/or height of the existing building, whichever is the greater:

Sub-area	Restriction
R(C)1	Maximum plot ratio of 5 and maximum building heights as stipulated on the Plan
R(C)2	Maximum 6 storeys in addition to 1 storey of carports
R(C)3	Maximum building height of 89 metres above Principal Datum
R(C)4	Maximum building height of 92 metres above Principal Datum
R(C)5	Maximum building height of 98 metres above Principal Datum
R(C)6	Maximum building height of 116 metres above Principal Datum
R(C)7	Maximum building height of 122.7 metres above Principal Datum
R(C)8	Maximum building height of 138 metres above Principal Datum
R(C)9	Maximum building height of 145 metres above Principal Datum
R(C)10	Maximum building height of 155 metres above Principal Datum

(2) On land designated "R(C)11", no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum building height of 130 metres above Principal Datum.

(Please see next page)

RESIDENTIAL (GROUP C) (Cont'd)

Remarks (Cont'd)

(3) In addition, no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the site coverage specified below, or the site coverage of the existing building, whichever is the greater:

Height - No. of Storeys Used for Domestic Purposes	Percentage Site Coverage Class of Site		
	A	B	C
3 and below	55	66.6	72.5
4	45	54	60
5	40	48	53
6	35	42	46
7	30	36	39.5
8	30	36	39.5
9	30	36	39.5
10	27.5	33	36
11	27.5	33	36
12	27.5	33	36
13	25	30	33
14	25	30	33
15	25	30	33
16	25	30	33
17	25	30	33
18	25	30	33
19	25	30	33
20	25	30	33
More than 20	Any development above 20 storeys shall not have a permitted site coverage in excess of that permitted for 20 storeys.		

(4) In determining the maximum plot ratio and site coverage for the purpose of paragraphs (1) and (3) above, any floor space that is constructed or intended for use solely as car park, loading/unloading bay, plant room~~,~~ ***and*** caretaker's office, ~~and~~ ***or*** caretaker's quarters~~, or~~ ***and*** recreational facilities for the use and benefit of all the owners or occupiers of the domestic building or domestic part of the building, provided such uses and facilities are ancillary and directly related to the development or redevelopment, may be disregarded.

(5) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the plot ratio/building height/site coverage restrictions stated in paragraphs (1), (2) and (3) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

GOVERNMENT, INSTITUTION OR COMMUNITY

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

Planning Intention

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

(Please see next page)

GOVERNMENT, INSTITUTION OR COMMUNITY (Cont'd)

Remarks

(1) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the maximum building height, in terms of number of storeys and/or metres above Principal Datum, as stipulated on the Plan or the height of the existing building, whichever is the greater. The provision for development/redevelopment to the height of the existing building is not applicable to the part of the Hong Kong Sanatorium and Hospital site which is subject to a maximum building height of 2 storeys as stipulated on the Plan.

(2) On land designated "Government, Institution or Community (1)", no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum plot ratio of 5 and a maximum site coverage of 62% (not exceeding 15m above ground level) and 46% (over 15m above ground level), or the plot ratio and site coverage of the existing building, whichever is the greater. In addition, a building gap with a minimum width of 4m in an east-west direction above 25mPD (except for fence wall not exceeding 2m in height) shall be provided between the buildings at the northern and southern parts of the zone as demarcated by a pecked line on the Plan.

(3) For the Hong Kong Sanatorium and Hospital site, the total number of hospital beds should not be in excess of 800 beds and not more than 15% of the total non-domestic GFA of the development shall be used for clinic purpose.

(4) In determining the relevant maximum number of storeys for the purposes of paragraph (1) above, any basement floor(s) may be disregarded.

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

(6) Under exceptional circumstances, for a development or redevelopment proposal, minor relaxation of the building gap requirement as stated in paragraph (2) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

OPEN SPACE

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

Planning Intention

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

OTHER SPECIFIED USES

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

For "Cemetery" only

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

Planning Intention

This zone is primarily to provide/reserve land intended for cemetery and such ancillary facilities.

Remarks

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

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

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

(Please see next page)

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

Planning Intention

This zone is primarily to provide/reserve land for sports and recreation club uses.

Remarks

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

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

(3) For land where no maximum building height is stipulated on the Plan, any new development, or redevelopment of an existing building (except in-situ redevelopment of an existing building up to its existing building height) requires permission from the Town Planning Board under section 16 of the Town Planning Ordinance.

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

(Please see next page)

OTHER SPECIFIED USES (Cont'd)

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
For "Stables, Private Sports/Recreation Club and Public Open Space" only	
Animal Boarding Establishment (stables only) Park and Garden Place of Recreation, Sports or Culture Playground/Playing Field Private Club	Flat (Staff Quarters not ancillary to the Specified Uses only) Off-course Betting Centre Public Utility Installation Utility Installation for Private Project

Planning Intention

This zone is primarily to reserve land intended for stables, private sports/recreation club and public open space uses.

Remarks

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

(2) An at-grade public open space of not less than 5,000m^2 shall be provided.

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

(Please see next page)

OTHER SPECIFIED USES (Cont'd)

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
For "Race Course" only	
Race Course Private Club	Government Use Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than Entrances Public Utility Installation Utility Installation for Private Project

Planning Intention

This zone is intended primarily to provide/reserve land for race course and its ancillary uses.

Remarks

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

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

(3) For land where no maximum building height is stipulated on the Plan, any new development, or redevelopment of an existing building (except in-situ redevelopment of an existing building up to its existing building height) requires permission from the Town Planning Board under section 16 of the Town Planning Ordinance.

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

(Please see next page)

OTHER SPECIFIED USES (Cont'd)

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

For "Petrol Filling Station" only

Petrol Filling Station	Government Use Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than Entrances Public Utility Installation Utility Installation for Private Project

Planning Intention

This zone is intended primarily for the provision for petrol filling station.

Remarks

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

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

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

GREEN BELT

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

Planning Intention

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

HONG KONG PLANNING AREA NO. 7

~~APPROVED~~ *DRAFT* WONG NAI CHUNG OUTLINE ZONING PLAN NO. S/H7/17*A*

EXPLANATORY STATEMENT

HONG KONG PLANNING AREA NO. 7

~~APPROVED~~ *DRAFT* WONG NAI CHUNG OUTLINE ZONING PLAN NO. S/H7/17*A*

EXPLANATORY STATEMENT

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~~APPROVED~~ *DRAFT* WONG NAI CHUNG OUTLINE ZONING PLAN NO. S/H7/17*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* Wong Nai Chung Outline Zoning Plan (OZP) No. S/H7/17*A*. It reflects the planning intention and objectives of the Town Planning Board (the Board) for the various land use zonings of the Plan.

2. AUTHORITY FOR THE PLAN AND PROCEDURES

2.1 On 29 August 1969, the draft Wong Nai Chung OZP No. LH 7/6, being the first statutory plan covering the Wong Nai Chung area, was exhibited for public inspection under section 5 of the Town Planning Ordinance (the Ordinance). On 10 March 1970, the then Governor in Council (G in C) approved the draft OZP. On 23 September 1975, the then G in C referred the approved OZP to the Board for amendment. Since then, the OZP had been amended eight times and exhibited for public inspection under section 5 or 7 of the Ordinance to reflect the changing circumstances.

2.2 On 7 December 1993, the then G in C, under section 9(1)(a) of the Ordinance, approved the draft Wong Nai Chung OZP, which was subsequently renumbered as S/H7/4. On 30 November 1999, the then G in C referred the approved OZP No. S/H7/4 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. Since then, the OZP had been amended three times and exhibited for public inspection under section 5 or 7 of the Ordinance to reflect the changing circumstances.

2.3 On 19 June 2001, the Chief Executive in Council (CE in C), under section 9(1)(a) of the Ordinance, approved the draft Wong Nai Chung OZP, which was subsequently renumbered as S/H7/8.

2.4 On 25 September 2001, the CE in C referred the approved OZP No. S/H7/8 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. Since then, the OZP had been amended twice and exhibited for public inspection under sections 5 and 7 respectively to reflect the changing circumstances.

2.5 On 29 April 2003, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft Wong Nai Chung OZP, which was subsequently renumbered as S/H7/11. On 16 December 2003, the CE in C referred the approved Wong Nai Chung OZP No. S/H7/11 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance.

2.6 On 8 December 2006, the draft Wong Nai Chung OZP No. S/H7/12 incorporating amendments to the Notes of the Plan in accordance with the revised Master Schedule of Notes to Statutory Plans endorsed by the Board as well as the rezoning of the residential sites at Ventris Road, Shan Kwong Road, Hawthorn Road, Mui Hing Street, Sing Woo Road and Holly Road from “Residential (Group B)” (“R(B)”) to “R~~esidential~~ (~~Group~~ B)6” ~~(“R(B)6”)~~, “R~~esidential~~ (~~Group~~ B)7” and “Residential (Group C)2” ***(“R(C)2”)***, was exhibited for public inspection under section 5 of the Ordinance. During the two-month exhibition period, a total of 31 representations were received. On 16 February 2007, the Board published the representations for three weeks for public comments. Nine comments were received. After giving consideration to the representations and comments on 15 June 2007, the Board decided to propose an amendment to the OZP to partially meet some of the representations by amending the maximum building height of the sites at 20, 24 and 34-40 Shan Kwong Road from 115mPD to 130mPD. On 31 August 2007, the proposed amendment to rezone the concerned sites from “R(B)6” to “R~~esidential~~ (~~Group~~ B)8” was published for three weeks for further representations under section 6C(2) of the Ordinance. No further representation was received. On 5 October 2007, the Board amended the draft OZP No. S/H7/12 by the proposed amendment under section 6G of the Ordinance.

2.7 On 2 November 2007, the draft Wong Nai Chung OZP No. S/H7/13, incorporating amendments to reflect the existing boundaries of the Hong Kong Football Club, Kwai Sing Lane and a petrol filling station at Sing Woo Road was exhibited for public inspection under section 7 of the Ordinance. During the exhibition period, 14 representations were received. No comments on the representations were received. After giving consideration to the representations on 25 April 2008, the Board decided not to uphold the representations.

2.8 On 18 January 2008, the draft Wong Nai Chung OZP No. S/H7/14 incorporating mainly amendments to rezone two sites at Leighton Road and Stubbs Road from “Commercial/Residential” to “Commercial” (“C”) and sites at 101 Leighton Road, 17 Ventris Road, 12-18 Kwai Sing Lane and 32 Green Lane from “Government, Institution or Community” (“G/IC”) to “C(1)”, “R(B)9”, “R(B)10” and “R(C)11” respectively as well as amendments to stipulate building heights restrictions for the “C”, “Residential (Group A)” (“R(A)”), “R(B)”, “R(C)1”, “G/IC” and ***Other Specified Uses*** *(*“OU”*)* zones, was exhibited for public inspection under section 7 of the Ordinance. During the exhibition period, a total of 50 representations were received. On 28 March 2008 and 1 April 2008, the Board published the representations for ~~3~~*three* weeks for public comments. A total of 383 valid comments were received and one of them was later withdrawn before the Board’s consideration of the representations.

2.9 After giving consideration to the representations and comments under section 6B(1) of the Ordinance on 8 August 2008, the Board decided to propose amendments to the OZP to meet/partially meet 34 representations and not to uphold the remaining representations. On 29 August 2008, the proposed amendments were published for public inspection under section 6C(2) of the Ordinance. The proposed amendments mainly included the relaxation of the stipulated maximum building heights for the "R(A)", "R(B)", "R(B)10" and "R(C)1" sites to the south of the Happy Valley Race Course as well as the "OU" annotated "Stables, Private Sports/Recreation Club and Public Open Space" zone, revision to the stipulated maximum building heights for the "OU" annotated "Race Course" ("OU(Race Course)") and "Sports and Recreation Club" ("OU(SRC)") zones and the "G/IC" zone covering the Man Lam Christian Church, deletion of the building height restrictions for four pieces of land in the "OU(SRC)" zone, and corresponding revision to Remark (3) in the Notes for the "OU(Race Course)" and "OU(SRC)" zones. Upon expiry of the three-week public inspection period, six further representations against some of the proposed amendments were received. After giving consideration to the further representations on 14 November 2008, the Board decided not to uphold the further representations and to amend the OZP by the proposed amendments under sections 6F(8) and 6G of the Ordinance.

2.10 On 30 September 2010, the draft Wong Nai Chung OZP No. S/H7/15 incorporating amendments to the building height restrictions for the "G/IC" zone covering the Hong Kong Sanatorium and Hospital (HKSH) site was exhibited for public inspection under section 7 of the Ordinance. During the exhibition period, a total of 1,068 representations were received. On 24~~.12.~~ ***December*** 2010, the Board published the representations for ~~3~~***three*** weeks for public comments. A total of ~~9~~***nine*** comments were received. After giving consideration to the representations and comments on 8 April 2011, 11 May 2012 and 17 August 2012 under section 6B(1) of the Ordinance, the Board decided to meet HKSH's representation by further amending the building height restrictions and the Notes of the "G/IC" zone for the HKSH site and not to uphold the remaining representations. On 14 September 2012, the proposed amendments were published for public inspection under section 6C(2) of the Ordinance. Upon expiry of the three-week public inspection period, a total of 874 valid further representations were received. After giving consideration to the further representations on 14 December 2012, the Board decided not to uphold the further representations and to amend the OZP by the proposed amendments under sections 6F(8) of the Ordinance.

2.11 On 26 August 2011, the draft Wong Nai Chung OZP No. S/H7/16 incorporating amendments mainly to rezone a site covering Pioneer Memorial Church and the former Hong Kong Sam Yuk Secondary School at 17A Ventris Road from "G/IC" to ~~"Government, Institution or Community(1)" (~~"G/IC(1)"~~)~~ to amend the building height restrictions and stipulate plot ratio and site coverage restrictions and building gap requirement for the zone was exhibited for public inspection under section 7 of the Ordinance. During the exhibition period, a total of 11 representations were received. On 4~~.11.~~ ***November*** 2011, the Board published the representations for ~~3~~*three* weeks for public comments and ~~1~~*one* comment was received. After giving consideration to the representations and comment on 17 February 2012, the Board decided not to uphold the representations.

2.12 On 22 June 2012, the Board agreed to seek the CE's agreement, under section 8(2) of the Ordinance, to extend the time limit for submission of the draft Wong Nai Chung OZP No. S/H7/16 to the CE in C for a further period of six months so as to allow sufficient time to complete the representation consideration process in respect of the draft Wong Nai Chung OZP No. S/H7/15. On 9 July 2012, the CE approved the proposed extension of the time limit.

2.13 On 18 October 2012, a member of the public sought a Judicial Review (JR) of the Board's decisions on 17 August 2012 regarding the representations in relation to the draft Wong Nai Chung OZP No. S/H7/15. The JR was refused by the Court of First Instance on 7 March 2013.

2.14 On 8 July 2014, the CE in C under section 9(1)(a) of the Ordinance, approved the draft Wong Nai Chung OZP, which was subsequently renumbered as S/H7/17. On 18 July 2014, the approved Wong Nai Chung OZP No. S/H7/17 ~~(the Plan)~~ was exhibited for public inspection under section 9(5) of the Ordinance.

2.15 On 13 July 2015, the CE in C referred the approved Wong Nai Chung OZP No. S/H7/17 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. The reference back of the OZP for amendment was notified in the Gazette on 21 August 2015 under section 12(2) of the Ordinance.

2.16 On XXX 2015, the draft Wong Nai Chung OZP No. S/H7/18 (the Plan), incorporating amendments mainly to revise building height restrictions for two "G/IC" sites covering the Man Lam Christian Church at Village Road and part of the Po Leung Kuk at Leighton Road was exhibited for public inspection under section 5 of the Ordinance.

3. OBJECT OF THE PLAN

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

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

3.3 Since the Plan is to show broad land use zonings, there would be situations in which small strips of land not intended for building development purposes and carry no development right under the lease, such as the areas restricted as non-building area or 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 calculations. Development within residential zones should be restricted to building lots carrying development right in order to maintain the character and amenity of the Wong Nai Chung area and not to overload the road network in this area.

4. NOTES OF THE PLAN

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

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

5. THE PLANNING SCHEME AREA

5.1 The Area is shown by a heavy broken line on the Plan. The Area covers about 138 hectares of land. It is bounded by Leighton Road in the north, Hong Kong Stadium and Tai Hang Road in the east, Wong Nai Chung Gap Road in the south and Stubbs Road in the west. The Area has been mostly developed except the "Green Belt" areas.

5.2 The southern part of the Area is predominantly residential, while the northern part, comprising the areas generally known as Happy Valley and Caroline Hill, has been developed predominantly for sports and recreation clubs. The race course and the South China Athletic Association Stadium are important landmarks in the Area. There are other specified uses including some cemeteries in the western and southern parts of the Area.

6. POPULATION

According to the 2011 Population Census, the population of the Area was about 32,900. It is estimated that the planned population of the Area would be about 40,000.

7. BUILDING HEIGHT RESTRCTIONS IN WONG NAI CHUNG PLANNING SCHEME AREA

7.1 In order to provide better planning control on the development intensity and building height upon development/redevelopment and to meet public aspirations for greater certainty and transparency in the statutory planning system, a review of the Wong Nai Chung OZP has been taken with a view to incorporating appropriate building height restrictions in the Notes for various development zones. In the absence of building height control, tall buildings may proliferate at random locations and the scale may be out-of-context in the locality, resulting in negative impacts on the visual quality of the Area. In order to prevent excessively tall or out-of-context buildings, to preserve some key urban design attributes for the Area (e.g. stepped building height from the racecourse) and to provide better control on building height profile of the Area, appropriate building height restrictions are imposed for the "C", "R(A)", "R(B)", "R(C)", "G/IC" and "OU" zones on the Plan.

7.2 The building height restrictions are to preserve the views to the ridgelines near Wong Nai Chung Gap from public view points and to maintain a stepped building height concept recommended in the Urban Design Guidelines Study with lower building along the racecourse, taking account of the local area context, the local wind environment, and the need to maintain visually compatible building masses in the wider setting. There are four main building height bands – 85 metres above Principal Datum (mPD), 100mPD, 115mPD and 130mPD for the "C", "R(A)" and "R(B)" zones at the valley floor area – increasing progressively from the racecourse to the valley floor and upper hill areas. The building height bands help preserve views to the ridgelines, achieve a stepped height profile for visual permeability and wind penetration and circulation. Building height restrictions of 150mPD, 170mPD, 180mPD, 210mPD and 240mPD are imposed for the medium to high-rise residential developments within the "R(B)" and "R(C)1" zones along Broadwood Road.

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

7.4 An Air Ventilation Assessment (AVA) by expert evaluation has been undertaken to assess the likely impact of the building heights of the development sites within the Wong Nai Chung Area on the pedestrian wind environment. The building height bands shown on the Plan have taken into account the findings of the AVA as appropriate.

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

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

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

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

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

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

(f) other factors, such as need for tree preservation, innovative building design and planning merits that would bring about improvements to townscape and amenity of the locality and would not cause adverse landscape and visual impacts.

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

8. LAND USE ZONINGS

8.1 Commercial ("C") : Total Area 1.24 ha

8.1.1 This zone is intended primarily for commercial developments, which may include uses such as office, shop, services, place of entertainment, eating place and hotel, functioning as territorial business/financial centre(s) and regional or district commercial/shopping centre(s). These areas are usually major employment nodes. The sites zoned for this purpose is located to the south of Queen's Road East, at Stubbs Road and the junction of Leighton Road and Hysan Avenue.

8.1.2 Developments and redevelopments in the "C" sites are subject to a maximum building height of 100mPD as stipulated on the Plan. Minor relaxation of the building height restrictions may be considered by the Board through the planning permission system pursuant to paragraph 7.5 above. Each application for minor relaxation of building height restriction will be considered on its own merit.

8.1.3 A gross floor area of not less than 715m² for Government, institution or community facilities should be provided at the "C(1)" site at Leighton Road.

8.2 Residential (Group A) ("R(A)") : Total Area 5.65 ha

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

8.2.2 The areas zoned for this purpose include the existing residential developments along Leighton Road, Wong Nai Chung Road and Sing Woo Road.

8.2.3 Developments and redevelopments in the "R(A)" sites are subject to maximum building heights of 85mPD, 100mPD and 115mPD as stipulated on the Plan. Minor relaxation of the building height restrictions may be considered by the Board through the planning permission system pursuant to paragraph 7.5 above. Each application for minor relaxation of building height restriction will be considered on its own merit.

8.3 Residential (Group B) ("R(B)") : Total Area 15.40 ha

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

8.3.2 Areas zoned for this purpose include the Leighton Hill, areas along Link Road and south of the race course in Shan Kwong Road, Village Road, Sing Woo Road, etc. Developments and redevelopments in the "R(B)" sites are subject to maximum building heights of 100mPD, 115mPD, 130mPD and 170mPD as stipulated on the Plan, and/or other building height restrictions as specified in the Notes of the Plan.

8.3.3 Some areas along Fung Fai Terrace, Happy View Terrace, Ventris Road, Shan Kwong Road and Hawthorn Road are defined as sub-areas in the "R(B)" zone with restrictions on plot ratio and/or building height. These restrictions are specified in the 'Remarks' column in the Notes of the Plan. They are mainly based on the need to maintain the character of the areas and the restriction previously imposed administratively in the Special Control Area (SCA) due to the poor access of the areas.

8.3.4 Minor relaxation of the building height restrictions may be considered by the Board through the planning permission system pursuant to paragraph 7.5 above. Each application for minor relaxation of building height restriction will be considered on its own merit.

8.4 Residential (Group C) ("R(C)") : Total Area 17.83 ha

8.4.1 This zone is intended primarily for low to medium-density residential developments where commercial uses serving the residential neighbourhood may be permitted on application to the Board. This zone covers areas situated in the southern part of the Area along Blue Pool Road, Briar Avenue, Tai Hang Road and Shan Kwong Road as well as in the eastern part of the Area along Broadwood Road. The sloping areas surrounding Happy View Terrace are zoned "R(C)1", and these areas together with the Happy View Terrace serve as the main wind corridor for the Area. These sloping areas are designated as non-building area on the Plan to preserve the wind corridor.

8.4.2 In land use terms, the "R(C)" zone is slightly more restrictive than the "R(B)" zone. For example, office use would not be permitted under this zone. Moreover, developments in this zone are subject to specific control on building bulk and building height. These restrictions, based on the restrictions previously imposed administratively in the SCA, are stipulated for a variety of reasons, such as the limited capacity of access road, the need to preserve views and to maintain the existing character/amenity of the area. These development restrictions are shown in the Notes of the Plan and/or stipulated on the Plan.

8.4.3 Minor relaxation of the building height restrictions may be considered by the Board through the planning permission system pursuant to paragraph 7.5 above. Each application for minor relaxation of building height restriction will be considered on its own merit.

8.4.4 The building at 32 Green Lane with a building height of 146mPD is considered incompatible with the stepped height profile of the surrounding developments. It is zoned "R(C)11" with the intention to restrict the building height of the future development to a maximum of 130mPD upon redevelopment to respect the stepped height profile in the surrounding areas.

8.4.5 The "R(C)1" zones along Broadwood Road have been developed into medium to high-rise residential developments. For future redevelopment of these sites, it is encouraged that sufficient gaps should be provided between buildings to facilitate the penetration of north-easterly prevailing wind through these sites to the valley area.

8.5 Government, Institution or Community ("G/IC") : Total Area 14.32 ha

8.5.1 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. The areas zoned for this use include existing schools, market, churches, temples, Hong Kong Sanatorium and Hospital ***(HKSH)***, Po Leung Kuk, Government offices and workshop, service reservoir and police station. A fire station is planned at Hawthorn Road.

8.5.2 Developments and redevelopments in the "G/IC" sites are subject to maximum building heights in terms of mPD and/or number of storeys as stipulated on the Plan. Building height restriction for most of the "G/IC" sites is stipulated in terms of number of storeys while school developments in SCA and some other sites are controlled in terms of mPD. Minor relaxation of the building height restrictions may be considered by the Board through the planning permission system pursuant to paragraph 7.5 above. Each application for minor relaxation of building height restriction will be considered on its own merit.

8.5.3 A site at 17A Ventris Road designated as "G/IC(1)" is for the provision of church and elderly facilities. If the development on the site involves elderly housing, which is regarded as 'Residential Institution' use, planning permission from the Board is required. Development within the zone is restricted to maximum building height of 5 storeys and 90mPD for the northern and southern parts of the zone respectively, a maximum plot ratio of 5 and a maximum site coverage of 62% (not exceeding 15m above ground level) and 46% (over 15m above ground level). In addition, a building gap with a minimum width of 4m in an east-west direction above 25mPD (except for fence wall not exceeding 2m in height) shall be provided between the buildings for church and elderly facilities at the northern and southern parts of the zone respectively in order to facilitate air ventilation through the site and to provide a visual break. Minor relaxation of the plot ratio, site coverage and building height restrictions may be considered by the Board through the planning permission system. Under exceptional circumstances, minor relaxation of the building gap requirement may be considered by the Board on application. Each application for minor relaxation will be considered on its own merits.

8.5.4 For the HKSH site at 2 Village Road, the total number of hospital beds is restricted to 800 and not more than 15% of the total non-domestic GFA of the development shall be used for clinic purpose in order to minimize any adverse traffic impact.

8.5.5 For Po Leung Kuk at 66 Leighton Road, any new development or redevelopment within the site should respect the Main Building, which is a Grade 2 historic building. Responsive building design for the new development or redevelopment, such as appropriate

setback distance and stepped building height profile, should be adopted to respect the setting of the historic building. Other design measures such as building setback along Link Road and roof garden with a level comparable to the Leighton Hill Road to the west of the site should also be considered with a view to improving the visual amenity of the new development or redevelopment and facilitating air ventilation of the area. In addition, any affected social welfare and educational facilities within the site should be duly reprovisioned.

8.6 Open Space ("O") : Total Area 9.34 ha

This zone is intended primarily for 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. It covers five existing open spaces including the Happy Valley Sports Ground in the middle of the race course, two at both sides of Sports Road, one along the southern bend of Wong Nai Chung Road and one at Kwai Fong Street.

8.7 Other Specified Uses ("OU") : Total Area 35.50ha

8.7.1 This zone is primarily to provide/reserve land for specific purposes and uses with low-rise developments. The areas zoned for these uses include the race course, the sports and recreation clubs to its north, the South China Athletic Association Stadium, the Jockey Club stables, private sports/recreation clubs and a public open space at the southern end of Shan Kwong Road, the petrol filling station at Sing Woo Road, and the cemeteries to the west of Wong Nai Chung Road and at Shan Kwong Road.

8.7.2 The "OU" zone is intended to serve as spatial and visual relief to the urban environment. In order to preserve the existing character of some "OU" sites, on land designated "OU(SRC)" and "OU(Race Course)", any new development, or redevelopment of an existing building (except in-situ redevelopment of an existing building up to its existing building height) on land where no maximum building height is stipulated on the Plan requires permission from the Board under section 16 of the Town Planning Ordinance. For the "OU" annotated "Stables, Private Sports/Recreation Club and Public Open Space" zone, an at-grade public open space of not less than 5,000m^2 shall be provided.

8.7.3 Developments and redevelopments in the "OU" sites are subject to maximum building heights in terms of mPD and/or number of storeys as stipulated on the Plan. Minor relaxation of the building height restrictions may be considered by the Board through the planning permission system pursuant to paragraph 7.5 above. Each application for minor relaxation of building height restriction will be considered on its own merit.

8.8 Green Belt ("GB") : Total Area 20.60 ha

The planning intention of this zone is primarily for the conservation of the existing natural environment amid the built-up areas/at the urban fringe, to safeguard it from encroachment by urban type development, and to provide additional outlets for passive recreational activities. There is a general presumption against development within this zone. Development within this zone will be carefully controlled and development proposals will be assessed on individual basis taking into account the relevant Town Planning Board Guidelines. The hillsides along Stubbs Road on the south-western periphery of the Area as well as those along Broadwood Road and Tai Hang Road on the eastern periphery are zoned for this purpose.

9. COMMUNICATIONS

9.1 Roads

The major routes serving the Area are Morrison Hill Road, Leighton Road, Wong Nai Chung Road, Blue Pool Road and Sing Woo Road. There is an elevated road system connecting the Aberdeen Tunnel with the Canal Road Flyover.

9.2 Public Transport

The Area is served by various modes of public transport including buses, tram, public light buses and taxis to nearby districts including Causeway Bay.

10. UTILITY SERVICES

The Area is well served with piped water supply, drainage and sewerage systems. Electricity, gas and telephone services are also available and no difficulties are anticipated in meeting the future requirements for utility services upon full development.

11. CULTURAL HERITAGE

11.1 *There are* ~~T~~*t*wenty *two graded historic* buildings in the Area~~,~~ including No. 11 and No. 15 Yuk Sau Street, No. 118 and No. 120 Blue Pool Road, the Chapel in Jewish Cemetery, the Chapel in Hong Kong Cemetery, the Pavilion, Service Hall and Gardener's House in Parsee Cemetery, Tung Lin Kok Yuen at Shan Kwong Road, St. Margaret's Church at Broadwood Road, St. Paul's Primary Catholic School ***and Hindu Temple*** at Wong Nai Chung Road, Sikh Temple at Queen's Road East, Gateway and St. Michael's Cemetery Chapel in St. Michael's Catholic Cemetery, Main Building in Po Leung Kuk, No. 16, No. 17, *No. 23* and No. 24 Fung Fai Terrace and Pioneer Memorial Church of Seventh-day Adventists at Ventris Road~~, are graded historical buildings~~.

11.2 Prior consultation with the Antiquities and Monuments Office ***(AMO)*** of the Leisure and Cultural Services Department should be made if any development***, redevelopment and/***or rezoning proposals ~~may~~ ***might*** affect ~~these~~ ***the above graded*** historic~~al~~ buildings ***and their immediate environs. Details of the declared monuments and historic buildings could be obtained from the official website of the AMO.***

12. IMPLEMENTATION

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

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

12.3 Planning applications to the Board will be assessed on individual merits. In general, the Board's consideration of the planning applications will take into account all relevant planning considerations which may include the departmental outline development plans/layout plans and the guidelines published by the Board. The outline development plans and layout plans are available for public inspection at the Planning Department. Guidelines published by the Board are available from the Board's website, the Secretariat of the Board and the Technical Services Division of the Planning Department. Application forms and Guidance Notes for planning applications can be downloaded from the Board's website and are available from the Secretariat of the Board, and the Technical Services Division and the relevant District Planning Office of the Planning Department. Applications should be supported by such materials as the Board thinks appropriate to enable it to consider the applications.

中華基督教會香港閩南堂
MAN LAM CHRISTIAN CHURCH, HONG KONG
THE CHURCH OF CHRIST IN CHINA

13 August 2012

Director of Planning
17F, North Point Government Offices
333 Java Road
North Point
Hong Kong
(Attention: Miss. Y. S. Wong Ophelia)

By Fax 2877 0389 and
By Hand

Dear Miss Wong,

Request for Relaxation of Building Height Restriction of Man Lam Christian Church, Hong Kong, <u>The Church of Christ in China, 9 Village Road, Hong Kong</u>

I refer to our meetings on 28 March 2011 and 4 May 2012 regarding the Representation Nos. R47 and R1025 to Town Planning Board on releasing the building height of Man Lam Christian Church ("MLCC") site on the Draft Wong Nai Chung Outline Zoning Plans Nos. S/H7/14 and S/H7/15 respectively.

Enclosed please find the redevelopment proposal of MLCC which delineates an 11-storey church building with the specific usage of the additional space. We should be most grateful for your kind consideration and relaxation of the building height restriction on the MLCC site to the building as requested in the redevelopment proposal.

Should you have any questions regarding the proposal, please contact Mr. Windsor Too of our church on 2893 2242.

Yours faithfully,

MAN LAM CHRISTIAN CHURCH
中華基督教會
香港閩南堂
HONG KONG

PLANNING DEPT.
13 AUG 2012
RECEIVED (TS)

Ms. Helen SHIH
Chairlady,
Man Lam Christian Church, Hong Kong
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Redevelopment Proposal of Man Lam Christian Church, Hong Kong
The Church of Christ in China, 9 Village Road, Happy Valley, Hong Kong

Introduction

1. The purpose of this submission is to seek the approval of Town Planning Board ("TPB") to relax the building height restriction ("BHR") of Man Lam Christian Church, The Church of Christ in China at 9 Village Road, Happy Valley, Hong Kong ("MLCC") as stipulated on the Draft Wong Nai Chung Outline Zoning Plans Nos. S/H7/14 and S/H7/15.

Background

2. On 18 January 2008, Draft Wong Nai Chung Outline Zoning Plan No. S/H7/14 was gazetted restricting all sites on the GIC zones, including the subject site of MLCC, to a height of not exceeding the existing bulk. In other words, the height of MLCC was limited to 4-storey only, despite the actual height was 5-storey.

3. On 17 March 2008, MLCC submitted Representation R47 to the TPB expressing opposition of the amendment of OZP with justifications and with a proposal to uplift the BHR. Justifications for uplifting the BHR are as follows:

(1) The building height restrictions contravene the Planning Intention of the G/IC zone.

(2) The development and redevelopment right of private property should be fully respected.

(3) The imposition of building height restrictions with a maximum of 4-storeys unnecessarily limits the amount of Gross Floor Area available for future expansion of services.

(4) There is no consistency applied to the G/IC zone in the Wong Nai Chung OZP. The Hong Kong Sanatorium and Hospital in the immediate vicinity has an existing building height as well as maximum height restriction of 148mPD. It is simply not convincing to impose a 4-storey height restriction on the MLCC site.

(5) The stipulation of building height restrictions on the G/IC zones in the Wong Nai Chung OZP is not fair and not justified.

(6) Land resources should be better utilized to its maximum development potential.

(7) The restricted building height of MLCC is inconsistent with its immediate vicinity of 100m above HKPDB.

(8) The subject site is neither a waterfront site nor adjacent to major open space. A building height restriction of up to 4-storey is not well justified.

(9) No public consultation has been made to the Wanchai District Council. No notification was received by land owners or residents. As a result land owners and residents have not been able to present their views on the restriction. It is rather unusual for the Government to impose building height restrictions without any prior public consultation.

(10) The subject site itself is too small to provide visual relief in the surrounding context.

(11) Unlike other institutional & social welfare facilities, there is no planning standards and guidelines for a church development.

For details of the Representation, please see Appendix I.

4. On 8 August 2008, the TPB considered MLCC's Representation R47 and decided to partially uphold the BHR to 5-storey (building height of the existing church building). In the deliberation session, some TPB Members expressed that privately owned GIC sites should be distinguished from Government owned GIC sites in determining building height restrictions and advised that proper assistance and guidance be provided to MLCC in respect of the planning permission process should it wish to embark on a redevelopment scheme. For details of the TPB's decision, please see Appendix II.

5. On 30 Nov. 2010, MLCC submitted Representation R1025 to express our concerns on the inconsistent treatment by the Government in releasing the BHR of GIC sites of Draft Wong Nai Chung Outline Zoning Plan No. S/H7/15 but not the site of MLCC. For details of MLCC's submission, please see Appendix III.

6. On 8 April 2011, MLCC attended a TPB Meeting and made a presentation. According to the decision of the TPB, if MLCC needed to amend the BHR, Town Planning Board ("PlanD") would facilitate as far as possible. For details of the TPB decision, please see Appendix IV.

<u>MLCC</u>

General description of the subject site

7. MLCC is located on The Remaining Portion of Sub-section 1 of Section A of Inland Lot No. 2341 (IL 2341 sA ss1 RP). The site, privately owned by the

Incorporated Trustees of the Man Lam Christian Church since 4 December 1967, is triangular shaped with a small area of about 331 sq.m. (Please see the site plan at Appendix V).

8. Pursuant to the Government Lease and the Modification Letter dated 22 November 1952, "the Government has approved the erection of a Church on the above lot provided that the design and deposition thereof are approved by the Director of Public Works". The Modification Letter also permitted ".... the erection on the above subsection of the lot of a Church of a design to be approved by the Director of Public Works with a tower not exceeding 56 feet high". According to the current land administration practice, the height restriction of 56 feet height can be released upon lease modification and payment of premium.

General description of the subject building

9. According to the approved building plans, the total gross floor area of the existing building is only around 1,150 sq.m. representing a plot ratio of about 3.465. Current usage of the church building is as follows (see photos of MLCC at Appendix VI):

Floor	**Approximate GFA(sq.m.)**	**Usage**
4	172	Pastor's Quarters
3	187	Gallery and 1 Small Office
2	134	One Classroom cum Gown Room and washrooms
1	327	Church Nave and One Office for 3 staff
G	327	Parish Hall
Total	1,147	

General description of the surrounding developments

10. MLCC is in a residential neighbourhood. To the east along Wang Tak Street and Shan Kwong Road are residential developments of 4 to 27 storeys. To the south along Village Road are residential developments of 14 to 31 storeys. To the west along Village Road and Fung Fai Terrance are low-rise residential developments of 3 to 5 storeys. To the further north-west and north are The Sanatorium and Hospital and the Race Course. To the north-east is the Emperor (Happy Valley) Hotel. Please see the location plan at Appendix VII.

General description of the MLCC

11. MLCC has been situated at the subject site for about 55 years. Our church was founded in June 1938 by a group of faithful Christians from Fujian. The site was bought on 20 January 1951 with members' donation at a consideration of HK$91,107.60. The previous church building was built in 1953. The existing 5-storey church was completed in 1983 to provide a better spiritual service centre for the local population and a wider district community. In the course of redevelopment 29 years ago, we had considered to further utilize the development potential of the site permitted under relevant statutory control so as to expand our spiritual service for the local population and a wider district community. The proposal was dropped at that time due to the financial considerations.

12. The mission of our church is to extend the Kingdom of God by the preaching of the Good News, the provision of pastoral care for church members, and the engagement in social, educational and community services. We are now providing spiritual worships on Sundays and fellowships for various age and gender groups on weekdays and Saturdays. As we are the only Christian church in Happy Valley, we shoulder the great responsibility for the local community.

13. 2012 Short Term Plan of MLCC is as follows:

April	Praise Dance
May	Parent talks
July and August	Vacation Bible School
1-10 August	For the first time, to be one of the venues of the 84th Bible Conference
August	Evangelical Concert
September	Starting a Happy Valley Children's Choir in September 2012

14. Long Term Plan of MLCC is as follows:

- Spiritual care for patients in HK Sanatorium and Hospital (working jointly with Chaplains of the hospital)
- Activities and spiritual services for staff of the hospital
- Children / youth / women services for local population
- Staff quarters for ministers and preachers
- Counselling service for the community
- Performance of marriage ceremonies, funeral services and memorial services
- Small group classical concert

The Church's future development plans for providing community services in Happy Valley are now seriously affected in view of the lack of available space.

Proposed Development

General description of the proposal

15. MLCC proposes to carry out alteration and addition to the existing building to a 11-storey church with a total Gross Floor Area of about 2,179 sq.m., plot ratio of around 6.58. The proposed uses of each floor are as follows (Please see the Floor Plans and Section Plan at Appendix VIII and IX respectively):

Floor	**Approximate GFA(sq.m.)**	**Proposed Usage**
10	172	Pastor's Quarters
9	172	Library/Study Room
8	172	Counselling Room/Prayer Room
7	172	Conference Room/Classrooms
6	172	Childcare Room/Classrooms
5	172	Choir/Music Room
4	172	Administration Office
3	187	Gallery and One Small Office for Pastor
2	134	One Classroom cum Gown Room and washrooms
1	327	Church Nave and One Office for 3staff
G	327	Parish Hall
Total	2,179	

16. In our proposal, there is no change for G/F to 3/F but the existing Pastor's Quarters will be moved from 3/F to 10/F so that all the floors from G/F to 9/F can be reserved for the sole purpose of church and community services.

17. The 4/F is planned for Pastor and Administrative Offices use. This is due to the reason that the existing office design is to accommodate only two staff and we need more office space to support the daily operation. Over the years, our pastor/missionary team and our administrative staff were expanded from two staff to seven. Our pastor and missionary staff do not have their own office to hold counseling and private interviews. Furthermore, some of the church members also come to our church to serve as volunteers and stay in the office during office hours.

18. The 5/F is planned for the Choir/Music Room. The number of church choir has expanded from one to five plus a worship band team and a handchime team. There is no room with proper acoustics design for the choirs and instrumental team purposes, which requires space for piano and equipment. The problem will become more severe after the setting up of Happy Valley Children Choir in September 2012. In this regard, a purpose-built Choir/Music Room will allow the choirs to have space for practicing and serve our God better.

19. The 6/F will be used for Childcare Room/Classrooms. The existing childcare room for toddlers takes up part of our gallery at 3/F. Parent with toddlers find it difficult to concentrate on their worship and worry about disturbance to other church members. A childcare room with tailor-made design and facilities would allow these parents to concentrate on their worship and take good care of their children at the same time. Also the existing childcare room can be converted into worship space to accommodate more members for services.

20. The 7/F is scheduled for Conference Room/Classroom purposes. In the lack of proper conference room, all meetings are now conducted at the G/F parish hall while our church members are also having gathering/fellowship at the same place. This situation is particularly not desirable when some topics have to be discussed seriously. A proper conference room would facilitate more effective and efficient discussion in future.

21. The 8/F will be used for Counselling Room/Prayer Room. At present, all counselling services are carried out in the Administrative Office at 1/F or pastor's small office at 3/F. In view of counselling service has to be conducted in place with more privacy, we propose to use the whole 8/F for either counselling or prayer use.

22. The 9/F is planned for Library/Study Room purposes. The existing library at 4/F is very small and is hard to accommodate more than 5 persons to read at the same time. A proper library would allow us to have more spiritual/missionary reference books to facilitate the teaching of our pastor/missionary staff/Bible teachers.

Design and/or planning merits

23. As the additions and alteration is miniature, there is no adverse impact on the surrounding neighbourhood on traffic flow, visual obstruction, etc. But in return, it would allow our church to grow along with the needs of the community.

Financing

24. Our church will self finance the cost of alteration and additions. With the additional space, we can release the existing tight usage of space and would provide better services for larger target groups i.e. local Fujianese using home dialect and Christians and non-Christians in Happy Valley and Hong Kong with no language restrictions generally.

Conclusion

25. MLCC is committed to continue serving the district and the wider community. In view of the current tight floor space, we are subject to severe limitation in the expansion of our services due to the planning restriction. We need space to serve our Church members and the local community.

26. The alteration and addition is a small scale one and is compatible with the planning intention of the GIC zone. It would utilize the land resources to facilitate the long term planning and development of the MLCC and hence to benefit the community.

MAN LAM CHRISTIAN CHURCH 中華基督教會 香港閩南堂 HONG KONG

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13 AUG 2012
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Ms. Helen SHIH
Chairlady,
Man Lam Christian Church, Hong Kong
The Church of Christ in China

Appendices

I	MLCC's Representation No. R47 of Draft Wong Nai Chung Outline Zoning Plan No. S/H7/14
II	TPB's decision on MLCC's Representation No. R47
III	MLCC's Representation No. R1025 of Draft Wong Nai Chung Outline Zoning Plan No. S/H7/15
IV	TPB's decision on MLCC's Representation No. R1025
V	Site Plan
VI	Photos of MLCC
VII	Location Plan
VIII	Floor Plans of Proposal
IX	Section Plan of Proposal

Appendix I

<u>MLCC's Representation No. R47 of Draft Wong Nai Chung Outline Zoning Plan No. S/H7/14</u>

Annex II-6 of TPB Paper No. 8147

中華基督教會香港閩南堂
MAN LAM CHRISTIAN CHURCH, HONG KONG
THE CHURCH OF CHRIST IN CHINA

TF

17 March 2008

The Secretary
Town Planning Board
15/F, North Point Government Offices
333 Java Road
North Point
Hong Kong

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TOWN PLANNING BOARD

Dear Sir / Madam,

Representation in Relation to the Wong Nai Chung Outline Zoning Plan No. S/H7/14

The Man Lam Christian Church, Hong Kong submits this Representation in opposition to the height restrictions that have been imposed on the Wong Nai Chung Outline Zoning Plan gazetted on 18 January 2008.

Our church has been an established institution in Happy Valley for over 55 years and has been serving the local population and a wider district community with significant contributions in various aspects. We purchased the subject land lot in 1951 with our own church members' donation. The existing premises was redeveloped with Occupation Permit issued in 1983. Twenty five years ago there was no need for us to develop the premises up to the permitted Gross Area and building height. But this does not mean that we will never redevelop our site. We are of the view that the development and redevelopment rights of private property must be fully respected by the Government even though we have not developed up to the permitted development intensity. We surely would redevelop our site when needs arise, particularly when our ministry has expanded to such extent that we need more floor area for our service.

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The imposition of existing building height limits to all the "G/IC" zones in Happy Valley reflects a backward planning approach of the Government in general and ignored the redevelopment rights and potential of future expansion of the Church in particular to meeting the community needs. We could hardly see a visionary Government policy in this respect.

We are writing to raise objection to the 4-storey building height limit stipulated in the "G/IC" zone within which our Church building is located. The Church has an existing building height of 5-storey. The existing development control framework including Building (Planning) Regulations under the Buildings Ordinance already provides a valid development control over the site. The Government must, therefore, provide fair and justifiable reasons of why building height restrictions are imposed and how do these restrictions are of the aspirations and benefits to the community.

We therefore urge the Town Planning Board members to seriously consider our Representation, also taking into account that we are a non profit-making organization serving the community of Happy Valley, not maximizing Gross Floor Area for commercial purpose. The role and functions of "G/IC" zones including our Church should be seen differently. The non-Government "G/IC" zones should also be distinguished from the Government "G/IC" zones with particular regard to private development rights.

Enclosed is a completed Representation Form with more details of the Representation. For the ease of understanding of <u>all</u> our Church members, please issue your correspondence in bilingual.

Yours faithfully,
For and On Behalf of
Man Lam Christian Church, Hong Kong (The Church of Christ in China)

Dr. TAW Jin Liam Chairman	Mr. Hudson SOO Secretary	Rev. Dr. HUI Hoi Ming Minister-in-charge

Encl.

1. Introduction

1.1 On the 18 January 2008 the Town Planning Board gazetted changes to the Draft Wong Nai Chung Outline Zoning Plan. Representations have been invited in relation to the changes included on the amended Outline Zoning Plan No. S/H7/14 under section 6(1) of the Town Planning Ordinance.

1.2 This Representation is prepared and submitted on behalf of the Man Lam Christian Church, Hong Kong, The Church of Christ in China (the Church / Our Church). The registered owner of the site is the Incorporated Trustees of the Man Lam Christian Church of The Remaining Portion of Sub-section 1 of Section A of Inland Lot No. 2341. The Church is currently managed by The Board of Elders and Deacons elected by church members.

1.3 The subject site is located at 9 Village Road, Happy Valley, Hong Kong. It abuts two streets and is located at the section between Village Road and Wang Tak Street. It is currently a 5-storey free-standing church. The location of the Church is indicated on **Figure 1** (also an extract of the new Wong Nai Chung Outline Zoning Plan No. S/H7/14).

1.4 The Church is affected by the proposed amendment to include a height limit in "Government, Institution or Community" (G/IC) zone, depriving the potential rights of future redevelopment that it entitled under the development control framework.

1.5 This Representation is in opposition to the proposed amendments.

2. Background and Planning Intention

2.1 The site has primarily been used as a Church (Religious Institution) since 13 June 1953. It was purchased on 18 January 1951 by donations from the Church members. The existing premises was redeveloped and completed in 1983. The Church had not developed up to its fullest potential of the site due to the financial consideration.

2.2 The Planning Intention of the "G/IC" zone, as stated in the Notes of the OZP, "is intended primarily for the provision of Government, institution or community facilities serving 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". The existing church use complies fully with the Planning Intention of the G/IC zone.

2.3 The Church is located on The Remaining Portion of Sub-section 1 of Section A of Inland Lot No. 2341. Pursuant to the Government Lease and the Modification Letter dated 22 November 1952, "the Government has approved the erection of a Church on the above lot provided that the design and deposition thereof are approved by the Director of Public Works" and "to permit the erection on the above subsection of the lot of a Church of a design to be approved by the Director of Public Works with a tower not exceeding 56 feet high". According to the current land administration practice, the height restriction of 56 feet height can be released upon lease modification and payment of premium. There is no restriction on building height and development intensity of the site.

3. The Proposed Amendments and Proposal to meet the Points of Objection

3.1 The subject site is affected by the following amendment item:

"Item A - Stipulation of building height restrictions for the "Commercial", "Residential (Group A)", "Residential (Group B)", "Residential (Group C)", "Government, Institution or Community" and "Other Specified Uses" zones."

The Notes of the new OZP also remarked the following:

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

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

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

3.2 A maximum building height of 4-storey was imposed on the site under the proposed amendment.

3.3 This Representation proposes to delete the height limit imposed under the new Outline Zoning Plan.

4. Significance and History of the Man Lam Christian Church

4.1 The Church was found in June 1938 by a group of faithful and dedicated Christians from Fujian. The site was purchased on 20 January 1951 with the members' donation at a consideration of HK$91,107.60. The previous building on site was built in 1953. The existing 5-storey church was redeveloped in 1983 to provide a better spiritual service for the local population and a wider district community. The Church has been situated at the subject site for about 55 years.

4.2 The mission of our Church is centred on Christianity with preaching of the Good News, the provision of pastoral care for Church Members, and the engagement in social, educational and community services. We are now providing spiritual worships on Sundays and fellowship for various age and gender groups on weekdays and

Saturdays. As we are going to be the only Christian Church after the move out Ling Chuen Church, Evangelical Free Church of China located at G/F 28-30 King Kwong Street in Happy Valley in the near future, we shall shoulder a greater responsibility for the local community.

4.3 The followings are some of our future plans:

(1) We are at present working closely with the chaplains in the Hong Kong Sanatorium & Hospital to visit, counsel and comfort the sick and their distraught relatives. We are also actively planning for the provision of spiritual services for the 400 nurses studying and working in the said hospital.

(2) In view of the lack of local provisions, we have an agenda to expand our Church to provide facilities for Children & Youth Centre, Elderly Centre, Study Room, Kindergarten, Nursery, Christian bookstore and library services, etc for the local population and a wider district community.

(3) Over the years as our church membership increases we have gradually expanded our full time preaching staff and administrators to support the Church services. We expanded our pastor/preacher team from 1 pastor and 1 administrator in 1983 to 2 pastors, 2 preachers and 3 administrative staff at present. In view of this expansion, the provision of 2 living quarters in the existing church building is not sufficient. In view of this expansion, more staff quarters are needed if we want to retain our work force which is crucial for our ministry.

5. Comments on the Proposed Amendments: Reasons Why Building Height Restrictions Should be Removed

5.1 <u>Implementation of Planning Intention</u>

The Planning Intention for the G/IC zone is included in the Notes to the Outline Zoning Plan and is a statutory statement to what the uses on G/IC sites such as the Church site are intended to achieve. The Church has been entirely developed and planned in line with the Planning Intention of the zone.

The Planning Intention should cover the planned and future uses of the site rather than the existing status.

The building height restrictions contravene the Planning Intention of the G/IC zone which is primarily for the provision of G/IC facilities serving the needs of the local residents and/or a wider district, region or the territory. The G/IC zone is also intended to provide land for uses directly in support of the work of the organization providing social services to meet community needs.

5.2 Development Rights

The development and redevelopment rights of the private property should be fully respected. The non-Government G/IC zones should be distinguished from the Government G/IC zones which are under private land ownership and developed for the benefits of the community.

The land owner has not developed his / her premises up to a maximum potential does not mean that the private property right would be deprived. The sudden curtailment of development / redevelopment right has rendered uncertainty to property owners and created a very bad example in planning which must be seriously reviewed by the Government.

5.3 Impact on Redevelopment Potential and Scope for Provision for Services

The imposition of building height restrictions with a maximum of 4-storey unnecessary limits the amount of Gross Floor Area available for future expansion of services. The building height limit would significantly affect the long term use and redevelopment of the subject site. It would largely hinder the future expansion and development of the Church in providing a variety of services to the local population, as well as at a wider district context.

Unlike residential and commercial development, the uses and functions of G/IC sites including the Church should be considered differently from planning objectives.

5.4 Consistency of G/IC Zoning within the Wong Nai Chung OZP

Unlike other zonings in the same OZP, there is no consistency applied to the G/IC zones in the Wong Nai Chung OZP. The Hong Kong Sanatorium and Hospital in the immediate vicinity has an existing building height as well as maximum height restriction of 148mPD. It is simply not convincing to impose 4-storey height restriction into the Representer's Church site.

The existing building heights of the G/IC zones should not be used as the benchmark of building height restrictions. The Government must provide fair and convincing justifications of imposing building height restrictions of G/IC zones to existing heights.

5.5 Consistency of G/IC zoning with other OZPs

The stipulation of building height restrictions on the G/IC zones in the Wong Nai Chung OZP is not fair, and not justified. It is not consistent with the policy
long adopted by the Board for G/IC zones in other OZPs.

5.6 Better Utilization of Land Resources

The redevelopment of church sites in other parts of Hong Kong such as The Church of Christ in China Mongkok Church at 56 Bute Street, Wing Kwong Pentecost Holiness Church at 22 Heng Lam Street, Hong Kong Baptist Church at 50 Caine Road, Yan Fook Church at 789 Cheung Sha Wan Road, etc demonstrated a better utilization of land resources for provisions of multiple institutional and community services such as kindergartens, schools, Children's Play Area, Christian bookstores / libraries, as well as a variety of functional room / space such as study room, counselling, etc, in addition to Church use which set good examples of meeting community needs. The composite development including office uses is also able subsidize the fixed and operating costs of the church and/or other services as well. No public money has to be involved.

5.7 Consistency in the Immediate Vicinity

The surrounding context along Village Road and Shan Kwong Road has been zoned as "Residential (Group B)" with a new building height restriction of 100mPD. It is simply unfair to the owner of the subject site that redevelopment of only up to 4-storey is allowed. There also appears to be no justification of imposing existing building height as the limit of the subject site.

Moreover, the residential development to immediate south of the Church site belongs to the same land lot. Justification must be given on why two different building height restrictions are imposed on one single lot. This is both unfair and prejudicial.

When the surrounding areas with 100mPD is fully developed / redeveloped, the subject site, with only 4-storey high, would be surrounded by high-rise which would have adverse impact on sunlight, air ventilation, wind penetration, etc. This requires careful consideration of the Planning Authority.

5.8 Urban Design and Relevant Considerations

The subject site is neither a waterfront site nor adjacent to major open space. Building height restriction of up to 4-storey is not well justified.

The subject site itself is too small to provide spatial and visual relief in the surrounding context.

5.9 No Public Consultation prior to the Gazette of the New Plan

No public consultation has been made to the Wanchai District Council. No notification was received from land owners or residents. It is rather unusual for the Government to impose building height restrictions without any prior public consultation. This practice contravenes the principle of transparency and openness of the planning system in Hong Kong.

5.10 Existing Building Height

The existing building height of the Church is 5-storey high. It is factually wrong to assume the existing building height is 4-storey.

6. Conclusion

The stipulation of building height restrictions is not a forward planning approach but a backward planning approach. G/IC sites should be considered as public assets for the uses to meet the community needs. The role of the G/IC sites should be seen in a wider approach which could serve the population in a broader context. This Representation, therefore, proposes the removal of building height limit on the subject site under the new Outline Zoning Plan, which are seen as not necessary and not justified.

Yours faithfully,
For and On Behalf of
Man Lam Christian Church, Hong Kong (The Church of Christ in China)

Dr. TAW Jin Liam Chairman	Mr. Hudson SOO Secretary	Rev. Dr. HUI Hoi Ming Minister-in-charge

Appendix II

TPB's decision on MLCC's Representation No. R47

城市規劃委員會
香港北角渣華道三百三十三號
北角政府合署十五樓

TOWN PLANNING BOARD
15/F., North Point Government Offices
333 Java Road, North Point,
Hong Kong.

傳真 Fax: 2877 0245 or 2522 8426
電話 Tel: 2231 4810
來函檔號 Your Reference:
覆函請註明本會檔號
In reply please quote this ref.: TPB/R/S/H7/14-47

By Registered Post and Fax
(2832 7141)

3 September 2008

Man Lam Christian Church, The Church of Christ In China
9 Village Road
Happy Velly
Hong Kong
(Attn.: Dr. Rev. H.M. Hui)

Dear Sir/Madam,

Representation No. R/S/H7/14-47 in respect of
<u>Draft Wong Nai Chung Outline Zoning Plan No. S/H7/14</u>

I refer to my letter to you dated 1.8.2008.

After giving consideration to the representations and the related comments, the Town Planning Board (TPB) decided on 8.8.2008 to propose amendments to the above Plan to partially meet the representation by amending the building height (BH) restriction for the "Government, Institution or Community" ("G/IC") zone covering Man Lam Christian Church from 4 storeys to 5 storeys.

The TPB decided not to uphold the remaining part of the representation for the following reasons:

(a) apart from providing GIC facilities, the "G/IC" sites in the built-up urban area also serve as visual relief and breathing space. Deletion or further relaxation of the BH restrictions for the "G/IC" sites may set an undesirable precedent, which can result in proliferation of high-rise G/C developments, leading to cumulative loss of visual relief and breathing space for the Wong Nai Chung Area; and

(b) to cater for site-specific circumstances, there is provision for application for minor relaxation of the BH restrictions under the Outline Zoning Plan (OZP). Should there be any functional or operational needs for developments to exceed the stipulated BH restrictions, planning permission from the TPB may be sought under section 16 of the Town Planning Ordinance (the Ordinance). Each application would be considered by the TPB on its individual merits and a set of criteria for consideration of such applications has been set out in the Explanatory Statement of the OZP, which is also relevant to this zone. There is no predetermined figure for the percentage of relaxation that can be allowed. It would be determined by making reference to the impacts the relaxation has on the surrounding area. Application under section 12A of the Ordinance can also be made for amendment of plan if it is considered appropriate.

A copy of the relevant extract of minutes of the TPB meeting held on 8.8.2008 is enclosed herewith for your reference.

A notice of the proposed amendments has been published on 29.8.2008 in the Gazette and the newspapers for three weeks for further representations. From the date of publication of the notice, the proposed amendments have been available for public inspection at the Planning Enquiry Counters (PECs) of the Planning Department (Hotline : 2231 5000) at 17/F, North Point Government Offices, 333 Java Road, North Point and 14/F, Sha Tin Government Offices, 1 Sheung Wo Che Road, Sha Tin, the Hong Kong District Planning Office (the HK DPO) at 14/F, North Point Government Offices, 333 Java Road, North Point, the Secretariat of the TPB at 15/F, North Point Government Offices, and the relevant District Office, and can be viewed at the TPB's website (www.info.gov.hk/tpb/). Any person, other than that who has made any representation or comment after consideration of which the proposed amendments are proposed, may make further representation to the TPB in respect of the proposed amendments during the three-week period specified in the notice. After the expiry of the three-week period for publication of the proposed amendments, the further representation(s), if any, will be made available for public inspection at the PECs. The availablity of the further representations for public inspection will be notified on the TPB's website (www.info.gov.hk/tpb/).

If adverse further representation is received, you will be invited to attend a further hearing. If no further representation or only supportive further representation is received, the TPB will amend the draft plan by the proposed amendments. In the latter case, you will be notified of the TPB's decision in due course.

If you wish to seek further clarifications/information on matters relating to the above decision, please feel free to contact Mr. Tom Yip of the Hong Kong District Planning Office at 2231 4935.

Yours faithfully,

(Miss Y.K. NG)
for Secretary, Town Planning Board

YKN/GL/js

Appendix III

MLCC's Representation No. R1025 of Draft Wong Nai Chung Outline Zoning Plan No. S/H7/15

中華基督教會香港閩南堂
MAN LAM CHRISTIAN CHURCH, HONG KONG
THE CHURCH OF CHRIST IN CHINA

RECEIVED 30 P 2:04

30 November 2010

The Secretary
Town Planning Board
15/F, North Point Government Offices
333 Java Road
North Point
Hong Kong

Dear Sir / Madam,

Representation in Relation to the
Wong Nai Chung Outline Zoning Plan No. S/H7/15

We write to express our concerns over the inconsistent treatment afforded to the Hong Kong Sanatorium & Hospital site.

We would like to draw your attention to our Representation (R47) of 17 March 2008 to the Town Planning Board (Reference No. TPB/R/S/H7/14-47) raising our objection to the Building Height Restriction on the Church site located at 9 Village Road, Happy Valley, as stipulated on the draft Wong Nai Chung Outline Zoning Plan No. S/H7/14 exhibited for public inspection on 18 January 2008. A copy of the Representation with reasons of objections is included in Annex A for your ease of reference.

The Representation argued that the private property rights and the future redevelopment potential of the site should be respected. The consistency of G/IC zoning within the Wong Nai Chung OZP should be observed. The Representation called for the abolition of the Building Height Restrictions proposed to be imposed on the G/IC zone covering Man Lam Christian Church site. Unfortunately, the Town Planning Board decided on 8 August 2008 to

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傳真：2832 7141

北角堂
香港北角渣華道128號渣華商業中心四字樓
電話：2563 3302　2563 3340
傳真：2563 3340
電郵：mlcc@hkcccc.org

香港仔堂
香港仔湖南街安泰大廈3樓C座
電話：2555 1002
傳真：2555 7724

maintain any future development of the Church site to the existing height of 5-storeys.

In view of the recent gazette of the Wong Nai Chung OZP Plan No. S/H7/15 on the permitted Building Heights (a maximum of 115mPD) for the Hong Kong Sanatorium & Hospital site, we are of the view that such permitted Building Heights should also be applicable to other G/IC zones in the same OZP in Wong Nai Chung Planning Area.

It is totally inequitable to lift the height restrictions on the Hong Kong Sanatorium & Hospital site to such a Building Height while restricting other G/IC zones only to the existing Building Heights. The discrepancy is exacerbated by the proximity of the two sites: a mere physical distance of 15 yards between the two sites (please see Annex II). The TPB should provide justification for such double standards and huge difference in the Building Height restrictions of the two G/IC zones.

We would re-iterate that the Man Lam Christian Church site was purchased with our own money from donations of church members. The private property rights with development and redevelopment rights should be respected and also the potential of future expansion for the benefits of the community should not be ignored. This unilateral action of the Government in usurping the rights of property owners amounts to expropriation of the rights of private citizens – an act contrary to the Basic Law.

We need a visionary Government with long term and sensible land use planning of all G/IC sites in Hong Kong. Simply imposing Building Height Restrictions of all G/IC zones without a long term plan would eventually lead to a situation that the NGOs will be short of physical space and cannot provide adequate services to the community with the growing population.

For the convenience of ALL church members, please provide all the correspondence and associated papers bilingual in English and Chinese.

Yours faithfully,

Dr. TAW Jin Liam
Chairman

Mr. Hudson SOO
Secretary

Mr. SIU Ka Cheung
Minister in Charge

For and On Behalf of
Man Lam Christian Church, Hong Kong (The Church of Christ in China)

Appendix IV
TPB's decision on MLCC's Representation No. R1025

城市規劃委員會

香港北角渣華道三百三十三號
北角政府合署十五樓

TOWN

15/F., North Point Government Offices
333 Java Road, North Point,
Hong Kong.

傳真 Fax: 2877 0245 / 2522 8426

電話 Tel: 2231 4810

By Registered Post

來函檔號 Your Reference:
覆函請註明本會檔號
In reply please quote this ref.: TPB/R/S/H7/15-1025

6 May 2011

Man Lam Christian Church, Hong Kong, The Church of Christ in China
9 Village Road
Happy Valley
Hong Kong
(Attn: Taw Jin Liam)

Dear Sir/Madam,

Draft Wong Nai Chung Outline Zoning Plan No. S/H7/15
(Representation No. R1025)

I refer to my letter to you dated 1.4.2011.

After giving consideration to the representations and related comments, the Town Planning Board (TPB) noted on 8.4.2011 that the part of your representation which is related to the building height restriction (BHR) on the Man Lam Christian Church, Hong Kong site are invalid.

The TPB also decided not to propose amendment to the above Plan to meet the remaining part of your representation for the following reasons:

(a) in amending the BHRs for the Hong Kong Sanatorium and Hospital (HKSH) site, the TPB has thoroughly assessed the specific development scheme and technical assessments submitted by HKSH and balanced relevant factors, including the planning intention of the "Government, Institution, Community ("G/IC") zone, surrounding land uses, the development and operation needs of the hospital, technical constraints of the site, the permissible Gross Floor Area of the site under the lease and Buildings Ordinance, the availability of other development options, compatibility of the building heights (BHs) with the general BH bands for the area and surrounding developments, visual impact of the proposed development on major local vantage points, and acceptability of the development from traffic and infrastructural viewpoints; and

(b) if there is an intention to amend the BHR for their "G/IC" site for redevelopment and expansion of the existing facilities, you may submit a specific development scheme with relevant technical assessments, if necessary, for consideration. Such scheme may be submitted to the TPB in form of an application under section 12A of the Town Planning Ordinance for amendment to the Outline Zoning Plan. Alternatively, if the scheme is well justified and supported by the relevant government bureaux/departments, Planning Department may recommend to the TPB to amend the BHR under section 5 or 7 of the Town Planning Ordinance.

A copy of the relevant extract of minutes of the TPB meeting held on 8.4.2011 is enclosed herewith for your reference.

In accordance with section 8 of the Town Planning Ordinance, the above Plan together with a schedule of the representation(s) and comment(s), if any, will be submitted to the Chief Executive in Council for a decision.

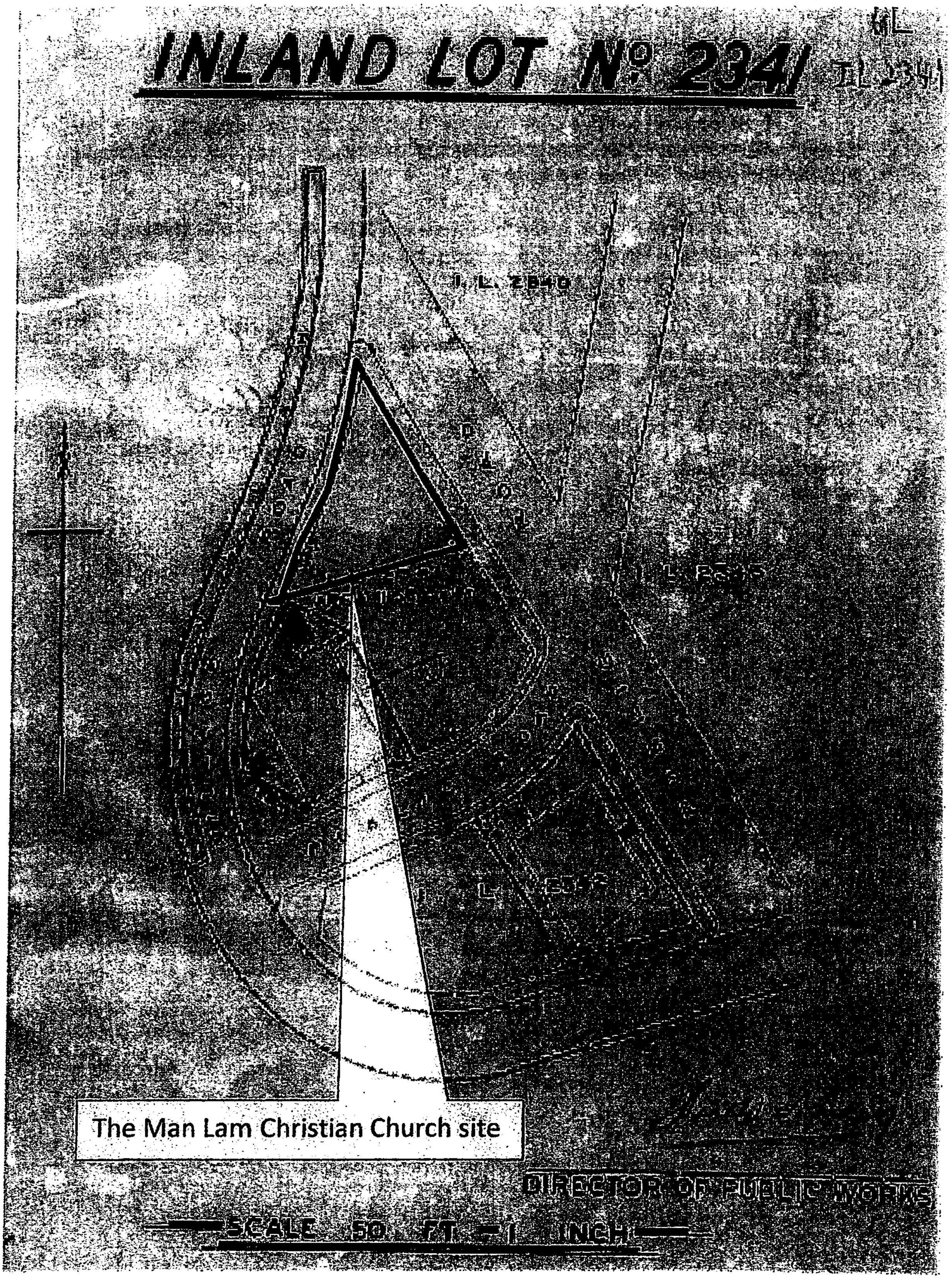
If you wish to seek further clarification/information on matters relating to the above decision, please contact Mr. Louis Kau of Hong Kong District Planning Office at 2231 4917.

Yours faithfully,

(S.K. CHEUNG)
for Secretary, Town Planning Board

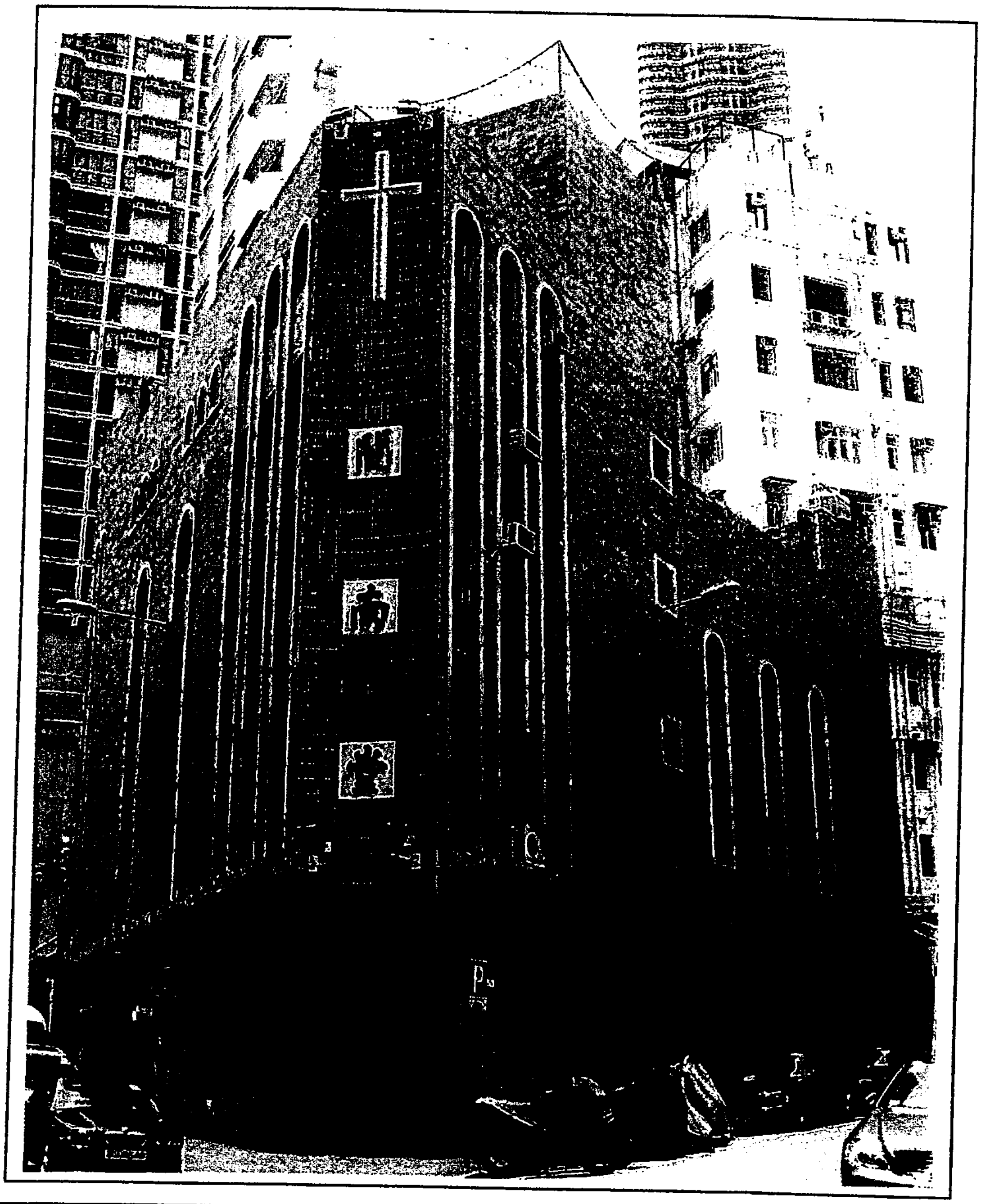
(With Chinese Translation)
SKC/LL/m

Appendix V
Site Plan



Appenidix VI

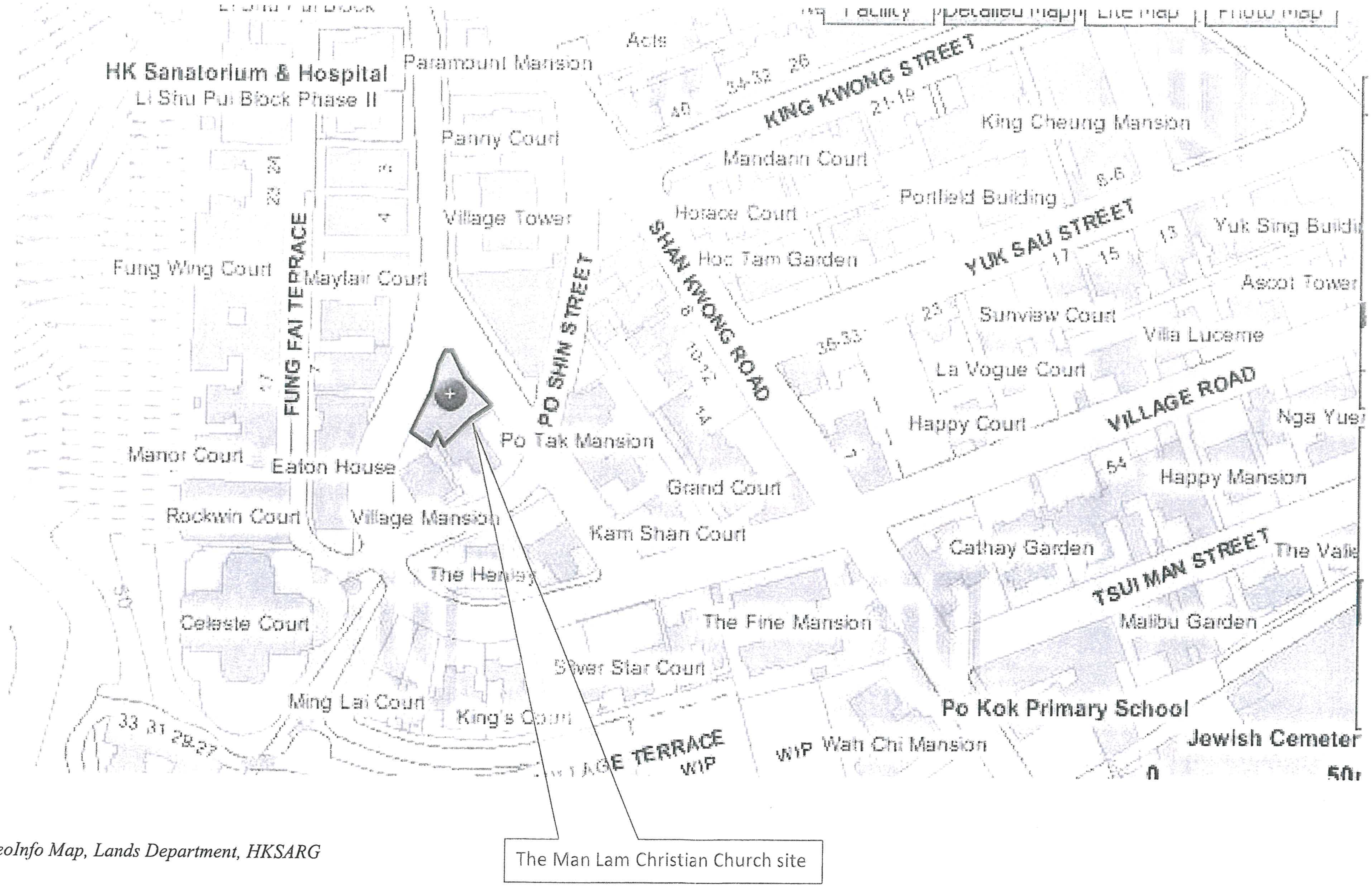
Photo of MLCC



Floor	Approximate GFA(sq.m.)	Usage
4	172	Pastor's Quarters
3	187	Gallery and 1 Small Office
2	134	One Classroom cum Gown Room and washrooms
1	327	Church Nave and One Office for 3 staff
G	327	Parish Hall
Total	1,147	

Appendix VII

<u>Location Plan</u>



Source : GeoInfo Map, Lands Department, HKSARG

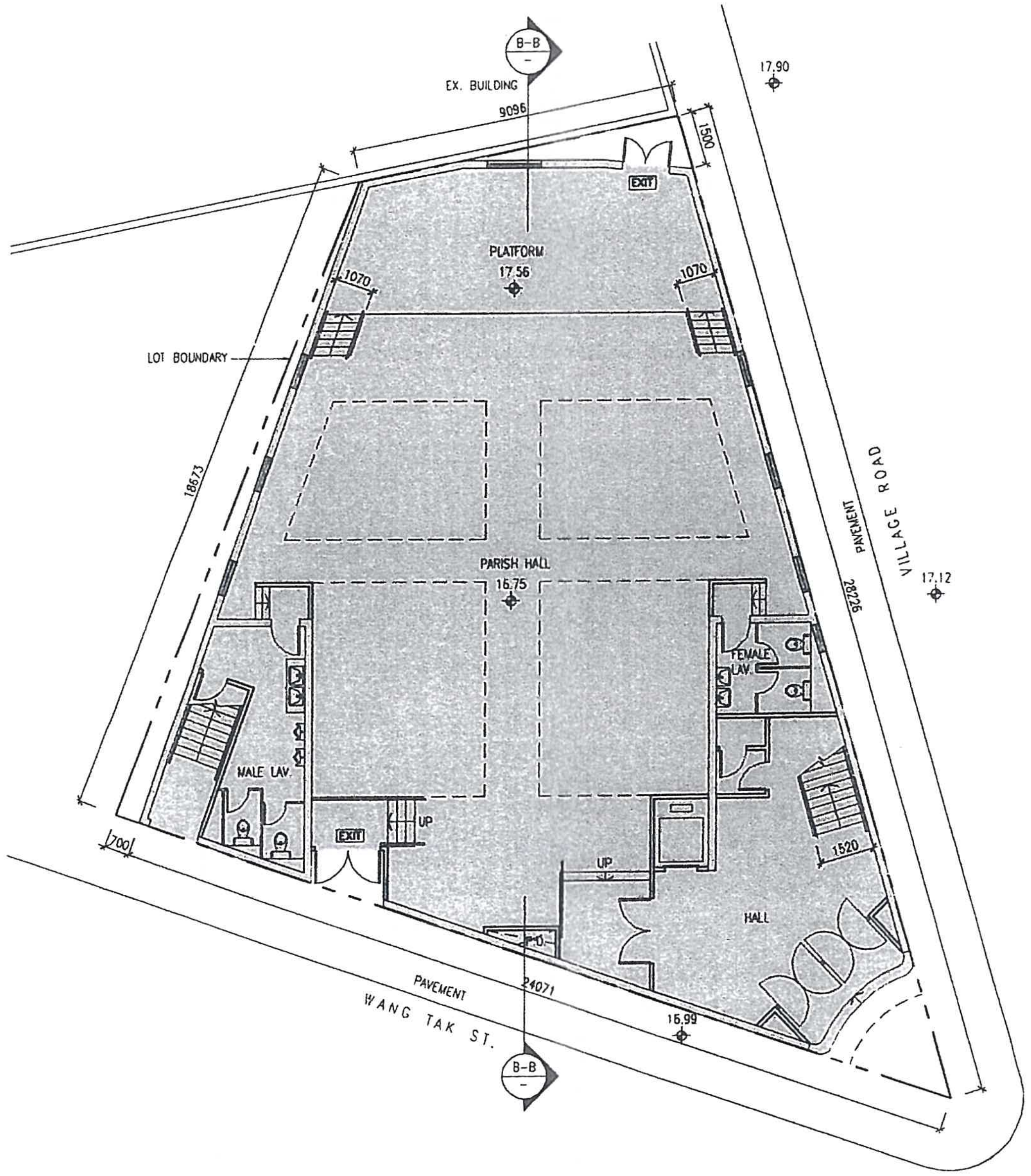
Appendix VIII
Floor Plans of Proposal

LEGEND :

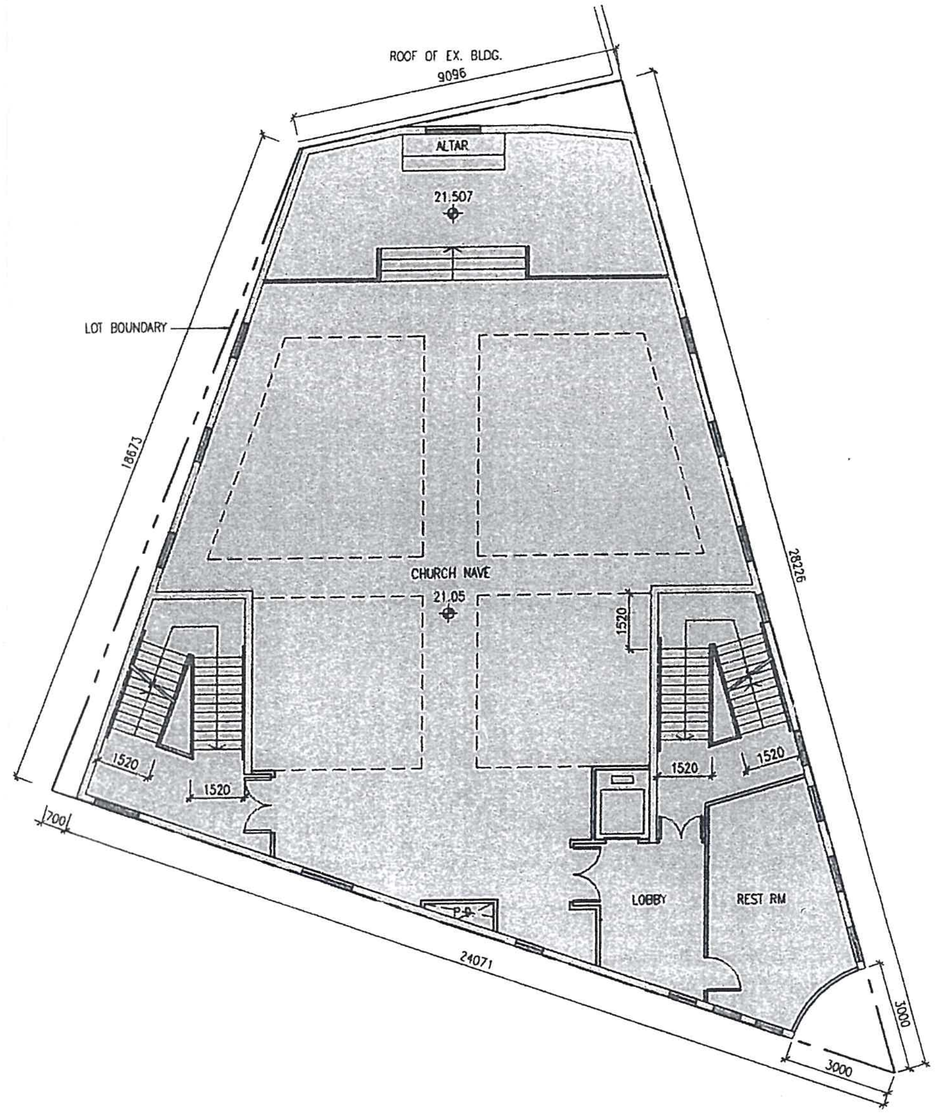
- EXISTING BUILDING

NEW ADDITION / EXTENSION WORKS

- CHOIR / MUSIC ROOM
- MULTI-PURPOSE / ACTIVITIES ROOM
- LIBRARY / STUDY ROOM
- PASTOR'S QUARTERS



01 GROUND FLOOR PLAN 1:200



02 1ST FLOOR PLAN 1:200

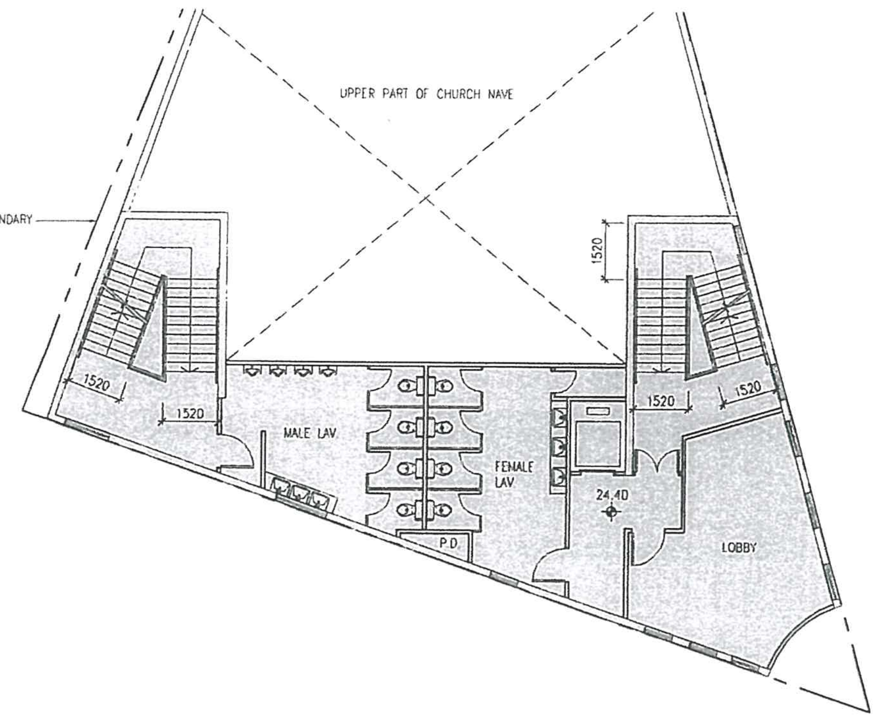
Project MAN LAM CHRISTIAN CHURCH		
Drawing GROUND FLOOR & 1ST FLOOR PLAN		
Computer file GB-01	Plot Date	
Project Number	Scale 1:200	
Drawing Number GB-01	Rev. -	Issue status 0000

Plan 29 of 32

Appendix VIII
Floor Plans of Proposal

LEGEND :

- EXISTING BUILDING
- NEW ADDITION / EXTENSION WORKS
- CHOIR / MUSIC ROOM
- MULTI-PURPOSE / ACTIVITIES ROOM
- LIBRARY / STUDY ROOM
- PASTOR'S QUARTERS



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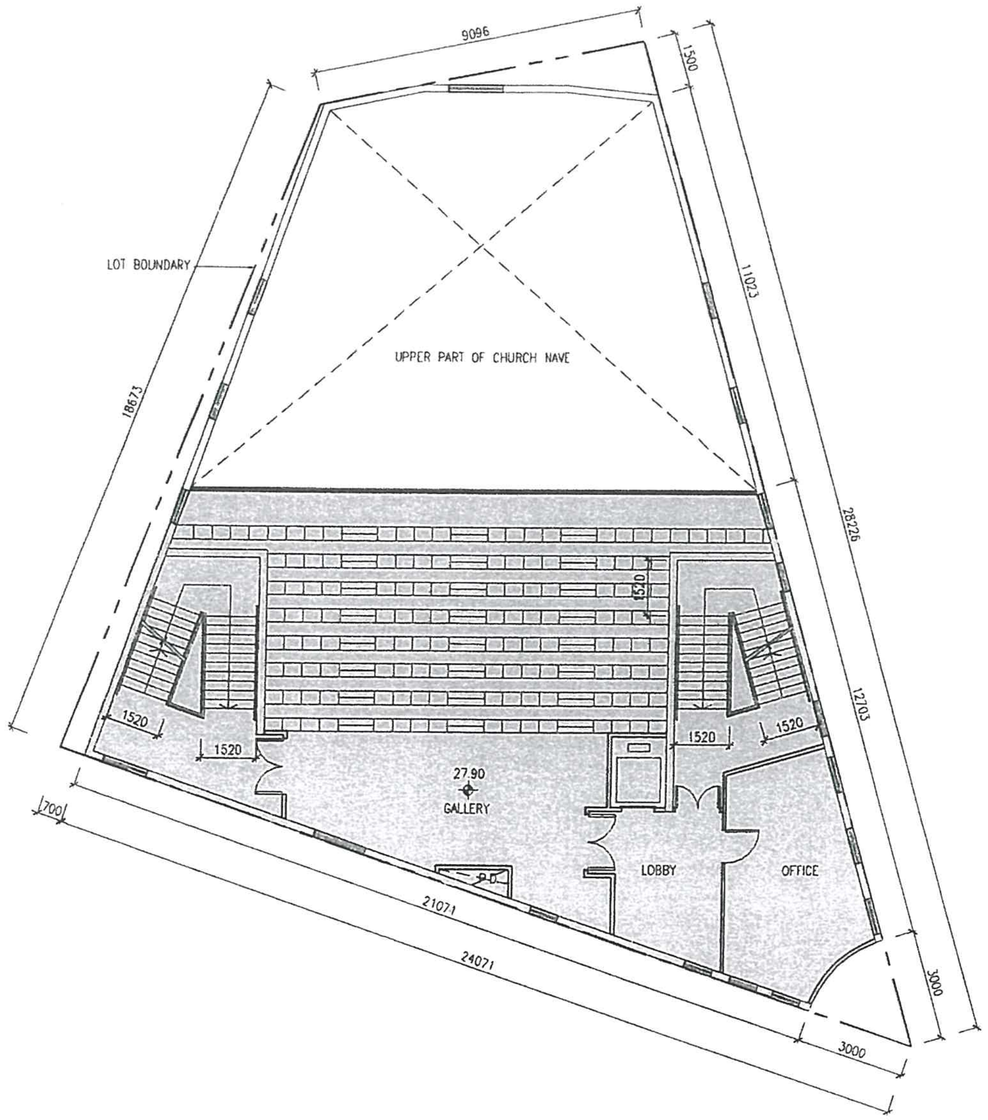

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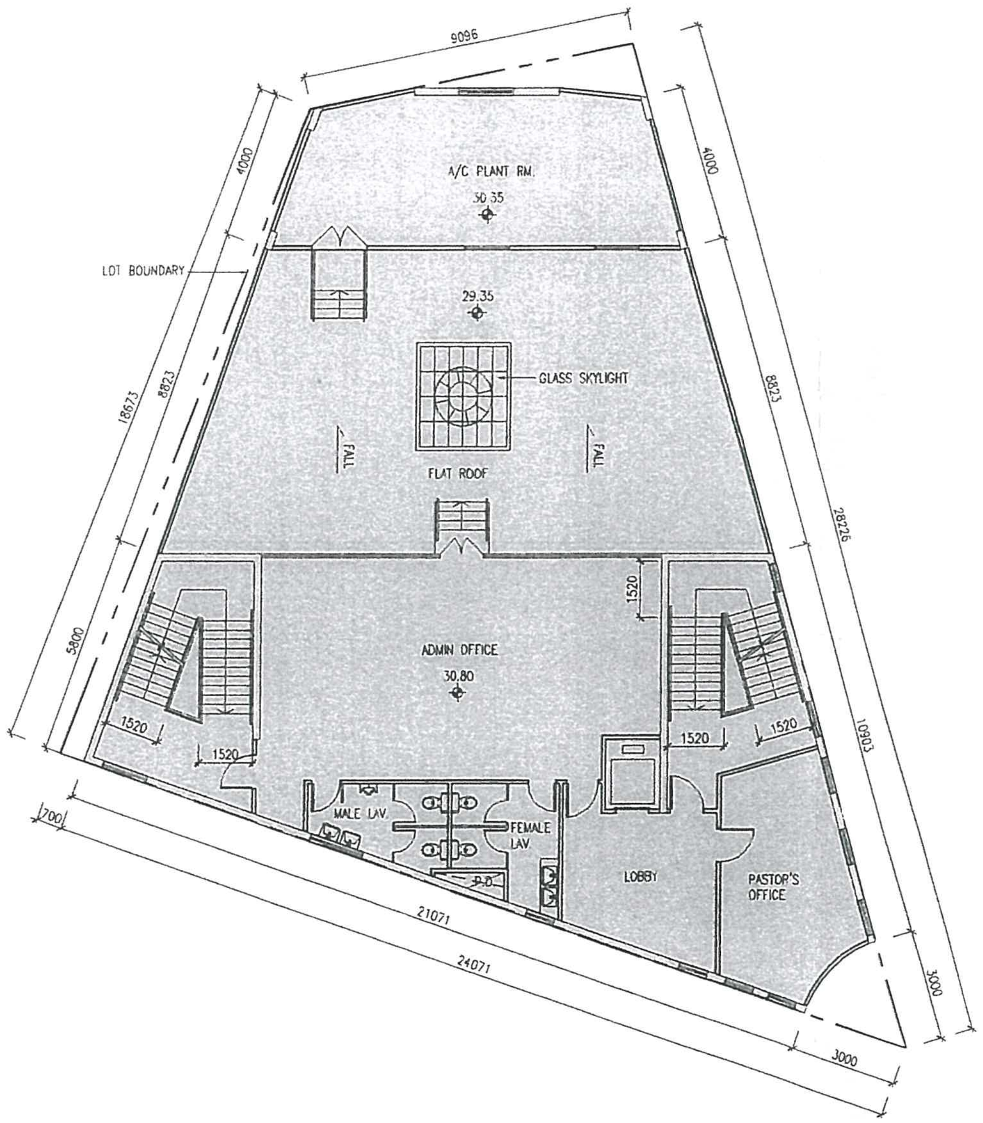

03 4TH FLOOR PLAN 1:200

Project: MAN LAM CHRISTIAN CHURCH	
Drawing: 2ND FLOOR TO 4TH FLOOR PLAN	
Computer file: GB-02	Plot Date:
Project Number:	Scale: 1:200
Drawing Number: GB-02	Rev.: - / Issue status: 0000

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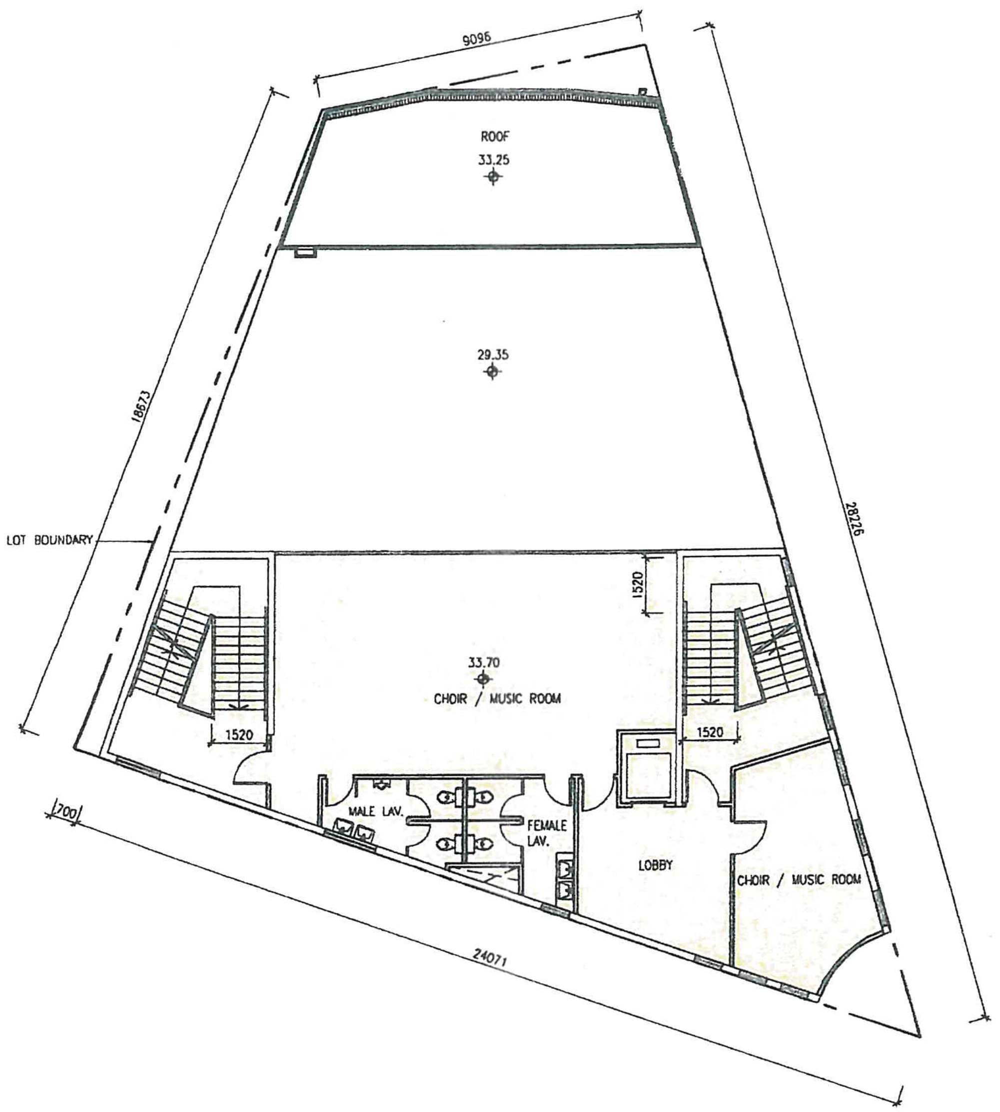
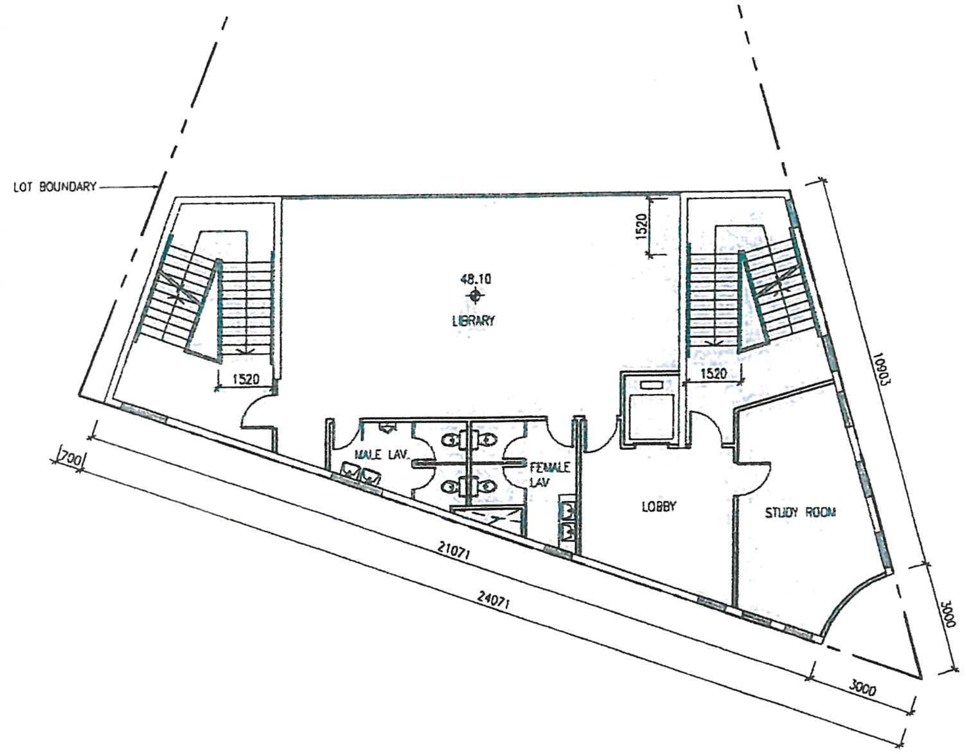
Page 30 of 32

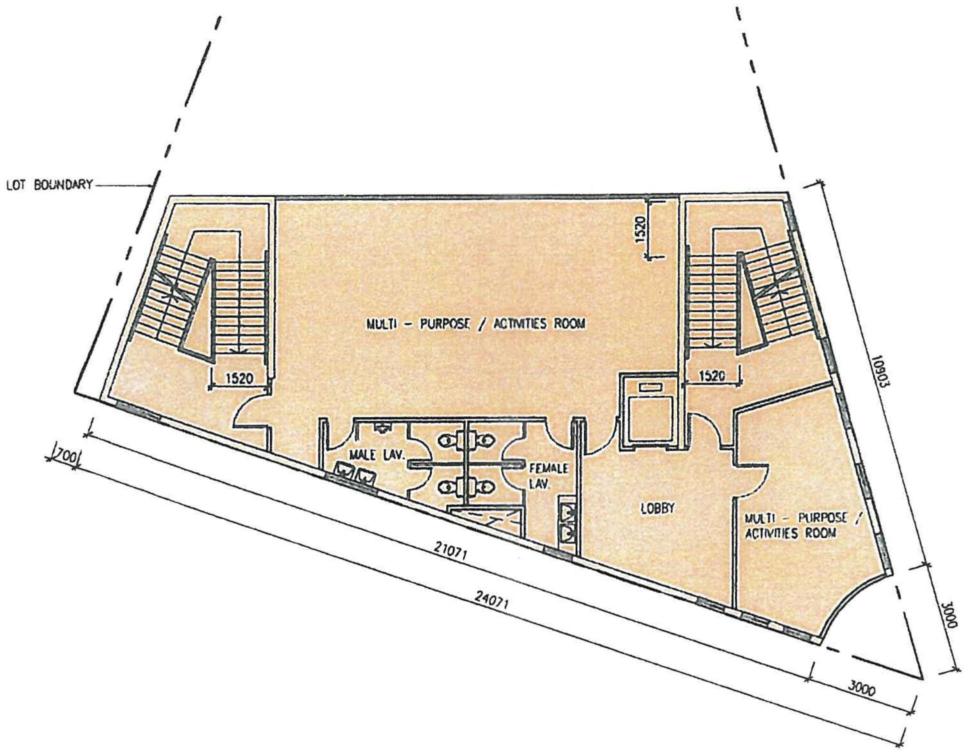
Appendix VIII
Floor Plans of Proposal



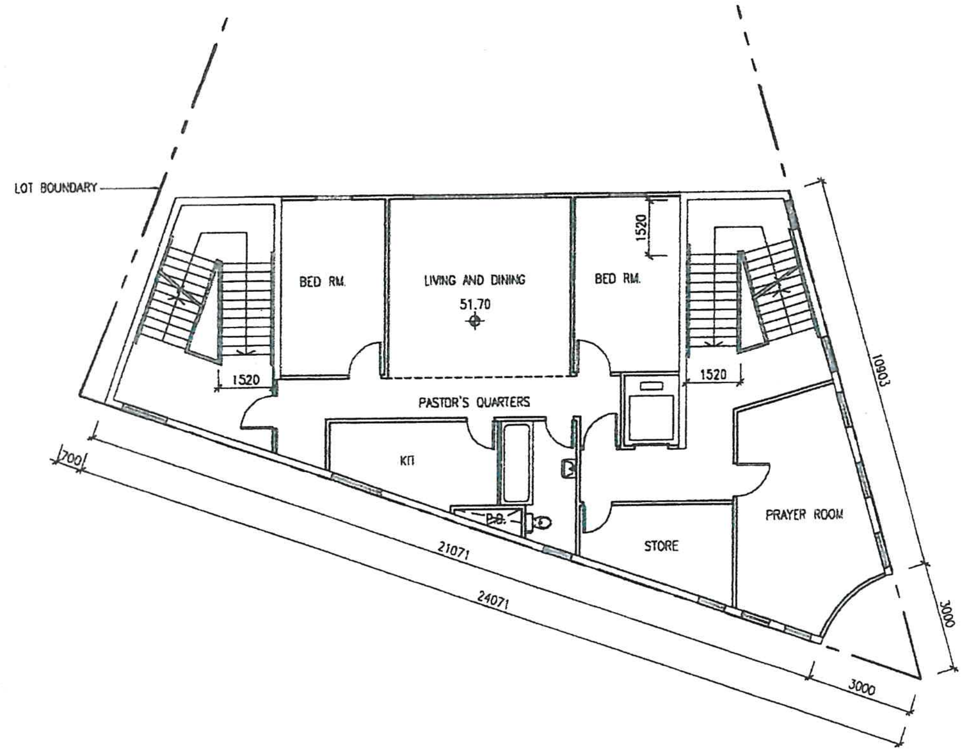
01 5TH FLOOR PLAN 1:200



03 9TH FLOOR PLAN 1:200



02 6TH FLOOR TO 8TH FLOOR PLAN 1:200



04 10TH FLOOR PLAN 1:200

LEGEND :

EXISTING BUILDING

NEW ADDITION / EXTENSION WORKS

CHOIR / MUSIC ROOM

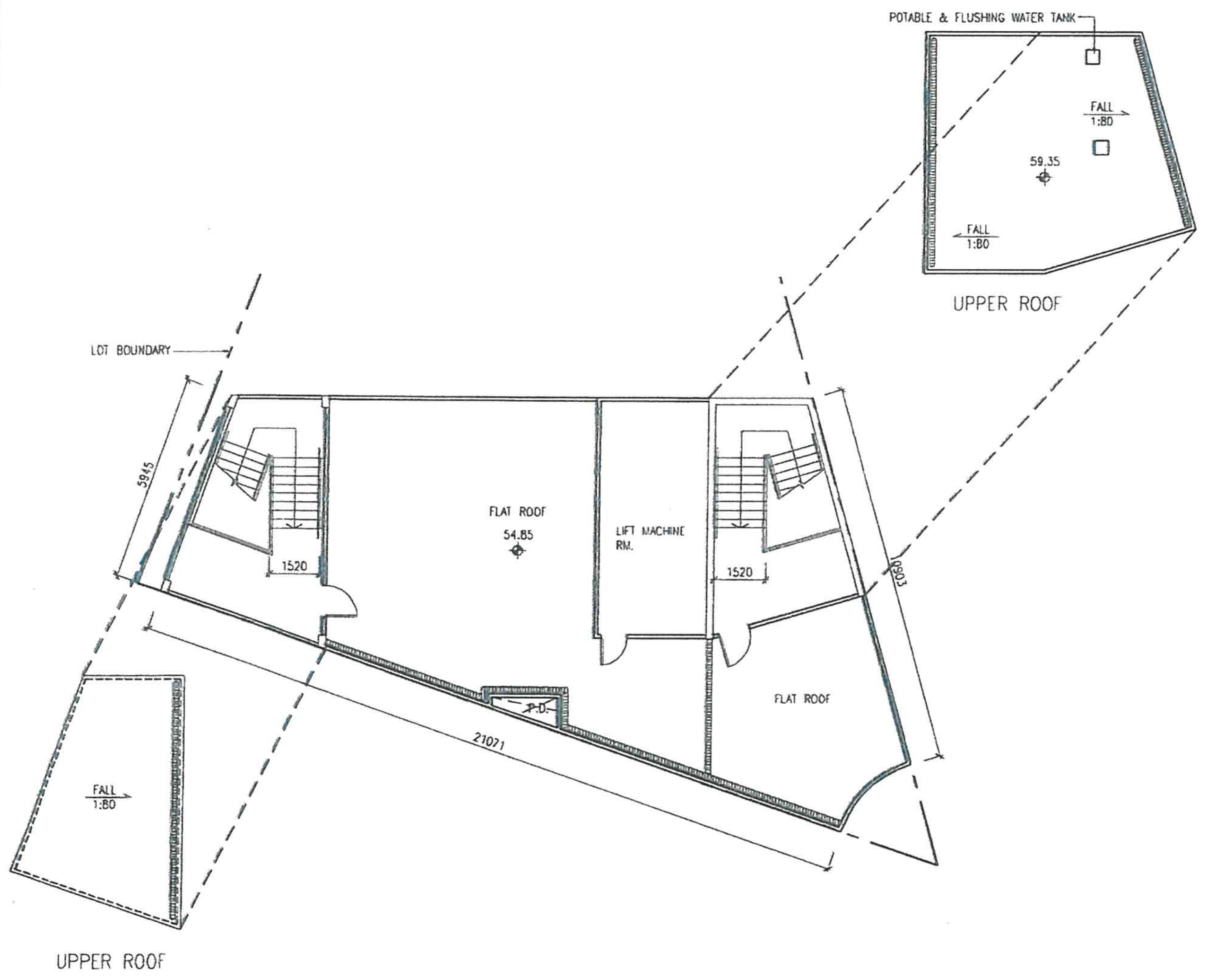
MULTI-PURPOSE / ACTIVITIES ROOM

LIBRARY / STUDY ROOM

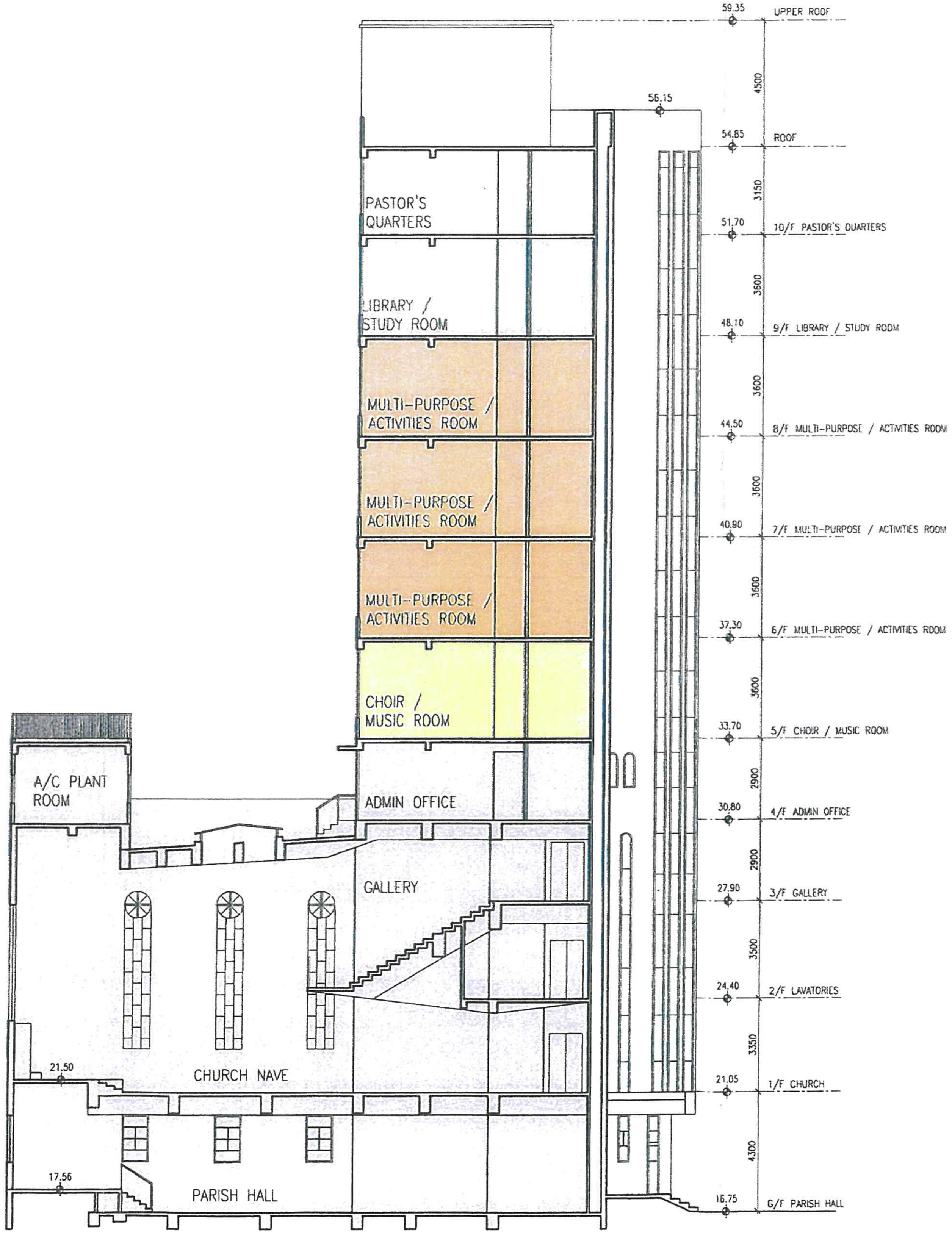
PASTOR'S QUARTERS

Project MAN LAM CHRISTIAN CHURCH	
Drawing 5TH FLOOR TO 10TH FLOOR PLAN	
Computer file GB-03	Plot Date
Project Number	Scale 1:200
Drawing Number GB-03	Rev. - / Issue status 0000

Appendix IX
Section Plan of Proposal



01 ROOF & UPPER ROOF PLAN 1:200



02 SECTION B-B 1:200

LEGEND :

EXISTING BUILDING

NEW ADDITION / EXTENSION WORKS

CHOIR / MUSIC ROOM

MULTI-PURPOSE / ACTIVITIES ROOM

LIBRARY / STUDY ROOM

PASTOR'S QUARTERS

Project MAN LAM CHRISTIAN CHURCH	
Drawing ROOF PLAN & SECTION	
Computer file GB-04	Plot Date
Project Number	Scale 1:200
Drawing Number GB-04	Rev. - / Issue status 0000

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BY HAND

中華基督教會香港閩南堂
MAN LAM CHRISTIAN CHURCH, HONG KONG
THE CHURCH OF CHRIST IN CHINA

9 December 2012

District Planning Office, Hong Kong
North Point Government Offices
333 Java Road, North Point, Hong Kong
(Attention: Mr. Louis KAU)

By Fax(No. 2895 3957)
and By Hand

Dear Mr. Kau,

Request for Relaxation of Building Height Restriction of
Man Lam Christian Church, Hong Kong,
The Church of Christ in China, 9 Village Road, Hong Kong

We refer to your letter of 24 September 2012 and attach herewith our reply for your follow up action please.

