



圖例
NOTATION

ZONES

COMMERCIAL
RESIDENTIAL (GROUP A)
RESIDENTIAL (GROUP B)
GOVERNMENT, INSTITUTION OR COMMUNITY
OPEN SPACE
OTHER SPECIFIED USES
GREEN BELT

C
R(A)
R(B)
GHC
O
OU
GB

地帶
商業
住宅 (甲類)
住宅 (乙類)
政府、機構或社區
休憩用地
其他指定用途
綠化地帶

COMMUNICATIONS

RAILWAY AND STATION (UNDERGROUND)
RAILWAY AND STATION (ELEVATED)
MAJOR ROAD AND JUNCTION
ELEVATED ROAD

交通
鐵路及車站 (地下)
鐵路及車站 (高架)
主要道路及路口
高架道路

MISCELLANEOUS

BOUNDARY OF PLANNING SCHEME
BUILDING HEIGHT CONTROL ZONE BOUNDARY
MAXIMUM BUILDING HEIGHT (IN METRES ABOVE PRINCIPAL DATUM)
MAXIMUM BUILDING HEIGHT (IN NUMBER OF STOREYS)
PETROL FILLING STATION
NON-BUILDING AREA

其他
規劃範圍界線
建築物高度管制區界線
最高建築物高度 (在主水平基準上若干米)
最高建築物高度 (樓層數目)
加油站
非建築用地

土地用途及面積一覽表
SCHEDULE OF USES AND AREAS

USES	大約面積及百分比 APPROXIMATE AREA & %		用途
	公頃 HECTARES	%	
COMMERCIAL	2.42	0.71	商業
RESIDENTIAL (GROUP A)	62.35	18.27	住宅 (甲類)
RESIDENTIAL (GROUP B)	4.74	1.39	住宅 (乙類)
GOVERNMENT, INSTITUTION OR COMMUNITY	50.86	14.90	政府、機構或社區
OPEN SPACE	52.15	15.28	休憩用地
OTHER SPECIFIED USES	44.03	12.90	其他指定用途
GREEN BELT	52.64	15.43	綠化地帶
MAJOR ROAD ETC.	72.07	21.12	主要道路等
TOTAL PLANNING SCHEME AREA	341.26	100.00	規劃範圍總面積

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

核准圖編號 S/K 13/25 的修訂
AMENDMENTS TO APPROVED PLAN No. S/K13/25

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

修訂項目 A 項
AMENDMENT ITEM A

修訂項目 B 1, B 2, B 3, B 4, B 5 項
AMENDMENT ITEMS B1, B2, B3, B4, B5

修訂項目 C 1, C 2, C 3, C 4 項
AMENDMENT ITEMS C1, C2, C3, C4

修訂項目 D 1, D 2, D 3, D 4, D 5, D 6 項
AMENDMENT ITEMS D1, D2, D3, D4, D5, D6

修訂項目 E 1, E 3 項
AMENDMENT ITEMS E1, E3

修訂項目 E 2, E 5 項
AMENDMENT ITEMS E2, E5

修訂項目 E 4 項
AMENDMENT ITEM E4

修訂項目 F 1, F 2, F 3 項
AMENDMENT ITEMS F1, F2, F3

修訂項目 G 1, G 2 項
AMENDMENT ITEMS G1, G2

修訂項目 E 1, E 3 項
AMENDMENT ITEMS E1, E3

修訂項目 E 2, E 5 項
AMENDMENT ITEMS E2, E5

修訂項目 E 4 項
AMENDMENT ITEM E4

修訂項目 F 1, F 2, F 3 項
AMENDMENT ITEMS F1, F2, F3

修訂項目 G 1, G 2 項
AMENDMENT ITEMS G1, G2

(參看附表)
(SEE ATTACHED SCHEDULE)

2010年11月19日 按照城市規劃條例第5條展示的
核准圖編號 S/K13/25 的修訂
AMENDMENTS TO APPROVED PLAN No. S/K13/25 EXHIBITED
UNDER SECTION 5 OF THE TOWN PLANNING ORDINANCE ON
19 NOVEMBER 2010