Should you have any questions regarding our proposal, please contact Mr. Windsor Too of our church on 2893 2242.

Yours faithfully,

MAN LAM CHRISTIAN CHURCH
中華基督教會
香港閩南堂
HONG KONG

Ms. Helen SHIH
Chairlady
Man Lam Christian Church, Hong Kong
The Church of Christ in China

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Proposed Extension of the Man Lam Christian Church
The Church of Christ in China at 9 Village Road, Hong Kong (MLCC)

No.	Bureau/Department	Comments	Responses from MLCC
1	Secretary for Home Affairs Ref. ( ) in HAB/D3/6/2/ 5/76 Dated 10.9.2012 [Contact: Mr. Michael YAU Tel.: 3509 8049]	(a) We note that the proposed facilities are prima facie for religious and ancillary use in the majority. Also, we are satisfied that the Man Lam Christian Church (MLCC), Hong Kong, is a charitable religious organization. As such, we give policy support to the religious facilities for the extension proposal of the Church as stipulated in the current submission.	(a) Noted with thanks.
2	District Lands Officer/ Hong Kong East Ref. (52) in LD DLO/HE 16/ 1734/52 (II) Dated 5.9.2012 [Contact: Mr. George LIU Tel.: 2835 1662]	(a) The government lease of the subject lot as varied and modified by a modification letter dated 22.11.1952 contains, inter alias, the following conditions: - non-offensive trade clause; - erection of a Church of a design to be approved by the Director… with a tower not exceeding 56 feet high (about 17m); and (b) The proposal does not comply with the prevailing lease condition. If the proposed extension is accepted by the Tow Planning Board and amendment to the OZP in this regard is eventually approved, subject to policy support given by the Home Affairs Bureau and/or other relevant bureau/department, the owner of the lot shall apply to the District Lands Office/Hong Kong East for a modification of the lease conditions of the lot to effect the proposed extension.	(a) Noted. (b) Noted with thanks. Application for lease modification would be submitted upon receipt of all requisite acceptance/approval.

No.	Bureau/Departments	Comments	Responses from MLCC
		However, there is no guarantee that such lease modification will be approved and if approved by the Lands Department acting in its capacity as the landlord at its discretion, it will be subject to such terms and conditions, including payment of premium and fees, as imposed by the Lands Department.	
3	Chief Building Surveyor, HKE & H, Buildings Department Ref. (9) in BD/TP(HK)/7 Pt. IX Dated 21.9.2012 [Contact: Mr. Raymond CHENG Tel.: 2626 1414]	(a) MLCC should demonstrate that the proposed site coverage (SC) and plot ratio (PR) calculation for both domestic and non-domestic part of the building is in compliance with the First Schedule of the Building (Planning) Regulations (B(P)R). It is noted that the SC for domestic part of the building may exceed the B(P)R; (b) The Code of Practice for Fire Safety in Buildings 2011 is applicable to the proposed works, in particular, the provision of interchange of staircase under Clause B8.2 of Code of Practice for Fire Safety in Buildings 2011 should be clarified; (c) MLCC should demonstrate that the proposed works is in compliance with Regulation 72 and Third Schedule of B(P)R. Design Manual: Barrier Free Access 2008 also refers;	(a) Noted with thanks. Demonstration of compliance in SC and PR calculations would be incorporated in the building plan submission stage. The domestic part would be changed into non-domestic use. (b) Noted with thanks. (c) Demonstration of compliance would be incorporated in the building plan submission stage.

No.	Bureaux/Departments	Comments	Responses from MLCC
		(d) The requirements set out in Practice Notes for Authorized Persons APP-151 and 152 are applicable if GFA concessions for green / amenity features and non-mandatory / non-essential plant rooms and services are to be granted under Buildings Ordinance (BO); and (e) Detailed checking for compliance with BO will be made at building plan submission stage.	(d) Noted with thanks. (e) Noted with thanks.
4	Commissioner for Transport Ref. ( ) in TD HR 146/192-VIL-1(L) Dated 12.9.2012 [Contact: Mr. LOONG Yau-tong Tel.: 2829 5262]	(a) MLCC should indicate the additional traffic (both vehicular and pedestrian) generated by the proposed extension. It should include the anticipated amount of visitors as a result of the new use, the anticipated pedestrian route, and assess the impact on the nearby footpath network and the impact on traffic in view of the existing traffic condition of Village Road, Happy Valley. It should substantiate its simple para. 23 of the extension proposal that the addition and alternation will not cause any adverse impact on the traffic flow;	(a) A survey was conducted on 28 October 2012 to ascertain transport means used by church members (see attached). About 3/4 of the respondents come to church either on foot or use public transport on Sunday Please note that we are a community church that mainly serves local residents, transient inhabitants and people working in the locale such as staff/patients in HK Sanatorium Hospital. The traffic impact during weekdays would be minimal. The extension of church building itself would not generate substantial increase in users/population as it merely

No.	Bureau/Department	Comments	Responses from MLCC
			provides the needed relief to shortage of space for existing facilities and services. Please see Appendix I.
		(b) MLCC should clarify what provision will be available to cater for the additional loading/unloading and parking demand as a result of the extension since there are no such facilities provided within the site at present; and	(b) There are no on-site loading/unloading/parking facilities at the MLCC at present. In view of the site limitation: very small area and triangular shape, it is unlikely and not intended that such facilities would be provided within the site.
		(c) We reserve our comment on whether the existing access is adequate to support the proposed extension upon submission of the above information by MLCC, noting there is no vehicular access on site at present.	(c) Noted.
5	Director of Environmental Protection Ref. (4) in EP1/H7/HV/114 Dated 19.9.2012 [Contact: Ms. Eva LAU Tel.: 2835 1127]	(a) It is noted from drawing nos. GB-02 and GB-04 that an A/C plant room is located on 4th floor. MLCC should confirm whether sensitive uses are provided with mechanical ventilation and/or central air-conditioning and do not rely on open windows for ventilation. Noting Hong Kong Sanatorium & Hospital is nearby, MLCC should also confirm whether the fresh air intakes, if any, are suitably located to avoid chimney & vehicular emission; and	(a) We confirm that sensitive uses are provided mechanical ventilation and/or central air-conditioning. We also confirm that we do not rely on open windows for ventilation.

No.	Bureau/Department	Comments	Responses from MLCC
		(b) Since there is increase in total GFA and PR, MLCC should submit a sewerage impact assessment to address the sewerage impact due to the increase of sewage flow and recommend mitigation measures/upgrading works, where necessary.	(b) We cannot afford to commission a sewerage impact assessment at the moment and would ask to use a layman approach to address relevant concerns as to whether there might be spare capacity in the district. A sewerage impact assessment would be submitted at the submission of detailed design stage, if this is mandatory.
6	Director of Fire Services Ref. (14) in FP 8/0656 <13> Dated 5.9.2012 [Contact: Mr. LAM Wai To Tel.: 2733 7582]	(a) No objection in principle to the extension proposal subject to fire service installations and water supplies for fire fighting being provided to the satisfaction of the Fire Services Department. Detailed fire safety requirements will be formulated upon receipt of formal submission of general building plans; and (b) The arrangement of emergency vehicular access shall comply with Section 6, Part D of the *Code of Practice for Fire Safety in Building 2011* which is administrated by the Buildings Department.	(a) Noted with thanks. (b) Noted with thanks. Village Road is wider than 6m. Public road (Wong Nai Chung Road) is around 160m away from building façade (Appendix II). Total length of building façade is 36m

No.	Bureau/Department	Comments	Responses from MLCC
			(Appendix III).
7	Chief Architect/ Central Management Division2 Ref. ( ) in ASD 18/92051/TEC/ DPO/1 Dated 7.9.2012 [Contact: SAY Swee Kwong Tel.: 2867 4335]	(a) In order to assess the visual impact of the extension proposal, it would be useful to have some information on the building heights of the surrounding buildings and some perspective artwork images/ photomontages of the proposed development in its surrounding context from different vantage points; (b) It is noted that the building height of the extension proposal is about 55mPD. According to para. 3(7) of the extension proposal, the surrounding developments are about 100mPD and the building height of the extension proposal is not incompatible with the surrounding developments; (c) After redevelopment of the old buildings in the vicinity, the site would be surrounded by much taller buildings, and therefore would only be viewed from a few streets close to the site. It is agreed that the site serves as a good breathing space in the neighbourhood but the effectiveness of this breathing space might be diminished and could only be enjoyed by limited people walking in nearby street or living in the few buildings facing the site, unless similar building height restrictions are imposed to the nearby sites; and	(a) See photo at Appendix IV. (b) Indeed the building height of the extension proposal is not incompatible with the surrounding developments. (c) The development and redevelopment right of the private property should be fully respected, including MLCC. MLCC, a private owned property, should not be as breathing space for the neighbourhood. MLCC should have the same redevelopment right as the old buildings in the vicinity.

No.	Bureaux/Departments	Comments	Responses from MLCC
		(d) The addition portion of the extension proposal is located at the corner of the site at the junction of Wang Tak Street and Village Road. Subject to compliance with related statutory requirements, alternative option of locating the addition portion away from the junction of Wang Tak Street and Village Road may be considered, so that the site may still retain a breathing space for the neighbourhood.	(d) Thank you for the good suggestion. We will take into account together with the practical constraints in the detailed design stage
8	Chief Town Planner/Urban Design & Landscape 6.9.2012 and 17.9.2012 <u>Urban Design</u> [Contact: Winnie CHU Tel.: 2231 4840] <u>Landscape</u> [Contact: Tak Y WONG Tel.: 2231 4846]	<u>Urban Design</u> (a) Existing low-rise low intensity GIC uses serve as the much needed visual relief and breathing space for the densely developed urban area in Hong Kong. Intensification of these GIC developments is not supported unless there are strong functional requirements and no adverse impacts;	(a) Thank you for the observation. Private property rights should be fully respected. The MLCC site is a privately owned property and should not be used to provide visual relief and breathing space for its surroundings. The extension provides much needed functional requirements for MLCC. The Happy Valley Sports Ground as well as other open space in the district are more appropriate to serve as visual relief and breathing space for the urban development.

No.	Bureau/Department	Comments	Responses from MLCC
			There is no foreseeable adverse impact arising from MLCC's moderate proposal.
		(b) Developments to the immediate east and south of the site are subject to a building height restriction of 100mPD. In such visual context, the proposed height of 55mPD for the church building is not expected to have adverse visual impacts;	(b) Totally agree with the observation.
		(c) It is most likely that the disposition of the additional floors is constrained by the physical layout and structural design of the existing church building and may not result the most desirable disposition from an urban design perspective. It would be better if the additional floors could be built on top of the southern portion of the site to set back as far away as possible from the junction of Village Road and Wang Tak Street. Otherwise, MLCC should be requested to provide justification for the proposed disposition; and	(c) Thank you for the good suggestion. At present, the fire escape, lift, machine room etc are all located at the northern portion of the site. In view of the existing site constraint and the financial capability of our church, it is not viable nor practicable to move the extension portion to the southern portion of the site. The suggestion could be considered in the redevelopment stage.

No.	Bureaux/Departments	Comments	Responses from MLCC
		<u>Landscape</u> (d) No adverse comment from the landscape point of view. However, it is advised that landscape planting should be provided on flat roofs to enhance the landscape quality of the church and local environment.	(d) Noted with thanks.
9	District Officer (Wan Chai) Ref. (21) in HAD WC GR/17/5/5/50 Dated 12.9.2012 [Contact: Miss Peggy NG Tel.: 2835 1971]	(a) In view of the significant increase in building height from 5 storeys to 11 storeys, together with the additional traffic generated by the proposed extension both during and after the construction, the District Council (DC) members concerned and nearby residents will likely express concerns on the foreseeable adverse visual and traffic impacts. We therefore trust the DC members concerned and nearby residents will be consulted and informed of the proposal as early as possible.	(a) TPB has existing mechanism to consult DC members and nearby residents on the proposal.

The following government departments have no comment to the extension proposal:

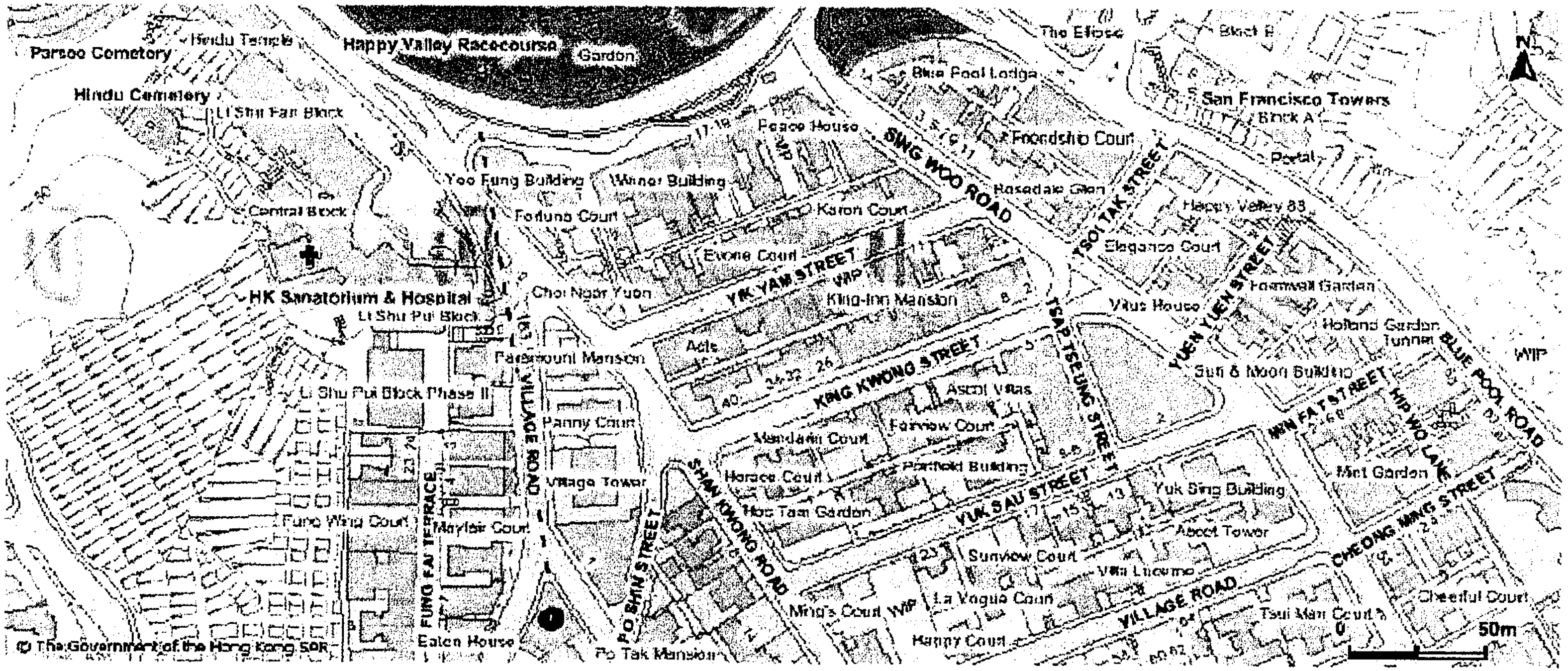
No.	Breaux/Department	Ref.	Date
10	Project Manager (Hong Kong Island & Islands), Civil Engineering and Development Department	( ) in HKI 1/7/1	30.8.2012
11	Commissioner of Police	(16) in HKI WCHDIST 1-150/20 (Pt.7)	28.8.2012
12	Chief Engineer/Development (2), Water Supplies Department	(10) in WSD 3054/44/68 Pt.9	31.8.2012
13	Chief Engineer/Hong Kong & Islands, Drainage Services Department	( ) in DSD HK/10/IL/2341/sA	5.9.2012

Appendix I - 2012 年 10 月 28 日 使用交通工具參加跑馬地堂主日崇拜問卷調查結果

	早堂 (8:30am)		日堂 (10:30am)		合共	
步行	15	32%	15	21%	30	25%
電車	10	21%	15	21%	25	21%
巴士	12	26%	18	25%	30	25%
小巴	1	2%	3	4%	4	3%
的士	4	9%	10	14%	14	12%
私家車	5	11%	12	16%	17	14%
合共	47		73		120	

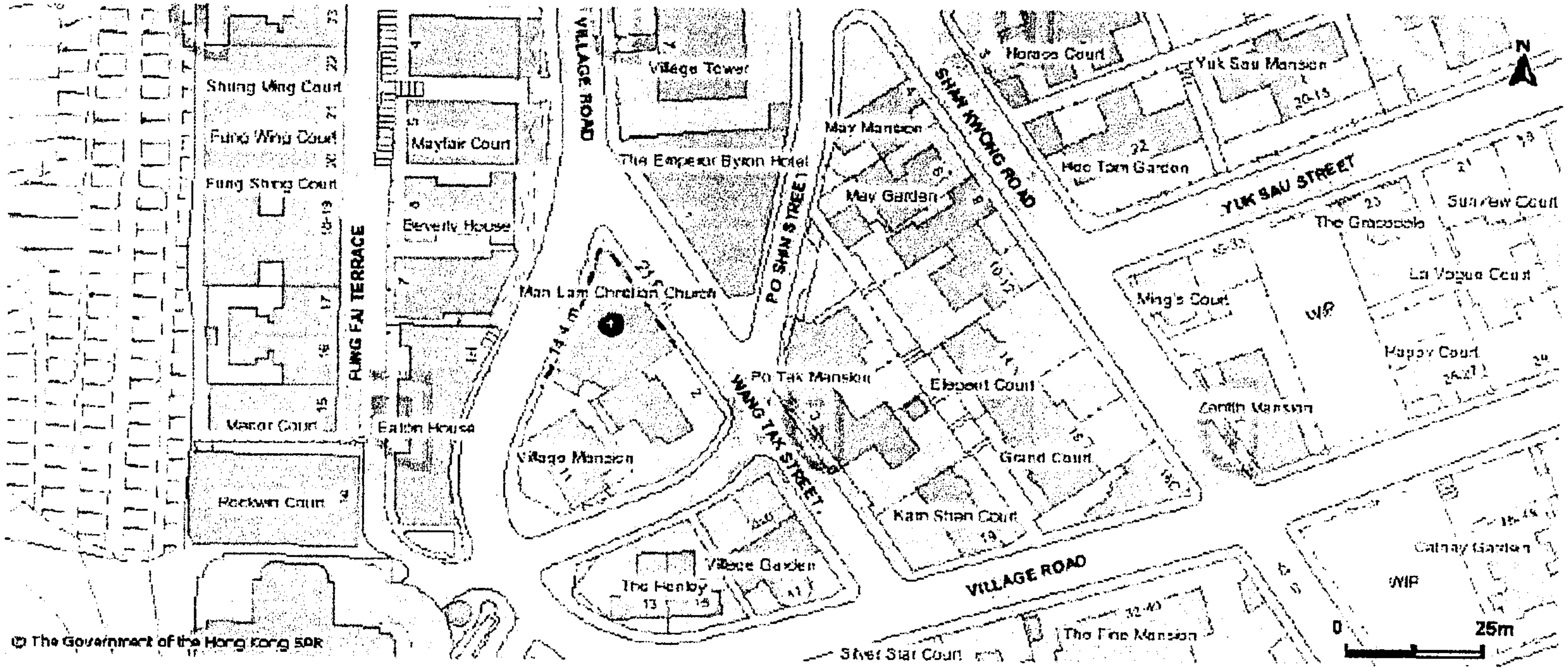
Appendix II - Map showing measurement of distance from MLCC to Wong Nai Chung Road. The distance is 163m.

地理資訊地圖
GeoInfo Map

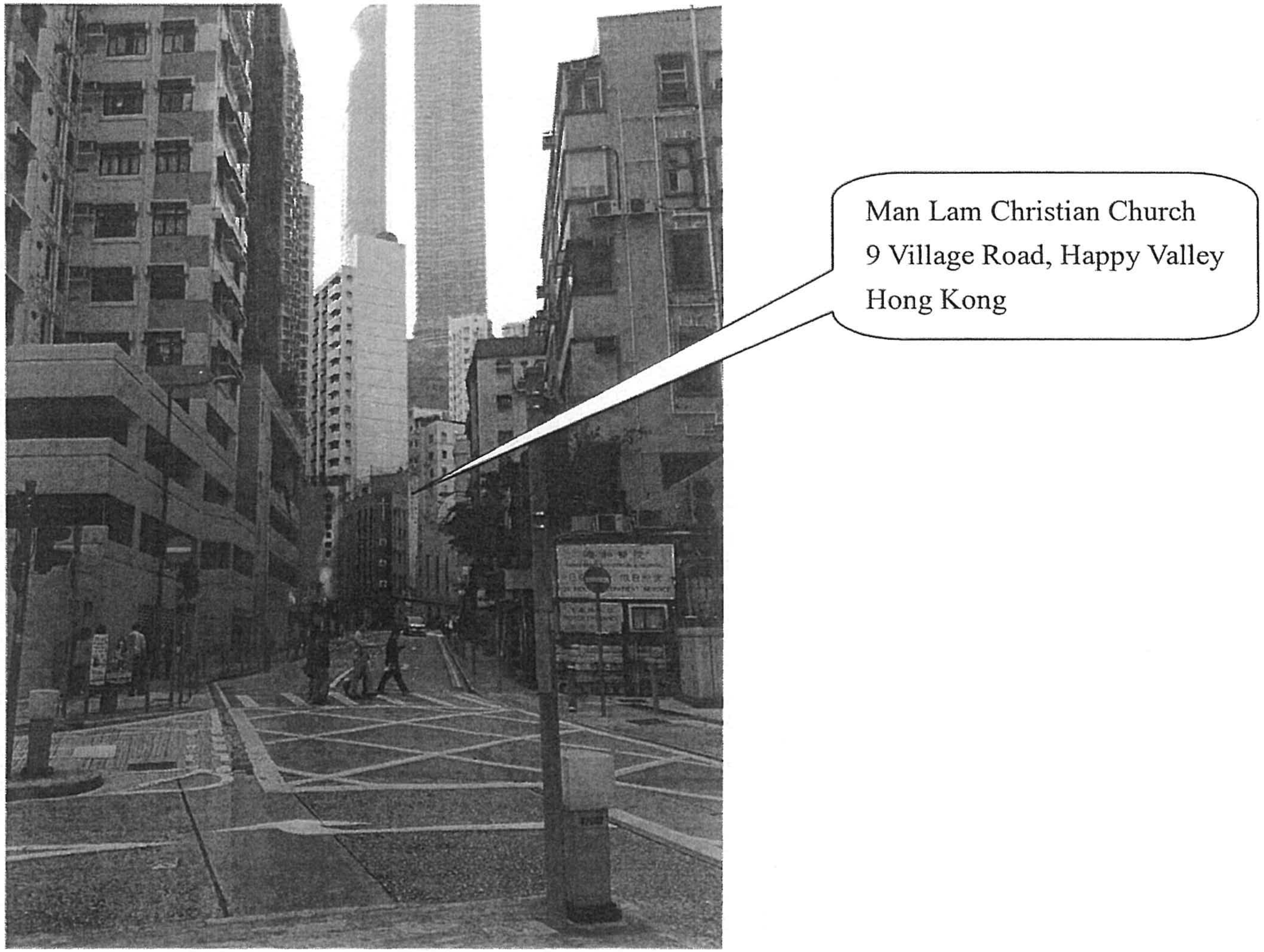


Appendix III - Map showing measurement of total length of building façade. The total length is 36m.

地理資訊地圖
GeoInfo Map



Appendix IV - Photo showing MLCC and its surrounding buildings



中華基督教會香港閩南堂
MAN LAM CHRISTIAN CHURCH, HONG KONG
THE CHURCH OF CHRIST IN CHINA

BY HAND

21 August 2013

District Planning Office, Hong Kong
North Point Government Offices
333 Java Road, North Point, Hong Kong
(Attention: Mr. Louis KAU)
[Your Ref. No. : HK-7/71]

By Fax (No. 2895 3957)
and By Hand

Dear Mr. Kau,

Request for Relaxation of Building Height Restriction of Man Lam Christian Church, Hong Kong, The Church of Christ in China, 9 Village Road, Hong Kong

We refer to your letter of 23 January 2013 and attach herewith our reply for your follow up action please.

Since there is/are no adverse departmental comments, we urge our proposal of relaxation of building height of MLCC to 11 storeys to be considered by the Town Planning Board. Grateful if this could be handled promptly.

Should you have any questions regarding our proposal, please contact the undersigned on 9482 1100.

Yours faithfully,

Ms. Helen SHIH
Chairlady
Man Lam Christian Church, Hong Kong
The Church of Christ in China

c.c. Secretary, Town Planning Board

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Proposed Extension of the Man Lam Christian Church
The Church of Christ in China at 9 Village Road, Hong Kong (MLCC)

No.	Bureaux/Departments	Comments	Responses from MLCC
1.	Commissioner for Transport [Contact Mr. CHAN Chun Ping Tel: 2829 5429]	(a) The traffic impact may be minimal during weekdays, but whether it will remain the same during weekend when most church activities will be taken place. In addition, figures should be provided to demonstrate that there would be minimal traffic impact for before and after the proposed extension. Otherwise, justifications for insignificant increase in the number of church users after the proposed extension should be provided.	(a) There is no additional religious worship space in our proposal and therefore **the amount of visitors would be similar to the existing situation.** The purpose of our extension is to **provide the needed relief to shortage of space for existing facilities** and services. Additional floor spaces such as classrooms, Pastor and Administrative Office, Choir/Music Room, Pastor's quarters are unlikely to generate additional visitors to the locality. Moreover, our development plan is to **serve local residence, transient inhabitants and people working in the locale** such as staff/patients in HK Sanatorium Hospital who mainly arrive our church on foot. Hence, the extension of church building itself **would have insignificant increase to traffic** of the locality.

No.	Bureaux/Departments	Comments	Responses from MLCC
		(b) Noting there will be no provision for the loading and unloading facilities within the subject site, the project proponent is required to address on what arrangement will be provided for the additional loading/unloading demand due to the proposed extension. Otherwise, justifications for an additional loading/unloading demand after the proposed extension should be provided.	(b) Our proposal is an extension of the existing building, not a redevelopment project and therefore there is less flexibility in building design. The external walls of the existing building are load bearing walls which are impossible to be removed to provide loading/unloading for the church. Moreover, due to the constraints of small size, triangular shape as well as uneven levelled spot level, it is not practical to provide loading/unloading area within the existing building. Furthermore, not every redevelopment or Additions and Alterations of church in HK is redeveloped with loading/unloading facilities.

No.	Bureaux/Departments	Comments	Responses from MLCC
2.	Director of Environmental Protection [Contact: Ms. Eva LAU Tel: 2835 1129]	(a) Since there is an increase in total gross floor area and plot ratio of the church, a quantitative sewerage impact assessment (SIA) is required to address the sewerage impact due to the increase of sewage flow and recommend mitigation measures/upgrading works, where necessary. Submission of SIA during the detailed design stage is acceptable. The requirement of SIA should be included as a condition of the proposed lease modification before commencement of the proposed extension.	(a) Noted with thanks.
		(b) Noting the project proponent confirmed that sensitive uses are provided with mechanical ventilation and/or central air-conditioning and do not rely on open windows for ventilation, and hence, adverse air quality impact is not anticipated provided that fresh air intakes are suitably located to avoid chimney and vehicular emission. The project proponent/Authorised Person should ensure fresh air intakes are suitably located during the detailed design stage.	(b) Noted with thanks.

BY HAND

中華基督教會香港閩南堂
MAN LAM CHRISTIAN CHURCH, HONG KONG
THE CHURCH OF CHRIST IN CHINA

10 October 2014

District Planning Office, Hong Kong
14/F North Point Government Offices
333 Java Road, North Point, Hong Kong
(Attention: Miss CHEUK Yuk Ming, Carol)
[Your Ref. No. : HK-7/71]

By Hand

Dear Miss Cheuk,

Request for Relaxation of Building Height Restriction of
Man Lam Christian Church, Hong Kong,
The Church of Christ in China, 9 Village Road, Hong Kong
(Updated Survey on Transport Means Used by Church Members)

We refer to your telephone on 21 August 2014 requesting us to provide an updated survey on transport means used by church members.

Enclosed please find an updated survey conducted on 7 September 2014 for your follow up action. Compared with our last survey held on 28 October 2012, we had less members using private cars or taxi (26% in 2012 but 24% in 2014) but we had more members used public transports such as buses, trams or vans (49% in 2012 but 54% in 2014). Furthermore, we had reduced number of members arrived on foot (25% in 2012 but 22% in 2014) as some families had moved out from Happy Valley.

Should you have any questions regarding the survey, please contact the undersigned on 9802 0402.

Yours faithfully,

Ms. Anita NG
Secretary
Man Lam Christian Church, Hong Kong
The Church of Christ in China

2014 年 9 月 7 日

使用交通工具參加跑馬地堂主日崇拜問卷調查結果

人數	早堂 (9:00am)		日堂 (10:45am)		合共	
步行	16	33%	13	16%	29	22%
電車	6	13%	17	21%	23	18%
巴士	13	27%	29	35%	42	32%
小巴	2	4%	3	4%	5	4%
的士	8	17%	9	11%	17	13%
私家車	3	6%	11	13%	14	11%
合共	48		82		130	

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E-mail: pac@planarch.com.hk

PlanArch Consultants Ltd.
建港規劃顧問有限公司

By Hand

Your Ref.: HK-7/69
Our Ref.: ps/h7/1011412

Hong Kong District Planning Office
Planning Department
14/F, North Point Government Offices
333 Java Road, Hong Kong
(Attn.: Miss Carol Cheuk)

2 October 2015

Dear Madam,

Proposed Redevelopment of the East Wing of Po Leung Kuk Headquarters
66 Leighton Road, Causeway Bay, Hong Kong

We refer to the redevelopment proposal of the proposed redevelopment of the East Wing of Po Leung Kuk Headquarters submitted on 16.1.2015 and 24.4.2015, and the response to comments dated 5.8.2015.

In response to the subsequent Government departmental comments received, enclosed please find attached 60 hard copies of the revised consolidated development proposal together with responses to comments for your circulation to the concerned Government bureaux and departments.

Should you have any questions, please feel free to contact the undersigned.

Thank you for your kind attention.

Yours faithfully,
For and on behalf of
PlanArch Consultants Ltd.

Betty S. F. Ho

w/e.

cc: Client

Attachment IV of
MPC Paper No. 11/15

Proposed Redevelopment of the East Wing of Po Leung Kuk Headquarters

Po Leung Kuk

PlanArch Consultants Ltd.
AD+RG Architecture Design and Research Group Ltd.
CKM Asia Ltd.
Kenneth Ng & Associates Ltd.
Cinotech Consultants Ltd.
ENVIRON Hong Kong

September 2015

1 BACKGROUND

1.1 In view of the growing demand for community and social welfare services, Po Leung Kuk (PLK) intends to redevelop the East Wing of its Headquarters at Leighton Road and to expand their services to different sectors of the community. Currently, the East Wing of PLK Headquarters provides education, residential care and day care services for children, other ancillary facilities including administration office for the Headquarters.

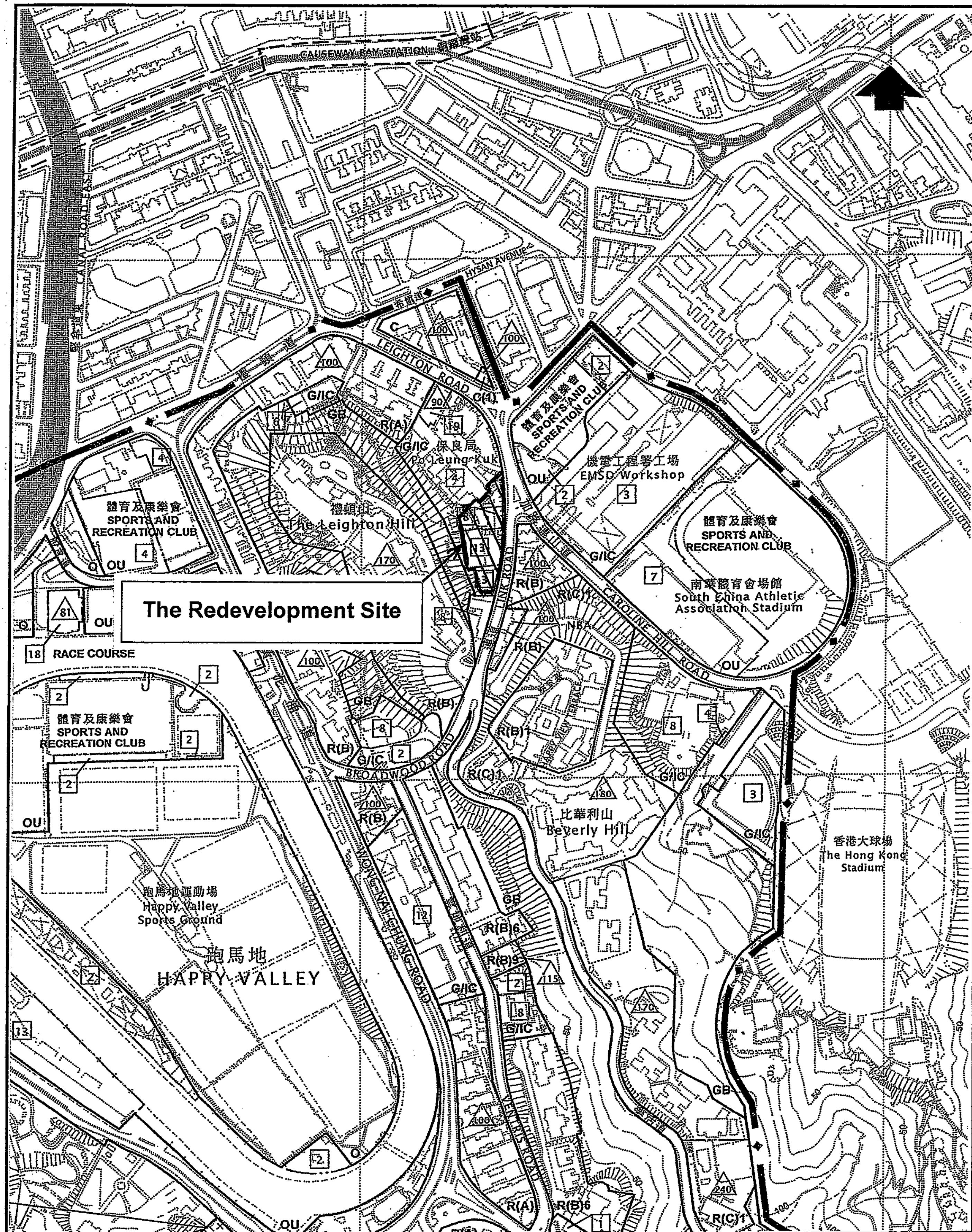
1.2 Initial consultations with relevant Government departments, including Social Welfare Department and Planning Department have been carried out to establish the need for increasing community and social welfare services, to explore possible expansion of the scope of services at PLK Headquarters for youngsters and elderly, and to review the development intensity, building bulk and design of proposed redevelopment scheme. All bureax and departments have no adverse comments to the proposed redevelopment, please refer to the consolidated response to comment table in Appendix I.

2 SITE CONTEXT OF PO LEUNG KUK HEADQUARTERS

2.1 PLK Headquarters is located at 66 Leighton Road, Causeway Bay, Hong Kong (Plan 1). It comprises of the PLK Main Building, Extension Wing of Main Building, HKU SPACE Po Leung Kuk Stanley Ho Community College TY Wong Building, Po Leung Kuk Vicwood K. T. Chong Building, Po Leung Kuk Kwok Law Kwai Chun Children Services Building and Vocational Training Centre.

2.2 PLK Headquarters is located amid a mixed residential, commercial and "G/IC" uses in the centre of Causeway Bay. Residential developments such as Bright Star Mansion, Silverwood and The Leighton Hill are located to the north, southeast and west of PLK Headquarters respectively. Sports and recreation club, such as Post Office Recreation Club and South China Athletic Association are located to the east, and commercial developments such as Lippo Leighton Tower are found to the northeast of PLK Headquarters.

2.3 In the Wong Nai Chung Outline Zoning Plan (OZP) No. S/H7/17 gazetted on 18.7.2014, the building height restriction stipulation mainly reflects the existing building heights of PLK Headquarters. Except HKU SPACE Po Leung Kuk Stanley Ho Community College TY Wong Building which is with a height restriction of 90mPD and 19 storeys, building heights in PLK Headquarters are restricted to 3 - 13 storeys.



Plan Based on Wong Nai Chung Outline Zoning Plan No. S/H7/17 Gazetted on 18.7.2014	Location Plan Po Leung Kuk Redevelopment Scale 1 : 5 000	Plan 1 **PlanArch Consultants Ltd.** Revision: Date: 9.1.2015

3 The PROPOSED REDEVELOPMENT SITE

3.1 The redevelopment site is located southeast of PLK Main Building, known as the East Wing (Plan 1) within the PLK Headquarters. This includes the Extension Wing of Main Building, Po Leung Kuk Vicwood K. T. Chong Building, Po Leung Kuk Kwok Law Kwai Chun Children Services Building and Vocational Tra Centre and the adjoining basketball court.

3.2 In the Wong Nai Chung Outline Zoning Plan (OZP), the redevelopment site has height restrictions ranging from 3 to 13 storeys (Plan 1), which mainly reflects the existing building heights. Since the height of new buildings in the proposed redevelopment exceeds the OZP stipulation, amendments to the height restrictions on the OZP will be required for the proposed redevelopment.

3.3 PLK Headquarters is under Government lease (Lease Extension of Inland Lot No. 9011). Under the lease conditions, the site should only be used for kindergarten and schools, child care centre, residential homes for children, the Po Leung Kuk Headquarters, and other uses as approved by the Director.

4 THE PROPOSED REDEVELOPMENT

4.1 The Need for Redevelopment

The floor area at the East Wing and Main Building is not sufficient for current services provided at PLK Headquarters, and most of the existing buildings are aging and not up to current standard. Besides, there is a strong need to extend services to youngsters and the elderly. In order to accommodate the proposed expansion of community and social welfare services, PLK intends to redevelop the East Wing of the Headquarters. Details of the proposed redevelopment including the layout plans, sections and photomontage are shown in Appendix II.

4.2 Building Height

The building heights ranging from 42mPD, 65mPD, 75mPD and 80mPD for the proposed development are proposed to respect the height profile of the surroundings. As shown in the layout plans, sections and photomontage in Appendix II, the proposed redevelopment fully respects the building heights of the neighbourhood, as the proposed building heights are much lower than that of Leighton Hill (170mPD) and Silverwood (100mPD) in the vicinity.

4.3 Design Efforts to Respect the Main Building and the Neighbourhood

Stepped height profile is adopted in the proposed redevelopment to respect the PLK Main Building which is currently a Grade 2 historic building and the surrounding environment. The proposed redevelopment will have lowered building heights (descending from 80mPD to 42mPD) towards the Main Building. Terraced, landscaped roof gardens and vertical greening are proposed at different levels to integrate more coherently with scale and the character of the Main Building. The depth of the terrace on 7/F (42mPD) facing the Main Building will be about 5m.

In order to ensure **visual permeability**, two building separations will be provided. One is located between the Main Building and the proposed redevelopment. In accordance with HKPSG, appropriate separation from the heritage building (the Main Building) is proposed. As shown in the photomontage in Appendix II, the building design of the proposed redevelopment will be compatible with the heritage feature of the Main Building. The maximum building separation facing Link Road is about 21m, while it narrows to about 10m at the back where it is shielded by trees and landscaping in a courtyard. This is further enhanced by the courtyard fronting Link Road with lush and mature landscaping as a visual buffer between the Main Building and the proposed redevelopment. The existing trees will be preserved and new trees are proposed at the courtyard to enhance **visual openness**. In addition, the proposed redevelopment will have vertical greening, climbing plant, potted plant and shrub on the façade facing the Main Building. Together, these landscaping will serve as a green wrap and link up the green backdrop at the back. Please refer to Appendix III for the Visual Appraisal for the potential visual impact of the proposed redevelopment.

In order to enhance **visual and air permeability** between the proposed redevelopment and adjacent buildings, including PLK Gold & Silver Exchange Society Pershing Tsang School, Jade Terrace and Caroline Height across Link Road, a wide building gap of about 24m is proposed at the southern portion of the redevelopment site as another building separation.

In addition, careful building design is adopted to avoid affecting the existing mature trees at the redevelopment site as far as possible. Although two existing trees will be felled, it will be compensated by 7 new trees, *Cinnamomum Burmanii*. Please refer to the proposed preliminary tree compensation plan in Appendix II. Landscaping and greening will also be provided at different levels of the proposed redevelopment. Please also refer to the Tree Appraisal Report in Appendix IV.

4.4 Development Intensity

About 18,780m^2 GFA will be provided in the proposed redevelopment. For the whole PLK site with a site area of about 12,272m^2, i.e. including the existing HKU SPACE Po Leung Kuk Stanley Ho Community College TY Wong Building, the Main Building and the proposed redevelopment, the overall plot ratio is about 3.07.

For the redevelopment site with a net site area of 3,765m^2, the plot ratio of the proposed redevelopment is about 4.99. Please refer to the following section and Appendix II for the breakdown of GFA.

4.5 Proposed Uses and Breakdown of GFA

Currently, PLK provides various child care and children services and education facilities to serve the community in the Headquarters. LWB has shown support to the proposed expansion of social welfare facilities and EdB has no objection to the reprovisioning of education facilities in the proposed redevelopment. The floor-to-floor height of the proposed redevelopment is approximately 3.2m to cater for the need of various proposed uses.

SWD has shown in-principle support to the proposed expansion and provision of various social welfare services including child care services, children services, kindergarten cum nursery and elderly services in the redevelopment plan of PLK. About 10,450m^2 GFA will be provided for these social welfare services.

In order to support the expansion of the social welfare services to serve the district, PLK proposes to expand their existing administration office and ancillary supporting facilities (e.g. maintenance workshop, store rooms, meeting rooms and staff rooms) from the existing 5,250m^2 to about 6,300m^2 in the proposed redevelopment to accommodate the increase in manpower, and upgrade the current administration office which has insufficient floor area.

The existing education facilities, including outdoor playground, school hall, kindergarten, pre-primary education service centre, resource/ learning centre, central campus TV, etc., with about 2,030 m^2 GFA will be reprovided in the proposed redevelopment. In total, about 18,780m^2 GFA will be provided in the proposed redevelopment.

4.6 No Adverse Traffic Impact

As demonstrated in the Traffic Impact Assessment (TIA) in Appendix V, the proposed redevelopment is feasible in traffic engineering point of views and the additional traffic would not induce adverse traffic impact to Link Road and the nearby road network.

The existing vehicular access of PLK Headquarters is located at Caroline Hill Road. The existing EVA run-in/out at Link Road will be retained and used by the proposed redevelopment to provide an additional vehicular access to serve the PLK Headquarters after the proposed redevelopment. Up-to-standard design for the run-in/out is proposed to meet the TPDM standard and to ensure adequate turning for the servicing vehicles and minimise the traffic impact to Link Road.

During the special events (which might be held 1 - 2 times a year during weekend / public holiday), as a contingency arrangement to minimize the adverse traffic impact to the nearby road junctions, the internal road will be arranged for one-way traffic with vehicles entering via the existing run-in/out at Link Road and main entrance of PLK at Caroline Hill Road; and leaving at Leighton Road next to HKU SPACE Po Leung Kuk Stanley Ho Community College TY Wong Building. Such arrangement shall facilitate the discharge of visitors' vehicles to Leighton Road instead of to the junctions of Link Road and Leighton Road or Link Road and Caroline Hill Road during major events

Underground parking area will be provided in the proposed redevelopment for reprovisioning of the existing 10 no. of private car parking spaces and 1 no. of loading/unloading spaces. In addition, 1 special bus layby for Reha-bus will be provided to serve the elderly care / day care centre.

In order to update the TIA conducted in 2012, an addendum was carried out to review the traffic impact based on the latest traffic data. The Addendum – Updated Junction Analysis in Appendix VI confirms that the proposed development will have negligible traffic impact. Transport Department had no objection to the submitted assessments.

4.7 No Adverse Environmental Impact

Noise sensitive uses, such as kindergartens, child care centre, elderly and children services and administration office in the proposed redevelopment will be centrally ventilated and they will not rely on open windows for ventilation. Fresh air intake will be located at roof top of the proposed redevelopment. As demonstrated on drawing no. A510/PD/014 in Appendix II, the fresh air intake and recreational areas are located away from the 5m buffer distance as required under Chapter 4 of HKPSG. In addition, chimneys in the area are not for industrial use. Therefore, no adverse noise and air quality impacts are anticipated.

As demonstrated in the Sewerage Impact Assessment in Appendix VII, the potential sewerage impact arising from the population increase due to the proposed redevelopment is minimal and no upgrading of the existing sewage network or sewage pumping station will be required. Both Environmental Protection Department and Drainage Services Department had no comments to the submitted Sewerage Impact Assessment.

A Preliminary Environmental Review (PER) will be prepared accordingly at detail design stage as requested by the Environmental Protection Department at the course of undergoing funding application to Lotteries Fund for construction cost.

4.8 No Adverse Impact on Built Heritage

Commissioner for Heritage's Office (CHO) of Development Bureau and the Antiquities and Monuments Office (AMO) of LCSD have no objection in principle to the proposed PLK redevelopment scheme given that the Main Building of PLK, a Grade 2 historic building, will be preserved in-situ and a condition survey for the Building should be conducted and a copy of the survey result should be submitted to CHO and AMO. Besides, works proposal will be provided to AMO prior to construction works and AMO will be consulted on the detailed design of the re-development in due course.

4.8 No Significant Adverse Air Ventilation Impact

As demonstrated in the Air Ventilation Assessment – Expert Evaluation in Appendix VIII, since the design of the proposed redevelopment scheme and the proposed mitigation measures has taken the surrounding building heights as well as the wind environment of the Wong Nai Chung and Causeway Bay area into account, it is considered that the proposed redevelopment scheme will not introduce significant adverse air ventilation impact to the surrounding area.

4.9 Funding of the Proposed Redevelopment

Since the proposed redevelopment will be expected to be partly self-financed by Po Leung Kuk and partly financed by the Government, the Government funding for the proposed social welfare facilities will be under Lotteries Fund, as advised by the Social Welfare Department.

Apart from those subvented social welfare facilities supported by Lotteries Fund, the reprovisioning of other existing facilities will be self-financed by Po Leung Kuk.

4.10 Support from Wan Chai District Council

PLK presented the proposed redevelopment proposal to Wan Chai District Council on 6.1.2015. Members of Wan Chai District Council generally supported the redevelopment proposal. Residents' representatives of The Leighton Hill were also consulted on 8.6.2015.

5 PROPOSED AMENDMENTS TO OZP FOR HEIGHT RELAXATION

5.1 In order to accommodate the proposed redevelopment, the building height stipulated on the OZP would be required to be amended to 65mPD to 80mPD as shown in the proposed scheme plan in Appendix II.

5.2 Po Leung Kuk has demonstrated the need to redevelop the site for more community and social welfare services to serve the growing population. LWB has also given support to the expansion of the social welfare services for the community.

5.3 Po Leung Kuk, a well-known charity organisation serving Hong Kong for over a century, can guarantee the proposed redevelopment will provide diversified social welfare services. The redevelopment proposal has incorporated innovative design which respects local environment and townscape, it can also maximise the potential of limited land resources in urban area to better serve the community. It is therefore recommended the Government should support the relaxation of building height to facilitate the proposed redevelopment.

APPENDIX I

RESPONSE TO COMMENT

Appendix I - Consolidated Response to Comments received from PlanD

	Comment	Response
1	**Comments of the Secretary for Education**	
(2)	PLK's revised extension proposal (Proposal) has been studied. I am pleased to know that a separate school hall and a separate playground will be provided for PLK Gold & Silver Exchange Society Pershing Tsang School (Pershing Tsang School) on completion of the redevelopment project as indicated in the Proposal. However, no clear information is found in respect of the exact area of the school hall and the playground in the Proposal.	At this preliminary stage, we confirm that area of school hall and outdoor playground in the proposal will not be less than their existing area. The exact area shall be finalized at the detailed design stage.
(3)	It was observed that the proposed playground was only around $280m^2$ after a rough calculation by using the scale indicated in Annex 1 of the Proposal. I would like to reiterate our stand as stated in our memo of 8 June 2011 to your department that PLK must provide no less school facilities for the use of Pershing Tsang School on completion of the redevelopment project. Please note that the current area of the school hall and the playground is $630m^2$ and $525m^2$ respectively. The proposed area of the new playground and the school hall should be no less than the current provision.	Please be clarified that: Existing outdoor playground: the gross area of the existing playground is $525m^2$ which includes ramps, planter and circulation area to other buildings. Existing school Hall: the gross floor area of the school hall is $630\ m^2$ and it includes lift lobby to upper office floors, toilets, M&E room, ramps, etc. Proposed provisions: We confirm that both the gross area of outdoor playground and school hall in the redevelopment will not be less than their corresponding existing areas of $525m^2$ and $630m^2$ respectively. The exact area shall be finalized at the detailed

	Comment	Response
		design stage.
(4)	I should be grateful if PLK could inform me the area of the re-provisioned school hall and the playground and mark them clearly in the Proposal.	Please refer to our response to item 2, 3 above.
(5)	No objection to the proposal with a gross area of 525m^2 and 630m^2 as the area of the playground and the school hall respectively for PLK Gold & Silver Exchange Society Pershing Tsang School on condition that the usable area of the playground provided by PLK should not be less than 400m^2.	Noted that EdB has no objection to the proposal with a gross area of 525m^2 and 630m^2 as the area of the playground and the school hall respectively for PLK Gold & Silver Exchange Society Pershing Tsang School, and the usable area of the playground to be reprovisioned by PLK will not be less than 400m^2.
2	**Comments of the Chief Town Planner/Urban Design & Landscape**	
(1)	Responses to Comments: Although the consultants stated that landscape design would be carried out in the detail design stage, they should allow sufficient planting areas and have a conceptual landscape design ready at this stage to ensure that there is sufficient area secured for landscape planting and that the landscape works could be feasibly implemented.	Based on the tree compensatory plan on the G/F, there are sufficient area for compensatory tree planting and other landscape works. Conceptually, there can be roof garden on different levels, vertical greening on the façade facing Link Road and greenery on ground level between the Main Building and new development and at the outdoor playground area. Further design development will be carried out in the next stage.

Comment		Response
(2)	Tree Survey: (i) A photo record of the existing trees should be submitted. (ii) Noted that the date of assessment is October 2010. For the formal submission an updated assessment within 2 years of the date of submission should be provided in accordance with the requirements of LAO PN 7/2007.	An updated Tree Appraisal Report is conducted in September 2015 with record of the existing trees, and it is incorporated at Appendix IV.
(3)	Tree Survey Plan: Tree nos.T9, T10 and T55 are very close to the proposed building. The applicant should review the feasibility of retaining those trees during the construction stage.	Noted and feasibility of retaining T9, T10 and T55 will be reviewed during construction stage.
(4)	Tree Compensation Plan: The tree species *Delonix regia* is a large tree with spreading form. Sufficient space should be allowed for the continued healthy growth of the proposed compensatory trees.	Noted. A smaller native tree species of *Cinnamomum burmanii* is proposed as compensatory tree in lieu of *Delonix regia*
(5)	The scale in the Tree Survey Plan and Tree Compensation Plan appears to be incorrect.	Noted and updated.
(6)	Proposed greenery areas should be clearly demarcated on plan.	Noted and please refer to Drawing No. AG6-GA-01 at Appendix IV.
(7)	According to Appendix II, roof gardens with tree planting, green wall and edge planters are proposed. The consultants should provide plans and typical details to demonstrate the feasibility of the	Noted and relevant plans and information will be prepared to demonstrate feasibility of the proposed landscape design in detailed design stage,

	Comment	Response
	proposed landscape design and demonstrate that the photomontages and sections shown are realistic and feasible. The consultants are reminded to minimize the extent of pruning for those retained trees which are very close to the proposed building.	 Noted.
3	**Chief Architect/CMD2, Architectural Services Department**	
	Please note that our concern on the considerable bulk of the redevelopment proposal is still valid under the circumstances that there is no Computational Fluid Dynamics analysis in the Air Ventilation Assessment of the proposal for vetting and the consolidated accommodation is not available at this stage that might affect the floor-to-floor height of the building as well as its visual impact.	Please be advised that an Air Ventilation Assessment – Expert Evaluation was carried out and it was concluded that the proposed redevelopment will not have adverse air ventilation impact. In detail design stage, the building design will be reviewed to minimize the potential visual impacts to the surroundings.
4	**Director of Environmental Protection**	
(1)	Having reviewed the revised Sewerage Impact Assessment (SIA) report, we consider it is in order and do not have further comments.	Noted that EPD had no further comments to the SIA submitted in August 2015 (Appendix VII).
(2)	We would like reiterate that if a Preliminary Environmental Review (PER) will be produced, the Environment Assessment report and SIA report may be suitably incorporated into the PER, which should	Noted and the PER will be prepared accordingly in detail design as requested by the EPD at the course of undergoing funding application to Lotteries Fund for construction cost.

	Comment	**Response**
	preferably also address other issues such as water quality, waste management/land contamination, hazard to life, etc.	
(3)	(iii) All noise sensitive uses in the proposed redevelopment (e.g. kindergartens, child care centre, elderly and children services and administration office) in the proposed redevelopment will be centrally ventilated and will **not** rely on open windows for ventilations.	Noted and Confirmed.
	(iv) Both the fresh air intake, which is located at rooftop of the proposed development, and the recreational areas are location away from 5m buffer distance under HKPSG.	Noted and Confirmed.
	Based on the (iii) and (iv) above, **subject to** the confirmation from the applicant that the chimneys in the region are not for industrial use, we do **not** have adverse comment to the extension proposal.	Noted and the applicant confirmed that chimneys in the area are not for industrial use.
5	**Commissioner for Transport, Transport Department**	
	No adverse comments on the updated traffic impact assessment.	Noted had no further comments to the updated traffic impact assessment submitted on 24.4.2015 (Appendix VI).

	Comment	Response
6	**Director of Social Welfare**	
	We understand that the proposed OZP amendments are based upon the redevelopment of PLK's redevelopment plan for provision of social welfare facilities, School/Kindergarten/Language Centre and institutional Use (Administration Office and ancillary facilities). We last indicated our no in-principle objection to the proposed OZP amendments which aim to adjust upward the existing BHRs to facilitate PLK's redevelopment plan in 2012. Whilst noting that there has been no proposed revision in respect of the gross floor area (GFA) and height restriction, we would have no specific comments on the submission at this stage. That said, PlanD may wish to take note that SWD has been in continued liaison with PLK in respect of the provision of welfare facilities at the subject site. During our meeting with PLK in late June 2015, PLK is requested to review the service mix and the floor area requirements for the welfare facilities in the light of the available GFA.	Noted that the Director of Social Welfare has no in-principle objection to the proposed OZP amendments and no specific comments on the submission. Details of the proposed development including floor area for different facilities will be determined in detail design in later stage. PLK will continue to closely liaise will SWD on the detail design of the proposed redevelopment.

	Comment	Response
7	**Commissioner for Heritage's Office (CHO) of Development Bureau and the Antiquities and Monuments Office (AMO) of LCSD**	
i.	No objection in principle to the proposed PLK redevelopment scheme given that:	Noted.
(a)	The Main Building of PLK, a Grade 2 historic building, will be preserved in-situ;	The Main Building of PLK, a Grade 2 historic building, will be preserved in-situ.
(b)	Since the subject site is in close vicinity to the Building, necessary precautionary measures and monitoring systems to safeguard the structural integrity of the Main Building should be in place in the course of construction works. A condition survey for the Building should be conducted and a copy of the survey result should be submitted for our comment and record;	Noted and a condition survey for the Building should be conducted and a copy of the survey result should be submitted to CHO and AMO.
(c)	Works proposals, such as foundation and piling works, which may affect the Main Building should be provided to AMO for comments prior to the commencement of any construction works on the site;	Noted and works proposal will be provided to AMO prior to construction works.
(d)	As proposed by PLK, the design of the new complex building will be compatible with the heritage features of the Main Building (second paragraph of Pt. 4.3 of the technical assessments attached to the memo). PLK is required to consult AMO on the detailed	AMO will be consulted on the detailed design of the re-development.

	Comment	Response
	design of the new complex building before commencement of any works; and	
(e)	It in learnt for Pt. 4.9 of the technical assessments that PLK will undergo the Public Works Programme for seeking government financial support. PLK should observe and go through the mechanism of the Heritage Impact Assessment as stipulated in the Development Bureau Technical Circular (Works) No. 6/2009, "Heritage Impact Assessment Mechanism for Capital Works Projects", if the proposed PLK redevelopment is a government capital works project.	Noted and as per advised from the Social Welfare Department, the Government funding for the proposed social welfare facilities will be under Lotteries fund.
8	**District Lands Officer/Hong Kong East, Lands Department**	
i.	From a lease point of view, there is no objection to the proposed building heights and GFA of the redevelopment project. Regarding the proposed new services/uses, subject to the policy support/comment from Director of Social Welfare, prior approval under lease would be required. However, there is no guarantee that such approval will be granted and if granted by the Lands Department (LandsD) acting in its capacity as the landlord, it will be subject to such terms and conditions as imposed by the LandsD after	Noted.

	Comment	Response
	consulting relevant bureau and departments.	
ii.	Any trees growing on the lot shall not be interfered with unless prior approval of his office has been obtained.	Noted and agreed.
9	**Planning Department**	
	Please advise what uses will be self-financed and what uses will be financed by the Government.	Please note the following breakdown of uses with and without funding support from government. Details of the uses will be determined in consultation with the Social Welfare Department in the detailed design stage: *Uses Supported by the Government:* 1. Babies Section 2. Children Care Services (under/ above 6 years old) 3. Day Creche 4. Kinder section 5. Kindergarten cum Nursery 6. New Comers' ward *Uses Self-financed by PLK* 1. Administration Office

Comment		Response
		2. Administration Office & Supporting Facilities 3. Adoption Services Unit 4. Centre for Children with Special Needs 5. Centre for Children with High Abilities 6. Children Art Centre 7. Children Development Centre 8. District Based Speech Therapy Services 9. Elderly Care/ Day Care Centre 10. Integrated Children Enhancement Programme 11. Integrated Family & Children Services Centre 12. Kindergarten 13. Pre-primary Education Service Centre 14. Parent Education Centre 15. School Hall 16. Student Guidance Service 17. Student support service 18. Resource/ Learning Centre 19. Youth Services

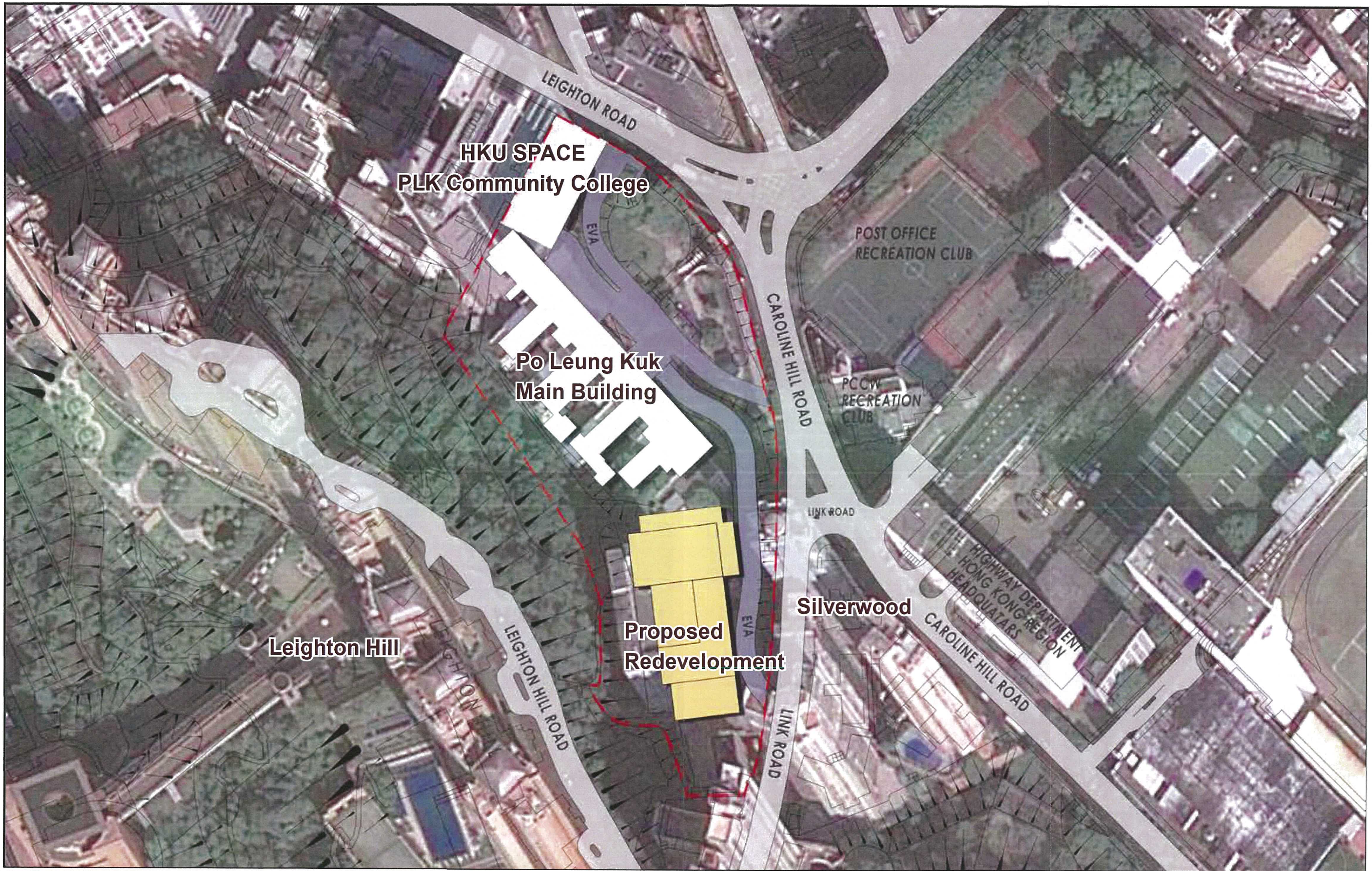
	Comment	Response
12	**Chief Town Planner/Urban Design & Landscape, Planning Department** (Contact Person: Ms Emma LEUNG; Tele. No.: 2231 4928)	
(1)	Section 3.3.3 – The sentences *"the downwashed effect would not be significant"* and *"it would help the air ventilation performance at the pedestrian level surrounding the redevelopment site"* are contradictory. The consultant should further elaborate on the argument or rectify.	Noted and sentences of *"it would help the air ventilation performance at the pedestrian level surrounding the redevelopment site" are deleted.*
(2)	Section 3.3.4, Building Orientation – The sentences *"the proposed redevelopment ... obstructed due to our proposed design"* and *"the wind blockage …….. maximize the penetration of prevailing wind under the annual wind conditions through the redevelopment site."* are contradictory. The consultant should revise the argument.	Noted and text amended in section 3.3.4
(3)	Section 4.2 ◆ Line 4 – It should read *"This would help to reduce the blockage of the **wind** from these wind directions."* ◆ The sentence *"However, since the decreasing height profile is not …… would not be observables."* is confusing as this point of view does not tally with the whole paragraph. The consultant should further elaborate on whether the stepped height profile is an effective measure under	Noted and text amended in Section 4.2.

Comment		Response
	these wind directions.	
(3)	Section 4.5 ◆ 2nd paragraph, line 2 – It should read "… the proposed design toward north the south is larger than the existing condition." ◆ The meaning of "… (which mean the blockage effect at the PLK …… under south wind)" is unclear. The consultant should provide further elaboration.	Noted and text amended in Section 4.5.
12	**Comments from residents' representatives of The Leighton Hill**	
	Residents' representatives of The Leighton Hill was consulted on 8.6.2015 and they have the following concerns:	
(a)	Concerns on potential traffic impact of the proposed development.	PLK has submitted an updated traffic impact assessment to PlanD on 24.4.2015 and Transport Department has no adverse comments on the updated traffic impact assessment, as indicated in Item 5 of this R to C table. An executive summary of the updated traffic impact assessment was sent to the residents' representatives to address their concerns on 10.8.2015.

	Comment	Response
(b)	Ecological impact to the existing trees on the slopes between PLK and The Leighton Hill due to the redevelopment of East Wing of Po Leung Kok Headquarters.	In the proposed redevelopment, no works will be carried out at the slope and therefore the existing trees will not be affected by the construction of proposed redevelopment. In addition, a sunlight study was under preparation to ascertain if there are any impacts of the proposed redevelopment to the conditions of the trees. It is anticipated that the study will be sent to the residents' representatives to address their concerns by early October 2015.
(c)	Concerns on adverse air ventilation due to the proposed development.	An executive summary of the air ventilation assessment expert evaluation was sent to the residents' representatives to address their concerns on 10.8.2015.

APPENDIX II

PROPOSED REDEVELOPMENT SCHEME



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PO LEUNG KUK

issue date	25/9/2015	drawn by	CC	Site and Surrounding Area
project	Technical Feasibility Study for the Redevelopment of East Wing of Po Leung Kuk	checked by	EC	
		approved by	BL	scale - / drawing & revision no A510/PD/001

Table 1.2.1
(GFA Calculation of Headquarters)

		GFA (sqm)
E1	Existing HKU SPACE PLK Community College	16130
E2	Existing Main Building	2815
E3	Transformer & Switch Room	N/A
P1	**Proposed Redevelopment**	**18780**
	Total *[A]*	**37725**

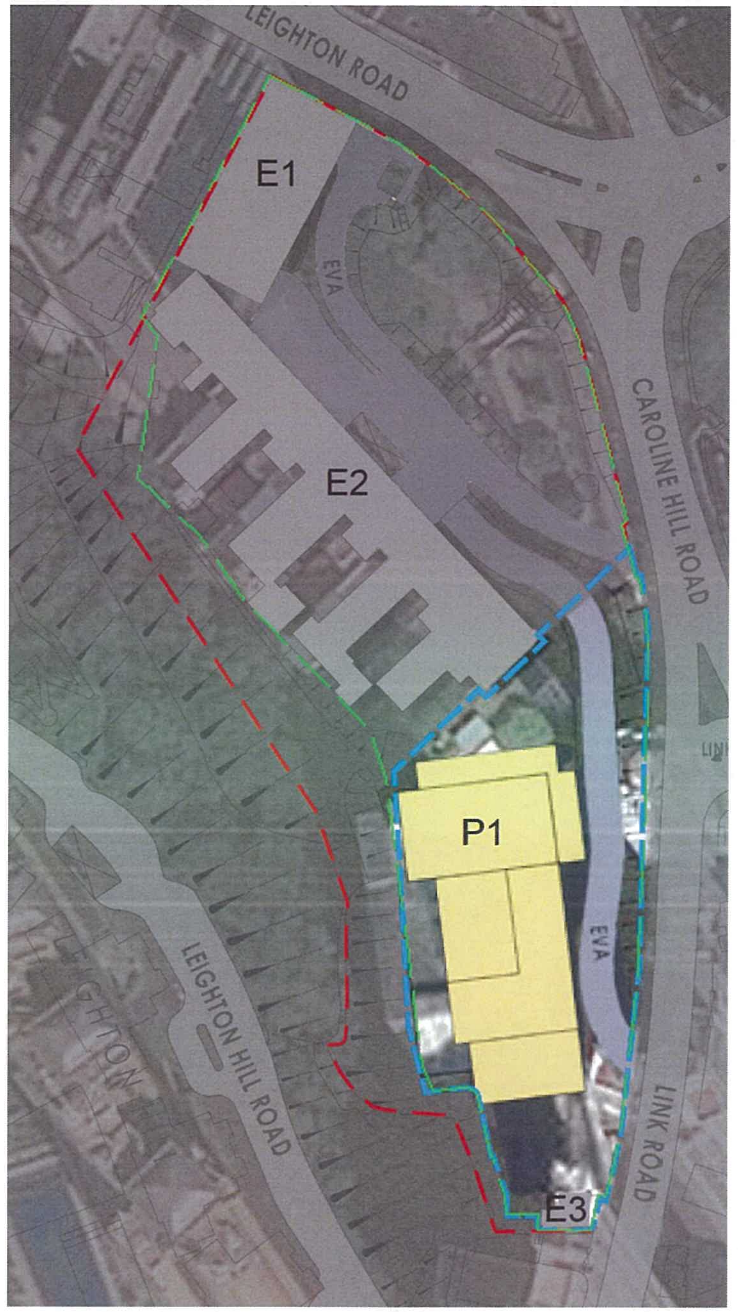
Table 1.2.2
(GFA Calculation of Existing Buildings in Headquarters)

		GFA (sqm)
E1	Existing HKU SPACE PLK Community College	16130
E2	Existing Main Building	2815
E3	Transformer & Switch Room	N/A
E4	Existing Nursery Building	1000
E5	Existing Children Services Building	680
E6	Existing Welfare Building	8501
E7	Existing Vocational Training Building	890
	Total	**30016**

Affected Buildings in Redevelopment Site

Table 1.2.3
(GFA Calculation for Proposed Redevelopment)

Total GFA (sqm)	
18/F	400
17/F	400
16/F	620
15/F	620
14/F	620
13/F	820
12/F	820
11/F	820
10/F	820
9/F	820
8/F	820
7/F	1210
6/F	905
5/F	905
4/F	1400
3/F	1400
2/F	1400
1/F	1400
G/F	1400
LG1/F	590
LG2/F	590
Grand Total GFA	**18780**



Overall Site Boundary
Overall Net Site Boundary
Net Site Boundary

Table 1.2.4
(Overall Site Coverage / Plot Ratio of Headquarters)

Overall Site Coverage (=3980/12272)	**32%**
GFA (sqm) ***[A]***	**37725**
Site Area (sqm) ***[B]*** (Red Boundary)	**12272**
Plot Ratio = ***[A]/[B]***	**3.07**

Table 1.2.5
(Overall Net Site Area/Plot Ratio concerned)

	Area (sqm)
Overall Net Site Area ***[C]*** (Green Boundary)	10405
Total GFA of Proposed Extension ***[D]***	**37725**
Plot Ratio = *[D]/[C]*	**3.63**

Table 1.2.6
(Net Site Area/Plot Ratio concerned)

	Area (sqm)
Net Site Area ***[E]*** (Blue Boundary)	3765
Total GFA of Proposed Extension ***[F]***	18780
Plot Ratio at Southern Portion of the site = *[F]/[E]*	**4.988**

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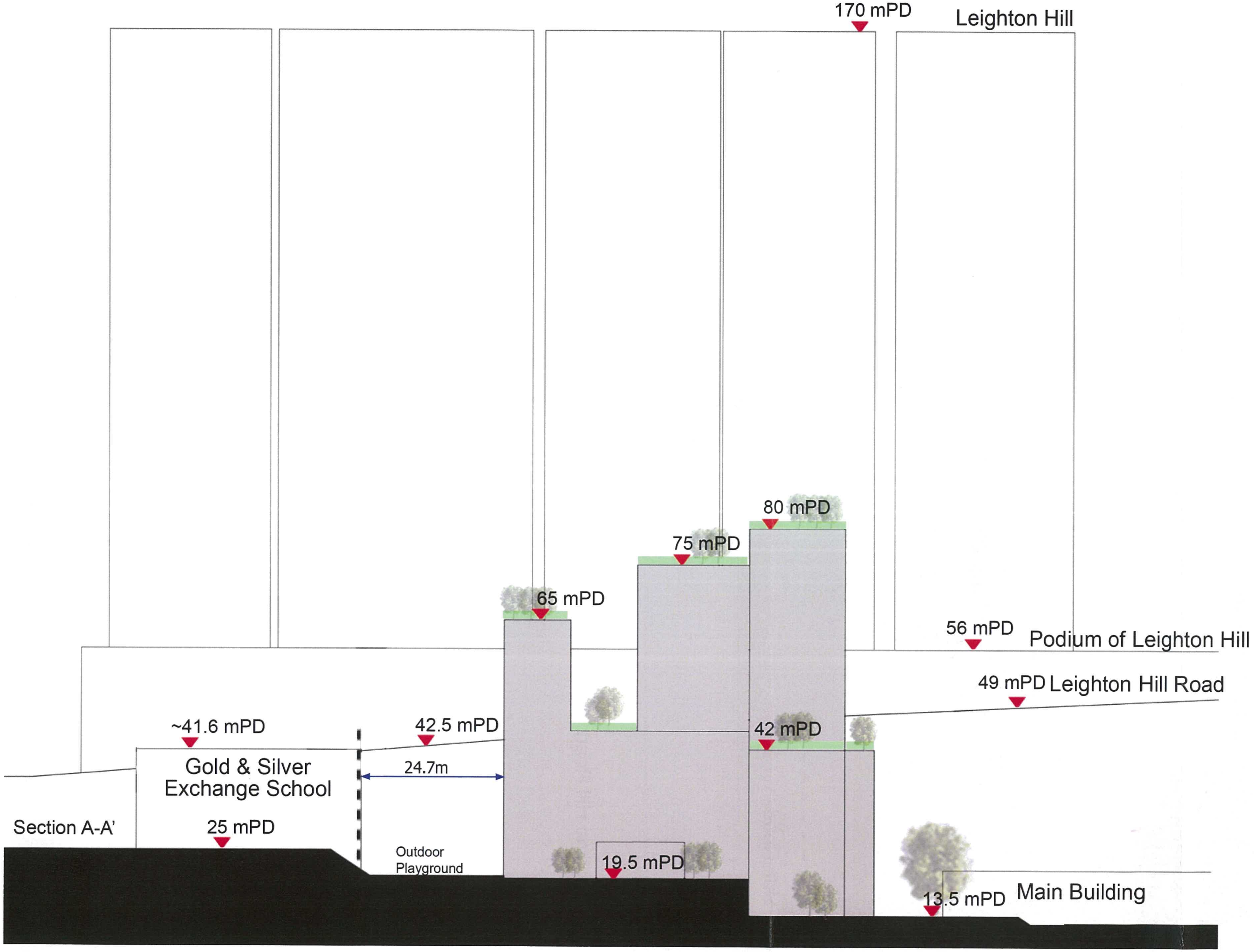
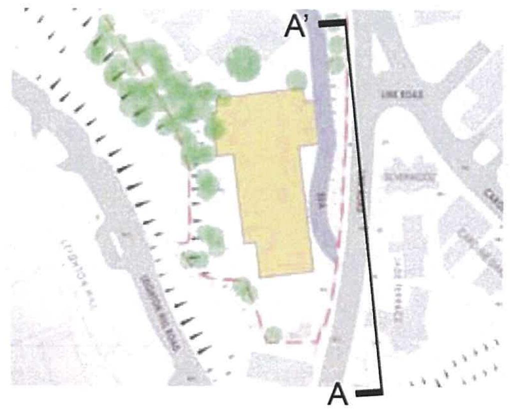
issue date	*25/9/2015*	***drawn by***	*CC*	GFA, Site Coverage and Plot Ratio Calculation of Proposed Redevelopment	
project	*Technical Feasibility Study for the Redevelopment of East Wing of Po Leung Kuk*	***checked by***	*EC*		
		approvedby	*BL*	***scale*** -	***drawing & revision no*** **A510/PD/002**





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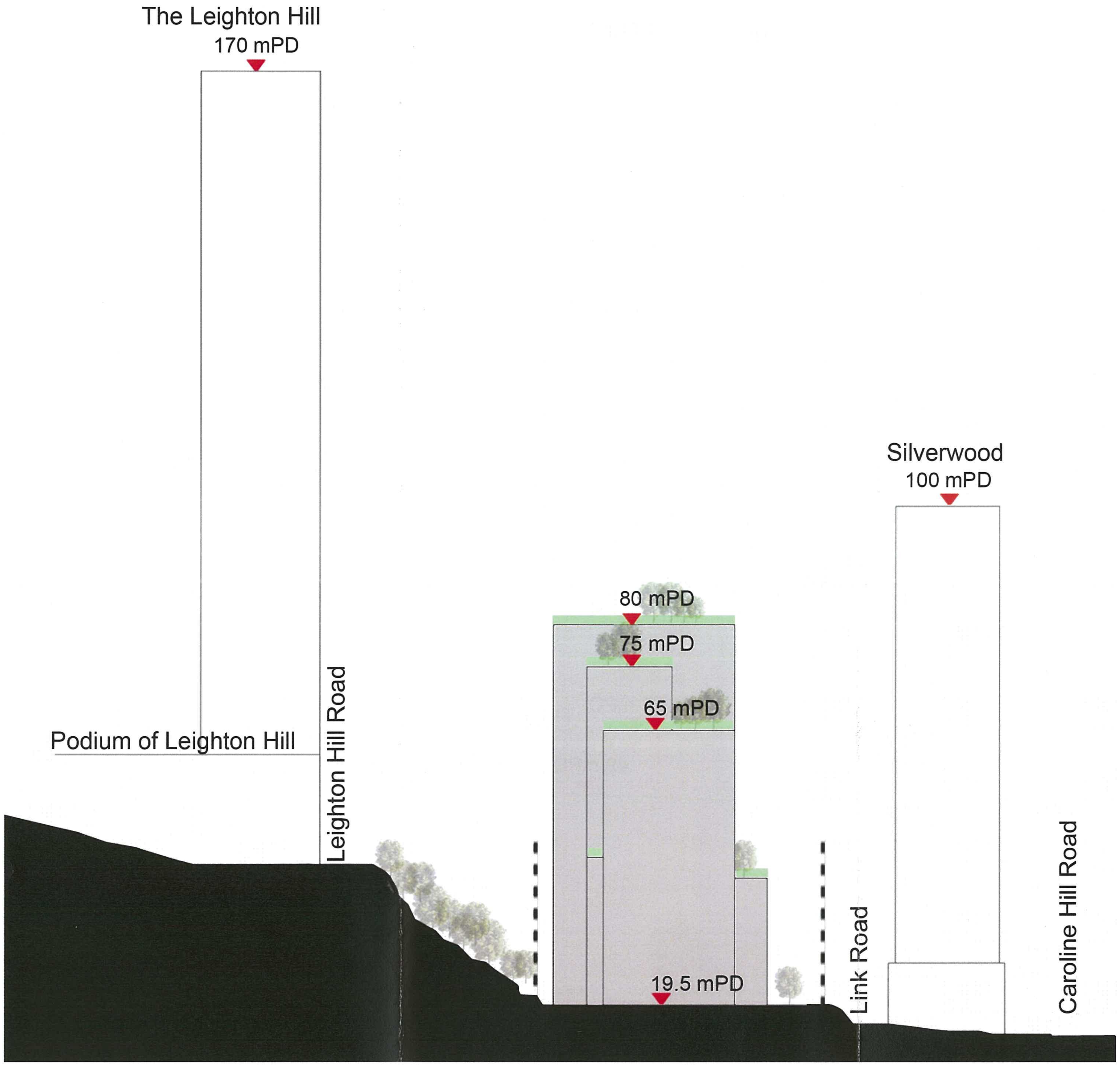
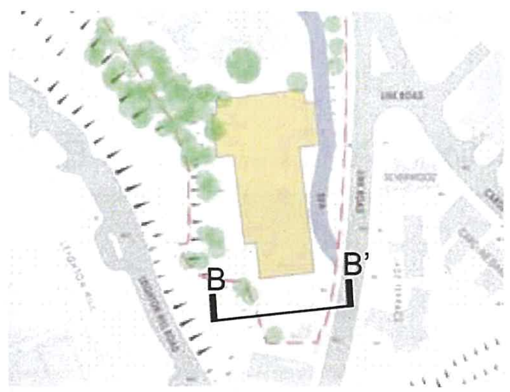
issue date	*25/9/2015*	***drawn by***	*CC*	Longitudinal Section Through The Site (A-A')
project	*Technical Feasibility Study for the Redevelopment of East Wing of Po Leung Kuk*	***checked by***	*EC*	
		approvedby	*BL*	***scale*** 1:800 ***drawing & revision no*** **A510/PD/003**



Section B-B'



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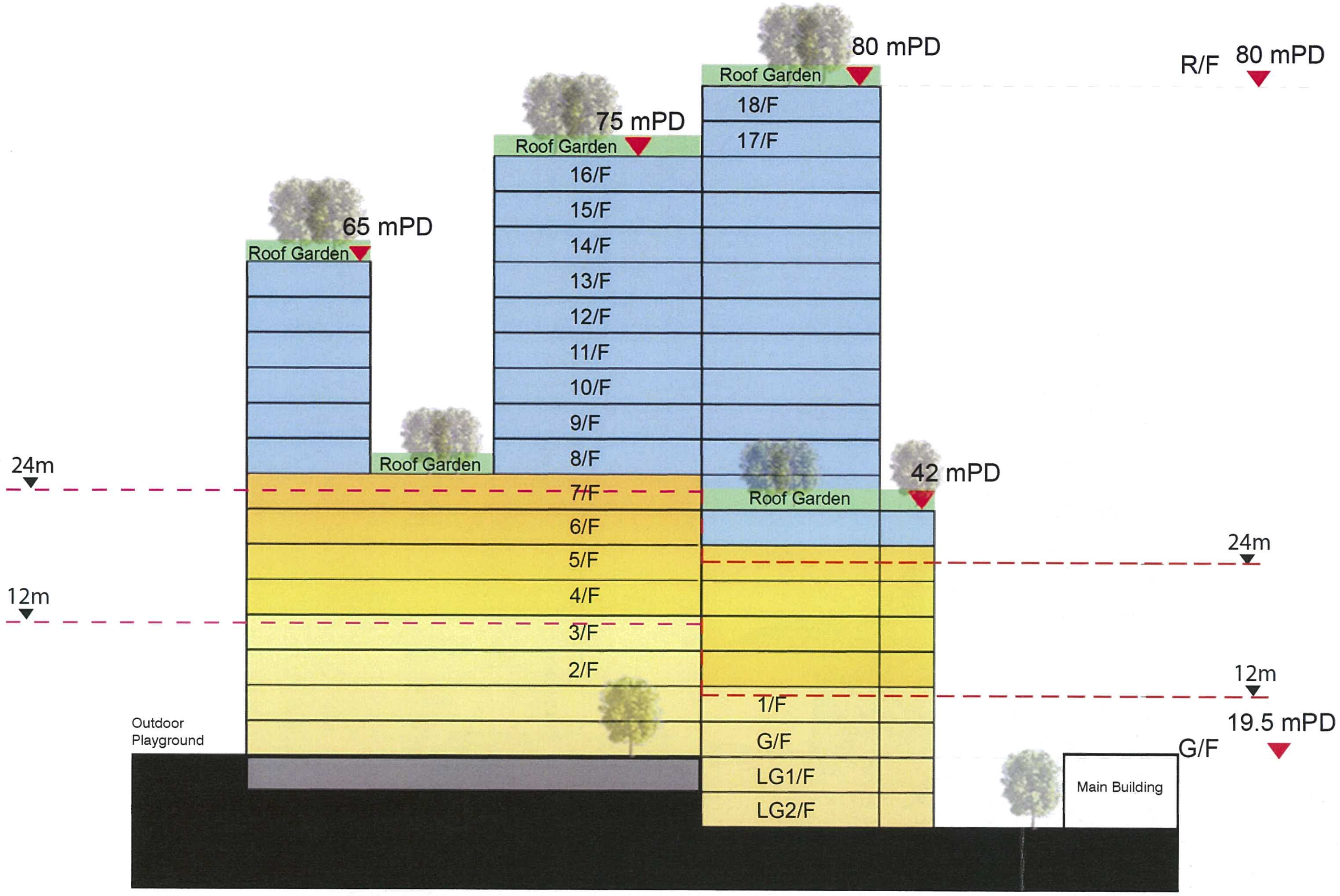
issue date	25/9/2015	**drawn by**	CC	Cross Section Through The Site (B-B')
project	*Technical Feasibility Study for the Redevelopment of East Wing of Po Leung Kuk*	**checked by**	EC	
		approvedby	BL	**scale** 1:800 **drawing & revision no** A510 /PD/004



Section A-A'

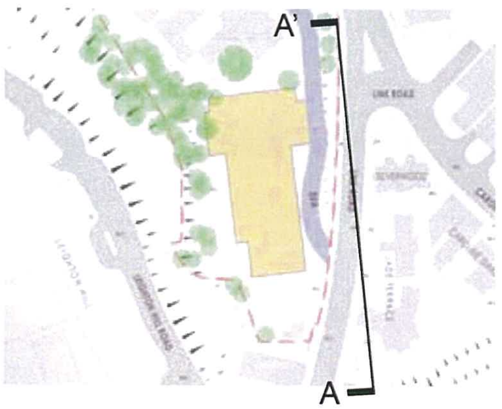


Table 1.5.1 (Uses of Proposed Redevelopment)

	GIC Uses
Floor above 24m	• PLK's Administration Office * • Administration Offices & Supporting Facilities for GIC * • Youth Services • Adoption Services Unit * • Centre for Children with special needs * • Student Support Service * • Parent Education Service * • Resource/Learning Centre *
Floor below 24m	• School Hall*# • Children Care Services (over 6-years-old) * • Elderly Care / Day Care Centre • Kindergarten cum Nursery * • Integrated Children Enhancement Programme * • Children Development Centre - Children Art Centre * - Centre for Children with High Abilities * • Student Guidance Service (Primary and Secondary) * • District-based Speech Therapy Service * • Pre-primary Education Service Centre *
Floor below 12m	• Children Care Services (under 6-years-old) • Babies Section * • New Comers' Ward * • Day Creche * • Kinder Section *
	• Supporting Facilities for GIC *

* Reprovision of existing services

\# School Hall may also be used as Basketball Court for future operation

Table 1.5.2
(GFA Summary for Proposed Redevelopment)

	Total GFA (sqm)
Floor above 24m	8335
Floor below 24m	4645
Floor below 12m	5800
Total GFA	**18780**

LEGEND

- Boundary Line
- Private Open Space
- Carparking/Basement
- Government/Institution or Community (above 24m)
- Government/Institution or Community (below 24m)
- Government/Institution or Community (below 12m)

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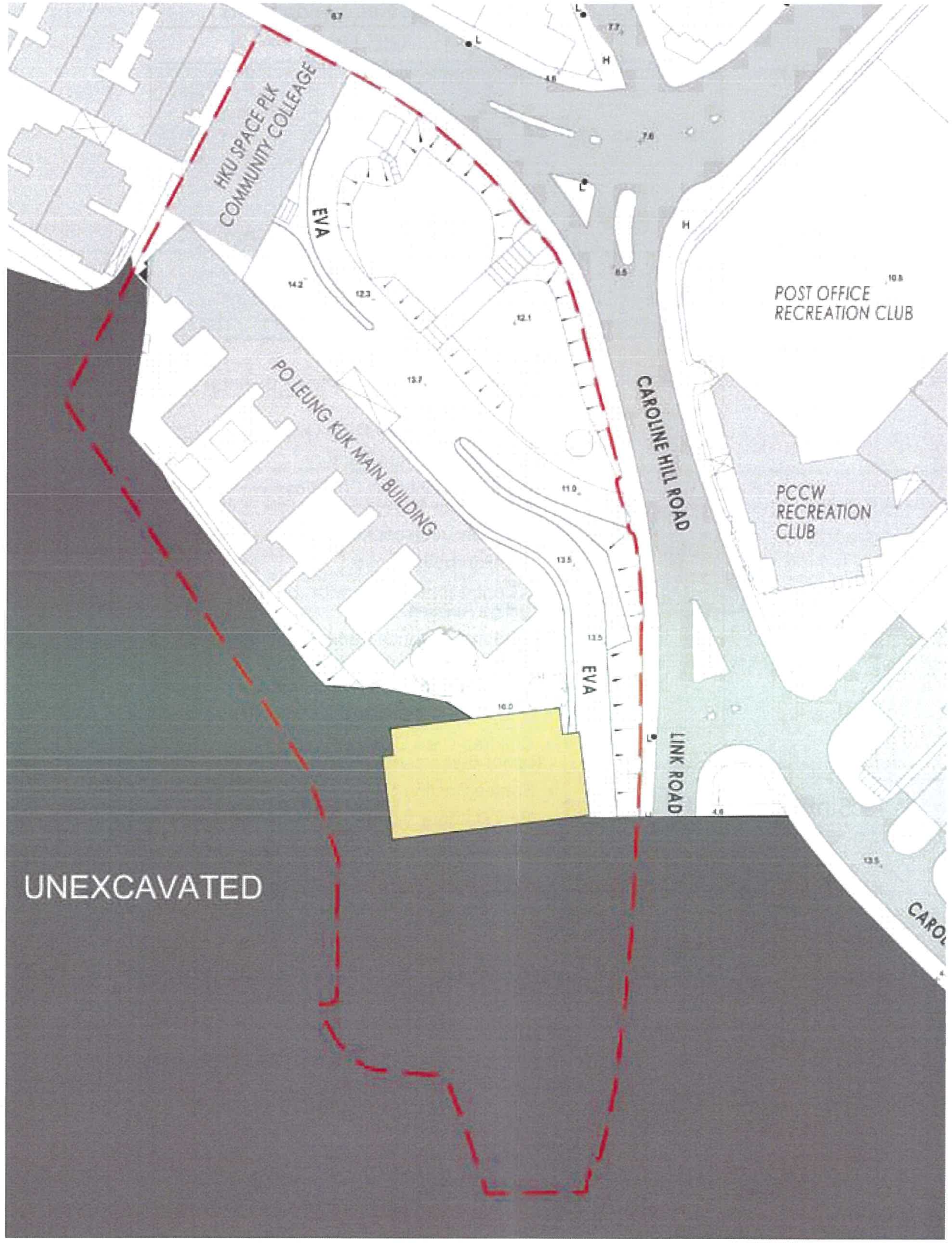
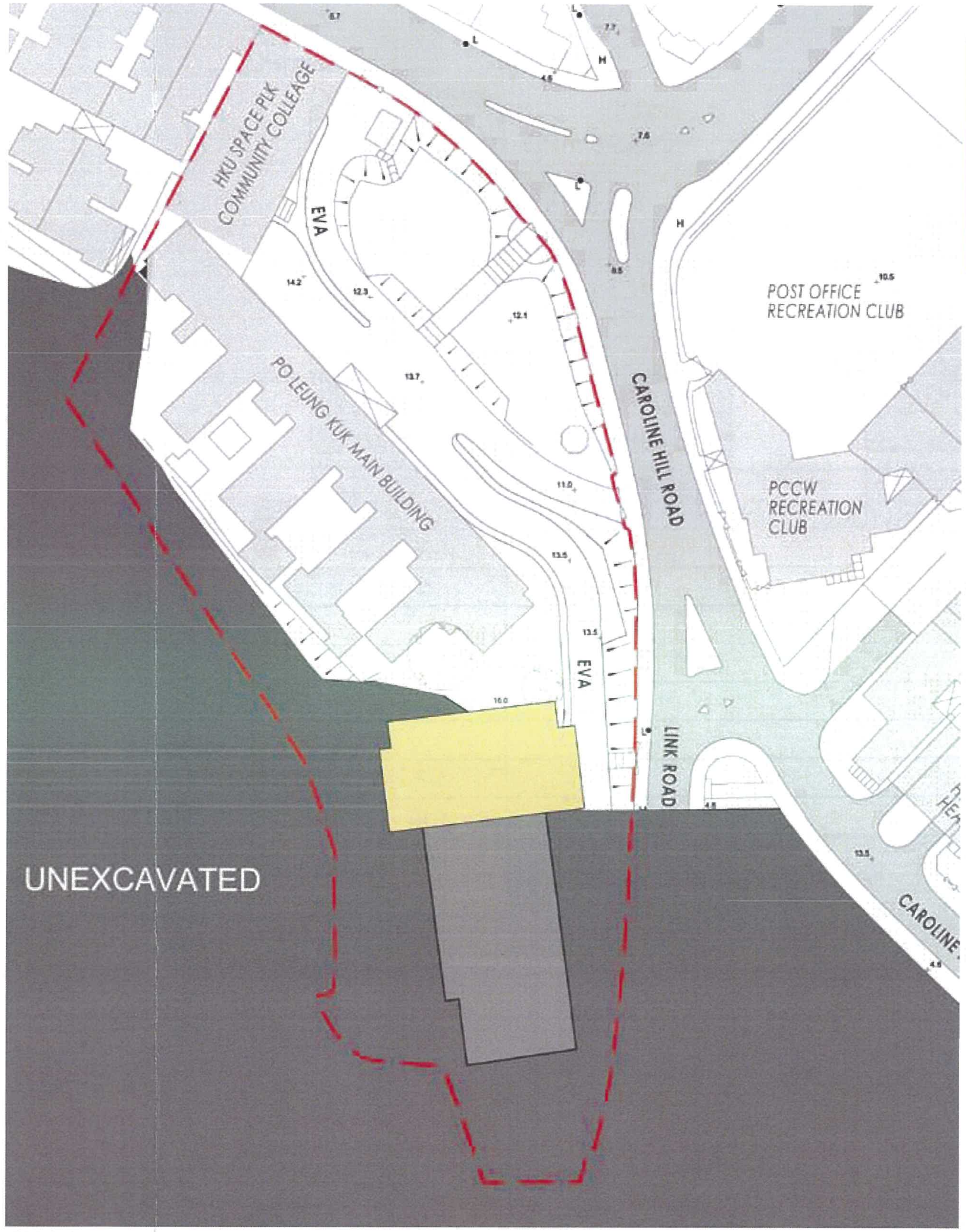
保良局
PO LEUNG KUK

issue date	*25/9/2015*	***drawn by***	*CC*	Section A-A'
project	*Technical Feasibility Study for the Redevelopment of East Wing of Po Leung Kuk*	***checked by***	*EC*	
		approved by	*BL*	***scale*** 1:600 ***drawing & revision no*** **A510/PD/005**



LG2/F
GFA: 590sqm



LG1/F
GFA: 590sqm

GIC (LG1-LG2/F)

- Children Care Services (under 6-years-old)
- Babies Section *
- New Comers' Ward *
- Day Creche *
- Kinder Section *
- Supporting Facilities for GIC *

* Reprovision of existing services

LEGEND

Boundary Line

Carparking/ Basement

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issue date	25/9/2015	drawn by	CC				
project	Technical Feasibility Study for the Redevelopment of East Wing of Po Leung Kuk	checked by	EC				
		approvedby	BL	scale	1:1000	drawing & revision no	A510/PD/006

G-1/F
GFA: 1400x2=2800sqm

GIC (G-1/F)

- Children Care Services (under 6-years-old)
- Babies Section *
- New Comers' Ward *
- Day Creche *
- Kinder Section *

* Reprovision of existing services

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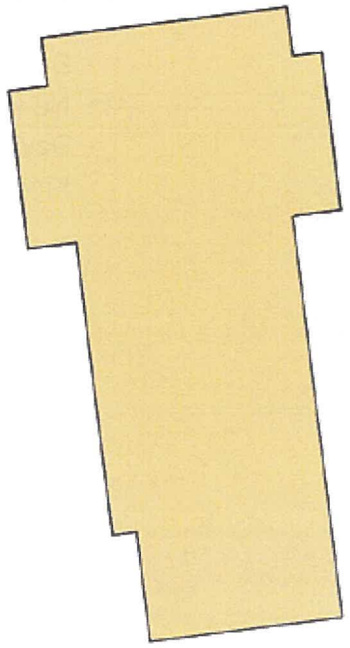
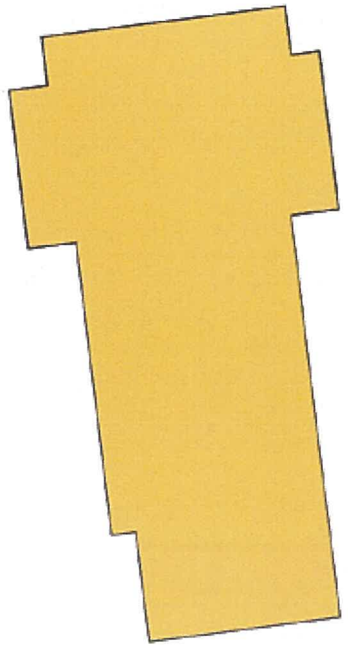
PO LEUNG KUK

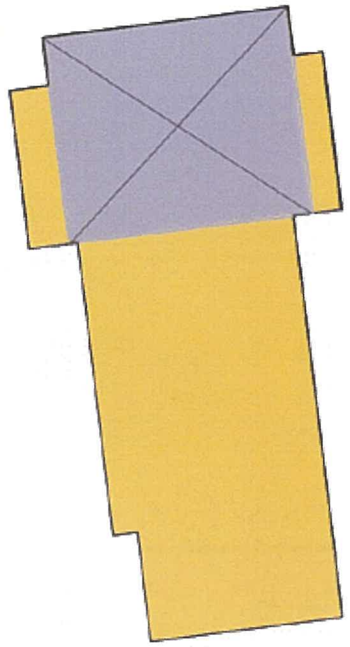
issue date	25/9/2015	drawn by	CC	G-1/F Floor Plan
project	Technical Feasibility Study for the Redevelopment of East Wing of Po Leung Kuk	checked by	EC	
		approved by	BL	scale 1:1000 — drawing & revision no A510/PD/007



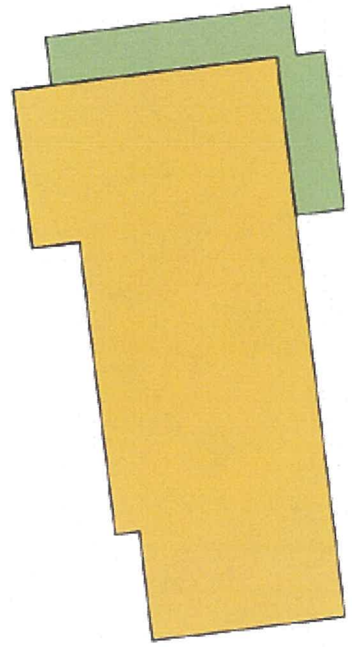
2-3/F
GFA: 1400x2=2800sqm



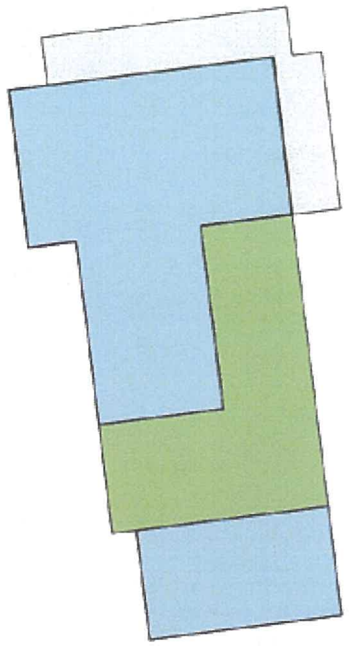
4/F
GFA: 1400sqm



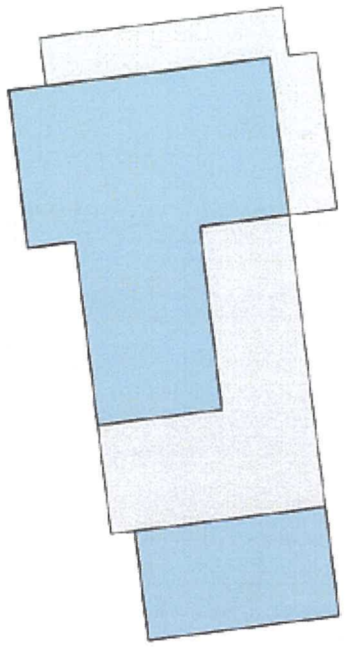
5-6/F
GFA: 905x2=1810sqm



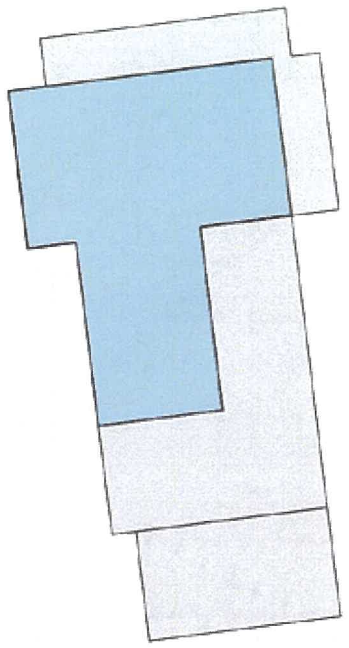
7/F
GFA: 1210sqm



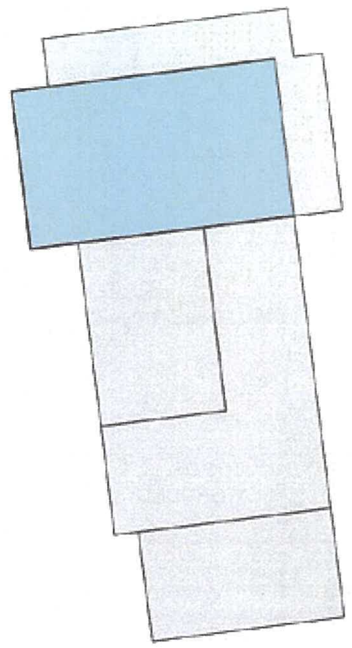
8/F
GFA: 820sqm



9-13/F
GFA: 820x5=4100sqm



14-16/F
GFA: 620x3=1860sqm



17-18/F
GFA: 400x2=800sqm

GIC (8-18/F)

- PLK's Administration Office *
- Administration Offices & Supporting Facilities for GIC *
- Youth Services
- Adoption Services Unit *
- Centre for Children with special needs *
- Student Support Service *
- Parent Education Service *
- Resource/Learning Centre *

GIC (4-7/F)

- School Hall *#
- Children Care Services (over 6-years-old) *
- Elderly Care / Day Care Centre
- Kindergarten cum Nursery *
- Integrated Children Enhancement Programme *
- Children Development Centre
  - Children Art Centre *
  - Centre for Children with High Abilities *
- Student Guidance Service (Primary and Secondary) *
- District-based Speech Therapy Service *
- Pre-primary Education Service Centre *

GIC (2-3/F)

- Children Care Services (under 6-years-old)
- Babies Section *
- New Comers' Ward *
- Day Creche *
- Kinder Section *

* Reprovision of existing services
\# School Hall may also be used as Basketball Court for future operation

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issue date	25/9/2015	**drawn by**	CC	2-18/F Floor Plan
project	*Technical Feasibility Study for the Redevelopment of East Wing of Po Leung Kuk*	**checked by**	EC	
		approvedby	BL	**scale** 1:1000 **drawing & revision no** A510/PD/008

Trees to be transplanted

New compensation trees

Trees to be felled

Note

- The tree data was based on the Topographical Survey conducted in Sep. 2015.
- A total 4 nos. of trees to be felled; to be compensated with 7 nos. of new trees of 0.2m dia. each.

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PO LEUNG KUK

issue date	*25/9/2015*	*drawn by*	CC	Tree Compensation Plan
project	*Technical Feasibility Study for the Redevelopment of East Wing of Po Leung Kuk*	*checked by*	EC	
		approved by	BL	
scale	1:1000	*drawing & revision no*	A510/PD/009	

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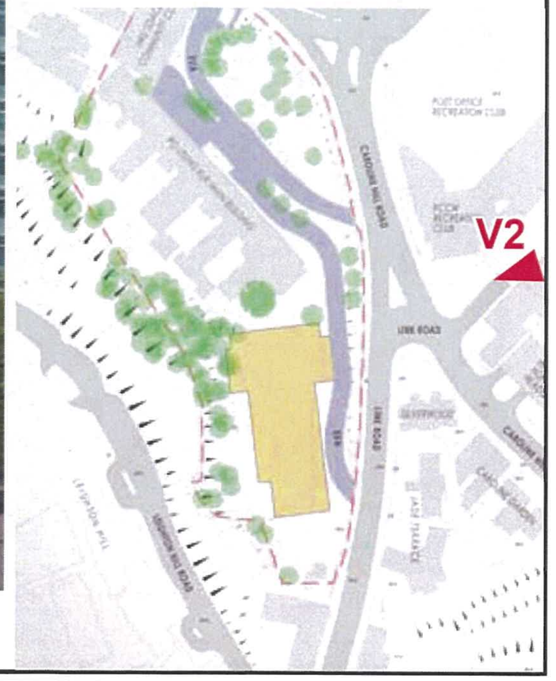
PO LEUNG KUK

issue date	25/9/2015	**drawn by**	CC	V1 - View from Street Level
project	Technical Feasibility Study for the Redevelopment of East Wing of Po Leung Kuk	**checked by**	EC	
		approvedby	BL	**scale** - **drawing & revision no** A510/PD/010



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PO LEUNG KUK

issue date	25/9/2015	drawn by	CC	V2 - Stepping Facade from the Main Building
project	Technical Feasibility Study for the Redevelopment of East Wing of Po Leung Kuk	checked by	EC	
		approved by	BL	scale - / drawing & revision no A510/PD/011

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PO LEUNG KUK

issue date	25/9/2015	drawn by	CC	V3 - View from street level
project	Technical Feasibility Study for the Redevelopment of East Wing of Po Leung Kuk	checked by	EC	
		approved by	BL	scale -

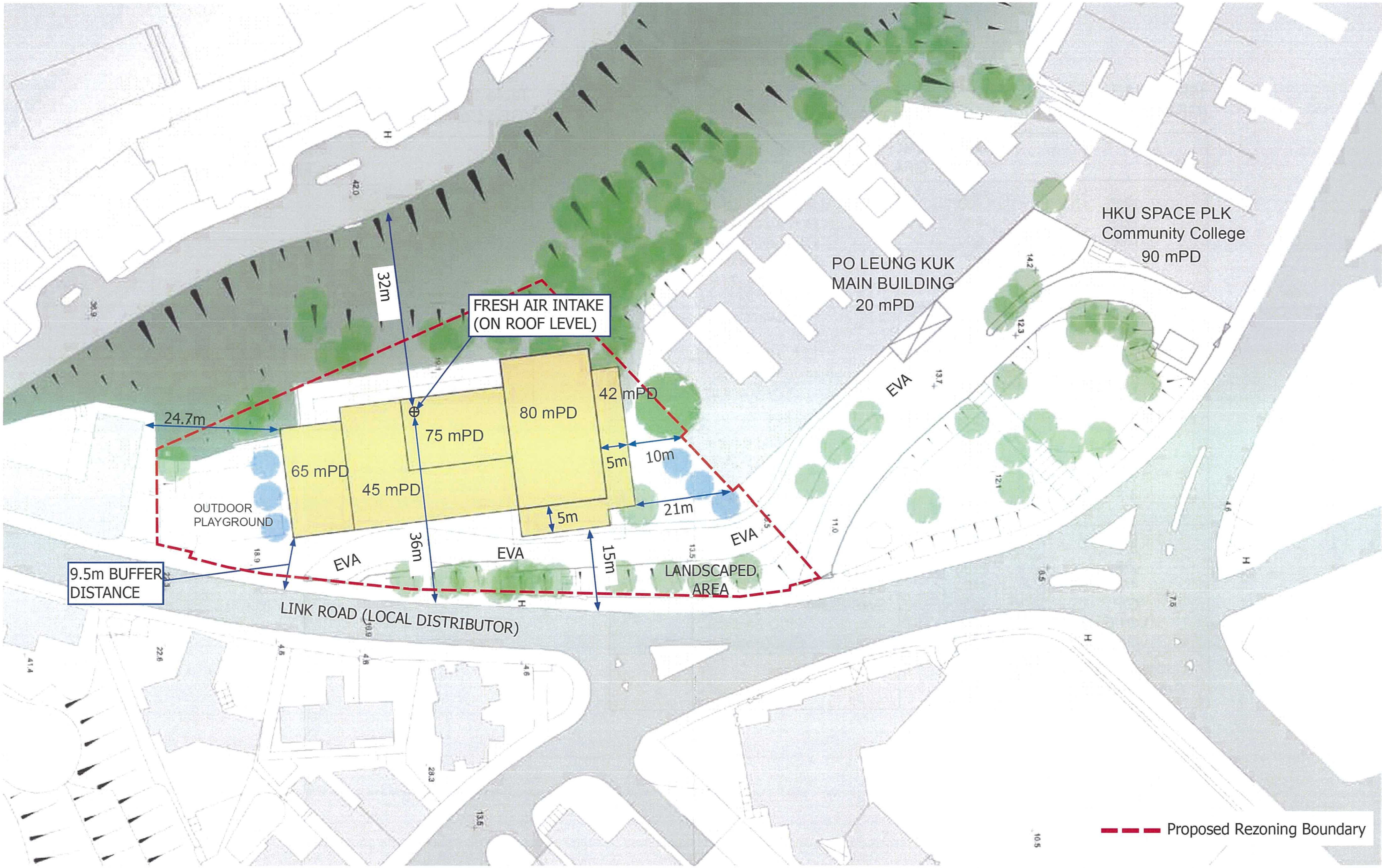
drawing & revision no A510/PD/012

Table 1.14.1
(GFA Calculation for Proposed Redevelopment)

	總樓面面積 (平方米) Total GFA (sqm)	
18/F	400	PLK Administration
17/F	400	PLK Administration
16/F	620	PLK Administration
15/F	620	PLK Administration
14/F	620	PLK Administration
13/F	820	PLK Administration
12/F	820	PLK Administration
11/F	820	PLK Administration
10/F	820	PLK Administration
9/F	820	PLK Administration and SWD Facilities
8/F	820	SWD Facilities
7/F	1210	SWD Facilities and Education Services
6/F	905	SWD Facilities and Education Services
5/F	905	SWD Facilities
4/F	1400	SWD Facilities
3/F	1400	SWD Facilities
2/F	1400	SWD Facilities
1/F	1400	SWD Facilities and Education Services
G/F	1400	SWD Facilities and Education Services
LG1/F	590	SWD Facilities
LG2/F	590	SWD Facilities
總樓面面積總和 **Grand Total GFA**	**18780**	

Table 1.14.2
(GFA Calculation for Proposed Redevelopment)

	總樓面面積 (平方米) Total GFA (sqm)
PLK Administration	6300
SWD Facilities	10450
Education Services	2030
總樓面面積總和 **Grand Total GFA**	18780



- 9.5m buffer distance measured from the edge of road kerb to the boundary of open space sites. (refer to Hong Kong Planning Standard Guidelines, Chapter 9)

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issue date	25/9/2015	**drawn by**	CC	Buffer Distance
project	Technical Feasibility Study for the Redevelopment of East Wing of Po Leung Kuk	**checked by**	EC	
		approvedby	BL	**scale** - **drawing & revision no** A510/PD/014

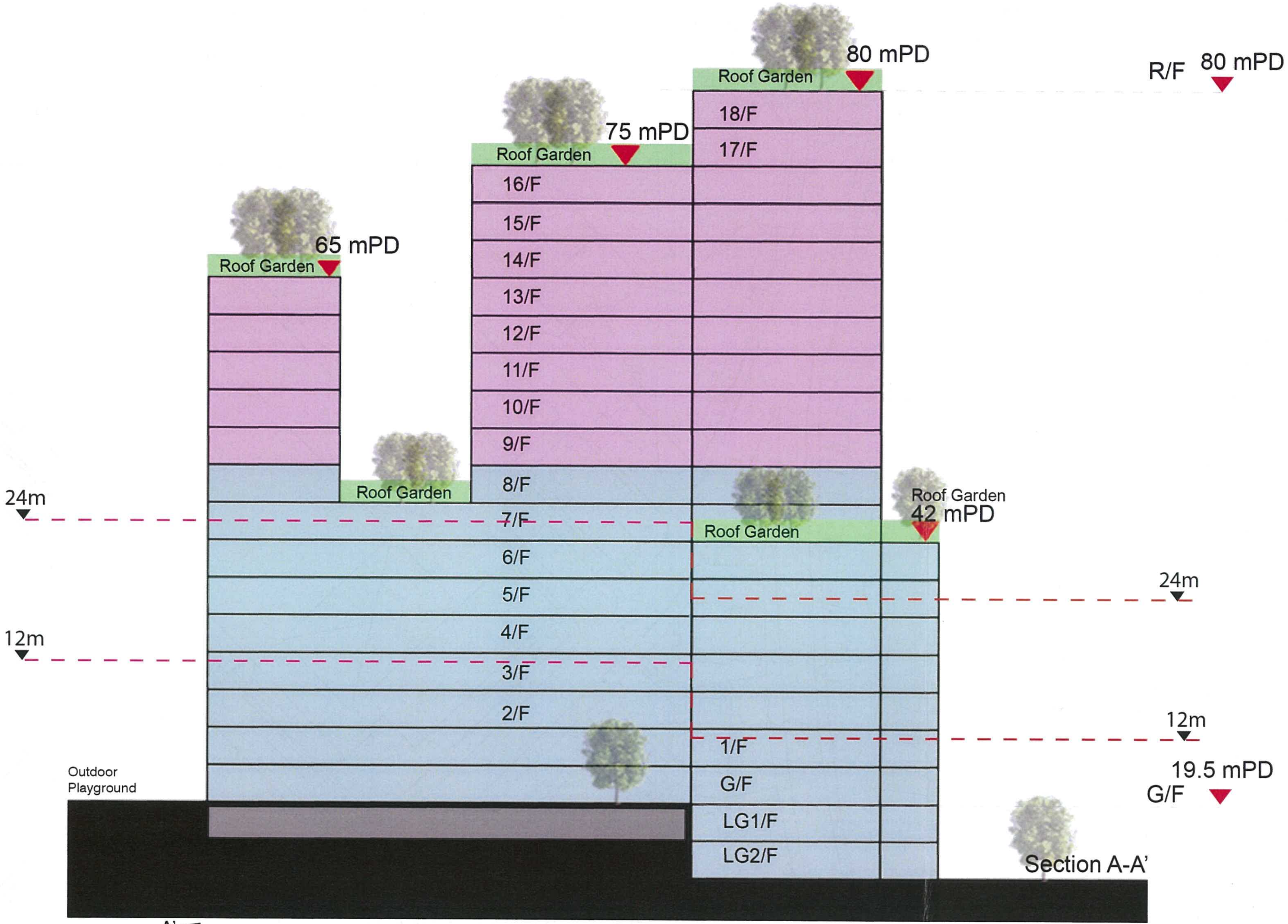
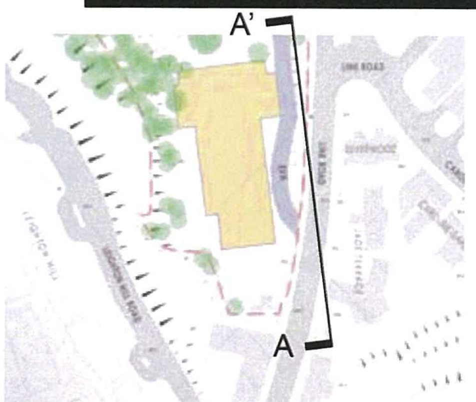


Table 1.16.1
(GFA Calculation for Proposed Redevelopment)

	Total GFA (sqm)
PLK Administration	6300
SWD Facilities and Education Services	10450+2030 = 12480

Total GFA (sqm)	
18/F	400
17/F	400
16/F	620
15/F	620
14/F	620
13/F	820
12/F	820
11/F	820
10/F	820
9/F	625
9/F	195
8/F	820
7/F	1210
6/F	905
5/F	905
4/F	1400
3/F	1400
2/F	1400
1/F	1400
G/F	1400
LG1/F	590
LG2/F	590
Grand Total GFA	**18780**



LEGEND

- Boundary Line
- Private Open Space
- Carparking/Basement

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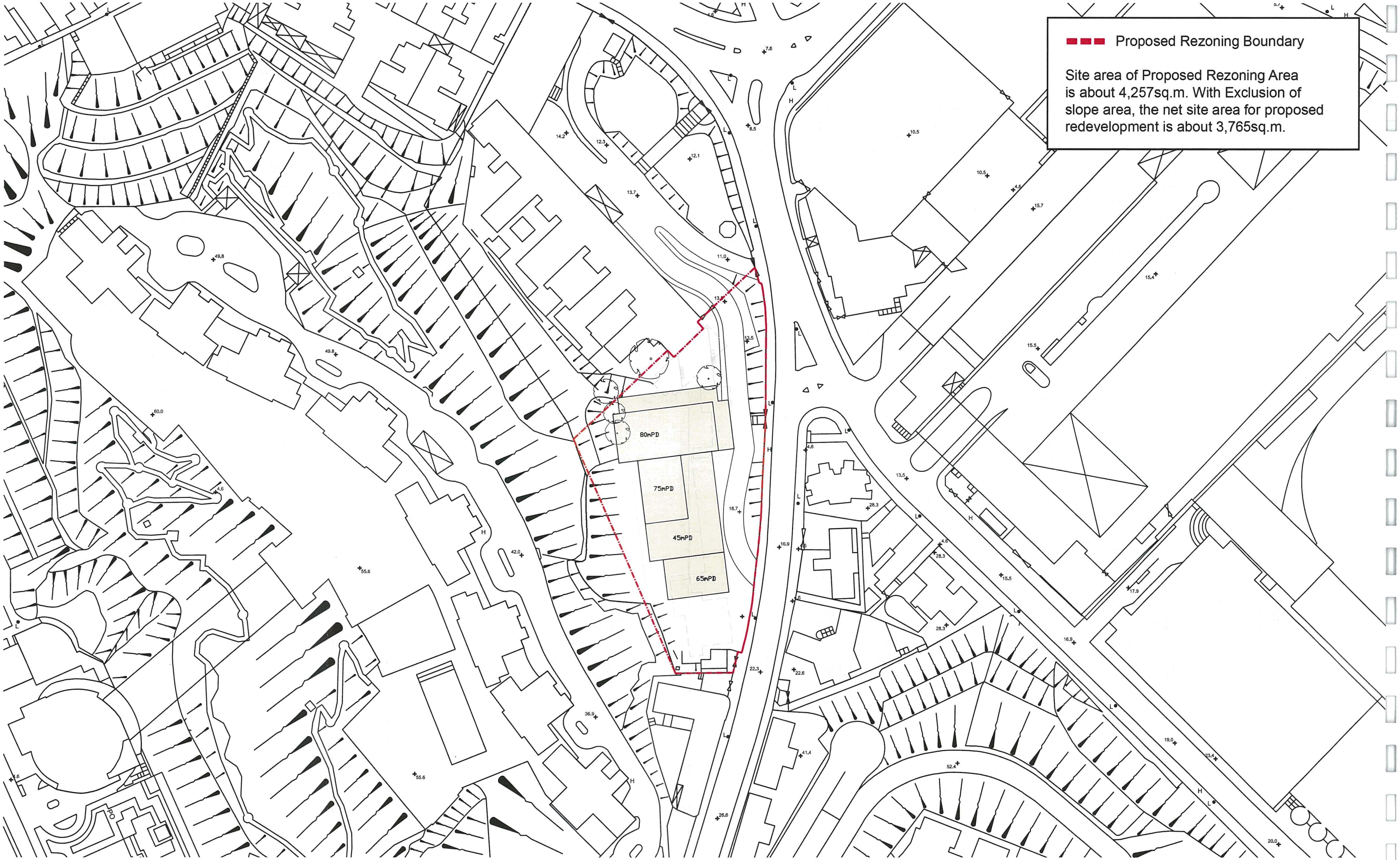
PO LEUNG KUK

issue date	25/9/2015	**drawn by**	CC	Section A-A'
project	*Technical Feasibility Study for the Redevelopment of East Wing of Po Leung Kuk*	**checked by**	EC	
		approved by	BL	
scale	1:500	**drawing & revision no**	A510/PD/015	



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PO LEUNG KUK

issue date	25/9/2015	**drawn by**	CC	Site Plan
project	Technical Feasibility Study for the Redevelopment of East Wing of Po Leung Kuk	**checked by**	EC	
		approved by	BL	**scale** 1:1000 (A3) **drawing & revision no** A510/PD/016

APPENDIX III

VISUAL APPRAISAL

Visual Appraisal for the Proposed Redevelopment of the East Wing of Po Leung Kuk Headquarters

1. Background

Po Leung Kuk (PLK) Headquarters is located at 66 Leighton Road, Causeway Bay, Hong Kong. In view of the growing demand for community and social welfare services, PLK intends to redevelop the East Wing of its Headquarters at Leighton Road and to expand their services to different sectors of the community. The proposed redevelopment will provide education, residential care and day care services for children, other ancillary facilities including administration office for the Headquarters, as well as increasing community and social welfare services for youngsters and elderly.

This visual appraisal is conducted to review the visual impact of the proposed redevelopment to the neighbourhood.

2. Site Context

The proposed redevelopment site is located within PLK Headquarters compound. There are 4 existing building blocks in the redevelopment site (including the Extension Wing of Main Building, Po Leung Kuk Vicwood K. T. Chong Building, Po Leung Kuk Kwok Law Kwai Chun Children Services Building and Vocational Training Centre) and their existing building height ranges from 3 to 13 storeys. The redevelopment site has different site formation levels. It is proposed to redevelop the site with a building height ranging from 7 storeys above 2 lower ground levels (42mPD) to 19 storeys (80mPD) above 2 lower ground levels .

Also within PLK HQ compound are the 3-storeyed (with a building height of 23.7mPD) PLK Main Building which is currently a Grade 2 historic building located to the north of the redevelopment site. HKU SPACE Po Leung Kuk Community College TY Wong Building, with a building height of about 90mPD is located further north, The PLK Gold & Silver Exchange Society Pershing Tsang School (about 41.6mPD) is located to the south.

The PLK HQ compound is located amid a mixed residential, commercial and "G/IC" uses in the centre of Causeway Bay. To the northeast across Leighton Road are the mixed commercial/residential uses including the Zoroastrian Building (about 86.3mPD) and Lippo Leighton Tower (about 104.2mPD). The PCCW Recreation Club has a building height of about 19.1mPD and the former CAD Headquarters Building has about 39.9mPD. To the East across Caroline Hill Road is the EMSD workshop of about 70mPD, but this site will be redeveloped for commercial/residential uses in the future. Across Link Road to the East are the residential buildings including Silverwood (about 107.8mPD) and Caroline Heights (about 88mPD) and Jade Terrace (about 99.1mPD). To the west of the redevelopment site is a knoll with man-made slopes. On this knoll is the residential development of The Leighton Hill which is built on a platform ranging from about 42 to 49mPD. The 8 residential towers have building heights ranging from about 159.7mPD to about 170.7mPD.

3. *Design Efforts to Respect the Main Building and the Neighbourhood*

Various design efforts were made to minimize the visual impact of the proposed redevelopment to the surroundings. These include:

- **Stepped height profile** is adopted in the proposed redevelopment. The building has an overall stepped height profile with various levels ranging from 42mPD to 80mPD. In order to respect the PLK Main Building which is currently a Grade 2 historic building, the proposed redevelopment will set back for 5m at 42mPD and above facing the Main Building. On the other side facing Link Road and the residential buildings, the redevelopment also features a stepped height at 42mPD. This will allow for more spacious separation from the residential towers.

- **Terraced, landscaped roof gardens** and **vertical greening** are proposed at different levels including the lower level (13.5mPD), ground level (19.5mPD) as well as roof levels of 42mPD, 65mPD, 75mPD and 80mPD. This greening efforts will integrate more coherently with the scale and character of the Main Building as well as the neighbourhood;

- In order to ensure **visual permeability**, **building separation** between the Main Building and the proposed redevelopment will be provided. The opening of the visual separation facing Link Road is about 21m, while it narrows to about 10m at the back where it is shielded by trees and landscaping in a courtyard. The existing trees will be preserved as far as possible and new trees are proposed at the courtyard to enhance **visual amenity**;

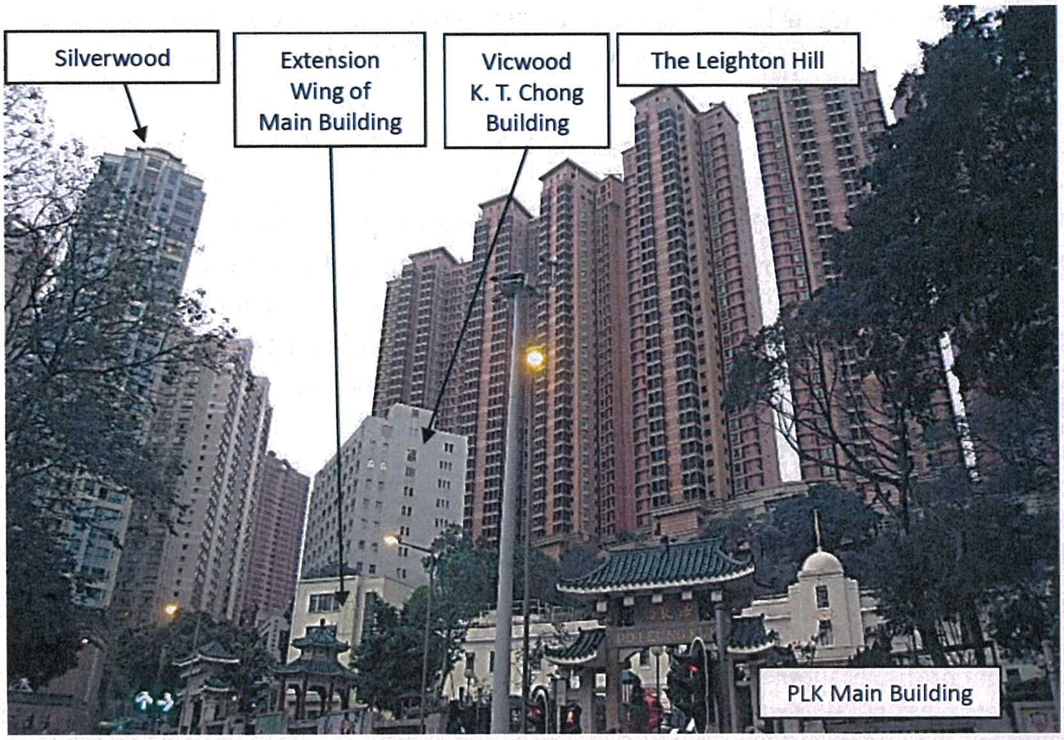
- In order to enhance **visual and air permeability** between the proposed redevelopment and adjacent buildings, including The PLK Gold & Silver Exchange Society Pershing Tsang School to the south, Jade Terrace and Caroline Height across Link Road to the east, a wide building gap of about 24m is proposed respectively.

4. *Viewpoints*

The redevelopment site is located in a high-rise and high density residential neighbourhood and it is only visible at pedestrian level from pedestrian level when viewing from north and south, therefore two viewpoints, one at Leighton Road (Vp1) and another one at Link Road (Vp2), are selected in the visual appraisal.

5. Discussion

Vp 1 - View from Leighton Road from the North



Existing View

Photomontage of Proposed Redevelopment

Vp 1 - View from Leighton Road from the North

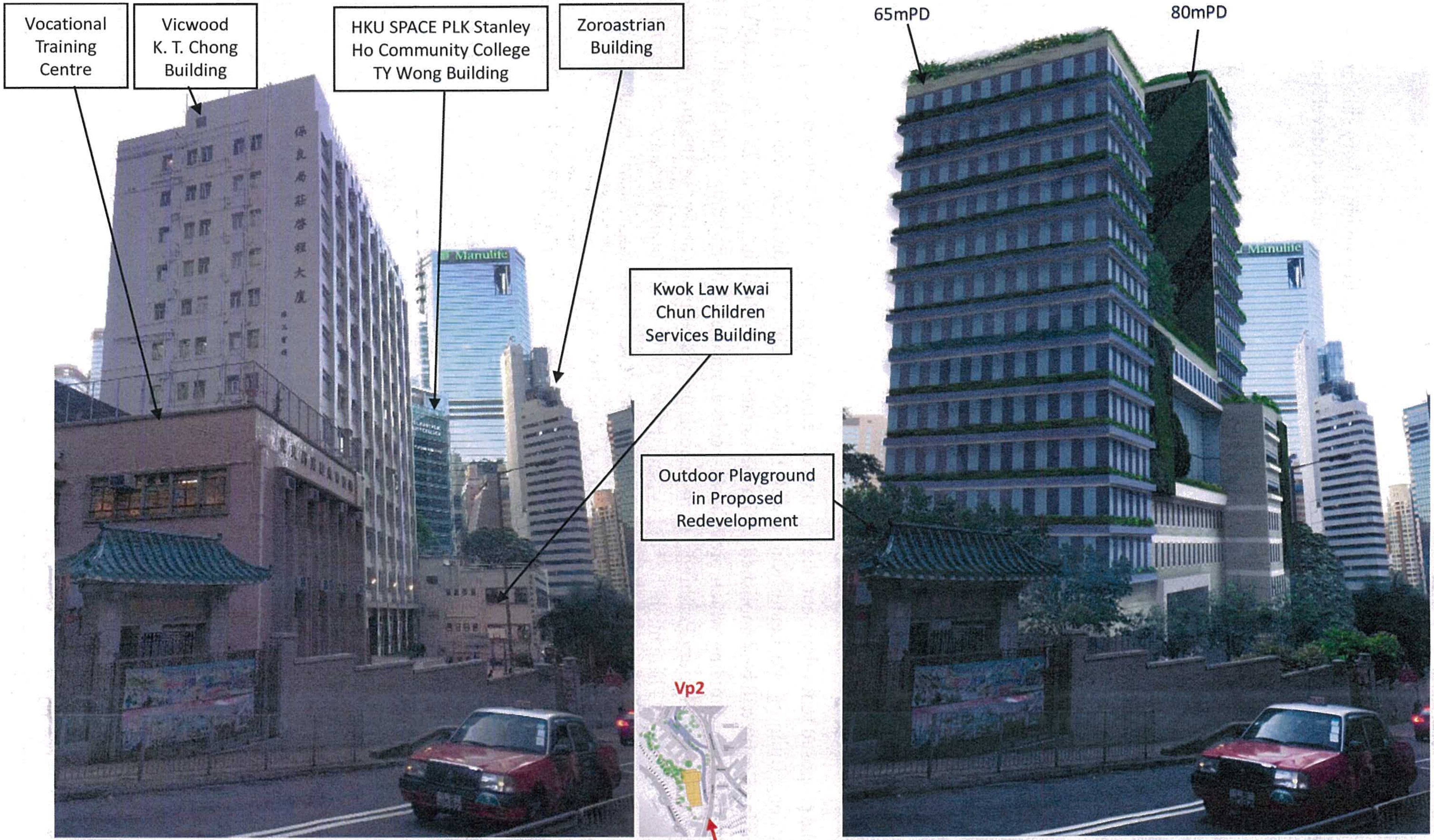
When viewing from north at pedestrian level, the increase in building height is apparent, as the existing Vicwood K. T. Chong Building has 13 storeys and the proposed redevelopment has a maximum building height of 19 storeys above 2 lower ground levels (80mPD). However, it will be seen against a backdrop of existing high-rise development (The Leighton Hill has a building height of about 170mPD) and therefore the character of these views are very similar, as demonstrated in the photomontage.

Since the Extension Wing of Main Building in the existing development will be demolished and there will be a set-back of a minimum of 10m from the Main Building in the proposed redevelopment, the distance from the Main Building will be increased in the proposed development. As a result, the visual separation between the Main Building and the adjacent building will be enhanced. Together with the existing trees to be preserved and new trees at the courtyard, the proposed redevelopment will be more compatible with the heritage building.

Terraced, landscaped roof gardens and vertical greening are proposed at different levels at the northern façade of the proposed redevelopment. As a result, the proposed redevelopment will be able to integrate more coherently with the scale and character of the Main Building.

The stepped height profile is adopted in the proposed redevelopment. The building height is descending from 80mPD to 42mPD for the nearest portion of the redeveloped building facing the Main Building. Coupled with the lush landscape treatment, the proposed redevelopment will respect and be compatible with the PLK Main Building. The varying height profile from 42mPD to 80mPD will break-up the visual mass of the proposed redevelopment, it will therefore create a more interesting and permeable development frontage.

Vp 2 - View from Link Road from the South



Existing View **Photomontage of the Proposed Redevelopment**

Vp 2 - View from Link Road from the South

When viewing from south at pedestrian level, the change in building height is very similar since the existing building height of Vicwood K. T. Chong Building is 13 storey and in the redevelopment proposal, the southern portion of the building is about 14 storey (65mPD) in height.

In the proposed redevelopment, the Vocational Training Centre in the south will be demolished and an outdoor playground with landscaping will be provided at southern part of the redevelopment. It will improve the visual permeability as the proposed redevelopment will provide a wide building separations from PLK Gold & Silver Exchange Society Pershing Tsang School in the south for greening and landscaping.

The new building in the redevelopment will have a wider facade, there will be variation in building height and design treatment to enrich the visual layers to make the building interesting. Together with a wider building set-back in the proposed redevelopment and proposed lush greening and landscaping, the proposed redevelopment will improve the visual permeability and amenity of the neighbourhood.

6. *Summary*

In the proposed redevelopment, the existing Extension Wing of Main Building, Po Leung Kuk Vicwood K. T. Chong Building, Po Leung Kuk Kwok Law Kwai Chun Children Services Building and Vocational Training Centre will be demolished. With the variation in the building height, as well as careful disposition of the proposed building which provide set-backs from the Main Building, Link Road and PLK Gold & Silver Exchange Society Pershing Tsang School, the visual permeability of the proposed redevelopment will be enhanced. There might be slight visual impact to the public at pedestrian level due to the increase in building height of the proposed redevelopment, however, these impacts will be greatly reduced by the design efforts adopted in the redevelopment scheme, including:

- Stepped height profile and variation in building form to respect the PLK Main Building and provision of set-back at 42mPD and above facing the Main Building;
- Stepped height profile facing Link Road and the residential buildings to allow for more spacious separation from the residential towers.
- Terraced, landscaped roof gardens and vertical greening at different levels of the proposed redevelopment to integrate coherently with the scale and character of the Main Building as well as the neighbourhood;
- Building separation between the Main Building and the proposed redevelopment, and preserving existing trees and planting new trees in between, to enhance visual openness;
- A wide building gap at the southern portion of the redevelopment site to enhance visual and air permeability between the proposed redevelopment and adjacent buildings.

As a result, no adverse visual impacts to the surrounding neighbourhood for the proposed redevelopment of East Wing of PLK Headquarters are envisaged.

APPENDIX IV

TREE APPRAISAL REPORT

Proposed Redevelopment of

East Wing of Po Leung Kuk

Tree Appraisal Report

Prepared by

Kenneth Ng & Associates Ltd

Sept 2015

Job No AG6

Proposed Redevelopment of East Wing of Po Leung Kuk

Tree Appraisal Report

1 OBJECTIVES

1.1 The aim of this Tree Survey Report is to:

1. To identify and record all the trees within the re-development boundary.
2. To locate their position and record data on height, crown spread and trunk diameter.
3. To evaluate their health, form, amenity value, and survival rate after transplanting.
4. To take photographic record of each tree within the site boundary.
5. To make recommendation for the trees affected by the proposed re-development.

2 METHODOLOGY

2.1 The tree survey methodology will strictly follow the guideline from Land Administration Office Practice Note No. 7/2007, Tree preservation and tree removal application for building development in private projects

2.2 The exact locations of the trees surveyed were identified with reference numbers provided. (Refer to Tree Survey plan, Dwg no. AG6-TFP-01A).

2.3 Result of the tree survey is shown in Tree Assessment Schedule with the following information:

1. Tree No.: tree number as marked on site and denoted corresponding on the plan.
2. Botanic Name: Latin species name & Chinese name
3. DBH (diameter at breast height, in meter): diameter of the main trunk measured at 1.3M height above ground level.
4. Height (in meter): height measured from ground level to the top branch.
5. Spread (in meter): average diameter of foliage canopy.
6. Form: as indicated with a grading of **G**ood, **Fair** or **P**oor.
7. Health: as indicated with a grading of **G**ood, **Fair** or **P**oor.
8. Amenity value: as indicated with a grading of **H**igh, **M**edium or **L**ow
9. Anticipated Survival Rate after transplantation: as indicated with a grading of **H**igh, **M**edium or **L**ow.
10. Photos No.: reference number of photographs of individual tree.
11. Top of soil level: as indicated with top of soil level above root collar
12. Justification: Reasons for proposed treatment to existing trees.
13. The proposed treatments in this application: recommendation for the tree to be **Transplanted**, **Retained** or **Fell**.
14. Remarks: The other comments for the tree. Anticipated root ball size to be preserved (with dia. x depth in mm) etc.

3. EXISTING CONDITION OF THE TREES

3.1 According to the Land Administration Office PN 7/2007, a "Tree" is defined as having a trunk diameter measure > 95 mm or more at a height of 1.3M above ground level. All individual trees have the trunk diameter smaller that 95mm are not classified as tree.

3.2 The proposed re-development is to support the expansion of Po Leung Kuk services to serve the district.

There are in total 34 trees surveyed within the re-development site. The most abundant species is Ficus variegata (8 nos.) which is a native species that can be found in most part of Hong Kong. Other species include: Acacia confusa (1 no.), Bauhinia X blakeana (1 no.), broussonetia papyrifera (1 no.) Celtis sinensis (1 no.), Cinnamomum burmanii (2 nos), Cinnamomum camphora (1 no), Cinnamomum parthenoxylon (1 nos.), Cratoxylum ligustrinum (1 no.), Delonix regia (1 no.), Eucalyptus citriodora (2 nos.), Liquidambar formosana (1 no.), Litchi chinensis (2 no.), Macaranga tanarius (1 nos.), Roystonea regia (4 nos.), Syzygium cumini (2 nos.), Syzygium jambos (2 no.).

3.3 There are 2 nos. dead trees on the slope.

3.4 Trees on the slope area mainly nature native woodland species commonly found in southern part of Hong Kong Island, In general, majority of the existing trees on the slope side are found to be poor in tree form and health condition.

3.5 Where as trees in front of the existing building and the playground are mainly ornamental planted for visual reason or fruit trees. They are found to be in good form and health condition.

3.6 None of the trees within the lot is identified as rare, endangered or protected tree species in Hong Kong.

4. PROPOSED DEVELOPMENT

4.1 The proposed redevelopment is a single tower block. The existing topography of the site consists of a flat side used by the previous building block with the playground on the north side and a sloped side on the south side. Access is from the north with a ramp up from Link Road. The proposed re-development shall remain on the flat area with access from the existing driveway. To meet the current regulation, extra flat area is required at the edge of the playground for EVA, this shall require to build into part of the northern slope.

4.2 Trees are mainly growing on the existing garden and on the slope.

5. PROPOSED TREATMENT TO THE EXISTING TREES

5.1 Effort has been made in planning the footprint of the proposed building block of the re-development which will be sited on the existing building and playground area, By doing so, little disturbance on existing trees with majority of trees will be preserved.

5.2 Out of the 34 trees, 2 trees will be affected by the building bulk and would have to be removed to make room for the proposed re-development, These 2 trees located at the edge of the southern slope, tree T33 is a large specimen tree of Delonix regia with a fair tree form and health condition, in view of its large tree size in terms of crown and height which cannot be transport on public road due to traffic regulation, its survival rate after transplanting is low. In addition, this tree is located at the edge of retaining structure for the southern slope, the root system will be tango with the existing retaining structure which prohibit the formation of proper root ball for transplanting. The second tree T38 is also poor in health condition and form, as this tree is suppressed by the tree behind and causing this tree leaning heavily towards the re-development site with an in-balance tree crown. Again, its tree size and crown spread prohibit from transport on public road for tree transplanting works. All these 2 trees are recommended to be felled with compensation.

5.3 The third tree, T35 is a smaller size tree with fair tree form, tree health condition and medium chance of survival after transplanting, it is recommend to transplant this tree within site.

5.4 The 2 dead trees located at the southern slope shall also be felled for the reason of public safety.

5.5 The remaining 29 trees will not be affected by the building foot print of the redevelopment and shall be retained with tree preservation works to improve their health condition, in particular those trees at the southern slope. Tree pruning work is required on 3 trees to be retained as those trees will be encroached within the extend of the proposed re-development block and the EVA retaining structure and the proposed site formation for the re-development.

5.6 Based on the extent of the proposed buildings and the associated engineering works for the slope, the proposed treatment to the existing trees are as follows:

- Existing trees survey on site — 34 nos
- No of trees proposed for felling(including 2 dead trees) — 4 nos
- No. of trees to be transplanted — 1 nos
- No. of trees to be retained — 29 nos

Please refer "Tree Assessment Schedule" for justification of felling of trees.

6 TREE COMPENSATION

6.1 The loss of 4 existing trees (including 2 dead trees) with an aggregate diameter of 1.36M and be compensated with a total of 7 nos. of compensation trees at 0.20M diameter with an aggregate diameter of 1.4M, this will satisfy the guideline at the ratio of 1:1 in terms of quality and quantities on trees felled.

6.2 For the species of 7 nos. compensation trees will be planted at 5M spacing, please refer to Tree Compensatory Plan detail.

6.3 The surface treatment of the area for new compensatory tree planting will be soft landscape areas to be planted with shrub / ground cover plants/ turf.

Section A

Tree Assessment Schedule

Project Name: Proposed Redevelopment of East Wing Of Po Leung Kuk

Project No.: AG6

Field Survey and Assessed on September 2015 by Kenneth C.K. Ng (RLA No. 034)

Kenneth Ng & Associates Ltd
Tree Survey Report
Sept. 2015
Dwg No. AG6-TFP-01A

Tree Assessment Schedule

Tree No.	Photo No.	Tree Species (Botanical Name)	Tree Size: Overall Height (M)	Tree Size: Average Crown Spread (M)	Tree Size: Trunk diameter (M)	Form: Good Fair Poor	Health: Good Fair Poor	Amenity Value: High Medium Low	Survival Rate after Transplanting: High Medium Low	Soil level above root collar: MPD	Recommendations: Transplant Retain Fell	Justification	Remarks
T1	1	*Litchi chinensis* 荔枝	11	10	0.58	F	F	M	L	12.81	R		On slope, Multi trunk
T2	2	*Litchi chinensis* 荔枝	11	8	0.48	F	F	M	L	13.48	R		On slope, Multi trunk
T3	3	*Acacia confusa* 台灣相思	12	5	0.35	F	F	M	L	13.04	R		On slope,
T4	4	*broussonetia papyrifera*	9	6	0.35	F	F	M	L	14.41	R		On slope, Multi trunk
T5	5	*Syzygium jambos* 蒲桃	8	5	0.18	F	F	M	L	15.64	R		On slope,
T6	6	*Ficus variegata* 青果榕	8	5	0.28	L	P	L	L	16.47	R		On slope, Multi trunk
T33	33	*Delonix regia* 鳳凰木	12	12	0.65	F	P	M	L	21.46	F	a,b,c,d	On slope,
T34	34	*Syzygium jambos* 蒲桃	25	12	1.10	F	F	H	L	21.44	R		
T35	35	*Cinnamomum burmanii* 陰香	7	4	0.15	F	F	M	M	22.51	T	a	
T37	37	*Syzygium cumini* 海南蒲桃	9	6	0.32	L	L	L	L	22.47	R		Multi trunk, Leaning, tree pruning works required.
T38	38	*Syzygium cumini* 海南蒲桃	10	6	0.35	L	L	L	L	22.49	F	a,b,c,d,	Multi trunk, Leaning,
T39	39	*Ficus variegata* 青果榕	12	9	0.65	L	F	M	L	22.81	R		On slope, Leaning, tree pruning works required
T40	40	*Celtis sinensis* 朴樹	10	7	0.19	M	F	M	L	24.55	R		On slope,
T43	43	*Cinnamomum camphora* 樟	16	12	0.38	M	F	M	L	26.62	R		On slope,
T44	44	*Cinnamomum parthenoxylon* 黃樟	10	8	0.29	M	F	M	L	27.32	R		On slope,
T45	45	*Ficus variegata* 青果榕	12	10	0.29	M	F	M	L	25.61	R		On slope, tree pruning works required
T46	46	*Ficus variegata* 青果榕	5	4	0.17	M	F	M	L	27.38	R		On slope, Multi trunk
T47	47	*Eucalyptus citriodora* 檸檬桉	13	6	0.25	M	F	M	L	27.18	R		On slope,
T48	48	*Eucalyptus citriodora* 檸檬桉	10	4	0.14	M	F	M	L	25.87	R		On slope,
T49	49	*Macaranga tanarius* 血桐	7	5	0.14	M	F	M	L	28.40	R		On slope,
T50	50	*Cinnamomum burmanii* 陰香	7	4	0.10	M	F	M	L	25.63	R		On slope,
T51	51	*dead*	12	6	0.24					25.92	F	f	On slope,
T52	52	*dead*	6	5	0.12					26.11	F	f	On slope,
T55	55	*Liquidambar formosana* 楓香	8	6	0.14	M	F	M	L	23.24	R		On slope,
T56	56	*Cratoxylum ligustrinum* 黃牛木	7	5	0.14	M	F	M	L	22.91	R		On slope,
T57	57	*Ficus variegata* 青果榕	9	5	0.15	M	F	M	L	22.09	R		On slope,
T58	58	*Bauhinia X blakeana* 洋紫荊	10	6	0.25	M	F	M	L	20.90	R		On slope,
T59	59	*Ficus variegata* 青果榕	6	4	0.20	L	F	M	L	23.66	R		Wall tree
T60	60	*Ficus variegata* 青果榕	7	5	0.22	L	F	M	L	23.59	R		Wall tree
T62	62	*Ficus variegata* 青果榕	15	12	0.38	L	F	M	L	26.51	R		Wall tree, Multi trunk
T64	64	*Roystonea regia* 王棕	10	4	0.30	G	F	H	L	16.74	R		On slope,
T65	65	*Roystonea regia* 王棕	7	4	0.22	G	F	H	L	17.03	R		On slope,
T66	66	*Roystonea regia* 王棕	10	5	0.38	G	F	H	L	17.25	R		On slope,
T67	67	*Roystonea regia* 王棕	7	5	0.32	G	F	H	L	17.47	R		On slope,

Summary:

29 tree recommended for retaining
1 trees recommended for transplanting
4 tree recommended for felling

a-in conflict with proposed site formation works
b- poor survival rate after transplant
c- cannot transplant outside lot due to traffic regulation on c
d- root ball not extractable for transplant

Project Name: Proposed Redevelopment of East Wing Of Po Leung Kuk

Project No.: AG6

Field Survey and Assessed on September 2015 by Kenneth C.K. Ng (RLA No. 034)

Kenneth Ng & Associates Ltd
Tree Survey Report
Sept. 2015
Dwg No. AG6-TFP-01A

Tree Assessment Schedule

Tree No.	Photo No.	Tree Species (Botanical Name)	Tree Size			Form	Health	Amenity Value	Survival Rate after Transplanting	Soil level above root collar	Recommend ations	Justification	Remarks
			Overall Height (M)	Average Crown Spread (M)	Trunk diameter (M)	Good Fair Poor	Good Fair Poor	High Medium Low	High Medium Low	MPD	Transplant Retain Fell		
	Total : 34 trees								e- in conflict with ingress / access f- dead tree				

Section B

Tree photo

Tree T1

Photo 1

Tree T2

Photo 2

Tree T3

Photo 3

Tree T4

Photo 4

Tree T5

Photo 5

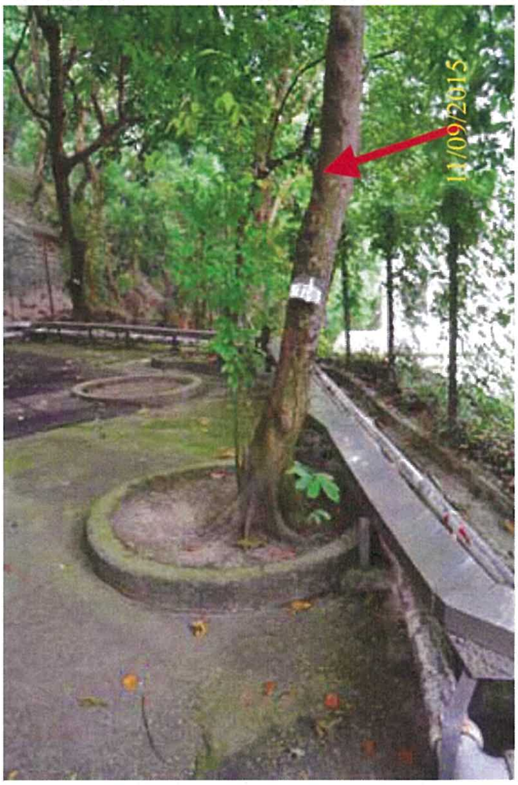
Tree T6

Photo 6

Tree T33

Tree T35

Photo 35



Tree T36

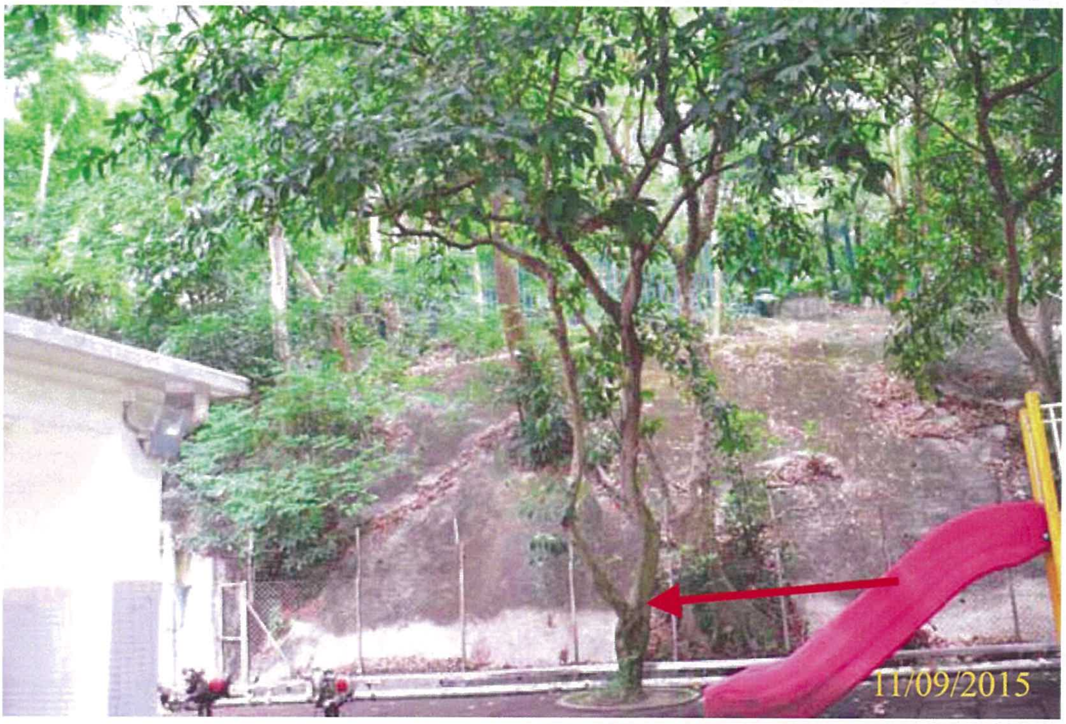
Photo 36

Tree T37

Photo 37

Tree T38

Photo 38



Tree T39

Photo 39

Tree T40

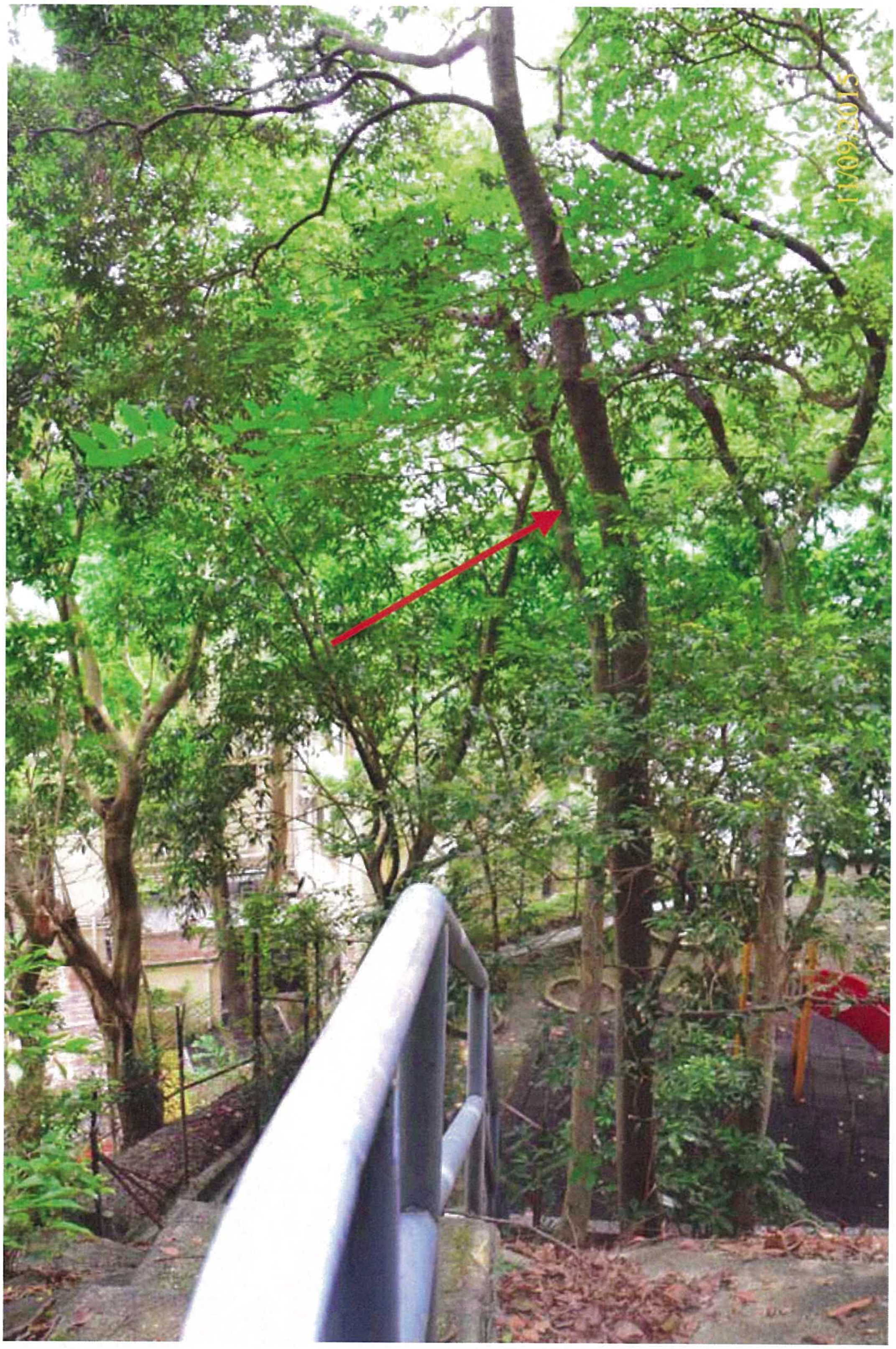
Photo 40

Tree T41

Photo 41

Tree T42

Photo 42

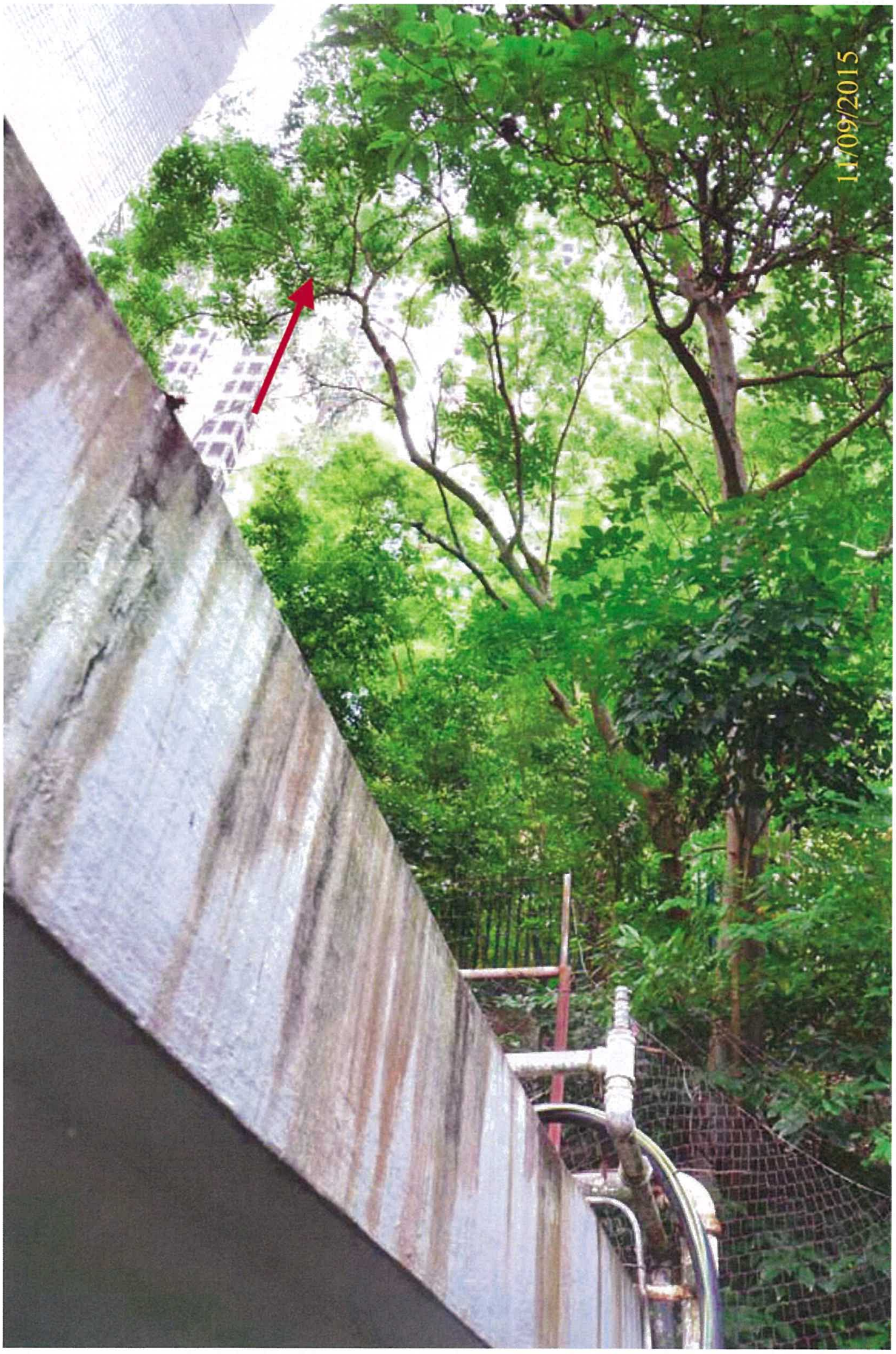


Tree T43

Photo 43

Tree T44

Photo 44

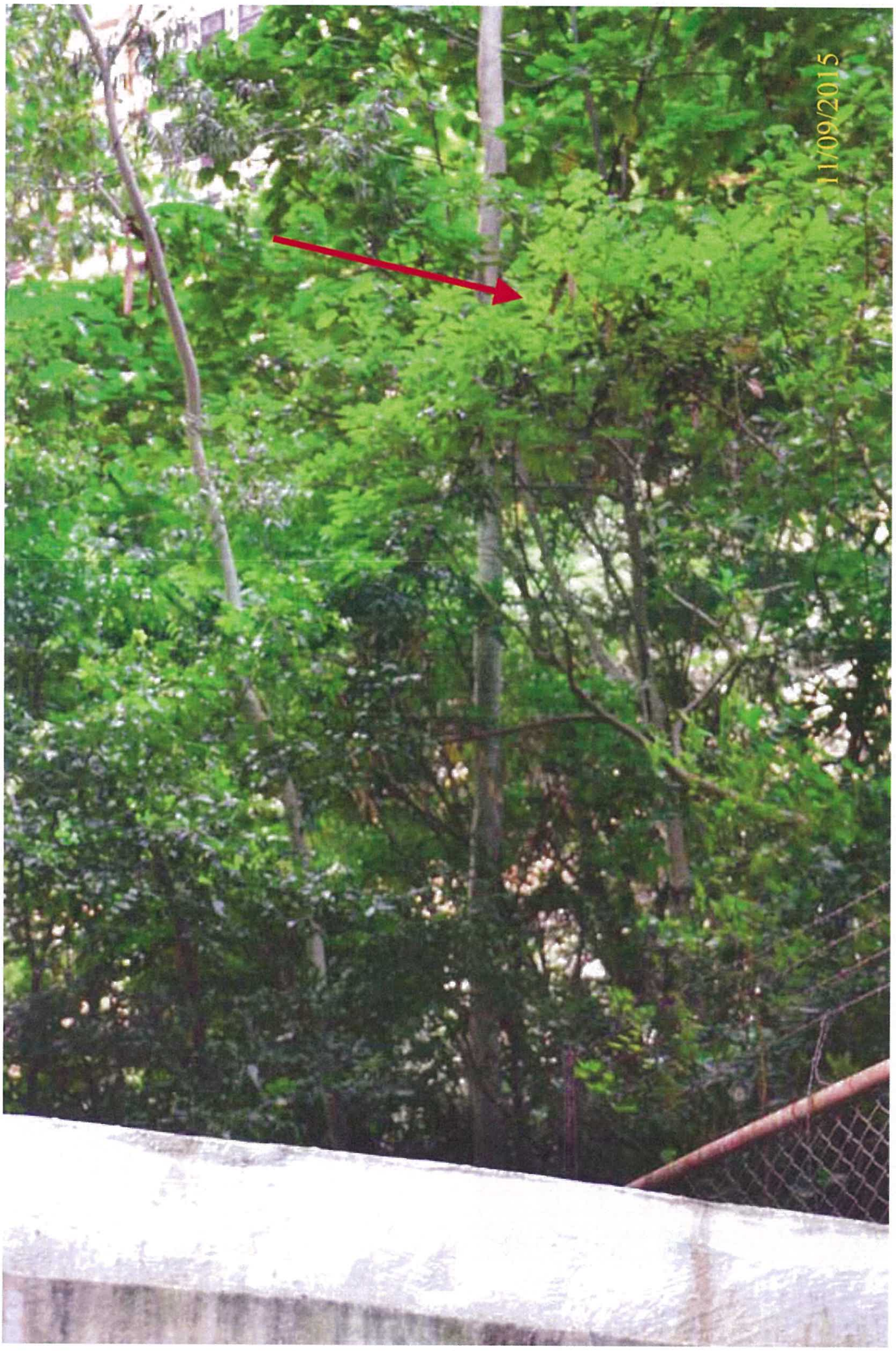


Tree T45

Photo 45

Tree T46

Photo 46



Tree T47

Photo 47

Tree T48

Photo 48

Tree T49

Photo 49

Tree T50

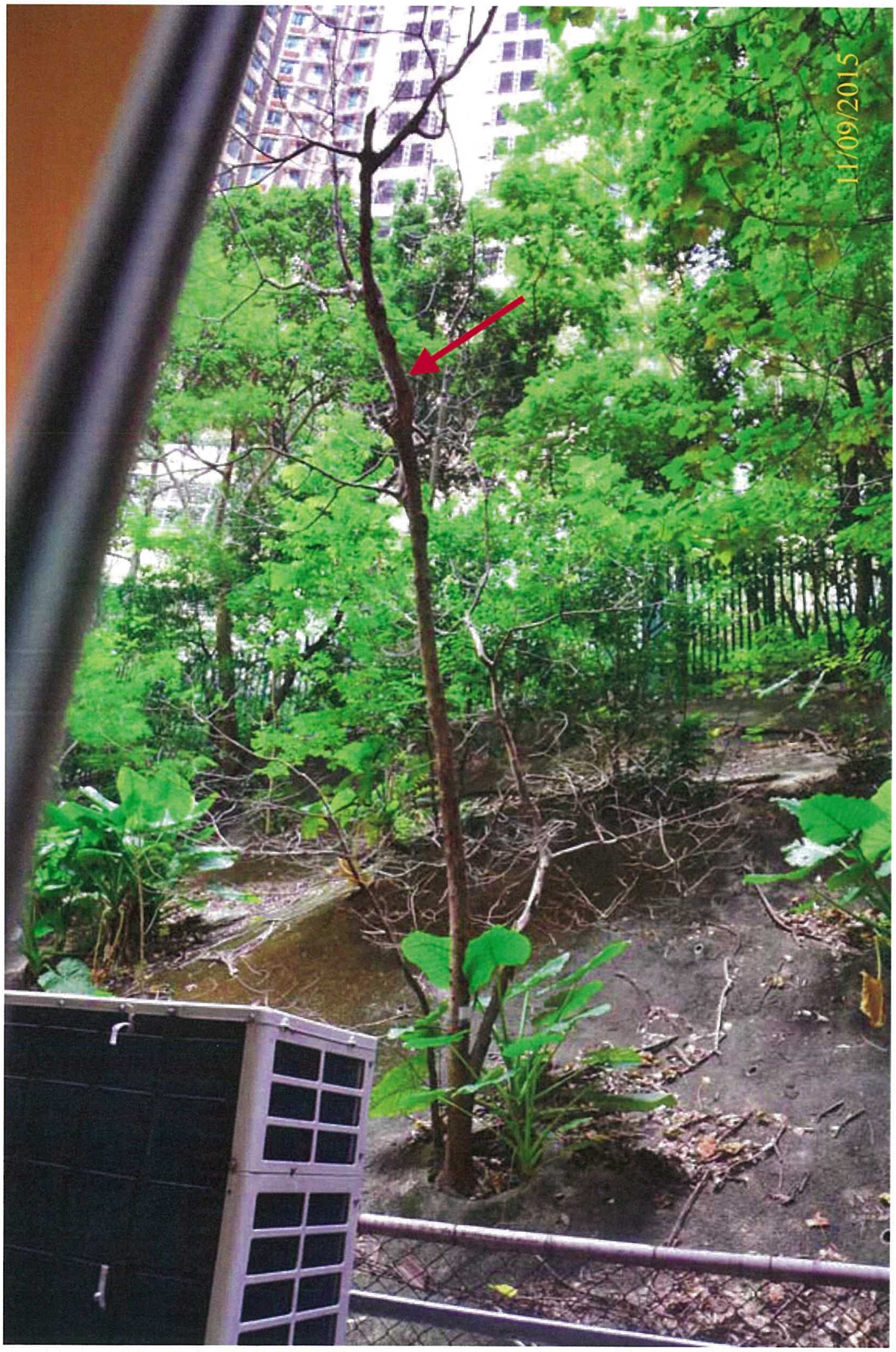
Photo 50

Tree T51

Photo 51

Tree T52

Photo 52



Tree T53

Photo 53

Tree T55

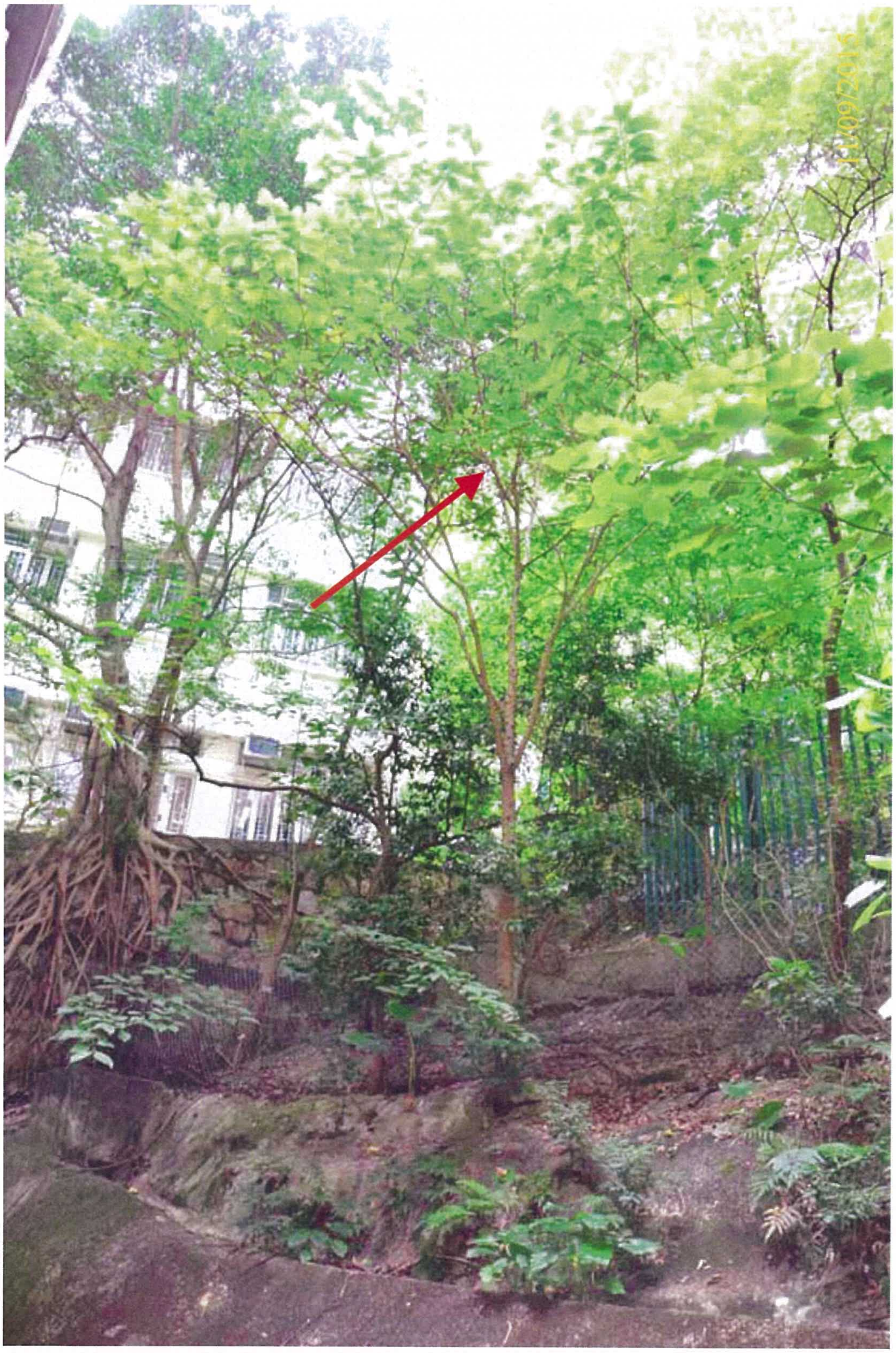
Photo 55

Tree T56

Photo 56

Tree T57

Photo 57

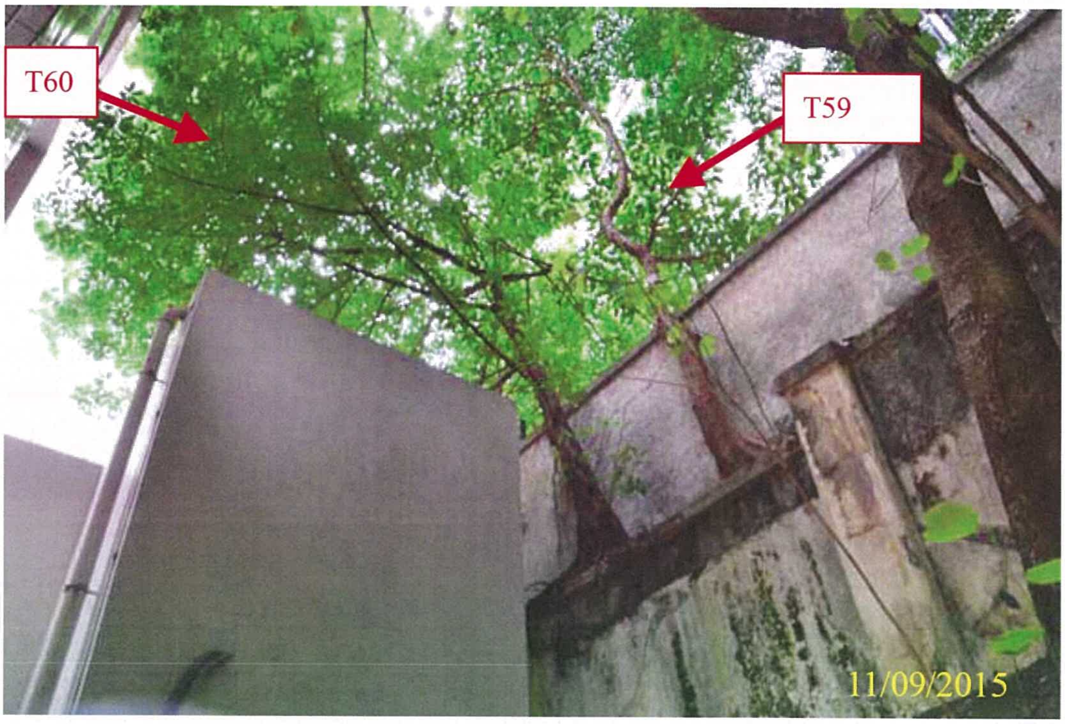


Tree T58

Photo 58

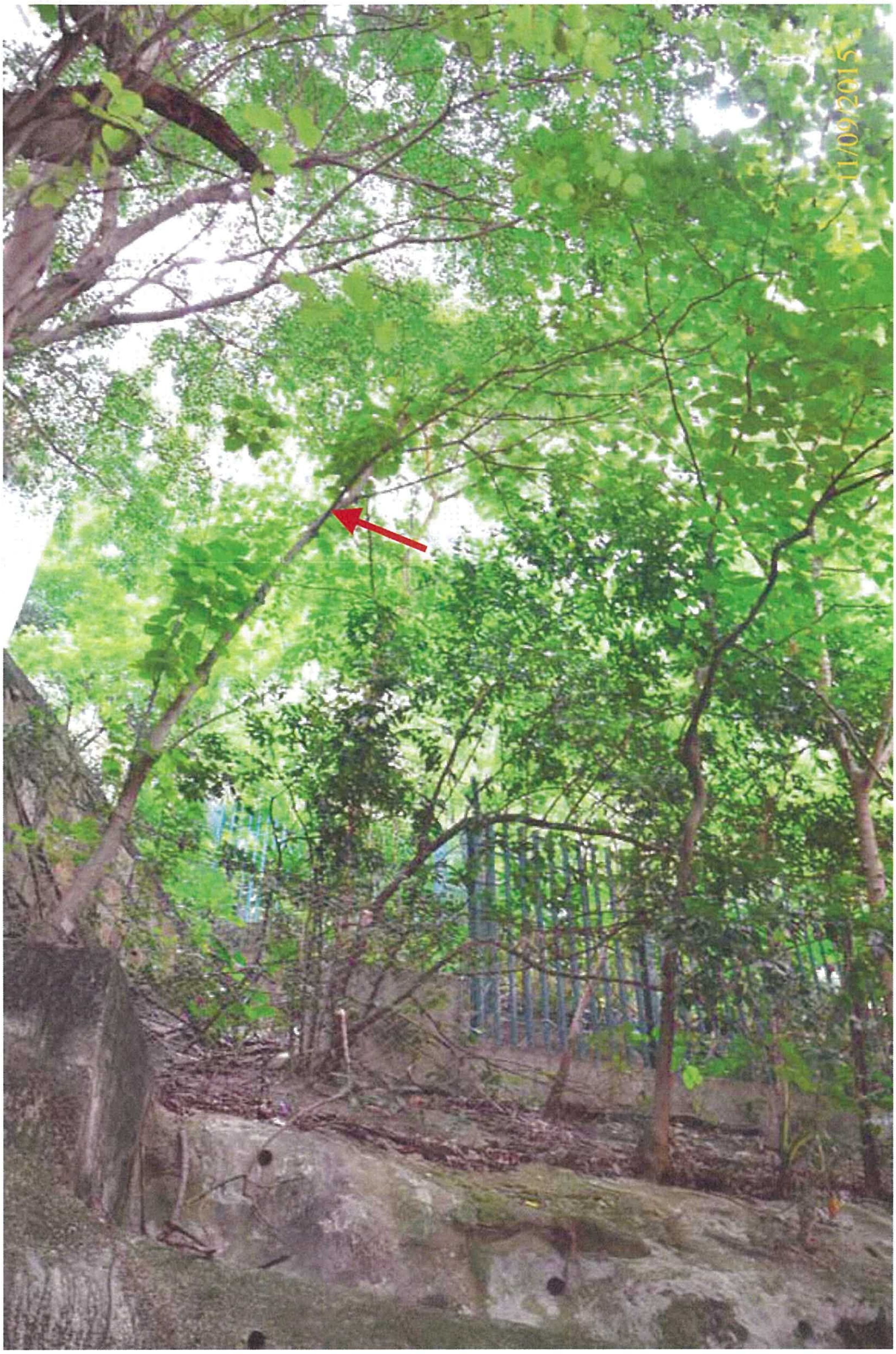
Tree T59 & T60

Photo 59, 60



Tree T61

Photo 61

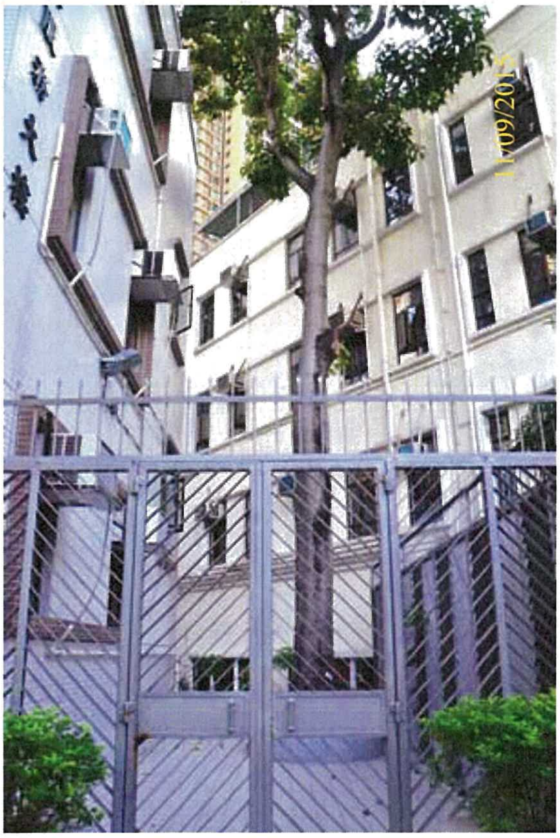


Tree T62

Photo T62

Tree T63

Photo 63



Tree T64, T65, T66, T67

Photo 64

Section C

Method Statement and Monitoring on the Preservation of Retained tree

and

Method Statement and Monitoring on the transplant tree

Method Statement and Monitoring System for Existing Trees to be Retained

Tree Preservation work shall be carried out in accordance with good horticultural practice and the General Specification for Building 2012 Edition Section 25.69 and the latest revision Architect Services Department HKSAR

1. Foreword:

   To protect the existing trees to be retained, the Contractor shall ensure for the whole duration of the Contract, the following:

   - no unnecessary intrusion into areas of tree stand is made,
   - no access routes will be allowed to pass through existing tree stand,
   - the limits of site clearance are to be agreed by the Landscape Architect on site before site clearance commences. ,
   - no nails or other fixings shall be driven into trees,
   - no fencing or signs shall be attached to trees,
   - no materials or machinery shall be stored under or against trees,
   - no workshop, canteens, or similar shall be installed beneath trees, nor shall equipment maintenance etc. be carried out under trees,
   - no trees shall be used as anchors for ropes or chains used in guying, pulling and the like.

   To enhance the health of the retained trees, the following tree surgery work will be required.

   i. Removal of broken, damaged and diseased branches.
   ii. Removal of weak or crossing branches to ensure a well-balanced crown.
   iii. Protection by fencing
   iv. Secure tree from tipping over with cable through out the construction period

2. Crown Thinning

   The retained trees has no conflict with the construction activity, no pruning is required.

3. Securing and Staking retained Trees

   The retained trees should be secured and tied properly to the temporary support. Wrap the area of trunk guyed above ground with pads of hessian or rubber to prevent the tie from chafing the trunk or branches.

   Secure retained tree with 3 no. cables from the trunk and drive the metal stakes 1000mm into ground.

4. Protection during Tree Surgery Work

   The tree trunk shall be wrapped and protected to prevent mechanical damage during tree surgery work and construction works. Care shall also be taken to prevent overheating with its resulting loss of foliage. Damaged branches shall be carefully pruned using a sharp clean implement to give a single flat sloping face cut and wounds shall be painted with a fungicidal bituminous sealing compound. Temporary protective fence shall be erected with details as in item 7.

5. Pests & Fungal Growth

The site shall regularly check for any insect attack, termite attach or fungus infestation particularly during known periods of activity. Carry out remedial measures on any such occurrence and shall use of sprayed insecticide/fungicides in strict accordance with the manufacturer's instructions. In case of termite attack, specialist shall be employed by the contractor to provide proposal to eliminate the termite with monthly monitoring report through out the contract and the establishment period and use of such materials shall be with due care and have regard to the safety and convenience of the general public and is to be carefully controlled to avoid unnecessary dispersion.

6. Maintenance/Establishment Works

Tree shall be maintained immediately and shall continue until the completion the project by the tree surgery works contractor. The maintenance works shall include all measures necessary to establish and maintain the tree in an acceptable vigorous and healthy growing condition under the supervision of the Arborist.

7. Creation and Protection of the Cordon Zone by protective fencing

Temporary protective fencing shall be erected before other works commence. Protective fence 2.0m high should be erected beyond the crown spread or the designed protection zone of all existing trees. The protective fence shall come with a padlocked door, access to it shall be restricted only to workers directly involved in tree work. No construction worker shall enter the cordon zone (CZ). No construction equipment or materials shall breach the CZ. No heat or fume shall drift into the CZ. No lifted materials shall sail above the CZ.

The base of the protective fence shall be sealed by sand bag at least 200 mm tall to prevent the entry of contaminated construction water and other effluent into the CZ.

8. Monitoring System

The performance of the retained trees shall be monitored throughout the project construction period on a monthly basis by recording on a Performa report. Tree growth condition with reference to trunk, branches, foliage, soil and root, any arboricultural problems and associated remedial measures. Any construction activities that may impact the trees negatively shall be reported well in advance to the Landscape Architect by the Arborist for planning of preventive tree work to avoid possible damages.

The contractor shall report to the management office the days establishment work on the retained tree and a countersigned record log book of the work carried out shall be kept at the site office and made available for inspection. All non-routine tree problems are to be promptly reported to the Landscape Architect

Photographs will be taken at the following key junctures of the tree works:

1. Before commencement
2. Monthly record photo through out the construction and establishment period

Monthly progress report with progress photo on the status of the retained trees should be prepared by the Arborist for the Landscape Architect to submit to Government Authority for record.

Method Statement and Monitoring System for Tree Surgery/Transplanting of Existing Tree

Tree Transplanting work shall be carried out in accordance with good horticultural practice and The General Specification for Building 2012 Edition Section 25.71 and latest revision Architectural Services Department, HKSAR

1. Crown thinning

   The total extent of crown thinning should be minimized and in any case should not exceed 1/4 of the original crown on vegetation mass. The height of tree shall not be reduced more than 1/4 of the overall tree height. Under No circumstances the central main leader of the trees should be pruned or interfered. Should branch pruning is consider necessary, this should aims specifically at the removal of dead, decayed, diseased, infested, broken, crossed, competing or dangerous branches. The objective is to produce a clean, well-spaced, well-shaped and balance head. Besides the above list of circumstances, all other healthy wood should not be cut or removed. To reduce transpiration though leaves in anticipation of root pruning, additional crown thinning will be implemented by means of leaf picking. This minimum-impact approach will also prevent the loss of the original tree crown form. All work shall be carried out in accordance with good horticultural practice and British Standard 4043 : 1989 - Recommendations for transplanting root balled tree work, and also based on the latest arboricultural concepts and best international practices, and shall be directed and supervised by the tree specialist or arborist.

   Safety precautions shall be taken to protect those engaged in operations as well as people and property in the vicinity. Pruning and removal of branches shall be done using sharp, clean implements to give a single flat, sloping face. Ragged edges of bark or wood are to be trimmed with a sharp knife. Large branches shall be removed in stages beginning with removal of the main weight of the branch with the final cut as close to the main stem as possible without damaging the bark. In the case of branch removal, the final cut should be aligned with the branch collar and the mid-point of the crotch. All cuts shall be made to avoid splintering or tearing of bark which would catch water and encourage rot. Branches less than 15 mm diameter may be cut with sharp secateurs. Any cuts or wounds over 25 mm diameter shall be painted with an approved fungicidal sealant.

   Cracks and cavities with rotten wood shall be cut back to healthy tissue. If necessary, a cavity that may accumulate water could be drained by drilling a small hole of 5 mm diameter into its bottom at an angle of about 45 degrees taking as far as possible the shortest path and pointing downwards. If necessary, cracks would be secured by rot bracing.

2. Tree pruning

   Trees requiring pruning or treatment will be categorised as follows.

   a) Light prune
   This shall include the removal of a few branches up to 75mm in diameter.

   b) Thin crown
   This shall include the picking of leaves of the crown with the extent not to exceed 1/3

of the original tree crown size.

c) Treat for pest and/or disease attack
This shall include the application of an approved pesticide or fungicide to the infected areas in accordance with the manufacturer's instructions and government guidelines.

3. Root Pruning

The width of root ball shall be 7 to 10 times the trunk diameter (DBH). Immediately upon commencement of the contract, root pruning to the specified size of root ball shall be carried out to ensure maximum new fibrous root growth prior to transplanting operations.

The first root pruning should be conducted at least 3 months in advance of transplanting.

The depth of the root ball varies from size and species, normally it shall be 1500 mm for DBH of 300-700 mm (medium tree).and 1200mm for DBH below 300 (small tree)

Root cutting shall be done in three stages in parallel. Each root cutting stage shall be performed at equal interval throughout the designated root preparation period as mentioned above.

The first stage shall involve cutting trenches on two sides of the proposed root ball.

The second stage shall involve cutting trenches on the other two sides of the proposed root ball.

The last stage shall be the cutting of the underside of the root ball and the transplanting of the tree to the final location.

Roots shall be cut free from ground, not pulled, using a suitable implement to give a clean cut. All roots thicker than 50mm diameter shall be treated with an approved sealant.

4. Root Ball Preparation

The formed root ball should be wrapped with hessian burlap and on the outside with wire mesh to ensure the soil is kept in full contact around the root system. The root ball shall then be tied with stainless steel chain net with wooden spacer for lifting.

The trenches for the root ball shall be 500 mm wide and backfilled with a prepared soil mix constituted of 3 parts by volume of decomposed granite thoroughly mixed with 1 part by volume of moist peat and root activator.

5. Preparation of the off-site temporary holding nursery and final location on site

At the off-site temporary holding nursery and final location on site, pits at pre-determined locations shall be dug in advance to appropriate width and depth in preparation to receive the transplanted trees. The pit shall be of a saucer shape, with a flat bottom in the centre and sloping sides. The flat bottom part shall be as wide as the root ball width, and each sloping edge shall also be as wide as the root ball plus 300mm on all sides.

6. Tree Uplifting and transit

The lifting, transplanting and planting of the trees shall be closely supervised on site by the tree specialist or arborist. The logistics of the transplanting operation shall be properly organized and timed in advance so as to enable transplanting of trees directly and promptly to the designated receiving sites of planting.

The trees shall be lifted carefully to avoid damage to stem, foliage and roots. The lifting cables and harnesses shall only be anchored to the root ball box or the chain net wrapping around the root ball for the ball and burlap method. They should never be attached to the trunk or branches. The upper part of the lifting cable should be spread out by frame spacer to prevent the cable from touching the branch at the time of lifting. Guying rope should be tie to the lifting cable to stabilize the tree at the time of lifting. The trunk and the branch should be protected by burlap wrapping.

After root ball preparation and in the process of transplanting to the off-site temporary holding nursery, root balls are to be carefully protected against direct sunlight, wind, drought, mechanical, smoke, artificial heat and other damages. Damaged branches shall be carefully pruned using a sharp clean implement to give a single flat sloping face cut and wounds shall be painted with a fungicidal bituminous sealing compound, approved by Landscape Architect.

The transplanted trees shall be planted in an upright position and allowing adequate space for future growth. A soil saucer of 150 mm high shall be formed on the soil surface around the edge of the root ball to permit rain or irrigation water to be retained and to slowly infiltrate into the root ball. Immediately thereafter the trees shall be watered to ensure a thorough soaking of the root balls.

7. Off-site Temporary Holding Nursery and Final Location

   During construction period, transplant trees will be temporary planted to the off-site temporary holding nursery. Upon completion, the transplant trees will be transplant directly to the final location on site.

8. Securing and Staking Transplanted Trees

Wrap all trees to be staked or guyed above ground with pads of hessian or rubber to prevent from chafing the trunk or branches.

Stake transplanted tree with 3 nos. cables from the trunk with one end tie above the lowest branch of the trunk and the other end tie to the metal stakes 1000mm long with 700 mm driven into ground.

9. Creation and Protection of the Cordon Zone

The off-site temporary holding nursery & final location for the trees shall be enclosed by a chain-link fence of 2000 mm tall with a padlocked door, and access to it shall be restricted only to workers directly involved in tree work. No construction worker shall enter the cordon zone (CZ). No construction equipment or materials shall breach the CZ. No heat or fume shall drift into the CZ. No lifted materials shall sail above the CZ.

The base of the chain-link fence shall be sealed by a water-proof rim such as sand bag of at least 300 mm tall to prevent the entry of contaminated construction water and other effluent into the CZ.

10. Maintenance / Establishment works and Monitoring of Transplanted Trees

The transplanted trees shall be maintained immediately after transplanting and shall continue until the completion of all construction work at the site, and thereafter for a period of 12 more months. Such maintenance shall include all measures necessary to establish and to recover from the transplant shock and to permit an acceptable vigorous healthy growing condition. This to include watering, fertilizing, weeding, apply root activator, staking, apply insecticide, etc.

Should weather condition is too dry or too hot, mist irrigation should be applied to each tree to upgrade the micro climatic condition surrounding the tree.

The performance of the transplanted trees shall be monitored throughout the maintenance period on a monthly basis by recording on a proforma report: tree growth condition with reference to trunk, branches, foliage, soil and root, any arboricultural problems and associated remedial measures. Any construction activities that may impact the trees negatively shall be reported well in advance to the Landscape Architect for planning of preventive tree work to avoid possible damages.

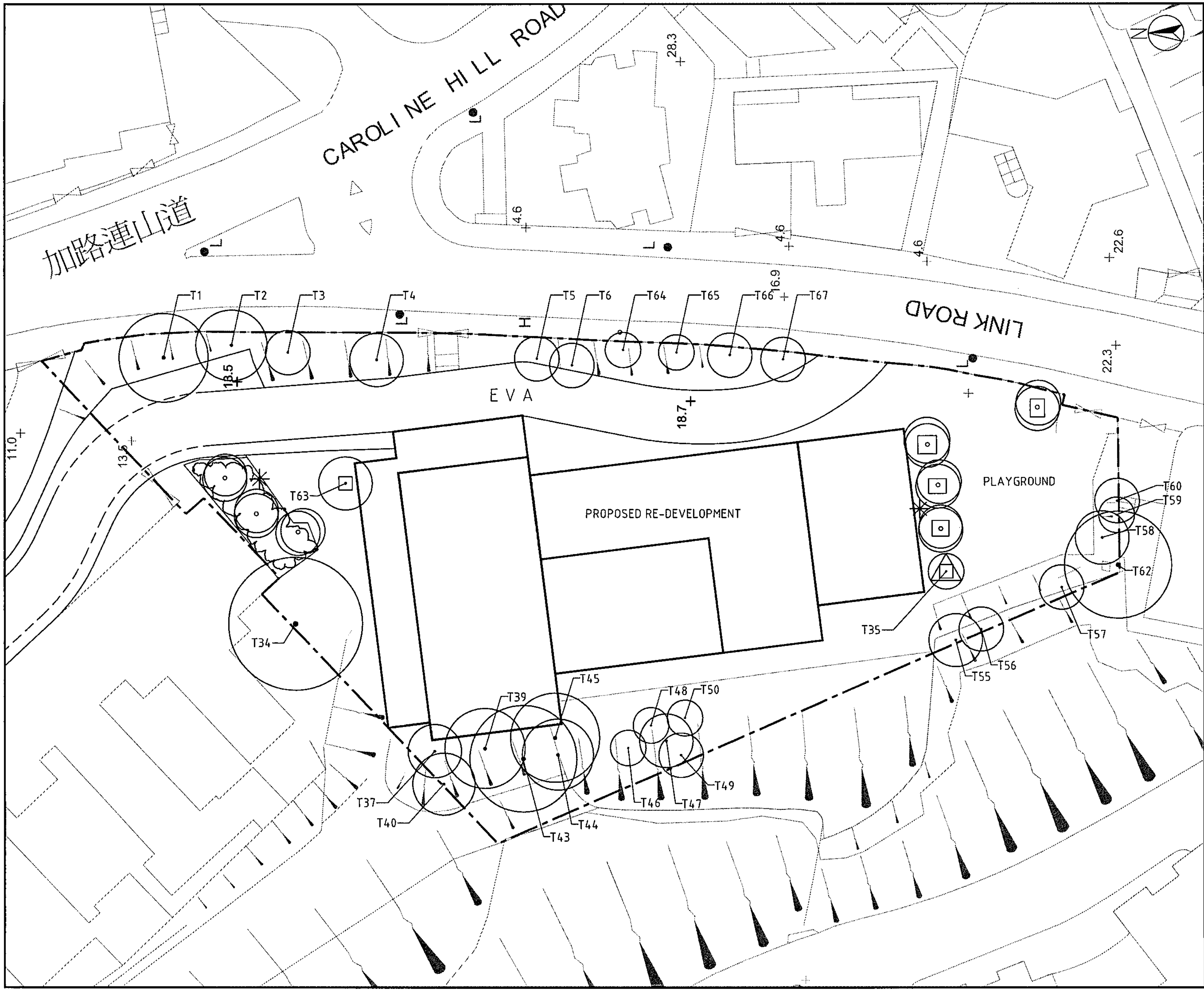
The contractor shall report to the management office before and after carrying out each days' maintenance works on the transplanted trees and a countersigned record log book of the work carried out shall be kept at the site office and made available for inspection. All non-routine tree problems are to be promptly reported to the Landscape Architect Photographs will be taken at the following key junctures of the tree works:

3. Before commencement
4. After crown thinning
5. 1st root pruning
6. 2nd root pruning
7. Final root pruning (under-cutting)
8. Forming root ball
9. Excavating tree pit at an off-site temporary holding nursery
10. Transit to the off-site temporary holding nursery
11. Planting at the off-site temporary holding nursery
12. Monthly record photo throughout the construction period
13. Upon Completion of Construction Works
14. Preparation works of root ball for transplant to final location
15. Excavating tree pit at final location
16. Transit to final location
17. Planting at final location
18. Monthly record photo during 12 months establishment / maintenance period after C of C

Monthly progress report with progress photo on the status of the transplant trees including all stages of transplanting works will be supervised and prepared by tree specialist or arborist for Landscape Architect's submission to Government for record.

Section D

Landscape Master Plan



LEGEND

- LOT BOUNDARY
- TREE TO BE RETAINED
- TREE TO BE TRANSPLANTED
- NEW TREE
- EXISTING DEVELOPMENT
- SHRUB/GROUNDCOVER PLANTING
- IRRIGATION WATER POINT
- PAVEMENT TREE PIT

修訂編號 No.	日期 Date	修訂 Revisions	簽署 By
A	9-2015	GENERAL REVISION	KN

吳振麒園境規劃師事務所有限公司
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Project Title 項目

Po Leung Kuk Headquarters Redevelopment, Causeway Bay, Hong Kong

Drawing Title 標題

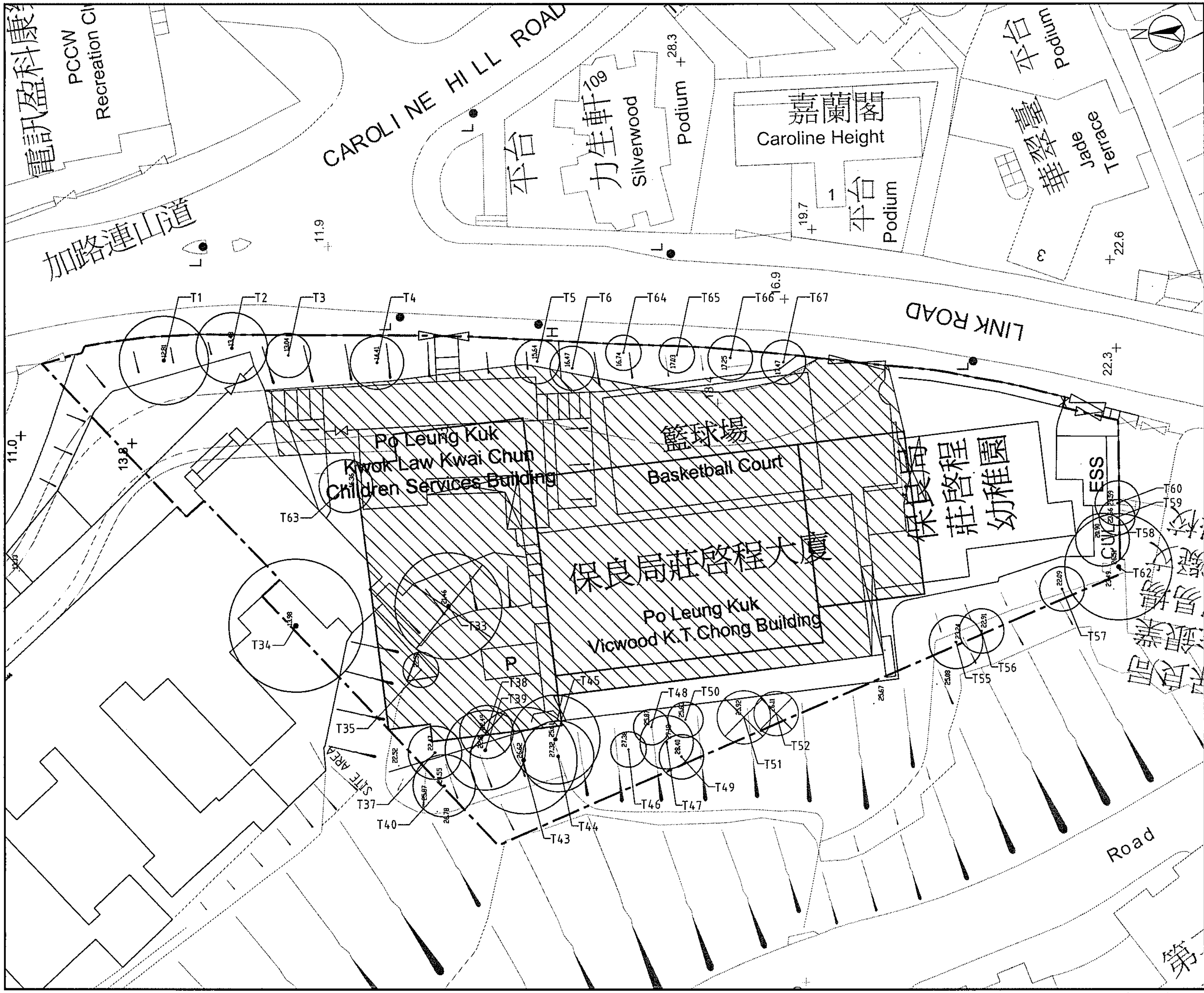
LANDSCAPE MASTER PLAN

Designed by 設計	KN	Approved by 審核	KN
Drawn by 繪圖	MK	Job No. 業務號	AG6
Checked by 校對	KN	Drawing No. 圖號	AG6-LMP-01A
Scale 比例	1 : 400		
Date 日期	SEP 2015		

size : A3 plot scale 1 : 1

Section E

Tree Survey Plan



LEGEND

- LOT BOUNDARY
- TREE TO BE RETAINED
- TREE TO BE FELLED
- TREE TO BE TRANSPLANTED
- EXISTING LEVEL
- EXISTING DEVELOPMENT
- PROPOSED DEVELOPMENT
- EXTENT OF SITE FORMATION WORKS

修訂編號 No.	日期 Date	修訂 Revisions	繪圖 By
A	9-2015	New Survey plan	KN

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Project Title 項目

Po Leung Kuk Headquarters Redevelopment, Causeway Bay, Hong Kong

Drawing Title 標題

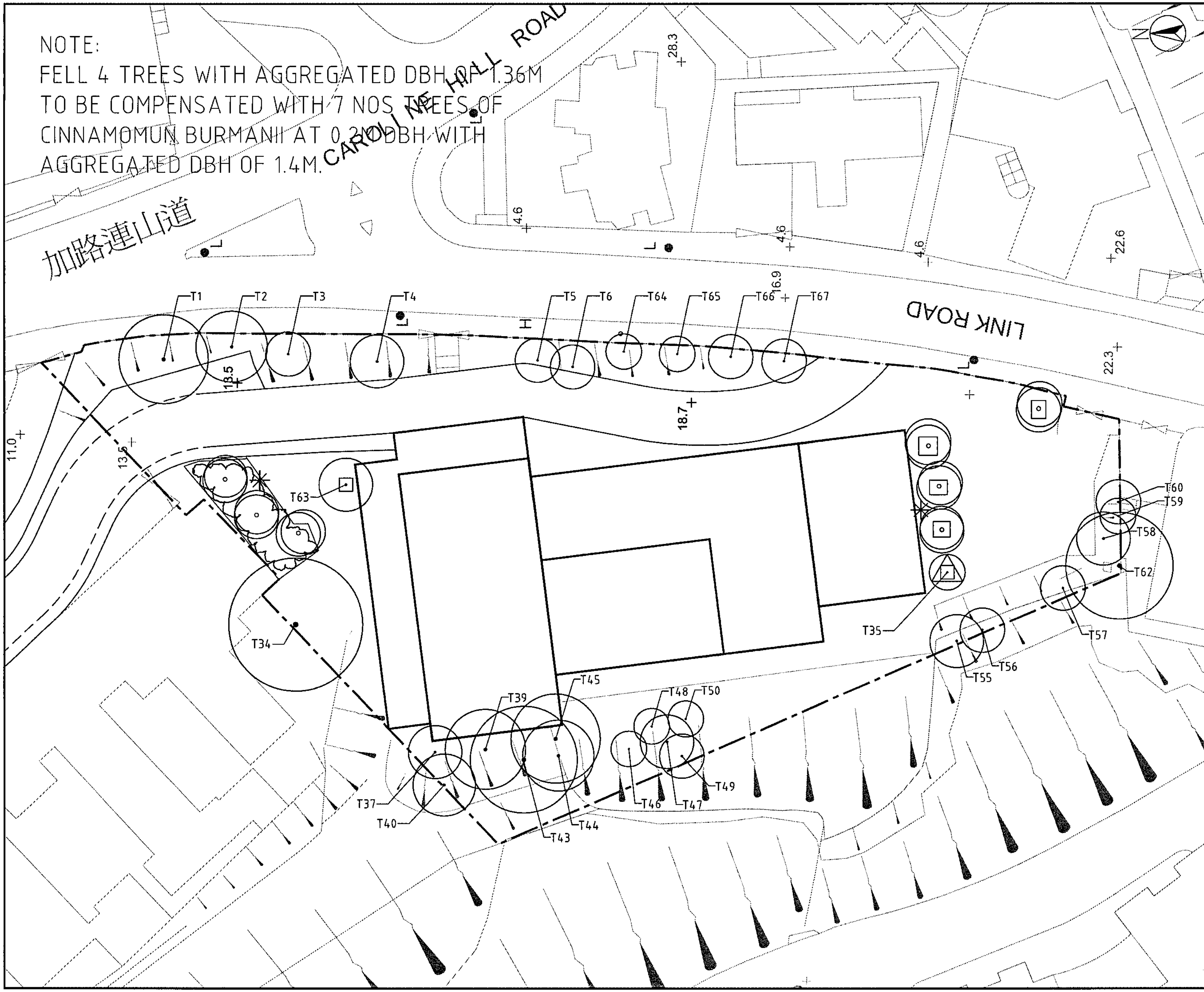
TREE SURVEY PLAN

Designed by 設計	KN	Approved by 審核	KN
Drawn by 繪圖	MK	Job No. 業務號	AG6
Checked by 校對	KN	Drawing No. 圖號	AG6-TFP-01A
Scale 比例	1 : 400		
Date 日期	SEP 2015		

size : A3 plot scale 1 : 1 Do not scale from drawing

Section F

Tree Compensatory Plan



LEGEND

- LOT BOUNDARY
- TREE TO BE RETAINED
- TREE TO BE TRANSPLANTED
- COMPENSATORY TREE
- PROPOSED DEVELOPMENT
- SHRUB/GROUNDCOVER PLANTING
- IRRIGATION WATER POINT
- PAVEMENT TREE PIT

修訂編號 No.	日期 Date	修訂 Revisions	繪圖 By
A	9-2015	GENERAL REVISION	KN

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Project Title 項目

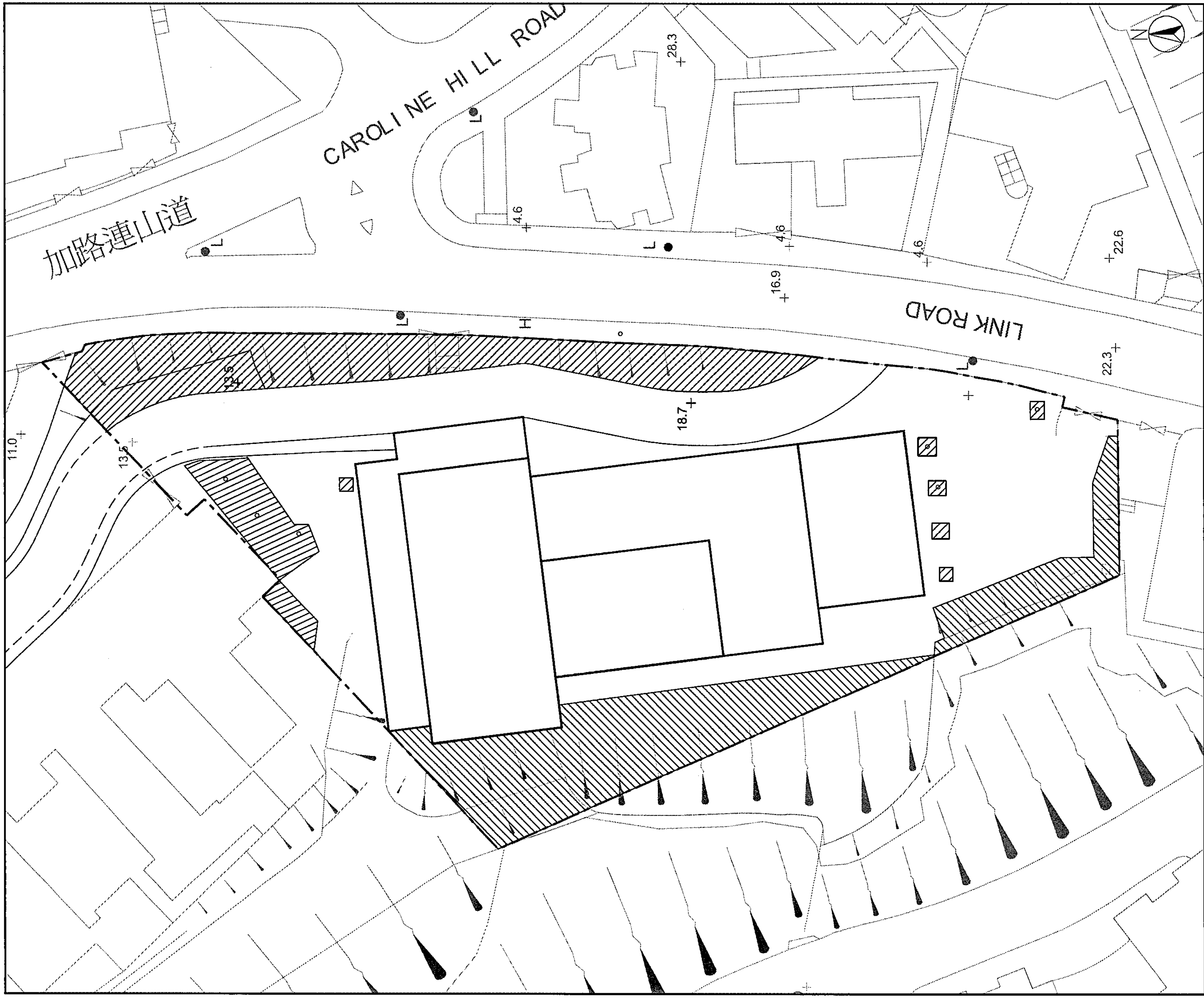
Po Leung Kuk Headquarters Redevelopment, Causeway Bay, Hong Kong

Drawing Title 標題

TREE COMPENSATORY PLAN

Designed by 設計	KN	Approved by 審核	KN
Drawn by 繪圖	MK	Job No. 業務號	AG6
Checked by 校對	KN	Drawing No. 圖號	AG6-TCP-01A
Scale 比例	1 : 400		
Date 日期	SEP 2015		

size : A3 plot scale 1 : 1



LEGEND

LOT BOUNDARY

GREENERY AREA =1114.1m²

修訂編號 No.	日期 Date	修訂 Revisions	繪圖 By

吳振麒園境規劃師事務所有限公司
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Project Title 項目

Po Leung Kuk Headquarters Redevelopment, Causeway Bay, Hong Kong

Drawing Title 標題

GREENERY AREA PLAN

Designed by 設計	KN	Approved by 審核	KN
Drawn by 繪圖	MK	Job No. 業務號	AG6
Checked by 校對	KN	Drawing No. 圖號	AG6-GA-01
Scale 比例	1 : 400		
Date 日期	SEP 2015		

size : A3 plot scale 1 : 1

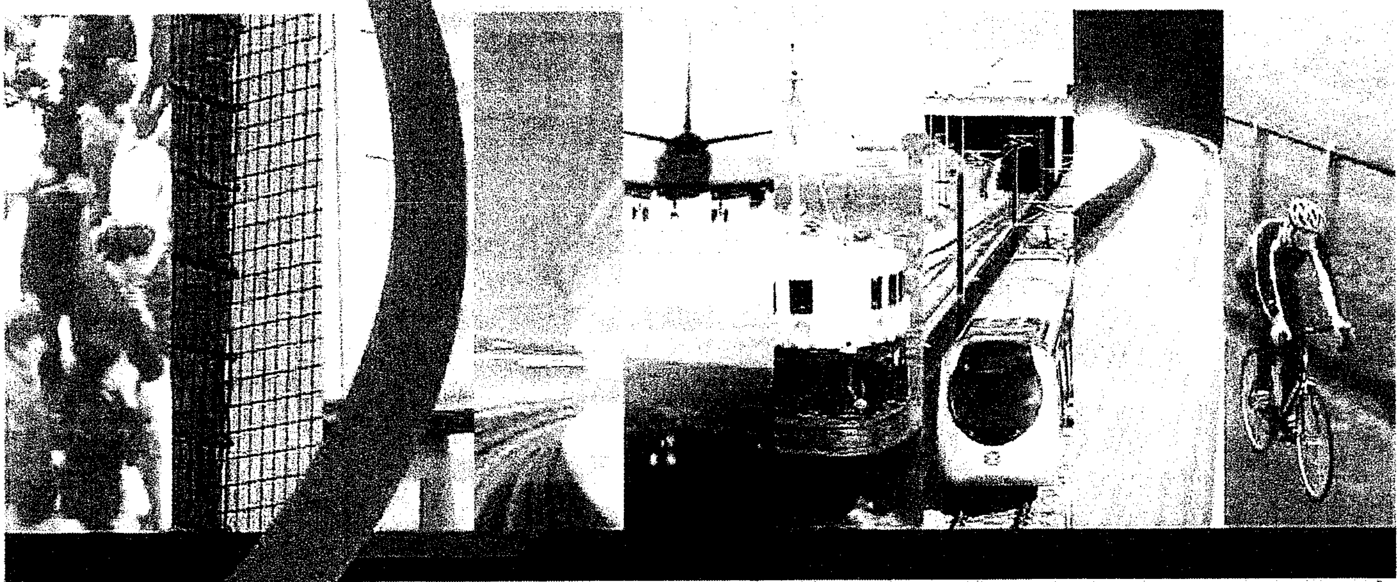
APPENDIX V

TRAFFIC IMPACT ASSESSMENT

The Redevelopment of East Wing of Po Leung Kuk at 66 Leighton Road, Causeway Bay, Hong Kong

Traffic Impact Assessment Report
June 2012

(Issue 3)



HWSPB 何黄
Traffic & Transportation Consultants

The Redevelopment of East Wing of Po Leung Kuk at 66 Leighton Road, Causeway Bay, Hong Kong

Traffic Impact Assessment Report
June 2012

CONTENTS

TABLES

FIGURES

APPENDIX

1. INTRODUCTION

1.1 Background

1.1.1 Po Leung Kuk (PLK) at 66 Leighton Road, Causeway Bay in Hong Kong provides comprehensive children, youth and elderly care services. The existing east wing building (Cheong Kai Ching) is proposed to be redeveloped for reprovision and upgrading of the existing facilities and services as well as for expansion of the anticipated increasing demand of the services.