S. LAU
SECRETARY
TOWN PLANNING BOARD

劉星
城市規劃委員會秘書

香港城市規劃委員會依據城市規劃條例擬備的牛頭角及九龍灣（九龍規劃區第13及17區）分區計劃大綱圖
TOWN PLANNING ORDINANCE, HONG KONG TOWN PLANNING BOARD
KOWLOON PLANNING AREAS No. 13 & 17 - NGAU TAU KOK & KOWLOON BAY - OUTLINE ZONING PLAN

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

圖則編號
PLAN No. S/K13/26

本摘要圖於2018年3月1日擬備
EXTRACT PLAN PREPARED ON 1.3.2018

參考編號 REFERENCE No. M/K13/17/108



Annex A2 of
TPB Paper No. 10397

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)
GOVERNMENT, INSTITUTION OR COMMUNITY	GIC	政府、機構或社區
OPEN SPACE	O	休憩用地
OTHER SPECIFIED USES	OU	其他指定用途
GREEN BELT	GB	綠化地帶
COMMUNICATIONS		交通
RAILWAY AND STATION (UNDERGROUND)		鐵路及車站 (地下)
RAILWAY AND STATION (ELEVATED)		鐵路及車站 (高架)
MAJOR ROAD AND JUNCTION		主要道路及路口
ELEVATED ROAD		高架道路
MISCELLANEOUS		其他
BOUNDARY OF PLANNING SCHEME		規劃範圍界線
BUILDING HEIGHT CONTROL ZONE BOUNDARY		建築物高度管制區界線
MAXIMUM BUILDING HEIGHT (IN METRES ABOVE PRINCIPAL DATUM)		最高建築物高度 (在主水平基準上若干米)
MAXIMUM BUILDING HEIGHT (IN NUMBER OF STOREYS)		最高建築物高度 (樓層數目)
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	大約面積及百分比 APPROXIMATE AREA & %		用途
	公頃 HECTARES	% 百分比	
COMMERCIAL	2.42	0.71	商業
RESIDENTIAL (GROUP A)	66.80	19.57	住宅 (甲類)
RESIDENTIAL (GROUP B)	4.74	1.39	住宅 (乙類)
GOVERNMENT, INSTITUTION OR COMMUNITY	49.62	14.54	政府、機構或社區
OPEN SPACE	48.33	14.16	休憩用地
OTHER SPECIFIED USES	44.28	12.98	其他指定用途
GREEN BELT	52.63	15.42	綠化地帶
MAJOR ROAD ETC.	72.44	21.23	主要道路等
TOTAL PLANNING SCHEME AREA	341.26	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7條展示。
THE ATTACHED NOTES ALSO FORM PART OF THIS PLAN
AND HAVE BEEN AMENDED FOR EXHIBITION UNDER
SECTION 7 OF THE TOWN PLANNING ORDINANCE

草圖編號 S/K 13/28 的修訂
AMENDMENTS TO DRAFT PLAN No. S/K13/28

AMENDMENTS EXHIBITED UNDER SECTION 7 OF THE TOWN PLANNING ORDINANCE		按照城市規劃條例第7條 展示的修訂
AMENDMENT ITEM A		修訂項目 A 項
AMENDMENT ITEM B		修訂項目 B 項
AMENDMENT ITEM C		修訂項目 C 項
AMENDMENT ITEM D1		修訂項目 D 1 項
AMENDMENT ITEM D2		修訂項目 D 2 項

(參看附表)
(SEE ATTACHED SCHEDULE)

2017年4月13日 按照城市規劃條例第7條展示的
草圖編號 S/K13/28 的修訂
AMENDMENTS TO DRAFT PLAN No. S/K13/28 EXHIBITED
UNDER SECTION 7 OF THE TOWN PLANNING ORDINANCE ON
13 APRIL 2017

Fiona LUNG
SECRETARY
TOWN PLANNING BOARD

香港城市規劃委員會依據城市規劃條例擬備的牛頭角及九龍灣（九龍規劃區第13及17區）分區計劃大綱圖
TOWN PLANNING ORDINANCE, HONG KONG TOWN PLANNING BOARD
KOWLOON PLANNING AREAS No. 13 & 17 - NGAU TAU KOK & KOWLOON BAY - OUTLINE ZONING PLAN

1:10000
0 200 400 600 800 METRES

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

圖則編號
PLAN No. S/K13/29

Building Design to Foster a Quality and Sustainable Built Environment

There has been rising public concern over the quality and sustainability of the built environment, including issues regarding building bulk and height, air ventilation, greening and energy efficiency in buildings. In 2009, the Council for Sustainable Development launched a public engagement process entitled “Building Design to Foster a Quality and Sustainable Built Environment” in collaboration with the Government. The exercise has pointed to a need for putting in place a package of new measures to foster a quality and sustainable built environment. This practice note sets out a package of measures, covering the following major elements, to promote a quality and sustainable built environment:

- (a) sustainable building design guidelines (SBD Guidelines) on building separation, building set back and site coverage of greenery,
- (b) gross floor area (GFA) concessions, and
- (c) energy efficiency of buildings.