1.1.2 Due to the redevelopment proposal, the total GFA of the new buildings will be increased. A TIA is therefore conducted for the proposed building to assess the traffic impact induced.

2. EXISTING TRAFFIC CONDITION

2.1 Existing Traffic Conditions

2.1.1 Po Leung Kuk is located in the urban area at Causeway Bay which is bounded by Leighton Road at the north and Caroline Hill Road / Link Road at the east. The existing major vehicular access is located at Caroline Hill Road between Leighton Road and Link Road section; the existing major pedestrian access is located at the southwest corner of the junction Leighton Road / Caroline Hill Road.

2.1.2 Recently, there are some traffic improvement schemes implemented at Link Road and Caroline Hill Road. The traffic condition at Link Road is therefore improved.

2.2 Existing Junction Performance, Queue and Delays

2.2.1 In order to study the existing traffic conditions, a survey was undertaken in both AM, NOON and PM peaks on neutral weekdays on 1 June 2012 (Friday) along Caroline Hill Road and Link Road. Based on the 2012 observed traffic flows presented in **Figure 2.1**, existing performance of the surveyed junctions were assessed and the results are listed in **Table 2.1** below:

Table 2.1 2012 Existing Junction Performance

No.	Road Junction	Type	RC / DFC		
			AM	NOON	PM
J1	Leighton Road / Caroline Hill Road	Signal	43%	25%	31%
J2	Caroline Hill Road / Link Road	Priority	0.30	0.52	0.57
J3	Broadwood Road / Link Road	Signal	7%	16%	14%

Note: Figures show Reserve Capacity (RC) in percentage (%) for signalised junctions and Demand Flow to Capacity (DFC) of critical approach for priority junctions and roundabouts.

2.2.2 The above table shows that all junctions are operating with adequate capacities.

2.2.3 The estimated queue lengths and delays of the surveyed junctions were assessed and the results are listed in **Table 2.2** below:

Table 2.2 2012 Existing Queue Lengths and Delays

No.	Approach	Average Queue Length (m)			Delay (s)		
		AM	NOON	PM	AM	NOON	PM
J1	Leighton Road WB	46m	47m	44m	30s	35s	35s
	Hoi Ping Road	43m	47m	42m	31s	28s	28s
	Leighton Road EB	24m	26m	23m	26s	30s	31s
	Caroline Hill Road	32m	39m	39m	42s	45s	41s
J2	Caroline Hill Road WB	5m	14m	8m	15s	32s	18s
	Caroline Hill Road NB	5m	5m	5m	9s	11s	9s
J3	Broadwood Road WB	80m	63m	64m	38s	43s	46s
	Broadwood Road NB	45m	48m	41m	52s	54s	52s
	Link Road SB	66m	64m	66m	60s	46s	45s

2.2.4 The above table shows that the queues are about 47m, 14m & 80m for the junction J1, J2 & J3 respectively; the delays are about 35s, 32s & 60s for the junction J1, J2 & J3 respectively.

3. THE PROPOSED DEVELOPMENT

3.1 Development Schedule of the New Building

3.1.1 The existing and proposed development schedules are summarized in the **Table 3.1**.

Table 3.1 Existing and Proposed Development Schedule

Building Uses in the Proposal		Existing Area	Proposed Area	Additional Traffic Generation
PLK's Administration Office *	Office & Supporting Facilities for GIC	**5250m² GFA**	**6300m² GFA**	✓ **(note 1)**
Administration Offices & Supporting Facilities for GIC*				
Youth Services				
Adoption Services Unit *				
Parent Education Service *	Re-provision of Existing Education Services	**2030m² GFA**	**2030m² GFA**	×
Resource / Learning Centre *				
Student Support Service *				
Pre-primary Education Service Centre *				
Student Guidance Service (Primary & Secondary) *				
Basketball Court *				
Kindergarten *				
Centre for Children with special needs *	Social Welfare Services	203m² NOFA **284.2m² GFA**	304m² NOFA **430m² GFA**	×
District-based Speech Therapy Service *				
Children Care Services (over 6-yearsold) *		1844m² NOFA **2582m² GFA**	1894.09m² NOFA **2660m² GFA**	×
Elderly Care / Day Care Centre		-	1933m² NOFA **2710m² GFA**	✓ **(note 2)**
Kindergarten cum Nursery *		288.2m² NOFA **403.5m² GFA**	600m² NOFA **840m² GFA**	× **(note 3)**
Integrated Children Enhancement Programme *		73.9m² NOFA **103.5m² GFA**	To be further considered	×
Children Development Centre * (Children Art Centre * & Centre for Children with High Abilities *)				
Children Care Services (under 6-years-old) *		537.93 m² NOFA **753m² GFA**	484.22m² NOFA **680m² GFA**	×
Babies Section *				
New Comers' Ward *		1017m² NOFA **1424m² GFA**	1231.74m² NOFA **1725m² GFA**	× **(note 4)**
Day Creche *		186.2m² NOFA **260.7m² GFA**	400m² NOFA **560m² GFA**	× **(note 5)**
Kinder Section *		567.54m² NOFA **795 m² GFA**	605.4m² NOFA **845 m² GFA**	×
Total GFA		**13885.9m²**	**18780m²**	

Note: * Re-provision of existing uses.

1 The increase of 1050m² GFA is mainly due to the upgrade on the existing office area, which is around 20% expansion. The expansion is allocated to both the office area for staff & area for storage / meeting rooms. Therefore, for met increase of area due to the expansion of office for staff is around 550m² in GFA.

2 New Elderly Care / Day Care Centre to be provided in the proposed building which is equivalent to 2710m² in GFA.

3 The increase of 436.5m² in GFA is to cater for expansion of capacity from 84 to 150 in Kindergarten cum Nursery to meet the service demand in the vicinity. Students do walk to and from the site.

4 The increase of $300m^2$ in GFA is to cater for 20 additional places to be provided in the New Comers' Ward. No regular daily traffic is generated.

5 The increase of $299.3m^2$ in GFA is to cater for expansion of capacity from 40 to 80 in Day Creche to meet the service demand. No regular daily traffic is generated for children below 2 years.

3.1.2 As illustrated in Table 3.1, the new redevelopment building for Po Leung Kuk is to improve the existing services and facilities to meet the current standard for social welfare service. The increase in GFA in the new building is reserved for expansion of the existing services for the population growth in the vicinity. The increase in GFA is summarized:

(a) Increase of storage / meeting rooms area for office use and office staff;
(b) Build New Elderly Care / Day Care Centre;
(c) Expansion of Kindergarten capacity;
(d) Increase of additional places in the New Comer's Ward;
(e) Expansion of Day Creche capacity.

3.1.3 There is no traffic generation from the existing kindergarten as PLK does not organize any nanny bus service for the student living in the vicinity of the school. The normal regular traffic of staff should have been included in the traffic counts survey conducted. The additional traffic for staff due to expansion of those facilities/services are therefore included in the assessment.

3.1.4 No additional traffic generation for the visitors / users is expected due to the increase in floor area (GFA) for expansion of kindergarten capacity, additional places in the New Comer's Ward and expansion of Day Creche capacity as they mainly serves the local community who normally make access to the facilities on foot.

3.1.5 Hence, only the items (a) and (b) are anticipated to induce additional traffic generation by redevelopment of Po Leung Kuk due to increase in office area and implementation of new service.

3.2 Additional Vehicular Access of the New Building

3.2.1 An additional vehicular access will be implemented which make use of the existing EVA for the new building and there is internal road linked between two site accesses so that the ingress and egress traffic will be redistributed to the both accesses.

3.3 Parking and Servicing Provision of the New Building

3.3.1 10 car parking spaces and 1 loading / unloading space will be provided to serve the parking and servicing demand for the existing services that to be reprovisioned at the new building. For the new service of Elderly Care / Day Care Centre, there will be 1 reha-bus bay to be provided.

4. TRAFFIC FORECAST AND IMPACT ASSESSMENT

4.1 Traffic Forecast Approach

4.1.1 It is anticipated that the proposed development will be fully completed by 2015 / 2016 (from demolition to construction). In order to assess the impact of the development related traffic on the local road network, it is necessary to forecast the traffic flows for 2019, the adopted design year.

4.2 2019 Reference Traffic Forecasts

4.2.1 To estimate the future traffic demand in the vicinity for this TIA, it is required to determine the annual traffic growth rate for the forecast traffic flows and is considered reasonable to adopt the growth trend from the Territorial Population and Employment Data Matrix (TPEDM).

4.3 Review on 2011, 2016 & 2021 TPEDM

4.3.1 In order to estimate the growth factors, the latest TPEPM data (i.e. 2009 based) received PlanD have been adopted and the data should have included the most up-to-date development planning in the vicinity. The population and employment forecast is summarized in **Table 4.1** to estimate the traffic growth from year 2011 to 2016 & 2016 to 2021.

Table 4.1 Population and Employment Forecast (TPEDM)

Description	CTS Zone	Data	2011	2016	2021	Annual Growth Rate	
						11-16	16-21
Wan Chai	036	Population	17,608	17,392	19,394	-0.25%	2.20%
		Employment	6,173	7,313	7,672	3.45%	0.96%
		036 Total	23,781	24,705	27,065	0.77%	1.84%
	039	Population	14,302	14,244	14,873	-0.08%	0.87%
		Employment	6,388	6,429	6,253	0.13%	-0.55%
		039 Total	20,690	20,673	21,126	-0.02%	0.44%
Total Population			**31,910**	**31,636**	**34,267**	**-0.17%**	**1.61%**
Total Employment			**12,561**	**13,742**	**13,925**	**1.81%**	**0.26%**
Overall Total			**44,471**	**45,378**	**48,191**	**0.40%**	**1.21%**

4.3.2 From **Table 4.1**, it showed that the local area overall total growth is +0.4% and +1.21% per annum for 2011 to 2016 and 2016 to 2021 respectively. Hence, it is proposed to adopt a conservative annual growth of +0.5% p.a. from 2012 to 2016 and +1.5% from 2016 to 2019 for the traffic assessment in this study.

4.4 Additional Development Traffic Generation

4.4.1 As afore-mentioned, the additional development traffic generation will be generated due to the increase in office area and implementation of new service. For the increase in office area, the traffic generation and attraction will be derived by comparing the change of the office area and the observed trip rate survey of the existing Po Leung Kuk.

4.4.2 The trip rate survey has been conducted in June 2012 at the existing Po Leung Kuk with 5250m^2 GFA. The surveyed trips and adopted trip rates for this study are summarized in **Table 4.2**

Table 4.2 Surveyed Trips and Adopted Trip Rates of Additional Office Area

Component	AM Peak		NOON Peak		PM Peak	
	Gen.	Att.	Gen.	Att.	Gen.	Att.
Surveyed Trips (pcu/ hr)	16	16	15	10	14	11
Adopted Trips Rates (pcu/ hr/ 100m^2 GFA)	0.3048	0.3048	0.2857	0.1905	0.2667	0.2095

4.4.3 For the implementation of new Elderly Care Centre, the traffic generation and attraction will be adopted by the Traffic Generation Characteristic Data Record No. 439 (DR439) issued by Transport Department and adopted trip rates for this study are summarized in **Table 4.3**.

Table 4.3 Trip Rates of New Elderly Care Centre (DR439)

Component	AM Peak		NOON Peak*		PM Peak	
	Gen.	Att.	Gen.	Att.	Gen.	Att.
Community Facilities (pcu/ hr/ 100m^2 GFA)	0.2350	0.2350	0.2350	0.2350	0.1150	0.1150

Note: * Noon Peak Trip Rates are equal to the AM Peak Trip Rates for the worst case approach.

4.4.4 Based on the proposed office area provision given in Table 3.1 and the adopted trip rates as shown in Table 4.2 and 4.3, the net traffic generation and attraction of the proposed development are estimated and summarized in **Table 4.4**

Table 4.4 Net Traffic Generation of the Proposed Development (pcu/hr)

Component	AM Peak		NOON Peak		PM Peak	
	Gen.	Att.	Gen.	Att.	Gen.	Att.
1050m^2 Additional Office GFA	4	4	3	2	3	2
2710m^2 New Elderly Care Centre GFA	6	6	6	6	3	3
Net Total	**10**	**10**	**9**	**8**	**6**	**5**
Overall Total (Net + Existing)	**26**	**26**	**24**	**18**	**20**	**16**

4.4.5 It is stressed that the trip rate adopted for the elderly care centre are considered over-estimated as the trip demand for elderly is extremely low and in non-regular pattern.

4.5 Redistribution of Traffic Generation Patterns

4.5.1 As mentioned in section 3.2, a new vehicular access will be implemented and a split of 50:50% are assumed as there is internal road linked between two site accesses.

4.6 2016 Design Traffic Forecasts

4.6.1 The estimated traffic generated from the proposed redevelopment was then assigned to the road network in accordance with the 2019 reference traffic flows as shown in **Figure 4.1**. By superimposing the development traffic flows onto the 2019 reference traffic flows with the redistribution of the ingress / egress traffic pattern as shown in **Figure 4.2**, the 2019 design traffic flows is derived as shown in **Figure 4.3**.

4.7 Traffic Impact Assessment

4.7.1 To assess the traffic impact due to the proposed development, capacity analysis of the concerned junctions for both reference and design scenarios in year 2019 has been carried out. The results are summarized and presented in **Table 4.5.**

Table 4.5 2019 Junction Performance

No.	Road Junction	Type	RC / DFC					
			Reference			Design		
			AM	NOON	PM	AM	NOON	PM
J1	Leighton Road / Caroline Hill Road	Signal	34%	17%	23%	34%	17%	23%
J2	Caroline Hill Road / Link Road	Priority	0.34	0.59	0.64	0.34	0.59	0.64
J3	Broadwood Road / Link Road	Signal	1%	10%	8%	1%	10%	8%

Note: Figures show Reserve Capacity (RC) in percentage (%) for signalised junctions and Demand Flow to Capacity (DFC) of critical approach for priority junctions and roundabouts.

4.7.2 The above table has demonstrated that there are adequate junction capacities to cater for the additional traffic demand induced by the redevelopment of Po Leung Kuk in the vicinity.

4.7.3 The estimated queue lengths and delays are assessed and the results are listed in **Tables 4.6** and **4.7** and the reference and design case respectively.

Table 4.6 2019 Reference Queue Lengths and Delays

No.	Approach	Average Queue Length (m)			Delay (s)		
		AM	NOON	PM	AM	NOON	PM
J1	Leighton Road WB	49m	51m	47m	30s	36s	36s
	Hoi Ping Road	46m	50m	45m	31s	29s	28s
	Leighton Road EB	26m	27m	25m	26s	30s	31s
	Caroline Hill Road	35m	44m	43m	43s	48s	43s
J2	Caroline Hill Road WB	5m	23m	10m	16s	42s	20s
	Caroline Hill Road NB	5m	5m	5m	9s	11s	9s
J3	Broadwood Road WB	92m	69m	71m	45s	46s	49s
	Broadwood Road NB	48m	50m	44m	53s	56s	55s
	Link Road SB	77m	70m	73m	71s	49s	49s

Table 4.7 2019 Design Queue Lengths and Delays

No.	Approach	Average Queue Length (m)			Delay (s)		
		AM	NOON	PM	AM	NOON	PM
J1	Leighton Road WB	49m	51m	47m	**31s**	**37s**	36s
	Hoi Ping Road	46m	50m	45m	31s	29s	28s
	Leighton Road EB	26m	**28m**	25m	26s	30s	31s
	Caroline Hill Road	35m	44m	43m	43s	48s	43s
J2	Caroline Hill Road WB	5m	**24m**	10m	**17s**	**44s**	20s
	Caroline Hill Road NB	5m	5m	5m	9s	11s	9s
J3	Broadwood Road WB	**93m**	69m	71m	**46s**	46s	**50s**
	Broadwood Road NB	48m	**51m**	44m	53s	56s	55s
	Link Road SB	**79m**	70m	73m	**73s**	49s	49s

4.7.4 The above table shows that the increase in traffic queues and delays are only 1 to 2 metres long and 1 second respectively. Hence, it is considered that the traffic impact is negligible.

4.8 Sensitivity Test on Different Traffic Generation Patterns

4.8.1 In order to further investigate the traffic impact traffic of the proposed redevelopment besides the 50:50% split of the two accesses, sensitivity tests are carried out with different traffic generation patterns and the following additional scenarios will be assessed:

Sensitivity Test 1: All Traffic Use the **Original** Access

Sensitivity Test 2: All Traffic Use the **New** Access

4.8.2 The traffic patterns at junction Leighton Road / Caroline Hill Road (J1) and Broadwood Road / Link Road (J3) will be no difference in the sensitivity tests as the ingress / egress traffic routing the development traffic will be remained unchanged. Hence, only junction Caroline Hill Road / Link Road (J2) need be assessed due to different traffic generation patterns.

4.8.3 The development traffic for the two scenarios will be reassigned to the 2019 reference case road network. The junction capacity, queue length and delay analysis for the sensitivity tests are summarized in **Tables 4.8** and **4.9** respectively.

Table 4.8 Sensitivity Test for 2019 Design Junction Performance (J2)

Junction Caroline Hill Road / Link Road (J2)			
Scenario	**DFC**		
	AM	**NOON**	**PM**
50:50% Split	0.34	0.59	0.64
All Original Access	0.34	0.59	0.64
All New Access	0.34	0.59	0.65

Note: Figures show Demand Flow to Capacity (DFC) of critical approach for priority junctions and roundabouts.

Table 4.9 Sensitivity Test for 2019 Design Queue Lengths and Delays (J2)

Junction Caroline Hill Road / Link Road (J2)							
Scenario	**Approach**	**Average Queue Length (m)**			**Delay (s)**		
		AM	**NOON**	**PM**	**AM**	**NOON**	**PM**
50:50% Split	Caroline Hill Road WB	5m	24m	10m	17s	44s	20s
	Caroline Hill Road NB	5m	5m	5m	9s	11s	9s
All Original Access	Caroline Hill Road WB	5m	24m	10m	17s	43s	20s
	Caroline Hill Road NB	5m	5m	5m	9s	11s	9s
All New Access	Caroline Hill Road WB	5m	25m	10m	17s	44s	20s
	Caroline Hill Road NB	5m	5m	5m	9s	11s	9s

4.8.4 From the above tables the analysis results of sensitivity tests show that the redevelopment will only induce negligible traffic impact to the junction Caroline Hill Road / Link Road (J2).

5. SUMMARY

5.1.1 This TIA report is carried out to support the redevelopment of Po Leung Kuk from a traffic engineering viewpoint.

5.1.2 The redevelopment building of Po Leung Kuk will mainly improve the existing services / facilities to meet the expanding service demand for the community. The GFA will increase by around 4,894m^2.

5.1.3 The increase in GFA for the office area and implementation of the new elderly care centre are expected to have additional traffic generation for the redevelopment of Po Leung Kuk.

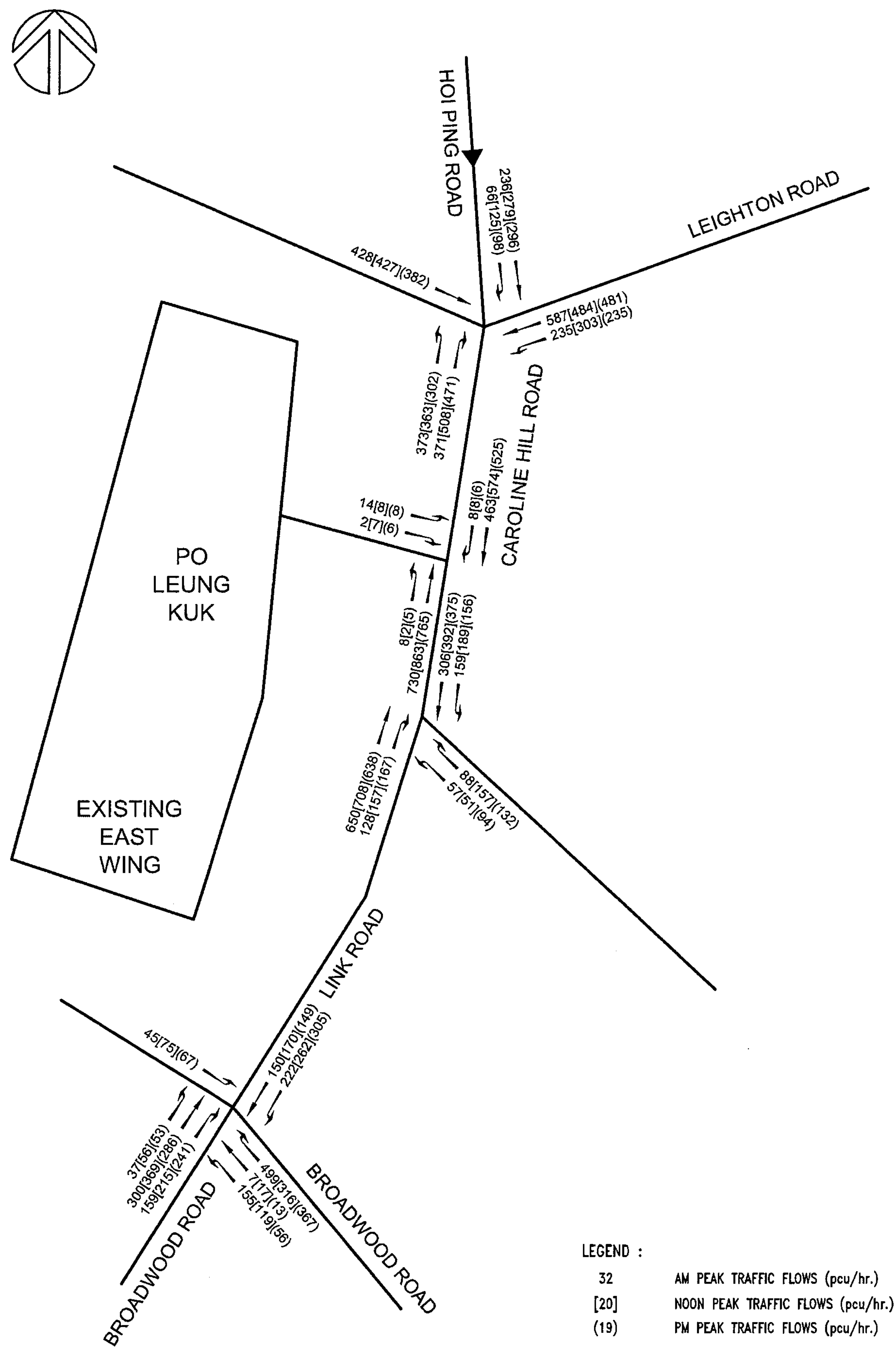
5.1.4 A new vehicular access arrangement is proposed to serve the redeveloped building and there will be two vehicular accesses: Link Road and Caroline Hill Road.

5.1.5 It is estimated that the proposed redevelopment will generate and attract additional traffic of about **20** pcu/hr, **17** pcu/hr and **11** pcu/hr in the AM peak, NOON peak and PM peak periods respectively.

5.1.6 Junction capacity analysis of the concerned junctions in the study area for both reference and design scenarios in year 2019, using an annual growth rate of +0.5% from 2012 to 2016 and +1.5% from 2016 to 2019, has been carried out and demonstrated that traffic impact is negligible and there are adequate junction capacities at concerned junctions along Caroline Hill Road and Link Road to cater the additional traffic demand induced by the redevelopment of Po Leung Kuk in the vicinity. Also, the increase in queue length and delays of the concerned junction are negligible.

5.1.7 Hence, it is concluded that the proposed redevelopment of PLK is feasible in traffic engineering point of views. The proposed new vehicular access at Link Road and additional traffic would not induce any unnecessary traffic impact to Link Road and the nearby road network.

FIGURES



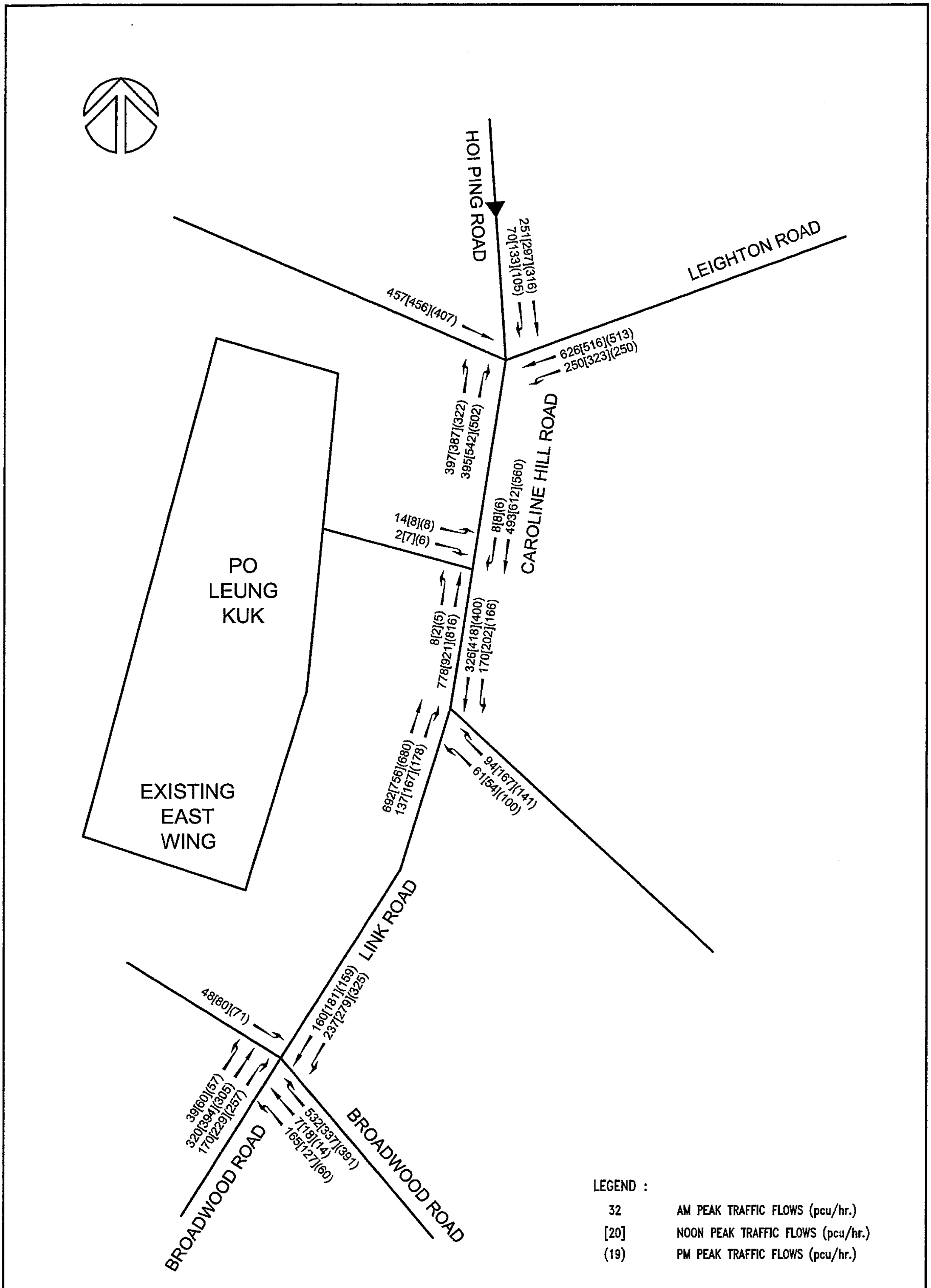
LEGEND :

32	AM PEAK TRAFFIC FLOWS (pcu/hr.)
[20]	NOON PEAK TRAFFIC FLOWS (pcu/hr.)
(19)	PM PEAK TRAFFIC FLOWS (pcu/hr.)

何黄交通顧問有限公司
Ho Wang SPB Limited
Traffic & Transportation Consultants

Project Title THE REDEVELOPMENT OF EAST WING OF PO LEUNG KUK AT 66 LEIGHTON ROAD, CAUSEWAY BAY, HK	Project No. J921	Figure No. 2.1	
	Scale N.T.S.	Date JUN 2012	
Figure Title 2012 OBSERVED TRAFFIC FLOWS	CADD Ref. J921/01TIA1/F0201/2012-06-06		Rev. -

H:\04(Thu)2012-06-07\J921-cad\01 TIA1\J921-F0201.dwg, A4, 1:1



何黃交通顧問有限公司
Ho Wang SPB Limited
Traffic & Transportation Consultants

Project Title
THE REDEVELOPMENT OF EAST WING OF PO LEUNG KUK AT 66 LEIGHTON ROAD, CAUSEWAY BAY, HK

Figure Title
2019 REFERENCE TRAFFIC FLOWS

Project No.	Figure No.
J921	4.1
Scale	Date
N.T.S.	JUN 2012
CADD Ref.	Rev.
J921/01TIA1/F0401A/2012-06-13	A

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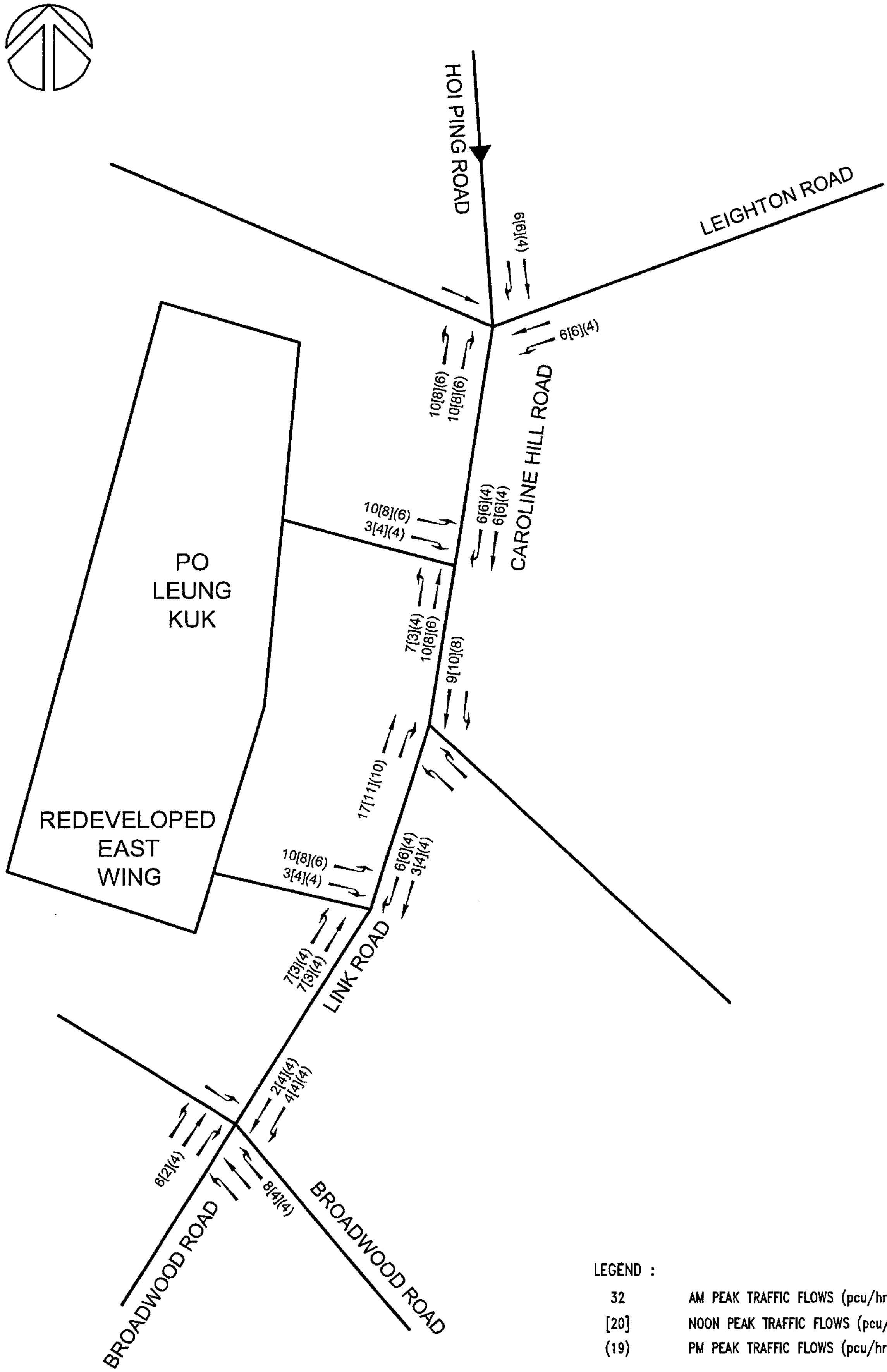

LEGEND :

32	AM PEAK TRAFFIC FLOWS (pcu/hr.)
[20]	NOON PEAK TRAFFIC FLOWS (pcu/hr.)
(19)	PM PEAK TRAFFIC FLOWS (pcu/hr.)

何黃交通顧問有限公司
Ho Wang SPB Limited
Traffic & Transportation Consultants

Project Title	Project No.	Figure No.
THE REDEVELOPMENT OF EAST WING OF PO LEUNG KUK AT 66 LEIGHTON ROAD, CAUSEWAY BAY, HK	J921	4.2
Figure Title	Scale: N.T.S.	Date: JUN 2012
DEVELOPMENT TRAFFIC FLOWS	CADD Ref.: J921/01TIA1/FD402/2012-06-06	Rev.: -

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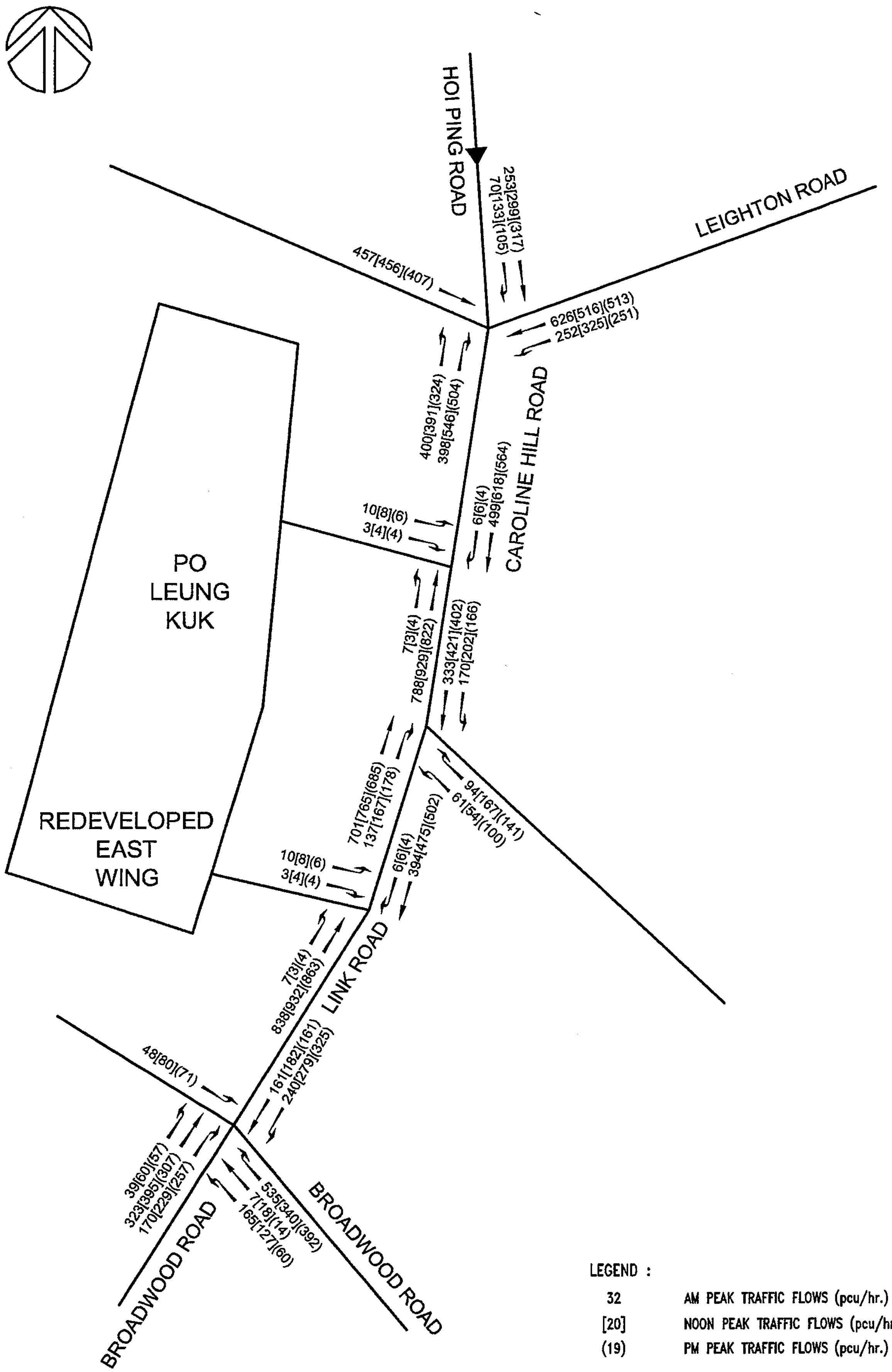

LEGEND :

32	AM PEAK TRAFFIC FLOWS (pcu/hr.)
[20]	NOON PEAK TRAFFIC FLOWS (pcu/hr.)
(19)	PM PEAK TRAFFIC FLOWS (pcu/hr.)

何黃交通顧問有限公司 Ho Wang SPB Limited Traffic & Transportation Consultants	Project Title THE REDEVELOPMENT OF EAST WING OF PO LEUNG KUK AT 66 LEIGHTON ROAD, CAUSEWAY BAY, HK Figure Title 2019 DESIGN TRAFFIC FLOWS	Project No. J921	Figure No. 4.3
		Scale N.T.S.	Date JUN 2012
		CADD Ref. J921/01TIA1/F0403A/2012-06-13	Rev. A

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APPENDIX A

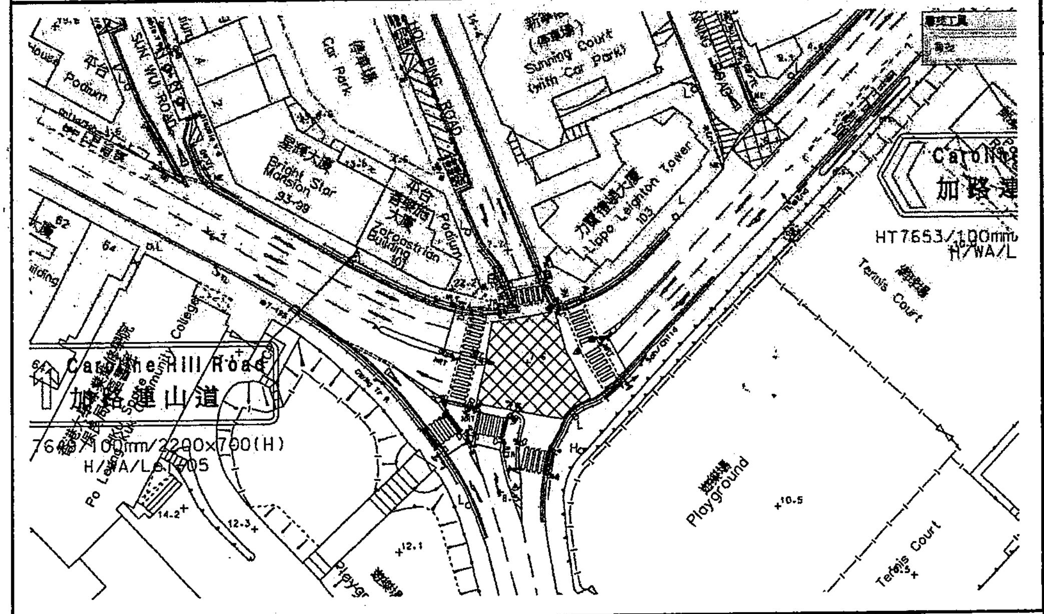
Calculation Sheets

Traffic Signal Junction Calculation Sheet

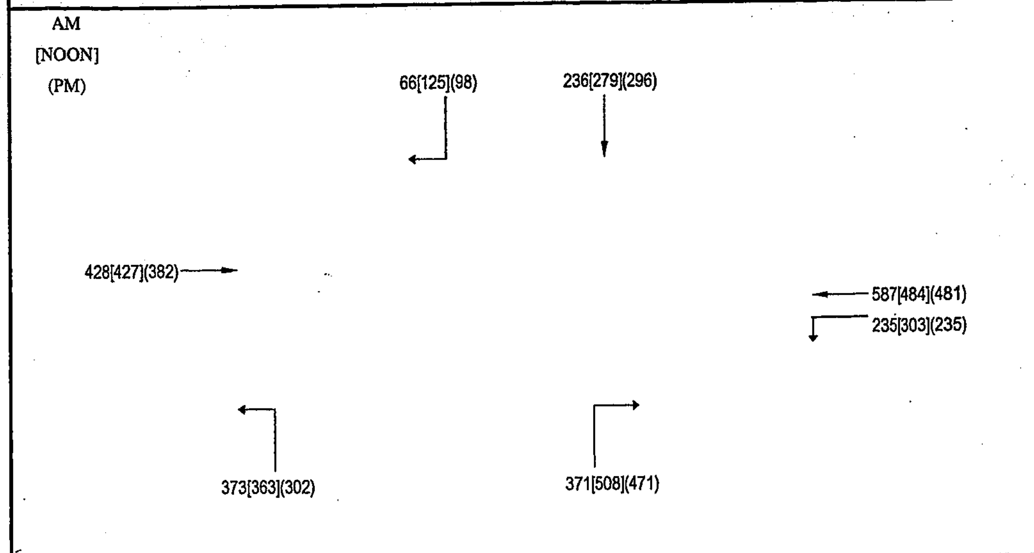
Ho Wang SPB Limited
Traffic & Transportation Consultants

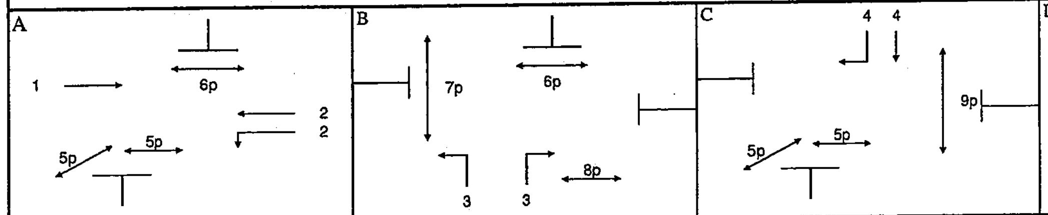
Job Title:	The Redevelopment of East Wing of Po Leung Kuk at 66 Leighton Road, Causeway Bay, HK	Ref. No.:	2012_J1S
Junction:	Leighton Road / Caroline Hill Road	Ref. No.:	
Scheme:	2012 Existing	Rev.:	-

Year: 2012 Job No.: J921



Peak Hour Traffic Flows (pcu/hr)





D E NOTE:

2	5	2	5	2		4
2	5	2	5	2	17	3

Approach / Phase	Stage	Lane No.	Wide (m)	No. Near	No. Oppo	Rad. L(m)	Rad. R(m)	Grad. (%)	Site Fact.	Turning Pro. (f)	Saturation Flow (pcu/hr)	AM Peak Flow	AM Peak y	AM Peak Crit.	NOON Peak Flow	NOON Peak y	NOON Peak Crit.	PM Peak Flow	PM Peak y	PM Peak Crit.
1 →	A	2	3.50	1							4070	428	0.105		427	0.105		382	0.094	
2A ←	A	1	3.50								2105	434	0.206	1	419	0.199		379	0.180	
2B	A	1	3.50	1		20				61 / 82 / 70	1880/1850/1865	388	0.206		368	0.199	1	337	0.180	1
3A	B	1	3.50	1		50				100	1910	373	0.195	1	363	0.190		302	0.158	
3B	B	1	3.50				25			100	1985	371	0.187		508	0.256	1	471	0.237	1
4A	C	1	3.50	1			15			100	1785	66	0.037		125	0.070		98	0.055	
4B ↓	C	1	3.50	1							1965	236	0.120	1	279	0.142	1	296	0.151	1

Critical Ped. Phase	Stage	Width Across	Min. GM	Min. FGM	Lost Time	Note	Crit.	Note	Crit.		Crit.
9p	C		10	7	17						

	AM		NOON		PM	
Check Critical Phase	2,3,4	2,3,9p	2,3,4	2,3,9p	2,3,4	2,3,9p
Sum of y values, Y	0.522	0.402	0.597	0.455	0.568	0.418
Lost time, L	17	34	17	34	17	34
Cycle Time, C	100	100	100	100	100	100
Practical Y, Y_{pr}	0.747	0.594	0.747	0.594	0.747	0.594
Reserve Capacity, R.C. (%)	43%	48%	25%	31%	31%	42%

Nearside Lane:	1940 + 100 x (W - 3.25)
Other Lanes:	2080 + 100 x (W - 3.25)
Gradient & Radius:	-42 x (gradient in %)
Opposed Traffic	-230
Turning Proportion:	x 1 / (1 + 1.5 f/R)
Practical Y (Y_{pr}):	0.9 x (1 - L/C)
Reserve Capacity (RC):	(Y_{pr}/Y - 1) x 100%

In accordance with TPDM - Volume 4.2.4

Calculated by: TE Date: Jun-2012 Checked by: KNL

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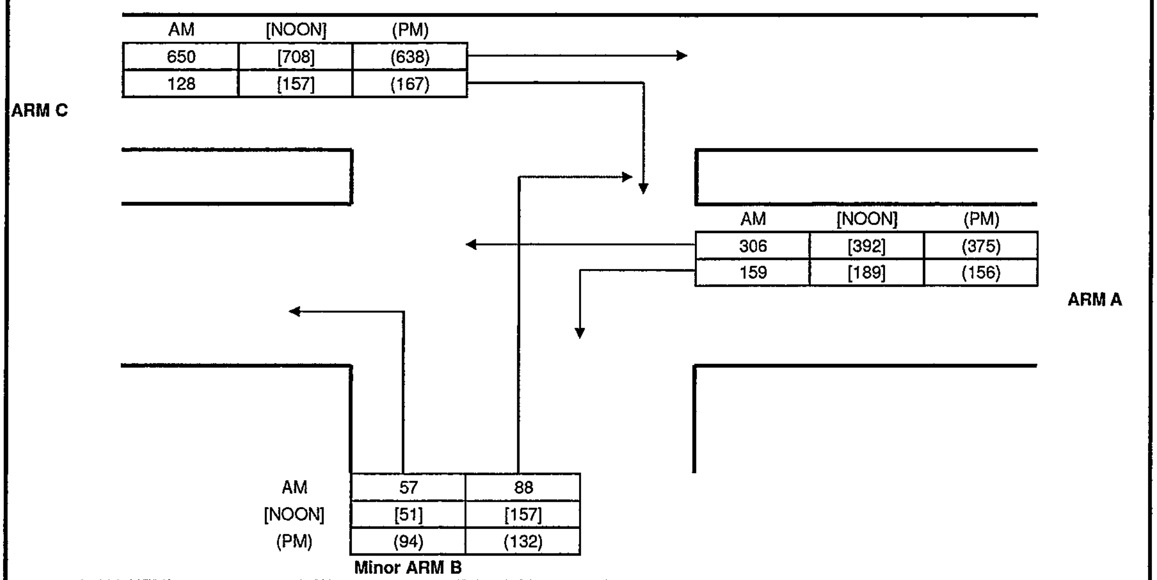
Simplified Priority Junction Capacity Calculation *Ho Wang SPB Limited*

Traffic & Transportation Consultants

Job Title:	The Redevelopment of East Wing of Po Leung Kuk at 66 Leighton Road, Causeway Bay, HK				
Junction:	Caroline Hill Road / Link Road			Ref. No.:	2012_J2P
Scheme:	2012 Existing			Ref. No.:	
Year:	2012	Job No.:	J921	Rev.:	-
ARM A:	Caroline Hill Road SB				
ARM B:	Link Road				
ARM C:	Caroline Hill Road NB				



GEOMETRY

Major road width	W	7.00	Lane widths	w(b-a)	3.50
Central Reserve width	Wcr	3.30		w(b-c)	3.50
2 Lane Minor Arm (Y/N)		N		w(c-b)	3.30
Visibilities	Vr(b-a)	200	Calculated	D	0.98
	Vl(b-a)	35		E	1.06
	Vr(b-c)	200		F	1.04
	Vr(c-b)	200		Y	0.76

ANALYSIS			AM PEAK	[NOON] PEAK	(PM) PEAK
TRAFFIC FLOWS	q(c-a)		650	708	638
	q(c-b)		128	157	167
	q(a-b)		159	189	156
	q(a-c)		306	392	375
	q(b-a)		88	157	132
	q(b-c)		57	51	94
	f		0.39	0.25	0.42
		Factor			
CAPACITIES	Q(b-a)	1	401	354	354
	Q(b-c)	1	680	651	651
	Q(c-b)	1	639	606	606
	Q(b-ac)	1	478	399	399
	Q(c-a)	1	1800	1800	1800
RFC's	b-a		0.219	0.444	0.373
	b-c		0.084	0.078	0.144
	c-b		0.200	0.259	0.276
	b-ac		0.303	0.521	0.566
	c-a		0.000	0.000	0.000

	AM	[NOON]	[NOON]
Worst RFC	**0.303**	**0.521**	**0.566**

Where Vl and Vr are visibility distances to the left or right of the respective streams

D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(Vl(b-a)-150))

E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))

F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))

Y = 1-0.0345W

f = proportion of minor traffic turning left

Q (b-ac) = Q(b-c)*Q(b-a)/(1-f)*Q(b-c)+f*Q(b-a)

T.P.D.M.V.2.4
Appendix 1

Capacity of combined streams
- in accordance with TPDM V2.4

Calculated by:	TE	Date:	Jun-12	Checked by:	KNL

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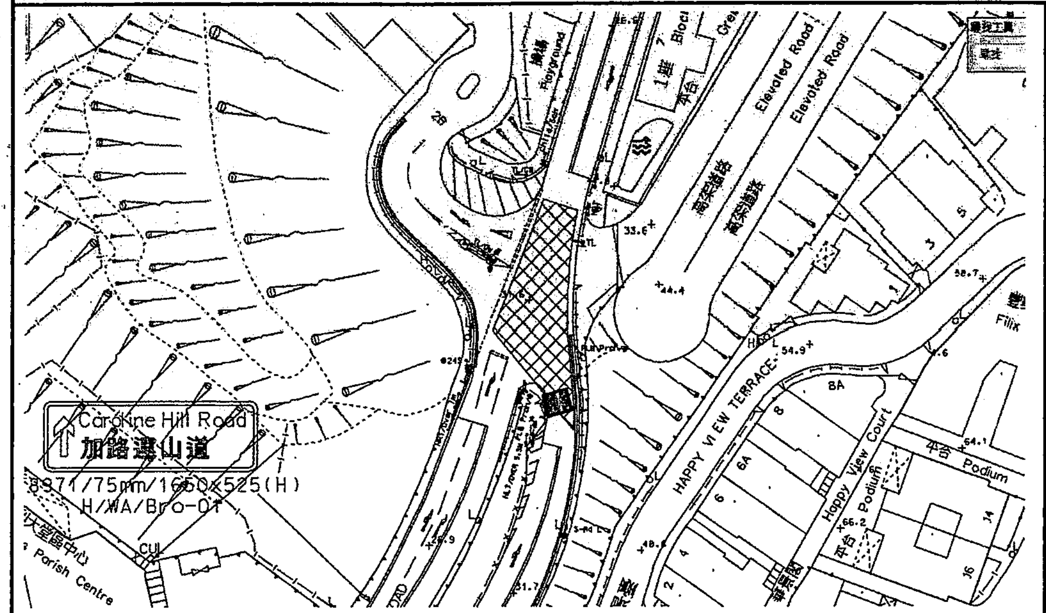
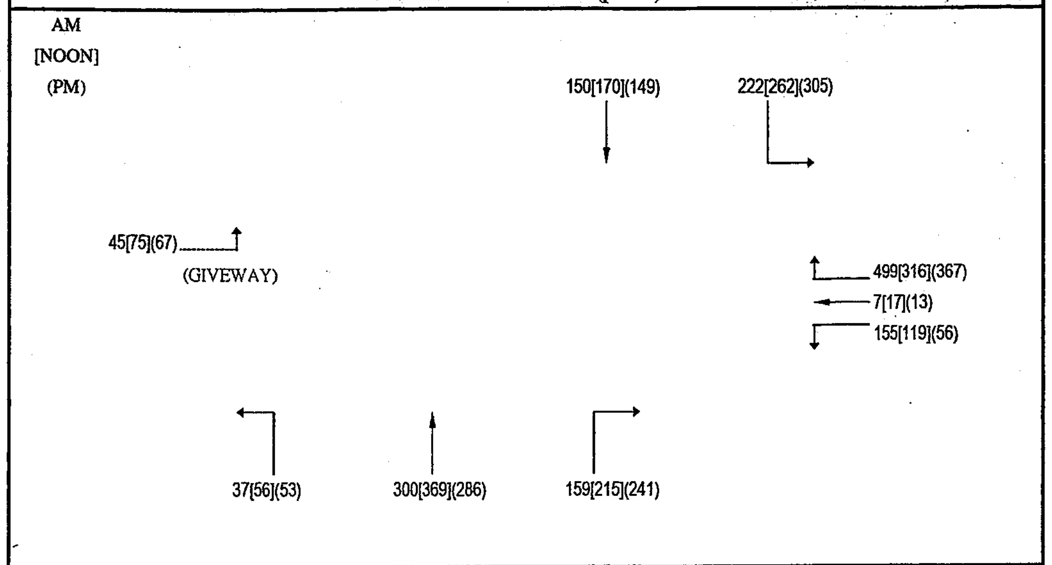
Traffic Signal Junction Calculation Sheet

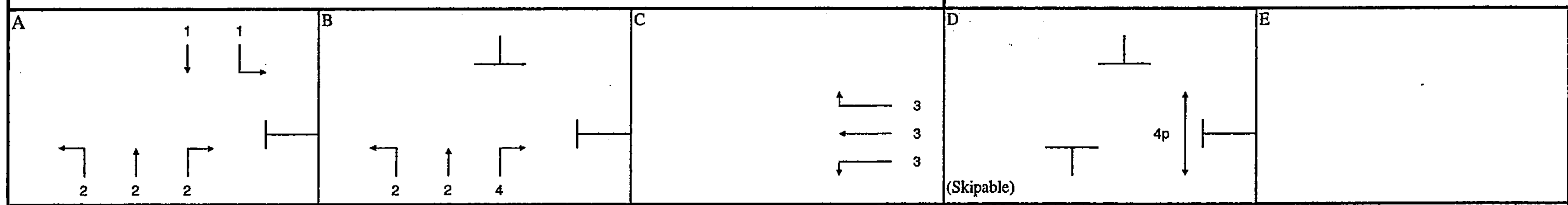
Ho Wang SPB Limited
Traffic & Transportation Consultants

Job Title:	The Redevelopment of East Wing of Po Leung Kuk at 66 Leighton Road, Causeway Bay, HK		
Junction:	Broadwood Road / Link Road	Ref. No.:	2012_J3S
Scheme:	2012 Existing	Ref. No.:	
Year: 2012	Job No.: J921	Rev.:	-



Peak Hour Traffic Flows (pcu/hr)





NOTE:

2		3	0		3	5		3	2	10	3

Approach / Phase	Stage	Lane No.	Wide (m)	No. Near	No. Oppo	Rad. L(m)	Rad. R(m)	Grad. (%)	Site Fact.	Turning Pro. (f)	Saturation Flow (pcu/hr)	AM Peak Flow	AM Peak y	AM Peak Crit.	NOON Peak Flow	NOON Peak y	NOON Peak Crit.	PM Peak Flow	PM Peak y	PM Peak Crit.
1	A	1	3.50	1		50				60 / 61 / 67	1930	372	0.193	1	432	0.224	1	454	0.236	1
2A	AB	1	3.50	1		20				11 / 13 / 16	1950/1945/1940	337	0.173		425	0.219		339	0.175	
2B	B	1	3.50				10			100	1830	159	0.087	1	215	0.117	1	241	0.132	1
3	C	1	3.50	1		5	50			99 / 96 / 97	1800/1785/1845	661	0.367	1	452	0.253	1	436	0.236	1

Critical Ped. Phase	Stage	Width Across	Min. GM	Min. FGM	Lost Time	Note	Crit.	Note	Crit.		Crit.
4p	D		5	5	10		1		1		1

Nearside Lane: 1940 + 100 x (W - 3.25)
Other Lanes: 2080 + 100 x (W - 3.25)
Gradient & Radius: -42 x (gradient in %)
Opposed Traffic: -230
Turning Proportion: x 1 / (1 + 1.5 f /R)
Practical Y (Y_{pr}): 0.9 x (1 - L/C)
Reserve Capacity (RC): (Y_{pr}/Y - 1) x 100%
In accordance with TPDM - Volume 4.2.4

	AM	NOON	PM
Check Critical Phase	1,2,3,4p	1,2,3,4p	1,2,3,4p
Sum of y values, Y	0.647	0.595	0.604
Lost time, L	28	28	28
Cycle Time, C	120	120	120
Practical Y, Y_{pr}	0.690	0.690	0.690
Reserve Capacity, R.C. (%)	7%	16%	14%

Calculated by:	TE	Date:	Jun-2012	Checked by:	KNL

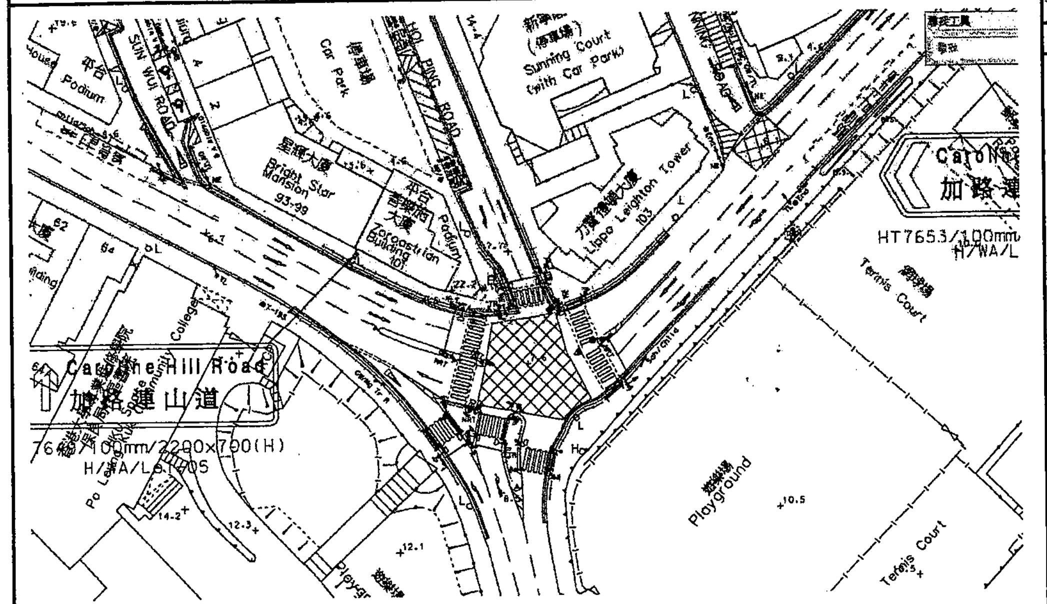
D:\Job\J921 Po Leung Kuk\[J921-Calculation_2.xls]2012_J3S

Traffic Signal Junction Calculation Sheet

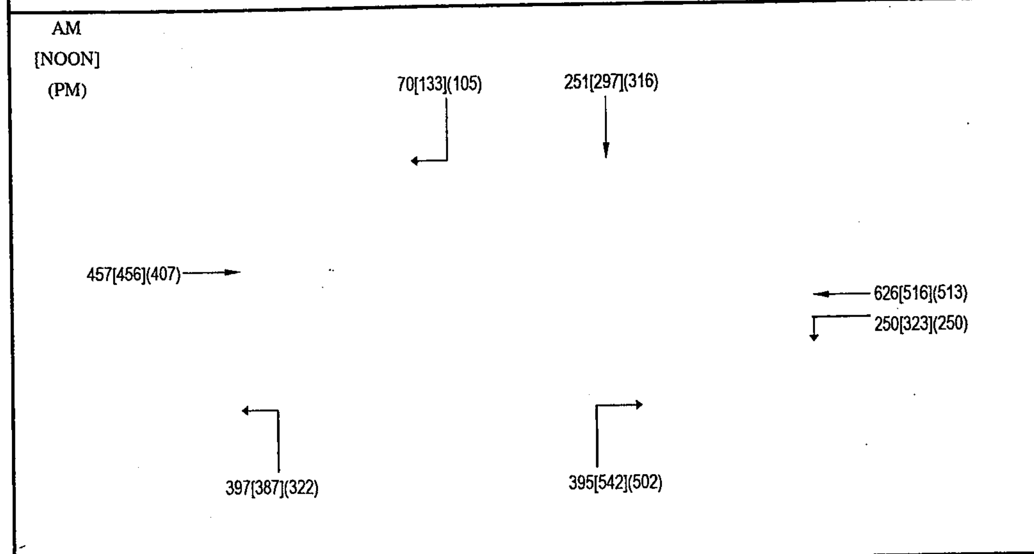
Ho Wang SPB Limited
Traffic & Transportation Consultants

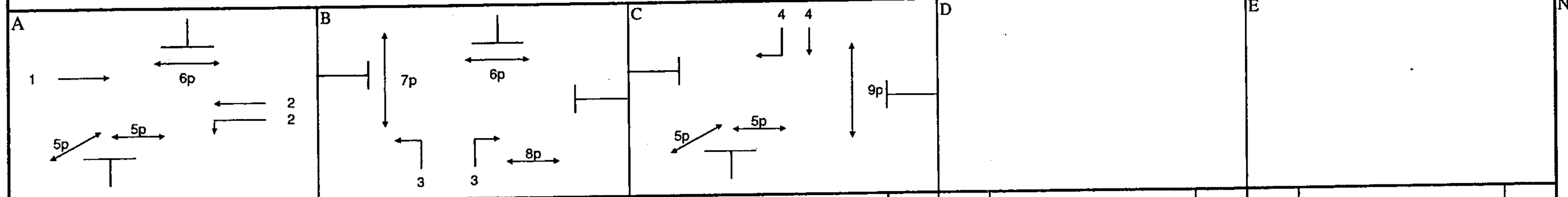
Job Title:	The Redevelopment of East Wing of Po Leung Kuk at 66 Leighton Road, Causeway Bay, HK	Ref. No.:	2019REF_J1S
Junction:	Leighton Road / Caroline Hill Road	Ref. No.:	
Scheme:	2019 Reference	Rev.:	-

Year: 2012 | Job No.: J921



Peak Hour Traffic Flows (pcu/hr)





NOTE:

2		5	2		5	2		4
2		5	2		5	2	17	3

Approach / Phase	Stage	Lane No.	Wide (m)	No. Near	No. Oppo	Rad. L(m)	Rad. R(m)	Grad. (%)	Site Fact.	Turning Pro. (f)	Saturation Flow (pcu/hr)	AM Peak Flow	AM Peak y	AM Peak Crit.	NOON Peak Flow	NOON Peak y	NOON Peak Crit.	PM Peak Flow	PM Peak y	PM Peak Crit.
1 →	A	2	3.50	1							4070	457	0.112		456	0.112		407	0.100	
2A ←	A	1	3.50								2105	463	0.220	1	446	0.212		404	0.192	
2B	A	1	3.50	1		20				60 / 82 / 70	1880/1850/1865	413	0.220		393	0.212	1	359	0.192	1
3A	B	1	3.50	1		50				100	1910	397	0.208	1	387	0.203		322	0.169	
3B	B	1	3.50				25			100	1985	395	0.199		542	0.273	1	502	0.253	1
4A	C	1	3.50	1			15			100	1785	70	0.039		133	0.075		105	0.059	
4B ↓	C	1	3.50	1							1965	251	0.128	1	297	0.151	1	316	0.161	1

Critical Ped. Phase	Stage	Width Across	Min. GM	Min. FGM	Lost Time	Note	Crit.	Note	Crit.		Crit.
9p	C		10	7	17						

	AM		NOON		PM	
Check Critical Phase	2,3,4	2,3,9p	2,3,4	2,3,9p	2,3,4	2,3,9p
Sum of y values, Y	0.555	0.428	0.636	0.485	0.606	0.445
Lost time, L	17	34	17	34	17	34
Cycle Time, C	100	100	100	100	100	100
Practical Y, Y_{pr}	0.747	0.594	0.747	0.594	0.747	0.594
Reserve Capacity, R.C. (%)	34%	39%	17%	22%	23%	33%

Nearside Lane:	1940 + 100 x (W - 3.25)
Other Lanes:	2080 + 100 x (W - 3.25)
Gradient & Radius:	-42 x (gradient in %)
Opposed Traffic	-230
Turning Proportion:	x 1 / (1 + 1.5 f /R)
Practical Y (Y_{pr}):	0.9 x (1 - L/C)
Reserve Capacity (RC):	(Y_{pr}/Y - 1) x 100%

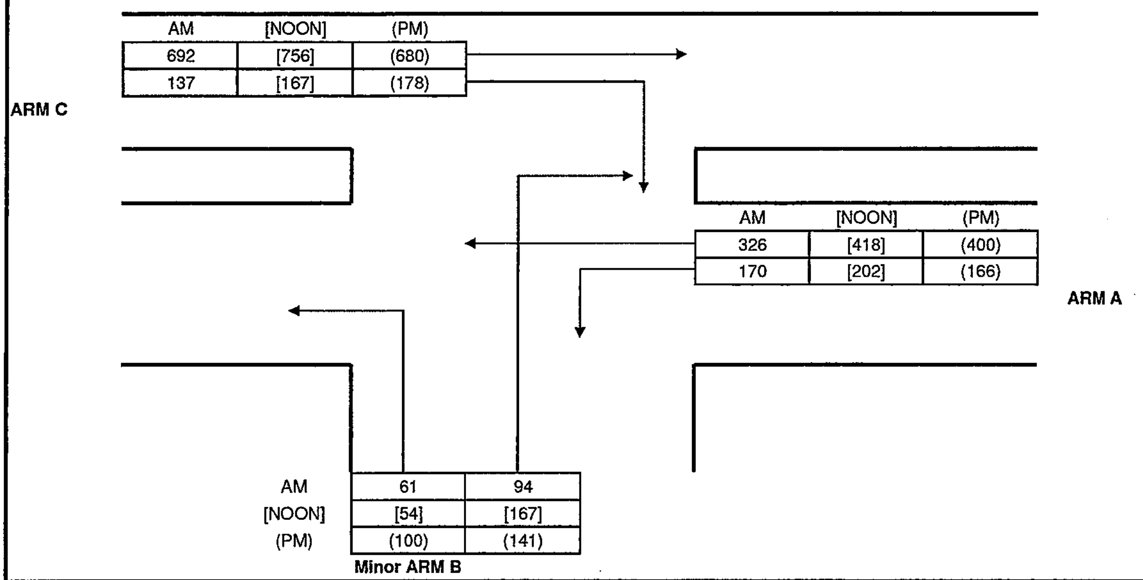
In accordance with TPDM - Volume 4.2.4

Calculated by:	TE	Date:	Jun-2012	Checked by:	KNL

Simplified Priority Junction Capacity Calculation *Ho Wang SPB Limited*

Traffic & Transportation Consultants

Job Title:	The Redevelopment of East Wing of Po Leung Kuk at 66 Leighton Road, Causeway Bay, HK				
Junction:	Caroline Hill Road / Link Road			Ref. No.:	:019REF_J2I
Scheme:	2019 Reference			Ref. No.:	
Year:	2012	Job No.:	J921	Rev.:	-
ARM A:	Caroline Hill Road SB				
ARM B:	Link Road				
ARM C:	Caroline Hill Road NB				



GEOMETRY

Major road width	W	7.00	Lane widths	w(b-a)	3.50
Central Reserve width	Wcr	3.30		w(b-c)	3.50
2 Lane Minor Arm (Y/N)		N		w(c-b)	3.30
Visibilities	Vr(b-a)	200	Calculated	D	0.98
	Vl(b-a)	35		E	1.06
	Vr(b-c)	200		F	1.04
	Vr(c-b)	200		Y	0.76

ANALYSIS			AM PEAK	[NOON] PEAK	(PM) PEAK
TRAFFIC FLOWS	q(c-a)		692	756	680
	q(c-b)		137	167	178
	q(a-b)		170	202	166
	q(a-c)		326	418	400
	q(b-a)		94	167	141
	q(b-c)		61	54	100
	f		0.39	0.24	0.41
		Factor			
CAPACITIES	Q(b-a)	1	384	333	333
	Q(b-c)	1	673	642	642
	Q(c-b)	1	630	595	595
	Q(b-ac)	1	462	377	377
	Q(c-a)	1	1800	1800	1800
RFC's	b-a		0.245	0.502	0.423
	b-c		0.091	0.084	0.156
	c-b		0.217	0.281	0.299
	b-ac		0.335	0.586	0.639
	c-a		0.000	0.000	0.000

	AM	[NOON]	[NOON]
Worst RFC	**0.335**	**0.586**	**0.639**

Where Vl and Vr are visibility distances to the left or right of the respective streams

D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(Vl(b-a)-150))

E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))

F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))

Y = 1-0.0345W

f = proportion of minor traffic turning left

Q (b-ac) = Q(b-c)*Q(b-a)/(1-f)*Q(b-c)+f*Q(b-a)

Capacity of combined streams
- in accordance with TPDM V2.4

T.P.D.M.V.2.4
Appendix 1

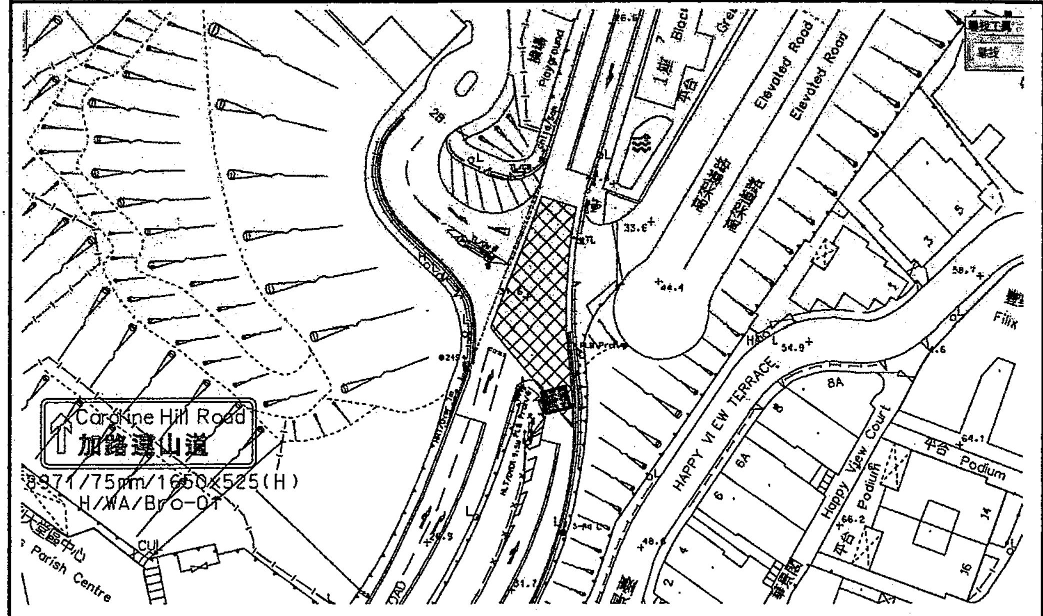
Calculated by:	TE	Date:	Jun-12	Checked by:	KNL

D:\Job\J921 Po Leung Kuk\[J921-Calculation_2.xls]2019REF_J2P

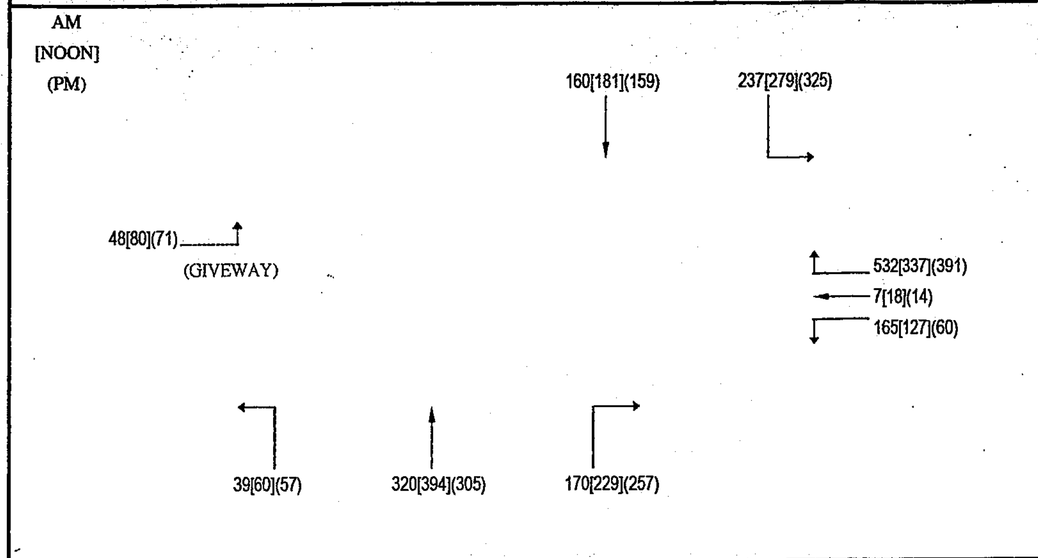
Traffic Signal Junction Calculation Sheet

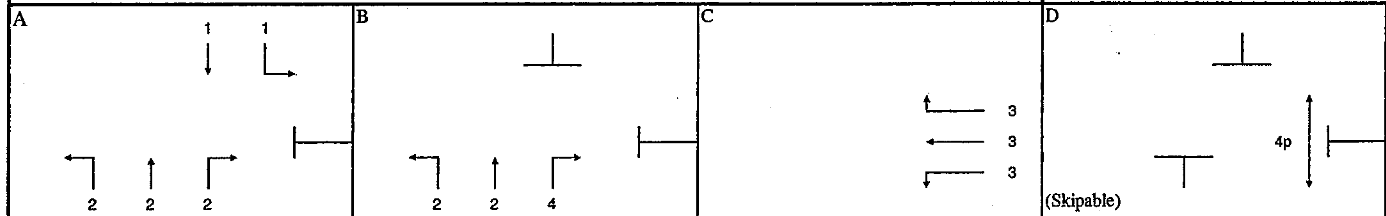
Ho Wang SPB Limited
Traffic & Transportation Consultants

Job Title:	The Redevelopment of East Wing of Po Leung Kuk at 66 Leighton Road, Causeway Bay, HK		
Junction:	Broadwood Road / Link Road	Ref. No.:	2019REF_J3S
Scheme:	2019 Reference	Ref. No.:	
Year: 2012	Job No.: J921	Rev.:	-



Peak Hour Traffic Flows (pcu/hr)





NOTE:

A			B			C			D			E		
2		2	0		3	5		3	2	10	3			

Approach / Phase	Stage	Lane No.	Wide (m)	No. Near	No. Oppo	Rad. L(m)	Rad. R(m)	Grad. (%)	Site Fact.	Turning Pro. (f)	Saturation Flow (pcu/hr)	AM Peak Flow	AM Peak y	AM Peak Crit.	NOON Peak Flow	NOON Peak y	NOON Peak Crit.	PM Peak Flow	PM Peak y	PM Peak Crit.
1	A	1	3.50	1		50				60 / 61 / 67	1930	397	0.206	1	460	0.238	1	484	0.251	1
2A	AB	1	3.50	1		20				11 / 13 / 16	1950/1945/1940	359	0.184		454	0.233		362	0.187	
2B	B	1	3.50				10			100	1830	170	0.093	1	229	0.125	1	257	0.140	1
3	C	1	3.50	1		5	50			99 / 96 / 97	1800/1785/1845	704	0.391	1	482	0.270	1	465	0.252	1

Critical Ped. Phase	Stage	Width Across	Min. GM	Min. FGM	Lost Time	Note	Crit.	Note	Crit.		Crit.
4p	D		5	5	10		1		1		1

Nearside Lane:	1940 + 100 x (W - 3.25)
Other Lanes:	2080 + 100 x (W - 3.25)
Gradient & Radius:	-42 x (gradient in %)
Opposed Traffic	-230
Turning Proportion:	x 1 / (1 + 1.5 f /R)
Practical Y (Y_{pr}):	0.9 x (1 - L/C)
Reserve Capacity (RC):	(Y_{pr} /Y - 1) x 100%

In accordance with TPDM - Volume 4.2.4

	AM	NOON	PM
Check Critical Phase	1,2,3,4p	1,2,3,4p	1,2,3,4p
Sum of y values, Y	0.690	0.634	0.644
Lost time, L	27	27	27
Cycle Time, C	120	120	120
Practical Y, Y_{pr}	0.698	0.698	0.698
Reserve Capacity, R.C. (%)	1%	10%	8%

Calculated by:	TE	Date:	Jun-2012	Checked by:	KNL

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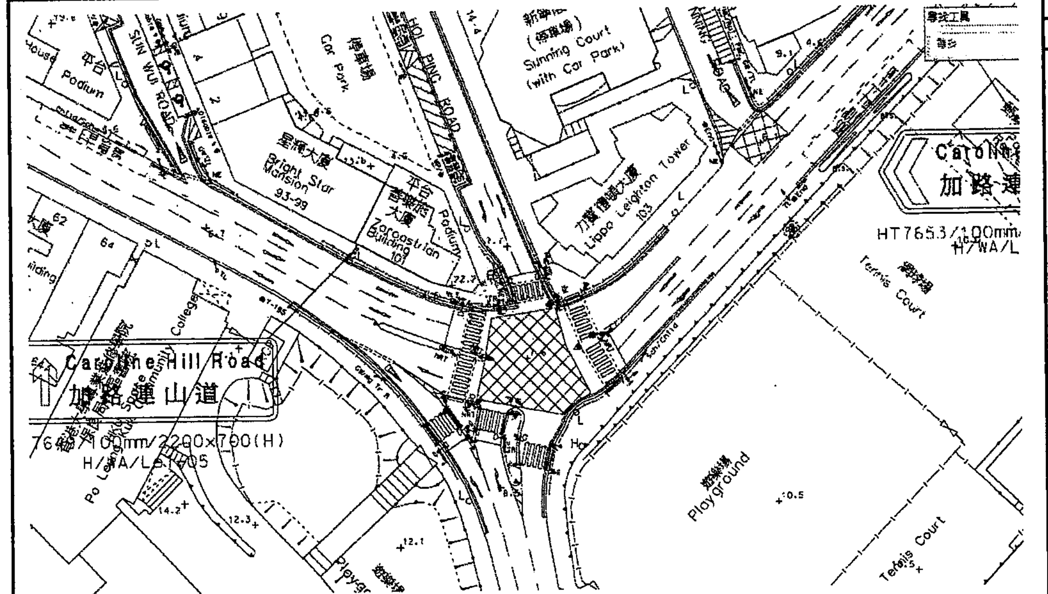
Traffic Signal Junction Calculation Sheet

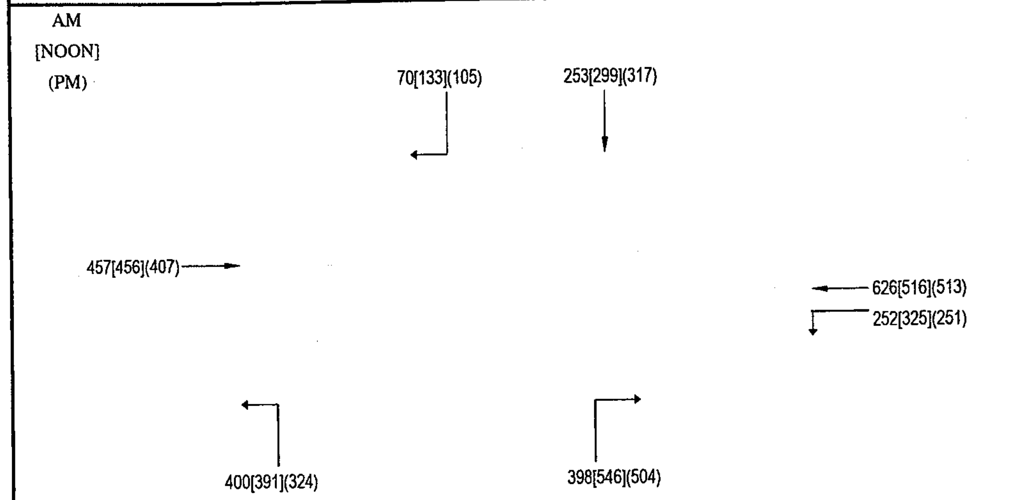
Ho Wang SPB Limited
Traffic & Transportation Consultants

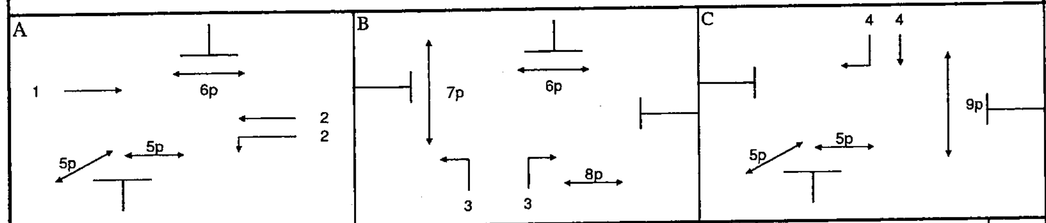
Job Title:	The Redevelopment of East Wing of Po Leung Kuk at 66 Leighton Road, Causeway Bay, HK	Ref. No.:	2019DES_J1S
Junction:	Leighton Road / Caroline Hill Road	Ref. No.:	
Scheme:	2019 Design	Rev.:	-

Year: 2012 | Job No.: J921



Peak Hour Traffic Flows (pcu/hr)





NOTE:

2		5	2		5	2		4
2		5	2		5	2	17	3

Approach / Phase	Stage	Lane No.	Wide (m)	No. Near	No. Oppo	Rad. L(m)	Rad. R(m)	Grad. (%)	Site Fact.	Turning Pro. (f)	Saturation Flow (pcu/hr)	AM Peak Flow	AM Peak y	AM Peak Crit.	NOON Peak Flow	NOON Peak y	NOON Peak Crit.	PM Peak Flow	PM Peak y	PM Peak Crit.
1 →	A	2	3.50	1							4070	457	0.112		456	0.112		407	0.100	
2A ←	A	1	3.50								2105	464	0.220	1	448	0.213		405	0.192	
2B	A	1	3.50	1		20				61 / 83 / 70	1880/1850/1865	414	0.220		393	0.213	1	359	0.193	1
3A	B	1	3.50	1		50				100	1910	400	0.209	1	391	0.205		324	0.170	
3B	B	1	3.50				25			100	1985	398	0.201		546	0.275	1	504	0.254	1
4A	C	1	3.50	1			15			100	1785	70	0.039		133	0.075		105	0.059	
4B ↓	C	1	3.50	1							1965	253	0.129	1	299	0.152	1	317	0.161	1

Critical Ped. Phase	Stage	Width Across	Min. GM	Min. FGM	Lost Time	Note	Crit.	Note	Crit.		Crit.
9p	C		10	7	17						

	AM		NOON		PM	
Check Critical Phase	2,3,4	2,3,9p	2,3,4	2,3,9p	2,3,4	2,3,9p
Sum of y values, Y	0.559	0.430	0.640	0.488	0.608	0.446
Lost time, L	17	34	17	34	17	34
Cycle Time, C	100	100	100	100	100	100
Practical Y, Y_{pr}	0.747	0.594	0.747	0.594	0.747	0.594
Reserve Capacity, R.C. (%)	34%	38%	17%	22%	23%	33%

Nearside Lane:	1940 + 100 x (W - 3.25)
Other Lanes:	2080 + 100 x (W - 3.25)
Gradient & Radius:	-42 x (gradient in %)
Opposed Traffic	-230
Turning Proportion:	x 1 / (1 + 1.5 f /R)
Practical Y (Y_{pr}):	0.9 x (1 - L/C)
Reserve Capacity (RC):	(Y_{pr}/Y - 1) x 100%

In accordance with TPDM - Volume 4.2.4

Calculated by: TE | Date: Jun-2012 | Checked by: KNL

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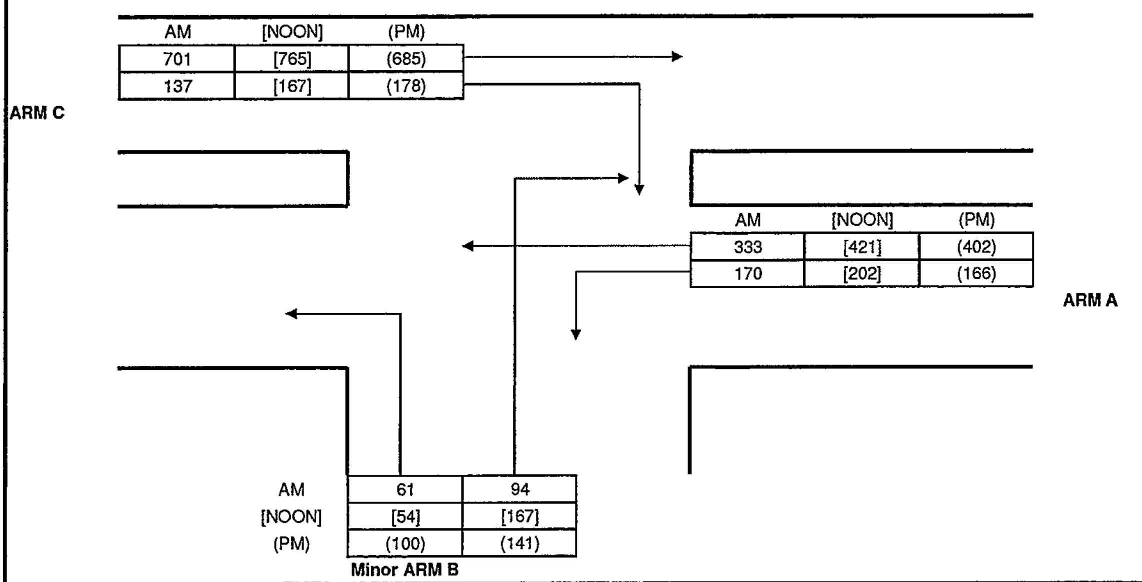
Simplified Priority Junction Capacity Calculation

Ho Wang SPB Limited
Traffic & Transportation Consultants

Job Title:	The Redevelopment of East Wing of Po Leung Kuk at 66 Leighton Road, Causeway Bay, HK		
Junction:	Caroline Hill Road / Link Road	Ref. No.:	:019DES_J2I
Scheme:	2019 Design	Ref. No.:	
Year:	2012 Job No.: J921	Rev.:	-
ARM A:	Caroline Hill Road SB		
ARM B:	Link Road		
ARM C:	Caroline Hill Road NB		



GEOMETRY

Major road width	W	7.00	Lane widths	w(b-a)	3.50
Central Reserve width	Wcr	3.30		w(b-c)	3.50
2 Lane Minor Arm (Y/N)		N		w(c-b)	3.30
Visibilities	Vr(b-a)	200	Calculated	D	0.98
	Vl(b-a)	35		E	1.06
	Vr(b-c)	200		F	1.04
	Vr(c-b)	200		Y	0.76

ANALYSIS			AM PEAK	[NOON] PEAK	(PM) PEAK
TRAFFIC FLOWS	q(c-a)		701	765	685
	q(c-b)		137	167	178
	q(a-b)		170	202	166
	q(a-c)		333	421	402
	q(b-a)		94	167	141
	q(b-c)		61	54	100
	f		0.39	0.24	0.41
		Factor			
CAPACITIES	Q(b-a)	1	381	331	331
	Q(b-c)	1	671	641	641
	Q(c-b)	1	628	594	594
	Q(b-ac)	1	459	375	375
	Q(c-a)	1	1800	1800	1800
RFC's	b-a		0.247	0.505	0.426
	b-c		0.091	0.084	0.156
	c-b		0.218	0.281	0.300
	b-ac		0.338	0.589	0.643
	c-a		0.000	0.000	0.000

	AM	[NOON]	[NOON]
Worst RFC	**0.338**	**0.589**	**0.643**

Where Vl and Vr are visibility distances to the left or right of the respective streams

D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(Vl(b-a)-150))

E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))

F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))

Y = 1-0.0345W

f = proportion of minor traffic turning left

Q (b-ac) = Q(b-c)*Q(b-a)/(1-f)*Q(b-c)+f*Q(b-a)

T.P.D.M.V.2.4
Appendix 1

Capacity of combined streams
- in accordance with TPDM V2.4

Calculated by:	TE	Date:	Jun-12	Checked by:	KNL

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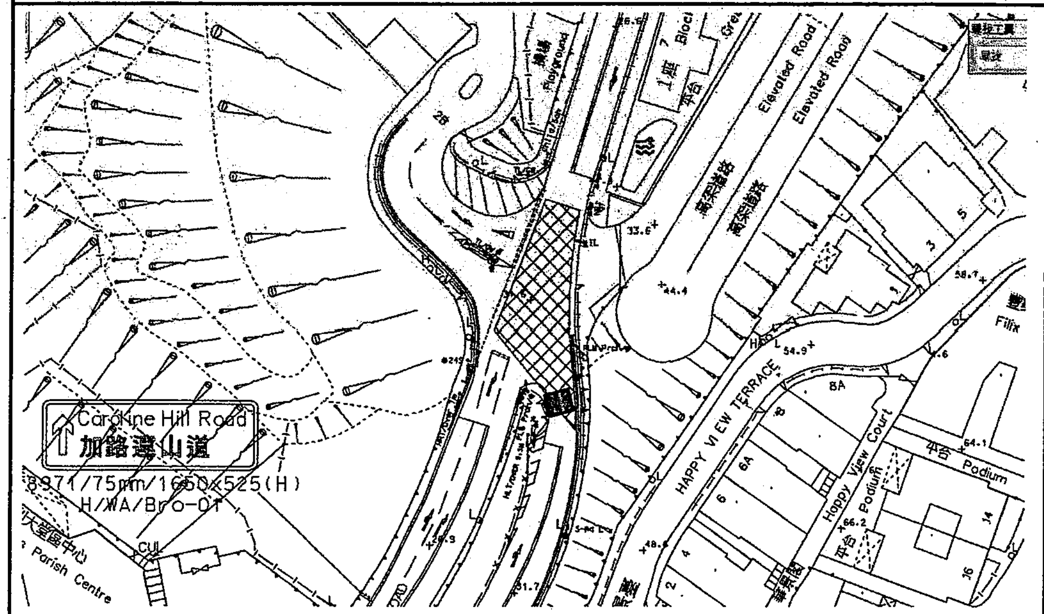
Traffic Signal Junction Calculation Sheet

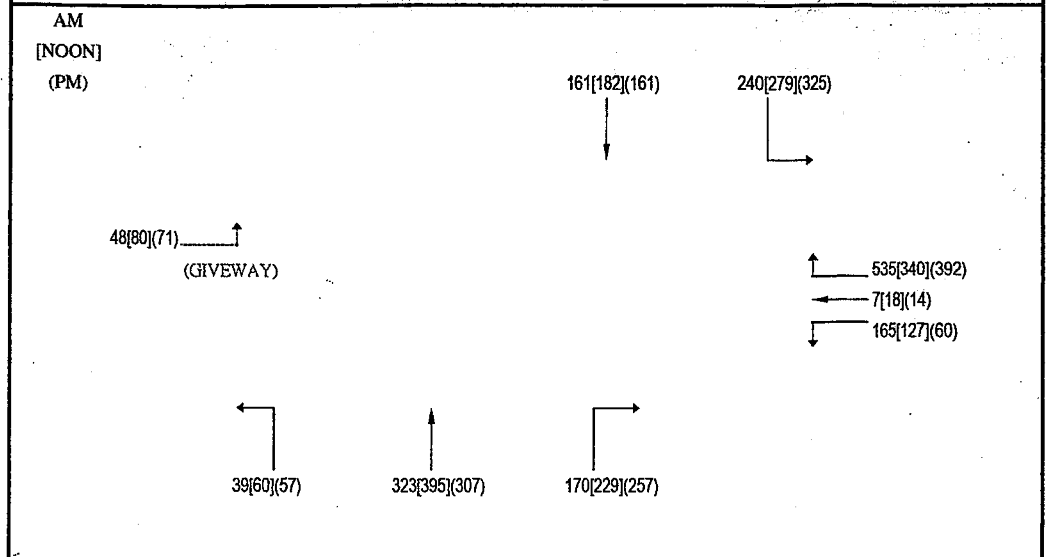
Ho Wang SPB Limited
Traffic & Transportation Consultants

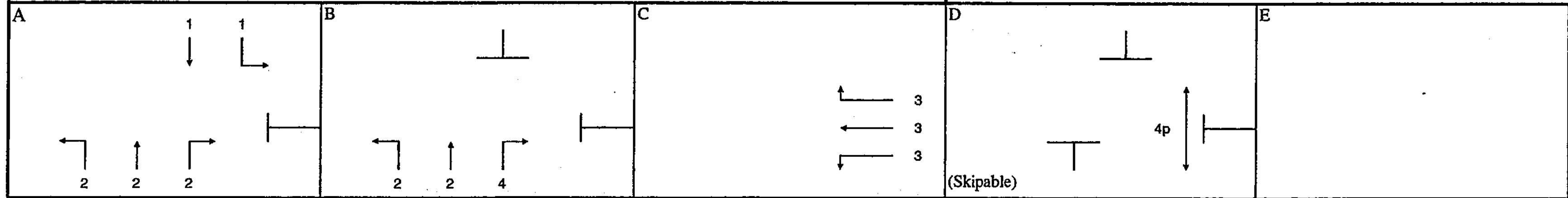
Job Title:	The Redevelopment of East Wing of Po Leung Kuk at 66 Leighton Road, Causeway Bay, HK		
Junction:	Broadwood Road / Link Road	Ref. No.:	2019DES_J3S
Scheme:	2019 Design	Ref. No.:	



Year:	2012	Job No.:	J921	Rev.:	-

Peak Hour Traffic Flows (pcu/hr)





NOTE:

A			B			C			D			E		
2		2	0		3	5		3	2	10	3			

Approach / Phase	Stage	Lane No.	Wide (m)	No. Near	No. Oppo	Rad. L(m)	Rad. R(m)	Grad. (%)	Site Fact.	Turning Pro. (f)	Saturation Flow (pcu/hr)	AM Peak Flow	AM Peak y	AM Peak Crit.	NOON Peak Flow	NOON Peak y	NOON Peak Crit.	PM Peak Flow	PM Peak y	PM Peak Crit.
1	A	1	3.50	1		50				60 / 61 / 67	1930	401	0.208	1	461	0.239	1	486	0.252	1
2A	AB	1	3.50	1		20				11 / 13 / 16	1950/1945/1940	362	0.186		455	0.234		364	0.188	
2B	B	1	3.50				10			100	1830	170	0.093	1	229	0.125	1	257	0.140	1
3	C	1	3.50	1		5	50			99 / 96 / 97	1800/1785/1845	707	0.393	1	485	0.272	1	466	0.253	1

Critical Ped. Phase	Stage	Width Across	Min. GM	Min. FGM	Lost Time	Note	Crit.	Note	Crit.		Crit.
4p	D		5	5	10		1		1		1

Nearside Lane:	1940 + 100 x (W - 3.25)
Other Lanes:	2080 + 100 x (W - 3.25)
Gradient & Radius:	-42 x (gradient in %)
Opposed Traffic	-230
Turning Proportion:	x 1 / (1 + 1.5 f/R)
Practical Y (Y_{pr}):	0.9 x (1 - L/C)
Reserve Capacity (RC):	(Y_{pr}/Y - 1) x 100%

In accordance with TPDM - Volume 4.2.4

	AM	NOON	PM
Check Critical Phase	1,2,3,4p	1,2,3,4p	1,2,3,4p
Sum of y values, Y	0.693	0.636	0.645
Lost time, L	27	27	27
Cycle Time, C	120	120	120
Practical Y, Y_{pr}	0.698	0.698	0.698
Reserve Capacity, R.C. (%)	1%	10%	8%

Calculated by:	TE	Date:	Jun-2012	Checked by:	KNL

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Queue Length Calculation Sheet

Ho Wang SPB Limited
Traffic & Transportation Consultants

Job Title:	The Redevelopment of East Wing of Po Leung Kuk at 66 Leighton Road, Causeway Bay, HK		
Junction:	Leighton Road / Caroline Hill Road	Ref. No.:	2012_J1Q
Scheme:	2012 Existing	Ref. No.:	
Year:	2012	Job No.: J921	Rev.: -
Arm A:	Leighton Road WB		
Arm B:	Hoi Ping Road		
Arm C:	Leighton Road EB		
Arm D:	Caroline Hill Road		

Caroline Hill Road	
Design Flow	236[279](296)
Delay (s)	42[45](41)
Ave. Q (m)	32[39](39)
Max. Q (m)	68[82](77)

Leighton Road EB	
Design Flow	428[427](382)
Delay (s)	26[30](31)
Ave. Q (m)	24[26](23)
Max. Q (m)	45[49](45)

Leighton Road WB	
Design Flow	822[787](716)
Delay (s)	30[35](35)
Ave. Q (m)	46[47](44)
Max. Q (m)	78[78](73)

Hoi Ping Road	
Design Flow	744[871](773)
Delay (s)	31[28](28)
Ave. Q (m)	43[47](42)
Max. Q (m)	72[78](72)

GREEN TIME, CYCLE TIME AND FLOWS DATA

		AM					[NOON]					(PM)				
	Number of Lanes, n	Effective Green, g (sec)	Cycle Time, c (sec)	Design Flow, q (pcu/hr)	Saturation Flow, S (pcu/hr)	PCU Factor, p	Effective Green, g (sec)	Cycle Time, c (sec)	Design Flow, q (pcu/hr)	Saturation Flow, S (pcu/hr)	PCU Factor, p	Effective Green, g (sec)	Cycle Time, c (sec)	Design Flow, q (pcu/hr)	Saturation Flow, S (pcu/hr)	PCU Factor, p
Arm A	2	33	100	822	3985	1.3	28	100	787	3955	1.3	26	100	716	3970	1.2
Arm B	2	31	100	744	3895	1.2	36	100	871	3895	1.2	35	100	773	3895	1.3
Arm C	2	33	100	428	4070	1.2	28	100	427	4070	1.2	26	100	382	4070	1.2
Arm D	1	19	100	236	1965	1.2	20	100	279	1965	1.2	22	100	296	1965	1.1

AM PEAK QUEUE LENGTH CALCULATION

	Effective Red, r (sec)	Effective Green Ratio, L	Degree of Saturation, X	Average Arrival Rate, M (veh/cyc)	Maximum Queue (vehs)*
Arm A	67	0.33	0.63	17.50	20
Arm B	69	0.31	0.61	16.81	20
Arm C	67	0.33	0.32	10.14	13
Arm D	81	0.19	0.63	5.33	9

	Max. Queue Length (m)	Estimated Delay, d(sec)	Average Queue Length, L1 (m)	Average Queue Length, L2 (m)	Average Queue Length (m)
Arm A	78	30	43	46	46
Arm B	72	31	40	43	43
Arm C	45	26	21	24	24
Arm D	68	42	32	32	32

NOON PEAK QUEUE LENGTH CALCULATION

	Effective Red, r (sec)	Effective Green Ratio, L	Degree of Saturation, X	Average Arrival Rate, M (veh/cyc)	Maximum Queue (vehs)*
Arm A	72	0.28	0.72	17.00	20
Arm B	64	0.36	0.63	19.36	21
Arm C	72	0.28	0.38	9.86	14
Arm D	80	0.20	0.72	6.53	12

	Max. Queue Length (m)	Estimated Delay, d(sec)	Average Queue Length, L1 (m)	Average Queue Length, L2 (m)	Average Queue Length (m)
Arm A	78	35	47	47	47
Arm B	78	28	44	47	47
Arm C	49	30	23	26	26
Arm D	82	45	39	37	39

PM PEAK QUEUE LENGTH CALCULATION

	Effective Red, r (sec)	Effective Green Ratio, L	Degree of Saturation, X	Average Arrival Rate, M (veh/cyc)	Maximum Queue (vehs)*
Arm A	74	0.26	0.68	16.17	20
Arm B	65	0.35	0.57	17.00	19
Arm C	74	0.26	0.36	9.19	13
Arm D	78	0.22	0.68	7.44	12

	Max. Queue Length (m)	Estimated Delay, d(sec)	Average Queue Length, L1 (m)	Average Queue Length, L2 (m)	Average Queue Length (m)
Arm A	73	35	43	44	44
Arm B	72	28	39	42	42
Arm C	45	31	21	23	23
Arm D	77	41	39	38	39

AM RESULT SUMMARY

		Maximum Queue Length (m)	Average Queue Length (m)
Arm A	Leighton Road	**78**	**46**
Arm B	Hoi Ping Road	**72**	**43**
Arm C	Leighton Road	**45**	**24**
Arm D	Caroline Hill Rc	**68**	**32**

NOON RESULT SUMMARY

	Maximum Queue Length (m)	Average Queue Length (m)
Arm A	**78**	**47**
Arm B	**78**	**47**
Arm C	**49**	**26**
Arm D	**82**	**39**