Sustainable Building Design Guidelines

2. The Buildings Department (BD) has commissioned a consultancy study on “Building Design that Supports Sustainable Urban Living Space in Hong Kong”. Based on the study, a set of SBD Guidelines has been developed to promote building separation, building set back and site coverage of greenery as promulgated in the Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers (PNAP) APP-152.

3. To enhance the quality and sustainability of the built environment, the Building Authority (BA) will take account of the compliance with the SBD Guidelines as promulgated in the PNAP APP-152, where applicable, as a pre-requisite in exempting or disregarding green / amenity features and non-mandatory / non-essential plant rooms and services from GFA and/or site coverage calculations (GFA concessions) in new building developments. Such green / amenity features and non-mandatory / non-essential plant rooms and services and the relevant practice notes promulgating the criteria and requirements for granting GFA concessions are summarised in Appendix A.

/Overall

Overall Cap on GFA Concessions

4. To contain the effect on the building bulk while allowing flexibility in the design for incorporating desirable green / amenity features and non-mandatory / non-essential plant rooms and services, an overall cap will be imposed on the total amount of GFA concessions for these features, except those features described in paragraph 5 below. This cap is set at 10 % of the total GFA of the development. If a development comprises both domestic and non-domestic buildings or in the case of a composite building, GFA concessions for features serving the domestic part or the non-domestic part of the development will be calculated separately such that GFA concessions for each part will be capped at 10%, based on the total GFA of the respective part of the development. Features that are subject to this overall cap of GFA concessions are listed in the table at Appendix A.

5. GFA concessions for the following features, which may have to satisfy their own individual acceptance criteria, will not be subject to the overall cap:

- (a) Mandatory features and essential plant rooms such as refuse storage chamber, telecommunications and broadcasting rooms;
- (b) Communal podium gardens and sky gardens that improve permeability of a development to its neighbourhood;
- (c) Floor space used solely for parking motor vehicles and loading and unloading of motor vehicles which is separately controlled given its significant impact on building bulk and height and the relevant transport, planning and environmental policies;
- (d) Voids in front of cinemas or in shopping arcades, etc. with operational needs in non-domestic developments;
- (e) Bonus GFA and / or GFA exemptions relating to dedication for public passage or surrender for road widening and building set back in accordance with the SBD Guidelines; and
- (f) Hotel concessions granted under regulation 23A of the Building (Planning) Regulations.

Pre-requisites for Granting GFA Concessions

6. To promote sustainable building designs and energy efficient features in new developments, compliance with the following requirements will be pre-requisites for the granting of GFA concessions for all green / amenity features and non-mandatory / non-essential plant rooms and services provided in a proposed development as described in Appendix A:

/(a)

- (a) Compliance with the SBD Guidelines on building separation, building set back and site coverage of greenery in PNAP APP-152, where applicable;
- (b) For domestic or composite development, compliance with the requirements of PNAP APP-156 on Design and Construction Requirements for Energy Efficiency of Residential Buildings, where applicable;
- (c) Submission of the official letter issued by the Hong Kong Green Building Council (HKGBC) acknowledging the satisfactory completion of project registration application for BEAM Plus certification;
- (d) Submission of a letter by the developer or owner undertaking to submit to the BD the following documents:
 - (i) Result of the Provisional Assessment under the BEAM Plus certification conferred / issued by the HKGBC to be submitted prior to the application for consent to commence the building works shown on the approved plans (consent);
 - (ii) Information on the estimated energy performance / consumption for the common parts (for domestic developments) or for the entire building (for non-domestic developments including hotels) to be submitted in the standard form (Appendix B) prior to the consent application;
 - (iii) Information specified in item (ii) above to be updated and submitted at the time of submitting application for occupation permit (OP);
 - (iv) Result of the Final Assessment under the BEAM Plus certification conferred / issued by the HKGBC, within 18 months of the date of issuance of the OP by the BA;
 - (v) Provisional energy efficiency report prior to the consent application in accordance with PNAP APP-156, where applicable; and
 - (vi) Final energy efficiency report upon application for an OP in accordance with PNAP APP-156, where applicable;
- (e) Compliance with the overall cap on GFA concessions as described in paragraph 4 above, where applicable; and

/ (f)

- (f) Compliance with the relevant acceptance criteria for the individual green and amenity features.

Conditions for Granting GFA Concessions

7. In addition to the acceptance criteria and conditions that may be imposed for granting GFA concessions as detailed in the relevant practice notes for the green / amenity features and non-mandatory / non-essential plant rooms and services described in paragraph 6 above, the following conditions may be imposed:

- (a) The modification is given in recognition of the undertaking submitted by the developer or owner as described in paragraph 6(d) above;
- (b) Information described in paragraph 6(d)(i), (ii) and (v) above shall be submitted to the BD prior to the consent application;
- (c) Information described in paragraph 6(d)(iii) and (vi) above shall be submitted to the BD at the time of submitting application for OP;
- (d) Information described in paragraph 6(d)(iv) above shall be submitted to the BD within 18 months of the date of the OP; and
- (e) The modification will be revoked if the consent application is submitted prior to the submission of information specified in item (b) above.

8. Authorized persons should consult a registered professional engineer under the Engineers Registration Ordinance of the relevant discipline in assessing the energy efficiency of the building and in completing the standard form at Appendix B;

Disclosure for Public Information

9. To increase the transparency of information to the public, the following information will be uploaded onto the BD website after the issuance of the occupation permit:

- (a) The estimated energy performance / consumption information as described in paragraph 6(d)(iii) above;
- (b) The results of the Provisional Assessment under the BEAM Plus certification as described in paragraph 6(d)(i) above, which will be replaced by the results of the Final Assessment described in paragraph 6(d)(iv) above, upon receipt; and

/(c)

- (c) The finalised RTTV and OTTV for RRF as recorded in the final energy efficiency report.

(HUI Siu-wai)
Building Authority

Ref. : BD GP/BREG/P/49

First issue January 2011

This revision September 2014 (AD/NB1) (paras. 6, 7 and 9, Item 27 in Appendix A and Appendix B amended and previous paras. 10 and 11 deleted)

List of GFA Concessions

		Practice Notes	Features subject to compliance with the pre-requisites in para. 6 & 7 of PNAP APP-151	Features Subject to the Overall Cap of 10% in para.4 of PNAP APP-151
Disregarded GFA under Regulation 23(3)(b) of the Building (Planning) Regulations (B(P)R)				
1.	Carpark and loading/unloading area excluding public transport terminus	PNAP APP-2 and APP-111		
2.	Plant rooms and similar services			
2.1	Mandatory feature or essential plant room, area of which is limited by respective PNAP or regulation, such as lift machine room, TBE room, refuse storage chamber, etc. ¹	PNAP APP-35 & APP-84		
2.2	Mandatory feature or essential plant room, areas of which is NOT limited by any PNAP or regulation, such as room occupied solely by FSI and equipment, meter room, transformer room, potable and flushing water tank, etc. ²	PNAP APP-2 and APP-42		
2.3	Non-mandatory or non-essential plant room, such as A/C plant room, AHU room, etc. ³	PNAP APP-2 and APP-42	✓	✓
Disregarded GFA under Regulation 23A(3) of the B(P)R				
3.	Area for picking up and setting down persons departing from or arriving at the hotel by vehicle	PNAP APP-40		
4.	Supporting facilities for a hotel	PNAP APP-40		
Green Features under Joint Practice Notes (JPNs)				
5.	Balcony for residential buildings	JPN1	✓	✓
6.	Wider common corridor and lift lobby	JPN1	✓	✓
7.	Communal sky garden	JPN1 & 2 PNAP APP-122	✓	
8.	Communal podium garden for non-residential buildings	JPN1	✓	
9.	Acoustic fin	JPN1	✓	
10.	Wing wall, wind catcher and funnel	JPN1	✓	
11.	Non-structural prefabricated external wall	JPN2	✓	✓
12.	Utility platform	JPN2	✓	✓
13.	Noise barrier	JPN2	✓	
Amenity Features				
14.	Counter, office, store, guard room and lavatory for watchman and management staff, Owners' Corporation Office	PNAP APP-42	✓	✓
15.	Residential recreational facilities including void, plant room, swimming pool filtration plant room, covered walkway etc serving solely the recreational facilities	PNAP APP-2, APP-42 and APP-104	✓	✓
16.	Covered landscaped and play area	PNAP APP-42	✓	