PM RESULT SUMMARY

	Maximum Queue Length (m)	Average Queue Length (m)
Arm A	**73**	**44**
Arm B	**72**	**42**
Arm C	**45**	**23**
Arm D	**77**	**39**

Effective Red, $r = c-g$
Effective Green Ratio, $L = g/c$
Degree of Saturation, $X = q/(SL)$
Average Arrival Rate, $M = qc/3600p$
Maximum Queue Length = 6 * Maximum Queue/n x p (Note: Convert Vehicle into pcu and assume 6m each pcu)
Estimated Delay, $d = c(1-L)^2/2(1-LX) + 3600pX^2/2q(1-X) - 0.65(c/(q/3600p)^2)^{(1/3)}*X^{(2+5L)}$
Average Queue Length, $L1 = 6q(r/2+d)/3600pn$ OR $L2 = 6qr/3600pn$ whichever the greater

In accordance with TPDM - Volume 4.2.5.2
** Note: The probability of maximum queue exceeding the critical value is 5% (TPDM V.4.2. Table 2.5.2.4)*

Calculated by: TE	Date: June-12	Checked by:	KNL

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Queue Length Calculation Sheet

Ho Wang SPB Limited
Traffic & Transportation Consultants

Job Title:	The Redevelopment of East Wing of Po Leung Kuk at 66 Leighton Road, Causeway Bay, HK				
Junction:	Broadwood Road / Link Road			Ref. No.:	2012_J3Q
Scheme:	2012 Existing			Ref. No.:	
Year:	2012	Job No.:	J921	Rev.:	-
Arm A:	Broadwood Road WB				
Arm B:	Broadwood Road NB RT				
Arm C:	Broadwood Road NB ST & LT				
Arm D:	Link Road SB				

Link Road SB	
Design Flow	372[432](454)
Delay (s)	60[46](45)
Ave. Q (m)	66[64](66)
Max. Q (m)	133[116](117)

Broadwood Road WB	
Design Flow	661[452](436)
Delay (s)	38[43](46)
Ave. Q (m)	80[63](64)
Max. Q (m)	142[113](114)

Broadwood Road NB ST & LT	
Design Flow	337[425](339)
Delay (s)	34[26](22)
Ave. Q (m)	45[48](36)
Max. Q (m)	87[92](74)

Broadwood Road NB RT	
Design Flow	159[215](241)
Delay (s)	52[54](52)
Ave. Q (m)	27[37](41)
Max. Q (m)	57[72](78)

GREEN TIME, CYCLE TIME AND FLOWS DATA

		AM					[NOON]					(PM)				
	Number of Lanes, n	Effective Green, g (sec)	Cycle Time, c (sec)	Design Flow, q (pcu/hr)	Saturation Flow, S (pcu/hr)	PCU Factor, p	Effective Green, g (sec)	Cycle Time, c (sec)	Design Flow, q (pcu/hr)	Saturation Flow, S (pcu/hr)	PCU Factor, p	Effective Green, g (sec)	Cycle Time, c (sec)	Design Flow, q (pcu/hr)	Saturation Flow, S (pcu/hr)	PCU Factor, p
Arm A	1	52	120	661	1800	1.1	39	120	452	1785	1.1	36	120	436	1845	1.1
Arm B	1	17	120	159	1830	1.0	20	120	215	1830	1.1	22	120	241	1830	1.0
Arm C	1	40	120	337	1950	1.1	53	120	425	1945	1.1	56	120	339	1940	1.1
Arm D	1	27	120	372	1930	1.1	35	120	432	1930	1.1	36	120	454	1925	1.1

AM PEAK QUEUE LENGTH CALCULATION

	Effective Red, r (sec)	Effective Green Ratio, L	Degree of Saturation, X	Average Arrival Rate, M (veh/cyc)	Maximum Queue (vehs)*
Arm A	68	0.44	0.84	20.53	22
Arm B	103	0.14	0.60	5.13	9
Arm C	80	0.33	0.52	10.10	13
Arm D	93	0.23	0.84	11.00	20

	Max. Queue Length (m)	Estimated Delay, d(sec)	Average Queue Length, L1 (m)	Average Queue Length, L2 (m)	Average Queue Length (m)
Arm A	142	38	80	75	80
Arm B	57	52	27	27	27
Arm C	87	34	42	45	45
Arm D	133	60	66	57	66

NOON PEAK QUEUE LENGTH CALCULATION

	Effective Red, r (sec)	Effective Green Ratio, L	Degree of Saturation, X	Average Arrival Rate, M (veh/cyc)	Maximum Queue (vehs)*
Arm A	81	0.33	0.78	13.70	17
Arm B	100	0.17	0.70	6.67	11
Arm C	67	0.44	0.50	12.43	13
Arm D	85	0.29	0.78	12.73	17

	Max. Queue Length (m)	Estimated Delay, d(sec)	Average Queue Length, L1 (m)	Average Queue Length, L2 (m)	Average Queue Length (m)
Arm A	113	43	63	61	63
Arm B	72	54	37	36	37
Arm C	92	26	42	48	48
Arm D	116	46	64	61	64

PM PEAK QUEUE LENGTH CALCULATION

	Effective Red, r (sec)	Effective Green Ratio, L	Degree of Saturation, X	Average Arrival Rate, M (veh/cyc)	Maximum Queue (vehs)*
Arm A	84	0.30	0.79	13.27	17
Arm B	98	0.18	0.72	7.83	13
Arm C	64	0.47	0.37	10.50	12
Arm D	84	0.30	0.79	14.13	18

	Max. Queue Length (m)	Estimated Delay, d(sec)	Average Queue Length, L1 (m)	Average Queue Length, L2 (m)	Average Queue Length (m)
Arm A	114	46	64	61	64
Arm B	78	52	41	39	41
Arm C	74	22	30	36	36
Arm D	117	45	66	64	66

AM RESULT SUMMARY

		Maximum Queue Length (m)	Average Queue Length (m)
Arm A	Broadwood Ro	**142**	**80**
Arm B	Broadwood Ro	**57**	**27**
Arm C	Broadwood Ro	**87**	**45**
Arm D	Link Road SB	**133**	**66**

NOON RESULT SUMMARY

	Maximum Queue Length (m)	Average Queue Length (m)
Arm A	**113**	**63**
Arm B	**72**	**37**
Arm C	**92**	**48**
Arm D	**116**	**64**

PM RESULT SUMMARY

	Maximum Queue Length (m)	Average Queue Length (m)
Arm A	**114**	**64**
Arm B	**78**	**41**
Arm C	**74**	**36**
Arm D	**117**	**66**

Effective Red, $r = c - g$
Effective Green Ratio, $L = g/c$
Degree of Saturation, $X = q/(SL)$
Average Arrival Rate, $M = qc/3600p$
Maximum Queue Length = 6 * Maximum Queue/n x p (Note: Convert Vehicle into pcu and assume 6m each pcu)
Estimated Delay, $d = c(1-L)^2/2(1-LX) + 3600pX^2/2q(1-X) - 0.65(c/(q/3600p)^2)^{(1/3)} \cdot X^{(2+5L)}$
Average Queue Length, $L1 = 6q(r/2+d)/3600pn$ OR $L2 = 6qr/3600pn$ whichever the greater

In accordance with TPDM - Volume 4.2.5.2
** Note: The probability of maximum queue exceeding the critical value is 5% (TPDM V.4.2. Table 2.5.2.4)*

Calculated by:	TE	Date:	June-12	Checked by:	KNL

Queue Length Calculation Sheet

Ho Wang SPB Limited
Traffic & Transportation Consultants

Job Title:	The Redevelopment of East Wing of Po Leung Kuk at 66 Leighton Road, Causeway Bay, HK				
Junction:	Leighton Road / Caroline Hill Road			Ref. No.:	2019REF_J1Q
Scheme:	2019 Reference			Ref. No.:	
Year:	2012	Job No.:	J921	Rev.:	-
Arm A:	Leighton Road WB				
Arm B:	Hoi Ping Road				
Arm C:	Leighton Road EB				
Arm D:	Caroline Hill Road				

Caroline Hill Road	
Design Flow	251[297](316)
Delay (s)	43[48](43)
Ave. Q (m)	35[44](43)
Max. Q (m)	72[92](85)

Leighton Road EB	
Design Flow	457[456](407)
Delay (s)	26[30](31)
Ave. Q (m)	26[27](25)
Max. Q (m)	48[52](47)

Leighton Road WB	
Design Flow	876[839](763)
Delay (s)	30[36](36)
Ave. Q (m)	49[51](47)
Max. Q (m)	81[84](77)

Hoi Ping Road	
Design Flow	792[929](824)
Delay (s)	31[29](28)
Ave. Q (m)	46[50](45)
Max. Q (m)	76[77](76)

GREEN TIME, CYCLE TIME AND FLOWS DATA

		AM					[NOON]					(PM)				
	Number of Lanes, n	Effective Green, g (sec)	Cycle Time, c (sec)	Design Flow, q (pcu/hr)	Saturation Flow, S (pcu/hr)	PCU Factor, p	Effective Green, g (sec)	Cycle Time, c (sec)	Design Flow, q (pcu/hr)	Saturation Flow, S (pcu/hr)	PCU Factor, p	Effective Green, g (sec)	Cycle Time, c (sec)	Design Flow, q (pcu/hr)	Saturation Flow, S (pcu/hr)	PCU Factor, p
Arm A	2	33	100	876	3985	1.3	28	100	839	3955	1.3	26	100	763	3970	1.2
Arm B	2	31	100	792	3895	1.2	36	100	929	3895	1.2	35	100	824	3895	1.3
Arm C	2	33	100	457	4070	1.2	28	100	456	4070	1.2	26	100	407	4070	1.2
Arm D	1	19	100	251	1965	1.2	20	100	297	1965	1.2	22	100	316	1965	1.1

AM PEAK QUEUE LENGTH CALCULATION

	Effective Red, r (sec)	Effective Green Ratio, L	Degree of Saturation, X	Average Arrival Rate, M (veh/cyc)	Maximum Queue (vehs)*
Arm A	67	0.33	0.67	18.65	21
Arm B	69	0.31	0.65	17.89	21
Arm C	67	0.33	0.34	10.83	14
Arm D	81	0.19	0.67	5.67	10

	Max. Queue Length (m)	Estimated Delay, d(sec)	Average Queue Length, L1 (m)	Average Queue Length, L2 (m)	Average Queue Length (m)
Arm A	81	30	47	49	49
Arm B	76	31	43	46	46
Arm C	48	26	23	26	26
Arm D	72	43	35	34	35

NOON PEAK QUEUE LENGTH CALCULATION

	Effective Red, r (sec)	Effective Green Ratio, L	Degree of Saturation, X	Average Arrival Rate, M (veh/cyc)	Maximum Queue (vehs)*
Arm A	72	0.28	0.77	18.12	22
Arm B	64	0.36	0.67	20.65	21
Arm C	72	0.28	0.40	10.53	14
Arm D	80	0.20	0.77	6.95	13

	Max. Queue Length (m)	Estimated Delay, d(sec)	Average Queue Length, L1 (m)	Average Queue Length, L2 (m)	Average Queue Length (m)
Arm A	84	36	51	51	51
Arm B	77	29	47	50	50
Arm C	52	30	25	27	27
Arm D	92	48	44	40	44

PM PEAK QUEUE LENGTH CALCULATION

	Effective Red, r (sec)	Effective Green Ratio, L	Degree of Saturation, X	Average Arrival Rate, M (veh/cyc)	Maximum Queue (vehs)*
Arm A	74	0.26	0.73	17.23	21
Arm B	65	0.35	0.61	18.12	20
Arm C	74	0.26	0.38	9.80	14
Arm D	78	0.22	0.73	7.95	13

	Max. Queue Length (m)	Estimated Delay, d(sec)	Average Queue Length, L1 (m)	Average Queue Length, L2 (m)	Average Queue Length (m)
Arm A	77	36	46	47	47
Arm B	76	28	42	45	45
Arm C	47	31	23	25	25
Arm D	85	43	43	41	43

AM RESULT SUMMARY

		Maximum Queue Length (m)	Average Queue Length (m)
Arm A	Leighton Road	81	49
Arm B	Hoi Ping Road	76	46
Arm C	Leighton Road	48	26
Arm D	Caroline Hill Rc	72	35

NOON RESULT SUMMARY

	Maximum Queue Length (m)	Average Queue Length (m)
Arm A	84	51
Arm B	77	50
Arm C	52	27
Arm D	92	44

PM RESULT SUMMARY

	Maximum Queue Length (m)	Average Queue Length (m)
Arm A	77	47
Arm B	76	45
Arm C	47	25
Arm D	85	43

Effective Red, $r = c - g$
Effective Green Ratio, $L = g/c$
Degree of Saturation, $X = q/(SL)$
Average Arrival Rate, $M = qc/3600p$
Maximum Queue Length = 6 * Maximum Queue/n x p (Note: Convert Vehicle into pcu and assume 6m each pcu)
Estimated Delay, $d = c(1-L)^2/2(1-LX) + 3600pX^2/2q(1-X) - 0.65(c/(q/3600p)^2)^{(1/3)}*X^{(2+5L)}$
Average Queue Length, $L1 = 6q(r/2+d)/3600pn$ OR $L2 = 6qr/3600pn$ whichever the greater

In accordance with TPDM - Volume 4.2.5.2
** Note: The probability of maximum queue exceeding the critical value is 5% (TPDM V.4.2. Table 2.5.2.4)*

Calculated by:	TE	Date:	June-12	Checked by:	KNL

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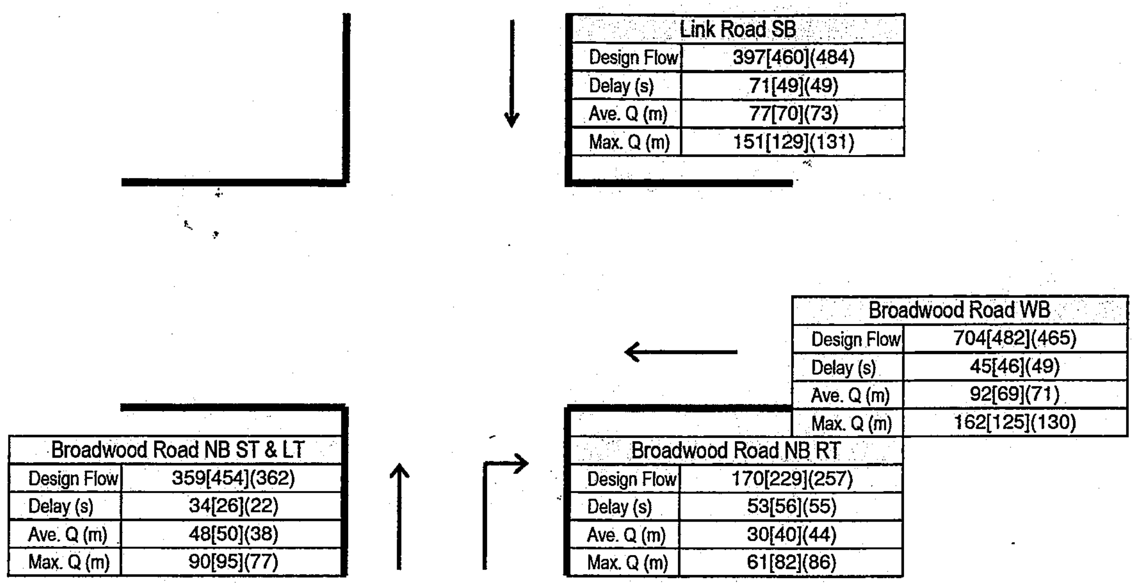
Queue Length Calculation Sheet

Ho Wang SPB Limited
Traffic & Transportation Consultants

Job Title:	The Redevelopment of East Wing of Po Leung Kuk at 66 Leighton Road, Causeway Bay, HK				
Junction:	Broadwood Road / Link Road			Ref. No.:	2019REF_J3Q
Scheme:	2019 Reference			Ref. No.:	
Year:	2012	Job No.:	J921	Rev.:	-
Arm A:	Broadwood Road WB				
Arm B:	Broadwood Road NB RT				
Arm C:	Broadwood Road NB ST & LT				
Arm D:	Link Road SB				



GREEN TIME, CYCLE TIME AND FLOWS DATA

	Number of Lanes, n	AM Effective Green, g (sec)	AM Cycle Time, c (sec)	AM Design Flow, q (pcu/hr)	AM Saturation Flow, S (pcu/hr)	AM PCU Factor, p	[NOON] Effective Green, g (sec)	[NOON] Cycle Time, c (sec)	[NOON] Design Flow, q (pcu/hr)	[NOON] Saturation Flow, S (pcu/hr)	[NOON] PCU Factor, p	(PM) Effective Green, g (sec)	(PM) Cycle Time, c (sec)	(PM) Design Flow, q (pcu/hr)	(PM) Saturation Flow, S (pcu/hr)	(PM) PCU Factor, p
Arm A	1	53	120	704	1800	1.1	40	120	482	1785	1.1	36	120	465	1845	1.1
Arm B	1	18	120	170	1830	1.0	20	120	229	1830	1.1	22	120	257	1830	1.0
Arm C	1	40	120	359	1950	1.1	53	120	454	1945	1.1	57	120	362	1940	1.1
Arm D	1	28	120	397	1930	1.1	35	120	460	1930	1.1	36	120	484	1925	1.1

AM PEAK QUEUE LENGTH CALCULATION

	Effective Red, r (sec)	Effective Green Ratio, L	Degree of Saturation, X	Average Arrival Rate, M (veh/cyc)	Maximum Queue (vehs)*
Arm A	67	0.44	0.89	21.87	25
Arm B	102	0.15	0.64	5.49	10
Arm C	80	0.34	0.55	10.76	14
Arm D	92	0.23	0.89	11.74	22

	Max. Queue Length (m)	Estimated Delay, d(sec)	Average Queue Length, L1 (m)	Average Queue Length, L2 (m)	Average Queue Length (m)
Arm A	162	45	92	79	92
Arm B	61	53	30	29	30
Arm C	90	34	44	48	48
Arm D	151	71	77	61	77

NOON PEAK QUEUE LENGTH CALCULATION

	Effective Red, r (sec)	Effective Green Ratio, L	Degree of Saturation, X	Average Arrival Rate, M (veh/cyc)	Maximum Queue (vehs)*
Arm A	80	0.33	0.82	14.61	19
Arm B	100	0.17	0.74	7.10	13
Arm C	67	0.44	0.52	13.28	14
Arm D	85	0.29	0.82	13.56	19

	Max. Queue Length (m)	Estimated Delay, d(sec)	Average Queue Length, L1 (m)	Average Queue Length, L2 (m)	Average Queue Length (m)
Arm A	125	46	69	65	69
Arm B	82	56	40	38	40
Arm C	95	26	45	50	50
Arm D	129	49	70	65	70

PM PEAK QUEUE LENGTH CALCULATION

	Effective Red, r (sec)	Effective Green Ratio, L	Degree of Saturation, X	Average Arrival Rate, M (veh/cyc)	Maximum Queue (vehs)*
Arm A	84	0.30	0.83	14.15	20
Arm B	98	0.19	0.76	8.35	14
Arm C	63	0.47	0.40	11.21	12
Arm D	84	0.30	0.83	15.07	20

	Max. Queue Length (m)	Estimated Delay, d(sec)	Average Queue Length, L1 (m)	Average Queue Length, L2 (m)	Average Queue Length (m)
Arm A	130	49	71	65	71
Arm B	86	55	44	42	44
Arm C	77	22	32	38	38
Arm D	131	49	73	68	73

AM RESULT SUMMARY

		Maximum Queue Length (m)	Average Queue Length (m)
Arm A	Broadwood Ro	**162**	**92**
Arm B	Broadwood Ro	**61**	**30**
Arm C	Broadwood Ro	**90**	**48**
Arm D	Link Road SB	**151**	**77**

NOON RESULT SUMMARY

	Maximum Queue Length (m)	Average Queue Length (m)
Arm A	**125**	**69**
Arm B	**82**	**40**
Arm C	**95**	**50**
Arm D	**129**	**70**

PM RESULT SUMMARY

	Maximum Queue Length (m)	Average Queue Length (m)
Arm A	**130**	**71**
Arm B	**86**	**44**
Arm C	**77**	**38**
Arm D	**131**	**73**

Effective Red, $r = c-g$
Effective Green Ratio, $L = g/c$
Degree of Saturation, $X = q/(SL)$
Average Arrival Rate, $M = qc/3600p$
Maximum Queue Length = 6 * Maximum Queue/n x p (Note: Convert Vehicle into pcu and assume 6m each pcu)
Estimated Delay, $d = c(1-L)^2/2(1-LX) + 3600pX^2/2q(1-X) - 0.65(c/(q/3600p)^2)^{(1/3)}*X^{(2+5L)}$
Average Queue Length, $L1 = 6q(r/2+d)/3600pn$ OR $L2 = 6qr/3600pn$ whichever the greater

In accordance with TPDM - Volume 4.2.5.2

** Note: The probability of maximum queue exceeding the critical value is 5% (TPDM V.4.2. Table 2.5.2.4)*

Calculated by:	TE	Date:	June-12	Checked by:	KNL

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Queue Length Calculation Sheet

Ho Wang SPB Limited
Traffic & Transportation Consultants

Job Title:	The Redevelopment of East Wing of Po Leung Kuk at 66 Leighton Road, Causeway Bay, HK				
Junction:	Leighton Road / Caroline Hill Road			Ref. No.:	2019DES_J1Q
Scheme:	2019 Design			Ref. No.:	
Year:	2012	Job No.:	J921	Rev.:	-
Arm A:	Leighton Road WB				
Arm B:	Hoi Ping Road				
Arm C:	Leighton Road EB				
Arm D:	Caroline Hill Road				

Caroline Hill Road	
Design Flow	253[299](317)
Delay (s)	43[48](43)
Ave. Q (m)	35[44](43)
Max. Q (m)	72[93](85)

Leighton Road EB	
Design Flow	457[456](407)
Delay (s)	26[30](31)
Ave. Q (m)	26[28](25)
Max. Q (m)	48[52](47)

Leighton Road WB	
Design Flow	878[841](764)
Delay (s)	31[37](36)
Ave. Q (m)	49[51](47)
Max. Q (m)	82[84](77)

Hoi Ping Road	
Design Flow	798[937](828)
Delay (s)	31[29](28)
Ave. Q (m)	46[50](45)
Max. Q (m)	76[77](76)

GREEN TIME, CYCLE TIME AND FLOWS DATA

		AM					[NOON]					(PM)				
	Number of Lanes, n	Effective Green, g (sec)	Cycle Time, c (sec)	Design Flow, q (pcu/hr)	Saturation Flow, S (pcu/hr)	PCU Factor, p	Effective Green, g (sec)	Cycle Time, c (sec)	Design Flow, q (pcu/hr)	Saturation Flow, S (pcu/hr)	PCU Factor, p	Effective Green, g (sec)	Cycle Time, c (sec)	Design Flow, q (pcu/hr)	Saturation Flow, S (pcu/hr)	PCU Factor, p
Arm A	2	33	100	878	3985	1.3	28	100	841	3955	1.3	26	100	764	3970	1.2
Arm B	2	31	100	798	3895	1.2	36	100	937	3895	1.2	35	100	828	3895	1.3
Arm C	2	33	100	457	4070	1.2	28	100	456	4070	1.2	26	100	407	4070	1.2
Arm D	1	19	100	253	1965	1.2	20	100	299	1965	1.2	22	100	317	1965	1.1

AM PEAK QUEUE LENGTH CALCULATION

	Effective Red, r (sec)	Effective Green Ratio, L	Degree of Saturation, X	Average Arrival Rate, M (veh/cyc)	Maximum Queue (vehs)*
Arm A	67	0.33	0.67	18.69	21
Arm B	69	0.31	0.66	18.03	21
Arm C	67	0.33	0.34	10.83	14
Arm D	81	0.19	0.67	5.72	10

	Max. Queue Length (m)	Estimated Delay, d(sec)	Average Queue Length, L1 (m)	Average Queue Length, L2 (m)	Average Queue Length (m)
Arm A	82	31	47	49	49
Arm B	76	31	44	46	46
Arm C	48	26	23	26	26
Arm D	72	43	35	34	35

NOON PEAK QUEUE LENGTH CALCULATION

	Effective Red, r (sec)	Effective Green Ratio, L	Degree of Saturation, X	Average Arrival Rate, M (veh/cyc)	Maximum Queue (vehs)*
Arm A	72	0.28	0.77	18.17	22
Arm B	64	0.36	0.67	20.83	21
Arm C	72	0.28	0.41	10.53	15
Arm D	80	0.20	0.77	7.00	13

	Max. Queue Length (m)	Estimated Delay, d(sec)	Average Queue Length, L1 (m)	Average Queue Length, L2 (m)	Average Queue Length (m)
Arm A	84	37	51	51	51
Arm B	77	29	47	50	50
Arm C	52	30	25	28	28
Arm D	93	48	44	40	44

PM PEAK QUEUE LENGTH CALCULATION

	Effective Red, r (sec)	Effective Green Ratio, L	Degree of Saturation, X	Average Arrival Rate, M (veh/cyc)	Maximum Queue (vehs)*
Arm A	74	0.26	0.73	17.25	21
Arm B	65	0.35	0.61	18.21	20
Arm C	74	0.26	0.38	9.80	14
Arm D	78	0.22	0.73	7.97	13

	Max. Queue Length (m)	Estimated Delay, d(sec)	Average Queue Length, L1 (m)	Average Queue Length, L2 (m)	Average Queue Length (m)
Arm A	77	36	46	47	47
Arm B	76	28	42	45	45
Arm C	47	31	23	25	25
Arm D	85	43	43	41	43

AM RESULT SUMMARY

		Maximum Queue Length (m)	Average Queue Length (m)
Arm A	Leighton Road	82	49
Arm B	Hoi Ping Road	76	46
Arm C	Leighton Road	48	26
Arm D	Caroline Hill R	72	35

NOON RESULT SUMMARY

	Maximum Queue Length (m)	Average Queue Length (m)
Arm A	84	51
Arm B	77	50
Arm C	52	28
Arm D	93	44

PM RESULT SUMMARY

	Maximum Queue Length (m)	Average Queue Length (m)
Arm A	77	47
Arm B	76	45
Arm C	47	25
Arm D	85	43

Effective Red,	$r = c-g$
Effective Green Ratio,	$L = g/c$
Degree of Saturation,	$X = q/(SL)$
Average Arrival Rate,	$M = qc/3600p$
Maximum Queue Length	= 6 * Maximum Queue/n x p (Note: Convert Vehicle into pcu and assume 6m each pcu)
Estimated Delay,	$d = c(1-L)^2/2(1-LX) + 3600pX^2/2q(1-X) - 0.65(c/(q/3600p)^2)$^(1/3)*X^(2+5L)
Average Queue Length,	L1 = 6q(r/2+d)/3600pn OR L2 = 6qr/3600pn whichever the greater

In accordance with TPDM - Volume 4.2.5.2

** Note: The probability of maximum queue exceeding the critical value is 5% (TPDM V.4.2. Table 2.5.2.4)*

Calculated by:	TE	Date:	June-12	Checked by:	KNL

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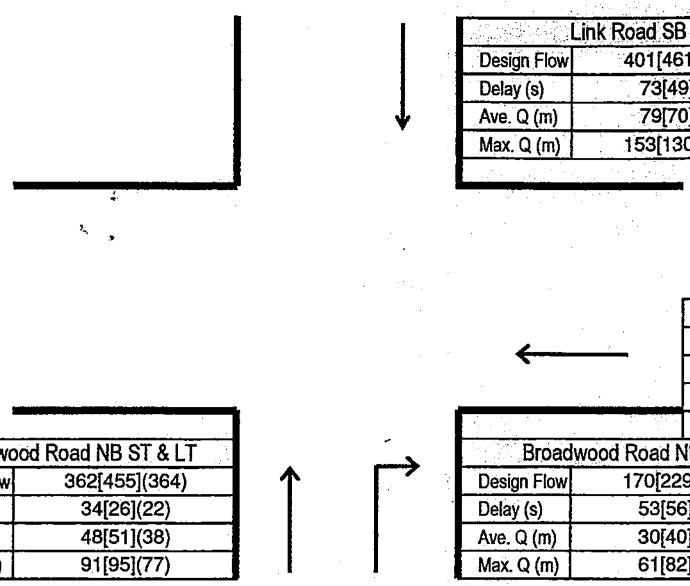
Queue Length Calculation Sheet

Ho Wang SPB Limited
Traffic & Transportation Consultants

Job Title:	The Redevelopment of East Wing of Po Leung Kuk at 66 Leighton Road, Causeway Bay, HK				
Junction:	Broadwood Road / Link Road			Ref. No.:	2019DES_J3Q
Scheme:	2019 Design			Ref. No.:	
Year:	2012	Job No.:	J921	Rev.:	-
Arm A:	Broadwood Road WB				
Arm B:	Broadwood Road NB RT				
Arm C:	Broadwood Road NB ST & LT				
Arm D:	Link Road SB				



Link Road SB	
Design Flow	401[461](486)
Delay (s)	73[49](49)
Ave. Q (m)	79[70](73)
Max. Q (m)	153[130](132)

Broadwood Road WB	
Design Flow	707[485](466)
Delay (s)	46[46](50)
Ave. Q (m)	93[69](71)
Max. Q (m)	164[127](131)

Broadwood Road NB ST & LT	
Design Flow	362[455](364)
Delay (s)	34[26](22)
Ave. Q (m)	48[51](38)
Max. Q (m)	91[95](77)

Broadwood Road NB RT	
Design Flow	170[229](257)
Delay (s)	53[56](55)
Ave. Q (m)	30[40](44)
Max. Q (m)	61[82](86)

GREEN TIME, CYCLE TIME AND FLOWS DATA

		AM					[NOON]					(PM)				
	Number of Lanes, n	Effective Green, g (sec)	Cycle Time, c (sec)	Design Flow, q (pcu/hr)	Saturation Flow, S (pcu/hr)	PCU Factor, p	Effective Green, g (sec)	Cycle Time, c (sec)	Design Flow, q (pcu/hr)	Saturation Flow, S (pcu/hr)	PCU Factor, p	Effective Green, g (sec)	Cycle Time, c (sec)	Design Flow, q (pcu/hr)	Saturation Flow, S (pcu/hr)	PCU Factor, p
Arm A	1	53	120	707	1800	1.1	40	120	485	1785	1.1	36	120	466	1845	1.1
Arm B	1	17	120	170	1830	1.0	20	120	229	1830	1.1	22	120	257	1830	1.0
Arm C	1	40	120	362	1950	1.1	53	120	455	1945	1.1	57	120	364	1940	1.1
Arm D	1	28	120	401	1930	1.1	35	120	461	1930	1.1	36	120	486	1925	1.1

AM PEAK QUEUE LENGTH CALCULATION

	Effective Red, r (sec)	Effective Green Ratio, L	Degree of Saturation, X	Average Arrival Rate, M (veh/cyc)	Maximum Queue (vehs)*
Arm A	67	0.44	0.89	21.96	25
Arm B	103	0.15	0.64	5.49	10
Arm C	80	0.34	0.55	10.85	14
Arm D	92	0.23	0.89	11.86	23

	Max. Queue Length (m)	Estimated Delay, d(sec)	Average Queue Length, L1 (m)	Average Queue Length, L2 (m)	Average Queue Length (m)
Arm A	164	46	93	79	93
Arm B	61	53	30	29	30
Arm C	91	34	45	48	48
Arm D	153	73	79	62	79

NOON PEAK QUEUE LENGTH CALCULATION

	Effective Red, r (sec)	Effective Green Ratio, L	Degree of Saturation, X	Average Arrival Rate, M (veh/cyc)	Maximum Queue (vehs)*
Arm A	80	0.33	0.82	14.70	19
Arm B	100	0.17	0.74	7.10	13
Arm C	67	0.44	0.53	13.31	14
Arm D	85	0.29	0.82	13.59	19

	Max. Queue Length (m)	Estimated Delay, d(sec)	Average Queue Length, L1 (m)	Average Queue Length, L2 (m)	Average Queue Length (m)
Arm A	127	46	69	65	69
Arm B	82	56	40	38	40
Arm C	95	26	45	51	51
Arm D	130	49	70	65	70

PM PEAK QUEUE LENGTH CALCULATION

	Effective Red, r (sec)	Effective Green Ratio, L	Degree of Saturation, X	Average Arrival Rate, M (veh/cyc)	Maximum Queue (vehs)*
Arm A	84	0.30	0.83	14.18	20
Arm B	98	0.19	0.76	8.35	14
Arm C	63	0.47	0.40	11.27	12
Arm D	84	0.30	0.83	15.13	21

	Max. Queue Length (m)	Estimated Delay, d(sec)	Average Queue Length, L1 (m)	Average Queue Length, L2 (m)	Average Queue Length (m)
Arm A	131	50	71	65	71
Arm B	86	55	44	42	44
Arm C	77	22	32	38	38
Arm D	132	49	73	68	73

AM RESULT SUMMARY

		Maximum Queue Length (m)	Average Queue Length (m)
Arm A	Broadwood Ro	**164**	**93**
Arm B	Broadwood Ro	**61**	**30**
Arm C	Broadwood Ro	**91**	**48**
Arm D	Link Road SB	**153**	**79**

NOON RESULT SUMMARY

	Maximum Queue Length (m)	Average Queue Length (m)
Arm A	**127**	**69**
Arm B	**82**	**40**
Arm C	**95**	**51**
Arm D	**130**	**70**

PM RESULT SUMMARY

	Maximum Queue Length (m)	Average Queue Length (m)
Arm A	**131**	**71**
Arm B	**86**	**44**
Arm C	**77**	**38**
Arm D	**132**	**73**

Effective Red, r = c-g
Effective Green Ratio, L = g/c
Degree of Saturation, X = q/(SL)
Average Arrival Rate, M = qc/3600p
Maximum Queue Length = 6 * Maximum Queue/n x p (Note: Convert Vehicle into pcu and assume 6m each pcu)
Estimated Delay, d = c(1-L)²/2(1-LX) + 3600pX²/2q(1-X) - 0.65(c/(q/3600p)²)^(1/3)*X^(2+5L)
Average Queue Length, L1 = 6q(r/2+d)/3600pn OR L2 = 6qr/3600pn whichever the greater

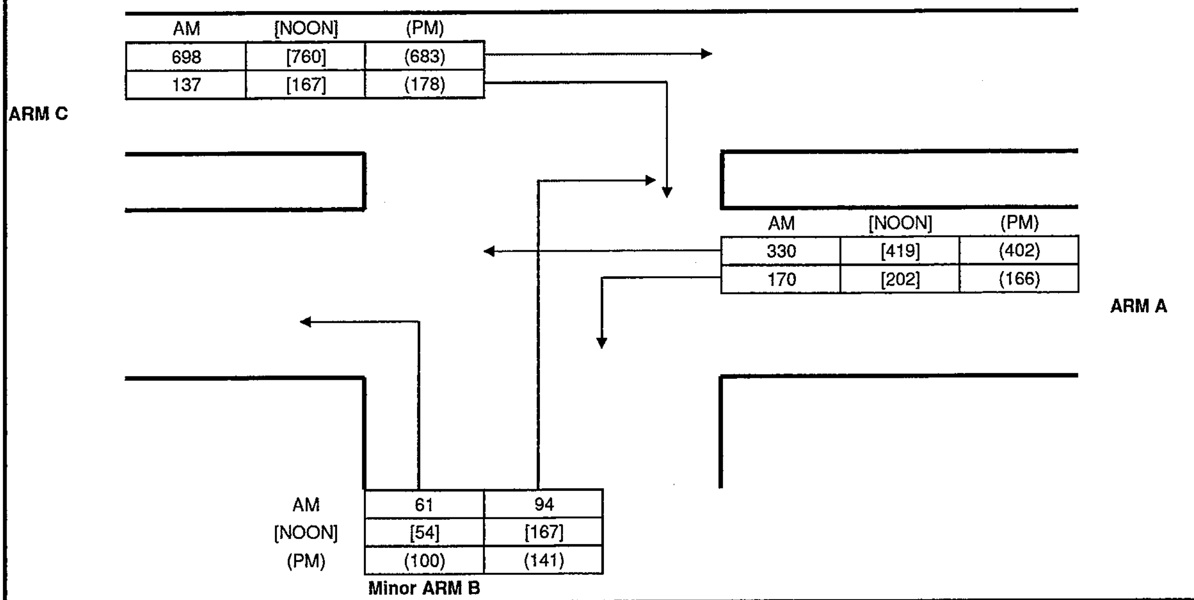
In accordance with TPDM - Volume 4.2.5.2
** Note: The probability of maximum queue exceeding the critical value is 5% (TPDM V.4.2. Table 2.5.2.4)*

Calculated by:	TE	Date:	June-12	Checked by:	KNL

Simplified Priority Junction Capacity Calculation *Ho Wang SPB Limited*

Traffic & Transportation Consultants

Job Title:	The Redevelopment of East Wing of Po Leung Kuk at 66 Leighton Road, Causeway Bay, HK				
Junction:	Caroline Hill Road / Link Road			Ref. No.:	19D_J2_S1
Scheme:	2019 Design	Sensitivity Test 1	All Original Access	Ref. No.:	
Year:	2012	Job No.:	J921	Rev.:	-
ARM A:	Caroline Hill Road SB				
ARM B:	Link Road				
ARM C:	Caroline Hill Road NB				



GEOMETRY

Major road width	W	7.00	Lane widths	w(b-a)	3.50
Central Reserve width	Wcr	3.30		w(b-c)	3.50
2 Lane Minor Arm (Y/N)		N		w(c-b)	3.30
Visibilities	Vr(b-a)	200	Calculated	D	0.98
	Vl(b-a)	35		E	1.06
	Vr(b-c)	200		F	1.04
	Vr(c-b)	200		Y	0.76

ANALYSIS		Factor	AM PEAK	[NOON] PEAK	(PM) PEAK
TRAFFIC FLOWS	q(c-a)		698	760	683
	q(c-b)		137	167	178
	q(a-b)		170	202	166
	q(a-c)		330	419	402
	q(b-a)		94	167	141
	q(b-c)		61	54	100
	f		0.39	0.24	0.41
CAPACITIES	Q(b-a)	1	382	332	332
	Q(b-c)	1	671	642	642
	Q(c-b)	1	629	595	595
	Q(b-ac)	1	460	376	376
	Q(c-a)	1	1800	1800	1800
RFC's	b-a		0.246	0.503	0.425
	b-c		0.091	0.084	0.156
	c-b		0.218	0.281	0.299
	b-ac		0.337	0.588	0.641
	c-a		0.000	0.000	0.000

	AM	[NOON]	[NOON]
Worst RFC	**0.337**	**0.588**	**0.641**

Where Vl and Vr are visibility distances to the left or right of the respective streams

D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(Vl(b-a)-150))

E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))

F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))

Y = 1-0.0345W

f = proportion of minor traffic turning left

Q (b-ac) = Q(b-c)*Q(b-a)/(1-f)*Q(b-c)+f*Q(b-a)

Capacity of combined streams
- in accordance with TPDM V2.4

T.P.D.M.V.2.4
Appendix 1

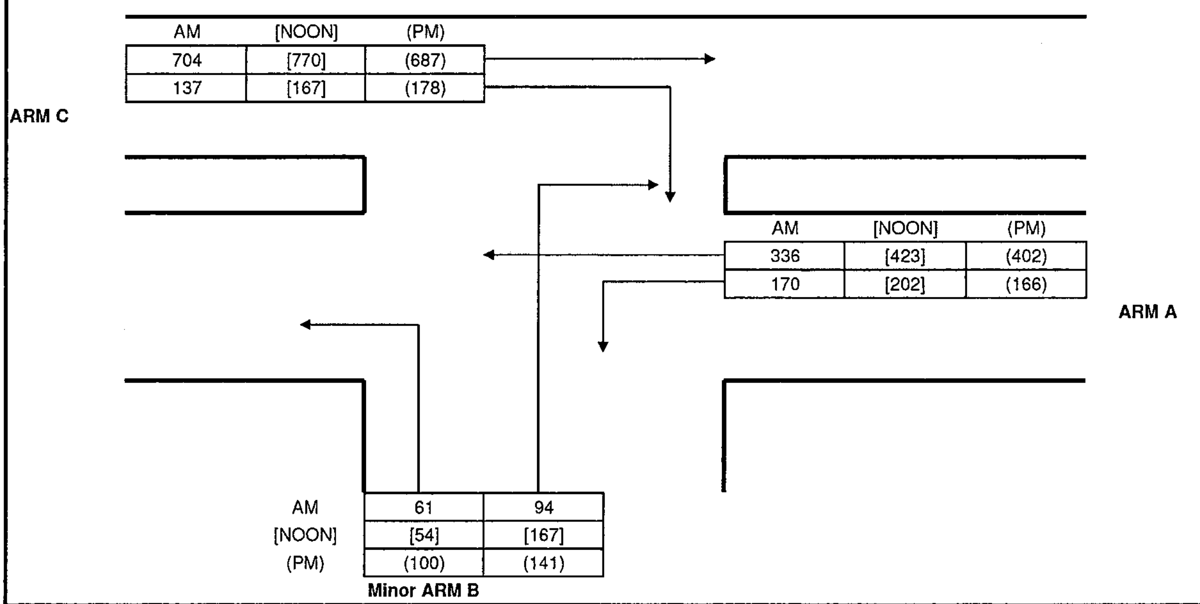
Calculated by:	TE	Date:	Jun-12	Checked by:	KNL

D:\Job\J921 Po Leung Kuk\[J921-Calculation_2.xls]19D_J2_S1

Simplified Priority Junction Capacity Calculation

Ho Wang SPB Limited
Traffic & Transportation Consultants

Job Title:	The Redevelopment of East Wing of Po Leung Kuk at 66 Leighton Road, Causeway Bay, HK				
Junction:	Caroline Hill Road / Link Road			Ref. No.:	19D_J2_S2
Scheme:	2019 Design	Sensitivity Test 2	All New Access	Ref. No.:	
Year:	2012	Job No.:	J921	Rev.:	-
ARM A:	Caroline Hill Road SB				
ARM B:	Link Road				
ARM C:	Caroline Hill Road NB				



GEOMETRY

Major road width	W	7.00	Lane widths	w(b-a)	3.50
Central Reserve width	Wcr	3.30		w(b-c)	3.50
2 Lane Minor Arm (Y/N)		N		w(c-b)	3.30
Visibilities	Vr(b-a)	200	Calculated	D	0.98
	Vl(b-a)	35		E	1.06
	Vr(b-c)	200		F	1.04
	Vr(c-b)	200		Y	0.76

ANALYSIS			AM PEAK	[NOON] PEAK	(PM) PEAK
TRAFFIC FLOWS	q(c-a)		704	770	687
	q(c-b)		137	167	178
	q(a-b)		170	202	166
	q(a-c)		336	423	402
	q(b-a)		94	167	141
	q(b-c)		61	54	100
	f		0.39	0.24	0.41
		Factor			
CAPACITIES	Q(b-a)	1	379	329	329
	Q(b-c)	1	670	641	641
	Q(c-b)	1	628	593	593
	Q(b-ac)	1	457	373	373
	Q(c-a)	1	1800	1800	1800
RFC's	b-a		0.248	0.508	0.429
	b-c		0.091	0.084	0.156
	c-b		0.218	0.282	0.300
	b-ac		0.339	0.592	0.646
	c-a		0.000	0.000	0.000

	AM	[NOON]	[NOON]
Worst RFC	**0.339**	**0.592**	**0.646**

Where Vl and Vr are visibility distances to the left or right of the respective streams

D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(Vl(b-a)-150))

E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))

F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))

Y = 1-0.0345W

f = proportion of minor traffic turning left

Q (b-ac) = Q(b-c)*Q(b-a)/(1-f)*Q(b-c)+f*Q(b-a)

Capacity of combined streams
- in accordance with TPDM V2.4

T.P.D.M.V.2.4
Appendix 1

Calculated by:	TE	Date:	Jun-12	Checked by:	KNL

TRANSPORT RESEARCH LABORATORY

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

VPICADY/4 ANALYSIS PROGRAM

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RUN TITLE
****

Caroline Hill Road / Link Road 2012 AM

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA

```
MAJOR ROAD (ARM C) ------------------------ MAJOR ROAD (ARM A)
                          I
                          I
                          I
                          I
                          I
                          I
                    MINOR ROAD (ARM B)
```

ARM A IS Caroline Hill Road SB
ARM B IS Link Road
ARM C IS Caroline Hill Road NB

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B
ETC.

.GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	3.30 M.
- VISIBILITY	(VC-B)	200.0 M.
- BLOCKS TRAFFIC		NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	200.0 M.
- VISIBILITY TO RIGHT	(VB-A)	200.0 M.
- LANE 1 WIDTH	(WB-C)	3.50 M.
- LANE 2 WIDTH	(WB-A)	3.50 M.

.TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 08.00 AND ENDS 09.30
LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.
DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	4.96	7.44	4.96
ARM B	15.00	45.00	75.00	1.50	2.25	1.50
ARM C	15.00	45.00	75.00	8.02	12.04	8.02

TURNING PROPORTIONS
TURNING COUNTS (VEH/HR)
(PERCENTAGE OF H.V.S)

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 - 09.30				
	ARM A	0.000	0.330	0.670
		0.0	131.0	266.0
		(0.0)	(22.9)	(30.1)
	ARM B	0.600	0.000	0.400
		72.0	0.0	48.0
		(23.6)	(0.0)	(25.0)
	ARM C	0.822	0.178	0.000
		528.0	114.0	0.0
		(26.0)	(16.7)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
B-C	0.60	8.96	0.067		0.0	0.1	1.0	
B-A	0.90	6.11	0.147		0.0	0.2	2.4	
C-A	6.60							
C-B	1.42	9.48	0.150		0.0	0.2	2.5	
A-B	1.64							
A-C	3.33							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.15-08.30								
B-C	0.72	8.62	0.083		0.1	0.1	1.3	
B-A	1.07	5.50	0.195		0.2	0.2	3.4	
C-A	7.88							
C-B	1.70	9.18	0.185		0.2	0.2	3.3	
A-B	1.96							
A-C	3.97							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.30-08.45								
B-C	0.88	8.13	0.108		0.1	0.1	1.8	
B-A	1.32	4.67	0.282		0.2	0.4	5.4	
C-A	9.65							
C-B	2.08	8.76	0.238		0.2	0.3	4.5	
A-B	2.39							
A-C	4.86							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.45-09.00								
B-C	0.88	8.12	0.108		0.1	0.1	1.8	
B-A	1.32	4.67	0.282		0.4	0.4	5.8	
C-A	9.65							
C-B	2.08	8.76	0.238		0.3	0.3	4.6	
A-B	2.39							
A-C	4.86							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.00-09.15								
B-C	0.72	8.62	0.083		0.1	0.1	1.4	
B-A	1.07	5.50	0.195		0.4	0.2	3.9	
C-A	7.88							
C-B	1.70	9.18	0.185		0.3	0.2	3.5	
A-B	1.96							
A-C	3.97							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.15-09.30								
B-C	0.60	8.95	0.067		0.1	0.1	1.1	
B-A	0.90	6.10	0.147		0.2	0.2	2.7	
C-A	6.60							
C-B	1.42	9.48	0.150		0.2	0.2	2.7	
A-B	1.64							
A-C	3.33							

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	(VEH/H)	* QUEUEING * * DELAY * (MIN)	(MIN/VEH)	* INCLUSIVE QUEUEING * * DELAY * (MIN)	(MIN/VEH)
B-C	65.8	43.9	8.4	0.13	8.4	0.13
B-A	98.7	65.8	23.7	0.24	23.7	0.24
C-A	724.0	482.7				
C-B	156.3	104.2	21.3	0.14	21.3	0.14
A-B	179.6	119.8				
A-C	364.7	243.2				
ALL	1589.2	1059.5	53.4	0.03	53.4	0.03

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

TRANSPORT RESEARCH LABORATORY

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

VPICADY/4 ANALYSIS PROGRAM

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RUN TITLE
****
Caroline Hill Road / Link Road 2012 NOON

. MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA

MAJOR ROAD (ARM C) ---------- MAJOR ROAD (ARM A)

I
I
I
I
I
I

MINOR ROAD (ARM B)

ARM A IS Caroline Hill Road SB
ARM B IS Link Road
ARM C IS Caroline Hill Road NB

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B
ETC.

. GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	3.30 M.
- VISIBILITY	(VC-B)	200.0 M.
- BLOCKS TRAFFIC		NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	200.0 M.
- VISIBILITY TO RIGHT	(VB-A)	200.0 M.
- LANE 1 WIDTH	(WB-C)	3.50 M.
- LANE 2 WIDTH	(WB-A)	3.50 M.

. TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 08.00 AND ENDS 09.30
LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.
DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	6.26	9.39	6.26
ARM B	15.00	45.00	75.00	1.99	2.98	1.99
ARM C	15.00	45.00	75.00	8.90	13.35	8.90

TIME	FROM/TO	ARM A	ARM B	ARM C
		TURNING PROPORTIONS TURNING COUNTS (VEH/HR) (PERCENTAGE OF H.V.S)		
08.00 - 09.30				
	ARM A	0.000	0.309	0.691
		0.0	155.0	346.0
		(0.0)	(30.3)	(23.1)
	ARM B	0.736	0.000	0.264
		117.0	0.0	42.0
		(42.7)	(0.0)	(33.3)
	ARM C	0.809	0.191	0.000
		576.0	136.0	0.0
		(30.0)	(28.7)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
B-C	0.52	7.81	0.067		0.0	0.1	1.0	
B-A	1.46	4.74	0.309		0.0	0.4	6.0	
C-A	7.20							
C-B	1.70	8.26	0.206		0.0	0.3	3.7	
A-B	1.94							
A-C	4.32							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.15-08.30								
B-C	0.63	7.30	0.086		0.1	0.1	1.4	
B-A	1.75	4.11	0.425		0.4	0.7	9.9	
C-A	8.60							
C-B	2.03	7.92	0.256		0.3	0.3	4.9	
A-B	2.31							
A-C	5.16							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.30-08.45								
B-C	0.77	6.50	0.118		0.1	0.1	1.9	
B-A	2.14	3.24	0.661		0.7	1.7	21.7	
C-A	10.53							
C-B	2.49	7.45	0.334		0.3	0.5	7.1	
A-B	2.83							
A-C	6.33							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.45-09.00								
B-C	0.77	6.46	0.119		0.1	0.1	2.0	
B-A	2.14	3.23	0.661		1.7	1.8	26.3	
C-A	10.53							
C-B	2.49	7.45	0.334		0.5	0.5	7.4	
A-B	2.83							
A-C	6.33							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.00-09.15								
B-C	0.63	7.26	0.086		0.1	0.1	1.5	
B-A	1.75	4.10	0.426		1.8	0.8	13.0	
C-A	8.60							
C-B	2.03	7.92	0.256		0.5	0.3	5.4	
A-B	2.31							
A-C	5.16							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.15-09.30								
B-C	0.52	7.78	0.067		0.1	0.1	1.1	
B-A	1.46	4.73	0.309		0.8	0.5	7.3	
C-A	7.20							
C-B	1.70	8.26	0.206		0.3	0.3	4.1	
A-B	1.94							
A-C	4.32							

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * * DELAY * (MIN)	* QUEUEING * * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * * DELAY * (MIN)	* INCLUSIVE QUEUEING * * DELAY * (MIN/VEH)
B-C	57.6	38.4	8.9	0.15	8.9	0.15
B-A	160.4	107.0	84.3	0.53	84.3	0.53
C-A	789.8	526.5				
C-B	186.5	124.3	32.6	0.17	32.6	0.17
A-B	212.5	141.7				
A-C	474.4	316.3				
ALL	1881.3	1254.2	125.8	0.07	125.9	0.07

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

TRANSPORT RESEARCH LABORATORY

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY/4 ANALYSIS PROGRAM

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RUN TITLE

****

Caroline Hill Road / Link Road 2012 PM

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

****

INPUT DATA

```
MAJOR ROAD (ARM C) ---------------------- MAJOR ROAD (ARM A)
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                        I
                        I
                  MINOR ROAD (ARM B)
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ARM A IS Caroline Hill Road SB
ARM B IS Link Road
ARM C IS Caroline Hill Road NB

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B
ETC.

.GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	3.30 M.
- VISIBILITY	(VC-B)	200.0 M.
- BLOCKS TRAFFIC		NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	200.0 M.
- VISIBILITY TO RIGHT	(VB-A)	200.0 M.
- LANE 1 WIDTH	(WB-C)	3.50 M.
- LANE 2 WIDTH	(WB-A)	3.50 M.

.TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 08.00 AND ENDS 09.30
LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.
DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	5.76	8.64	5.76
ARM B	15.00	45.00	75.00	2.44	3.66	2.44
ARM C	15.00	45.00	75.00	8.24	12.36	8.24

TIME	FROM/TO	ARM A	ARM B	ARM C
		TURNING PROPORTIONS / TURNING COUNTS (VEH/HR) / (PERCENTAGE OF H.V.S)		
08.00 - 09.30				
	ARM A	0.000	0.254	0.746
		0.0	117.0	344.0
		(0.0)	(11.1)	(13.4)
	ARM B	0.554	0.000	0.446
		108.0	0.0	87.0
		(16.7)	(0.0)	(11.5)
	ARM C	0.760	0.240	0.000
		501.0	158.0	0.0
		(31.7)	(10.8)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
B-C	1.09	9.76	0.111		0.0	0.1	1.8	
B-A	1.35	6.19	0.218		0.0	0.3	3.9	
C-A	6.26							
C-B	1.98	9.94	0.199		0.0	0.2	3.5	
A-B	1.46							
A-C	4.30							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.15-08.30								
B-C	1.30	9.30	0.140		0.1	0.2	2.4	
B-A	1.61	5.49	0.294		0.3	0.4	5.8	
C-A	7.48							
C-B	2.36	9.62	0.245		0.2	0.3	4.7	
A-B	1.75							
A-C	5.13							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.30-08.45								
B-C	1.59	8.59	0.185		0.2	0.2	3.3	
B-A	1.97	4.53	0.436		0.4	0.7	10.3	
C-A	9.16							
C-B	2.89	9.17	0.315		0.3	0.5	6.6	
A-B	2.14							
A-C	6.29							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.45-09.00								
B-C	1.59	8.58	0.185		0.2	0.2	3.4	
B-A	1.97	4.53	0.436		0.7	0.8	11.3	
C-A	9.16							
C-B	2.89	9.17	0.315		0.5	0.5	6.8	
A-B	2.14							
A-C	6.29							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.00-09.15								
B-C	1.30	9.28	0.140		0.2	0.2	2.5	
B-A	1.61	5.48	0.294		0.8	0.4	6.8	
C-A	7.48							
C-B	2.36	9.62	0.245		0.5	0.3	5.1	
A-B	1.75							
A-C	5.13							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.15-09.30								
B-C	1.09	9.75	0.112		0.2	0.1	1.9	
B-A	1.35	6.18	0.219		0.4	0.3	4.4	
C-A	6.26							
C-B	1.98	9.94	0.199		0.3	0.3	3.9	
A-B	1.46							
A-C	4.30							

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	(VEH/H)	* QUEUEING * * DELAY * (MIN)	(MIN/VEH)	* INCLUSIVE QUEUEING * * DELAY * (MIN)	(MIN/VEH)
B-C	119.3	79.5	15.3	0.13	15.3	0.13
B-A	148.1	98.7	42.5	0.29	42.5	0.29
C-A	687.0	458.0				
C-B	216.7	144.4	30.6	0.14	30.6	0.14
A-B	160.4	107.0				
A-C	471.7	314.5				
ALL	1803.1	1202.1	88.4	0.05	88.4	0.05

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

TRANSPORT RESEARCH LABORATORY

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

VPICADY/4 ANALYSIS PROGRAM

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RUN TITLE

****

Caroline Hill Road / Link Road 2019 Reference AM

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

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INPUT DATA

MAJOR ROAD (ARM C) -------------------- MAJOR ROAD (ARM A)

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MINOR ROAD (ARM B)

ARM A IS Caroline Hill Road SB

ARM B IS Link Road

ARM C IS Caroline Hill Road NB

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B
ETC.

.GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH		(W) 7.00 M.
CENTRAL RESERVE WIDTH		(WCR) 0.00 M.
MAJOR ROAD RIGHT TURN	- WIDTH	(WC-B) 3.30 M.
	- VISIBILITY	(VC-B) 200.0 M.
	- BLOCKS TRAFFIC	NO
MINOR ROAD	- VISIBILITY TO LEFT	(VB-C) 200.0 M.
	- VISIBILITY TO RIGHT	(VB-A) 200.0 M.
	- LANE 1 WIDTH	(WB-C) 3.50 M.
	- LANE 2 WIDTH	(WB-A) 3.50 M.

.TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MINUTES.

LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

	NUMBER OF MINUTES FROM START WHEN			RATE OF FLOW (VEH/MIN)		
ARM	FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	5.29	7.94	5.29
ARM B	15.00	45.00	75.00	1.60	2.41	1.60
ARM C	15.00	45.00	75.00	8.55	12.83	8.55

TIME	FROM/TO	ARM A	ARM B	ARM C
		TURNING PROPORTIONS TURNING COUNTS (VEH/HR) (PERCENTAGE OF H.V.S)		
08.00 - 09.30				
	ARM A	0.000	0.331	0.669
		0.0	140.1	283.4
		(0.0)	(22.9)	(30.1)
	ARM B	0.600	0.000	0.400
		76.9	0.0	51.4
		(23.6)	(0.0)	(25.0)
	ARM C	0.822	0.178	0.000
		562.1	122.0	0.0
		(26.0)	(16.7)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
B-C	0.64	8.85	0.073		0.0	0.1	1.1	
B-A	0.96	5.90	0.163		0.0	0.2	2.7	
C-A	7.03							
C-B	1.53	9.38	0.163		0.0	0.2	2.8	
A-B	1.75							
A-C	3.54							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.15-08.30								
B-C	0.77	8.48	0.090		0.1	0.1	1.4	
B-A	1.15	5.26	0.218		0.2	0.3	3.9	
C-A	8.39							
C-B	1.82	9.05	0.201		0.2	0.2	3.6	
A-B	2.09							
A-C	4.23							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.30-08.45								
B-C	0.94	7.93	0.118		0.1	0.1	1.9	
B-A	1.41	4.37	0.322		0.3	0.5	6.5	
C-A	10.28							
C-B	2.23	8.61	0.259		0.2	0.3	5.0	
A-B	2.56							
A-C	5.18							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.45-09.00								
B-C	0.94	7.92	0.118		0.1	0.1	2.0	
B-A	1.41	4.37	0.322		0.5	0.5	7.0	
C-A	10.28							
C-B	2.23	8.61	0.259		0.3	0.3	5.2	
A-B	2.56							
A-C	5.18							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.00-09.15								
B-C	0.77	8.47	0.090		0.1	0.1	1.5	
B-A	1.15	5.25	0.218		0.5	0.3	4.5	
C-A	8.39							
C-B	1.82	9.05	0.201		0.3	0.3	3.9	
A-B	2.09							
A-C	4.23							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.15-09.30								
B-C	0.64	8.84	0.073		0.1	0.1	1.2	
B-A	0.96	5.90	0.163		0.3	0.2	3.1	
C-A	7.03							
C-B	1.53	9.38	0.163		0.3	0.2	3.0	
A-B	1.75							
A-C	3.54							

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND		* QUEUEING * * DELAY *		* INCLUSIVE QUEUEING * * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
B-C	70.4	47.0	9.3	0.13	9.3	0.13
B-A	105.5	70.3	27.7	0.26	27.7	0.26
C-A	770.8	513.9				
C-B	167.3	111.5	23.6	0.14	23.6	0.14
A-B	192.1	128.0				
A-C	388.6	259.1				
ALL	1694.6	1129.7	60.6	0.04	60.6	0.04

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
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* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

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RUN TITLE
****
Caroline Hill Road / Link Road 2019 Reference NOON
.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
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INPUT DATA

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MAJOR ROAD (ARM C) ---------------------- MAJOR ROAD (ARM A)
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                    MINOR ROAD (ARM B)
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ARM A IS Caroline Hill Road SB
ARM B IS Link Road
ARM C IS Caroline Hill Road NB
STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B
ETC.

.GEOMETRIC DATA

DATA ITEM	MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 7.00 M.
CENTRAL RESERVE WIDTH	(WCR) 0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 3.30 M.
- VISIBILITY	(VC-B) 200.0 M.
- BLOCKS TRAFFIC	NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 200.0 M.
- VISIBILITY TO RIGHT	(VB-A) 200.0 M.
- LANE 1 WIDTH	(WB-C) 3.50 M.
- LANE 2 WIDTH	(WB-A) 3.50 M.

.TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 08.00 AND ENDS 09.30
LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.
DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	6.68	10.02	6.68
ARM B	15.00	45.00	75.00	2.11	3.17	2.11
ARM C	15.00	45.00	75.00	9.50	14.24	9.50

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 - 09.30		TURNING PROPORTIONS / TURNING COUNTS (VEH/HR) / (PERCENTAGE OF H.V.S)		
	ARM A	0.000	0.310	0.690
		0.0	165.7	368.9
		(0.0)	(30.3)	(23.1)
	ARM B	0.737	0.000	0.263
		124.5	0.0	44.5
		(42.7)	(0.0)	(33.3)
	ARM C	0.810	0.190	0.000
		615.1	144.7	0.0
		(30.0)	(28.7)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
B-C	0.56	7.65	0.073		0.0	0.1	1.1	
B-A	1.56	4.53	0.344		0.0	0.5	7.0	
C-A	7.69							
C-B	1.81	8.14	0.222		0.0	0.3	4.0	
A-B	2.07							
A-C	4.61							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.15-08.30								
B-C	0.66	7.09	0.094		0.1	0.1	1.5	
B-A	1.86	3.85	0.483		0.5	0.9	12.1	
C-A	9.18							
C-B	2.16	7.78	0.278		0.3	0.4	5.5	
A-B	2.47							
A-C	5.51							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.30-08.45								
B-C	0.81	6.15	0.132		0.1	0.2	2.2	
B-A	2.28	2.92	0.779		0.9	2.6	31.4	
C-A	11.24							
C-B	2.64	7.28	0.363		0.4	0.6	8.0	
A-B	3.03							
A-C	6.74							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.45-09.00								
B-C	0.81	6.07	0.134		0.2	0.2	2.3	
B-A	2.28	2.92	0.780		2.6	2.9	42.1	
C-A	11.24							
C-B	2.64	7.28	0.363		0.6	0.6	8.4	
A-B	3.03							
A-C	6.74							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.00-09.15								
B-C	0.66	7.00	0.095		0.2	0.1	1.6	
B-A	1.86	3.84	0.484		2.9	1.0	17.9	
C-A	9.18							
C-B	2.16	7.76	0.278		0.6	0.4	6.1	
A-B	2.47							
A-C	5.51							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.15-09.30								
B-C	0.56	7.61	0.073		0.1	0.1	1.2	
B-A	1.56	4.51	0.345		1.0	0.5	8.7	
C-A	7.69							
C-B	1.81	8.14	0.222		0.4	0.3	4.5	
A-B	2.07							
A-C	4.61							

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND		* QUEUEING * * DELAY *		* INCLUSIVE QUEUEING * * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
B-C	61.0	40.7	9.9	0.16	9.9	0.16
B-A	170.6	113.8	119.2	0.70	119.2	0.70
C-A	843.4	562.2				
C-B	198.4	132.2	36.6	0.18	36.6	0.18
A-B	227.2	151.4				
A-C	505.9	337.3				
ALL	2006.4	1337.6	165.7	0.08	165.7	0.08

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

TRANSPORT RESEARCH LABORATORY

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RUN TITLE

****

Caroline Hill Road / Link Road 2019 Reference PM

. MAJOR/MINOR JUNCTION CAPACITY AND DELAY

****

INPUT DATA

MAJOR ROAD (ARM C) ---------------------- MAJOR ROAD (ARM A)

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MINOR ROAD (ARM B)

ARM A IS Caroline Hill Road SB

ARM B IS Link Road

ARM C IS Caroline Hill Road NB

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

ETC.

. GEOMETRIC DATA

DATA ITEM	MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 7.00 M.
CENTRAL RESERVE WIDTH	(WCR) 0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 3.30 M.
- VISIBILITY	(VC-B) 200.0 M.
- BLOCKS TRAFFIC	NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 200.0 M.
- VISIBILITY TO RIGHT	(VB-A) 200.0 M.
- LANE 1 WIDTH	(WB-C) 3.50 M.
- LANE 2 WIDTH	(WB-A) 3.50 M.

. TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MINUTES.

LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	6.14	9.21	6.14
ARM B	15.00	45.00	75.00	2.60	3.90	2.60
ARM C	15.00	45.00	75.00	8.78	13.17	8.78

TIME	FROM/TO	TURNING PROPORTIONS TURNING COUNTS (VEH/HR) (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C
08.00 - 09.30				
	ARM A	0.000	0.253	0.747
		0.0	124.5	366.9
		(0.0)	(11.1)	(13.4)
	ARM B	0.555	0.000	0.445
		115.4	0.0	92.6
		(16.7)	(0.0)	(11.5)
	ARM C	0.760	0.240	0.000
		534.0	168.4	0.0
		(31.7)	(10.8)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
B-C	1.16	9.61	0.120		0.0	0.1	2.0	
B-A	1.44	5.95	0.242		0.0	0.3	4.4	
C-A	6.67							
C-B	2.11	9.83	0.214		0.0	0.3	3.9	
A-B	1.56							
A-C	4.59							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.15-08.30								
B-C	1.38	9.10	0.152		0.1	0.2	2.6	
B-A	1.72	5.21	0.331		0.3	0.5	6.9	
C-A	7.97							
C-B	2.51	9.48	0.265		0.3	0.4	5.2	
A-B	1.86							
A-C	5.48							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.30-08.45								
B-C	1.69	8.30	0.204		0.2	0.3	3.7	
B-A	2.11	4.18	0.504		0.5	1.0	13.1	
C-A	9.76							
C-B	3.08	9.00	0.342		0.4	0.5	7.4	
A-B	2.28							
A-C	6.71							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.45-09.00								
B-C	1.69	8.28	0.204		0.3	0.3	3.8	
B-A	2.11	4.18	0.504		1.0	1.0	14.6	
C-A	9.76							
C-B	3.08	9.00	0.342		0.5	0.5	7.7	
A-B	2.28							
A-C	6.71							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.00-09.15								
B-C	1.38	9.08	0.152		0.3	0.2	2.8	
B-A	1.72	5.20	0.331		1.0	0.5	8.2	
C-A	7.97							
C-B	2.51	9.48	0.265		0.5	0.4	5.7	
A-B	1.86							
A-C	5.48							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.15-09.30								
B-C	1.16	9.60	0.121		0.2	0.1	2.1	
B-A	1.44	5.94	0.243		0.5	0.3	5.1	
C-A	6.67							
C-B	2.11	9.83	0.214		0.4	0.3	4.2	
A-B	1.56							
A-C	4.59							

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	(VEH/H)	* QUEUEING * * DELAY * (MIN)	(MIN/VEH)	* INCLUSIVE QUEUEING * * DELAY * (MIN)	(MIN/VEH)
B-C	126.9	84.6	17.0	0.13	17.0	0.13
B-A	158.2	105.5	52.3	0.33	52.3	0.33
C-A	732.2	488.1				
C-B	230.9	153.9	34.1	0.15	34.1	0.15
A-B	170.7	113.8				
A-C	503.1	335.4				
ALL	1922.1	1281.4	103.4	0.05	103.4	0.05

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

TRANSPORT RESEARCH LABORATORY

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

VPICADY/4 ANALYSIS PROGRAM

RELEASE 2.0 (DEC 1996)

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RUN TITLE

****

Caroline Hill Road / Link Road 2019 Design AM

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

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INPUT DATA

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MAJOR ROAD (ARM C) ------------------- MAJOR ROAD (ARM A)
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                   MINOR ROAD (ARM B)
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ARM A IS Caroline Hill Road SB

ARM B IS Link Road

ARM C IS Caroline Hill Road NB

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

ETC.

.GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	3.30 M.
- VISIBILITY	(VC-B)	200.0 M.
- BLOCKS TRAFFIC		NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	200.0 M.
- VISIBILITY TO RIGHT	(VB-A)	200.0 M.
- LANE 1 WIDTH	(WB-C)	3.50 M.
- LANE 2 WIDTH	(WB-A)	3.50 M.

.TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MINUTES.

LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	5.37	8.05	5.37
ARM B	15.00	45.00	75.00	1.60	2.41	1.60
ARM C	15.00	45.00	75.00	8.64	12.96	8.64

TIME	FROM/TO	ARM A	ARM B	ARM C
		TURNING PROPORTIONS TURNING COUNTS (VEH/HR) (PERCENTAGE OF H.V.S)		
08.00 - 09.30				
	ARM A	0.000	0.326	0.674
		0.0	140.1	289.5
		(0.0)	(22.9)	(30.1)
	ARM B	0.600	0.000	0.400
		76.9	0.0	51.4
		(23.6)	(0.0)	(25.0)
	ARM C	0.824	0.176	0.000
		569.4	122.0	0.0
		(26.0)	(16.7)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
B-C	0.64	8.82	0.073		0.0	0.1	1.1	
B-A	0.96	5.86	0.164		0.0	0.2	2.7	
C-A	7.12							
C-B	1.53	9.35	0.163		0.0	0.2	2.8	
A-B	1.75							
A-C	3.62							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.15-08.30								
B-C	0.77	8.45	0.091		0.1	0.1	1.5	
B-A	1.15	5.21	0.220		0.2	0.3	4.0	
C-A	8.50							
C-B	1.82	9.02	0.202		0.2	0.3	3.7	
A-B	2.09							
A-C	4.32							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.30-08.45								
B-C	0.94	7.89	0.119		0.1	0.1	2.0	
B-A	1.41	4.31	0.326		0.3	0.5	6.6	
C-A	10.41							
C-B	2.23	8.57	0.260		0.3	0.3	5.0	
A-B	2.56							
A-C	5.29							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.45-09.00								
B-C	0.94	7.88	0.119		0.1	0.1	2.0	
B-A	1.41	4.31	0.326		0.5	0.5	7.1	
C-A	10.41							
C-B	2.23	8.57	0.260		0.3	0.3	5.2	
A-B	2.56							
A-C	5.29							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.00-09.15								
B-C	0.77	8.44	0.091		0.1	0.1	1.6	
B-A	1.15	5.20	0.221		0.5	0.3	4.6	
C-A	8.50							
C-B	1.82	9.02	0.202		0.3	0.3	3.9	
A-B	2.09							
A-C	4.32							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.15-09.30								
B-C	0.64	8.82	0.073		0.1	0.1	1.2	
B-A	0.96	5.86	0.164		0.3	0.2	3.1	
C-A	7.12							
C-B	1.53	9.35	0.163		0.3	0.2	3.0	
A-B	1.75							
A-C	3.62							

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND		* QUEUEING * * DELAY *		* INCLUSIVE QUEUEING * * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
B-C	70.4	47.0	9.3	0.13	9.3	0.13
B-A	105.5	70.3	28.1	0.27	28.1	0.27
C-A	780.8	520.5				
C-B	167.3	111.5	23.7	0.14	23.7	0.14
A-B	192.1	128.0				
A-C	396.9	264.6				
ALL	1713.0	1142.0	61.1	0.04	61.1	0.04

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

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END OF JOB

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RUN TITLE

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Caroline Hill Road / Link Road 2019 Design NOON

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

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INPUT DATA

MAJOR ROAD (ARM C) ---------------------- MAJOR ROAD (ARM A)

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MINOR ROAD (ARM B)

ARM A IS Caroline Hill Road SB

ARM B IS Link Road

ARM C IS Caroline Hill Road NB

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

ETC.

.GEOMETRIC DATA

DATA ITEM	MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 7.00 M.
CENTRAL RESERVE WIDTH	(WCR) 0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 3.30 M.
- VISIBILITY	(VC-B) 200.0 M.
- BLOCKS TRAFFIC	NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 200.0 M.
- VISIBILITY TO RIGHT	(VB-A) 200.0 M.
- LANE 1 WIDTH	(WB-C) 3.50 M.
- LANE 2 WIDTH	(WB-A) 3.50 M.

.TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MINUTES.

LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	6.72	10.07	6.72
ARM B	15.00	45.00	75.00	2.11	3.17	2.11
ARM C	15.00	45.00	75.00	9.59	14.38	9.59

TURNING PROPORTIONS
TURNING COUNTS (VEH/HR)
(PERCENTAGE OF H.V.S)

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 - 09.30				
	ARM A	0.000	0.308	0.692
		0.0	165.7	371.6
		(0.0)	(30.3)	(23.1)
	ARM B	0.737	0.000	0.263
		124.5	0.0	44.5
		(42.7)	(0.0)	(33.3)
	ARM C	0.811	0.189	0.000
		622.4	144.7	0.0
		(30.0)	(28.7)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
B-C	0.56	7.64	0.073		0.0	0.1	1.1	
B-A	1.56	4.50	0.346		0.0	0.5	7.0	
C-A	7.78							
C-B	1.81	8.13	0.222		0.0	0.3	4.0	
A-B	2.07							
A-C	4.64							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.15-08.30								
B-C	0.66	7.07	0.094		0.1	0.1	1.5	
B-A	1.86	3.82	0.486		0.5	0.9	12.3	
C-A	9.29							
C-B	2.16	7.77	0.278		0.3	0.4	5.5	
A-B	2.47							
A-C	5.55							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.30-08.45								
B-C	0.81	6.12	0.133		0.1	0.2	2.2	
B-A	2.28	2.89	0.788		0.9	2.7	32.3	
C-A	11.38							
C-B	2.64	7.27	0.364		0.4	0.6	8.0	
A-B	3.03							
A-C	6.79							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.45-09.00								
B-C	0.81	6.04	0.135		0.2	0.2	2.3	
B-A	2.28	2.88	0.789		2.7	3.1	43.7	
C-A	11.38							
C-B	2.64	7.27	0.364		0.6	0.6	8.5	
A-B	3.03							
A-C	6.79							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.00-09.15								
B-C	0.66	6.98	0.095		0.2	0.1	1.6	
B-A	1.86	3.81	0.487		3.1	1.0	18.4	
C-A	9.29							
C-B	2.16	7.77	0.278		0.6	0.4	6.1	
A-B	2.47							
A-C	5.55							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.15-09.30								
B-C	0.56	7.60	0.073		0.1	0.1	1.2	
B-A	1.56	4.49	0.346		1.0	0.5	8.8	
C-A	7.78							
C-B	1.81	8.13	0.222		0.4	0.3	4.5	
A-B	2.07							
A-C	4.64							

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	(VEH/H)	* QUEUEING * * DELAY * (MIN)	(MIN/VEH)	* INCLUSIVE QUEUEING * * DELAY * (MIN)	(MIN/VEH)
B-C	61.0	40.7	10.0	0.16	10.0	0.16
B-A	170.6	113.8	122.5	0.72	122.6	0.72
C-A	853.4	568.9				
C-B	198.4	132.2	36.6	0.18	36.6	0.18
A-B	227.2	151.4				
A-C	509.5	339.7				
ALL	2020.1	1346.7	169.1	0.08	169.2	0.08

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

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RUN TITLE

****

Caroline Hill Road / Link Road 2019 Design PM

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

****

INPUT DATA

MAJOR ROAD (ARM C) ------------------------ MAJOR ROAD (ARM A)

MINOR ROAD (ARM B)

ARM A IS Caroline Hill Road SB

ARM B IS Link Road

ARM C IS Caroline Hill Road NB

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

ETC.

.GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	3.30 M.
- VISIBILITY	(VC-B)	200.0 M.
- BLOCKS TRAFFIC		NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	200.0 M.
- VISIBILITY TO RIGHT	(VB-A)	200.0 M.
- LANE 1 WIDTH	(WB-C)	3.50 M.
- LANE 2 WIDTH	(WB-A)	3.50 M.

.TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MINUTES.

LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN: FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN): BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	6.17	9.25	6.17
ARM B	15.00	45.00	75.00	2.60	3.90	2.60
ARM C	15.00	45.00	75.00	8.83	13.24	8.83

TURNING PROPORTIONS / TURNING COUNTS (VEH/HR) / (PERCENTAGE OF H.V.S)

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 - 09.30				
	ARM A	0.000	0.252	0.748
		0.0	124.5	368.8
		(0.0)	(11.1)	(13.4)
	ARM B	0.555	0.000	0.445
		115.4	0.0	92.6
		(16.7)	(0.0)	(11.5)
	ARM C	0.762	0.238	0.000
		537.9	168.4	0.0
		(31.7)	(10.8)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
B-C	1.16	9.60	0.120		0.0	0.1	2.0	
B-A	1.44	5.93	0.243		0.0	0.3	4.5	
C-A	6.72							
C-B	2.11	9.82	0.214		0.0	0.3	3.9	
A-B	1.56							
A-C	4.61							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.15-08.30								
B-C	1.38	9.09	0.152		0.1	0.2	2.6	
B-A	1.72	5.19	0.332		0.3	0.5	6.9	
C-A	8.03							
C-B	2.51	9.48	0.265		0.3	0.4	5.2	
A-B	1.86							
A-C	5.50							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.30-08.45								
B-C	1.69	8.28	0.204		0.2	0.3	3.7	
B-A	2.11	4.16	0.507		0.5	1.0	13.2	
C-A	9.83							
C-B	3.08	8.99	0.342		0.4	0.5	7.4	
A-B	2.28							
A-C	6.74							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.45-09.00								
B-C	1.69	8.27	0.205		0.3	0.3	3.8	
B-A	2.11	4.16	0.508		1.0	1.0	14.8	
C-A	9.83							
C-B	3.08	8.99	0.342		0.5	0.5	7.7	
A-B	2.28							
A-C	6.74							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.00-09.15								
B-C	1.38	9.07	0.152		0.3	0.2	2.8	
B-A	1.72	5.18	0.332		1.0	0.5	8.2	
C-A	8.03							
C-B	2.51	9.48	0.265		0.5	0.4	5.7	
A-B	1.86							
A-C	5.50							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.15-09.30								
B-C	1.16	9.59	0.121		0.2	0.1	2.1	
B-A	1.44	5.92	0.243		0.5	0.3	5.1	
C-A	6.72							
C-B	2.11	9.82	0.214		0.4	0.3	4.2	
A-B	1.56							
A-C	4.61							

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * * DELAY * (MIN)	* QUEUEING * * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * * DELAY * (MIN)	* INCLUSIVE QUEUEING * * DELAY * (MIN/VEH)
B-C	126.9	84.6	17.0	0.13	17.0	0.13
B-A	158.2	105.5	52.8	0.33	52.8	0.33
C-A	737.6	491.7				
C-B	230.9	153.9	34.1	0.15	34.1	0.15
A-B	170.7	113.8				
A-C	505.7	337.1				
ALL	1930.0	1286.7	103.9	0.05	103.9	0.05

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

TRANSPORT RESEARCH LABORATORY

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

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RUN TITLE

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Caroline Hill Road / Link Road 2019 Design Sensitivity Test 1 AM

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

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INPUT DATA

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        MAJOR ROAD (ARM C) ---------------------- MAJOR ROAD (ARM A)
                                    I
                                    I
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                                    I
                                    I
                                    I
                              MINOR ROAD (ARM B)
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ARM A IS Caroline Hill Road SB

ARM B IS Caroline Hill Road WB

ARM C IS Link Road

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

ETC.

.GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	3.30 M.
- VISIBILITY	(VC-B)	200.0 M.
- BLOCKS TRAFFIC		NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	200.0 M.
- VISIBILITY TO RIGHT	(VB-A)	200.0 M.
- LANE 1 WIDTH	(WB-C)	3.50 M.
- LANE 2 WIDTH	(WB-A)	3.50 M.

.TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MINUTES.

LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	5.34	8.00	5.34
ARM B	15.00	45.00	75.00	1.60	2.41	1.60
ARM C	15.00	45.00	75.00	8.61	12.92	8.61

TURNING PROPORTIONS / TURNING COUNTS (VEH/HR) / (PERCENTAGE OF H.V.S)

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 - 09.30				
	ARM A	0.000	0.328	0.672
		0.0	140.1	286.9
		(0.0)	(22.9)	(30.1)
	ARM B	0.600	0.000	0.400
		76.9	0.0	51.4
		(23.6)	(0.0)	(25.0)
	ARM C	0.823	0.177	0.000
		567.0	122.0	0.0
		(26.0)	(16.7)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
B-C	0.64	8.83	0.073		0.0	0.1	1.1	
B-A	0.96	5.88	0.164		0.0	0.2	2.7	
C-A	7.09							
C-B	1.53	9.36	0.163		0.0	0.2	2.8	
A-B	1.75							
A-C	3.59							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.15-08.30								
B-C	0.77	8.46	0.091		0.1	0.1	1.4	
B-A	1.15	5.23	0.220		0.2	0.3	4.0	
C-A	8.46							
C-B	1.82	9.04	0.202		0.2	0.2	3.7	
A-B	2.09							
A-C	4.28							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.30-08.45								
B-C	0.94	7.91	0.119		0.1	0.1	2.0	
B-A	1.41	4.33	0.324		0.3	0.5	6.6	
C-A	10.37							
C-B	2.23	8.59	0.260		0.2	0.3	5.0	
A-B	2.56							
A-C	5.24							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.45-09.00								
B-C	0.94	7.90	0.119		0.1	0.1	2.0	
B-A	1.41	4.33	0.325		0.5	0.5	7.0	
C-A	10.37							
C-B	2.23	8.59	0.260		0.3	0.3	5.2	
A-B	2.56							
A-C	5.24							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.00-09.15								
B-C	0.77	8.46	0.091		0.1	0.1	1.5	
B-A	1.15	5.22	0.220		0.5	0.3	4.5	
C-A	8.46							
C-B	1.82	9.04	0.202		0.3	0.3	3.9	
A-B	2.09							
A-C	4.28							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME-SEGMENT)
09.15-09.30								
B-C	0.64	8.83	0.073		0.1	0.1	1.2	
B-A	0.96	5.87	0.164		0.3	0.2	3.1	
C-A	7.09							
C-B	1.53	9.36	0.163		0.3	0.2	3.0	
A-B	1.75							
A-C	3.59							

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * * DELAY * (MIN)	* QUEUEING * * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * * DELAY * (MIN)	* INCLUSIVE QUEUEING * * DELAY * (MIN/VEH)
B-C	70.4	47.0	9.3	0.13	9.3	0.13
B-A	105.5	70.3	28.0	0.27	28.0	0.27
C-A	777.5	518.3				
C-B	167.3	111.5	23.6	0.14	23.6	0.14
A-B	192.1	128.0				
A-C	393.3	262.2				
ALL	1706.1	1137.4	60.9	0.04	60.9	0.04

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.

* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

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RUN TITLE
****
Caroline Hill Road / Link Road 2019 Design Sensitivity Test 1 NOON

. MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA

MAJOR ROAD (ARM C) ---------------- MAJOR ROAD (ARM A)
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I
I
MINOR ROAD (ARM B)

ARM A IS Caroline Hill Road SB
ARM B IS Caroline Hill Road WB
ARM C IS Link Road

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B
ETC.

. GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	3.30 M.
- VISIBILITY	(VC-B)	200.0 M.
- BLOCKS TRAFFIC		NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	200.0 M.
- VISIBILITY TO RIGHT	(VB-A)	200.0 M.
- LANE 1 WIDTH	(WB-C)	3.50 M.
- LANE 2 WIDTH	(WB-A)	3.50 M.

. TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 08.00 AND ENDS 09.30
LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.
DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN: FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN): BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	6.69	10.04	6.69
ARM B	15.00	45.00	75.00	2.11	3.17	2.11
ARM C	15.00	45.00	75.00	9.54	14.31	9.54

TURNING PROPORTIONS
TURNING COUNTS (VEH/HR)
(PERCENTAGE OF H.V.S)

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 - 09.30				
	ARM A	0.000	0.309	0.691
		0.0	165.7	369.8
		(0.0)	(30.3)	(23.1)
	ARM B	0.737	0.000	0.263
		124.5	0.0	44.5
		(42.7)	(0.0)	(33.3)
	ARM C	0.810	0.190	0.000
		618.3	144.7	0.0
		(30.0)	(28.7)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
B-C	0.56	7.64	0.073		0.0	0.1	1.1	
B-A	1.56	4.52	0.345		0.0	0.5	7.0	
C-A	7.73							
C-B	1.81	8.14	0.222		0.0	0.3	4.0	
A-B	2.07							
A-C	4.62							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.15-08.30								
B-C	0.66	7.08	0.094		0.1	0.1	1.5	
B-A	1.86	3.84	0.484		0.5	0.9	12.2	
C-A	9.23							
C-B	2.16	7.78	0.278		0.3	0.4	5.5	
A-B	2.47							
A-C	5.52							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.30-08.45								
B-C	0.81	6.14	0.132		0.1	0.2	2.2	
B-A	2.28	2.91	0.782		0.9	2.6	31.7	
C-A	11.30							
C-B	2.64	7.27	0.364		0.4	0.6	8.0	
A-B	3.03							
A-C	6.76							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.45-09.00								
B-C	0.81	6.06	0.134		0.2	0.2	2.3	
B-A	2.28	2.90	0.784		2.6	3.0	42.7	
C-A	11.30							
C-B	2.64	7.27	0.364		0.6	0.6	8.4	
A-B	3.03							
A-C	6.76							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.00-09.15								
B-C	0.66	6.99	0.095		0.2	0.1	1.6	
B-A	1.86	3.83	0.485		3.0	1.0	18.1	
C-A	9.23							
C-B	2.16	7.78	0.278		0.6	0.4	6.1	
A-B	2.47							
A-C	5.52							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.15-09.30								
B-C	0.56	7.61	0.073		0.1	0.1	1.2	
B-A	1.56	4.51	0.345		1.0	0.5	8.8	
C-A	7.73							
C-B	1.81	8.14	0.222		0.4	0.3	4.5	
A-B	2.07							
A-C	4.62							

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * * DELAY * (MIN)	* QUEUEING * * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * * DELAY * (MIN)	* INCLUSIVE QUEUEING * * DELAY * (MIN/VEH)
B-C	61.0	40.7	10.0	0.16	10.0	0.16
B-A	170.6	113.8	120.5	0.71	120.6	0.71
C-A	847.8	565.2				
C-B	198.4	132.2	36.6	0.18	36.6	0.18
A-B	227.2	151.4				
A-C	507.1	338.1				
ALL	2012.1	1341.4	167.1	0.08	167.1	0.08

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

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TEL: CROWTHORNE (01344) 770018, FAX: 770864

THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS IN NO WAY RELIEVED OF HIS RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

RUN TITLE

****

Caroline Hill Road / Link Road 2019 Design Sensitivity Test 1 PM

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

****

INPUT DATA

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MAJOR ROAD (ARM C) ------------------------- MAJOR ROAD (ARM A)
                              I
                              I
                              I
                              I
                              I
                              I
                       MINOR ROAD (ARM B)
```

ARM A IS Caroline Hill Road SB
ARM B IS Caroline Hill Road WB
ARM C IS Link Road

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B
ETC.

.GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	3.30 M.
- VISIBILITY	(VC-B)	200.0 M.
- BLOCKS TRAFFIC		NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	200.0 M.
- VISIBILITY TO RIGHT	(VB-A)	200.0 M.
- LANE 1 WIDTH	(WB-C)	3.50 M.
- LANE 2 WIDTH	(WB-A)	3.50 M.

.TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 08.00 AND ENDS 09.30
LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.
DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	6.17	9.25	6.17
ARM B	15.00	45.00	75.00	2.60	3.90	2.60
ARM C	15.00	45.00	75.00	8.81	13.21	8.81

TIME	FROM/TO	ARM A	ARM B	ARM C
		TURNING PROPORTIONS TURNING COUNTS (VEH/HR) (PERCENTAGE OF H.V.S)		
08.00 - 09.30				
	ARM A	0.000	0.252	0.748
		0.0	124.5	368.8
		(0.0)	(11.1)	(13.4)
	ARM B	0.555	0.000	0.445
		115.4	0.0	92.6
		(16.7)	(0.0)	(11.5)
	ARM C	0.761	0.239	0.000
		536.3	168.4	0.0
		(31.7)	(10.8)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
B-C	1.16	9.60	0.120		0.0	0.1	2.0	
B-A	1.44	5.94	0.243		0.0	0.3	4.4	
C-A	6.70							
C-B	2.11	9.82	0.214		0.0	0.3	3.9	
A-B	1.56							
A-C	4.61							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.15-08.30								
B-C	1.38	9.09	0.152		0.1	0.2	2.6	
B-A	1.72	5.19	0.332		0.3	0.5	6.9	
C-A	8.01							
C-B	2.51	9.48	0.265		0.3	0.4	5.2	
A-B	1.86							
A-C	5.50							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.30-08.45								
B-C	1.69	8.29	0.204		0.2	0.3	3.7	
B-A	2.11	4.17	0.506		0.5	1.0	13.2	
C-A	9.80							
C-B	3.08	8.99	0.342		0.4	0.5	7.4	
A-B	2.28							
A-C	6.74							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.45-09.00								
B-C	1.69	8.27	0.205		0.3	0.3	3.8	
B-A	2.11	4.16	0.507		1.0	1.0	14.8	
C-A	9.80							
C-B	3.08	8.99	0.342		0.5	0.5	7.7	
A-B	2.28							
A-C	6.74							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.00-09.15								
B-C	1.38	9.07	0.152		0.3	0.2	2.8	
B-A	1.72	5.18	0.332		1.0	0.5	8.2	
C-A	8.01							
C-B	2.51	9.48	0.265		0.5	0.4	5.7	
A-B	1.86							
A-C	5.50							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.15-09.30								
B-C	1.16	9.59	0.121		0.2	0.1	2.1	
B-A	1.44	5.93	0.243		0.5	0.3	5.1	
C-A	6.70							
C-B	2.11	9.82	0.214		0.4	0.3	4.2	
A-B	1.56							
A-C	4.61							

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * * DELAY * (MIN)	* QUEUEING * * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * * DELAY * (MIN)	* INCLUSIVE QUEUEING * * DELAY * (MIN/VEH)
B-C	126.9	84.6	17.0	0.13	17.0	0.13
B-A	158.2	105.5	52.6	0.33	52.7	0.33
C-A	735.4	490.3				
C-B	230.9	153.9	34.1	0.15	34.1	0.15
A-B	170.7	113.8				
A-C	505.7	337.1				
ALL	1927.8	1285.2	103.8	0.05	103.8	0.05

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

TRANSPORT RESEARCH LABORATORY

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CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

VPICADY/4 ANALYSIS PROGRAM

RELEASE 2.0 (DEC 1996)

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RUN TITLE

****

Caroline Hill Road / Link Road 2019 Design Sensitivity Test 2 AM

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

****

INPUT DATA

```
MAJOR ROAD (ARM C) ------------------ MAJOR ROAD (ARM A)
                          I
                          I
                          I
                          I
                          I
                          I
                   MINOR ROAD (ARM B)
```

ARM A IS Caroline Hill Road SB
ARM B IS Caroline Hill Road WB
ARM C IS Link Road

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B
ETC.

.GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	3.30 M.
- VISIBILITY	(VC-B)	200.0 M.
- BLOCKS TRAFFIC		NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	200.0 M.
- VISIBILITY TO RIGHT	(VB-A)	200.0 M.
- LANE 1 WIDTH	(WB-C)	3.50 M.
- LANE 2 WIDTH	(WB-A)	3.50 M.

.TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 08.00 AND ENDS 09.30
LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.
DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	5.40	8.10	5.40
ARM B	15.00	45.00	75.00	1.60	2.41	1.60
ARM C	15.00	45.00	75.00	8.67	13.01	8.67

TIME	FROM/TO	ARM A	ARM B	ARM C
		TURNING PROPORTIONS TURNING COUNTS (VEH/HR) (PERCENTAGE OF H.V.S)		
08.00 - 09.30				
	ARM A	0.000	0.324	0.676
		0.0	140.1	292.1
		(0.0)	(22.9)	(30.1)
	ARM B	0.600	0.000	0.400
		76.9	0.0	51.4
		(23.6)	(0.0)	(25.0)
	ARM C	0.824	0.176	0.000
		571.9	122.0	0.0
		(26.0)	(16.7)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
B-C	0.64	8.81	0.073		0.0	0.1	1.1	
B-A	0.96	5.85	0.164		0.0	0.2	2.8	
C-A	7.15							
C-B	1.53	9.34	0.163		0.0	0.2	2.8	
A-B	1.75							
A-C	3.65							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.15-08.30								
B-C	0.77	8.44	0.091		0.1	0.1	1.5	
B-A	1.15	5.19	0.221		0.2	0.3	4.0	
C-A	8.54							
C-B	1.82	9.01	0.202		0.2	0.3	3.7	
A-B	2.09							
A-C	4.36							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.30-08.45								
B-C	0.94	7.87	0.119		0.1	0.1	2.0	
B-A	1.41	4.29	0.328		0.3	0.5	6.7	
C-A	10.45							
C-B	2.23	8.56	0.261		0.3	0.3	5.1	
A-B	2.56							
A-C	5.34							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.45-09.00								
B-C	0.94	7.87	0.119		0.1	0.1	2.0	
B-A	1.41	4.28	0.328		0.5	0.5	7.2	
C-A	10.45							
C-B	2.23	8.56	0.261		0.3	0.4	5.2	
A-B	2.56							
A-C	5.34							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.00-09.15								
B-C	0.77	8.43	0.091		0.1	0.1	1.6	
B-A	1.15	5.18	0.221		0.5	0.3	4.6	
C-A	8.54							
C-B	1.82	9.01	0.202		0.4	0.3	4.0	
A-B	2.09							
A-C	4.36							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.15-09.30								
B-C	0.64	8.81	0.073		0.1	0.1	1.2	
B-A	0.96	5.84	0.165		0.3	0.2	3.1	
C-A	7.15							
C-B	1.53	9.34	0.163		0.3	0.2	3.0	
A-B	1.75							
A-C	3.65							

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND		* QUEUEING * * DELAY *		* INCLUSIVE QUEUEING * * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
B-C	70.4	47.0	9.3	0.13	9.3	0.13
B-A	105.5	70.3	28.3	0.27	28.3	0.27
C-A	784.1	522.8				
C-B	167.3	111.5	23.7	0.14	23.7	0.14
A-B	192.1	128.0				
A-C	400.5	267.0				
ALL	1719.9	1146.6	61.4	0.04	61.4	0.04

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

TRANSPORT RESEARCH LABORATORY

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RUN TITLE

****

Caroline Hill Road / Link Road 2019 Design Sensitivity Test 2 NOON

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

****

INPUT DATA

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MAJOR ROAD (ARM C) ------------------------ MAJOR ROAD (ARM A)
                           I
                           I
                           I
                           I
                           I
                           I
                  MINOR ROAD (ARM B)
```

ARM A IS Caroline Hill Road SB

ARM B IS Caroline Hill Road WB

ARM C IS Link Road

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B
ETC.

.GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	3.30 M.
- VISIBILITY	(VC-B)	200.0 M.
- BLOCKS TRAFFIC		NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	200.0 M.
- VISIBILITY TO RIGHT	(VB-A)	200.0 M.
- LANE 1 WIDTH	(WB-C)	3.50 M.
- LANE 2 WIDTH	(WB-A)	3.50 M.

.TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MINUTES.

LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	6.74	10.11	6.74
ARM B	15.00	45.00	75.00	2.11	3.17	2.11
ARM C	15.00	45.00	75.00	9.64	14.46	9.64

TIME	FROM/TO	ARM A	ARM B	ARM C
		TURNING PROPORTIONS TURNING COUNTS (VEH/HR) (PERCENTAGE OF H.V.S)		
08.00 - 09.30				
	ARM A	0.000	0.307	0.693
		0.0	165.7	373.4
		(0.0)	(30.3)	(23.1)
	ARM B	0.737	0.000	0.263
		124.5	0.0	44.5
		(42.7)	(0.0)	(33.3)
	ARM C	0.812	0.188	0.000
		626.4	144.7	0.0
		(30.0)	(28.7)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
B-C	0.56	7.63	0.073		0.0	0.1	1.1	
B-A	1.56	4.49	0.347		0.0	0.5	7.1	
C-A	7.83							
C-B	1.81	8.13	0.223		0.0	0.3	4.0	
A-B	2.07							
A-C	4.67							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.15-08.30								
B-C	0.66	7.06	0.094		0.1	0.1	1.5	
B-A	1.86	3.80	0.488		0.5	0.9	12.4	
C-A	9.35							
C-B	2.16	7.76	0.278		0.3	0.4	5.5	
A-B	2.47							
A-C	5.57							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.30-08.45								
B-C	0.81	6.10	0.133		0.1	0.2	2.2	
B-A	2.28	2.87	0.794		0.9	2.8	32.8	
C-A	11.45							
C-B	2.64	7.26	0.364		0.4	0.6	8.1	
A-B	3.03							
A-C	6.83							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.45-09.00								
B-C	0.81	6.02	0.135		0.2	0.2	2.3	
B-A	2.28	2.86	0.795		2.8	3.2	44.8	
C-A	11:45							
C-B	2.64	7.26	0.364		0.6	0.6	8.5	
A-B	3.03							
A-C	6.83							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.00-09.15								
B-C	0.66	6.96	0.095		0.2	0.1	1.6	
B-A	1.86	3.80	0.489		3.2	1.0	18.7	
C-A	9.35							
C-B	2.16	7.76	0.278		0.6	0.4	6.1	
A-B	2.47							
A-C	5.57							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.15-09.30								
B-C	0.56	7.59	0.073		0.1	0.1	1.2	
B-A	1.56	4.48	0.348		1.0	0.6	8.9	
C-A	7.83							
C-B	1.81	8.13	0.223		0.4	0.3	4.5	
A-B	2.07							
A-C	4.67							

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	(VEH/H)	* QUEUEING * * DELAY * (MIN)	(MIN/VEH)	* INCLUSIVE QUEUEING * * DELAY * (MIN)	(MIN/VEH)
B-C	61.0	40.7	10.0	0.16	10.0	0.16
B-A	170.6	113.8	124.6	0.73	124.6	0.73
C-A	859.0	572.7				
C-B	198.4	132.2	36.7	0.18	36.7	0.18
A-B	227.2	151.4				
A-C	512.0	341.3				
ALL	2028.1	1352.1	171.3	0.08	171.3	0.08

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

TRANSPORT RESEARCH LABORATORY

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

VPICADY/4 ANALYSIS PROGRAM

RELEASE 2.0 (DEC 1996)

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RUN TITLE

****

Caroline Hill Road / Link Road 2019 Design Sensitivity Test 2 PM

. MAJOR/MINOR JUNCTION CAPACITY AND DELAY

****

INPUT DATA