17.	Horizontal screen/covered walkway, trellis	PNAP APP-42	✓	✓ ⁹
18.	Larger lift shaft	PNAP APP-89	✓	✓
19.	Chimney shaft	PNAP APP-2	✓	✓
20.	Other non-mandatory or non-essential plant room, such as boiler room, SMATV room ⁴	PNAP APP-2	✓	✓
21.	Pipe duct, air duct for mandatory feature or essential plant room ⁵	PNAP APP-2 & APP-93		
22.	Pipe duct, air duct for non-mandatory or non-essential plant room ⁶	PNAP APP-2	✓	✓
23.	Plant room, pipe duct, air duct for environmentally friendly system and feature ⁷	PNAP APP-2	✓	
24.	High headroom and void in front of cinema, shopping arcade etc. in non-domestic development ⁸	PNAP APP-2	✓	
25.	Void over main common entrance (prestige entrance) in non-domestic development	PNAP APP-2 & APP-42	✓	✓
26.	Void in duplex domestic flat and house	PNAP APP-2	✓	✓
27.	Sunshade and reflector	PNAP APP-19, APP-67 & APP-156		
28.	Minor projection such as AC box, window cill, projecting window	PNAP APP-19 & APP-42		
29.	Other projection such as air-conditioning box and platform with a projection of more than 750mm from the external wall	PNAP APP-19	✓	✓
Other Items				
30.	Refuge floor including refuge floor cum sky garden	PNAP APP-2 & APP-122		
31.	Covered area under large projecting/overhanging feature	PNAP APP-19		
32.	Public transport terminus (PTT)	PNAP APP-2		
33.	Party structure and common staircase	PNAP ADM-2		
34.	Horizontal area of staircase, lift shaft and vertical duct solely serving floor accepted as not being accountable for GFA	PNAP APP-2		
35.	Public passage	PNAP APP-108		
36.	Covered set back area	PNAP APP-152		
Bonus GFA				
37.	Bonus GFA	PNAP APP-108		

Notes:

- 1 Mandatory feature or essential plant room, area of which is limited by respective PNAP or regulation, include duct for basement smoke extraction system, lift machine room, telecommunications and broadcasting room, refuse storage chamber, refuse storage and material recovery chamber, material recovery chamber, refuse storage and material recovery room, or similar feature / plant room, and pipe and air ducts which are part of the distribution network for such mandatory feature or essential plant and contained within such room.
- 2 Mandatory feature or essential plant room, area of which is NOT limited by any PNAP or regulation*, include electrical switch room, meter room, transformer room, generator room, potable and flushing water tank and pump room, sewage treatment plant room, refuse chute, refuse hopper room, room occupied solely by fire service installations and equipment such as fire service / sprinkler water tank and pump room, fire control centre, CO2 room, fan for smoke extraction system / staircase pressurization system, hose reel closet, sump pump room/ pump room for rainwater, soil and waste disposal, or similar feature / plant room and pipe and air ducts which are part of the distribution network for such mandatory feature or essential plant and contained within such room.

- 3 Non-mandatory feature or non-essential plant room, area of which may be disregarded under regulation 23(3)(b) of the B(P)R, include plant room occupied solely by machinery or equipment for air-conditioning or heating system such as AC plant room, air handling unit room, or similar plant room, and pipe and air ducts which are part of the distribution network for such feature or plant and contained within such room.
- 4 Other non-mandatory feature or non-essential plant room, area of which may be exempted under regulation 23(3)(a) of the B(P)R, include hot water boiler room, filtration plant room for swimming pool in a hotel or for a water feature in a communal garden/landscape area, SMATV room, or similar plant room, and pipe and air ducts which are part of the distribution network for such feature or plant and contained within such room.
- 5 Pipe duct, air duct for mandatory feature or essential plant room, include pipe duct for rainwater, soil and waste disposal and individual pipe and air ducts which are part of the distribution network for such mandatory feature or essential plant as described in notes 1 and 2 above, and located outside such plant room.
- 6 Pipe duct, air duct for non-mandatory feature or non-essential plant room, include individual pipe and air ducts which are part of the distribution network for such non-mandatory feature or non-essential plant as described in notes 3 and 4 above and located outside such plant room.
- 7 Plant room for environmentally friendly system and feature, area of which may be exempted under regulation 23(3)(a) of the B(P)R, include plant room for rainwater harvesting / grey water recycling system, battery room for solar panels, or similar system / feature, and pipe and air ducts which are part of the distribution network for such system and feature.
- 8 High headroom and void in front of cinema, shopping arcade etc. in non-domestic development include void in front of cinema, theatre balcony, banking hall, shopping arcade, cockloft floor for storage within the ground storey in single-staircase building, auditorium, sporting hall, school hall and religious institution that have operational justifications.
- 9 Horizontal screen / covered walkway / trellis may be excluded from the overall cap on GFA concessions subject to provision of greenery to BA's satisfaction as stipulated under PNAP APP-42.
- * Although the feature or plant room, area of which is not limited by any PNAP or regulation, only the minimum amount of GFA necessary for accommodating and maintaining the services and commensurate with the the development would be allowed to be disregarded as stated in PNAP APP-2.

(9/2014)

Declaration on Annual Energy Use of a Building Development

樓宇發展項目每年能源消耗量聲明

Part I: Building Particulars

第一部分: 樓宇詳情

(a) Building name 樓宇名稱 (if known 如知悉): (English) _____ (中文) _____

(b) Address of site 地盤地址: (English) _____

(中文) _____

(c) Lot number 地段編號: _____

(d) Type of building 樓宇類型:

* Domestic Building 住宅樓宇 / Non-domestic Building 非住宅樓宇 / Composite Building 綜合用途樓宇

(e) Provision of Central Air Conditioning 提供中央空調 *YES 是 / NO 否

(f) Provision of Energy Efficient Features 提供具能源效益的設施 *YES 是 / NO 否

(g) Please list the * proposed / installed Energy Efficient Features (add separate sheet if necessary)

請列出 * 擬安裝 / 已安裝的具能源效益的設施 (如有需要, 請另頁說明)

English

中文

1. _____
2. _____
3. _____

Part II: Predicted Annual Energy Use^① of * Proposed / Completed * Building / Part of Building第二部分: * 擬興建 / 已竣工 * 樓宇 / 部分樓宇預計每年能源消耗量^①

Type of Development 發展項目類型	Location 位置	Internal Floor Area Served (m ²) 使用有關裝置的內部樓面面積 (平方米)	Annual Energy Use of Baseline Building ^② (m ² /annum) 基線樓宇 ^② 每年能源消耗量 (平方米/年)		Annual Energy Use of Proposed/Completed Building (m ² /annum) 擬 * 興建/已竣工樓宇每年能源消耗量 (平方米/年)	
			Electricity 電力 kWh 千瓦小時	Town Gas / LPG 煤氣 / 石油氣 unit 用量單位	Electricity 電力 kWh 千瓦小時	Town Gas / LPG 煤氣 / 石油氣 unit 用量單位
Domestic Development (excluding Hotel) 住用發展項目 (不包括酒店)	Central building services installation ^③ 中央屋宇裝備裝置 ^③					
Non-domestic Development ^④ (including Hotel) 非住用發展項目 ^④	Podium(s) (central building services installation) 平台 (中央屋宇裝備裝置)					
	Podium(s) (non-central building services)					

(包括酒店)	installation) 平台 (非中央屋宇裝備裝置)					
	Tower(s) (central building services installation) 塔樓 (中央屋宇裝備裝置)					
	Tower(s) (non - central building services installation) 塔樓 (非中央屋宇裝備裝置)					

Note: In general, the lower the estimated “Annual Energy Use” of the building, the more efficient the building in terms of energy use. For example, if the estimated “annual energy use of proposed building” is less than the estimated “annual energy use of baseline building”, it means the predicted use of energy is more efficient in the proposed building than in the baseline building. The larger the reduction, the greater the efficiency.