```
MAJOR ROAD (ARM C) ------------------ MAJOR ROAD (ARM A)
                         I
                         I
                         I
                         I
                         I
                         I
                  MINOR ROAD (ARM B)
```

ARM A IS Caroline Hill Road SB

ARM B IS Caroline Hill Road WB

ARM C IS Link Road

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

ETC.

. GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	3.30 M.
- VISIBILITY	(VC-B)	200.0 M.
- BLOCKS TRAFFIC		NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	200.0 M.
- VISIBILITY TO RIGHT	(VB-A)	200.0 M.
- LANE 1 WIDTH	(WB-C)	3.50 M.
- LANE 2 WIDTH	(WB-A)	3.50 M.

. TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MINUTES.

LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	6.17	9.25	6.17
ARM B	15.00	45.00	75.00	2.60	3.90	2.60
ARM C	15.00	45.00	75.00	8.85	13.27	8.85

TURNING PROPORTIONS / TURNING COUNTS (VEH/HR) / (PERCENTAGE OF H.V.S)

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 - 09.30				
	ARM A	0.000	0.252	0.748
		0.0	124.5	368.8
		(0.0)	(11.1)	(13.4)
	ARM B	0.555	0.000	0.445
		115.4	0.0	92.6
		(16.7)	(0.0)	(11.5)
	ARM C	0.762	0.238	0.000
		539.5	168.4	0.0
		(31.7)	(10.8)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
B-C	1.16	9.60	0.120		0.0	0.1	2.0	
B-A	1.44	5.93	0.243		0.0	0.3	4.5	
C-A	6.74							
C-B	2.11	9.82	0.214		0.0	0.3	3.9	
A-B	1.56							
A-C	4.61							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.15-08.30								
B-C	1.38	9.09	0.152		0.1	0.2	2.6	
B-A	1.72	5.18	0.332		0.3	0.5	6.9	
C-A	8.05							
C-B	2.51	9.48	0.265		0.3	0.4	5.2	
A-B	1.86							
A-C	5.50							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.30-08.45								
B-C	1.69	8.28	0.204		0.2	0.3	3.7	
B-A	2.11	4.15	0.508		0.5	1.0	13.3	
C-A	9.86							
C-B	3.08	8.99	0.342		0.4	0.5	7.4	
A-B	2.28							
A-C	6.74							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.45-09.00								
B-C	1.69	8.26	0.205		0.3	0.3	3.8	
B-A	2.11	4.15	0.508		1.0	1.0	14.8	
C-A	9.86							
C-B	3.08	8.99	0.342		0.5	0.5	7.7	
A-B	2.28							
A-C	6.74							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.00-09.15								
B-C	1.38	9.07	0.152		0.3	0.2	2.8	
B-A	1.72	5.17	0.333		1.0	0.5	8.2	
C-A	8.05							
C-B	2.51	9.48	0.265		0.5	0.4	5.7	
A-B	1.86							
A-C	5.50							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
09.15-09.30								
B-C	1.16	9.59	0.121		0.2	0.1	2.1	
B-A	1.44	5.92	0.244		0.5	0.3	5.2	
C-A	6.74							
C-B	2.11	9.82	0.214		0.4	0.3	4.2	
A-B	1.56							
A-C	4.61							

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	(VEH/H)	* QUEUEING * * DELAY * (MIN)	(MIN/VEH)	* INCLUSIVE QUEUEING * * DELAY * (MIN)	(MIN/VEH)
B-C	126.9	84.6	17.0	0.13	17.0	0.13
B-A	158.2	105.5	52.9	0.33	52.9	0.33
C-A	739.7	493.2				
C-B	230.9	153.9	34.1	0.15	34.1	0.15
A-B	170.7	113.8				
A-C	505.7	337.1				
ALL	1932.1	1288.1	104.0	0.05	104.0	0.05

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.

* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

APPENDIX B

Response to TD's Comments dated 11 June 2012

Response to Comments

TD's Comments dated 11 June 2012	Response to Comments
I refer to your e-mail dated 7 June 2012 and the attached TIA report for the captioned development. My comments are as follows:	
i. For para 2.2.1, the junction assessment should also include Saturday afternoon which traffic congestion is often observed.	There are no office hour and no school activities on Saturday afternoon. Hence no significant traffic is observed on Saturday. Letter from PLK is attached (ref: 12/G09/005/216).
ii. For Table 3.1, it is not clear why there will be no additional traffic generated from the expansion of kindergarten, children development centre, new comers' ward, Day Creche and Kinder Section, etc.	There is no traffic generation from the existing kindergarten as PLK does not organize any nanny bus service for the student living in the vicinity of the school. The normal regular traffic of staff should have been included in the traffic counts survey conducted. The additional traffic for staff due to expansion of those facilities/services are therefore included in the assessment.
iii. Re. para. 4.1.1, the design year used in the TIA should be 3 years after the planned completion of the development, i.e. 2019 for completion in 2016.	Noted. 2019 traffic forecast and assessment are included.
iv. The TIA should take into account any committed or planned developments in the vicinity on an area/district basis and over a longer development horizon, at least 3 years after the planned completion of the development. Pls. ask PlanD for any information on new development at Caroline Hill Road.	As we have adopted to use latest TPEPM data (i.e. 2009 based) received PlanD, the data should have included the most up-to-date development planning known.
v. For Para. 4.3.2, agreement from PlanD should also be sought for the adopted growth factor 0.5%. Also any development at Caroline Hill Road.	As we have adopted TPEDM data growth trend for the traffic forecast, the 0.5% p.a. growth from 2012 to 2016 is reasonable. The growth from 2016 to 2019 of 1.5% p.a. is derived from TPEDM as well.
vi. For Para. 5.1.4, please state clearly what distribution of traffic will be using these two vehicular access.	A split of 50:50% are assumed as there is internal road linked between two site accesses.
vii. In your summary, you should state clearly whether the proposed vehicular access at Link Road would induce unnecessary traffic impact to Link Road.	Noted. The TIA report is revised accordingly.
viii. Queue length and calculated delay should be included in your junction assessments.	Noted. The TIA report has included these accordingly.

保良局 PO LEUNG KUK

TEL: 2277 8888 • FAX: 2576 4505

Our Ref.: 12/G09/005/216

14 June 2012

Architecture Design and Research Group Ltd.
Room 1002, 111 Leighton Road,
Causeway Bay, H.K.

Attn : Prof. Bernard Lim

Dear Sirs,

Re: Technical Feasibility Study for The Redevelopment of East Wing of Po Leung Kuk at <u>66 Leighton Road, Causeway Bay, Hong Kong</u>

With reference to Transport Department's comment via email dated 11 June 2012 to your sub-consultant Ho Wang SPB Ltd., we would like to provide our confirmation for your further liaison with Transport Department:

TD's Comment via email on 11 June 2012	Po Leung Kuk's Response
i. For para 2.2.1, the junction assessment should also include Saturday afternoon which traffic congestion is often observed.	We confirm that there are no office hour and no school activities (for Kindergarten/Day crèche) on Saturday afternoon
ii. For Table 3.1, it is not clear why there will be no additional traffic generated from the expansion of kindergarten, children development centre, new comers' ward, Day Creche and Kinder Section, etc.	We do not organize any nanny bus service for the student living in the vicinity of the school

Should you have any queries, please do not hesitate to contact the undersigned at 2277 8113.

Yours faithfully,

Eddie W.C. LEUNG
Head of Property & Works

EDL/CC/WL

香港禮頓道六十六號
66 LEIGHTON ROAD, HONG KONG
電郵 E-MAIL: plkinfo@poleungkuk.org.hk
網址 WEBSITE: http://www.poleungkuk.org.hk

APPENDIX VI

ADDENDUM – UPDATED JUNCTION ANALYSIS

Background

The anticipated completion year of the proposed redevelopment of the East Wing of Po Leung Kuk (PLK) Headquarters at 66 Leighton Road, Causeway Bay (the "Proposed Redevelopment") is revised from 2015/2016 to 2018. In this connection, the adopted design year for the traffic impact assessment (TIA) is revised to 2021, i.e., 3 years after the planned completion year of the Proposed Redevelopment.

The updated traffic impact assessment is presented in the following paragraphs.

Existing Traffic Flows

To quantify the existing traffic flows, manual classified counts were conducted on Tuesday, 6th January 2015 during the AM, Noon and PM peak periods at the following junctions:

- J1: Leighton Road / Caroline Hill Road;
- J2: Caroline Hill Road / Link Road; and
- J3: Broadwood Road / Link Road.

The traffic counts were classified by vehicle type to enable traffic flows in passenger car units (pcu) to be calculated. The AM, Noon and PM peak hours identified from the surveys are found to be between 0815 - 0915 hours, 1200 - 1300 hours and 1730 - 1830 hours respectively.

The observed 2015 AM, Noon and PM peak hour traffic flows in pcu/hour are presented in Figure 1.

Existing Junction Analysis

Analysis on the performance of the surveyed junctions is conducted based on the followings:

(i) Observed 2015 traffic flows; and
(ii) Junction analysis method found in the Transport Planning and Design Manual (TPDM) and the latest signal information obtained from the Traffic Control Division (TCD) of Transport Department (TD).

The existing layouts of the 3 analysed junctions are shown in Figures 2 – 4.

The (i) existing junction capacities; and (ii) queue lengths and delays of the surveyed junctions are summarised in Tables 1 and Table 2 respectively, and the detailed calculations are found in the Annex 1.

TABLE 1 EXISTING JUNCTION PERFORMANCE

Ref.	Junction	Type of Junction	Parameter	AM Peak Hour	Noon Peak Hour	PM Peak Hour
J1	Leighton Road / Caroline Hill Road	Signal	RC	46%	48%	38%
J2	Caroline Hill Road / Link Road	Priority	RFC	0.314	0.462	0.355
J3	Broadwood Road / Link Road	Signal	RC	24%	39%	39%

Note: RFC - ratio-of-flow to capacity; RC – reserved capacity

TABLE 2 EXISTING QUEUE LENGTHS AND DELAYS

Ref.	Approach	Average Queue Length (m)			Delay (s)		
		AM Peak Hour	Noon Peak Hour	PM Peak Hour	AM Peak Hour	Noon Peak Hour	PM Peak Hour
J1	Leighton Road WB	35 m	49 m	49 m	33 s	41 s	43 s
	Hoi Ping Road	46 m	38 m	38 m	37 s	30 s	31 s
	Leighton Road EB	18 m	21 m	21 m	30 s	35 s	37 s
	Caroline Hill Road	35 m	40 m	48 m	52 s	53 s	59 s
J2	Caroline Hill Road NB	2 m	5 m	3 m	10 s	17 s	13 s
	Link Road	3 m	5 m	3 m	11 s	14 s	12 s
J3	Broadwood Road WB	72 m	47 m	55 m	30 s	31 s	34 s
	Broadwood Road NB	39 m	29 m	32 m	32 s	19 s	21 s
	Link Road SB	52 m	43 m	69 m	45 s	33 s	46 s

Public Transport Services

The subject site is located close to high capacity public transport services. The MTR Causeway Bay Station is located within 500m, or about 9 minutes' walk from the subject site.

In addition, numerous franchised bus routes and public light buses operate within 500m from the subject site. Details of the road-based public transport services are presented in Table 3 and Figure 5.

TABLE 3 PUBLIC TRANSPORT SERVICES OPERATING CLOSE TO THE SUBJECT SITE

Route	Routeing	Frequency (minutes)
CTB 1	Kennedy Town - Happy Valley	8 -15
CTB 5 [1]	Felix Villas - Causeway Bay	20
CTB 5B	Kennedy Town - Causeway Bay	7 – 15
CTB 5S	Sai Ying Pun - Wan Chai	6 – 15
CTB 5X	Kennedy Town - Causeway Bay	12 – 20
CTB 8X	Siu Sai Wan - Happy Valley	7 – 25
CTB 10	Kennedy Town - North Point Ferry Pier	7 – 20
CTB 11	Central - Jardine's Lookout	10 - 20
CTB 19	Siu Sai Wan - Happy Valley	10 - 30
CTB 19P [1]	Shau Kei Wan - Happy Valley	1 per day
CTB 25A	Wan Chai - Braemar Hill	6 – 15
CTB 37B	Chi Fu Fa Yuen - Admiralty	6 – 16
CTB 37X [1]	Chi Fu Fa Yuen - Admiralty	5 – 15
CTB 72	Wah Kwai Estate - Causeway Bay	4 – 10
CTB 72A	Sham Wan - Causeway Bay	13 – 17
CTB 75	Sham Wan - Central	7 – 16
CTB 76	Shek Pai Wan - Causeway Bay	15 – 30
CTB 77	Tin Wan - Shau Kei Wan	13 – 20
CTB 90	Ap Lei Chau Estate - Central	7 – 16
CTB 96	Lei Tung Estate - Causeway Bay	12 – 20
CTB 97	Lei Tung Estate - Central	3 – 15
CTB 511 [1]	Central - Tai Hang Drive	3 per day
CTB 592	South Horizons - Causeway Bay	3 – 15
CTB 629A [2]	Ocean Park - Central	3 per day
CTB 629S [1]	Admiralty - Ocean Park	3 per day
CTB 789	Siu Sai Wan - Admiralty	4 – 15
CTB 962 [3]	Tuen Mun - Causeway Bay	6 – 20
CTB 962B [3]	Tuen Mun - Admiralty	14 – 23
CTB 962P [1]	Tuen Mun - Causeway Bay	2 – 9
CTB 962S [1]	Tuen Mun - Causeway Bay	6 per day
CTB 962X	Tuen Mun - Causeway Bay	12 – 20

TABLE 3 PUBLIC TRANSPORT SERVICES OPERATING CLOSE TO THE SUBJECT SITE (CONT'D)

Route	Routeing	Frequency (minutes)
CTB 967X [3]	Causeway Bay - Tin Shui Wai	6 per day
CTB 969	Tin Shui Wai Town Centre - Causeway Bay	7 – 16
CTB 969X [1]	Tin Shui Wai Town Centre - Causeway Bay	4 per day
CTB A11	North Point Ferry Pier - Airport	15 – 30
CTB E11	Tin Hau Station - AsiaWorld-Expo	12 – 20
CTB E11S [1]	Tung Chung - Tin Hau Station	2 per day
CTB N11 [4]	Central - Airport	10 per day
CTB N72 [4]	Wah Kwai Estate - Quarry Bay	15 – 20
CTB N8X [4]	Siu Sai Wan - Central	30
CTB N90 [4]	Ap Lei Chau Estate - Central	15 – 20
CTB N962 [4]	Tuen Mun - Causeway Bay	30
CTB N969 [4]	Tin Shui Wai Town Centre - Causeway Bay	30
KMB 108	Shing Tak Street - Braemer Hill	15 – 20
KMB 603	Ping Tin - Central Ferry Piers	7 – 20
KMB 603P [2]	Admiralty Railway Station - Ping Tin	2 per day
KMB 936 [1]	Lei Muk Shue - Causeway Bay	3 per day
KMB 968	Causeway Bay - Yuen Long	4 – 15
KMB N368 [4]	Yuen Long - Central	20 – 25
NWFB 2	Grand Promenade - Central	15 – 20
NWFB 2A	Yiu Tung Estate - Wan Chai Ferry Pier	5 – 15
NWFB 2X	Shau Kei Wan / Aldrich Bay Wan Chai Ferry Pier	5 – 10
NWFB 8	Heng Fa Chuen - Wan Chai Ferry Pier	10 – 15
NWFB 8P	Siu Sai Wan - Wan Chai Ferry Pier	4 – 13
NWFB 15B	Tin Hau Station - The Peak	20
NWFB 23	North Point Ferry Pier - Pokfield Road	3 – 12
NWFB 23B [3]	Braemar Hill - Park Road / Robinson Road	5 per day
NWFB 25	Central - Braemar Hill	15 – 20
NWFB 26	Lai Tak Tsuen - Hollywood Road	12 – 20
NWFB 38	Chi Fu Fa Yuen - North Point Ferry Pier	8 – 15
NWFB 42	Wah Fu - North Point Ferry Pier	8 – 15
NWFB 42C [3]	Cyberport - North Point Ferry Pier	2 per day
NWFB 63	North Point Ferry Pier - Stanley Prison	30
NWFB 65	North Point Ferry Pier - Stanley Market	15 – 20
NWFB 590A	South Horizons - Admiralty	11 – 20
NWFB H1	Central (Star Ferry) - Tsim Sha Tsui	30
NWFB N8 [4]	Wan Chai Ferry Pier - Heng Fa Chuen	30
NWFB N8P [4]	Siu Sai Wan - Wan Chai	15
KMB / CTB 102	Shau Kei Wan - Mei Foo	3 – 10
KMB / CTB 103	Pokfield Road - Chuk Yuen	14 – 25
KMB / CTB 107	Wah Kwai Estate - Kowloon Bay	5 – 20
KMB / CTB 107P [3]	Hung Hom - Cyberport	4 per day
KMB / CTB 117	Happy Valley - Sham Shui Po	16 – 23
KMB / CTB 170	Wah Fu - Sha Tin Station	10 – 20
KMB / CTB 171	South Horizons - Lai Chi Kok	4 – 13
KMB / CTB 171A [1]	Lei Tung Estate - Lai Chi Kok	9 – 11
KMB / CTB 182	Central - Sha Tin	8 – 20
KMB / CTB 307	Tai Po Centre - Central / Sheung Wan	5 – 20
KMB / CTB 619	Central - Shun Lee Estate	5 – 18
KMB / CTB 621 [3]	Central - Laguna City	16 per day
KMB / CTB 671	Ap Lei Chau - Diamond Hill Station	12 – 26
KMB / CTB 678 [3]	Sheung Shui - Causeway Bay	4 per day
KMB / CTB 681	Central- Ma On Shan Town Centre	4 – 20
KMB / CTB 681P [3]	Ma On Shan - Sheung Wan	9 per day
KMB / CTB 690 [1]	Tseung Kwan O - Central	2 per day
KMB / CTB N170 [4]	Wah Fu - Sha Tin Town Centre	20
KMB / CTB N171 [4]	Ap Lei Chau Estate - Lai Chi Kok	20
KMB / CTB N182 [4]	Central - Sha Tin	20
KMB / CTB N619 [4]	Central - Shun Lee Estate	20
KMB / NWFB 106	Siu Sai Wan - Wong Tai Sin	5 – 10

TABLE 3 PUBLIC TRANSPORT SERVICES OPERATING CLOSE TO THE SUBJECT SITE (CONT'D)

Route	Routeing	Frequency (minutes)
KMB / NWFB 109	Central - Ho Man Tin Estate	10 – 20
KMB / NWFB 112	North Point - So Uk Estate	2 – 10
KMB / NWFB 113	Kennedy Town - Choi Hung	10 – 17
KMB / NWFB 116	Quarry Bay - Tsz Wan Shan	3 – 10
KMB / NWFB 601	Admiralty - Po Tat Estate	5 – 15
KMB / NWFB 680	Admiralty - Ma On Shan	8 – 17
KMB / NWFB 914 [1]	Tin Hau Station - Hoi Lai Estate	12 – 18
KMB / NWFB 914P [1]	Hoi Lai Estate - Causeway Bay	1 per day
KMB / NWFB 914X [1]	Hoi Lai Estate - Causeway Bay	3 per day
KMB / NWFB 948 [3]	Tin Hau Station - Cheung Wang Estate	15 - 20
KMB / NWFB 601P [3]	Sheung Wan - Po Tat Estate	5 – 10
KMB / NWFB 680A [1]	Ma On Shan - Admiralty	3 per day
KMB / NWFB 680B [1]	Ma On Shan - Admiralty	3 per day
KMB / NWFB 680P [1]	Ma On Shan - Admiralty	4 per day
KMB / NWFB 680X [3]	Central - Ma On Shan	7 per day
KMB / NWFB 948 [1]	Cheung On - Causeway Bay	2 per day
KMB / NWFB 948P [1]	Cheung On - Causeway Bay	2 per day
KMB / NWFB 948X [1]	Cheung Wang Estate - Tin Hau Station	4 per day
KMB / NWFB N121 [4]	Central - Ngau Tau Kok	15
KMB / NWFB N122 [4]	Shau Kei Wan - Mei Foo	15
KMB / NWFB N680 [4]	Central - Ma On Shan	20 – 30
KMB / NWFB N691 [4]	Central - Tiu Keng Leng	20 – 25
GMB 14M	Causeway Bay - Jardine's Lookout	4 – 10
GMB 21A	Causeway Bay - Lai Tak Tsuen	5 – 10
GMB 21M	Causeway Bay - Tai Hang Dr	6 – 12
GMB 26	Causeway Bay - HK Adventist Hospital	15 – 20
GMB 28	Upper Baguio Villa - Causeway Bay	5 – 15
GMB 28S	Providence Bay - Shatin Town Centre	30
GMB 30	Causeway Bay - Happy Valley	6 – 10
GMB 36 [1]	Ap Lei Chau - Wan Chai	4 per day
GMB 36S	Ap Lei Chau - Causeway Bay	20 – 40
GMB 36X	Ap Lei Chau - Causeway Bay	8 – 15
GMB 39M	Yue On Court - Tin Hau Station	8 – 15
GMB 40	Stanley Village - Causeway Bay	3 – 15
GMB 40X	Stanley Prison - Causeway Bay	4 – 9
GMB 56	Robinson Rd - North Point	6 – 8
GMB 56A	Robinson Rd - Causeway Bay	8 – 15
RMB	Sai Wan – Wan Chai And Causeway Bay	–
RMB	Wan Chai And Causeway Bay – Shau Kei Wan	–

Note: CTB – Citybus; NWFB – New World First Bus
KMB – Kowloon Motor Bus; GMB – Green Minibus
RMB – Red Minibus
[1] – AM Peak Service; [2] – PM Peak Service
[3] – AM & PM Peak Service; [4] – Overnight Service

The close proximity to MTR station and comprehensive land-based public transport network services offer convenient access to the commuters, students and visitors of the Proposed Redevelopment.

2021 Traffic Flows

Year 2021 traffic flows for the junction capacity analysis is derived based on the followings:

(i) the observed 2015 traffic flows;
(ii) the adopted traffic growth in the 2012 TIA report for the Proposed Redevelopment dated September 2012 (the "2012 TIA Report"); and
(iii) the expected additional traffic generation by the Proposed Redevelopment.

As mentioned in the 2012 TIA report, conservative (higher) annual growth rates of +0.5% and +1.5% were assumed for the periods 2011 - 2016 and 2016 - 2021 respectively when deriving the future year traffic flow.

The traffic growths from 2015 to 2021 are calculated using the following equations, with X_1 and X_2 being the annual growth rates for 2011 – 2016 and 2016 – 2021 respectively.

$$\textit{2015 to 2016 traffic growth factor} = (1+X_1)$$
$$\textit{2016 to 2021 traffic growth factor} = (1+X_2)^5$$

Hence, the 2021 traffic flows are calculated using the equations as follows:

$$\textit{2021 Traffic Flow} = \textit{Observed 2015 Traffic Flow} \times (1+0.5\%) \times (1+1.5\%)^5$$

Additional Traffic Generation of the Proposed Redevelopment

To quantify traffic generation by the existing PLK, updated traffic generation surveys were conducted on Tuesday, 6th January 2015. It is noted that one of the existing kindergartens of PLK has provided school bus service since 2013. At present, this kindergarten operates 5 nos. 28-seater school buses, which use the run-in/out at Link Road for access and the basketball field fronting the kindergarten for pick-up/drop-off. Hence, the school bus traffic has also been included in the updated traffic generation survey. The observed traffic generation of the existing PLK are summarized in Table 4.

TABLE 4 OBSERVED TRAFFIC GENERATIONS OF EXISTING PO LEUNG KOK

Component	**Observed Traffic Generation of the existing PLK (pcu/ hr)**					
	AM Peak Hour		**Noon Peak Hour**		**PM Peak Hour**	
	GEN	**ATT**	**GEN**	**ATT**	**GEN**	**ATT**
Existing PLK (excluding the school bus traffic)	18	22	12	11	9	3
School bus traffic	10	10	20	10	0	0
Total	**28**	**32**	**32**	**21**	**9**	**3**

Note: GEN – Generation; ATT - Attraction

Based on the Planning Statement and the 2012 TIA Report, a comparison on the existing and proposed development parameters is presented in Table 5.

TABLE 5 COMPARISON ON THE DEVELOPMENT PARAMETERS

Use	**Existing GFA [a]**	**Proposed GFA [b]**	**Additional GFA [b] – [a]**
PLK Administration	5,250 m^2	6,300 m^2	1,050 m^2
Social Welfare Services	6,605.9 m^2	10,450 m^2	3,844.1 m^2
Education Services	2,030 m^2	2,030 m^2	0 m^2

With the Proposed Redevelopment, there is no increase in total GFA for the education services under Education Bureau. The breakdown of the proposed education and social welfare service facilities, and the estimation of the traffic generations of these uses are presented in Table 6.

TABLE 6 BREAKDOWN OF EDUCATION AND SOCIAL WELFARE FACILITIES AND THE CORRESPONDING ESTIMATION OF TRAFFIC GENERATION

Classification under Government's Policy	Use	Area (GFA) and No. of Students		Existing Transport	Estimated Traffic Generation in the Assessment
		Existing	Proposed		
Education (under Education Bureau)	Kindergarten	422 m² Student no.: AM: 195 PM: 124	650 m² Student no.: AM: 195 PM: 124	3 modes of transport: School bus, i.e., 5 nos, walk to school, and, public transport services.	There is no change of student numbers; hence, there is no increase in traffic generation. The 5 school bus trips are incorporated in the assessment. The increase of area is to comply with the current Government standard.
	Other education facilities, such as library, learning centre and campus TV facilities	1,608 m²	1,380 m²	Use public transport	The area for other education facilities is reduced and the traffic generation is remote.
	Total Education =	**2,030 m²**	**2,030 m²**	**The 5 school bus trips have been taken into account in the traffic assessment.**	
Social Welfare Facilities (under Social Welfare Department)	Kindergarten cum Nursery	288 m² Student no.: 84	600 m² Student no.: 150	There is no school bus service. Some students live in PLK, and some students walk or use public transport services.	No school bus service will be provided after the redevelopment. There is no increase in traffic due to the kindergarten and nursery uses. Some increase in school quota is for the students who live in PLK.
	Nursery	217 m² Student no.: 48	400 m² Student no.: 80		
	Other social service facilities	6,100.9 m²	9,450 m²		
	Total Social Welfare Facilities =	**6,605.9 m² GFA**	**10,450 m² GFA**	**Traffic generations due to the total social facilities have been taken into account in the traffic assessment.**	

Based on Tables 5 and 6, the additional traffic generations of the Proposed Redevelopment were due to the increase in office area and social welfare services. According to the PLK, the aforesaid current school bus service is operated by using 5 nos. 28-seater school buses, which will not be increased after the proposed redevelopment.

In this connection, the adopted trip rates for the office area are derived by using the traffic generation of survey results in Table 4, excluding the school bus traffic. The adopted trip rates are summarized in Table 7.

TABLE 7 OBSERVED TRAFFIC GENERATIONS AND ADOPTED TRIP RATES OF THE ADDITIONAL PLK ADMINISTRATION AREA

Component	AM Peak Hour		Noon Peak Hour		PM Peak Hour	
	GEN	ATT	GEN	ATT	GEN	ATT
Observed Traffic Generation of the existing PLK (excluding school bus traffic) (pcu/ hr)	18	22	12	11	9	3
Adopted Trips Rates (pcu/hr/100m^2 GFA)	0.3429	0.4190	0.2286	0.2095	0.1714	0.0571

Note: GEN – Generation; ATT - Attraction

The adopted trip rates for the social welfare services obtained from the 2012 TIA Report and are presented in Table 8.

TABLE 8 TRIP RATES FOR THE PROPOSED SOCIAL WELFARE SERVICES

Component	AM Peak Hour		Noon Peak Hour(1)		PM Peak Hour	
	GEN	ATT	GEN	ATT	GEN	ATT
Community Facilities (pcu/hr/100m^2 GFA) (from DR439)	0.2350	0.2350	0.2350	0.2350	0.1150	0.1150

Note: (1) Noon Peak Trip Rates are equal to the AM Peak Trip Rates for the worst case approach.
GEN – Generation; ATT - Attraction

By using the adopted trip rates in Tables 7 and 8, the additional traffic generation of the Proposed Redevelopment are estimated and summarized in Table 9.

TABLE 9 ADDITIONAL TRAFFIC GENERATION OF THE PROPOSED REDEVELOPMENT (PCU/HR)

Component	AM Peak Hour		Noon Peak Hour		PM Peak Hour	
	GEN	ATT	GEN	ATT	GEN	ATT
PLK Administration 1,050m^2 GFA	4	5	2	3	2	1
Social Welfare Services 3,844.1m^2 GFA	10	10	10	10	5	5
Total Additional Traffic =	**14**	**15**	**12**	**13**	**7**	**6**

Note: GEN – Generation; ATT - Attraction

From Tables 4 and 9, the total traffic associated with the PLK (including the Proposed Redevelopment) is presented in Table 10.

TABLE 10 TOTAL TRAFFIC ASSOCIATED WITH THE PLK (INCLUDE THE PROPOSED REDEVELOPMENT) (PCU/HR)

Component	AM Peak Hour		Noon Peak Hour		PM Peak Hour	
	GEN	ATT	GEN	ATT	GEN	ATT
Existing PLK Traffic Generation (excluding the school bus traffic) (from Table 4)	18	22	12	11	9	3
School bus traffic (from Table 4)	10	10	20	10	0	0
Total Additional Traffic (from Table 9)	14	15	12	13	7	6
Total Traffic Associated with PLK (after redevelopment) =	**42**	**47**	**44**	**34**	**16**	**9**

Note: GEN – Generation; ATT - Attraction

Redistribution of Traffic Generation Patterns

As mentioned in 2012 TIA report, a new vehicular access will be provided, and since the old and new site access points will be linked by internal road, it was assumed that the distribution of total traffic associated with the PLK after the redevelopment (as presented in Table 10) on the 2 site accesses is 50%: 50%. The distributions of the development traffic are shown in Figure 6.

Year 2021 peak hour traffic flows without and with the Proposed Redevelopment are shown in Figures 7 and 8 respectively.

2021 Junction Capacity Analysis

Year 2021 junction capacity analysis for the case without and with the Proposed Redevelopment are summarised in Table 11 and detailed calculations are found in the Annex 1.

TABLE 11 2021 JUNCTION PERFORMANCE

Ref.	Junction	Type of Junction	Parameter	Without the Proposed Redevelopment			With the Proposed Redevelopment		
				AM Peak Hour	Noon Peak Hour	PM Peak Hour	AM Peak Hour	Noon Peak Hour	PM Peak Hour
J1	Leighton Road / Caroline Hill Road	Signal	RC	35%	36%	27%	33%	34%	26%
J2	Caroline Hill Road / Link Road	Priority	RFC	0.348	0.544	0.416	0.348	0.544	0.417
J3	Broadwood Road / Link Road	Signal	RC	14%	28%	28%	14%	27%	28%

Note: RFC - ratio-of-flow to capacity; RC – reserved capacity

Table 11 concludes that the Proposed Redevelopment has no adverse impact to the analysed junctions.

The estimated queue lengths and delays for the cases without and with the Proposed Redevelopment are presented in Tables 12 and 13 respectively. Detailed calculations are found in the Annex 1.

TABLE 12 2021 QUEUE LENGTHS AND DELAYS WITHOUT THE PROPOSED REDEVELOPMENT

No.	Approach	Average Queue Length (m)			Delay (s)		
		AM Peak Hour	Noon Peak Hour	PM Peak Hour	AM Peak Hour	Noon Peak Hour	PM Peak Hour
J1	Leighton Road WB	38 m	53 m	53 m	33 s	44 s	45 s
	Hoi Ping Road	50 m	41 m	41 m	38 s	31 s	32 s
	Leighton Road EB	20 m	22 m	23 m	30 s	35 s	37 s
	Caroline Hill Road	38 m	43 m	52 m	56 s	60 s	76 s
J2	Caroline Hill Road NB	2 m	8 m	5 m	11 s	22 s	15 s
	Link Road	3 m	7 m	4 m	11 s	17 s	13 s
J3	Broadwood Road WB	78 m	51 m	60 m	33 s	32 s	35 s
	Broadwood Road NB	43 m	31 m	34 m	32 s	19 s	22 s
	Link Road SB	57 m	47 m	75 m	47 s	35 s	52 s

TABLE 13 2021 QUEUE LENGTHS AND DELAYS WITH THE PROPOSED REDEVELOPMENT

No.	Approach	Average Queue Length (m)			Delay (s)		
		AM Peak Hour	Noon Peak Hour	PM Peak Hour	AM Peak Hour	Noon Peak Hour	PM Peak Hour
J1	Leighton Road WB	38 m	54 m	53 m	33 s	44 s	45 s
	Hoi Ping Road	50 m	42 m	42 m	38 s	31 s	32 s
	Leighton Road EB	20 m	22 m	23 m	30 s	35 s	37 s
	Caroline Hill Road	38 m	44 m	53 m	57 s	61 s	77 s
J2	Caroline Hill Road NB	2 m	8 m	5 m	11 s	22 s	15 s
	Link Road	3 m	7 m	4 m	11 s	17 s	13 s
J3	Broadwood Road WB	78 m	51 m	60 m	33 s	32 s	35 s
	Broadwood Road NB	43 m	31 m	35 m	32 s	19 s	22 s
	Link Road SB	57 m	47 m	75 m	47 s	35 s	52 s

Tables 12 and 13 show that with the Proposed Redevelopment, the increase in traffic queues and delays are only 1 metre and 1 second respectively. Hence, the traffic impact due to the Proposed Redevelopment is negligible.

Temporary Holding Area for School Buses

In addition to the proposed internal transport facilities described in the Planning Statement, a temporary holding area sufficient for the 5 school buses will be provided within the PLK after the proposed redevelopment, to ensure that these school buses could conduct pick-up and drop-off within the PLK.

Sensitivity Test on Different Traffic Generation Patterns

In order to further investigate the traffic impact other than the 50%: 50% distribution of the development traffic to the 2 site accesses, sensitivity tests similar to the 2012 TIA Report were conducted with different traffic generation patterns.

The following 2 additional scenarios were assessed:

- Scenario 1: All Traffic Use the Original Access; and
- Scenario 2: All Traffic Use the New Access

The distributions of the development traffic for these 2 scenarios are shown in Figures 9 and 10. The development traffic flows were reassigned to the 2021 road network for the 2 scenarios. Year 2021 peak hour traffic flows with the Proposed Redevelopment for these 2 scenarios are shown in Figures 11 and 12 respectively. In these 2 scenarios, the entering / leaving routes of the development traffic at the Junction of Leighton Road / Caroline Hill Road (J1) and the Junction of Broadwood Road / Link Road (J3) will be same to that in the case of 50%:50% distribution. Hence, only the Junction of Caroline Hill Road / Link Road (J2) was assessed with the traffic patterns of the above-mentioned scenarios.

Results of the sensitivity tests on the (i) junction capacities; and (ii) queue length and delay analysis are summarized in Tables 14 and 15 respectively.

TABLE 14 SENSITIVITY TEST FOR 2021 JUNCTION PERFORMANCE - JUNCTION OF CAROLINE HILL ROAD / LINK ROAD (J2)

Scenario	Junction Performance (RFC)		
	AM Peak Hour	Noon Peak Hour	PM Peak Hour
50% : 50% Traffic Flow Distribution on the 2 Accesses	0.348	0.544	0.417
Scenario 1: All Traffic Use the Original Access	0.346	0.534	0.416
Scenario 2: All Traffic Use the New Access	0.350	0.555	0.419

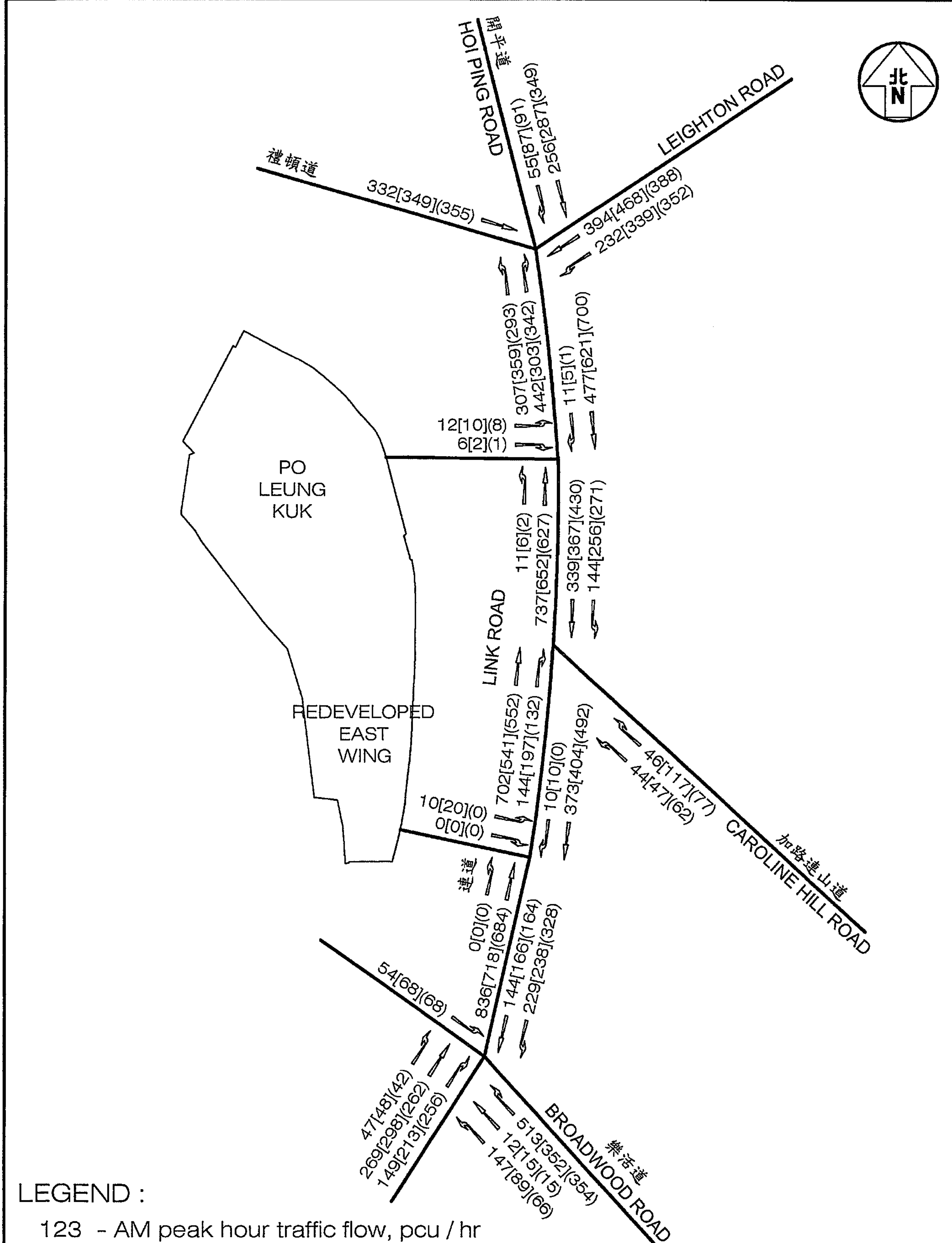
Note: RFC - ratio-of-flow to capacity

From Table 14, the results of the sensitivity test for junction performance show that the impact of the Proposed Redevelopment on the Junction of Caroline Hill Road / Link Road (J2) is remote.

TABLE 15 SENSITIVITY TEST FOR 2021 QUEUE LENGTHS AND DELAYS - JUNCTION OF CAROLINE HILL ROAD / LINK ROAD (J2)

Scenario	Approach	Average Queue Length (m)			Delay (s)		
		AM Peak Hour	Noon Peak Hour	PM Peak Hour	AM Peak Hour	Noon Peak Hour	PM Peak Hour
50% : 50% Traffic Flow Distribution on the 2 Accesses	Caroline Hill Road NB	2 m	8 m	5 m	11 s	22 s	15 s
	Link Road	3 m	7 m	4 m	11 s	17 s	13 s
Scenario 1: All Traffic Use the Original Access	Caroline Hill Road NB	2 m	8 m	5 m	11 s	22 s	15 s
	Link Road	3 m	7 m	4 m	11 s	17 s	13 s
Scenario 2: All Traffic Use the New Access	Caroline Hill Road NB	2 m	8 m	5 m	11 s	22 s	15 s
	Link Road	3 m	7 m	4 m	11 s	17 s	13 s

Table 15 shows that there is no change in traffic queues and delays at the Junction of Caroline Hill Road / Link Road (J2) for the different scenarios. Hence, the traffic impact due to different traffic generation patterns is negligible.



LEGEND :

123 - AM peak hour traffic flow, pcu / hr

[456] - NOON peak hour traffic flow, pcu / hr

(789) - PM peak hour traffic flow, pcu / hr

Project Title	Job No.	Figure No.			Scale in A4
PROPOSED REDEVELOPMENT OF THE EAST WING OF PO LEUNG KUK AT 66 LEIGHTON ROAD, CAUSEWAY BAY	J6349	1			N.T.S.
	Designed by	Drawn by	Checked by	Revision	Date
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Figure Title

2015 OBSERVED PEAK HOUR TRAFFIC FLOWS

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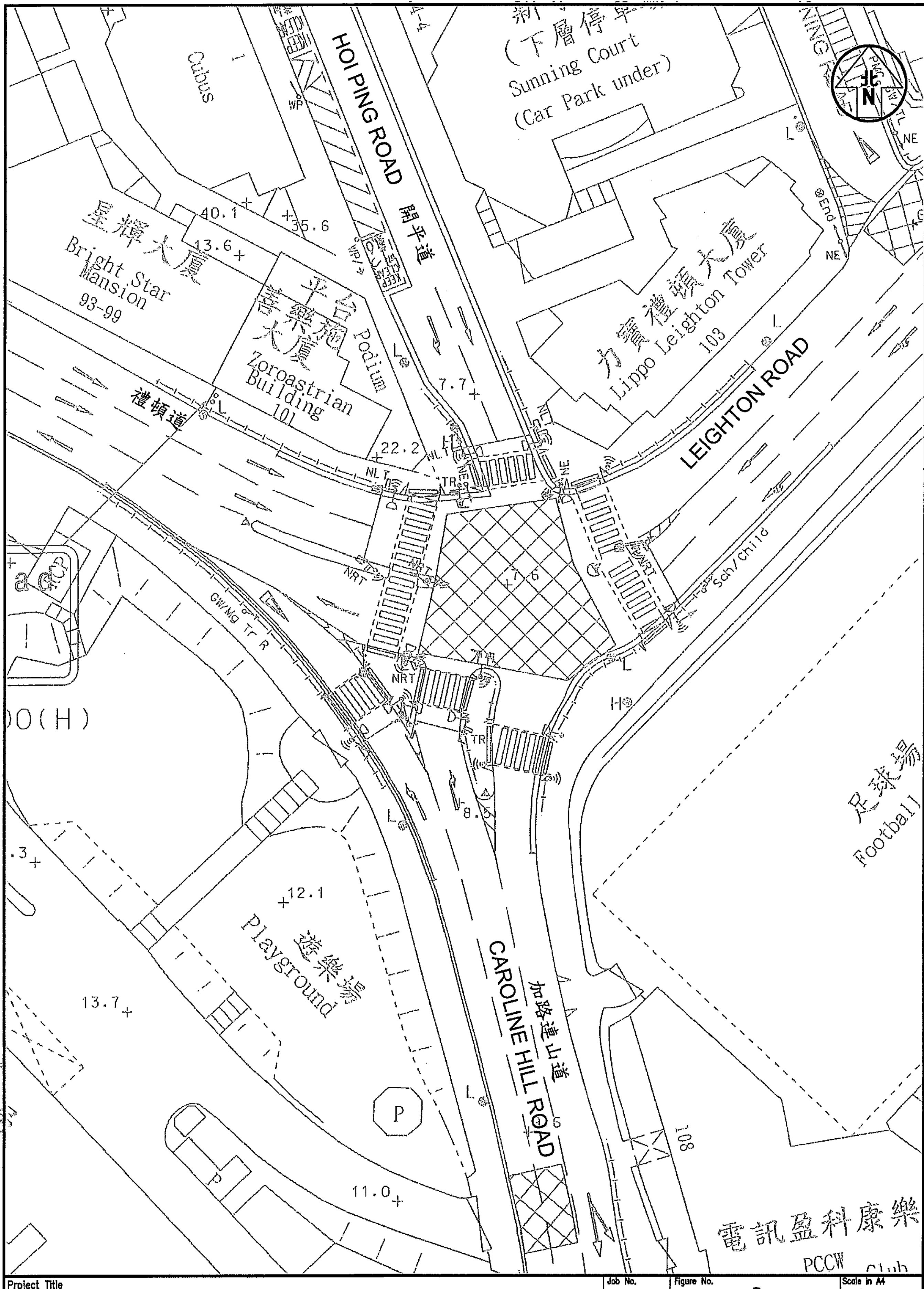

Project Title	Job No.	Figure No.	Scale in A4
PROPOSED REDEVELOPMENT OF THE EAST WING OF PO LEUNG KUK AT 66 LEIGHTON ROAD, CAUSEWAY BAY	J6349	2	1 : 500

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Figure Title

JUNCTION OF LEIGHTON ROAD / CAROLINE HILL ROAD

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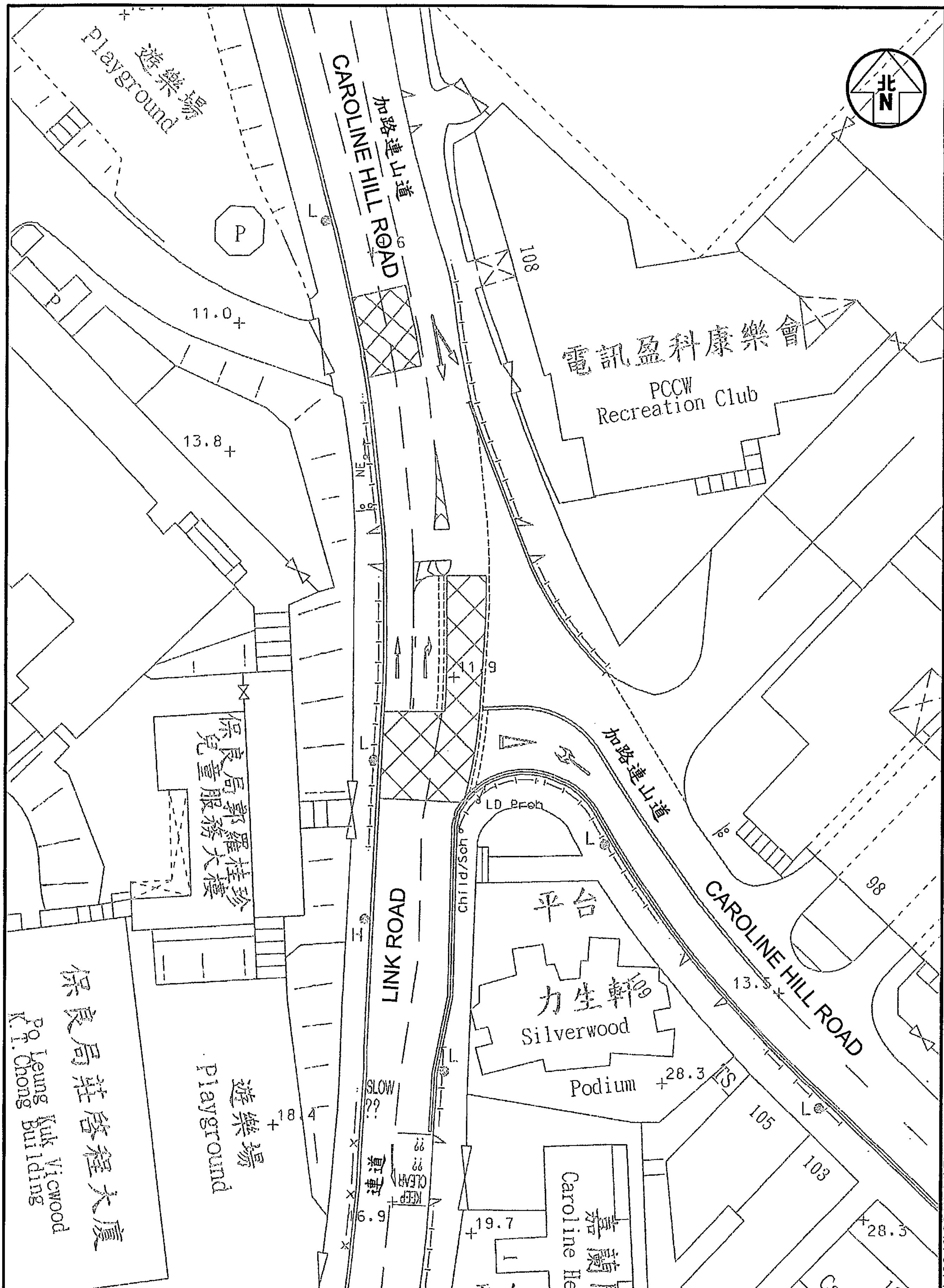

Project Title	Job No.	Figure No.	Scale in A4
PROPOSED REDEVELOPMENT OF THE EAST WING OF PO LEUNG KUK AT 66 LEIGHTON ROAD, CAUSEWAY BAY	J6349	3	1 : 500

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Figure Title

JUNCTION OF CAROLINE HILL ROAD / LINK ROAD

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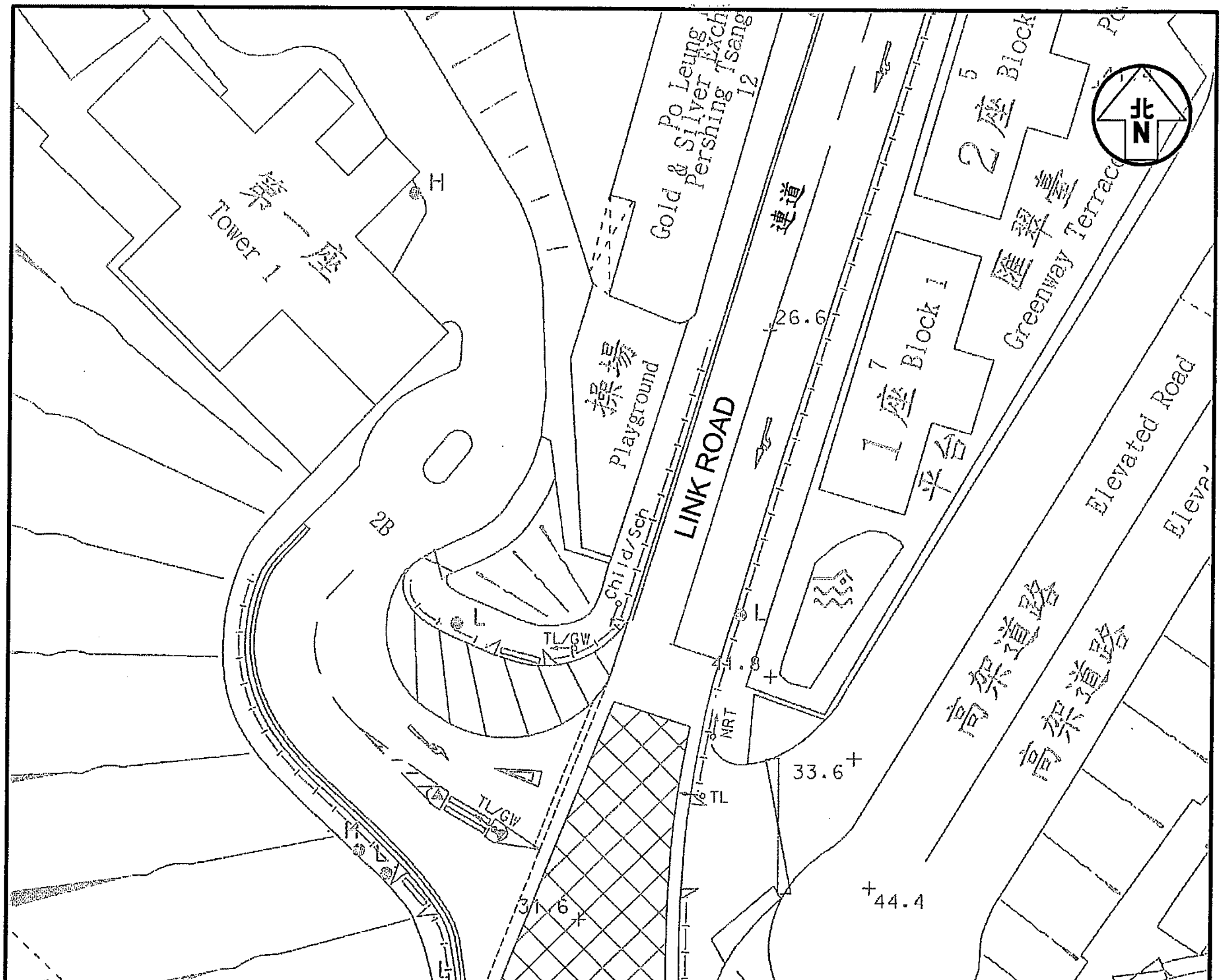

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PROPOSED REDEVELOPMENT OF THE EAST WING OF PO LEUNG KUK AT 66 LEIGHTON ROAD, CAUSEWAY BAY	J6349	4	1 : 500

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Figure Title

JUNCTION OF BROADWOOD ROAD / LINK ROAD

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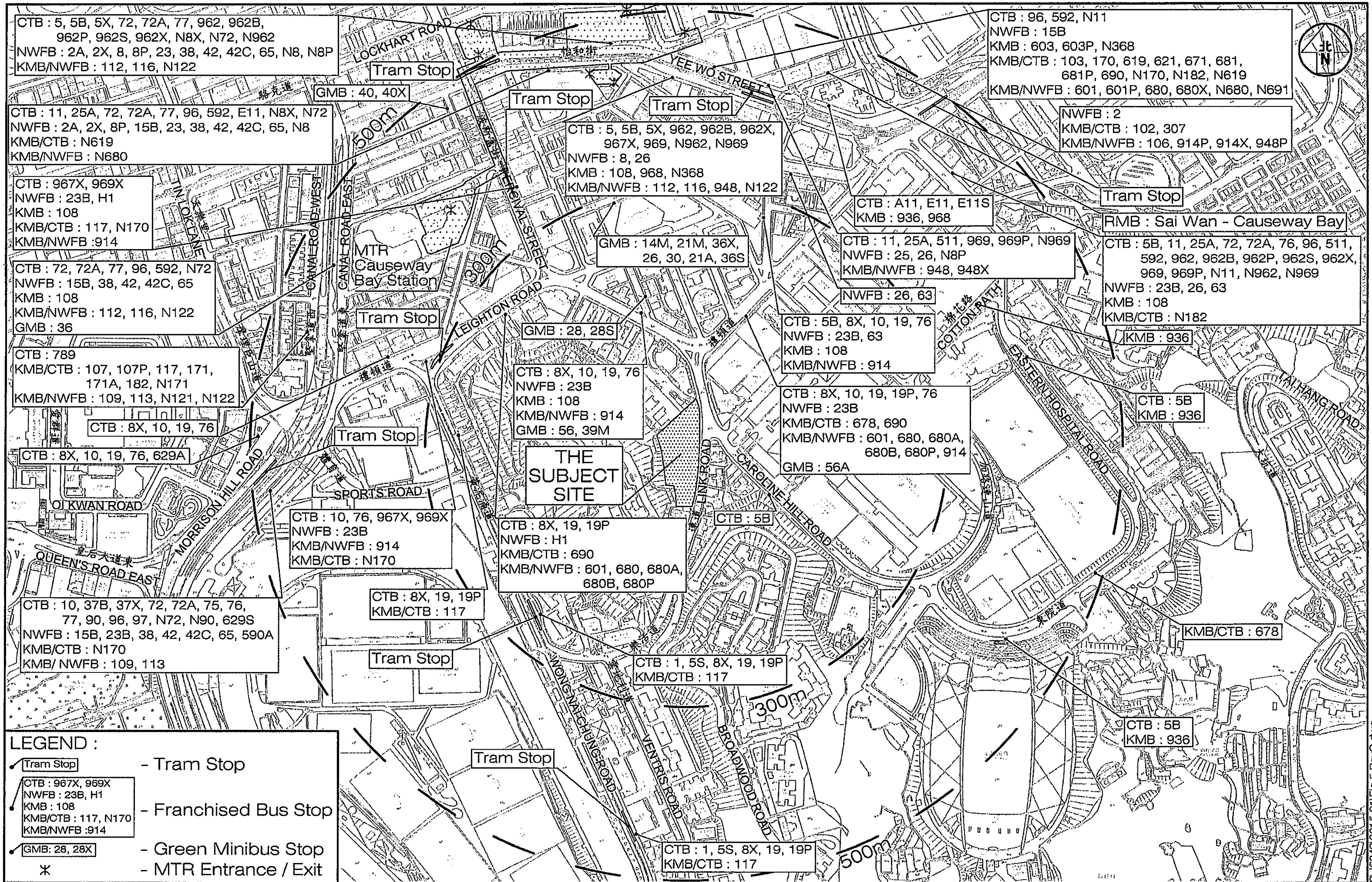

Project Title	PROPOSED REDEVELOPMENT OF THE EAST WING OF PO LEUNG KUK AT 66 LEIGHTON ROAD, CAUSEWAY BAY J6349
Figure Title	PUBLIC TRANSPORT SERVICES AVAILABLE IN THE VICINITY OF THE SUBJECT SITE
Figure No.	5
Revision	C
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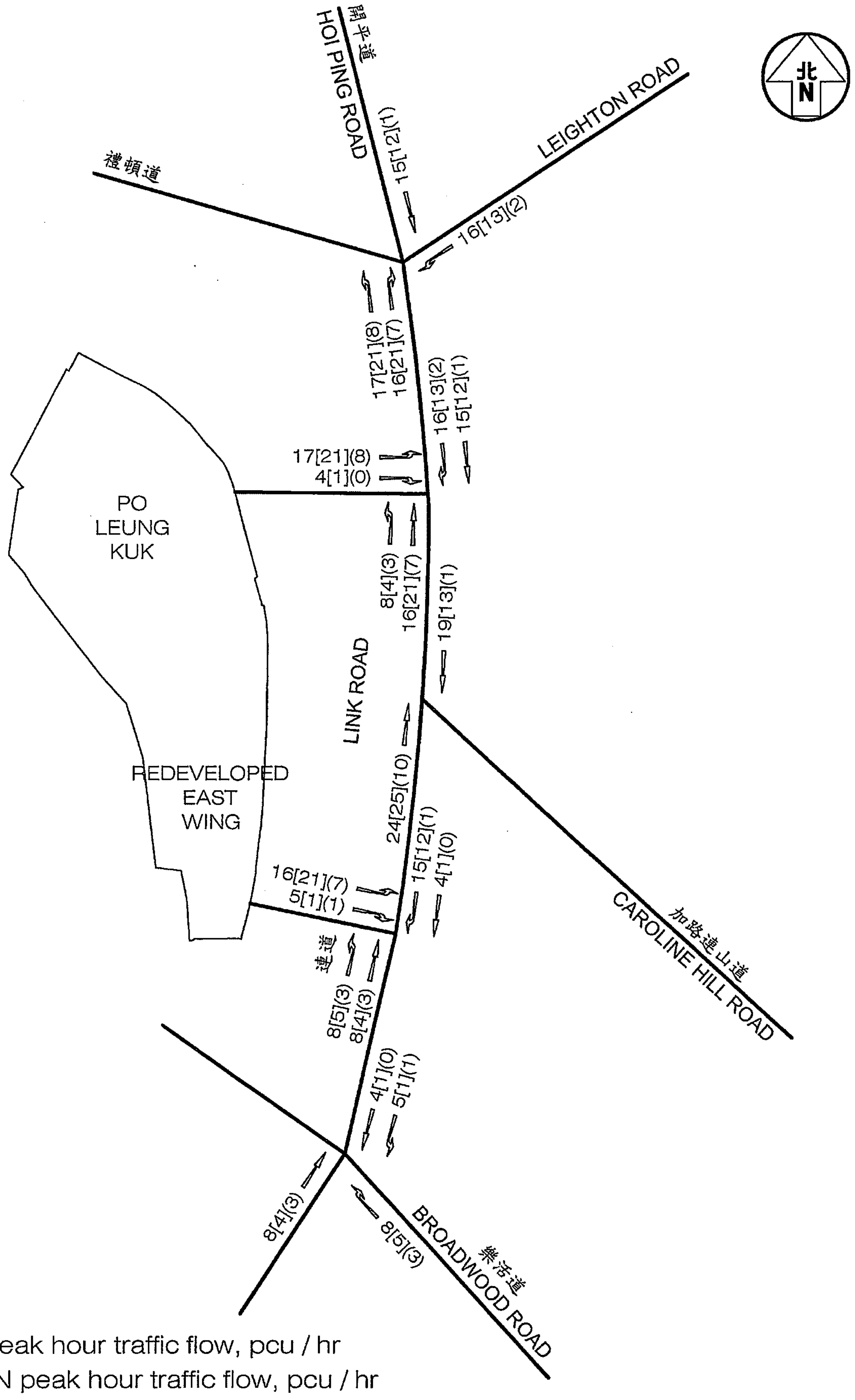

LEGEND :

123 - AM peak hour traffic flow, pcu / hr

[456] - NOON peak hour traffic flow, pcu / hr

(789) - PM peak hour traffic flow, pcu / hr

Project Title	Job No.	Figure No.	Scale in A4
PROPOSED REDEVELOPMENT OF THE EAST WING OF PO LEUNG KUK AT 66 LEIGHTON ROAD, CAUSEWAY BAY	J6349	6	N.T.S.

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Figure Title

DISTRIBUTION OF THE DEVELOPMENT TRAFFIC

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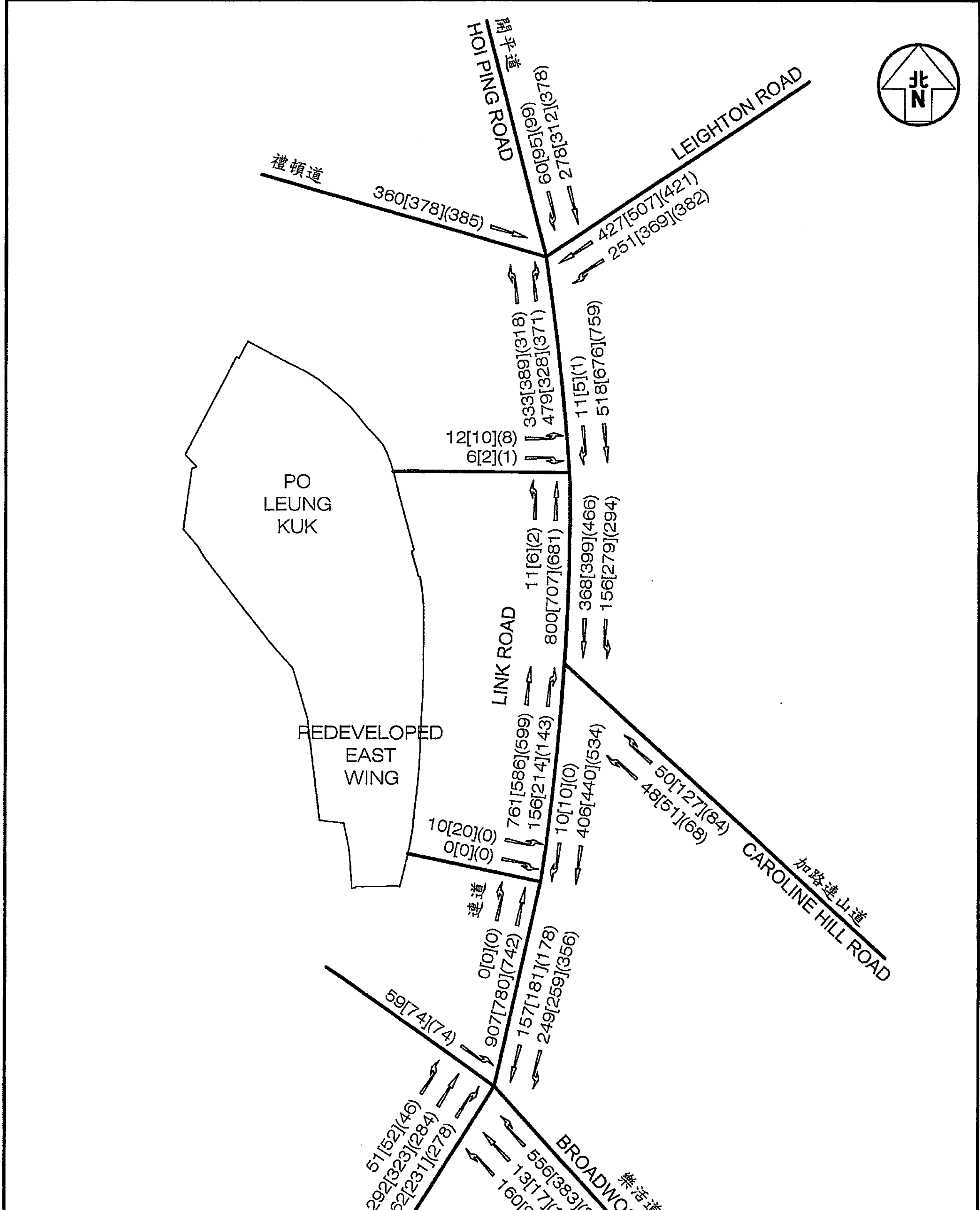

LEGEND :

123 - AM peak hour traffic flow, pcu / hr

[456] - NOON peak hour traffic flow, pcu / hr

(789) - PM peak hour traffic flow, pcu / hr

Project Title: PROPOSED REDEVELOPMENT OF THE EAST WING OF PO LEUNG KUK AT 66 LEIGHTON ROAD, CAUSEWAY BAY	Job No. J6349	Figure No. 7			Scale in A4 N.T.S.
	Designed by L K K	Drawn by L C S	Checked by	Revision A	Date 25 FEB 2015
Figure Title: 2021 PEAK HOUR TRAFFIC FLOW WITHOUT PROPOSED REDEVELOPMENT	CKM Asia Limited				

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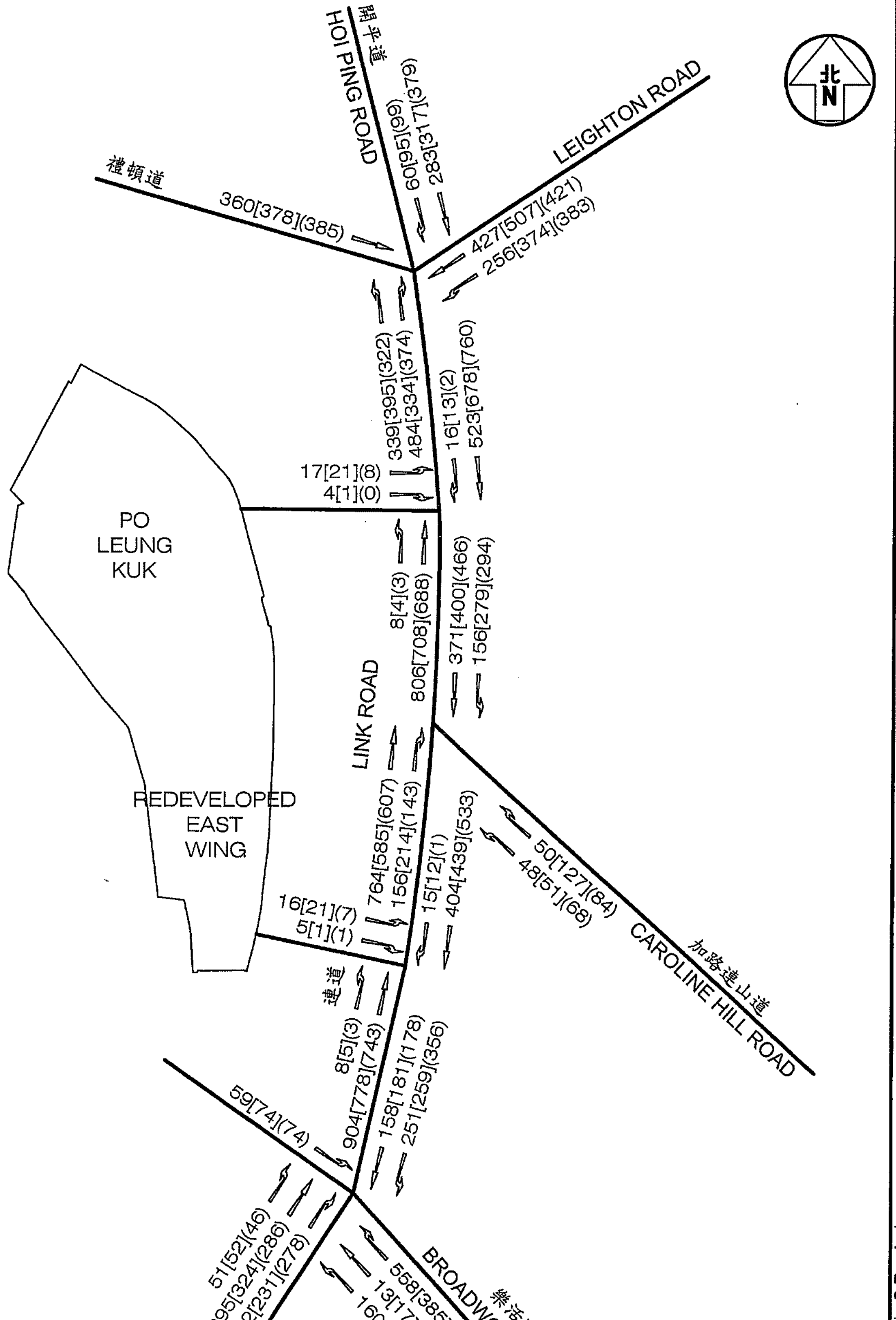

LEGEND :

123 - AM peak hour traffic flow, pcu / hr

[456] - NOON peak hour traffic flow, pcu / hr

(789) - PM peak hour traffic flow, pcu / hr

Project Title: PROPOSED REDEVELOPMENT OF THE EAST WING OF PO LEUNG KUK AT 66 LEIGHTON ROAD, CAUSEWAY BAY	Job No. J6349	Figure No. 8			Scale in A4 N.T.S.
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Figure Title: 2021 PEAK HOUR TRAFFIC FLOW WITH PROPOSED REDEVELOPMENT	CKM Asia Limited				

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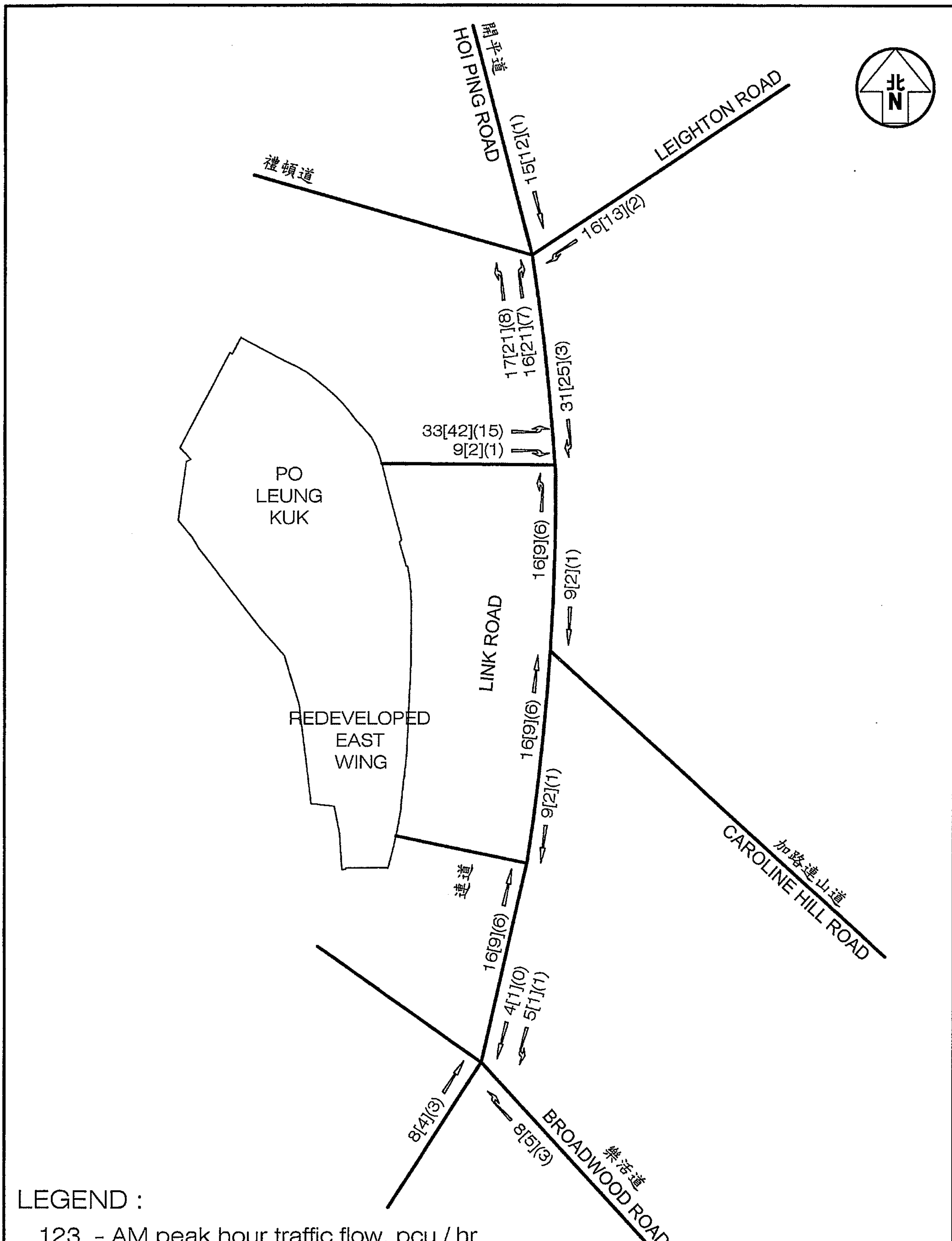

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[456] - NOON peak hour traffic flow, pcu / hr

(789) - PM peak hour traffic flow, pcu / hr

Project Title	Job No.	Figure No.	Scale in A4
PROPOSED REDEVELOPMENT OF THE EAST WING OF PO LEUNG KUK AT 66 LEIGHTON ROAD, CAUSEWAY BAY	J6349	9	N.T.S.

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Figure Title

DISTRIBUTION OF THE DEVELOPMENT TRAFFIC FOR SCENARIO 1: ALL TRAFFIC USE THE ORIGINAL ACCESS

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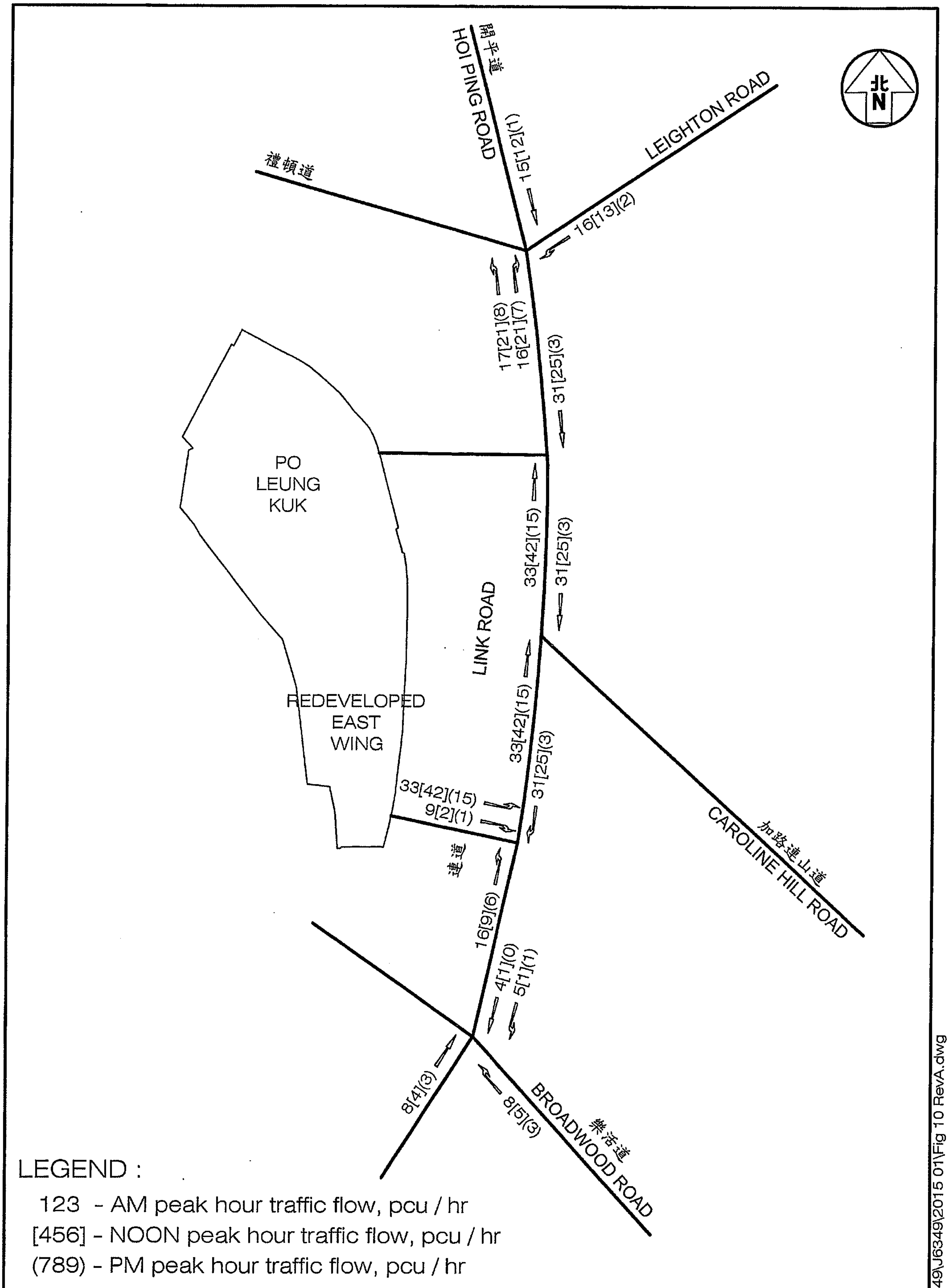

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PROPOSED REDEVELOPMENT OF THE EAST WING OF PO LEUNG KUK AT 66 LEIGHTON ROAD, CAUSEWAY BAY	J6349	10	N.T.S.

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Figure Title

DISTRIBUTION OF THE DEVELOPMENT TRAFFIC FOR SCENARIO 2: ALL TRAFFIC USE THE NEW ACCESS

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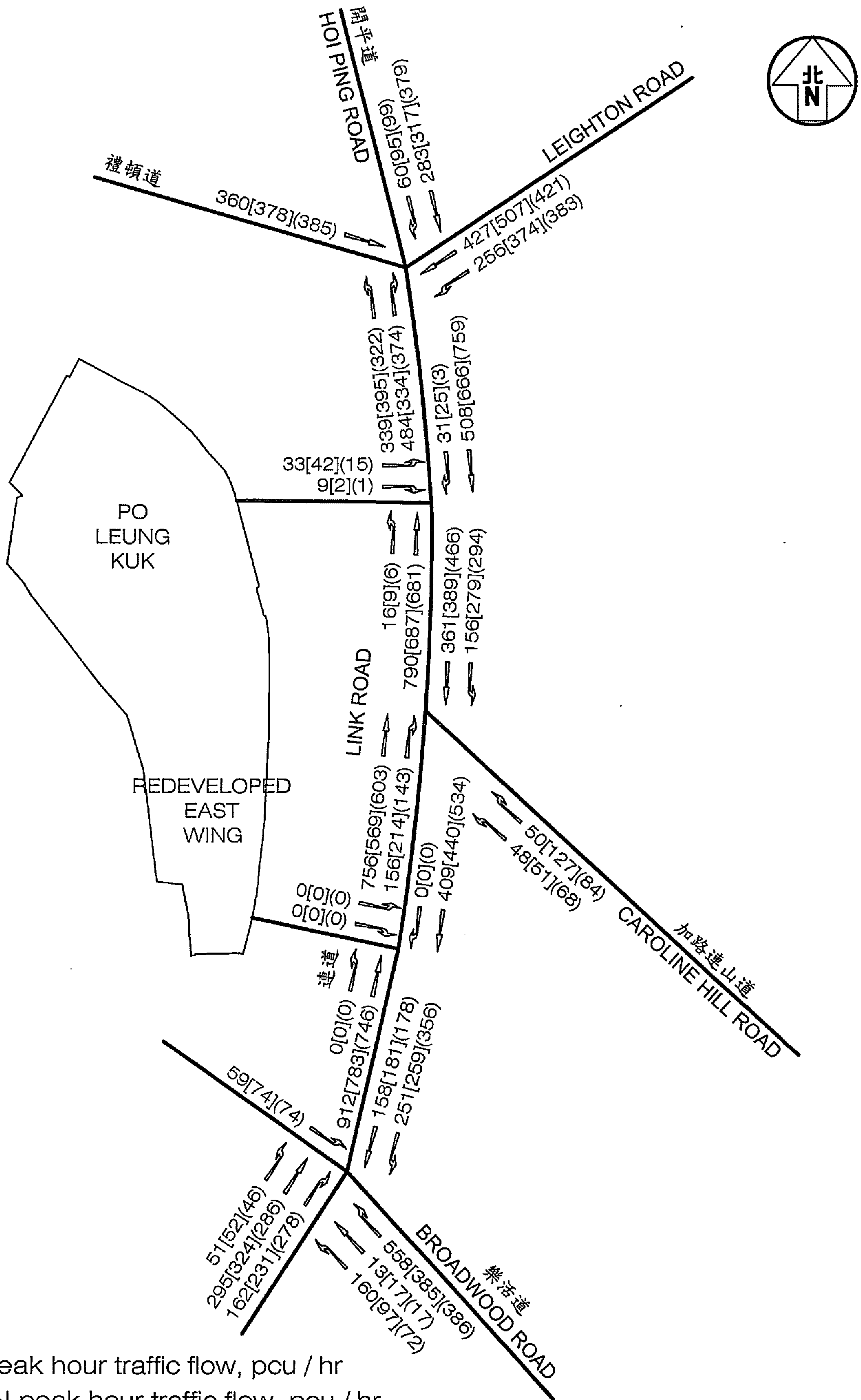

LEGEND :

123 - AM peak hour traffic flow, pcu / hr

[456] - NOON peak hour traffic flow, pcu / hr

(789) - PM peak hour traffic flow, pcu / hr

Project Title	Job No.	Figure No.	Scale in A4
PROPOSED REDEVELOPMENT OF THE EAST WING OF PO LEUNG KUK AT 66 LEIGHTON ROAD, CAUSEWAY BAY	J6349	11	N.T.S.

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Figure Title

2021 PEAK HOUR TRAFFIC FLOW WITH PROPOSED REDEVELOPMENT FOR SCENARIO 1

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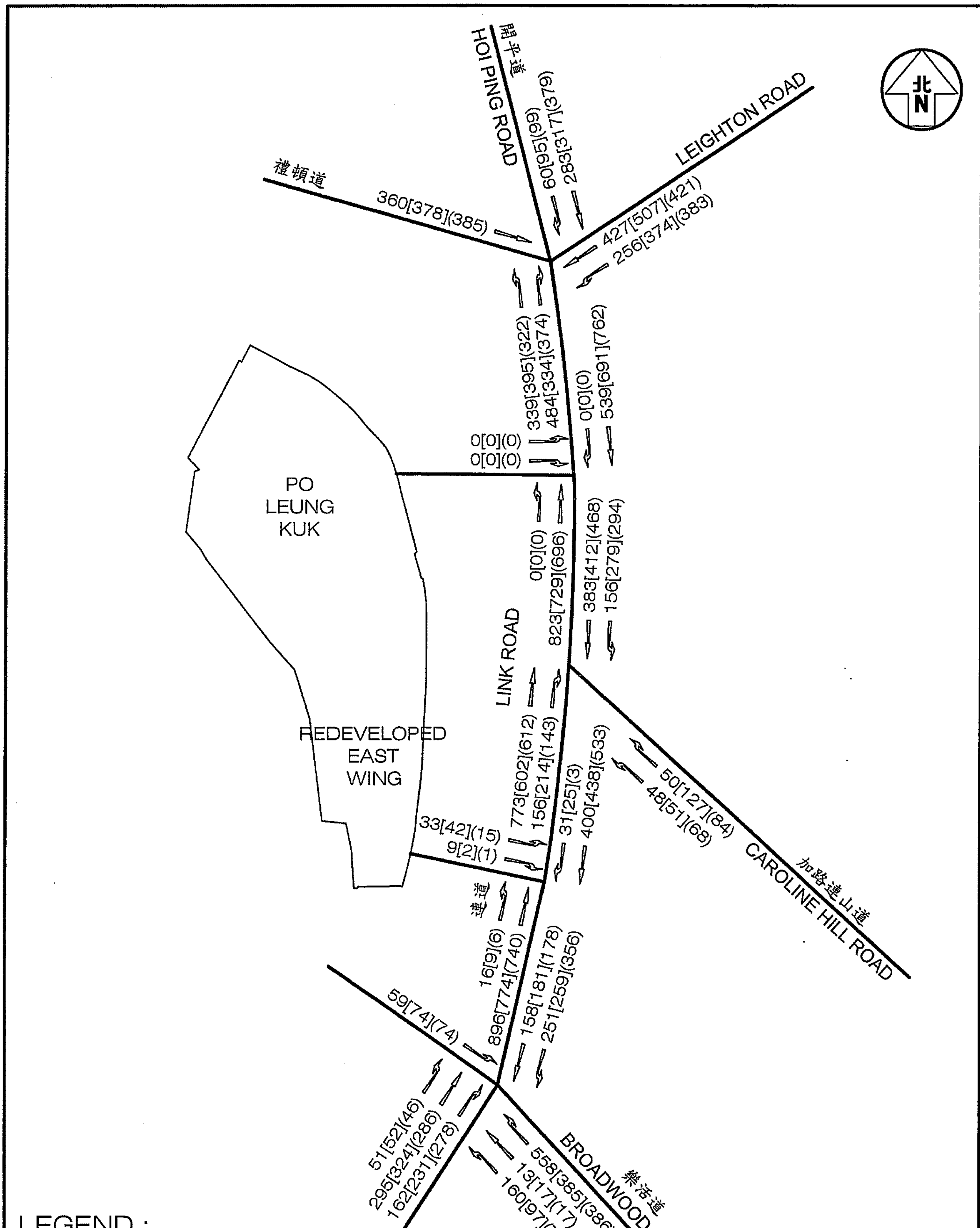

LEGEND :

123 - AM peak hour traffic flow, pcu / hr

[456] - NOON peak hour traffic flow, pcu / hr

(789) - PM peak hour traffic flow, pcu / hr

Project Title: PROPOSED REDEVELOPMENT OF THE EAST WING OF PO LEUNG KUK AT 66 LEIGHTON ROAD, CAUSEWAY BAY	Job No. J6349	Figure No. 12			Scale in A4 N.T.S.
	Designed by L K K	Drawn by L C S	Checked by	Revision A	Date 25 FEB 2015
Figure Title: 2021 PEAK HOUR TRAFFIC FLOW WITH PROPOSED REDEVELOPMENT FOR SCENARIO 2	CKM Asia Limited Traffic and Transportation Planning Consultants 21st Floor, Methodist House, 36 Hennessy Road, Wan Chai, Hong Kong Tel : (852) 2520 5990 Fax : (852) 2528 6343 Email : mail@ckmasia.com.hk				

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Annex 1:
Junction Analysis

Junction: Leighton Road / Caroline Hill Road — Job Number: J6349

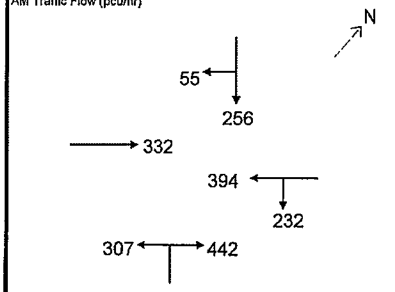
Scenario: Existing AM and PM — P.1

Design Year: 2015 — Designed By: — Checked By: — Date: 22 Jan 2015

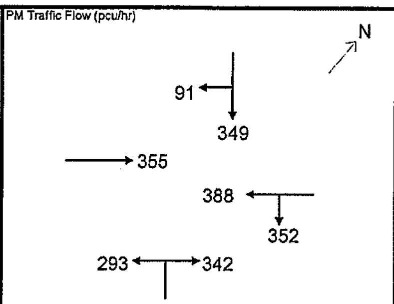
Approach		Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	AM Peak Turning %	AM Sat. Flow (pcu/hr)	AM Flow (pcu/hr)	AM y value	AM Critical y	PM Peak Turning %	PM Sat. Flow (pcu/hr)	PM Flow (pcu/hr)	PM y value	PM Critical y
Leighton Road EB	SA	A1	1	3.25				1940	160	0.082			1940	171	0.088	
	SA	A2	1	3.25				2080	172	0.083			2080	184	0.088	
Leighton Road WB	LT+SA	B1	1	3.50	20.0		78	1856	297	0.160	0.160	100	1828	352	0.193	0.193
	SA	B2	1	3.00				2055	329	0.160			2055	388	0.189	
Caroline Hill Road NB	LT	C1	2,3	3.00	30.0		100	1824	307	0.168		100	1824	293	0.161	
	RT	C2	2	4.00		20.0	100	2005	442	0.220	0.220	100	2005	342	0.171	0.171
Hoi Ping Road SB	SA	D1	3	3.00				1915	256	0.134	0.134		1915	349	0.182	0.182
	RT	D2	3	3.00		10.0	100	1665	55	0.033		100	1665	91	0.055	

Pedestrian Phase	Phase	Stage							
	$E_{(P)}$	1,2	Min Crossing Time =	11	sec GM +	6	sec FGM =	17	sec
	$F_{(P)}$	1	Min Crossing Time =	10	sec GM +	5	sec FGM =	15	sec
	$G_{(P)}$	1,3	Min Crossing Time =	14	sec GM +	5	sec FGM =	19	sec
	$H_{(P)}$	2	Min Crossing Time =	10	sec GM +	7	sec FGM =	17	sec
	$I_{(P)}$	2	Min Crossing Time =	14	sec GM +	5	sec FGM =	19	sec
	$J_{(P)}$	3	Min Crossing Time =	10	sec GM +	7	sec FGM =	17	sec

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

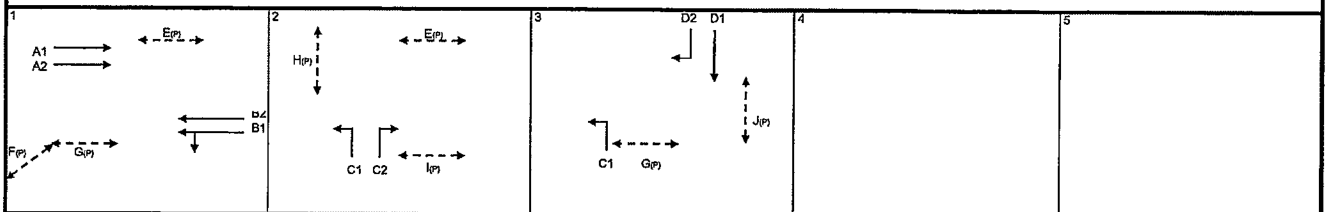


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

$S_M=\frac{S}{1+1.5f/r}$ $S_M=\frac{S-230}{1+1.5f/r}$

	AM Peak	Check Pedestrian Phase	PM Peak	Check Pedestrian Phase
Sum y	0.514	0.294	0.545	0.375
L (s)	20	36	20	36
C (s)	120	120	120	120
practical y	0.750	0.630	0.750	0.630
R.C. (%)	46%	115%	38%	68%

Note:



AM	G =	I/G = 8	G =	I/G = 7	G =	I/G = 8	G =	I/G =	G =	
	G =	I/G = 9	G = 19	I/G = 2	G =	I/G = 8	G =	I/G =	G =	
PM	G =	I/G = 8	G =	I/G = 7	G =	I/G = 8	G =	I/G =	G =	
	G =	I/G = 9	G = 19	I/G = 2	G =	I/G = 8	G =	I/G =	G =	

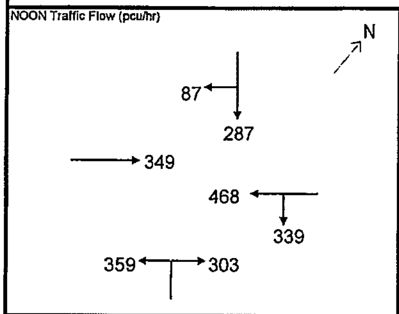
Signal Junction Analysis

Junction:	Leighton Road / Caroline Hill Road	Job Number:	J6349
Scenario:	Existing NOON		P.2
Design Year:	2015	Designed By:	
Checked By:		Date:	22 Jan 2015

Approach		Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	NOON Peak Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y
Leighton Road EB	SA	A1	1	3.25				1940	168	0.087	
	SA	A2	1	3.25				2080	181	0.087	
Leighton Road WB	LT+SA	B1	1	3.50	20.0		89	1842	381	0.207	0.207
	SA	B2	1	3.00				2055	426	0.207	
Caroline Hill Road NB	LT	C1	2,3	3.00	30.0		100	1824	359	0.197	
	RT	C2	2	4.00		20.0	100	2005	303	0.151	0.151
Hoi Ping Road SB	SA	D1	3	3.00				1915	287	0.150	0.150
	RT	D2	3	3.00		10.0	100	1665	87	0.052	

Pedestrian Phase	Phase	Stage							
	$E_{(P)}$	1,2	Min Crossing Time =	11	sec GM +	6	sec FGM =	17	sec
	$F_{(P)}$	1	Min Crossing Time =	10	sec GM +	5	sec FGM =	15	sec
	$G_{(P)}$	1,3	Min Crossing Time =	14	sec GM +	5	sec FGM =	19	sec
	$H_{(P)}$	2	Min Crossing Time =	10	sec GM +	7	sec FGM =	17	sec
	$I_{(P)}$	2	Min Crossing Time =	14	sec GM +	5	sec FGM =	19	sec
	$J_{(P)}$	3	Min Crossing Time =	10	sec GM +	7	sec FGM =	17	sec

NOON Traffic Flow (pcu/hr)

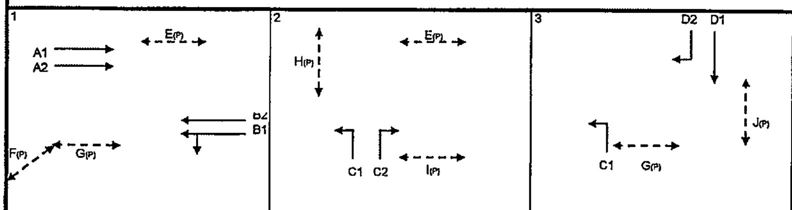


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

$S_M=\frac{S}{1+1.5f/r}$ $S_M=\frac{S-230}{1+1.5f/r}$

	NOON Peak	Check Pedestrian Phase
Sum y	0.508	0.357
L (s)	20	36
C (s)	120	120
practical y	0.750	0.630
R.C. (%)	48%	77%

Note:



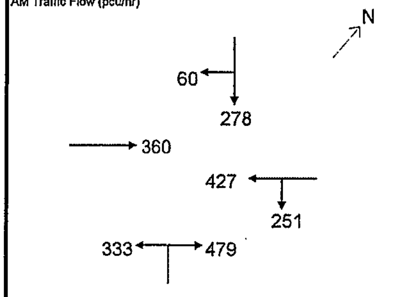
NOON	G =	I/G = 8	G =	I/G = 7	G =	I/G = 8	G =	I/G =	G =	
	G =	I/G = 9	G = 19	I/G = 2	G =	I/G = 8	G =	I/G =	G =	

Junction:	Leighton Road / Caroline Hill Road	Job Number:	J6349
Scenario:	Future Condition Without Proposed Development AM and PM		P.3
Design Year:	2021	Designed By:	
Checked By:		Date:	22 Jan 2015

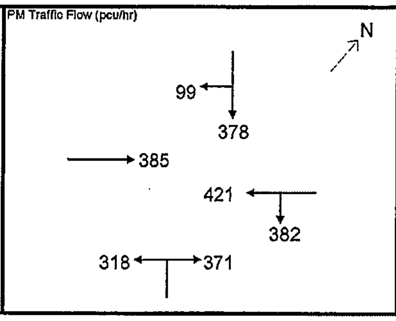
Approach		Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Leighton Road EB	SA	A1	1	3.25				1940	174	0.090			1940	186	0.096	
	SA	A2	1	3.25				2080	186	0.089			2080	199	0.096	
Leighton Road WB	LT+SA	B1	1	3.50	20.0		78	1856	322	0.173	0.173	100	1828	382	0.209	0.209
	SA	B2	1	3.00				2055	356	0.173			2055	421	0.205	
Caroline Hill Road NB	LT	C1	2,3	3.00	30.0		100	1824	333	0.183		100	1824	318	0.174	
	RT	C2	2	4.00		20.0	100	2005	479	0.239	0.239	100	2005	371	0.185	0.185
Hoi Ping Road SB	SA	D1	3	3.00				1915	278	0.145	0.145		1915	378	0.197	0.197
	RT	D2	3	3.00		10.0	100	1665	60	0.036		100	1665	99	0.059	

Pedestrian Phase	Phase	Stage								
	$E_{(P)}$	1,2	Min Crossing Time =	11	sec GM +	6	sec FGM =	17	sec
	$F_{(P)}$	1	Min Crossing Time =	10	sec GM +	5	sec FGM =	15	sec
	$G_{(P)}$	1,3	Min Crossing Time =	14	sec GM +	5	sec FGM =	19	sec
	$H_{(P)}$	2	Min Crossing Time =	10	sec GM +	7	sec FGM =	17	sec
	$I_{(P)}$	2	Min Crossing Time =	14	sec GM +	5	sec FGM =	19	sec
	$J_{(P)}$	3	Min Crossing Time =	10	sec GM +	7	sec FGM =	17	sec

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

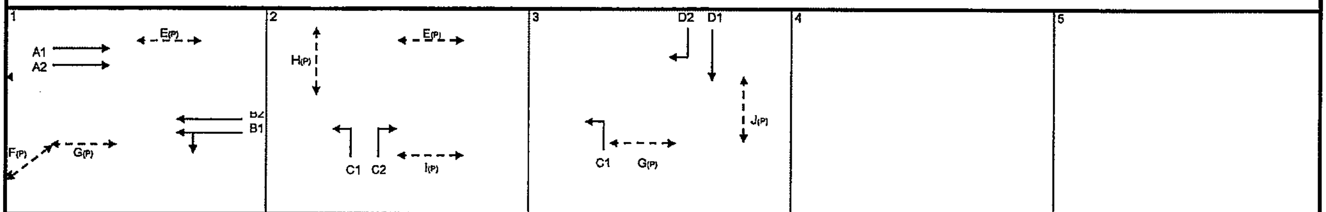


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

$S_M=\dfrac{S}{1+1.5f/r}$ $S_M=\dfrac{S-230}{1+1.5f/r}$

	AM Peak	Check Pedestrian Phase	PM Peak	Check Pedestrian Phase
Sum y	0.558	0.319	0.591	0.406
L (s)	20	36	20	36
C (s)	120	120	120	120
practical y	0.750	0.630	0.750	0.630
R.C. (%)	35%	98%	27%	55%

Note:



AM	G =	I/G = 8	G =	I/G = 7	G =	I/G = 8	G =	I/G =	G =
	G =	I/G = 9	G = 19	I/G = 2	G =	I/G = 8	G =	I/G =	G =
PM	G =	I/G = 8	G =	I/G = 7	G =	I/G = 8	G =	I/G =	G =
	G =	I/G = 9	G = 19	I/G = 2	G =	I/G = 8	G =	I/G =	G =

Junction: Leighton Road / Caroline Hill Road — Job Number: J6349

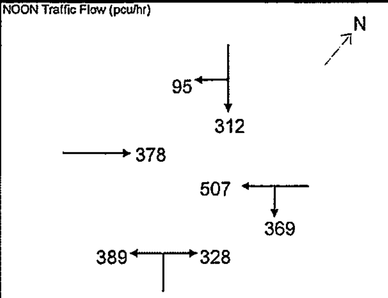
Scenario: Future Condition Without Proposed Development NOON — P.4

Design Year: 2021 — Designed By: ______ — Checked By: ______ — Date: 22 Jan 2015

Approach		Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	NOON Peak Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y
Leighton Road EB	SA	A1	1	3.25				1940	182	0.094	
	SA	A2	1	3.25				2080	196	0.094	
Leighton Road WB	LT+SA	B1	1	3.50	20.0		89	1842	414	0.225	
	SA	B2	1	3.00				2055	462	0.225	0.225
Caroline Hill Road NB	LT	C1	2,3	3.00	30.0		100	1824	389	0.213	
	RT	C2	2	4.00		20.0	100	2005	328	0.164	0.164
Hoi Ping Road SB	SA	D1	3	3.00				1915	312	0.163	0.163
	RT	D2	3	3.00		10.0	100	1665	95	0.057	

Pedestrian Phase	Phase	Stage					
Pedestrian Phase	$E_{(P)}$	1,2	Min Crossing Time =	11	sec GM +	6	sec FGM = 17 sec
	$F_{(P)}$	1	Min Crossing Time =	10	sec GM +	5	sec FGM = 15 sec
	$G_{(P)}$	1,3	Min Crossing Time =	14	sec GM +	5	sec FGM = 19 sec
	$H_{(P)}$	2	Min Crossing Time =	10	sec GM +	7	sec FGM = 17 sec
	$I_{(P)}$	2	Min Crossing Time =	14	sec GM +	5	sec FGM = 19 sec
	$J_{(P)}$	3	Min Crossing Time =	10	sec GM +	7	sec FGM = 17 sec

NOON Traffic Flow (pcu/hr)

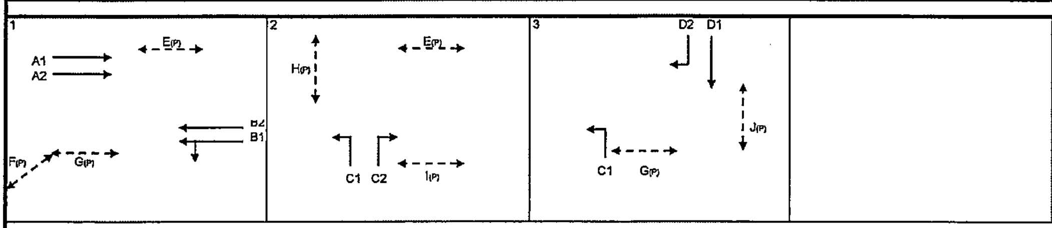


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

$S_M=\frac{S}{1+1.5f/r}$ $S_M=\frac{S-230}{1+1.5f/r}$

	NOON Peak	Check Pedestrian Phase
Sum y	0.551	0.388
L (s)	20	36
C (s)	120	120
practical y	0.750	0.630
R.C. (%)	36%	62%

Note:



NOON	G =	I/G = 8	G =	I/G = 7	G =	I/G = 8	G =	I/G =	G =
	G =	I/G = 9	G = 19	I/G = 2	G =	I/G = 8	G =	I/G =	G =

Junction: Leighton Road / Caroline Hill Road — Job Number: J6349

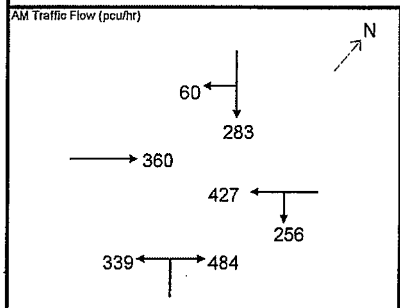
Scenario: Future Condition With Proposed Development AM and PM — P.5

Design Year: 2021 — Designed By: — Checked By: — Date: 22 Jan 2015

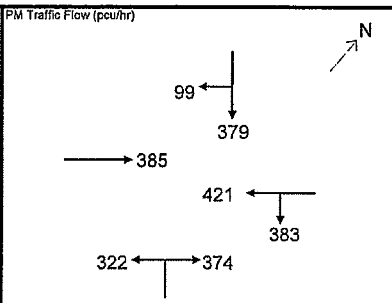
Approach		Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Leighton Road EB	SA	A1	1	3.25				1940	174	0.090			1940	186	0.096	
	SA	A2	1	3.25				2080	186	0.089			2080	199	0.096	
Leighton Road WB	LT+SA	B1	1	3.50	20.0		79	1855	324	0.175	0.175	100	1828	383	0.210	0.210
	SA	B2	1	3.00				2055	359	0.175			2055	421	0.205	
Caroline Hill Road NB	LT	C1	2,3	3.00	30.0		100	1824	339	0.186		100	1824	322	0.177	
	RT	C2	2	4.00		20.0	100	2005	484	0.241	0.241	100	2005	374	0.187	0.187
Hoi Ping Road SB	SA	D1	3	3.00				1915	283	0.148	0.148		1915	379	0.198	0.198
	RT	D2	3	3.00		10.0	100	1665	60	0.036		100	1665	99	0.059	

Pedestrian Phase	Phase	Stage							
	E(P)	1,2	Min Crossing Time =	11	sec GM +	6	sec FGM =	17	sec
	F(P)	1	Min Crossing Time =	10	sec GM +	5	sec FGM =	15	sec
	G(P)	1,3	Min Crossing Time =	14	sec GM +	5	sec FGM =	19	sec
	H(P)	2	Min Crossing Time =	10	sec GM +	7	sec FGM =	17	sec
	I(P)	2	Min Crossing Time =	14	sec GM +	5	sec FGM =	19	sec
	J(P)	3	Min Crossing Time =	10	sec GM +	7	sec FGM =	17	sec

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

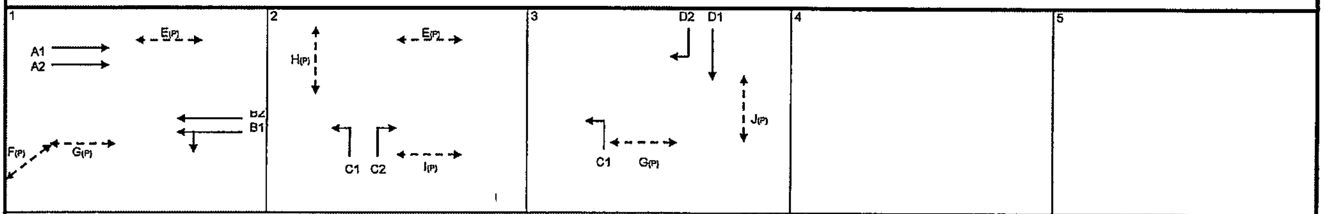


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

$S_M=\frac{S}{1+1.5f/r}$ $S_M=\frac{S-230}{1+1.5f/r}$

	AM Peak	Check Pedestrian Phase	PM Peak	Check Pedestrian Phase
Sum y	0.564	0.322	0.594	0.407
L (s)	20	36	20	36
C (s)	120	120	120	120
practical y	0.750	0.630	0.750	0.630
R.C. (%)	33%	95%	26%	55%

Note:



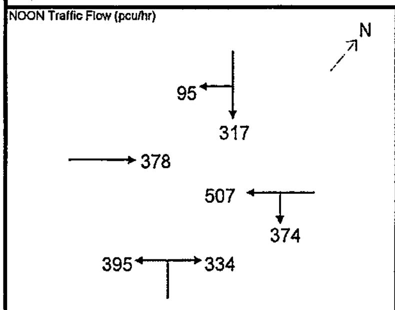
	Stage 1		Stage 2		Stage 3		Stage 4		Stage 5
AM	G =	I/G = 8	G =	I/G = 7	G =	I/G = 8	G =	I/G =	G =
	G =	I/G = 9	G = 19	I/G = 2	G =	I/G = 8	G =	I/G =	G =
PM	G =	I/G = 8	G =	I/G = 7	G =	I/G = 8	G =	I/G =	G =
	G =	I/G = 9	G = 19	I/G = 2	G =	I/G = 8	G =	I/G =	G =

Junction:	Leighton Road / Caroline Hill Road			Job Number:	J6349
Scenario:	Future Condition With Proposed Development NOON				P.6
Design Year:	2021	Designed By:	Checked By:	Date:	22 Jan 2015

Approach		Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	NOON Peak Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y
Leighton Road EB	SA	A1	1	3.25				1940	182	0.094	
	SA	A2	1	3.25				2080	196	0.094	
Leighton Road WB	LT+SA	B1	1	3.50	20.0		90	1841	416	0.226	0.226
	SA	B2	1	3.00				2055	465	0.226	
Caroline Hill Road NB	LT	C1	2,3	3.00	30.0		100	1824	395	0.217	
	RT	C2	2	4.00		20.0	100	2005	334	0.167	0.167
Hoi Ping Road SB	SA	D1	3	3.00				1915	317	0.166	0.166
	RT	D2	3	3.00		10.0	100	1665	95	0.057	

Pedestrian Phase	$E_{(P)}$	1,2	Min Crossing Time =	11	sec GM +	6	sec FGM =	17	sec
	$F_{(P)}$	1	Min Crossing Time =	10	sec GM +	5	sec FGM =	15	sec
	$G_{(P)}$	1,3	Min Crossing Time =	14	sec GM +	5	sec FGM =	19	sec
	$H_{(P)}$	2	Min Crossing Time =	10	sec GM +	7	sec FGM =	17	sec
	$I_{(P)}$	2	Min Crossing Time =	14	sec GM +	5	sec FGM =	19	sec
	$J_{(P)}$	3	Min Crossing Time =	10	sec GM +	7	sec FGM =	17	sec

NOON Traffic Flow (pcu/hr)

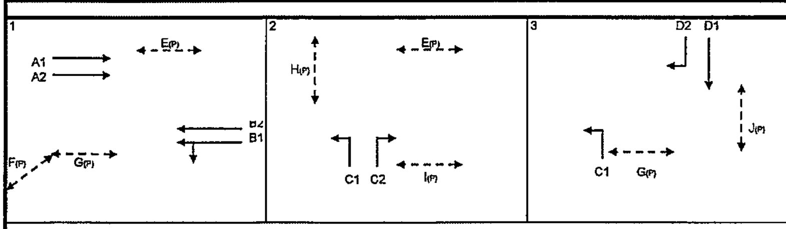


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

$S_M=\frac{S}{1+1.5f/r}$ $S_M=\frac{S-230}{1+1.5f/r}$

	NOON Peak	Check Pedestrian Phase
Sum y	0.558	0.392
L (s)	20	36
C (s)	120	120
practical y	0.750	0.630
R.C. (%)	34%	61%

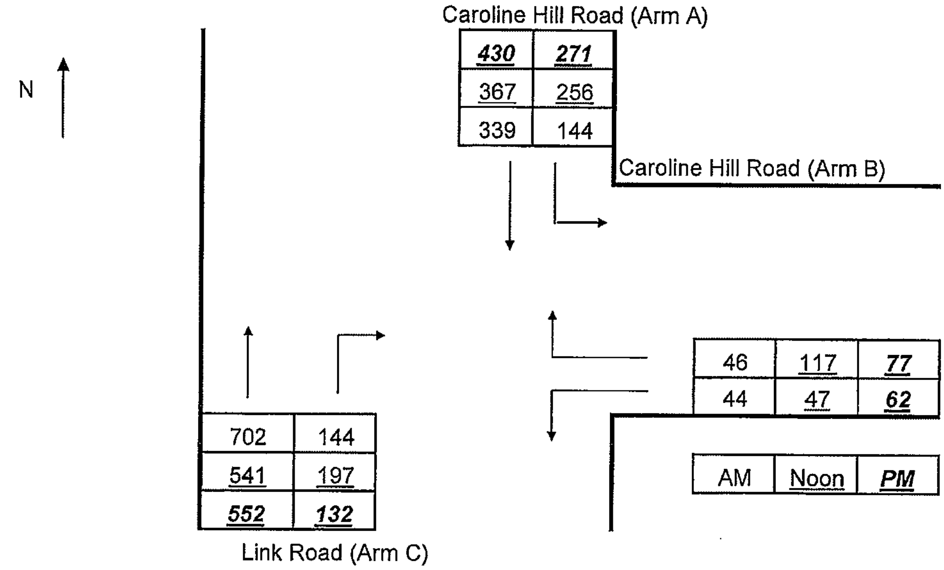
Note:



NOON	G =	I/G = 8	G =	I/G = 7	G =	I/G = 8	G =	I/G =	G =	
	G =	I/G = 9	G = 19	I/G = 2	G =	I/G = 8	G =	I/G =	G =	

Priority Junction Analysis

Junction:	Caroline Hill Road / Link Road				
Design Year:	2015	Job Number:	J6349	Date:	22 January 2015
Scheme:	Existing Condition				P.7



Y = 1 - 0.0345W

q-AB, etc = the design flow of movement AB, etc

where W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

v-rBA, etc = visibility to the right for waiting vehicles in stream BA, etc

v-lBA, etc = visibility to the left for waiting vehicles in stream BA, etc

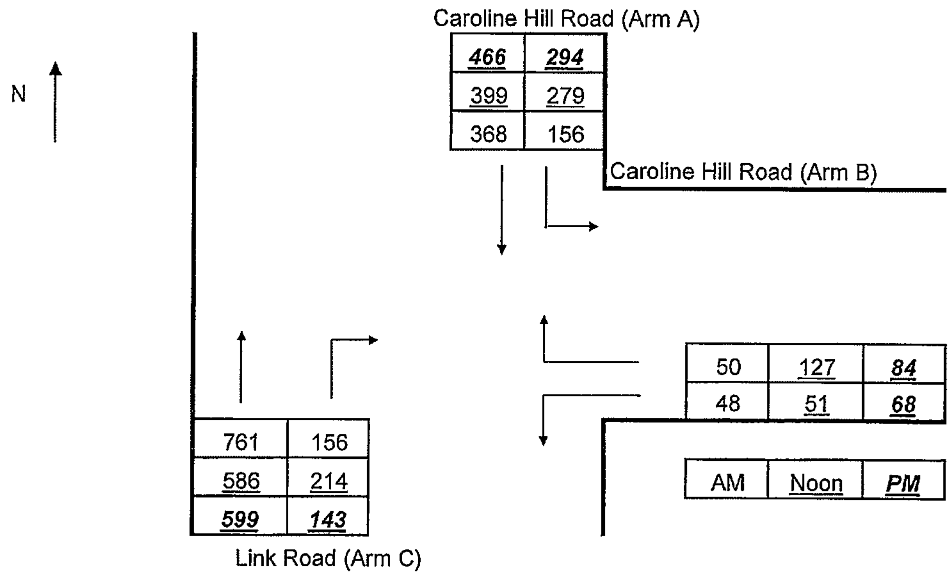
	Input		Input		Input		Input	
	W	7.30	V-rBA	80	V-rBC	80	w-BA	3.00
Geometry :	W-CR	1.50	V-lBA	29	V-rCB	40	w-BC	3.00
							w-CB	2.60

	Traffic Flows, pcu/min	AM	Noon	PM	Capacity, pcu/min	AM	Noon	PM
Analysis :	q-B-AC	1.65	3.00	2.54	Q-B-ACD	7.64	6.49	7.15
	q-C-A	12.83	9.89	10.09	Q-A-B	0.00	0.00	0.00
	q-C-B	2.63	3.60	2.41	Q-A-C	8.37	7.79	7.47
	q-A-B	2.63	4.68	4.95	Q-A-D	0.00	0.00	0.00
	q-A-C	6.20	6.71	7.86	Q-D-AB	0.00	0.00	0.00

Ratio-of-flow to Capacity	AM	Noon	PM
B-AC	0.215	0.462	0.355
C-B	0.314	0.462	0.323

Priority Junction Analysis

Junction:	Caroline Hill Road / Link Road				
Design Year:	2021	Job Number:	J6349	Date:	22 January 2015
Scheme:	Future Condition without Proposed Development				P.8



Y = 1 - 0.0345W

q-AB, etc = the design flow of movement AB, etc

where W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

v-rBA, etc = visibility to the right for waiting vehicles in stream BA, etc

v-lBA, etc = visibility to the left for waiting vehicles in stream BA, etc

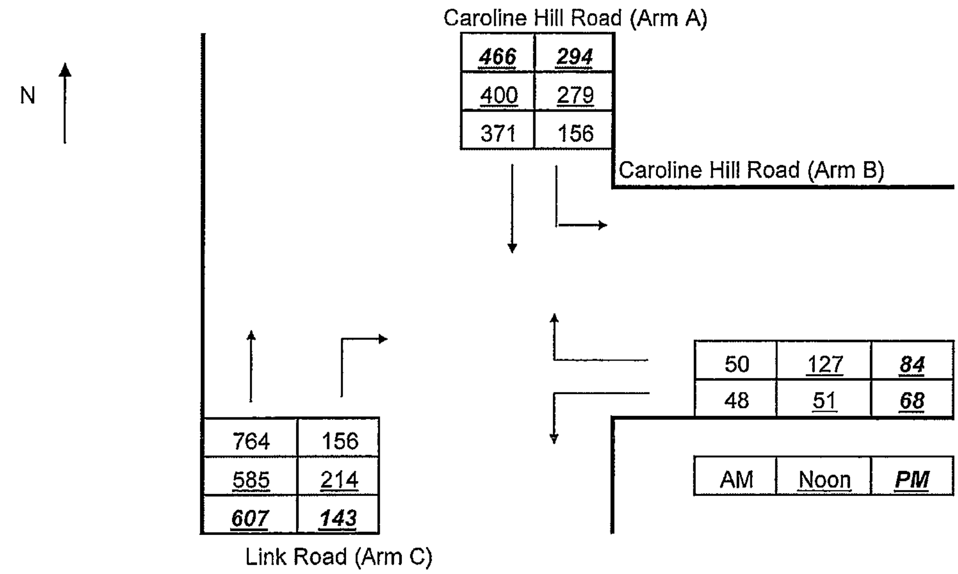
	Input		Input		Input		Input	
	W	7.30	V-rBA	80	V-rBC	80	w-BA	3.00
Geometry :	W-CR	1.50	V-lBA	29	V-rCB	40	w-BC	3.00
							w-CB	2.60

	Traffic Flows, pcu/min	AM	Noon	PM	Capacity, pcu/min	AM	Noon	PM
Analysis :	q-B-AC	1.79	3.25	2.78	Q-B-ACD	7.20	5.99	6.69
	q-C-A	13.91	10.71	10.95	Q-A-B	0.00	0.00	0.00
	q-C-B	2.85	3.91	2.61	Q-A-C	8.20	7.57	7.22
	q-A-B	2.85	5.08	5.37	Q-A-D	0.00	0.00	0.00
	q-A-C	6.73	7.29	8.52	Q-D-AB	0.00	0.00	0.00

Ratio-of-flow to Capacity	AM	Noon	PM
B-AC	0.249	0.544	0.416
C-B	0.348	0.517	0.362

Priority Junction Analysis

Junction:	Caroline Hill Road / Link Road				
Design Year:	2021	Job Number:	J6349	Date:	22 January 2015
Scheme:	Future Condition with Proposed Development				P.9



Y = 1 - 0.0345W

q-AB, etc = the design flow of movement AB, etc

where W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

v-rBA, etc = visibility to the right for waiting vehicles in stream BA, etc

v-lBA, etc = visibility to the left for waiting vehicles in stream BA, etc

	Input		Input		Input		Input	
	W	7.30	V-rBA	80	V-rBC	80	w-BA	3.00
Geometry :	W-CR	1.50	V-lBA	29	V-rCB	40	w-BC	3.00
							w-CB	2.60

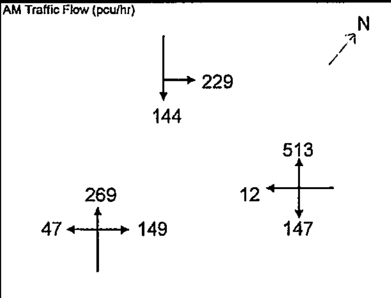
Traffic Flows, pcu/min		AM	Noon	PM	Capacity, pcu/min	AM	Noon	PM
Analysis :	q-B-AC	1.79	3.25	2.78	Q-B-ACD	7.17	5.99	6.66
	q-C-A	13.97	10.69	11.10	Q-A-B	0.00	0.00	0.00
	q-C-B	2.85	3.91	2.61	Q-A-C	8.19	7.56	7.22
	q-A-B	2.85	5.08	5.37	Q-A-D	0.00	0.00	0.00
	q-A-C	6.78	7.31	8.52	Q-D-AB	0.00	0.00	0.00

Ratio-of-flow to Capacity	AM	Noon	PM
B-AC	0.250	0.544	0.417
C-B	0.348	0.517	0.362

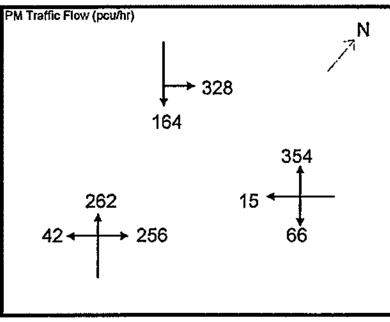
Junction:	Broadwood Road / Link Road	Job Number:	J6349
Scenario:	Existing AM and PM		P.10
Design Year: 2015	Designed By:	Checked By:	Date: 22 Jan 2015

Approach		Phase	Stage	Width (m)	Radius (m)		AM Peak					PM Peak				
					Left	Right	Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y	Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y
Link Road	LT+SA+RT	A1	1	3.50	80.0	80.0	61	1943	373	0.192	0.192	67	1941	492	0.254	0.254
Broadwood Road (Western)	LT+SA	B1	1,2	3.00	25.0		15	1898	316	0.166		14	1899	304	0.160	
	RT	B2	1,2	3.00		15.0	100	1638	149	0.091		100	1638	256	0.156	
Broadwood Road (Eastern)	LT+SA+RT	C1	3	3.50	25.0	60.0	98	1856	672	0.362	0.362	97	1857	435	0.234	0.234
Pedestrian Phase		$D_{(P)}$	4		Min	Green	=	5	GM	+	7	FGM	=	12	sec	

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

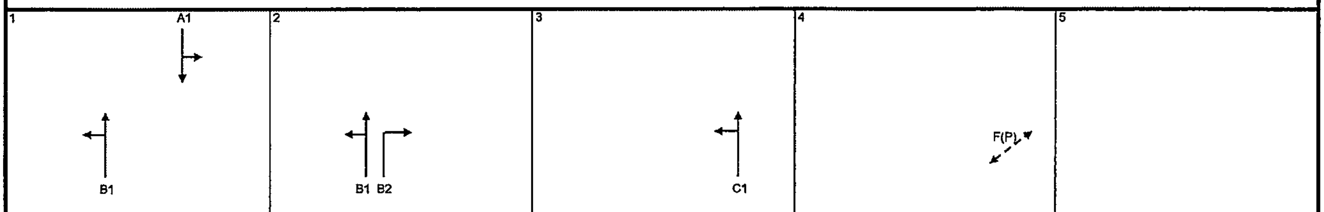


$S=1940+100(W-3.25)$ $\quad S_M=\dfrac{S}{1+1.5f/r}$

$S=2080+100(W-3.25)$ $\quad S_M=\dfrac{S-230}{1+1.5f/r}$

	AM Peak	PM Peak
Sum y	0.554	0.488
L (s)	33	33
C (s)	140	135
practical y	0.688	0.680
R.C. (%)	24%	39%

Note:



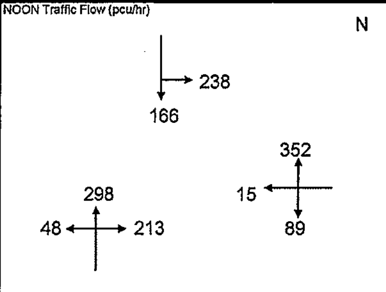
AM	G =	I/G = 3	G = 5	I/G = 8	G =	I/G = 3	G = 12	I/G = 4	G =
	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =
PM	G =	I/G = 3	G = 5	I/G = 8	G =	I/G = 3	G = 12	I/G = 4	G =
	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =

Junction:	Broadwood Road / Link Road
Scenario:	Existing NOON
Design Year:	2015
Designed By:	
Checked By:	
Job Number:	J6349
	P.11
Date:	22 Jan 2015

Approach		Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	NOON Peak Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y
Link Road	LT+SA+RT	A1	1	3.50	80.0	80.0	59	1944	404	0.208	0.208
Broadwood Road (Western)	LT+SA	B1	1,2	3.00	25.0		14	1899	346	0.182	
	RT	B2	1,2	3.00		15.0	100	1638	213	0.130	
Broadwood Road (Eastern)	LT+SA+RT	C1	3	3.50	25.0	60.0	97	1857	456	0.246	0.246

Pedestrian Phase	$D_{(P)}$	4		Min	Green	=	5	GM	+	5	FGM	=	10	sec

NOON Traffic Flow (pcu/hr)

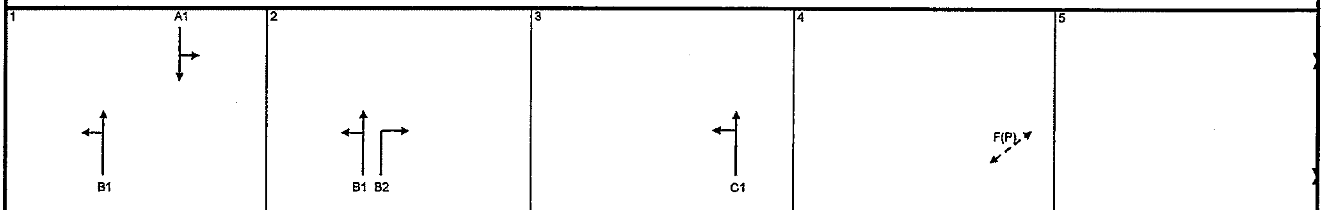


$S=1940+100(W-3.25)$ $\quad S_M=\frac{S}{1+1.5f/r}$

$S=2080+100(W-3.25)$ $\quad S_M=\frac{S-230}{1+1.5f/r}$

	NOON Peak
Sum y	0.453
L (s)	33
C (s)	110
practical y	0.630
R.C. (%)	39%

Note:

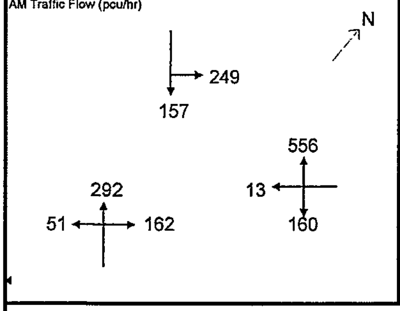


NOON	G =	I/G = 3	G = 5	I/G = 8	G =	I/G = 3	G = 12	I/G = 4	G =
	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =

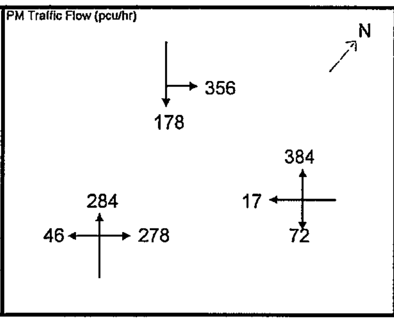
Junction:	Broadwood Road / Link Road	Job Number:	J6349
Scenario:	Future Condition Without Proposed Development AM and PM		P.12
Design Year:	2021	Designed By:	
Checked By:		Date:	22 Jan 2015

Approach		Phase	Stage	Width (m)	Radius (m)		AM Peak					PM Peak				
					Left	Right	Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y	Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y
Link Road	LT+SA+RT	A1	1	3.50	80.0	80.0	61	1943	406	0.209	0.209	67	1941	534	0.275	0.275
Broadwood Road (Western)	LT+SA	B1	1,2	3.00	25.0		15	1898	343	0.181		14	1899	330	0.174	
	RT	B2	1,2	3.00		15.0	100	1638	162	0.099		100	1638	278	0.170	
Broadwood Road (Eastern)	LT+SA+RT	C1	3	3.50	25.0	60.0	98	1856	729	0.393	0.393	96	1858	473	0.255	0.255
Pedestrian Phase		$D_{(P)}$	4		Min	Green	=	5	GM	+	5	FGM	=	10	sec	

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

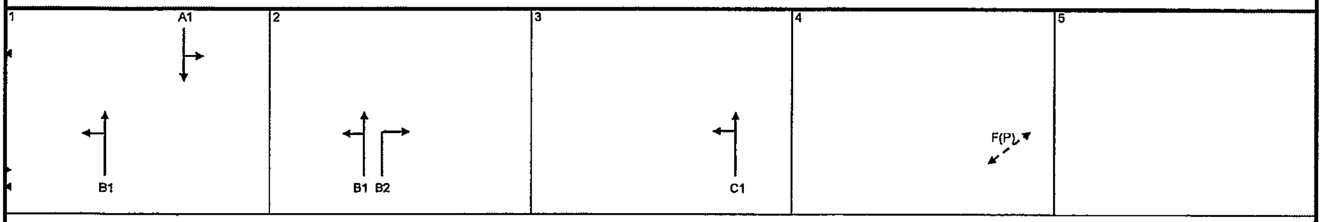


$S=1940+100(W-3.25)$ $S_M=\frac{S}{1+1.5f/r}$

$S=2080+100(W-3.25)$ $S_M=\frac{S-230}{1+1.5f/r}$

	AM Peak		PM Peak	
Sum y	0.602		0.530	
L (s)	33		33	
C (s)	140		135	
practical y	0.688		0.680	
R.C. (%)	14%		28%	

Note:



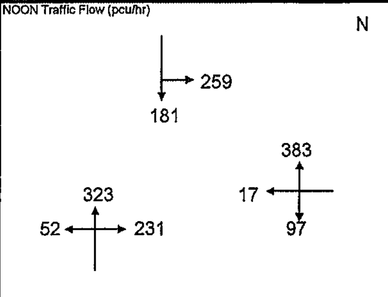
AM	G =	I/G = 3	G = 5	I/G = 8	G =	I/G = 3	G = 12	I/G = 4	G =
	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =
PM	G =	I/G = 3	G = 5	I/G = 8	G =	I/G = 3	G = 12	I/G = 4	G =
	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =

Junction:	Broadwood Road / Link Road		Job Number:	J6349
Scenario:	Future Condition Without Proposed Development NOON			P.13
Design Year:	2021	Designed By:	Checked By:	Date: 22 Jan 2015

Approach		Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	NOON Peak Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y
Link Road	LT+SA+RT	A1	1	3.50	80.0	80.0	59	1944	440	0.226	0.226
Broadwood Road (Western)	LT+SA	B1	1,2	3.00	25.0		14	1899	375	0.197	
	RT	B2	1,2	3.00		15.0	100	1638	231	0.141	
Broadwood Road (Eastern)	LT+SA+RT	C1	3	3.50	25.0	60.0	97	1857	497	0.268	0.268

Pedestrian Phase	$D_{(P)}$	4	Min	Green	=	5	GM	+	5	FGM	=	10	sec

NOON Traffic Flow (pcu/hr)

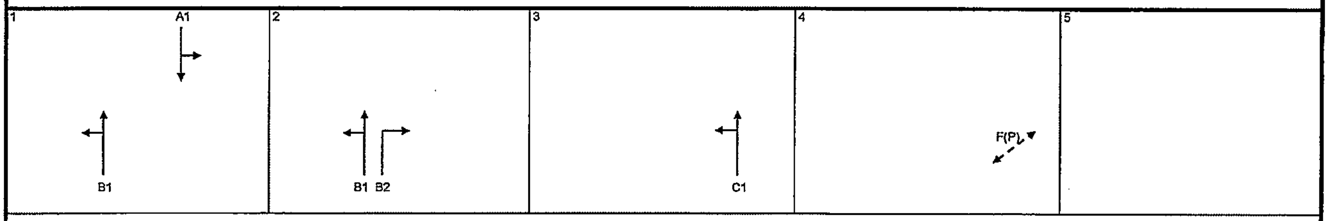


$S=1940+100(W-3.25)$ $\quad S_M=\frac{S}{1+1.5f/r}$

$S=2080+100(W-3.25)$ $\quad S_M=\frac{S-230}{1+1.5f/r}$

	NOON Peak
Sum y	0.494
L (s)	33
C (s)	110
practical y	0.630
R.C. (%)	28%

Note:

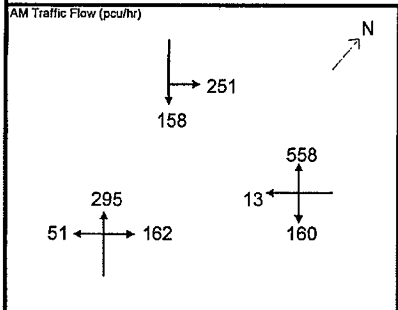


NOON	G =	I/G = 3	G = 5	I/G = 8	G =	I/G = 3	G = 12	I/G = 4	G =
	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =

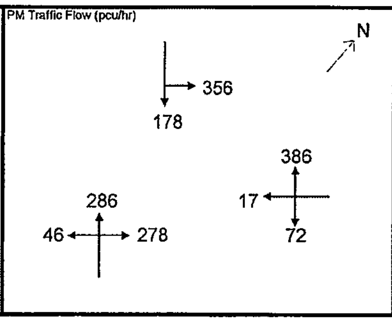
Junction:	Broadwood Road / Link Road	Job Number:	J6349
Scenario:	Future Condition With Proposed Development AM and PM		P.14
Design Year: 2021	Designed By:	Checked By:	Date: 22 Jan 2015

Approach		Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Link Road	LT+SA+RT	A1	1	3.50	80.0	80.0	61	1943	409	0.211	0.211	67	1941	534	0.275	0.275
Broadwood Road (Western)	LT+SA	B1	1,2	3.00	25.0		15	1898	346	0.182		14	1899	332	0.175	
	RT	B2	1,2	3.00		15.0	100	1638	162	0.099		100	1638	278	0.170	
Broadwood Road (Eastern)	LT+SA+RT	C1	3	3.50	25.0	60.0	98	1856	731	0.394	0.394	96	1858	475	0.256	0.256
Pedestrian Phase		$D_{(P)}$	4		Min	Green	=	5	GM	+	5	FGM	=	10	sec	

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

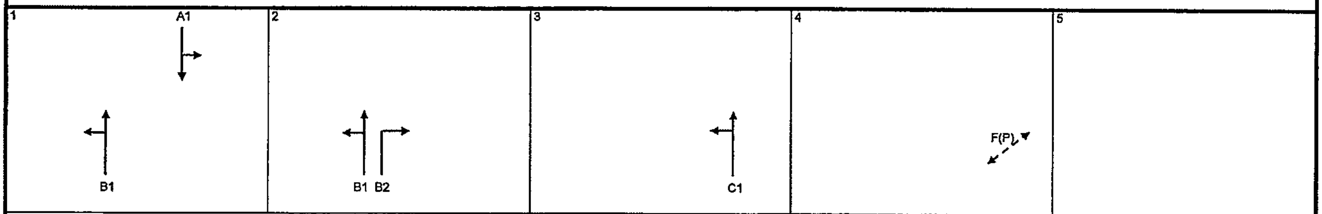


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

$S_M=\frac{S}{1+1.5f/r}$ $S_M=\frac{S-230}{1+1.5f/r}$

	AM Peak		PM Peak	
Sum y	0.604		0.531	
L (s)	33		33	
C (s)	140		135	
practical y	0.688		0.680	
R.C. (%)	14%		28%	

Note:



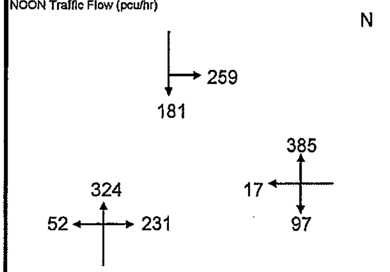
	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =
AM		3	5	8		3	12	4	
PM		3	5	8		3	12	4	

Junction:	Broadwood Road / Link Road	Job Number:	J6349
Scenario:	Future Condition With Proposed Development NOON		P.15
Design Year: 2021	Designed By:	Checked By:	Date: 22 Jan 2015

Approach		Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	NOON Peak Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y
Link Road	LT+SA+RT	A1	1	3.50	80.0	80.0	59	1944	440	0.226	0.226
Broadwood Road (Western)	LT+SA	B1	1,2	3.00	25.0		14	1899	376	0.198	
	RT	B2	1,2	3.00		15.0	100	1638	231	0.141	
Broadwood Road (Eastern)	LT+SA+RT	C1	3	3.50	25.0	60.0	97	1857	499	0.269	0.269

Pedestrian Phase	$D_{(P)}$	4		Min	Green	=	5	GM	+	5	FGM	=	10	sec

NOON Traffic Flow (pcu/hr)

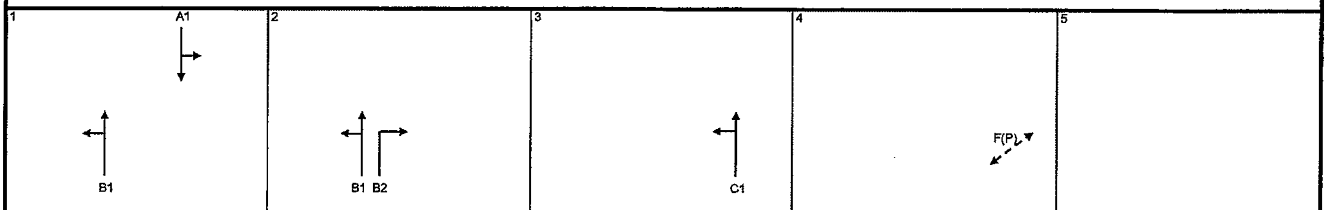


$S=1940+100(W-3.25)$ $S_M=\frac{S}{1+1.5f/r}$

$S=2080+100(W-3.25)$ $S_M=\frac{S-230}{1+1.5f/r}$

Note:

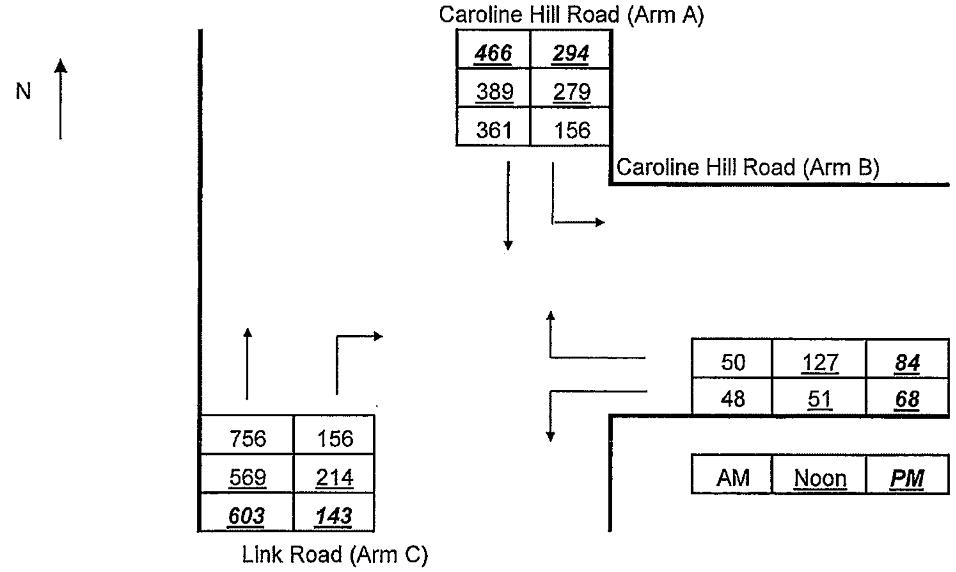
	NOON Peak
Sum y	0.495
L (s)	33
C (s)	110
practical y	0.630
R.C. (%)	27%



NOON	G =	I/G = 3	G = 5	I/G = 8	G =	I/G = 3	G = 12	I/G = 4	G =
	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =

Priority Junction Analysis

Junction:	Caroline Hill Road / Link Road				
Design Year:	2021	Job Number:	J6349	Date:	22 January 2015
Scheme:	Future Condition with Proposed Development (All traffic use **ORIGINAL** access)				P.16



Y = 1 - 0.0345W

q-AB, etc = the design flow of movement AB, etc

where W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

v-rBA, etc = visibility to the right for waiting vehicles in stream BA, etc

v-lBA, etc = visibility to the left for waiting vehicles in stream BA, etc

	Input		Input		Input		Input	
	W	7.30	V-rBA	80	V-rBC	80	w-BA	3.00
Geometry :	W-CR	1.50	V-lBA	29	V-rCB	40	w-BC	3.00
							w-CB	2.60

	Traffic Flows, pcu/min	AM	Noon	PM	Capacity, pcu/min	AM	Noon	PM
Analysis :	q-B-AC	1.79	3.25	2.78	Q-B-ACD	7.25	6.11	6.68
	q-C-A	13.82	10.40	11.02	Q-A-B	0.00	0.00	0.00
	q-C-B	2.85	3.91	2.61	Q-A-C	8.23	7.61	7.22
	q-A-B	2.85	5.08	5.37	Q-A-D	0.00	0.00	0.00
	q-A-C	6.60	7.11	8.52	Q-D-AB	0.00	0.00	0.00

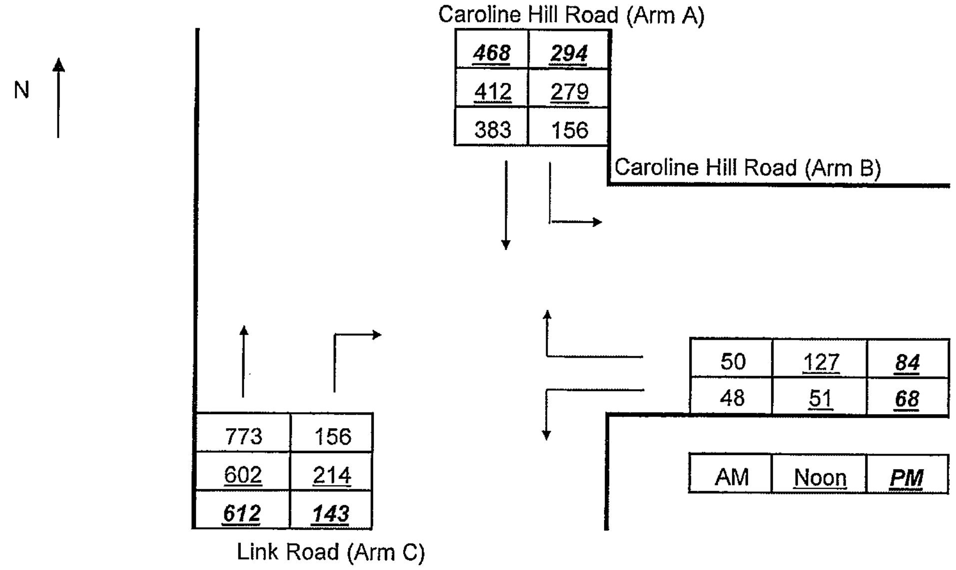
Ratio-of-flow to Capacity	AM	Noon	PM
B-AC	0.247	0.534	0.416
C-B	0.346	0.514	0.362

Priority Junction Analysis

Junction: Caroline Hill Road / Link Road

Design Year: 2021 Job Number: J6349 Date: 22 January 2015

Scheme: Future Condition with Proposed Development (All traffic use **NEW** access) P.17



$Y = 1 - 0.0345W$

q-AB, etc = the design flow of movement AB, etc

where W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

v-rBA, etc = visibility to the right for waiting vehicles in stream BA, etc

v-lBA, etc = visibility to the left for waiting vehicles in stream BA, etc

	Input		Input		Input		Input	
	W	7.30	V-rBA	80	V-rBC	80	w-BA	3.00
Geometry :	W-CR	1.50	V-lBA	29	V-rCB	40	w-BC	3.00
							w-CB	2.60

	Traffic Flows, pcu/min	AM	Noon	PM	Capacity, pcu/min	AM	Noon	PM
Analysis :	q-B-AC	1.79	3.25	2.78	Q-B-ACD	7.07	5.87	6.64
	q-C-A	14.13	11.01	11.19	Q-A-B	0.00	0.00	0.00
	q-C-B	2.85	3.91	2.61	Q-A-C	8.14	7.51	7.21
	q-A-B	2.85	5.08	5.37	Q-A-D	0.00	0.00	0.00
	q-A-C	7.00	7.53	8.56	Q-D-AB	0.00	0.00	0.00

Ratio-of-flow to Capacity	AM	Noon	PM
B-AC	0.253	0.555	0.419
C-B	0.350	0.521	0.362

Junction: Leighton Road / Hoi Ping Road / Caroline Hill Road
Design Year: 2015 Existing
Cycle Time (C) : 120
Time of the Day: AM Peak Hour

Job no.	J6349
Sheet no.	1
Date	22/1/2015
Calculated by	Checked by

Critical Approach	1 Number of Lanes	2 Design Flow	3 P.C.U. Factor	4 Effective Green (Sec)	5 Effective Red (Sec)=C - 4	6 Average Queue Length (metres) = (2 x 5)/(600x 1 x 3)
Leighton Road WB	2	626	1.2	40	80	35
Caroline Hill Road	2	749	1.1	37	83	46
Leighton Road EB	2	332	1.2	40	80	18
Hoi Ping Road	1	256	1.2	23	97	35

Estimated Delay (sec)	7 Effective Green Ratio λ= 4/C	8 Saturation Flow (P.C.U/hr)	9 Degree of Saturation X=2/(7x8)	10 Average Arrival Rate (vehs./cycles) M=(2xC)/(3600x3)	11 Maximum Queue (vehs) Nm From Table 2.5.2.4 T.P.D.M Vol.4	12 Maximum Queue Length (metres) =(6x11)/1
33	0.3	3911	0.5	17.33	20	60
37	0.3	3828	0.6	22.22	25	75
30	0.3	4020	0.3	8.98	11	33
52	0.2	1915	0.7	7.16	12	72

TRAFFIC SIGNAL QUEUE LENGTH CALCULATION	
Intersaction	

Junction: Leighton Road / Hoi Ping Road / Caroline Hill Road
Design Year: 2015 Existing
Cycle Time (C) : 120
Time of the Day: Noon Peak Hour

Job no.	J6349
Sheet no.	2
Date	22/1/2015
Calculated by	Checked by

Critical Approach	1 Number of Lanes	2 Design Flow	3 P.C.U. Factor	4 Effective Green (Sec)	5 Effective Red (Sec)=C - 4	6 Average Queue Length (metres) = (2 x 5)/(600x 1 x 3)
Leighton Road WB	2	807	1.2	34	86	49
Caroline Hill Road	2	662	1.1	43	77	38
Leighton Road EB	2	349	1.2	34	86	21
Hoi Ping Road	1	287	1.2	24	96	40

Estimated Delay (sec)	7 Effective Green Ratio λ= 4 /C	8 Saturation Flow (P.C.U/hr)	9 Degree of Saturation X=2 /(7 x 8)	10 Average Arrival Rate (vehs./cycles) M=(2 xC)/(3600x 3)	11 Maximum Queue (vehs) Nm From Table 2.5.2.4 T.P.D.M Vol.4	12 Maximum Queue Length (metres) =(6x 11)/ 1
41	0.3	3897	0.7	22.70	26	78
30	0.4	3828	0.5	19.68	21	63
35	0.3	4020	0.3	9.61	12	36
53	0.2	1915	0.7	8.30	14	84

TRAFFIC SIGNAL QUEUE LENGTH CALCULATION	
Intersaction	

Junction: Leighton Road / Hoi Ping Road / Caroline Hill Road
Design Year: 2015 Existing
Cycle Time (C) : 120
Time of the Day: PM Peak Hour

Job no.	J6349
Sheet no.	3
Date	22/1/2015
Calculated by	Checked by

Critical Approach	1 Number of Lanes	2 Design Flow	3 P.C.U. Factor	4 Effective Green (Sec)	5 Effective Red (Sec)=C - 4	6 Average Queue Length (metres) = (2 x 5)/(600x 1 x 3)
Leighton Road WB	2	740	1.1	31	89	49
Caroline Hill Road	2	635	1.1	42	78	38
Leighton Road EB	2	355	1.3	31	89	21
Hoi Ping Road	1	349	1.1	26	94	48

Estimated Delay (sec)	7 Effective Green Ratio λ= 4/C	8 Saturation Flow (P.C.U/hr)	9 Degree of Saturation X=2/(7x8)	10 Average Arrival Rate (vehs./cycles) M=(2xC)/(3600x3)	11 Maximum Queue (vehs) Nm From Table 2.5.2.4 T.P.D.M Vol.4	12 Maximum Queue Length (metres) =(6x11)/1
43	0.3	3883	0.7	21.91	26	78
31	0.4	3828	0.5	19.55	22	66
37	0.3	4020	0.3	9.47	12	36
59	0.2	1915	0.8	10.34	19	114

TRAFFIC SIGNAL QUEUE LENGTH CALCULATION	
Intersaction	

Junction: Leighton Road / Hoi Ping Road / Caroline Hill Road
Design Year: 2021 Without Proposed Development
Cycle Time (C) : 120
Time of the Day: AM Peak Hour

Job no.	J6349
Sheet no.	4
Date	22/1/2015
Calculated by	Checked by

Critical Approach	1 Number of Lanes	2 Design Flow	3 P.C.U. Factor	4 Effective Green (Sec)	5 Effective Red (Sec)=C - 4	6 Average Queue Length (metres) = (2 x 5)/(600x 1 x 3)
Leighton Road WB	2	678	1.2	40	80	38
Caroline Hill Road	2	812	1.1	37	83	50
Leighton Road EB	2	360	1.2	40	80	20
Hoi Ping Road	1	278	1.2	23	97	38

Estimated Delay (sec)	7 Effective Green Ratio λ= 4 /C	8 Saturation Flow (P.C.U/hr)	9 Degree of Saturation X= 2 /(7 x 8)	10 Average Arrival Rate (vehs./cycles) M=(2 xC)/(3600x 3)	11 Maximum Queue (vehs) Nm From Table 2.5.2.4 T.P.D.M Vol.4	12 Maximum Queue Length (metres) =(6x 11)/ 1
33	0.3	3911	0.5	18.77	21	63
38	0.3	3828	0.7	24.09	26	78
30	0.3	4020	0.3	9.74	12	36
56	0.2	1915	0.8	7.78	14	84

TRAFFIC SIGNAL QUEUE LENGTH CALCULATION	
Intersaction	

Junction: Leighton Road / Hoi Ping Road / Caroline Hill Road
Design Year: 2021 Without Proposed Development
Cycle Time (C) : 120
Time of the Day: Noon Peak Hour

Job no.	J6349
Sheet no.	5
Date	22/1/2015
Calculated by	Checked by

Critical Approach	1 Number of Lanes	2 Design Flow	3 P.C.U. Factor	4 Effective Green (Sec)	5 Effective Red (Sec)=C - 4	6 Average Queue Length (metres) = (2 x 5)/(600x 1 x 3)
Leighton Road WB	2	876	1.2	34	86	53
Caroline Hill Road	2	717	1.1	43	77	41
Leighton Road EB	2	378	1.2	34	86	22
Hoi Ping Road	1	312	1.2	24	96	43

Estimated Delay (sec)	7 Effective Green Ratio λ= 4/C	8 Saturation Flow (P.C.U/hr)	9 Degree of Saturation X=2/(7x8)	10 Average Arrival Rate (vehs./cycles) M=(2xC)/(3600x3)	11 Maximum Queue (vehs) Nm From Table 2.5.2.4 T.P.D.M Vol.4	12 Maximum Queue Length (metres) =(6x11)/1
44	0.3	3897	0.8	24.65	28	84
31	0.4	3828	0.5	21.32	23	69
35	0.3	4020	0.3	10.41	13	39
60	0.2	1915	0.8	9.02	17	102

TRAFFIC SIGNAL QUEUE LENGTH CALCULATION	
Intersaction	

Junction: Leighton Road / Hoi Ping Road / Caroline Hill Road
Design Year: 2021 Without Proposed Development
Cycle Time (C) : 120
Time of the Day: PM Peak Hour

Job no.	J6349
Sheet no.	6
Date	22/1/2015
Calculated by	Checked by

Critical Approach	1 Number of Lanes	2 Design Flow	3 P.C.U. Factor	4 Effective Green (Sec)	5 Effective Red (Sec)=C - 4	6 Average Queue Length (metres) = (2 x 5)/(600x 1 x 3)
Leighton Road WB	2	803	1.1	31	89	53
Caroline Hill Road	2	689	1.1	42	78	41
Leighton Road EB	2	385	1.3	31	89	23
Hoi Ping Road	1	378	1.1	26	94	52

Estimated Delay (sec)	7 Effective Green Ratio λ= 4 /C	8 Saturation Flow (P.C.U/hr)	9 Degree of Saturation X= 2 /(7 x 8)	10 Average Arrival Rate (vehs./cycles) M=(2 xC)/(3600x 3)	11 Maximum Queue (vehs) Nm From Table 2.5.2.4 T.P.D.M Vol.4	12 Maximum Queue Length (metres) =(6x 11)/ 1
45	0.3	3883	0.8	23.77	28	84
32	0.4	3828	0.5	21.21	23	69
37	0.3	4020	0.4	10.27	14	42
76	0.2	1915	0.9	11.20	23	138

TRAFFIC SIGNAL QUEUE LENGTH CALCULATION	
Intersaction	

Junction: Leighton Road / Hoi Ping Road / Caroline Hill Road
Design Year: 2021 With Proposed Development
Cycle Time (C) : 120
Time of the Day: AM Peak Hour

Job no.	J6349
Sheet no.	7
Date	22/1/2015
Calculated by	Checked by

Critical Approach	1 Number of Lanes	2 Design Flow	3 P.C.U. Factor	4 Effective Green (Sec)	5 Effective Red (Sec)=C - 4	6 Average Queue Length (metres) = (2 x 5)/(600x 1 x 3)
Leighton Road WB	2	683	1.2	40	80	38
Caroline Hill Road	2	823	1.1	37	83	51
Leighton Road EB	2	360	1.2	40	80	20
Hoi Ping Road	1	283	1.2	23	97	38

Estimated Delay (sec)	7 Effective Green Ratio λ= 4 /C	8 Saturation Flow (P.C.U/hr)	9 Degree of Saturation X= 2 / 7 x 8)	10 Average Arrival Rate (vehs./cycles) M=(2 xC)/(3600x 3)	11 Maximum Queue (vehs) Nm From Table 2.5.2.4 T.P.D.M Vol.4	12 Maximum Queue Length (metres) =(6x 11)/ 1
33	0.3	3910	0.5	18.90	22	66
38	0.3	3828	0.7	24.42	26	78
30	0.3	4020	0.3	9.74	12	36
57	0.2	1915	0.8	7.92	15	90

TRAFFIC SIGNAL QUEUE LENGTH CALCULATION	
Intersaction	

Junction: Leighton Road / Hoi Ping Road / Caroline Hill Road
Design Year: 2021 With Proposed Development
Cycle Time (C) : 120
Time of the Day: Noon Peak Hour

Job no.	J6349
Sheet no.	8
Date	22/1/2015
Calculated by	Checked by

Critical Approach	1 Number of Lanes	2 Design Flow	3 P.C.U. Factor	4 Effective Green (Sec)	5 Effective Red (Sec)=C - 4	6 Average Queue Length (metres) = (2 x 5)/(600x 1 x 3)
Leighton Road WB	2	881	1.2	34	86	54
Caroline Hill Road	2	729	1.1	43	77	42
Leighton Road EB	2	378	1.2	34	86	22
Hoi Ping Road	1	317	1.2	24	96	44

Estimated Delay (sec)	7 Effective Green Ratio λ= 4 /C	8 Saturation Flow (P.C.U/hr)	9 Degree of Saturation X= 2 /(7 x 8)	10 Average Arrival Rate (vehs./cycles) M=(2 xC)/(3600x 3)	11 Maximum Queue (vehs) Nm From Table 2.5.2.4 T.P.D.M Vol.4	12 Maximum Queue Length (metres) =(6x 11)/ 1
44	0.3	3896	0.8	24.79	28	84
31	0.4	3828	0.5	21.67	23	69
35	0.3	4020	0.3	10.41	13	39
61	0.2	1915	0.8	9.16	18	108

TRAFFIC SIGNAL QUEUE LENGTH CALCULATION	
Intersaction	

Junction: Leighton Road / Hoi Ping Road / Caroline Hill Road
Design Year: 2021 With Proposed Development
Cycle Time (C) : 120
Time of the Day: PM Peak Hour

Job no.	J6349
Sheet no.	9
Date	22/1/2015
Calculated by	Checked by

Critical Approach	1 Number of Lanes	2 Design Flow	3 P.C.U. Factor	4 Effective Green (Sec)	5 Effective Red (Sec)=C - 4	6 Average Queue Length (metres) = (2 x 5)/(600x 1 x 3)
Leighton Road WB	2	804	1.1	31	89	53
Caroline Hill Road	2	696	1.1	42	78	42
Leighton Road EB	2	385	1.3	31	89	23
Hoi Ping Road	1	379	1.1	26	94	53

Estimated Delay (sec)	7 Effective Green Ratio λ= 4/C	8 Saturation Flow (P.C.U/hr)	9 Degree of Saturation X= 2/(7 x 8)	10 Average Arrival Rate (vehs./cycles) M=(2 xC)/(3600x 3)	11 Maximum Queue (vehs) Nm From Table 2.5.2.4 T.P.D.M Vol.4	12 Maximum Queue Length (metres) =(6x 11)/1
45	0.3	3883	0.8	23.80	28	84
32	0.4	3828	0.5	21.42	23	69
37	0.3	4020	0.4	10.27	14	42
77	0.2	1915	0.9	11.23	23	138

TRAFFIC SIGNAL QUEUE LENGTH CALCULATION	
Intersaction	

Junction:	Broadwood Road / Link Road
Design Year:	2015 Existing
Cycle Time (C) :	140
Time of the Day:	AM Peak Hour

Job no.	J6349
Sheet no.	10
Date	22/1/2015
Calculated by	Checked by

Critical Approach	1 Number of Lanes	2 Design Flow	3 P.C.U. Factor	4 Effective Green (Sec)	5 Effective Red (Sec)=C - 4	6 Average Queue Length (metres) = (2 x 5)/(600x 1 x 3)
Broadwood Rd WB	1	672	1.1	70	70	72
Broadwood Rd NB RT	1	149	1.1	56	84	20
Broadwood Rd NB ST & LT	1	316	1.1	56	84	39
Link Road SB	1	373	1.2	42	98	52

Estimated Delay (sec)	7 Effective Green Ratio λ= 4 /C	8 Saturation Flow (P.C.U/hr)	9 Degree of Saturation X= 2 /(7 x 8)	10 Average Arrival Rate (vehs./cycles) M=(2 xC)/(3600x 3)	11 Maximum Queue (vehs) Nm From Table 2.5.2.4 T.P.D.M Vol.4	12 Maximum Queue Length (metres) =(6x 11)/ 1
30	0.5	1856	0.7	24.08	20	120
28	0.4	1638	0.2	5.51	8	48
32	0.4	1898	0.4	10.93	13	78
45	0.3	1943	0.6	12.45	16	96

TRAFFIC SIGNAL QUEUE LENGTH CALCULATION	
Intersaction	

Junction:	Broadwood Road / Link Road
Design Year:	2015 Existing
Cycle Time (C) :	110
Time of the Day:	Noon Peak Hour

Job no.	J6349
Sheet no.	11
Date	22/1/2015
Calculated by	Checked by

Critical Approach	1 Number of Lanes	2 Design Flow	3 P.C.U. Factor	4 Effective Green (Sec)	5 Effective Red (Sec)=C - 4	6 Average Queue Length (metres) = (2 x 5)/(600x 1 x 3)
Broadwood Rd WB	1	456	1.1	42	68	47
Broadwood Rd NB RT	1	213	1.1	54	56	18
Broadwood Rd NB ST & LT	1	346	1.1	54	56	29
Link Road SB	1	404	1.1	37	73	43

Estimated Delay (sec)	7 Effective Green Ratio λ= 4 /C	8 Saturation Flow (P.C.U/hr)	9 Degree of Saturation X= 2 /(7 x 8)	10 Average Arrival Rate (vehs./cycles) M=(2 xC)/(3600x 3)	11 Maximum Queue (vehs) Nm From Table 2.5.2.4 T.P.D.M Vol.4	12 Maximum Queue Length (metres) =(6x 11 / 1
31	0.4	1857	0.6	12.56	15	90
17	0.5	1638	0.3	5.85	7	42
19	0.5	1899	0.4	9.49	11	66
33	0.3	1944	0.6	10.89	14	84

TRAFFIC SIGNAL QUEUE LENGTH CALCULATION	
Intersaction	

Junction: Broadwood Road / Link Road
Design Year: 2015 Existing
Cycle Time (C) : 135
Time of the Day: PM Peak Hour

Job no.	J6349
Sheet no.	12
Date	22/1/2015
Calculated by	Checked by

Critical Approach	1 Number of Lanes	2 Design Flow	3 P.C.U. Factor	4 Effective Green (Sec)	5 Effective Red (Sec)=C - 4	6 Average Queue Length (metres) = (2 x 5)/(600x 1 x 3)
Broadwood Rd WB	1	435	1.1	54	81	55
Broadwood Rd NB RT	1	256	1.0	67	68	29
Broadwood Rd NB ST & LT	1	304	1.1	67	68	32
Link Road SB	1	492	1.1	44	91	69

Estimated Delay (sec)	7 Effective Green Ratio λ= 4 /C	8 Saturation Flow (P.C.U/hr)	9 Degree of Saturation X=2 /(7 x 8)	10 Average Arrival Rate (vehs./cycles) M=(2 xC)/(3600x 3)	11 Maximum Queue (vehs) Nm From Table 2.5.2.4 T.P.D.M Vol.4	12 Maximum Queue Length (metres) =(6x 11 / 1
34	0.4	1857	0.6	15.22	17	102
21	0.5	1638	0.3	9.49	11	66
21	0.5	1899	0.3	10.51	11	66
46	0.3	1941	0.8	17.18	21	126

TRAFFIC SIGNAL QUEUE LENGTH CALCULATION	
Intersaction	

Junction:	Broadwood Road / Link Road
Design Year:	2021 Without Proposed Development
Cycle Time (C) :	140
Time of the Day:	AM Peak Hour

Job no.	J6349
Sheet no.	13
Date	22/1/2015
Calculated by	Checked by

Critical Approach	1 Number of Lanes	2 Design Flow	3 P.C.U. Factor	4 Effective Green (Sec)	5 Effective Red (Sec)=C - 4	6 Average Queue Length (metres) = (2 x 5)/ (600x 1 x 3)
Broadwood Rd WB	1	729	1.1	70	70	78
Broadwood Rd NB RT	1	162	1.1	56	84	22
Broadwood Rd NB ST & LT	1	343	1.1	56	84	43
Link Road SB	1	406	1.2	42	98	57

Estimated Delay (sec)	7 Effective Green Ratio λ= 4 /C	8 Saturation Flow (P.C.U/hr)	9 Degree of Saturation X=(2 /(7 x 8))	10 Average Arrival Rate (vehs./cycles) M=(2 xC)/ (3600x 3)	11 Maximum Queue (vehs) Nm From Table 2.5.2.4 T.P.D.M Vol.4	12 Maximum Queue Length (metres) =(6x 11)/ 1
33	0.5	1856	0.8	26.12	23	138
29	0.4	1638	0.2	6.00	8	48
32	0.4	1898	0.5	11.87	14	84
47	0.3	1943	0.7	13.55	17	102

TRAFFIC SIGNAL QUEUE LENGTH CALCULATION	
Intersaction	

Junction:	Broadwood Road / Link Road	Job no.	J6349
Design Year:	2021 Without Proposed Development	Sheet no.	14
Cycle Time (C) :	110	Date	22/1/2015
Time of the Day:	Noon Peak Hour	Calculated by	Checked by

Critical Approach	1 Number of Lanes	2 Design Flow	3 P.C.U. Factor	4 Effective Green (Sec)	5 Effective Red (Sec)=C - 4	6 Average Queue Length (metres) = (2 x 5)/(600x 1 x 3)
Broadwood Rd WB	1	497	1.1	42	68	51
Broadwood Rd NB RT	1	231	1.1	54	56	19
Broadwood Rd NB ST & LT	1	375	1.1	54	56	31
Link Road SB	1	440	1.1	37	73	47

Estimated Delay (sec)	7 Effective Green Ratio λ= 4/C	8 Saturation Flow (P.C.U/hr)	9 Degree of Saturation X= 2/(7 x 8)	10 Average Arrival Rate (vehs./cycles) M=(2 xC)/(3600x 3)	11 Maximum Queue (vehs) Nm From Table 2.5.2.4 T.P.D.M Vol.4	12 Maximum Queue Length (metres) =(6x 11)/ 1
32	0.4	1857	0.7	13.69	16	96
18	0.5	1638	0.3	6.34	8	48
19	0.5	1899	0.4	10.28	11	66
35	0.3	1944	0.7	11.86	15	90

TRAFFIC SIGNAL QUEUE LENGTH CALCULATION	
Intersaction	

Junction: Broadwood Road / Link Road
Design Year: 2021 Without Proposed Development
Cycle Time (C) : 135
Time of the Day: PM Peak Hour

Job no.	J6349
Sheet no.	15
Date	22/1/2015
Calculated by	Checked by

Critical Approach	1 Number of Lanes	2 Design Flow	3 P.C.U. Factor	4 Effective Green (Sec)	5 Effective Red (Sec)=C - 4	6 Average Queue Length (metres) = (2 x 5)/(600x 1 x 3)
Broadwood Rd WB	1	473	1.1	54	81	60
Broadwood Rd NB RT	1	278	1.0	67	68	31
Broadwood Rd NB ST & LT	1	330	1.1	67	68	34
Link Road SB	1	534	1.1	44	91	75

Estimated Delay (sec)	7 Effective Green Ratio λ= 4 /C	8 Saturation Flow (P.C.U/hr)	9 Degree of Saturation X=2 /(7 x 8)	10 Average Arrival Rate (vehs./cycles) M=(2 xC)/(3600x 3)	11 Maximum Queue (vehs) Nm From Table 2.5.2.4 T.P.D.M Vol.4	12 Maximum Queue Length (metres) =(6x 11)/ 1
35	0.4	1858	0.6	16.55	18	108
22	0.5	1638	0.3	10.30	11	66
22	0.5	1899	0.4	11.40	12	72
52	0.3	1941	0.8	18.65	23	138

TRAFFIC SIGNAL QUEUE LENGTH CALCULATION	
Intersaction	

Junction:	Broadwood Road / Link Road	Job no.	J6349
Design Year:	2021 With Proposed Development	Sheet no.	16
Cycle Time (C) :	140	Date	22/1/2015
Time of the Day:	AM Peak Hour	Calculated by	Checked by

Critical Approach	1 Number of Lanes	2 Design Flow	3 P.C.U. Factor	4 Effective Green (Sec)	5 Effective Red (Sec)=C - 4	6 Average Queue Length (metres) = (2 x 5)/(600x 1 x 3)
Broadwood Rd WB	1	731	1.1	70	70	79
Broadwood Rd NB RT	1	162	1.1	56	84	22
Broadwood Rd NB ST & LT	1	346	1.1	56	84	43
Link Road SB	1	409	1.2	42	98	57

Estimated Delay (sec)	7 Effective Green Ratio λ= 4 /C	8 Saturation Flow (P.C.U/hr)	9 Degree of Saturation X= 2 /(7 x 8)	10 Average Arrival Rate (vehs./cycles) M=(2 xC)/(3600x 3)	11 Maximum Queue (vehs) Nm From Table 2.5.2.4 T.P.D.M Vol.4	12 Maximum Queue Length (metres) =(6x 11 / 1
33	0.5	1856	0.8	26.19	23	138
29	0.4	1638	0.2	6.00	8	48
32	0.4	1898	0.5	11.97	14	84
47	0.3	1943	0.7	13.65	17	102

TRAFFIC SIGNAL QUEUE LENGTH CALCULATION	
Intersaction	

Junction:	Broadwood Road / Link Road
Design Year:	2021 With Proposed Development
Cycle Time (C) :	110
Time of the Day:	Noon Peak Hour

Job no.	J6349
Sheet no.	17
Date	22/1/2015
Calculated by	Checked by

Critical Approach	1 Number of Lanes	2 Design Flow	3 P.C.U. Factor	4 Effective Green (Sec)	5 Effective Red (Sec)=C - 4	6 Average Queue Length (metres) = (2 x 5)/ (600x 1 x 3)
Broadwood Rd WB	1	499	1.1	42	68	51
Broadwood Rd NB RT	1	231	1.1	54	56	19
Broadwood Rd NB ST & LT	1	376	1.1	54	56	31
Link Road SB	1	440	1.1	37	73	47

Estimated Delay (sec)	7 Effective Green Ratio λ= 4 /C	8 Saturation Flow (P.C.U/hr)	9 Degree of Saturation X=2 /(7 x 8)	10 Average Arrival Rate (vehs./cycles) M=(2 xC)/ (3600x 3)	11 Maximum Queue (vehs) Nm From Table 2.5.2.4 T.P.D.M Vol.4	12 Maximum Queue Length (metres) =(6x 11)/ 1
32	0.4	1857	0.7	13.74	16	96
18	0.5	1638	0.3	6.34	8	48
19	0.5	1899	0.4	10.31	11	66
35	0.3	1944	0.7	11.86	15	90

TRAFFIC SIGNAL QUEUE LENGTH CALCULATION	
Intersaction	

Junction:	Broadwood Road / Link Road
Design Year:	2021 With Proposed Development
Cycle Time (C) :	135
Time of the Day:	PM Peak Hour

Job no.	J6349
Sheet no.	18
Date	22/1/2015
Calculated by	Checked by

Critical Approach	1 Number of Lanes	2 Design Flow	3 P.C.U. Factor	4 Effective Green (Sec)	5 Effective Red (Sec)=C - 4	6 Average Queue Length (metres) = (2 x 5)/ (600x 1 x 3)
Broadwood Rd WB	1	475	1.1	54	81	60
Broadwood Rd NB RT	1	278	1.0	67	68	31
Broadwood Rd NB ST & LT	1	332	1.1	67	68	35
Link Road SB	1	534	1.1	44	91	75

Estimated Delay (sec)	7 Effective Green Ratio λ= 4/C	8 Saturation Flow (P.C.U/hr)	9 Degree of Saturation X=2/(7x8)	10 Average Arrival Rate (vehs./cycles) M=(2xC)/(3600x3)	11 Maximum Queue (vehs) Nm From Table 2.5.2.4 T.P.D.M Vol.4	12 Maximum Queue Length (metres) =(6x11)/1
35	0.4	1858	0.6	16.62	18	108
22	0.5	1638	0.3	10.30	11	66
22	0.5	1899	0.4	11.47	12	72
52	0.3	1941	0.8	18.65	23	138

TRAFFIC SIGNAL QUEUE LENGTH CALCULATION	
Intersaction	

APPENDIX VII

SEWERAGE IMPACT ASSESSMENT

PO LEUNG KUK

The Redevelopment of East Wing of Po Leung Kuk at 66 Leighton Road, Hong Kong

Sewerage Impact Assessment
May 2015

Approved By	KS Lee (Principal Environmental Consultant)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.
CINOTECH accepts no responsibility for changes made to this report by third parties

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1 INTRODUCTION

1.1 Background

1.1.1 The East Wing of Po Leung Kuk will undergo redevelopment in order to cope with the increasing demand for the services. Cinotech Consultants Limited was appointed by Po Leung Kuk (the Client) to prepare the Sewerage Impact Assessment report to address the potential sewage impact due to the increase in population during the operational phase of the redevelopment.

1.1.2 The location for the Redevelopment is currently occupied by several buildings. These existing buildings will be demolished for redevelopment.

Figure 1.1 Project Layout

1.2 Purpose of this Sewerage Impact Assessment Study

1.2.1 This Sewerage Impact Assessment Report aims to address all potential sewerage impacts of the Redevelopment. It evaluates the adequacy of the existing sewerage networks and proposes new connections, if necessary, in order to cope with the increase in sewerage flows likely to be contributed by the Redevelopment.

2 SEWERAGE IMPACT ASSESSMENT

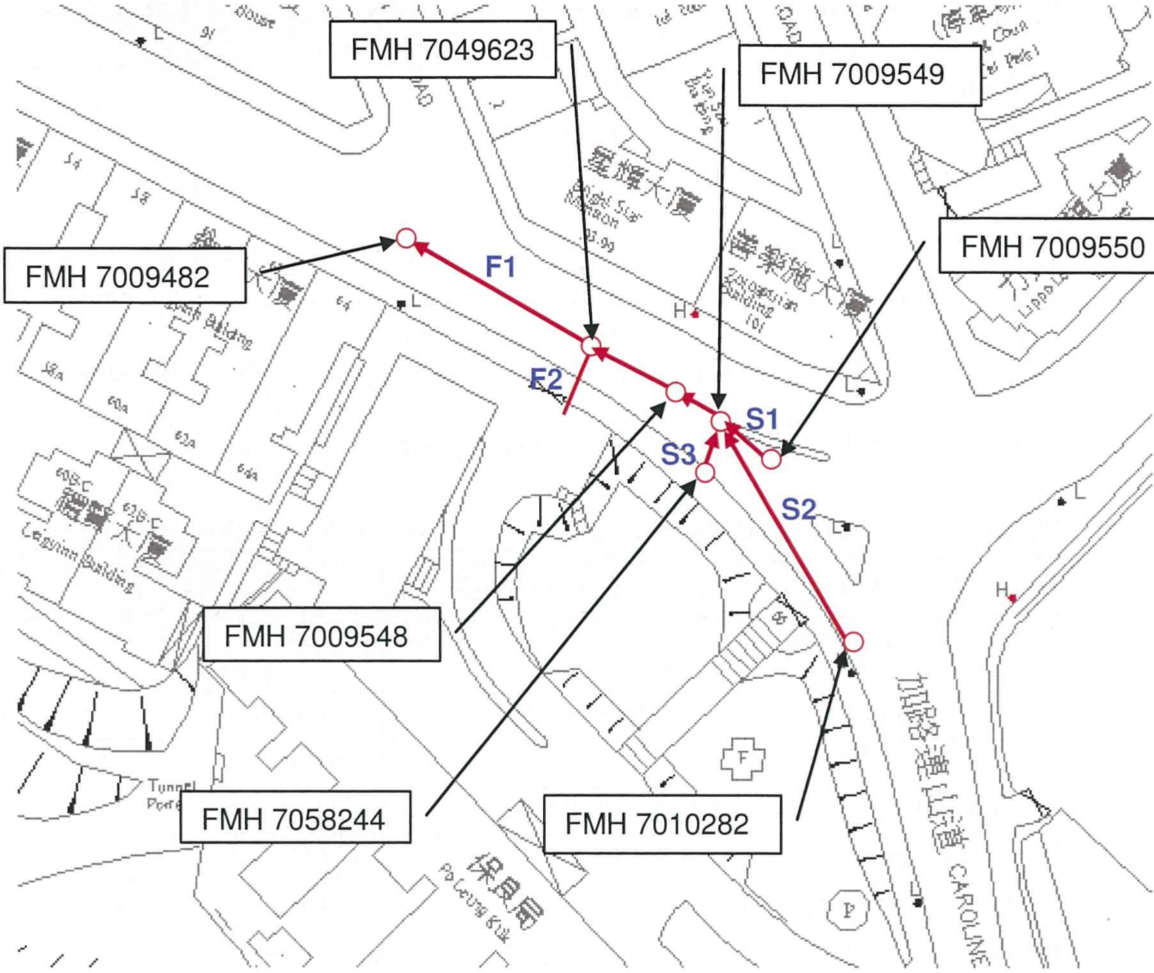
2.1 Water Quality Assessment Criteria

2.1.1 In Hong Kong, the Water Pollution Control Ordinance (CAP 358), 1980 (WPCO) provides for the control of water pollution. Territorial waters have been subdivided into 10 Water Control Zones (WCZ) and four supplementary WCZs, each with a prescribed Water Quality Objectives. The study area lies within the Victoria Harbour (Phase III) WCZ.

2.2 Capacity of Existing Sewerage System

2.2.1 The existing sewerage network was revised based on the latest drainage record sheet (11-SW-15B-1) from Drainage Services Department on 11 November 2014. The sewerage network supporting the Redevelopment site and the other parts of the Po Leung Kuk include a 225mm diameter underground pipe to Leighton Road (Pipe F2). The first segment of pipes (Manhole FMH7049623 to FMH7009482) is 600mm diameter to downstream along Leighton Road (Pipe F1). The location plan is presented in Figure 2.1.

Figure 2.1 Location Plan of the Existing Sewerage System



2.2.2 There are three upstream pipes connecting to the pipe at Leighton Road. They are S1 (from Manhole FMH 7009550 to FMH 7009549), S2 (from Manhole FMH 7010282 to FMH 7009549) and S3 (from Manhole FMH 7058244 to FMH 7009549),

2.2.3 By using Colebrook White equations for pipe capacities estimation, the capacity of the pipe F1 is 0.729 m^3/s assuming the viscosity and roughness are 1.14E-06 m^2/s and 3mm respectively. The total capacities of the upstream pipe (S1, S2, S3) is 0.373 m^3/s (32263 m^3/day). The detailed calculations are presented in Appendix A.

2.2.4 Based on the information provided by the Client, there is an increment in the end users (including East Wing and the other parts of Po Leung Kuk) after redevelopment of East Wing. Similar with existing situation, the types of end users are divided into two groups by their occupying time, namely daytime only and 24 hours. The existing and planned population after redevelopment for the whole building are presented in Table 2.1.

Table 2-1 Existing and Estimated Number of End Users

Type of End Users	Existing Population	Estimated Population after redevelopment
12 hours a day	243	287
24 hours a day	912	1303
Total	1155	1590

2.2.5 According to EPD's *Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning*, the unit flow factors for commercial activities J10 (Restaurant and Hotel) was adopted in estimation of sewage generate from both the employees and low cost rental activities. The global peaking factor including storm water is 6 for the population between 1000 and 5000. The percentages of the contribution of the total pipe capacity (F1) are presented in Table 2.2.

Table 2-2 Contribution and their Percentages of the Total Pipe Capacity

Item	Values	
	Pipe F1	Pipe F2
Maximum Capacity of the Pipe	63005 m^3/day	10183 m^3/day
Total Contribution of Existing Population	2304 m^3/day	2304 m^3/day
Percentage of Existing Contribution	3.66 %	22.62 %
Total Contribution of Estimated Population	2721 m^3/day	2721 m^3/day
Percentage of Estimated Contribution	4.32 %	26.72 %
Net Increment in Percentage	0.66%	4.1%
Maximum Capacity of the Upstream Pipes	32263 m^3/day	--
Maximum Percentage of Flow of Pipe F1	55.5%	--

2.3 Impact Evaluation

2.3.1 Since the increment of the total number of end users is less than 500 per day, the contribution from the population of proposed redevelopment to the total capacity of the existing sewerage network is only about 4.32%, based on the existing sizes and locations of the sewerage pipe Manhole FSH7049623 to FSH7009482. The net increment of the sewage capacity due to the redevelopment is 0.66% and 4.1% for pipe F1 and pipe F2 respectively. The maximum percentage of flow of Pipe F1 including the capacities of the upstream pipes is 55.5%. Therefore, the potential sewage impact due to the proposed redevelopment should be minimal. No updating of the existing sewage network nor sewage pumping station is required.

3 CONCLUSION

3.1.1 The East Wing of Po Leung Kuk is proposed to be redeveloped in order to cope with the increasing demand for the services. Population in the Po Leung Kuk shall be increased from 1,155 to 1,590.

3.1.2 Since the increment of the total number of end users is 435 per day only, the net increment of the sewage capacity due to the redevelopment is 0.66% and 4.1%. Therefore, the potential sewage impact due to the proposed redevelopment should be minimal. No updating of the existing sewage network or sewage pumping station is required.

APPENDIX A
DETAIL CALCULATION OF SEWERAGE IMPACT ASSESSMENT

Existing Pipes / Box Culvert

Segment	Upstream NO.	Downstream NO.	pipe dia.(mm)	pipe length (m)	Upstream invert level(mP.D.)*	Downstream invert level(mP.D.)	Area(m^2)	slope	Wetted Perimeter (m)	Hydraulic radius(m)	Viscosity (m^2/s)	Roughness	Velocity(m/s)	Capcity(m^3/s)
F1	FMH7049623	FMH7009482	600	25	5.19	4.76	0.2827	0.0172	1.8850	0.1500	0.00000114	3	2.5791	0.7292
F2	--	FMH7049623	225	8.5	6.1	5.39	0.0398	0.0835	0.7069	0.0563	0.00000114	3	2.9642	0.1179
S1	FMH7009550	FMH7009549	150	7.5	6.39	5.61	0.0177	0.1040	0.4712	0.0375	0.00000114	3	2.5055	0.0443
S2	FMH7010282	FMH7009549	300	26.5	6.68	5.61	0.0707	0.0404	0.9425	0.0750	0.00000114	3	2.5010	0.1768
S3	FMH7058244	FMH7009549	300	5	5.76	5.61	0.0707	0.0300	0.9425	0.0750	0.00000114	3	2.1553	0.1524

*The ground level of F2 is 7.1 mPD. The upstream invert level of F2 is assumed to be 6.1 mPD.

Pipe	F1		F2	
Maximum Capacity	0.7292	m^3/s	0.1179	m^3/s
	63005	m^3/day	10183	m^3/day
Unit Flow Factors for J10	1.58	m^3/day/employee	1.58	m^3/day/employee
Existing Population for Employed Population	243	employee	243	employee
Peaking Factor excluding Stormwater Allowance	6		6	
Total Contribution of Existing Population	2304	m^3/day	2304	m^3/day
Percentage of Contribution of Total Pipe Capacity	3.66%		22.62%	
Future Population for Employed Population	287	employee	287	employee
Peaking Factor excluding Stormwater Allowance	6		6	
Total Contribution of Future Population	2721	m^3/day	2721	m^3/day
Percentage of Contribution of Total Pipe Capacity	4.32%		26.72%	
Maximum Capacity of Upstream (S1+S2+S3)	0.3734	m^3/s		
	32263	m^3/day		
Total Percentage of Contribution	55.5%			
(Including project impact and the upstream sewers S1, S2 and S3)				

APPENDIX VIII

AIR VENTILATION ASSESSMENT - EXPERT EVALUATION

Air Ventilation Assessment for Proposed Redevelopment of the East Wing of Po Leung Kuk Headquarters

Prepared for:

AD+RG Architecture Design and Research Group Ltd

Prepared by:
ENVIRON Hong Kong Limited

Date:
Aug 2015

Project Number:
PACPLKRDAI00

Reference:
R2648_V3.4

ENVIRON

Air Ventilation Assessment for Proposed Redevelopment of the East Wing of Po Leung Kuk Headquarters

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1.0 Introduction

In view of the growing demand for community and social welfare services, Po Leung Kuk (PLK) intends to redevelop the East Wing of its Headquarters at Leighton Road and to expand their services to different sectors of the community. Currently, the East Wing of PLK Headquarters provides education, residential care and day care services for children, other ancillary facilities including administration office for the Headquarters.

The redevelopment proposal is to demolish the East Wing of PLK Headquarters and to construct a medium rise building with stepping height levels ranging from about 42mPD to 80mPD to respect the height profile of the surroundings.

ENVIRON Hong Kong Limited has been commissioned by the project proponent, Po Leung Kuk, to conduct this air ventilation assessment. The details of the development scheme have been provided by AD+RG Architecture Design and Research Group Ltd (the project architect).

1.1 Objectives

In this study, the air ventilation performance with respect to the proposed redevelopment has been evaluated qualitatively with due consideration of site wind availability, topography and building morphology. The proposed redevelopment site is located at the north-eastern fringe of the Wong Nai Chung Area, therefore, the Expert Evaluation on Wong Nai Chung Area (herewith named as EE for WNC) prepared for Planning Department will be referenced. Further, the redevelopment site is also closed to the northwest region of the Causeway Bay area, Expert Evaluation on Causeway Bay (herewith named as EE for CB) Area is also referenced. The Experimental Site Wind Availability Study for Causeway Bay, Hong Kong prepared by The Chinese University of Hong Kong for the Planning Departments is also referred (herewith named as ESWAS for CB).

1.2 Redevelopment Site and its Environs

PLK Headquarters is located at 66 Leighton Road, Causeway Bay, Hong Kong (**Figure 1**). It comprises of the PLK Main Building, Extension Wing of Main Building, HKU SPACE Po Leung Kuk Stanley Ho Community College TY Wong Building, Po Leung Kuk Vicwood K. T. Chong Building, Po Leung Kuk Kwok Law Kwai Chun Children Services Building and Vocational Training Centre.

PLK Headquarters is located amid a mixed residential, commercial and "G/IC" uses in the centre of Causeway Bay. Residential developments such as Bright Star Mansion, Silverwood and The Leighton Hill are located to the north, southeast and west of PLK Headquarters respectively. Sports and recreation club, such as Post Office Recreation Club and South China Athletic Association are located to the east, and commercial developments such as Lippo Leighton Tower are found to the northeast of PLK Headquarters.

The redevelopment site is located southeast of PLK Main Building, known as the East Wing (**Figure 1**) within the PLK Headquarters. This includes the Extension Wing of Main Building, Po Leung Kuk Kwok Law Kwai Chun Children Services Building (27.8 mPD), Po Leung Kuk Vicwood K. T. Chong Building, and Vocational Training Centre (~ 62 mPD) and the adjoining basketball court.

As shown in **Figure 1**, the redevelopment site is elongated with small site area (about 0.38 ha) and is located along the Link Road which travel from north to south.

1.3 Proposed Schemes

The master layout plan of the proposed redevelopment scheme and sections are shown in **Figure 2**. The proposed redevelopment scheme is a linear block aligning from north-northwest to south-south-east with some stepping designs at both ends.

As mentioned in section 1.1, stepping profile has been incorporated in the proposed redevelopment scheme in respecting to the existing topography profile and the existing building in the vicinity. As the PLK Main Building which is currently a Grade 2 historic building and the surrounding environment is located at the north of the redevelopment site, the proposed redevelopment will have lowered building heights (descending from 80mPD to ~42mPD) towards the Main Building. Terraced and landscaped roof gardens are proposed at different levels to integrate more coherently with scale and the character of the Main Building which is a low-rise development. The building separation between the proposed redevelopment scheme and the PLK Main Building is about 10m wide.

At the southern portion of the proposed redevelopment scheme, there is also a stepping design from 80 mPD sloping down to 65 mPD to the southern end with a roof garden at ~ 45 mPD at the middle portion. The building separation between the proposed redevelopment scheme and the built Gold & Silver Exchange School to the south is about 25m.

Figure 3 shows a section of the proposed redevelopment scheme and **Figure 4** shows the mPD level of different portions of the proposed redevelopment scheme.

Figure 5 shows an overlay of the proposed redevelopment scheme and the existing buildings.

2.0 Site Wind Availability

2.1 Site Wind Availability Data

According to the simulated annual windrose extracted from EE for WNC, the local area is dominated by winds from the north-east sector annually. Concurring to the wind pattern monitored at Waglan Island, the wind rose for this area indicates that winds from the north-east sector (NNE to E) are dominant (**Figure 6**). Wind from north-east quadrant accounts for about 53% of all winds that occur at the Wong Nai Chung Area where the redevelopment site located. Remaining wind mainly comes from the south-east and south-west quadrants which account for about 38% of all wind events. Remaining wind comes from the north-west quadrants. The three wind directions with highest frequency of occurrences include ENE, NE, and E. According to the EE for WNC, the winds in summer period are mainly coming from South-western to Eastern directions; while the winds in non-summer period is from North-eastern wind and Eastern wind, similar to the annual wind frequency.

As the redevelopment site is also close to the northwest region of Causeway Bay area, the wind pattern at Causeway Bay area is also reviewed. Wind rose at Causeway Bay area extracted from EE for CB is shown in **Figure 7**. From the wind rose, the annual prevailing wind directions for Causeway Bay are north-easterlies (NE), northerlies (N) and easterlies (E). The summer prevailing winds are: easterlies (E), south, south-south westerlies (SSW), and south-westerlies (SW).

A more recent study for the Causeway Bay with wind tunnels was prepared by the Chinese University of Hong Kong for the Planning Department. The study area of ESWAS for CB covers the area where the proposed redevelopment scheme located. Therefore, a more site specific wind flow directions can be referred. As the building height of proposed redevelopment scheme is ranging from ~ 42 mPD to ~ 80 mPD, the wind rose corrected to 50m is referred. The wind rose at 500m is also reviewed. **Figure 8** and **9** shows the wind rose extracted from the ESWAS for CB.

As the wind rose extracted from ESWAS for CB is more site-specific, this assessment will refer to this lasted study. The percentage of the wind from different directions during annual conditions and summer conditions based on the ESWAS for CB corrected to 50m is summarized in the following table. The information below shows that the dominated wind flow during annual conditions are mainly from ESE, NNE, NE and N. The dominated wind flow during summer conditions are mainly from SW and ESE.

Table 1 Experimental Site Wind Availability Data for the Study Area (at 50m above ground)

Wind Angle	Directions	Total (Annual)	Total (Summer)
0 or 360	North	**12.25%**	2.50%
22.5	North North East	**16.50%**	4.50%
45	North East	**14.75%**	4.50%
67.5	East North East	0.00%	0.00%
90	East	0.00%	0.00%
112.5	East South East	**29.00%**	**21.50%**
135	South East	3.50%	7.00%
157.5	South South East	4.50%	10.00%
180	South	3.00%	6.50%

202.5	South South West	3.00%	8.00%
225	South West	8.00%	**24.00%**
247.5	West South West	0.00%	0.00%
270	West	2.75%	6.50%
292.5	West North West	0.50%	2.00%
315	North West	0.25%	1.50%
337.5	North North West	2.00%	1.50%

The percentage of the wind from different directions during annual conditions and summer conditions based on the ESWAS for CB at 500m is also summarized in the following table. The information below shows that the dominated wind flow of the area during annual conditions are mainly from E, ENE and N. The dominated wind flow during summer conditions are mainly from SW, E and S.

Table 2 Experimental Site Wind Availability Data for the Study Area (at 500m above ground)

Wind Angle	Directions	Annual	Summer
0	North	**12.5%**	2.5%
22.5	North North East	8.0%	2.0%
45	North East	8.5%	2.5%
67.5	East North East	**14.5%**	4.5%
90	East	**24.0%**	**14.0%**
112.5	East South East	5.0%	8.0%
135	South East	3.5%	6.5%
157.5	South South East	3.0%	6.5%
180	South	4.0%	**10.5%**
202.5	South South West	3.0%	8.5%
225	South West	5.0%	**14.5%**
247.5	West South West	3.0%	9.5%
270	West	2.5%	6.5%
292.5	West North West	1.0%	2.0%
315	North West	1.0%	1.0%
337.5	North North West	1.5%	1.0%

To summarize, the annual prevailing wind of the area is identified to from N, NE, NNE, E and ESE direction while the summer prevailing wind is from E, S, ESE and SW directions.

2.2 Building Morphology and Topography

2.2.1 Northeastern Portion of the Wong Nai Chung Area

The redevelopment site is located at the north-eastern fringe of the Wong Nai Chung Area, at the middle portion of Link Road. Existing high-rise residential developments are located immediate southwest of the redevelopment site (The Leighton Hill) and located further south of the redevelopment site (Beverly Hill). Medium-rise residential developments (Silverwood, Caroline Height, Jade Terrace and Garoline Garden) can be found east of the redevelopment site, opposite of the Link Road. Low rise development (such as EMSD Workshop and South China Athletic Association Stadium) is located further east of the redevelopment site. The existing low rise PLK main building and Gold & Silver Exchange School are located north and south of the redevelopment site. **Figure 10** shows the building height of the existing neighboring developments. The height of the neighbouring building is tabulated as follows:

Table 3 Existing Building Height of Neighbouring Development at Wong Nai Chung Area

Name of Building	mPD level of Building Roof	Location from Redevelopment site
The Leighton Hill	~ 159.7 to ~ 170.7 mPD	Southwest
Beverly Hill	~ 168 to ~ 188 mPD	South
Silverwood	~ 107.8 Mpd	East
Caroline Height	~ 88 mPD	East
Jade Terrace	~ 99.1 mPD	East
Caroline Garden	~ 110.8 mPD	East
PLK Main Building	~ 23.7 mPD	North
Gold & Silver Exchange School	~ 41.6 mPD	South
EMSD Workshop	~ 39.9 mPD	Northeast
South China Athletic Association Stadium	~ 32.8 mPD	East
Post Office Recreation Club	~ 19.1 mPD	Northeast

2.2.2 Northwest Region of Causeway Bay Area

Apart from the Wong Nai Chung, the redevelopment site is also close to the western region of the Causeway Bay area. The majority landuse in the western region of the Causeway Bay area are commercial and residential (C/R) developments sitting on a flat terrain from 3.7 mPD to 8.5 mPD. High-rise commercial developments (such as Lippo Leighton Tower and Zoroastrian Building) are sitting along the opposite side of the Leighton Road, further north of the redevelopment site. A medium-rise development, Bright Star Mansion, is located immediate west of the Zoroastrian Building. There were Sunning Court (building height around 60mPD) and Sunning Plaza (building height around 180mPD) located further north of the Leighton Tower along Hoi Ping Road. It is understood that both Sunning Court and Sunning Plaza will be re-developed and under construction, the future design are uncertain at this moment. However, according to the OZP, the maximum building height is 130mPD, it is anticipated that future development would not be higher than 130mPD. Therefore, the blockage effect would be similar at that area before or after the re-development.

Table 4 Existing Building Height of Neighbouring Development at Causeway Bay Area

Name of Building	mPD level of Building Roof	Location from Redevelopment site
Lippo Leighton Tower	~ 104 mPD	North
Zoroastrian Building	~ 86 mPD	North
Bright Star Mansion	~ 37 mPD	North

As shown in the Figure 10, the redevelopment site is surrounded with high-rise residential developments to its west and east. The Leighton Hill with ~ 160 to 171 mPD is located to the west and the Silverwood (~ 108 mPD), Caroline Height (~ 88 mPD) and Jade Terrace (~99 mPD) are located to the east. The medium rise Gold & Silver Exchange School (~42 mPD) is located to the south; while the low rise PLK Main Building (~ 24 mPD) is located to the north. High rise developments are located north of the Leighton Road, i.e. ~ 86 mPD Zoroastrian Building and ~ 104 mPD Lippo Leighton Tower. The Link Road is running from north to south and it is located to the immediate east of the redevelopment site. The high-rise development Beverly Hill with ~ 168 mPD is located further southeast of the redevelopment site with a number of high-rise developments with ~ 67 to 76 mPD in between.

2.3 Nearby Topography

Wong Nai Chung Area is sitting on the basin of the valley and surrounded by the green belt. The subject site is located to the west of Caroline Hill road and Link Road. The water front is about 1km away to the north of subject site. The ground elevation increase slowly toward south. Jardine's Lookout located about 2km to the southeast of the subject site with hill top of 410mPD. Mount Nicholson located about 2km to the south of the site with hill top of 410mPD.

2.4 Localized Wind Performance

From the wind tunnel data discussed in section 2.1 above, the annual prevailing wind of the area is identified to be from N, NE, NNE, E and ESE directions while the summer prevailing wind is from E, S, ESE and SW directions. However, as mentioned in section 2.3 above, the redevelopment site is surrounded with a number of high-rise developments in surroundings; and these existing developments will affect the wind from reaching the Redevelopment site.

The following sections discuss the localized wind performance of the redevelopment site with consideration of existing built development in the vicinity.

Annual Wind

The annual prevailing wind of the area is identified to be from N, NE, NNE, E and ESE directions.

Under the wind from N, the high rise buildings (Zoroastrian Building and Lippo Leighton Tower) are located further north of the redevelopment site. These existing buildings may reduce the wind speed from north direction to the redevelopment site. However, the local Hoi Ping Road is located between the two high rise buildings; and it connects to the Link Road which is running from north to south and is located to the east of the redevelopment site. The northern wind is likely to flow along the area which has relatively open exposure to wind, i.e. the Hoi Ping Road and Caroline Hill Road to the north and the Link Road to the east and south of the redevelopment site.

As the building to the northeast of the redevelopment site is low rise (PCCW Recreation Club with ~ 19 mPD), the wind from NE will flow across the PCCW Recreation Club and reach the redevelopment site. Since the building height of the existing PLK Vicwood K.T. Chong Building which align from slightly north-northwest to south-southeast at the redevelopment site is ~ 62 mPD which is taller than the Leighton Hill Road behind (from 31.6 mPD to 49.8 mPD). The speed of the wind from NE direction is reduced by the existing building at the redevelopment site. However, as the high rise development, The Leighton Hill (~ 160 to 171 mPD), is located to the southwest of the redevelopment site, it will block the NE wind from flowing to the further downwind area. The downwash effect due to The Leighton Hill may collect the NE wind at higher level and divert the wind to the pedestrian level between the Leighton Hill and the redevelopment site.

Similar to the NE, part of the PCCW recreation club is located at the upwind direction, and the wind from NNE will flow across it and reach the redevelopment site. The existing PLK Vicwood K.T. Chong Building at the redevelopment site will block the wind from reaching the downwind area, such as the Leighton Hill Road. However, the downwash effect due to The Leighton Hill may improve the wind performance of the area between the Leighton Hill and the redevelopment site.

For the wind from east direction, a row of high rise existing buildings (Silverwood, Caroline Height, Caroline Garden and Jade Terrace) are located opposite side of the Link Road and these buildings are at upwind direction. These existing buildings block the eastern wind from reaching the redevelopment site and its downwind area. However, at the northern portion of the redevelopment site adjacent to the PLK Main Building near the junction of the Link Road and Caroline Hill Road, there are no high rise existing buildings at upwind location. The eastern wind may flow across the PLK Main Building.

For the wind from ESE direction, similar to the wind from east direction, the row of the existing high-rise buildings at upwind direction block the ESE wind from reaching the redevelopment site and its downwind area.

Therefore, to sum up, the dominated wind at the redevelopment site area and its surrounding area is from N, NNE, NE and E direction. For the easterly wind, only the northern portion of the redevelopment site where no high rise building at upwind will enjoy the wind.

Summer Wind

The summer prevailing wind of the area is from E, S, ESE and SW directions.

Two of the dominated summer wind directions are from E and ESE directions which are also part of the dominant annual wind directions. The relevant discussion of these wind directions are presented in above.

For the wind from S direction, it is expected that the wind will flow along the Link Road which is aligning from south to north. As shown in Figure 10, high-rise residential developments are located at both sides of the Link Road. To the south of the redevelopment site, there is an existing school development with the building height at ~ 42 mPD. All these existing buildings create a channel effect and the wind will therefore flow the area where has relatively open exposure to wind. Therefore, the southern wind will flow along the Link Road, where has less resistance.

For the wind from SW direction, the much taller existing high-rise development, The Leighton Hill, block the wind and therefore, no wind will reach the redevelopment site.

Therefore, generally speaking, the dominated wind at the redevelopment site and its surrounding area during summer condition are from S and E directions. Similar to the annual wind, only the northern portion of the redevelopment site, where no high rise building at upwind, will enjoy the eastern wind.

3.0 Discussion on Important Pedestrian Areas, Problem Area and Good Design Features

3.1 Important Pedestrian Areas

The proposed building height (H) is approximately 66.5m above ground. Therefore, the concerned area would be the immediate surrounding area only, i.e. the footpath of Link Road, the main building of PLK, the Gold & Silver Exchange School as well as the Leighton Hill. The immediate west of the redevelopment site is slope area and not accessible to public.

3.2 Problem Areas

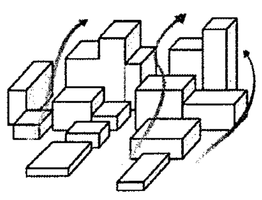
According to the EE on WNC Area, a problem area near the redevelopment site, is identified to be the Beverly Hill and adjacent residential neighbourhood (as indicated in **Figure 11**). However, as the redevelopment site is not located at the upwind area of the problem area under the annual and summer prevailing wind direction, the wind performance at the problem area would not be affected by the future development at the development site.

3.3 Good 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 redevelopment. It must be noted that there is no podium proposed in the proposed redevelopment scheme.

3.3.1 Building Height

Under the OZP, the building height of the surrounding landuse zone is ranging from about 170mPD (R(B) zone) to 30 mPD (G/IC zone). The proposed height of the redevelopment site is ranging from about 42 mPD to 80 mPD with various levels stepping (**Figure 3**). The lowest level 42 mPD is at the northern part of the proposed building where the lowest PLK main building located; and there is a stepping down from 80 mPD to 65 mPD at the southern part with a ~ 45 mPD roof garden at middle. Stepping designs are recommended at both northern and southern end of the proposed redevelopment scheme. As shown in the Table 1, the dominated wind flow during annual conditions are mainly from ESE, NNE, NE and N. The dominated wind flow during summer conditions are mainly from SW, S and ESE. The proposed redevelopment scheme is align slightly from NNW to SSE. Therefore, for dominant wind directions from north (under annual condition) or from south (under summer condition), the stepping would help wind deflection and avoid air stagnation for the wind from northerlies and southerlies; which would help to promote air movements; as recommended in section 11.2.11 of Chapter 11: Urban Design Guidelines of the Hong Kong Planning Standards and Guidelines (HKPSG). Below is the illustration figure extracted from HKPSG.



3.3.2 Building Disposition and Setback

As shown in the MLP, there is a setback of most of the portion of the proposed redevelopment scheme from the Link Road from ~ 9.5 to ~ 13m (**Figure 4**). The setback would enhance the wind flow along the Link Road, i.e. the wind from north and south direction.

There is about 25m building separation between the proposed redevelopment scheme and the Gold & Silver Exchange School (roof level at ~ 42 mPD) to enhance the wind flow from east or northeast directions although there is not much wind from these direction due to the present of high rise existing building at upwind direction. Nevertheless, the width and height ratio of this separation is 25m: 41.6m , i.e. ~ 1 : 2, which is considered to minimize the potential impact.

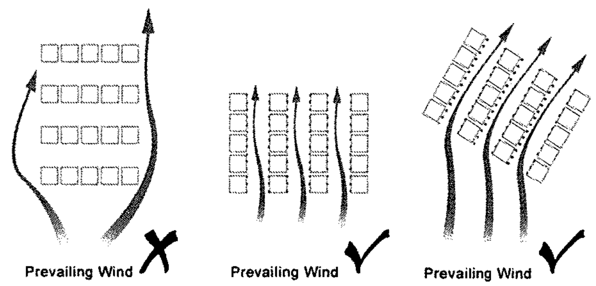
In addition, there is about 10m separation between the proposed development scheme and the main building which is low rise development (roof level at ~ 23.7 mPD). This separation is located at the northern part of the redevelopment site at the junction of the Link Road and Caroline Hill Road where no high –rise buildings is located at upwind from east direction. This will enhance the passage of wind from east direction.

3.3.3 No podium design

There is no podium design at the redevelopment site. In annual conditions when the wind direction from ESE, NNE, NE and N, there may be some downwash wind generated by the proposed stepping design. Since the wind come from abovementioned direction already obstructed by surrounding development, the downwash effect would not be significant.

3.3.4 Building Orientation

Furthermore, the proposed redevelopment aligns from NNW to SSE which is similar to the annual wind from north. When comparing the proposed building design with the existing condition, the building frontage of the proposed design toward north is larger than the existing condition. It is expected some northerly wind will be obstructed due to the proposed development. In order to minimize the blockage effect, the building orientation will be parallel to the prevailing wind direction and enhance the penetration of prevailing wind under annual wind conditions, as recommended in the HKPSG (see the figure below).



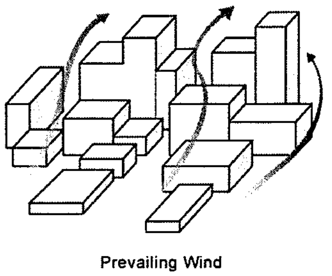
4.0 Expert Evaluation of Air Ventilation Performance of the Proposed Development Scheme

4.1 Assessment Methodology

Section 3.0 describes the good feature in the design of the proposed redevelopment scheme. Section 2.4 describes the wind availability at the redevelopment site; and the dominated wind flow during annual conditions at the redevelopment site and surrounding area are mainly from N, NNE, NE, and E. The dominated wind flow at the redevelopment site and surrounding area during summer conditions are mainly from S and E. The wind from the SW and ESE directions are blocked by the existing high rise built development at upwind; and therefore these winds cannot reach the redevelopment site. For the wind from SW, the Leighton Hill has blocked the wind. Similar to the wind from southwest direction, the high-rise buildings along Link Road such as Silverwood, Caroline Height, Caroline Garden, Jade Terrace, at the upwind direction would block winds from ESE direction across the southern portion of the redevelopment site during both annual and summer condition. The proposed redevelopment scheme will be evaluated against the dominated wind directions identified above.

4.2 Wind from N to NNE direction

The proposed redevelopment scheme is aligning from slightly NNW to SSE. After further taking the stepping designs at both ends, the proposed redevelopment scheme is in some degree parallel to the dominated wind direction from northerly direction, such as from N to NNE. This would help to reduce the blockage of the from these wind directions. These wind can flow along the building to the downwind area. Further, the stepping designs would promote the wind flow across the proposed redevelopment scheme to the downwind area, such as the Gold & Silver Exchange School. As advised by the urban design guidelines, gradation of building heights would help wind deflection and avoid air stagnation. Below is the stepping height illustration diagram extracted from the HKPSG.



In addition, the proposed redevelopment scheme is not encroached into the Link Road which is considered to be the air path of this area under these wind directions. As mentioned in section 2.4, the northern wind and southern wind will flow along the area, where is relatively open exposure to wind, i.e. Link Road. There are about 9.5m to 13m setback from the Link Road such that the width of the air path for wind passing through is increased. Setback from the Link Road (~ 9.5m to ~13m) as well as from the nearby medium rise building (~ 25m from Gold and Silver Exchange School) have been provided to enhance wind flow surrounding the proposed redevelopment scheme, including the pedestrian level, for the dominated wind directions from NNE and N directions. **Figure 4** shows the set-back from the proposed redevelopment scheme to the Link Road and nearby buildings. This setback to the Gold and Silver Exchange School is larger than that of the existing vocational training center which is about 11m (as indicated in **Figure 5**). The wind flow along the Link Road is slightly better in the proposed redevelopment scheme with a wider area for wind flow across. Therefore, in comparing with the existing building, it is considered that the wind performance at the downwind area, i.e. Gold & Silver Exchange School, would not be significantly affected.

The existing tall building (The Leighton Hill Road, ~ 163 to 170.7 mPD) to the west of the redevelopment site and that along the opposite side of the Link Road (such as Silverwood, Caroline Height, Jade Terrace and Caroline Garden, from 88 mPD to 110.8 mPD) are not located at the downwind area under the N to NNE wind directions. The wind performance of these built developments would not be affected after the redevelopment.

As the existing PLK Main Building is located at the upwind of the proposed redevelopment scheme under the wind from N and NNE directions, its wind performance will not be affected by the proposed redevelopment scheme.

When comparing the proposed building design with the existing condition, the building frontage of the proposed design toward north is larger than the existing condition. It is expected some northerly wind will be obstructed due to our proposed design. However, on the other hand, the increase in setback from subject site to the Gold and Silver Exchange School is larger than that of the existing vocational training center which is expected enhance the wind flow along Link Road and Gold & Silver Exchange School. Therefore, it is anticipated that the increase in building frontage toward north would not significantly affect the wind flow to downwind area under N and NNE wind.

4.3 Wind from NE direction

For the wind from NE, the high-rise buildings along the opposite side of the Link Road (such as Silverwood, Caroline Height, Jade Terrace and Caroline Garden) are not located at the downwind area in relation to the redevelopment site. Therefore, the wind performance around these developments would not be affected by the proposed redevelopment. The Gold and Silver Exchange School is located south of the proposed redevelopment site. The wind environmental around the school is dominated by the existing high-rise developments to the opposite of Link Road, rather than the proposed redevelopment.

The Leighton Hill and the Leighton Hill Road is located downwind of the proposed redevelopment scheme; but it is sitting on hill top with the level between 37 mPD to 50 mPD. The tallest portion of the proposed redevelopment scheme is ~ 80 mPD which is taller than the Leighton Hill Road behind. The wind flow from the NE direction at the Leighton Hill Road would be affected by the proposed redevelopment. To improve the condition, a roof garden at ~45mPD in the middle part of the future building, which is similar to the road level of Leighton Hill Road, is proposed. Illustration diagram is shown in **Figure 12**. Therefore, it is considered that the blockage effect due to the proposed re-development scheme is minimized, and the wind performance at the Leighton Hill Road and Leighton Hill would not be significantly affected.

As the existing PLK Main Building is located at the upwind of the proposed redevelopment scheme under the wind from NE direction, its wind performance will not be affected by the proposed redevelopment scheme.

When comparing the proposed building design with the existing condition, the increase in building frontage toward north would not significantly affect the wind flow along Link Road, since the setback between building and Link Road are the same as indicated in Figure 5. Similar to N and NNE wind, the wind flow at Gold & Silver Exchange School would not significantly affected due to the increase in setback between the redevelopment site and school. However, the increase in building height would expected to obstruct the wind flow to leeward area, i.e. area to the southwest at Leighton Hill.

4.4 Wind from E direction

As mentioned in section 2.4, the existing high-rise built development along the eastern side of Link Road block the wind from E to the most of the redevelopment site and its downwind area. The proposed redevelopment scheme is lower than those upwind built developments. Therefore, there would not have any significant impact due to the proposed redevelopment scheme.

At the northern portion of the redevelopment site, the wind from east direction will flow across the junction of the Link Road and Caroline Hill Road where no high rise built developments, reach the site and to the downwind area. In order to minimize the potential impact, there is a about 10m building separation proposed between the proposed redevelopment scheme and the PLK main building. This separation would help to minimize the potential blockage of the wind. Also, the most northern portion of the proposed redevelopment scheme is at 42 mPD which is similar to the level of the Leighton Hill Road behind. This will further minimize the potential blockage of the eastern wind to the downwind area.

As mentioned in section 3.3.2, there is about 10m separation between the proposed development scheme and the main building which is low rise development (roof level at ~ 23.7 mPD). This separation is located at the northern part of the redevelopment site at the junction of the Link Road and Caroline Hill Road where no high –rise buildings is located at upwind from east direction. This will enhance the passage of wind from east direction.

The PLK main building is not at the downwind area of the redevelopment site. Therefore, the wind performance at the main building would not be significant affected as the proposed redevelopment scheme would not block the wind to the main building under this wind direction.

When comparing the proposed building design with the existing condition, the increase in building height would expected to obstruct the wind flow to leeward area, i.e. Leighton Hill to the west. As mentioned, mitigation measure is provided in order to minimize the potential impact, i.e. 10m building separation between the proposed redevelopment scheme and the PLK main building and lower building height at northern portion.

4.5 Wind from S direction

The Gold and Silver Exchange School with building height at ~ 42 mPD is located at the immediate upwind of the proposed redevelopment scheme. The school will block the wind from south direction at the pedestrian level to the redevelopment site and the PLK Main Building behind. As mentioned in section 2.4, it is considered that the wind from south direction will flow along the Link Road. The existing built development along the Link Road would create a channel effect; and the wind will flow along the area where relative open exposure to wind. The proposed redevelopment scheme has setback from the Link Road with about 9.5m at the southern portion and about 13m at the northern portion (Figure 4). This setback will reduce the surface roughness along the Link Road and promote the wind flow to the downwind area. Also, the setback distance is increase from upwind to downwind area with the largest setback close to the PLK Main Building. It is considered that this will further minimize the potential blockage of the proposed redevelopment scheme to the downwind area such as PLK Main Building.

When comparing the proposed building design with the existing condition, the building frontage of the proposed design toward the south is larger than the existing condition. It is expected some southerly wind will be obstructed due to our proposed design. The wind flow at PLK main building would be reduced. However, it is noted that the PLK main building aligning NW to SE and the increase in building frontage is near to the slop toward west of the proposed design (which mean the blockage effect to downward area already affected by the existing PLK main building). Therefore, the increase in building frontage of the proposed design toward north would not have significant implication at further north area, i.e. Leighton Road.

4.6 Impact on the large open space

There are large open spaces or low rise development to the east and the northeast of the redevelopment site with the Caroline Hill Road and Link Road located in between, and they are South China Athletic Association Stadium, and Post Office Recreation Club. Section 2.1 describes the wind availability of the area; and the dominated wind flow of the area during annual conditions are mainly from ESE, NNE, NE, E and N. The dominated wind flow of the area during summer conditions are mainly from SW, ESE, S and E.

For the dominated wind directions in Annual Conditions (ESE, NNE, NE, E and N), the proposed redevelopment scheme is located at downwind area of the open space and the low rise development. Therefore, the proposed redevelopment scheme would not have any impact on the wind performance at these low rise areas.

For the wind from SW in summer condition, the built high-rise development, The Leighton Hill and that along the Link Road Silverwood, Caroline Height, Caroline Garden, and Jade Terrace have blocked the wind to reach these areas. The redevelopment site is located between the Leighton Hill and the built developments along the Link Road. Also, the building height of the proposed redevelopment scheme is lower than that of these built high-rise developments. Therefore, the proposed redevelopment scheme would not affect the wind performance of these low-rise areas under this wind direction.

For the wind from S, the redevelopment site is not located at the upwind of the open space and low rise area. Therefore, the proposed redevelopment scheme would not affect the wind performance of these low-rise areas under this wind direction.

4.7 Impact on the Problematic Area identified in EE WNC

Based on the EE on WNC Area, a problematic area near the redevelopment site, is identified to be the northwest of the Beverly Hill where is currently a vacant site (as indicated in **Figure 11**). However, as the problematic area is not located at the downwind area of the redevelopment site under any dominant annual wind directions or summer wind directions, the wind performance at the problematic area would not be affected by the proposed development.

4.8 Summary of Relative Air Ventilation Performance

The proposed redevelopment scheme is a linear block slightly aligning from NNW to SSE with stepping at both ends. A roof garden is located at the middle of the proposed redevelopment scheme with roof level at 45 mPD which is similar to the road level of the Leighton Hill Road to the west of the redevelopment site. The proposed redevelopment scheme is parallel to some dominant wind directions (such as NNE and N as well as S) such that the wind can pass through the redevelopment site. Provision of the setback from the Link Road would enhance the wind flow across this road with a wider separation in comparing with the existing buildings. The stepping design at the northern portion as well as provision of the roof garden would minimize the potential blockage of the wind from NE during annual and summer condition. The existing built high-rise developments opposite of the Link Road have blocked the wind flow across the southern portion of the redevelopment site from E and ESE direction. Similar to the wind from ESE, the built high-rise The Leighton Hill has blocked the wind flow from SW direction across the redevelopment site during the summer condition.

When comparing the proposed building design with the existing condition, the increase in building height and larger building frontage to the north would possible affect the wind flow to some nearby area. Therefore, mitigation measure is provided in order to minimize the potential impact, e.g. more building setback from the subject site to the nearby building and lower building height at northern portion.

Therefore, it is considered that any potential blockage of the dominated wind flow due to the proposed redevelopment scheme have been minimized.

5.0 Conclusion

The proposed redevelopment scheme has been qualitatively evaluated. Design of the proposed redevelopment scheme has taking the surrounding buildings height as well as the wind performance of the area into account. Mitigation measures in terms of provision of stepping and roof garden have been recommended to minimize the potential blockage of the wind from NE directions. Maximal setback from the Link Road is provided to the proposed redevelopment scheme so as to minimize the potential blockage to this localized air path. A localized setback at the roof garden will help to minimize the potential blockage of the wind from NE wind. The existing built developments have blocked the dominant wind directions from SW, E and ESE that the proposed redevelopment has insignificant impact on the air ventilation performance of the downwind area. The open space to the northeast of subject site is not located at the downwind of the proposed redevelopment scheme under major annual prevailing wind that the associated air ventilation performance is not affected by the proposed redevelopment scheme. In view of the above, it is considered that any potential blockage of the dominated wind flow due to the proposed redevelopment scheme have been minimized.

Figures

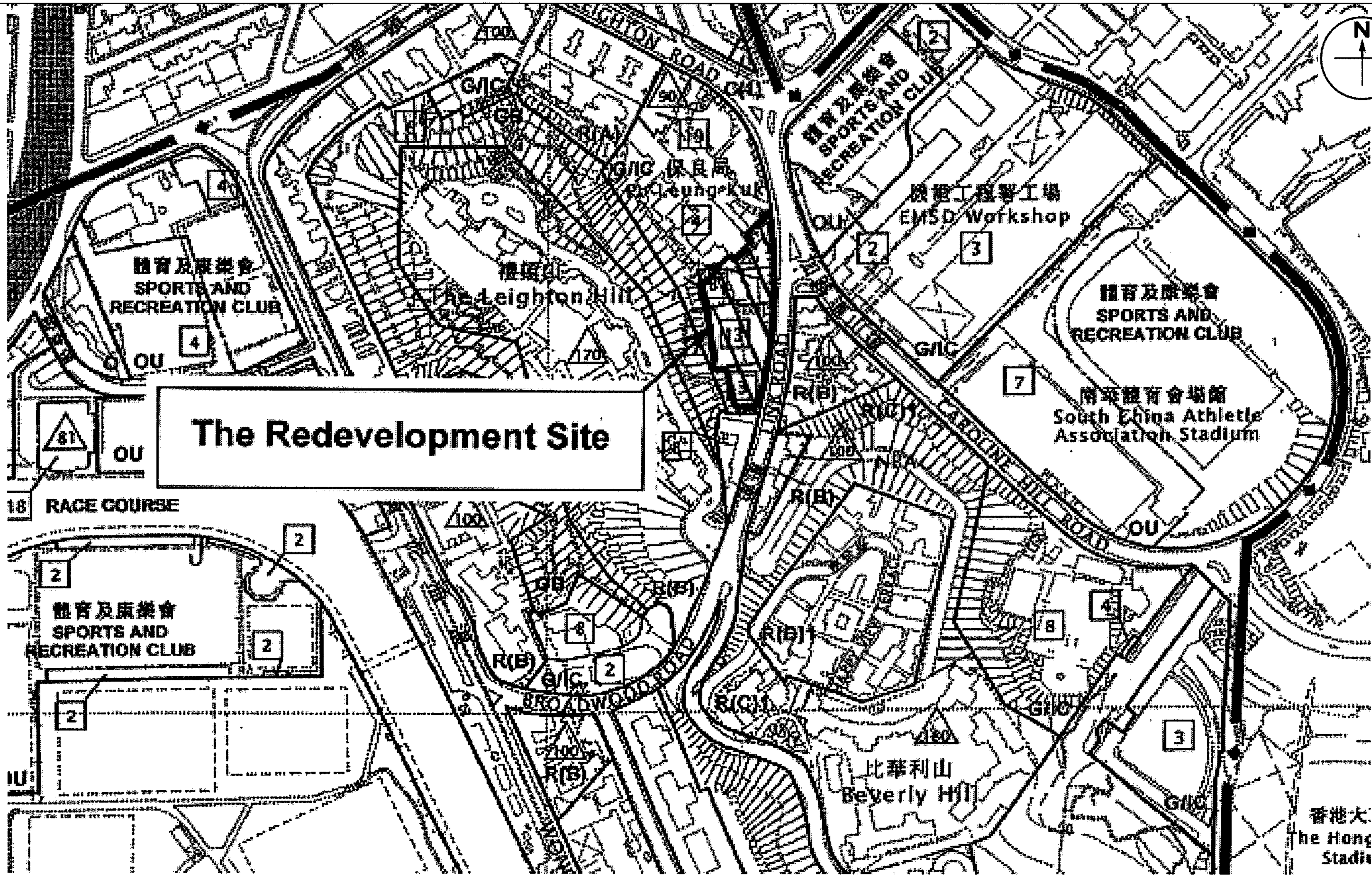


Figure:	1	ENVIRON
Title:	Location of the Redevelopment site and its Environs	Drawn by: SL
		Checked by: TC
Project:	Air Ventilation Assessment - Expert Evaluation for Proposed Redevelopment of East Wing of Po Leung Kuk Headquarters	Rev.: 1.1
		Date: Sep 2012

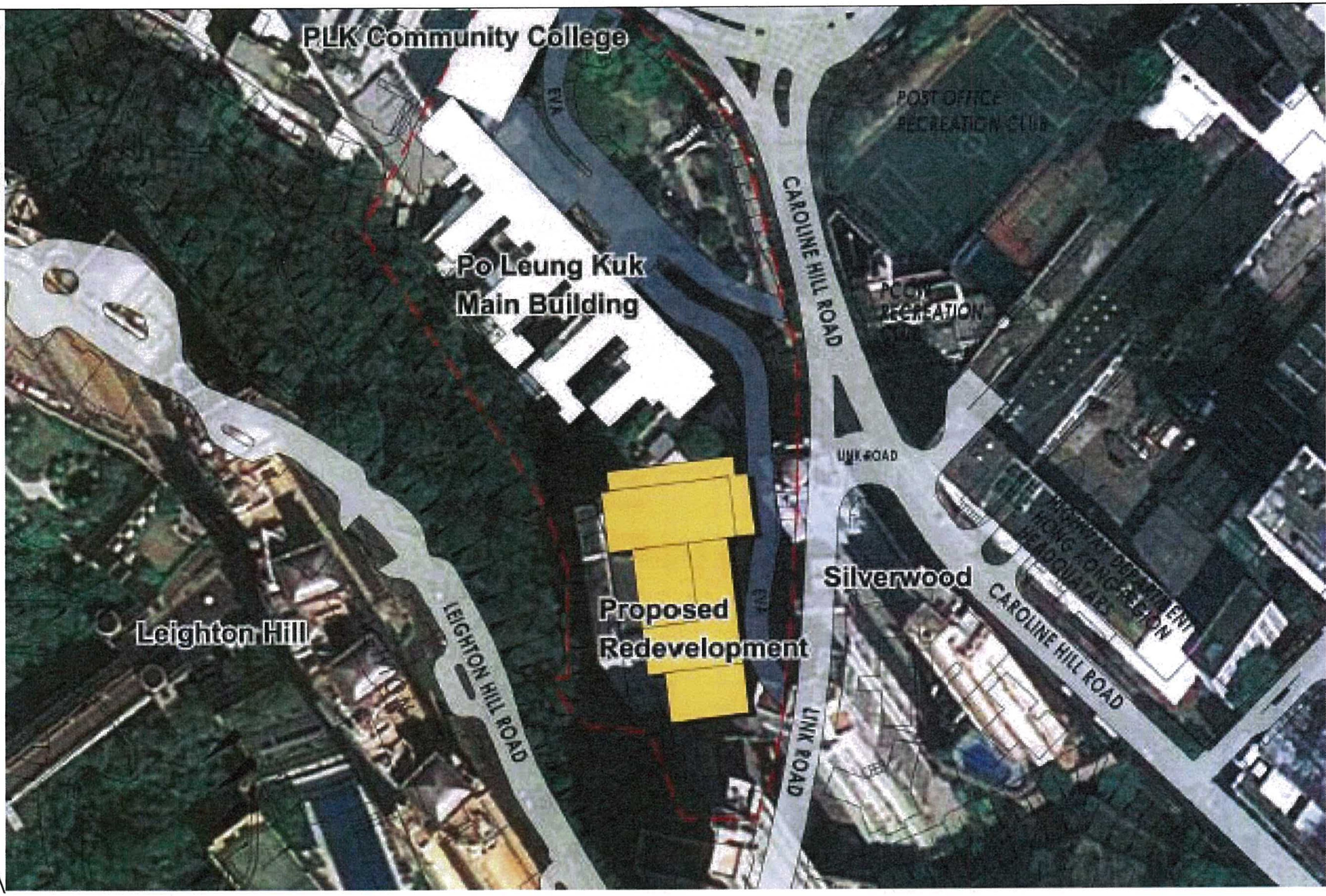


Figure: 2	ENVIRON
Title: Master Layout Plan of the Proposed Redevelopment Scheme	Drawn by: SL
	Checked by: TC
Project: Air Ventilation Assessment - Expert Evaluation for Proposed Redevelopment of East Wing of Po Leung Kuk Headquarters	Rev.: 2.0
	Date: Jan 2015

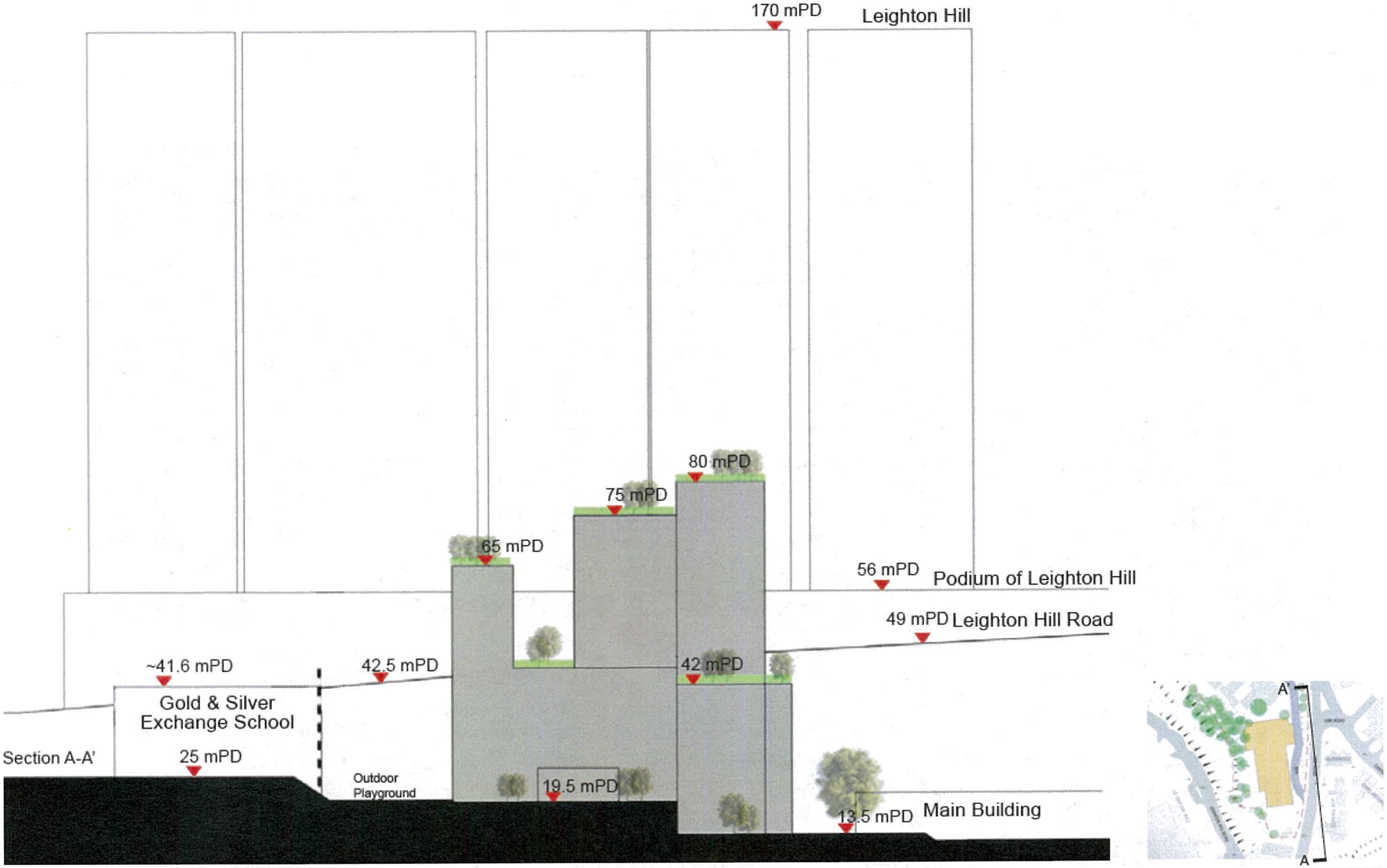


Figure: 3

Title: Section of the Proposed Redevelopment Scheme

Project: Air Ventilation Assessment - Expert Evaluation for Proposed Redevelopment of East Wing of Po Leung Kuk Headquarters

ENVIRON

Drawn by:	SL
Checked by:	TC
Rev.:	2.0
Date:	Jan 2015

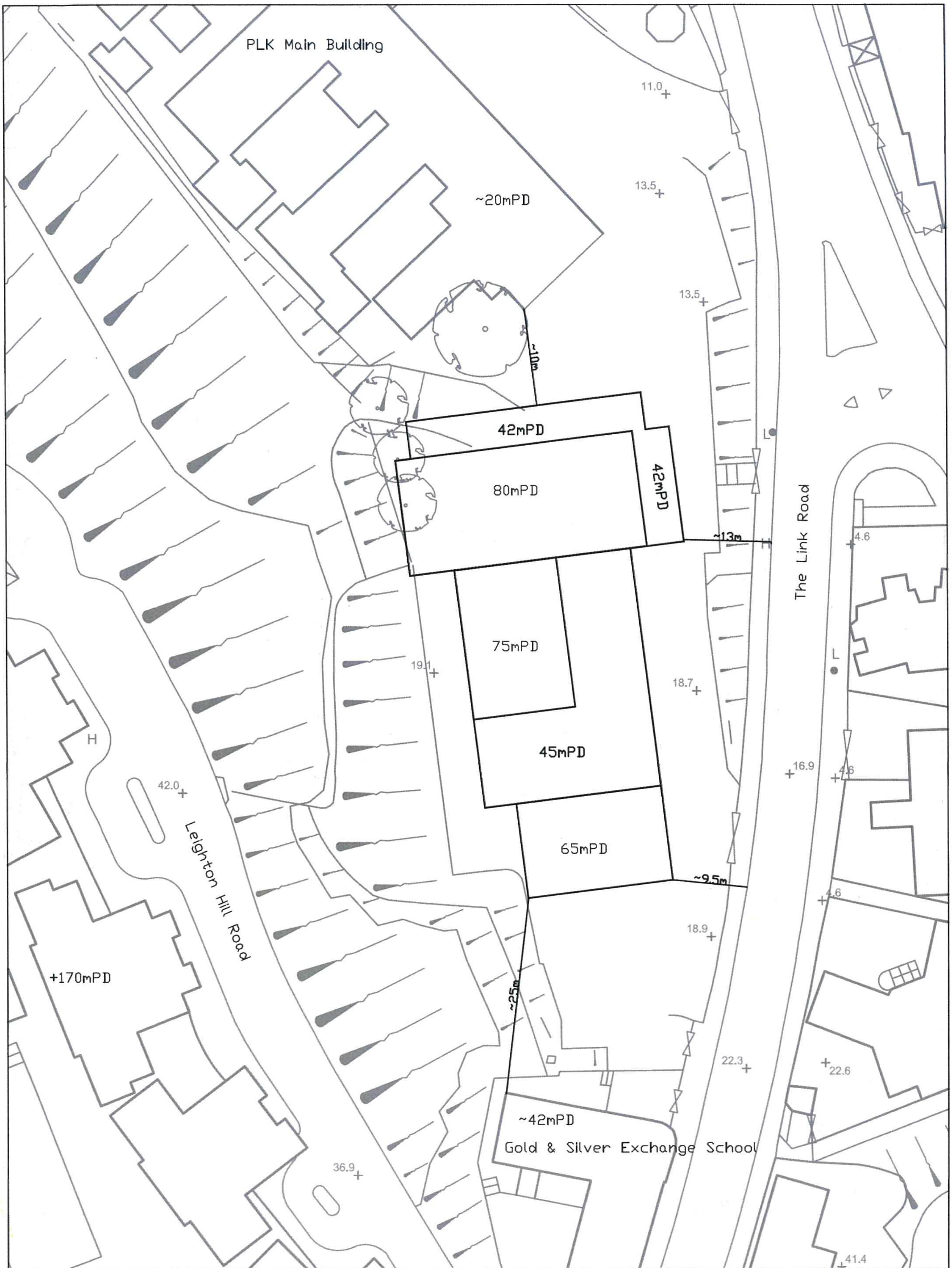


Figure:	4	ENVIRON
Title:	Setback from the Proposed Redevelopment Scheme to the Link Road and nearby Building	Drawn by: SL
		Checked by: CC
Project:	Air Ventilation Assessment - Expert Evaluation for Proposed Redevelopment of East Wing of Po Leung Kuk Headquarters	Rev.: 1.0
		Date: Aug 2015

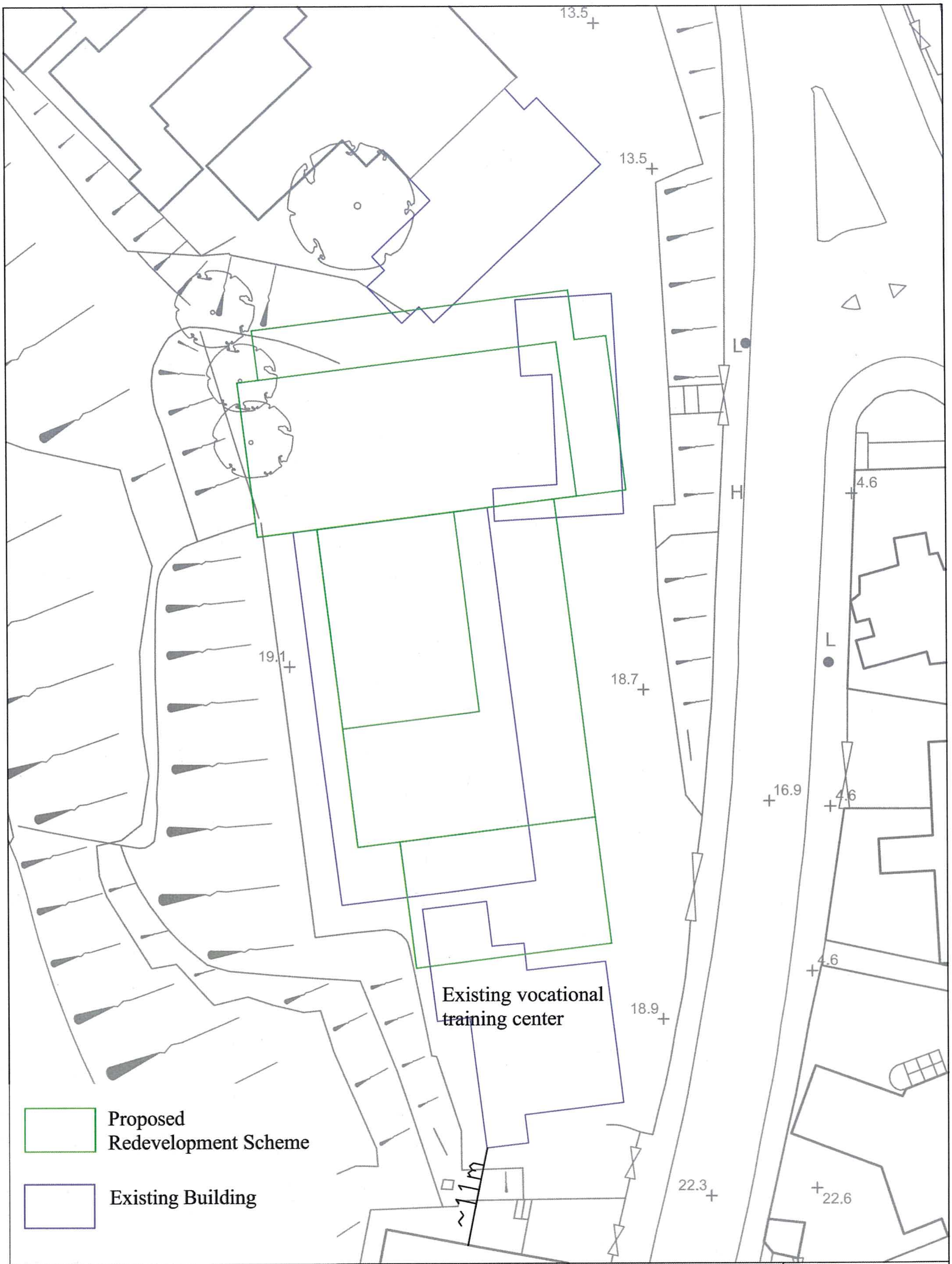


Figure:	5	ENVIRON	
Title:	Overlapping of the Proposed Redevelopment Scheme and the existing building at the Subject Site	Drawn by:	SLo
		Checked by:	CC
Project:	Air Ventilation Assessment - Expert Evatuation for Proposed Redevelopment of East Wing of Po Leung Kuk Headquarters	Rev.:	1.0
		Date:	Aug 2015

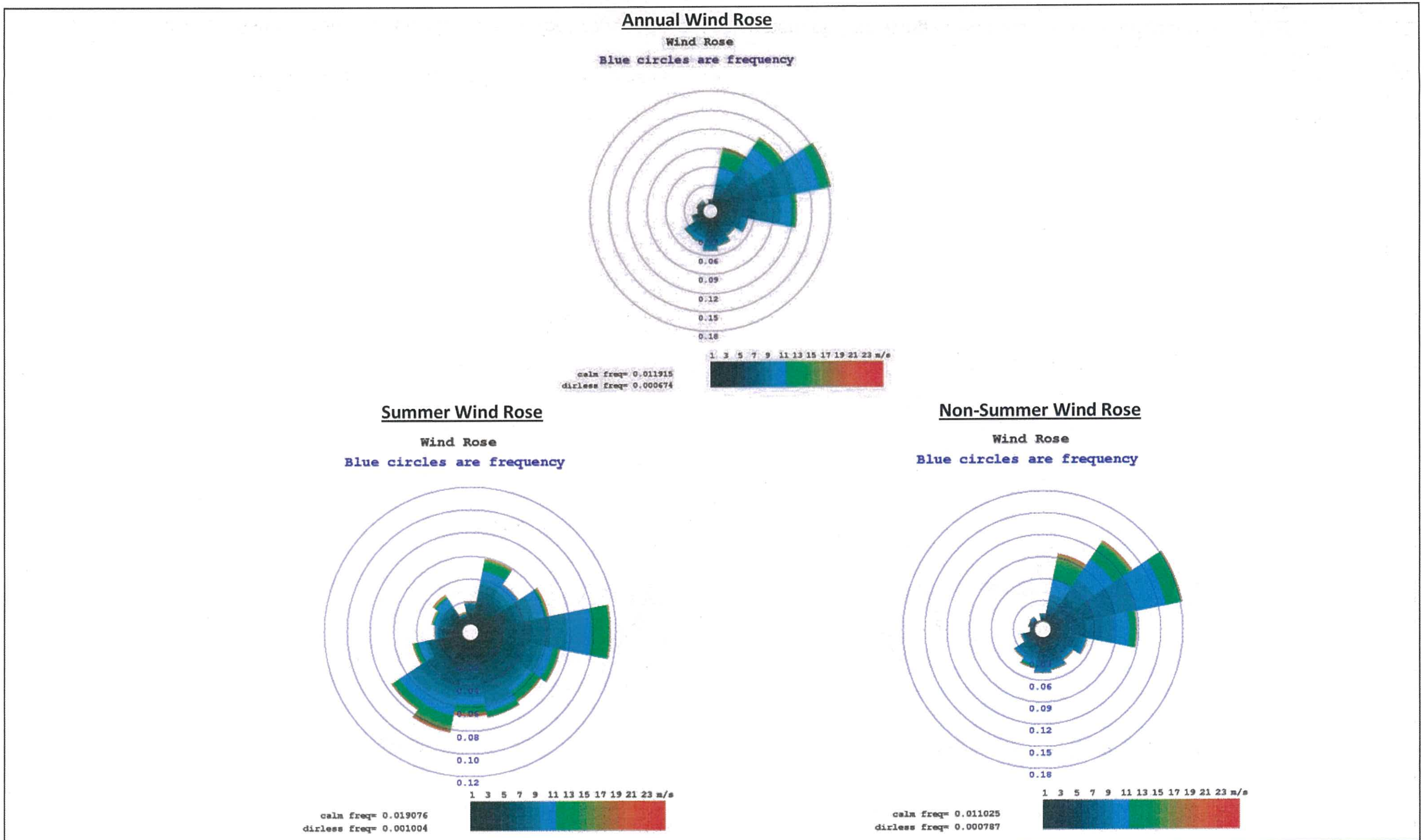


Figure: 6	ENVIRON
Title: Annual and Seasonal Windrose from MM5 Data – Wong Nai Chung Area	Drawn by: WT
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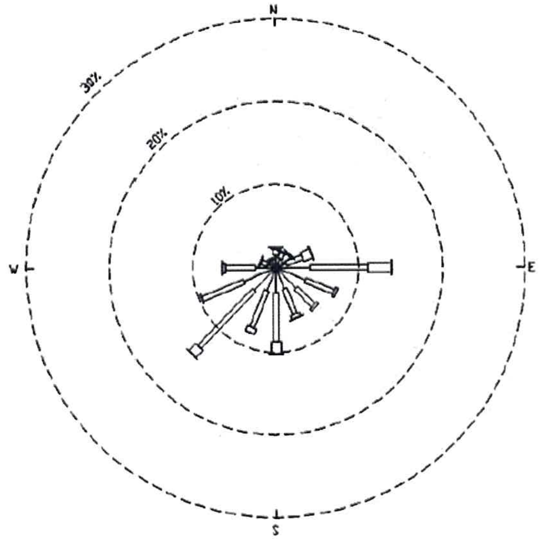
Project: Air Ventilation Assessment - Expert Evaluation for Proposed Redevelopment of East Wing of Po Leung Kuk Headquarters	Rev.: 3.1
	Date: June 2015

Summer Wind Rose



Annual, Non-typhoon Wind Rose

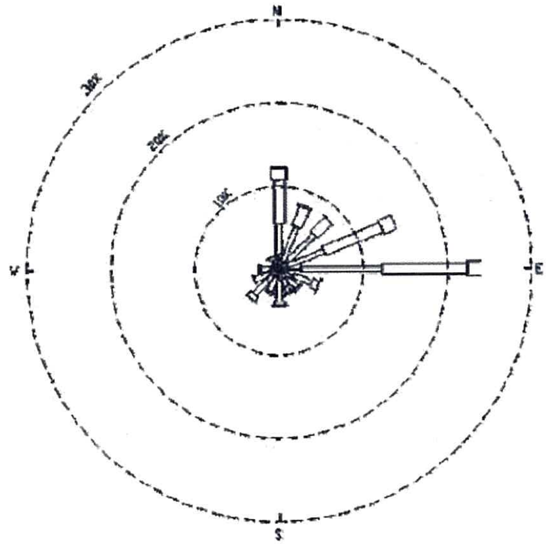


Figure: 7	ENVIRON
Title: Annual and Seasonal Windrose from MM5 Data – Causeway Bay Area	Drawn by: SLo Checked by: TC
Project: Air Ventilation Assessment - Expert Evaluation for Proposed Redevelopment of East Wing of Po Leung Kuk Headquarters	Rev.: 2.1 Date: Apr 2015

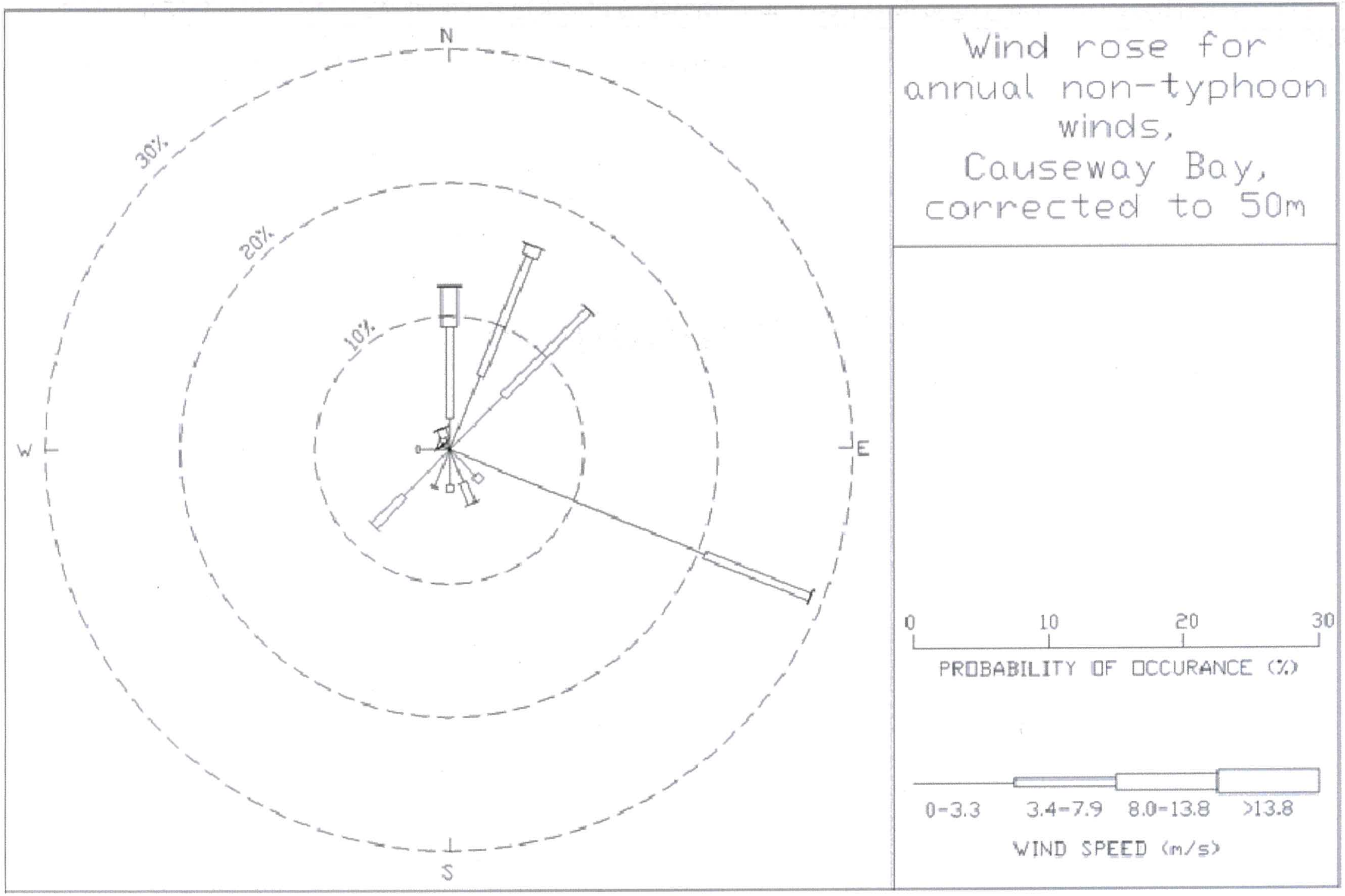


Figure:	8a	ENVIRON
Title:	Wind rose for annual, non-typhoon winds for Causeway Bay, corrected to 50m	Drawn by: SLo
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Project:	Air Ventilation Assessment - Expert Evaluation for Proposed Redevelopment of East Wing of Po Leung Kuk Headquarters	Rev.: 3.1
		Date: June 2015

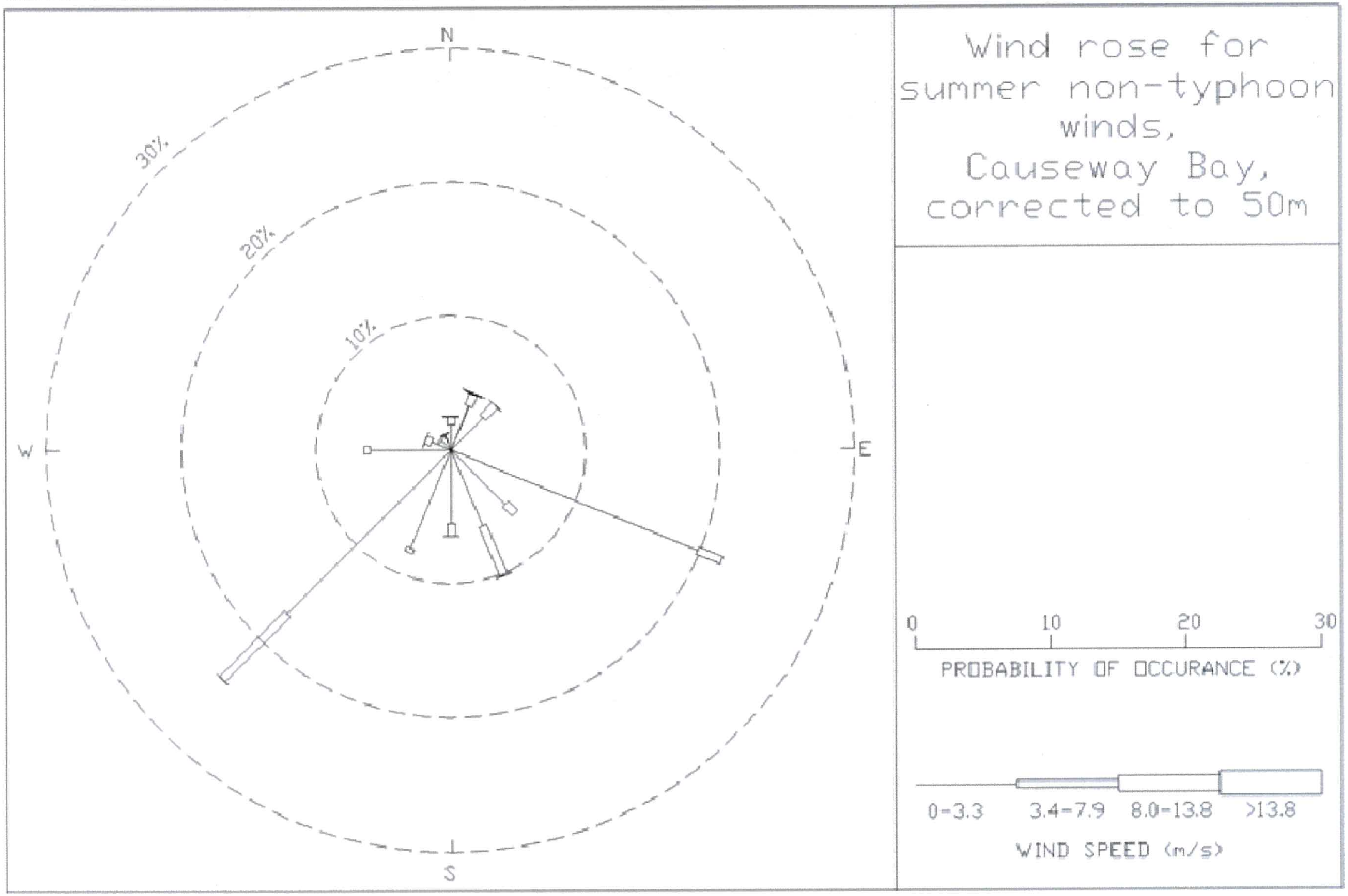

Figure:	8b	ENVIRON
Title:	Wind rose for summer, non-typhoon winds for Causeway Bay, corrected to 50m	Drawn by: SLo
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Project:	Air Ventilation Assessment - Expert Evaluation for Proposed Redevelopment of East Wing of Po Leung Kuk Headquarters	Rev.: 3.1
		Date: Jun 2015

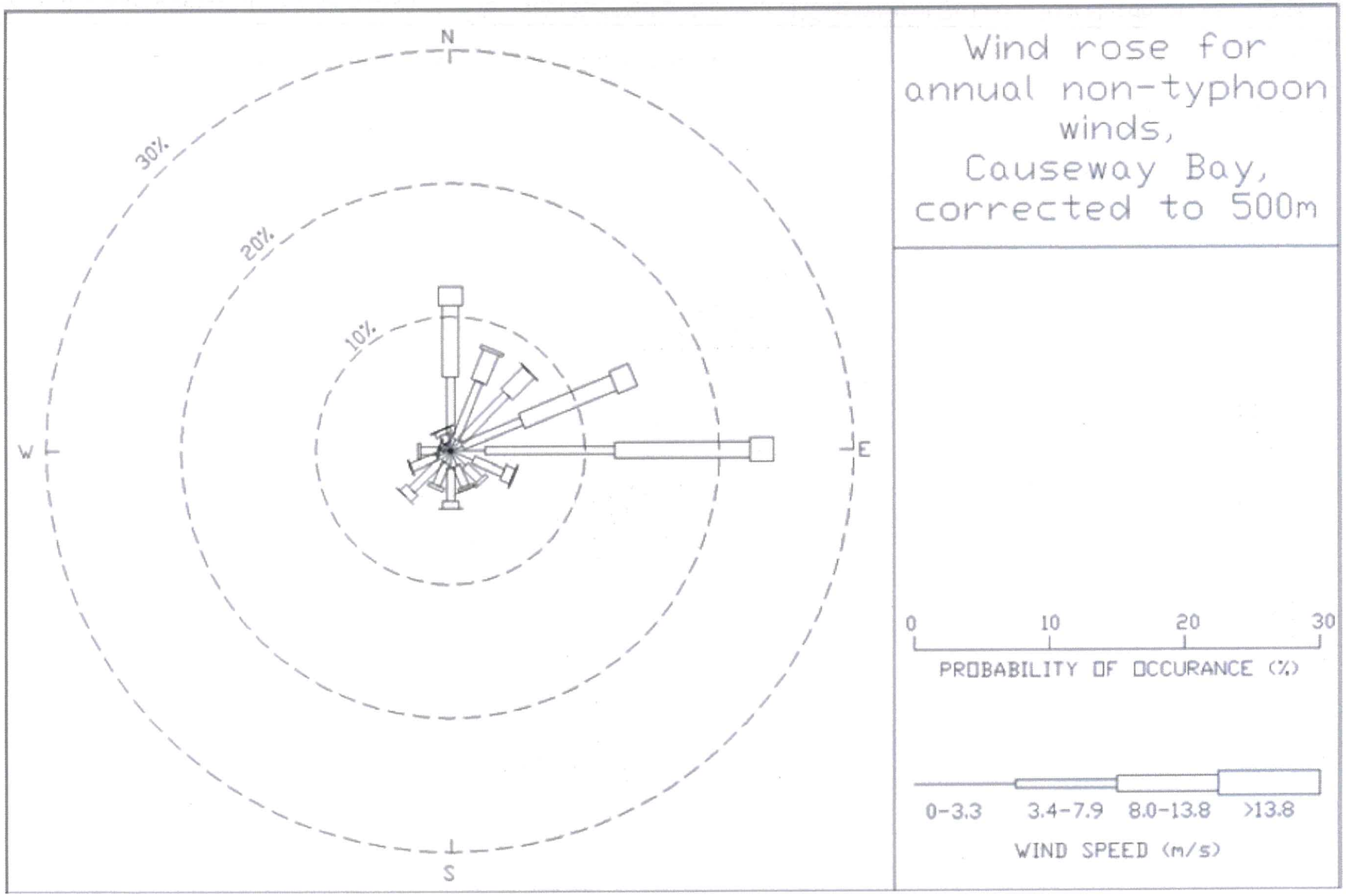

Figure:	9a	ENVIRON
Title:	Wind rose for annual, non-typhoon winds for Causeway Bay, corrected to 500m	Drawn by: SLo
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Project:	Air Ventilation Assessment - Expert Evaluation for Proposed Redevelopment of East Wing of Po Leung Kuk Headquarters	Rev.: 3.1
		Date: June 2015

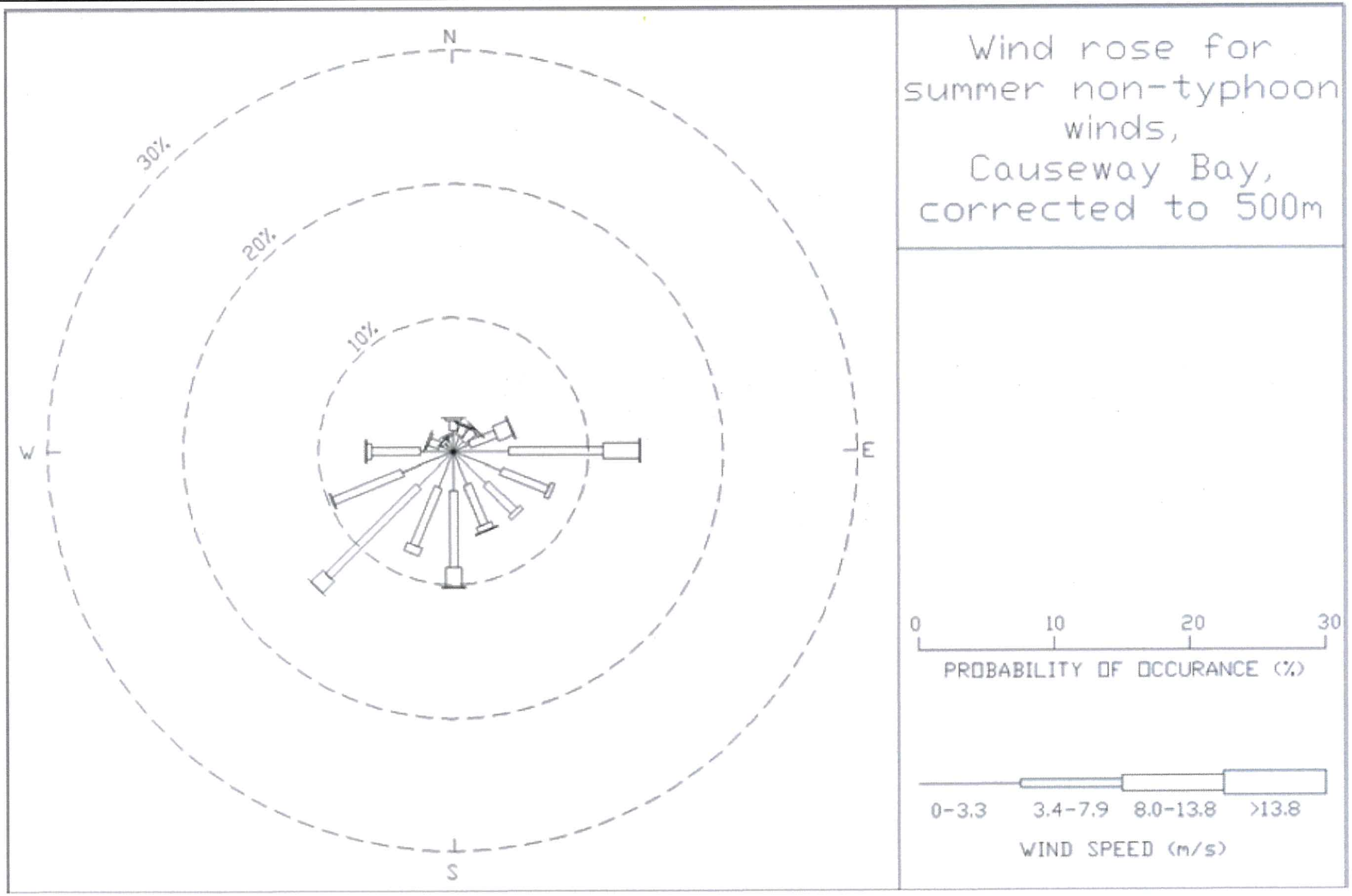

Figure:	9b	ENVIRON	
Title:	Wind rose for summer, non-typhoon winds for Causeway Bay, corrected to 500m	Drawn by:	SLo
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Project:	Air Ventilation Assessment - Expert Evaluation for Proposed Redevelopment of East Wing of Po Leung Kuk Headquarters	Rev.:	3.1
		Date:	Jun 2015

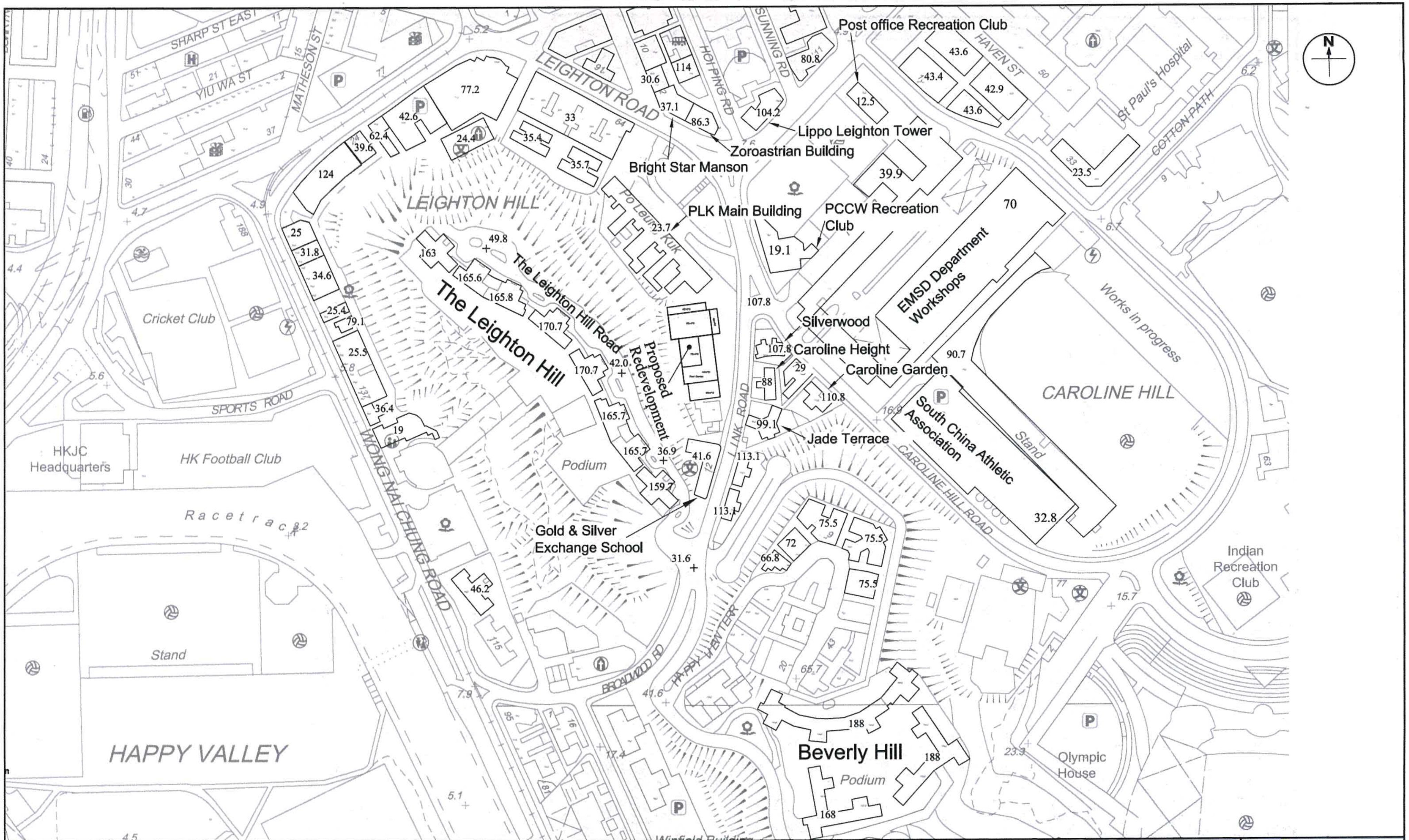

Figure: 10	ENVIRON
Title: Building Height of Existing Neighboring Development	Drawn by: WT
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Project: Air Ventilation Assessment - Expert Evaluation for Proposed Redevelopment of East Wing of Po Leung Kuk Headquarters	Rev.: 3.1
	Date: June 2015

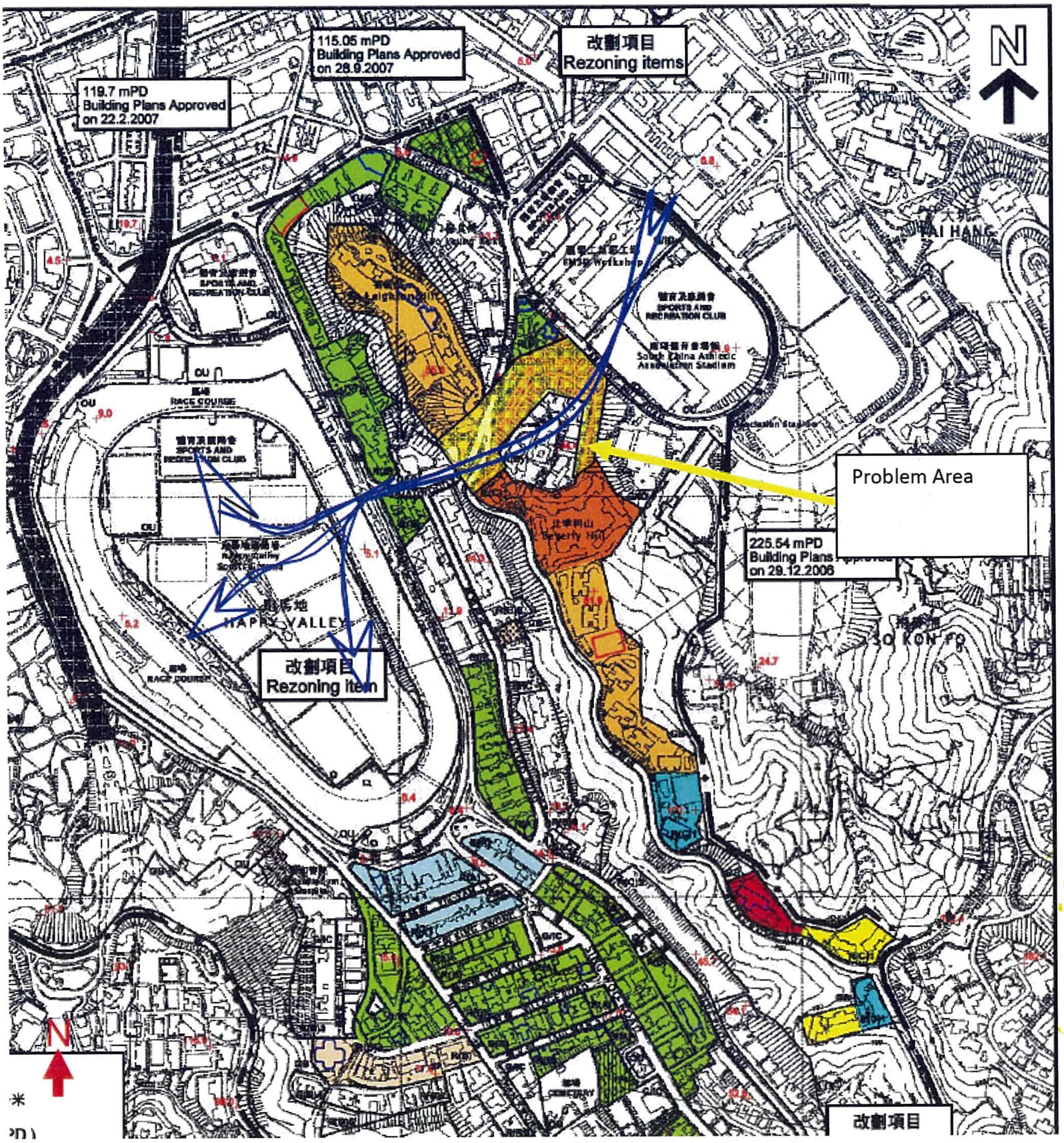


Figure: 11	ENVIRON	
Title: Problem Area near Beverly Hill	Drawn by:	SL
	Checked by:	CC
Project: Air Ventilation Assessment - Expert Evaluation for Proposed Redevelopment of East Wing of Po Leung Kuk Headquarters	Rev.:	1.0
	Date:	Apr 2015

Figure:	12	ENVIRON
Title:	Illustration of Wind Flow of Northeasterly Wind across the Proposed Redevelopment Scheme to downwind area	Drawn by: WT Checked by: CC
Project:	Air Ventilation Assessment – Expert Evaluation for Proposed Redevelopment of East Wing of Po Leung Kuk Headquarters	Rev.: 3.1 Date: Aug 2015

Attachment V-a of
<u>MPC Paper No. 11/15</u>

Comparison of the Existing and Proposed Development Parameters of the Proposals

<u>Extension Proposal of The Church of Christ in China – Man Lam Christian Church (MLCC) at 9 Village Road</u>

	Existing Development (a)	**Proposed Extension (b)**	**Difference (b)-(a)**
Site Area	331m^2	331m^2	Nil
No. of Storeys	5	11	+ 6 (+ about 120%)
Building Height (main roof)	about 17m (about 34mPD)	about 38m (about 55mPD)	+ 21m (+ about 123.53%)
Gross Floor Area	1,147m^2	2,179m^2	+ 1,032m^2 (+ about 89.97%)
Plot Ratio	3.465	6.583	+ 3.118 (+ about 89.99%)

Major Floor Uses	
G/F[1]	Entrance, Parish Hall
1/F[1]	Church Nave and Staff Office
2/F[1]	Upper Part of Church Nave and One Classroom cum Gown Room
3/F[1]	Upper Part of Church Nave, Gallery and Office
4/F	Administration Office, Pastor's Office, Flat Roof and E&M facilities
5/F	Choir/Music Room and Roof
6/F	Childcare Room / Classrooms
7/F	Conference Room / Classroom
8/F	Counselling Room / Prayer Room
9/F	Library and Study Room
10/F[2]	Pastor's Quarters, Prayer Room and Store

(1) In the extension proposal, floor uses from G/F to 3/F of the existing 5-storey church building will remain unchanged. No on-site car parking and loading/unloading facilities will be provided

(2) The existing Pastor's Quarters will be relocated from 4/F to 10/F

Comparison of the Existing and Proposed Development Parameters of the Proposals

Redevelopment Proposal of Po Leung Kuk (PLK) at 66 Leighton Road

	Existing Development (a)	Proposed Redevelopment (b)	Difference (b)-(a)
Whole PLK Site Area	12,272m^2	12,272m^2	Nil
Overall Gross Floor Area	30,016m^2	37,725m^2	+ 7,709m^2 (+about 26%)
Overall Plot Ratio	2.45	3.07	+ 0.62 (+about 25%)
Redevelopment Site Area	3,765m^2	3,765m^2	Nil
Gross Floor Area (Redevelopment Site Only)	11,071 m^2 (1)	18,780m^2 (2)	+ 7,709 m^2 (+about 70% %)
Plot Ratio (Redevelopment Site Only) (3)	2.941	4.988	+ 2.047 (+about 70%)
No. of Storeys (Redevelopment Site Only)	3 to 13	9 to 21	+ 6 to + 11 (+about 62% to 200%)
Building Height (main roof) (Redevelopment Site Only)	28mPD to 62mPD	42mPD to 80mPD	+ 14 to + 18 (+about 29% to 50%)
Overall Parking and Servicing Provision	10 car parking spaces(4) 1 loading/unloading bay(4) 1 new rehabilitation bus lay-by		
Major Floor Uses (Redevelopment Site Only)			
LG2/F	Supporting facilities		
LG1/F	Supporting facilities and car parking spaces		
G/F-3/F (below 12m)	Social welfare facilities (children care services)		
2/F (part) to 7/F (12m – 24m)	Educational facilities (incl. kindergarten cum nursery and school hall) Social welfare facilities (incl. children care services, elderly care/day care centre and children development centre)		
6/F (part) to 18/F (24m – 80m)	Social welfare facilities (incl. centre for child with special needs and youth services), Educational facilities (incl. learning centre) Administration offices and supporting facilities		

(1) GFA includes the existing Nursery Building of 1,000m^2; existing Children Services Building of 680m^2; existing Welfare Building of 8,501m^2 and existing Vocational Training Building of 890m^2

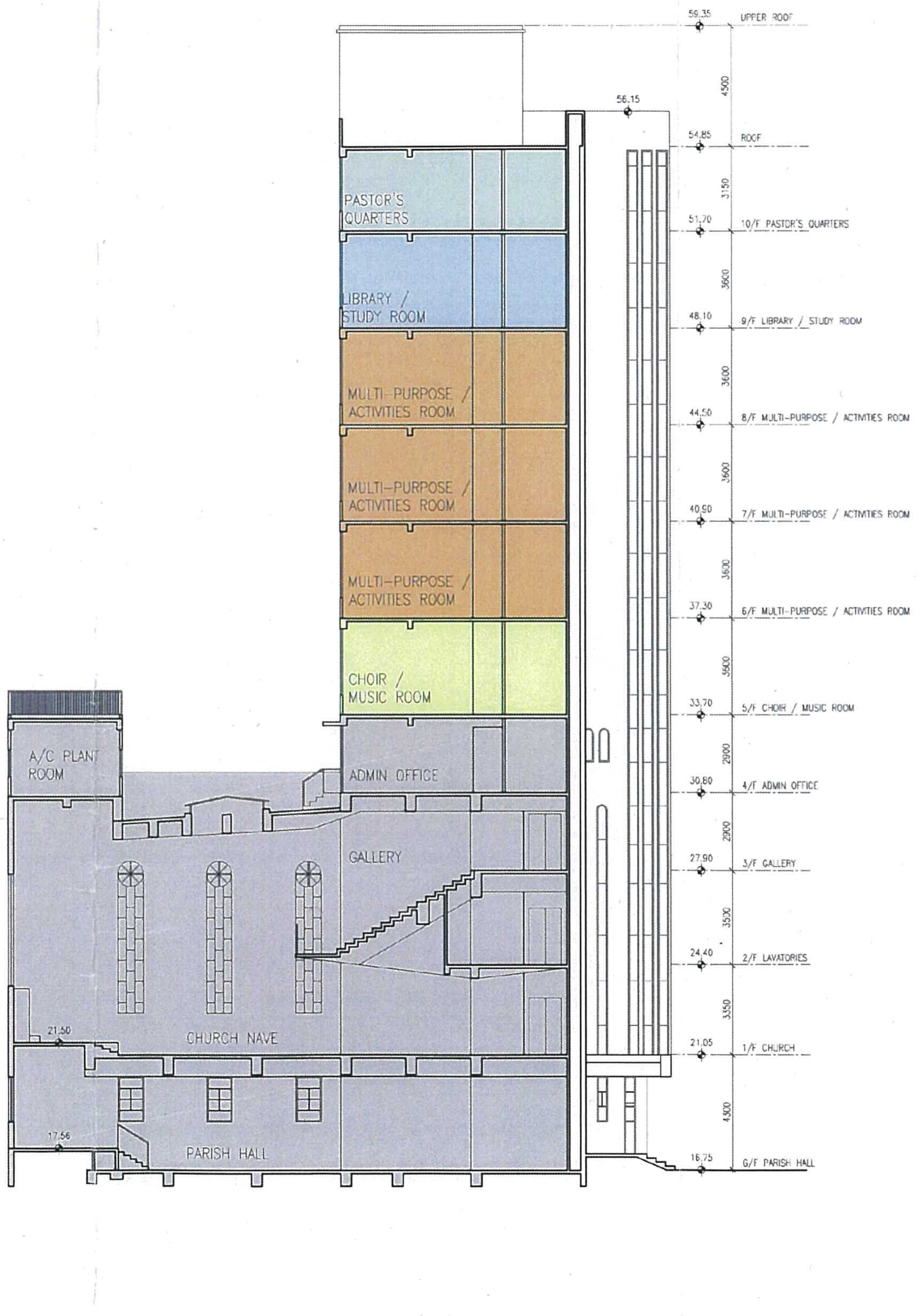
(2) GFA consists of Educational Facilities of 2,030m^2; Institutional Use (administration office and supporting facilities) of 6,300m^2 and Social Welfare Facilities of 10,450m^2, in which includes re-provisioning of existing educational facilities (2,030m^2), administration offices and supporting facilities (5,250m^2) and social welfare facilities (6,606m^2 out of which 2,815m^2 is to be relocated from the Main Building)

(3) Based on the net redevelopment site area of 3,765m^2

(4) For re-provisioning of existing car parking and loading/unloading facilities

Appendix IX

Section Plan of Proposal



LEGEND :

- EXISTING BUILDING

NEW ADDITION / EXTENSION WORKS

- CHOIR / MUSIC ROOM
- MULTI-PURPOSE / ACTIVITIES ROOM
- LIBRARY / STUDY ROOM
- PASTOR'S QUARTERS

02 SECTION B-B ~~1:200~~

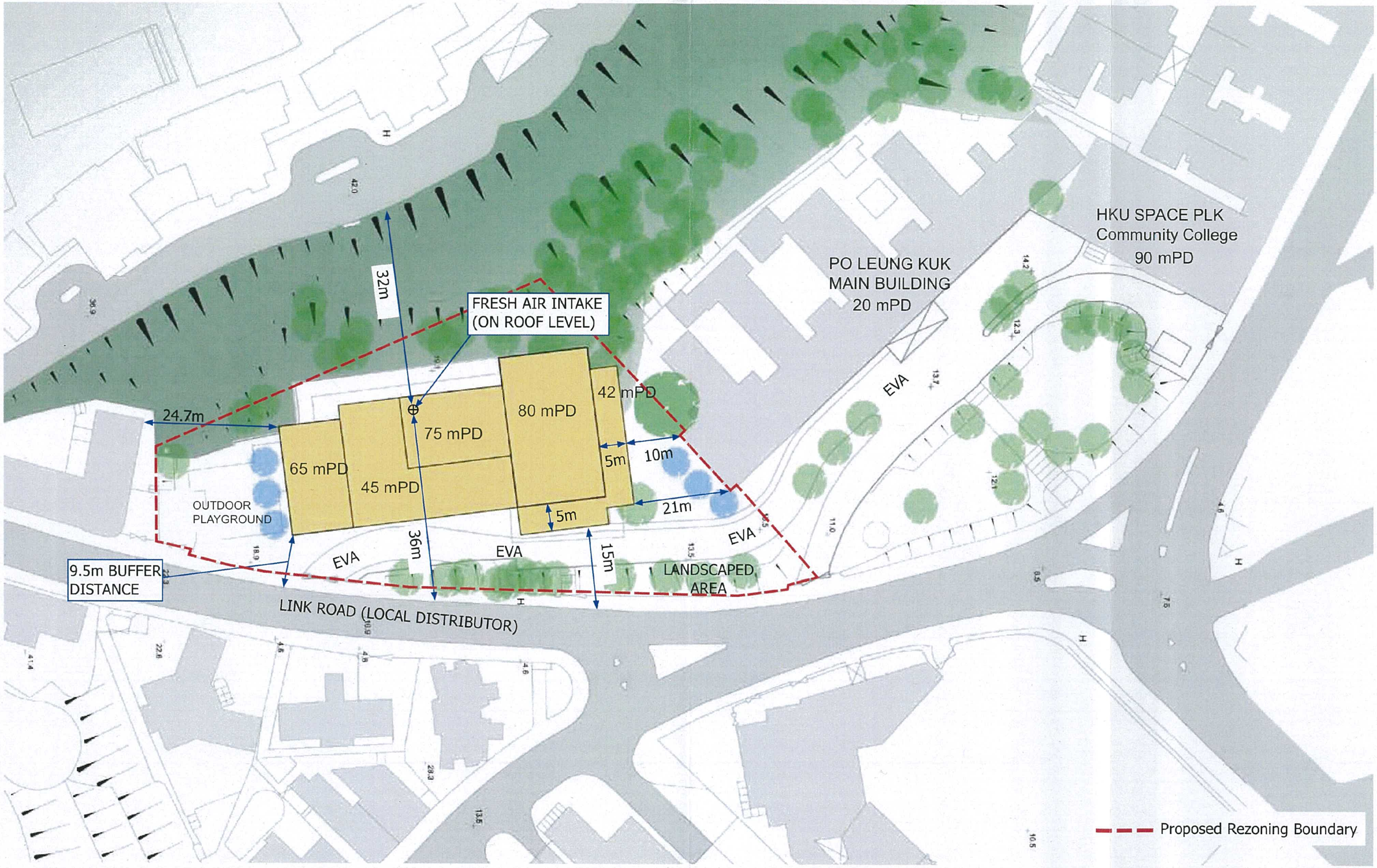
Project: MAN LAM CHRISTIAN CHURCH		
Drawing: ROOF PLAN & SECTION		
Computer file: GB-04	Plot Date	
Project Number	Scale: ~~1:200~~	
Drawing Number: GB-04	Rev.: -	Issue status: 0000

This drawing is to be read in conjunction with all related drawings. Do not scale from this drawing. All dimensions must be checked and verified on site before commencing any work or producing shop drawings. The originator should be notified immediately of any discrepancy.

資料來源：由項目倡議人提供

SOURCE : SUBMITTED BY THE PROJECT PROPONENT

參考編號 REFERENCE No.	繪圖 DRAWING
M/H7/15/7	1



- 9.5m buffer distance measured from the edge of road kerb to the boundary of open space sites. (refer to Hong Kong Planning Standard Guidelines, Chapter 9)

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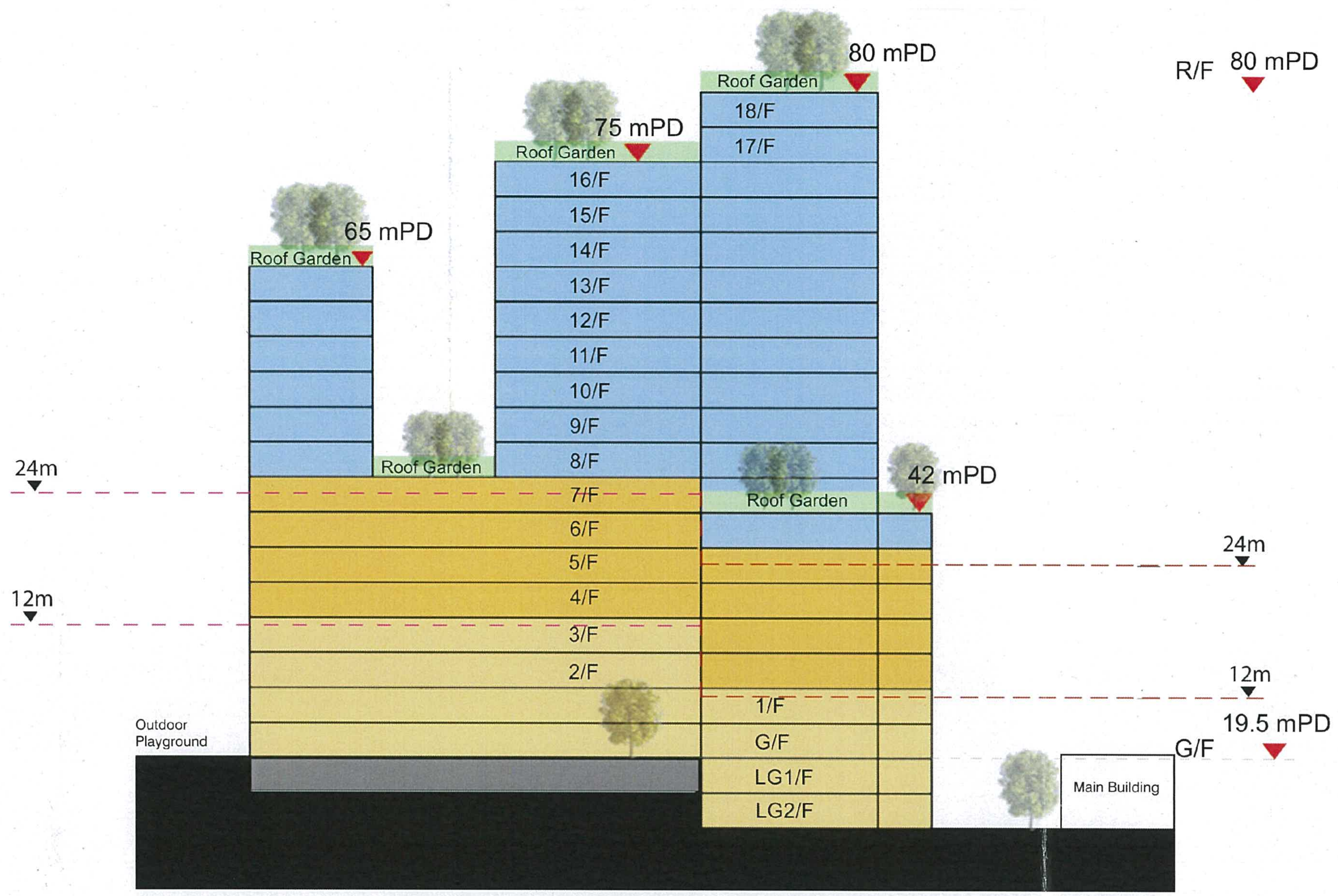
issue date	*25/9/2015*	*drawn by*	*CC*	Buffer Distance	
project	*Technical Feasibility Study for the Redevelopment of East Wing of Po Leung Kuk*	*checked by*	*EC*		
		approved by	*BL*	*scale* -	*drawing & revision no* A510/PD/014

資料來源：由項目倡議人提供
SOURCE : SUBMITTED BY THE PROJECT PROPONENT

參考編號 REFERENCE No. M/H7/15/7	繪圖 DRAWING 2



Section A-A'

Table 1.5.1 (Uses of Proposed Redevelopment)

	GIC Uses
Floor above 24m	• PLK's Administration Office * • Administration Offices & Supporting Facilities for GIC * • Youth Services • Adoption Services Unit * • Centre for Children with special needs * • Student Support Service * • Parent Education Service * • Resource/Learning Centre *
Floor below 24m	• School Hall*# • Children Care Services (over 6-years-old) * • Elderly Care / Day Care Centre • Kindergarten cum Nursery * • Integrated Children Enhancement Programme * • Children Development Centre - Children Art Centre * - Centre for Children with High Abilities * • Student Guidance Service (Primary and Secondary) * • District-based Speech Therapy Service * • Pre-primary Education Service Centre *
Floor below 12m	• Children Care Services (under 6-years-old) • Babies Section * • New Comers' Ward * • Day Creche * • Kinder Section *
	• Supporting Facilities for GIC *

* Reprovision of existing services

\# School Hall may also be used as Basketball Court for future operation

Table 1.5.2
(GFA Summary for Proposed Redevelopment)

	Total GFA (sqm)
Floor above 24m	8335
Floor below 24m	4645
Floor below 12m	5800
Total GFA	**18780**

LEGEND

- Boundary Line
- Private Open Space
- Carparking/Basement
- Government/Institution or Community (above 24m)
- Government/Institution or Community (below 24m)
- Government/Institution or Community (below 12m)

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PO LEUNG KUK

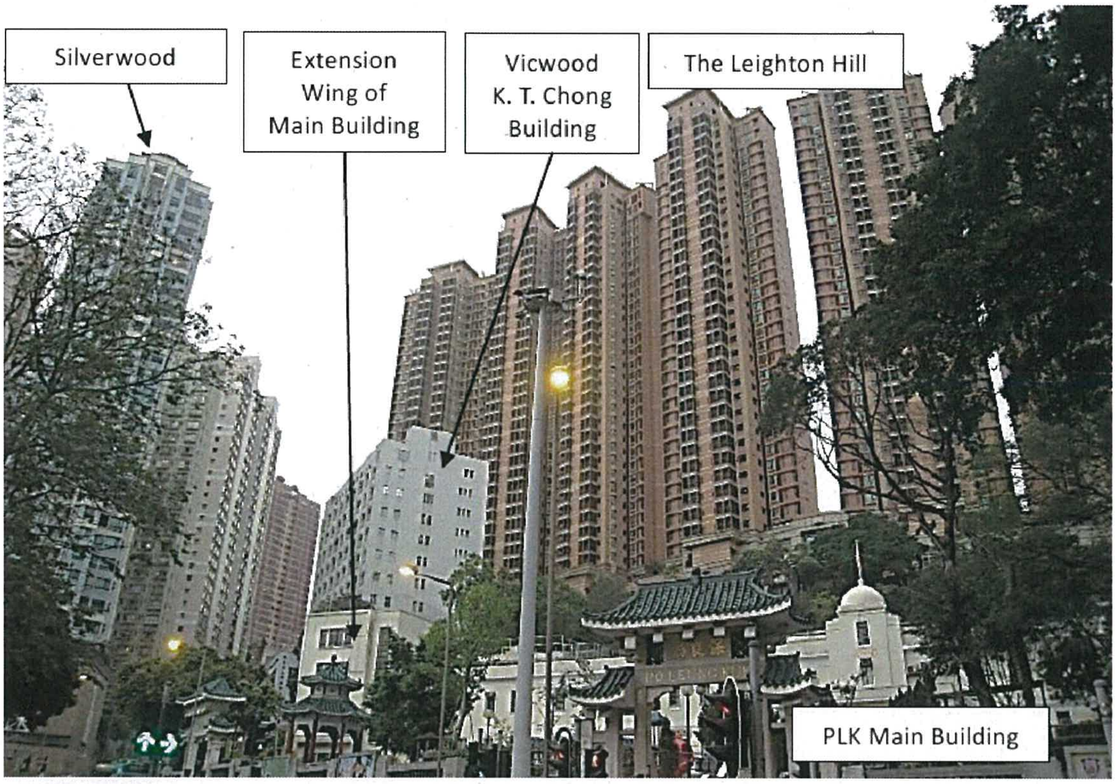
issue date	*25/9/2015*	*drawn by*	*CC*	Section A-A'	
project	*Technical Feasibility Study for the Redevelopment of East Wing of Po Leung Kuk*	*checked by*	*EC*		
		approved by	*BL*	*scale* ~~1:000~~	*drawing & revision no* **A510/PD/005**

資料來源：由項目倡議人提供
SOURCE : SUBMITTED BY THE PROJECT PROPONENT

參考編號 REFERENCE No.	繪圖 DRAWING
M/H7/15/7	3

5. *Discussion*

- <u>Vp 1 - View from Leighton Road from the North</u>



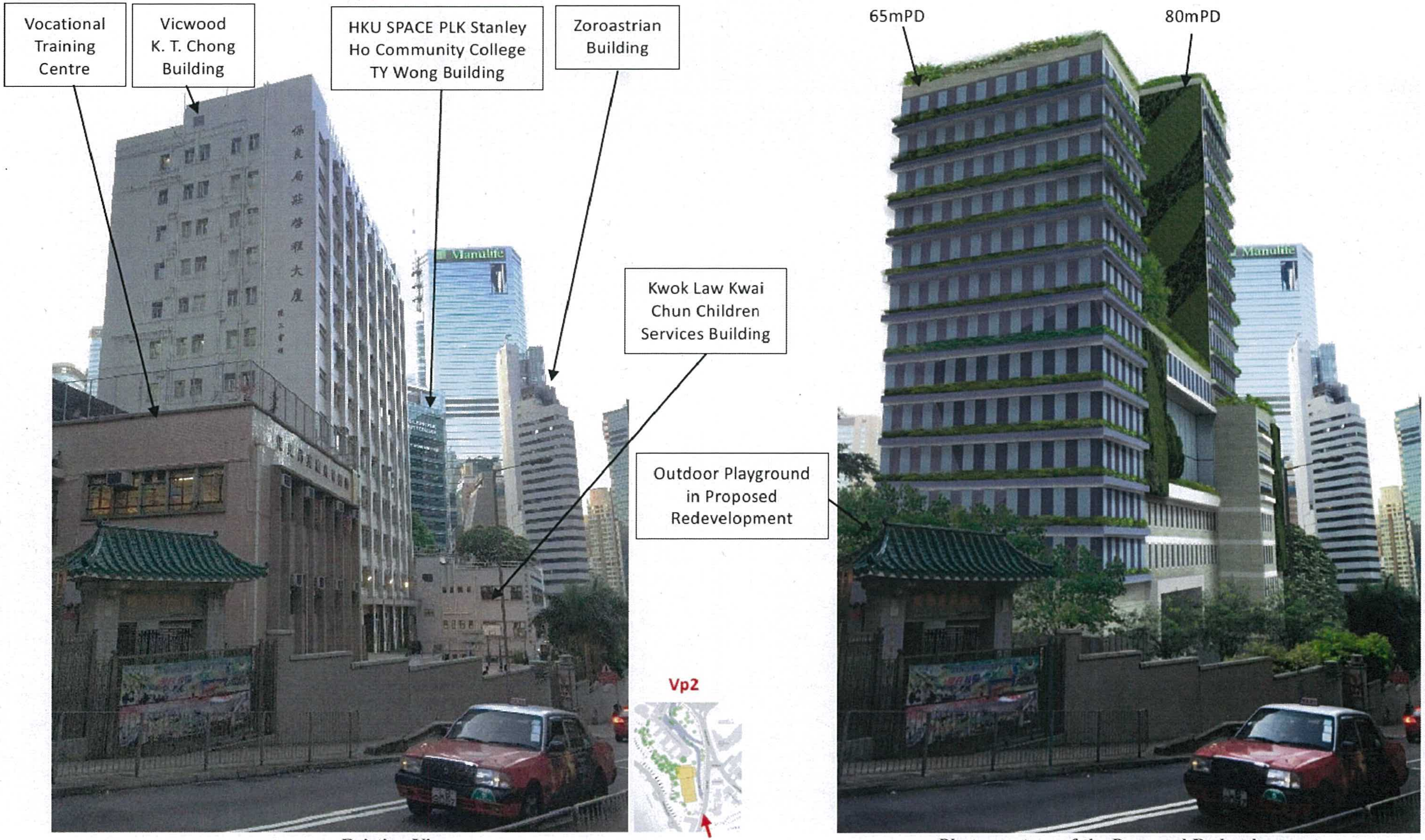
Existing View

Photomontage of Proposed Redevelopment

資料來源：由項目倡議人提供
SOURCE : SUBMITTED BY THE PROJECT PROPONENT

參考編號 REFERENCE No.	繪圖 DRAWING
M/H7/15/7	4

Vp 2 - View from Link Road from the South

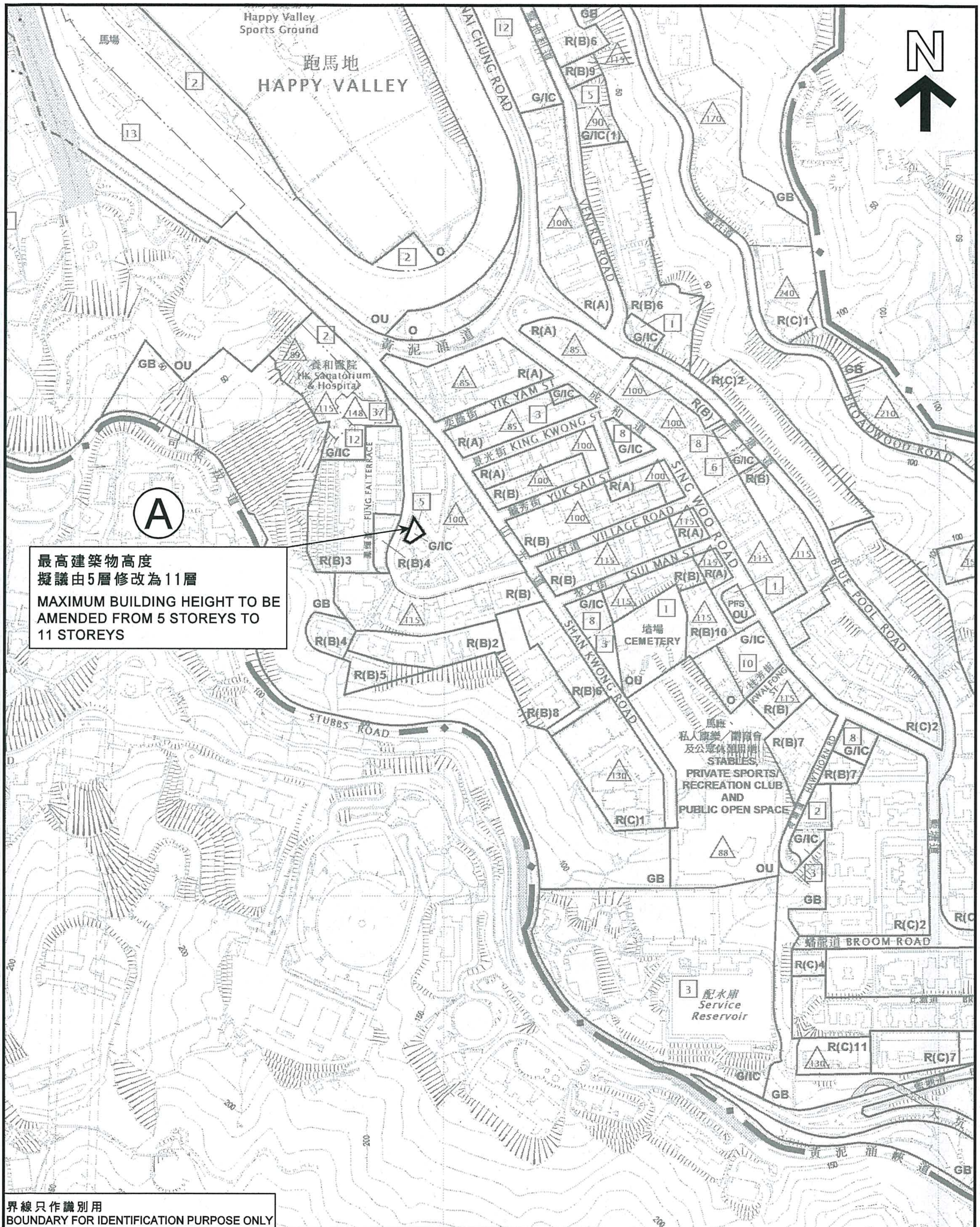


Existing View

Photomontage of the Proposed Redevelopment

資料來源：由項目倡議人提供
SOURCE : SUBMITTED BY THE PROJECT PROPONENT

參考編號 REFERENCE No.	繪圖 DRAWING
M/H7/15/7	5



界線只作識別用
BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

本摘要圖於2015年9月18日擬備，
所根據的資料為於2014年7月8日
核准的分區計劃大綱圖編號S/H7/17
EXTRACT PLAN PREPARED ON 18.9.2015
BASED ON OUTLINE ZONING PLAN No.
S/H7/17 APPROVED ON 8.7.2014

位置圖 LOCATION PLAN

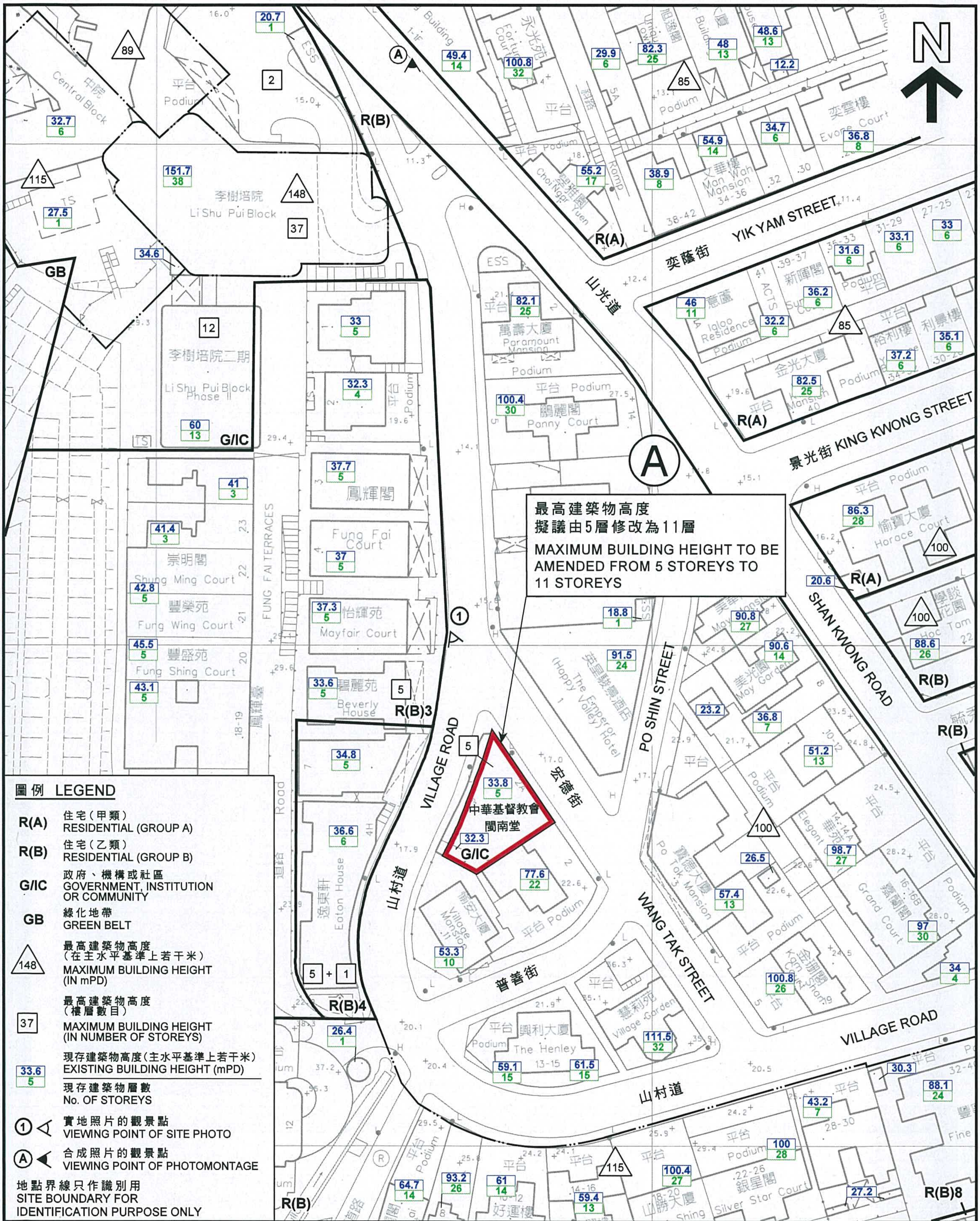
黃泥涌分區計劃大綱核准圖編號S/H7/17的擬議修訂項目
PROPOSED AMENDMENTS TO THE APPROVED
WONG NAI CHUNG OUTLINE ZONING PLAN No. S/H7/17
修訂項目A
AMENDMENT ITEM A

SCALE 1 : 5 000 比例尺
米 METRES 100 0 100 200 米 METRES

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/H7/15/7

圖 PLAN
1



本摘要圖於2015年9月17日擬備,
所根據的資料為測量圖編號
11-SW-15D及20B

EXTRACT PLAN PREPARED ON 17.9.2015
BASED ON SURVEY SHEETS No.
11-SW-15D & 20B

平面圖 SITE PLAN

黃泥涌分區計劃大綱核准圖編號S/H7/17的擬議修訂項目

PROPOSED AMENDMENTS TO THE APPROVED WONG NAI CHUNG OUTLINE ZONING PLAN No. S/H7/17

修訂項目A

AMENDMENT ITEM A

SCALE 1 : 1 000 比例尺

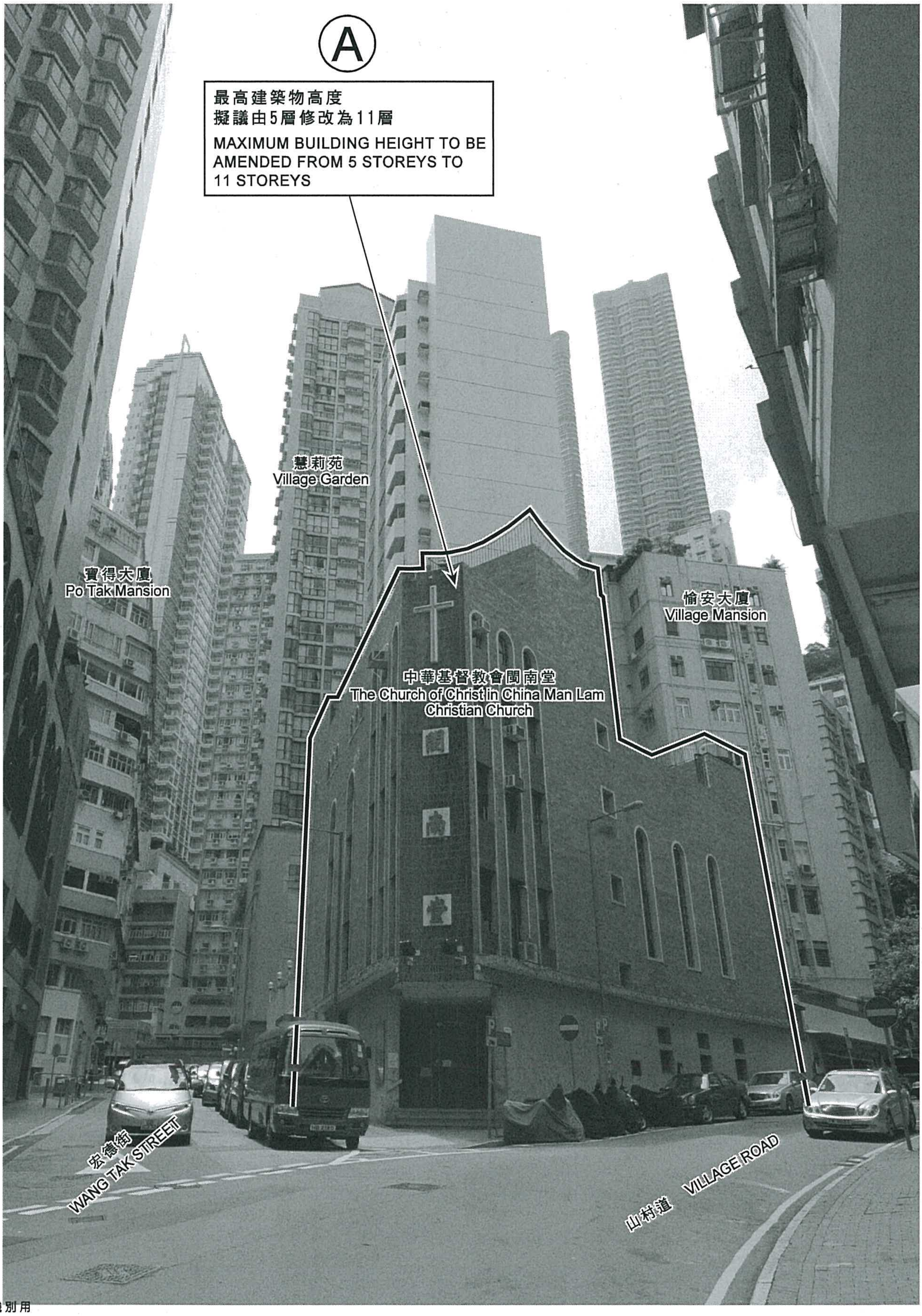
米 METRES 20 0 20 40 米 METRES

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/H7/15/7

圖 PLAN
2

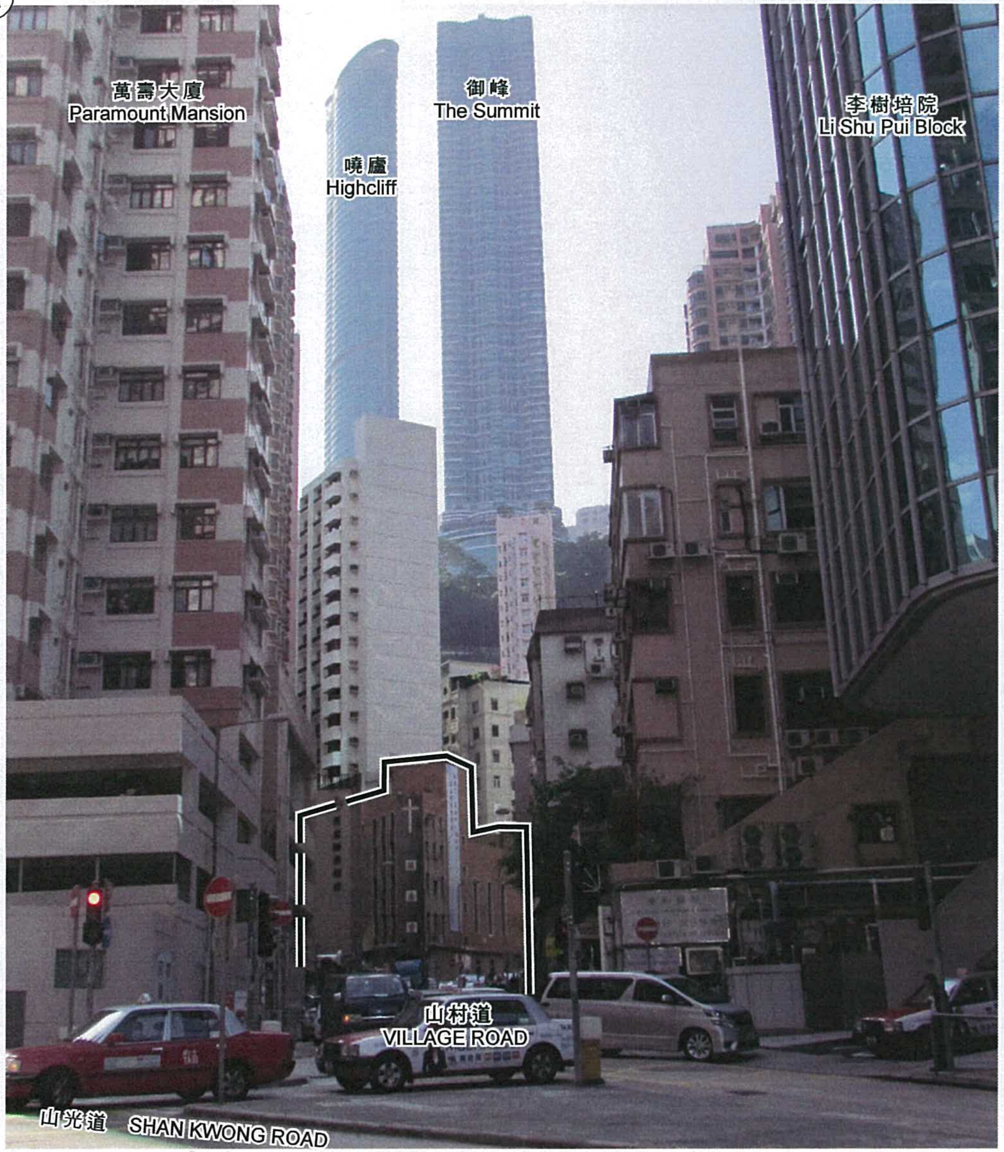
①



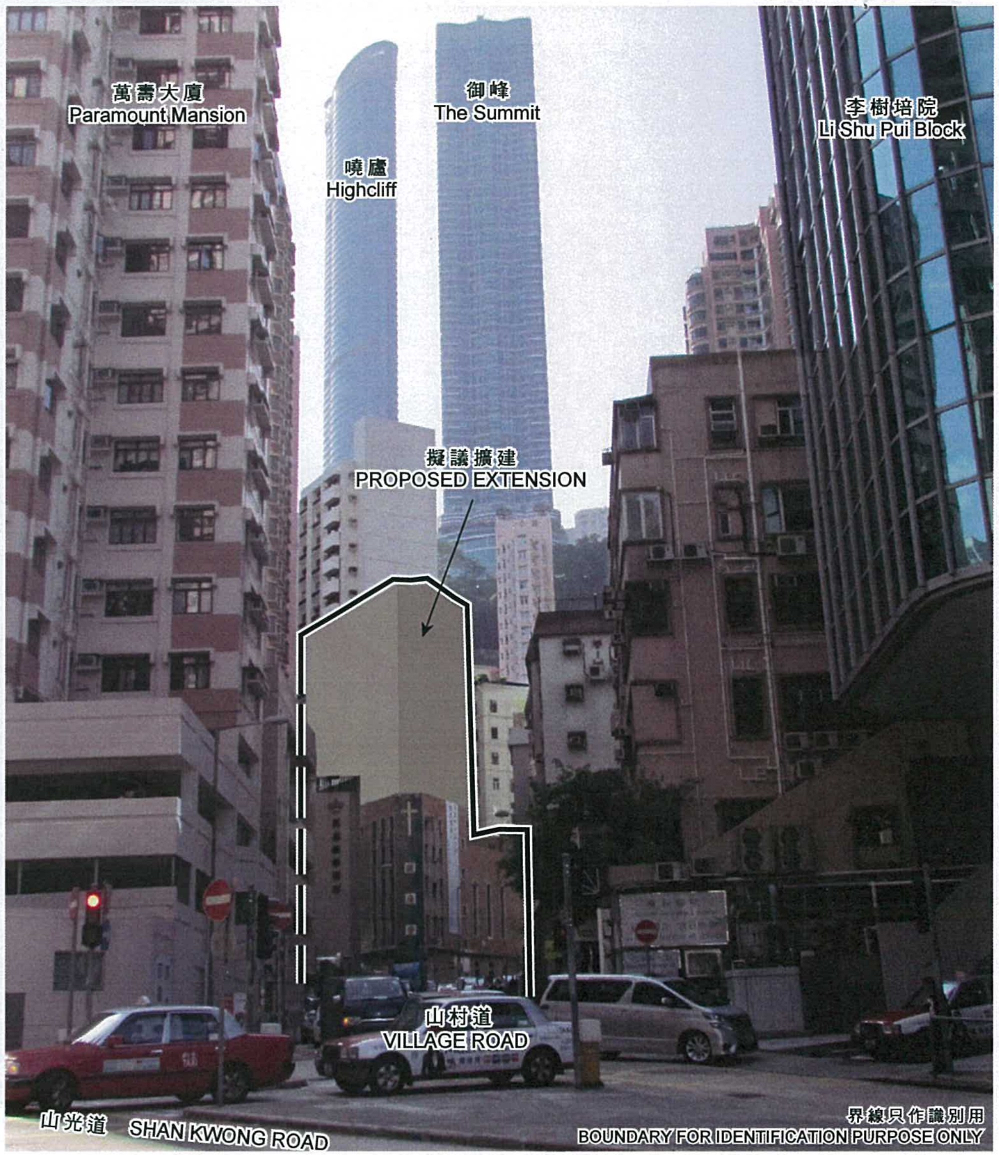
界線只作識別用
BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

本圖於2015年9月30日擬備，所根據的資料為2015年9月9日的實地照片 PLAN PREPARED ON 30.9.2015 BASED ON SITE PHOTO TAKEN ON 9.9.2015	實地現況照片 SITE PHOTO OF EXISTING CONDITION 黃泥涌分區計劃大綱核准圖編號S/H7/17的擬議修訂項目 PROPOSED AMENDMENTS TO THE APPROVED WONG NAI CHUNG OUTLINE ZONING PLAN No. S/H7/17 修訂項目A AMENDMENT ITEM A	規劃署 PLANNING DEPARTMENT 參考編號 REFERENCE No. M/H7/15/7	圖 PLAN 3

A

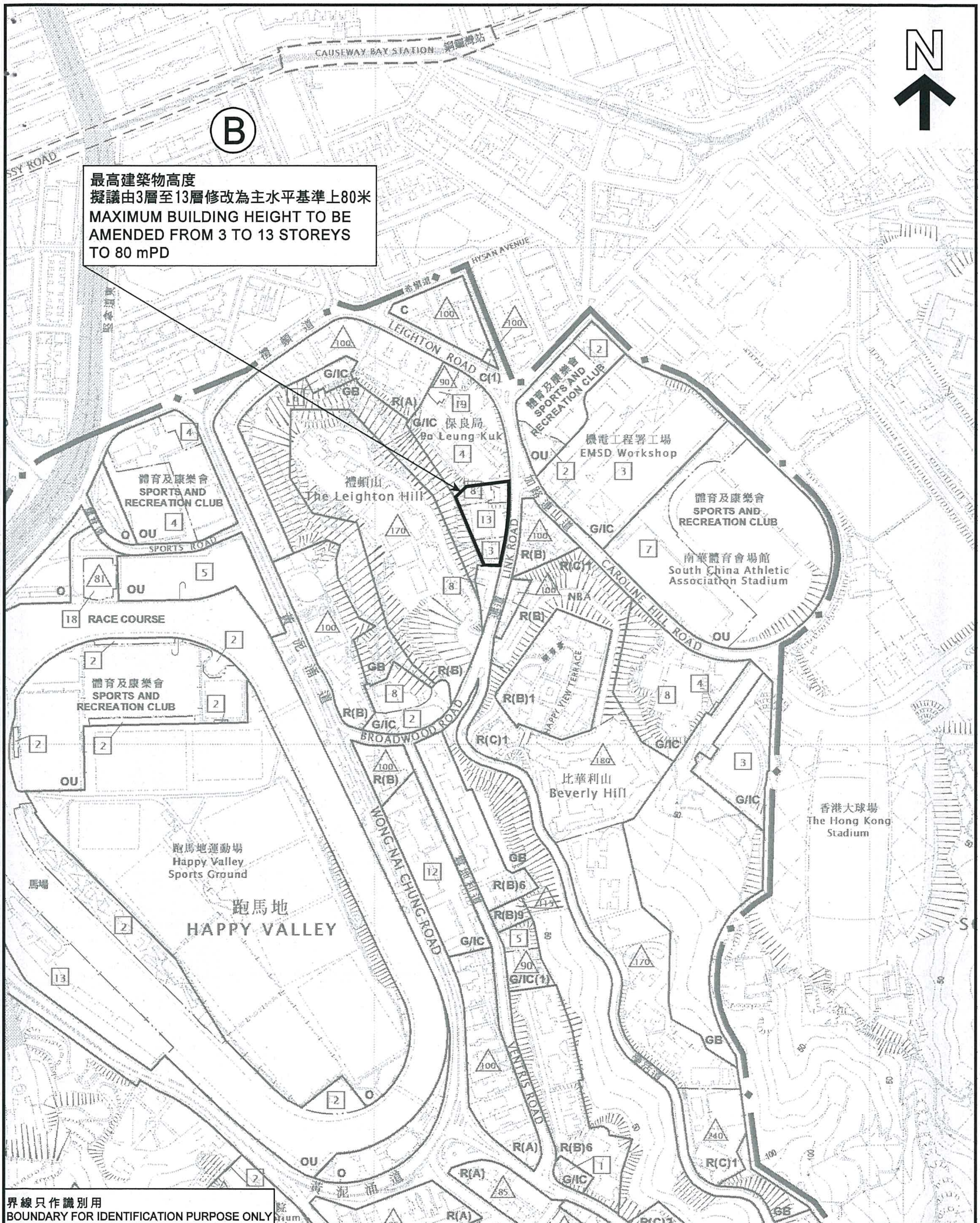


現有景觀 EXISTING VIEW



擬議擴建合成照片 PHOTOMONTAGE OF PROPOSED EXTENSION

本圖於2015年10月2日擬備，所根據的資料為2013年11月20日的實地照片 PLAN PREPARED ON 2.10.2015 BASED ON SITE PHOTO TAKEN ON 20.11.2013	**合成照片 PHOTOMONTAGE** 黃泥涌分區計劃大綱核准圖編號S/H7/17的擬議修訂項目 PROPOSED AMENDMENTS TO THE APPROVED WONG NAI CHUNG OUTLINE ZONING PLAN No. S/H7/17 修訂項目A AMENDMENT ITEM A	規劃署 PLANNING DEPARTMENT 參考編號 REFERENCE No. M/H7/15/7	圖 PLAN 4



本摘要圖於2015年9月17日擬備，
所根據的資料為於2014年7月8日
核准的分區計劃大綱圖編號S/H7/17
EXTRACT PLAN PREPARED ON 17.9.2015
BASED ON OUTLINE ZONING PLAN No.
S/H7/17 APPROVED ON 8.7.2014

位置圖 LOCATION PLAN

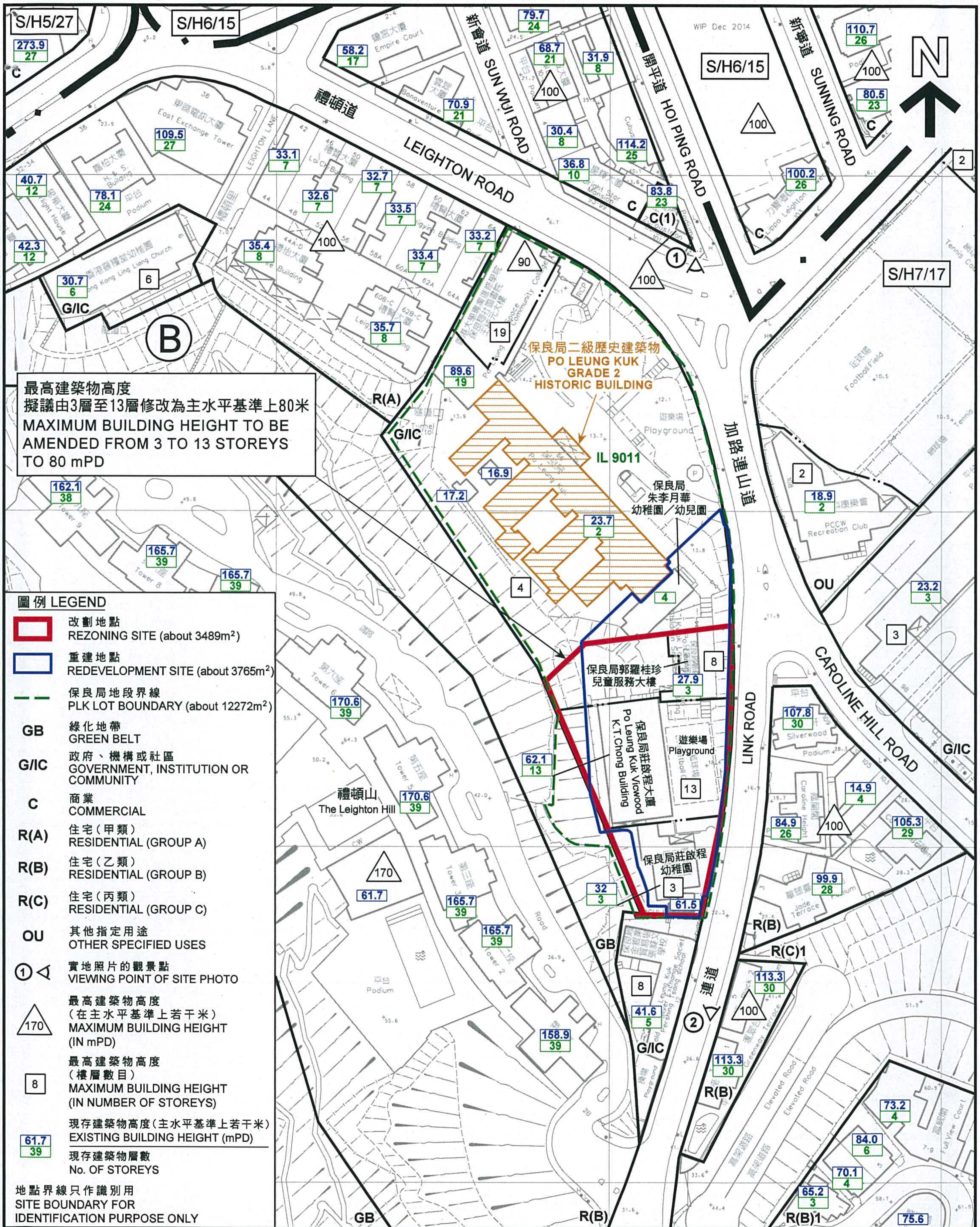
黃泥涌分區計劃大綱核准圖編號S/H7/17的擬議修訂項目
PROPOSED AMENDMENTS TO THE APPROVED
WONG NAI CHUNG OUTLINE ZONING PLAN No. S/H7/17
修訂項目B
AMENDMENT ITEM B

SCALE 1 : 5 000 比例尺
米 METRES 100 0 100 200 米 METRES

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/H7/15/7

圖 PLAN
5



本摘要圖於2015年9月18日擬備，
所根據的資料為測量圖編號11-SW-15B
EXTRACT PLAN PREPARED ON 18.9.2015
BASED ON SURVEY SHEET No.11-SW-15B

平面圖 SITE PLAN

黃泥涌分區計劃大綱核准圖編號S/H7/17的擬議修訂項目
PROPOSED AMENDMENTS TO THE APPROVED
WONG NAI CHUNG OUTLINE ZONING PLAN No. S/H7/17

修訂項目B
AMENDMENT ITEM B

SCALE 1 : 1 500 比例尺

米 METRES 25 0 25 50 米 METRES

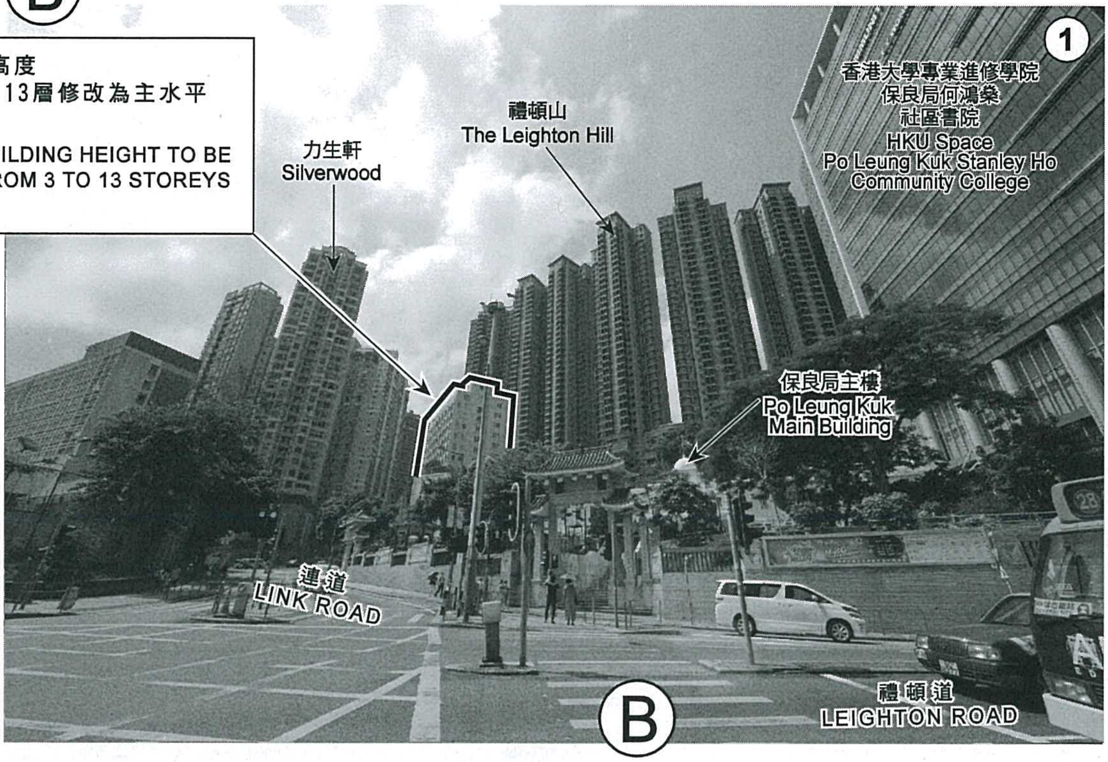
規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/H7/15/7

圖 PLAN
6

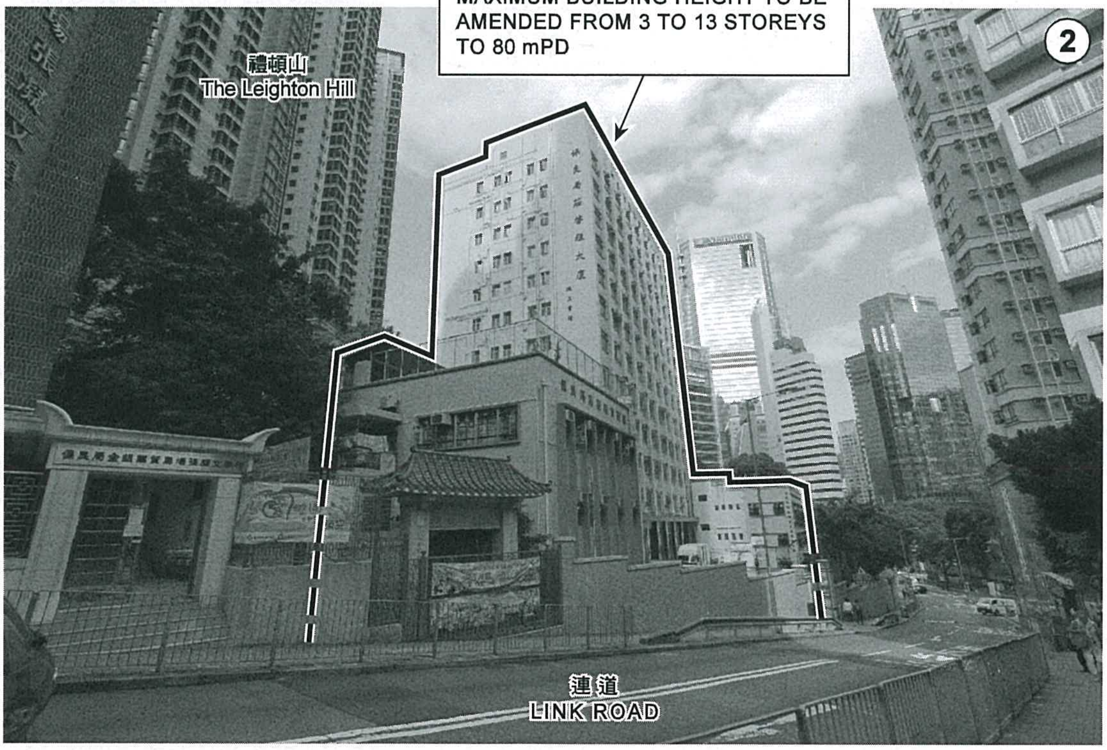
B

最高建築物高度
擬議由3層至13層修改為主水平基準上80米
MAXIMUM BUILDING HEIGHT TO BE AMENDED FROM 3 TO 13 STOREYS TO 80 mPD



B

最高建築物高度
擬議由3層至13層修改為主水平基準上80米
MAXIMUM BUILDING HEIGHT TO BE AMENDED FROM 3 TO 13 STOREYS TO 80 mPD



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本圖於2015年9月15日擬備，所根據的資料為攝於2015年9月9日(上)及2014年12月16日(下)的實地照片
PLAN PREPARED ON 15.9.2015 BASED ON SITE PHOTOS TAKEN ON 9.9.2015(UPPER) & 16.12.2014(LOWER)

實地現況照片
SITE PHOTOS OF EXISTING CONDITION

黃泥涌分區計劃大綱核准圖編號S/H7/17的擬議修訂項目
PROPOSED AMENDMENTS TO THE APPROVED WONG NAI CHUNG OUTLINE ZONING PLAN No. S/H7/17

修訂項目B
AMENDMENT ITEM B

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/H7/15/7

圖 PLAN
7