註：一般來說，樓宇的預計每年每平方米能源消耗量愈低，樓宇的能源消耗愈有效。例如，如果擬興建樓宇的預計每年能源消耗量少於基線樓宇預計的每年能源消耗量，則表示擬興建樓宇的預計能源使用較基線樓宇有效。減少愈多，效能愈大。

Part III 第三部分

The following installation(s) * is / are * designed / completed in accordance with the relevant Codes of Practice published by the Electrical and Mechanical Services Department:-

以下裝置乃按機電工程署公布的相關實務守則 設計 / 完成：-

Type of Installations 裝置類型	YES 是	NO 否	N/A 不適用
Lighting Installations 照明裝置			
Air Conditioning Installations 空調裝置			
Electrical Installations 電力裝置			
Lift & Escalator Installations 升降機及自動梯的裝置			
Performance-based Approach 以總能源為本的方法			

Please (✓) where appropriate 請在適當方格內填上(✓)號

Signature 簽署#
(Registered Professional Engineer 註冊專業工程師/ Registered
Energy Assessor 註冊能源效益評核人)

Certificate of Registration No. 註冊證書編號#

Date of expiry of registration 註冊到期日#

Signature 簽署#
(Authorized Person 認可人士)

Certificate of Registration No. 註冊證書編號#

Date of expiry of registration 註冊到期日#

Company Chop 公司印章/ Signature of applicant 申請人簽署

Date 日期

In accordance with the registration record 根據註冊記錄

* Delete whichever is inapplicable 請刪去不適用者

- ① The predicted annual energy use per m² per annum, in terms of electricity consumption (kWh) and town gas/LPG consumption (unit) of the development by the internal floor area served, where:-
預計每年每平方米能源消耗量〔以耗電量（千瓦小時）及煤氣/石油氣消耗量用量單位〕計算，指將發展項目的每年能源消耗總量除以使用有關裝置的內部樓面面積所得出的商，其中：
- (a) “total annual energy use” has the same meaning of “annual energy use” under Section 4 and Appendix 8 of the BEAM Plus for New Building (current version); and
“每年能源消耗量”與新建樓宇BEAM Plus標準（現行版本）第4節及附錄8中的「年能源消耗」具有相同涵義；及
- (b) “internal floor area”, in relation to a building, a space or a unit means the floor area of all enclosed space measured to the internal faces of enclosing external and/or party walls.
樓宇、空間或單位的“內部樓面面積”，指外牆及/或共用牆的內壁之內表面起量度出來的樓面面積。
- ② “Baseline Building” has the same meaning as “Baseline Building Model (zero-credit benchmark)” under Section 4 and Appendix 8 of the BEAM Plus for New Building (current version).
“基線樓宇”與新建樓宇BEAM Plus標準（現行版本）第4節及附錄8中的“基準建築物模型（零分標準）”具有相同涵義。
- ③ “Central Building Services Installation” has the same meaning as that in the Code of Practice for Energy Efficiency of Building Services Installation issued by the electrical and Mechanical Services Department.
“中央屋宇裝備裝置”與機電工程署發出的《屋宇裝備裝置能源效益實務守則》中的涵義相同。
- ④ Podium(s) normally means the lowest part of the development (usually the lowest 15m of the development and its basement, if any) carrying different use(s) from that of the tower(s) above. For development without clear demarcation between podium(s) and tower(s), the development, as a whole, should be considered as tower(s).
平台一般指發展項目的最低部分（通常為發展項目最低15米部分及其地庫(如適用)），並與其上的塔樓具有不同用途。對於並無明確劃分平台與塔樓的發展項目，應視整個發展項目為塔樓。

(9/2014)

Buildings Department	Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers	APP-152
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Sustainable Building Design Guidelines

This practice note promulgates guidelines on building design which will enhance the quality and sustainability of the built environment in Hong Kong. These guidelines are the Sustainable Building Design Guidelines (SBD Guidelines) referred to in Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers (PNAP) APP-151, the compliance with which the Building Authority (BA) will take into account, where applicable, as a pre-requisite in exempting or disregarding green and amenity features and non-mandatory / non-essential plant rooms and services from gross floor area and/or site coverage calculations (GFA concessions) for new building developments. Terminology used in the SBD Guidelines is listed in Appendix A.

Objectives

2. The SBD Guidelines establish 3 key building design elements to enhance the environmental sustainability of our living space. They are building separation, building setback and site coverage of greenery. The objectives are to achieve better air ventilation, enhance the environmental quality of our living space, provide more greenery, particularly at pedestrian level; and mitigate the heat island effect.

Building Separation

3. In order to improve air ventilation, enhance the environmental quality at pedestrian level and mitigate heat island effects arising from the undesirable screening effect of long buildings at different levels, building sites of the following categories should comply with the building separation requirements:

- (a) sites that are 20,000m² or above; or
- (b) sites that are less than 20,000m² and proposed with building or group of buildings having a *continuous projected façade length (L_p)* of 60m or above.

4. Building separation requirements for each *assessment zone*:

- (a) Design Requirement (1) – *L_p*

The *L_p* of a building or group of buildings along a *street* should not exceed the maximum permissible¹ which is calculated based on 5 times the *mean width of street canyon (U)*; and

/(b)

¹ See Appendix B for computation of maximum permissible *L_p*

(b) Design Requirement (2) – *Separating Distance (S)* and *Permeability (P)*

- (i) The *P*, comprising a minimum of 2/3 *Intervening Space (IS)* and a maximum of 1/3 *Permeable Element (PE)*, assessed on two vertical projection planes for the two categories of sites should not be less than those as shown in Table 1.
- (ii) Along the chosen projection planes, the *S* for the *IS* between the projected façade of the building and the site boundaries or the centreline of adjoining *streets* / lanes should not be less than 7.5m wide; and
- (iii) If such *IS* are not sufficient to meet 2/3 of the *P*, additional *IS* with *S* not less than 15m wide can be provided between 2 projected building façades for making up.

Table 1

Height (H) of the tallest building	Minimum P of buildings in each <i>assessment zone</i> on two projection planes		
	Site area < 20,000m ² and with L _p ≥ 60m	Site area ≥ 20,000m ²	
		Plane 1	Plane 2
H ≤ 60m	20%	20%	25%
H > 60m	20%	20%	33.3%

5. Detailed requirements and method of measurement on *L_p*, *S* and *P* are given in Appendix B.

6. Standalone residential building blocks of height not exceeding 15m can be exempted from the building separation requirements and disregarded in the assessment of such for other buildings.

Building Setback

7. In order to improve air ventilation, enhance the environmental quality at pedestrian level and mitigate street canyon effect, buildings fronting a *street* less than 15m wide should be set back to comply with one of the following requirements:

- (a) For maintaining a ventilation corridor with minimum section of 15m x 15m, no part of the building up to a level of 15m above the *street* level should be within 7.5m from the centreline of the *street* as shown in Figures C1 and C2 of Appendix C. Where level of a *street* varies, the minimum sectional area should be kept along the full frontage following the profile of the *street*.

/(b).....

- (b) Where a cross-ventilated communal podium garden with a clear height of not less than 4.5m is provided, no part of the building up to a level of 15m above the *street* level, should protrude above the 45° inclined plane, the base of which is placed at *street* level at the site boundary line on the opposite side of the *street* as shown in Figures C3 and C4 of Appendix C.

Typical examples on the application of building setback requirements are given in Figures C5 to C9 of Appendix C.

8. In determining the compliance with the setback requirement, the BA may take into account the following factors:

- (a) Structures higher than 15m above the *street* level may be allowed to build over the setback area². If the setback area is uncovered, a canopy that complied with regulation 10 of the B(P)R may be permitted;
- (b) Minor projecting features and signboards projecting not more than 600mm from the external walls and at a clear height of not less than 2.5m above the *street* level; and single-storey footbridges across the setback area may also be permitted;
- (c) Columns supporting the building above may be permitted within the setback areas subject to requirements as shown in Figure C2 of Appendix C; and
- (d) The setback area should be properly landscaped and paved, and be open without any permanent building structures other than landscaped features, perforated balustrades, perforated boundary walls and structural columns.

9. Buildings may be exempted from whole or parts of the building setback requirement with reference to a *street* where its height³ is less than 2 times the mean width of the *street*.

Site Coverage of Greenery

10. In order to improve the environmental quality of the urban space, particularly at the pedestrian level and to mitigate the heat island effect, sites with areas of 1,000m² or more should be provided with *greenery areas* in accordance with Table 2. Detail guidelines are provided in Appendix D.

/Table....

² The setback area at ground level under the footprint of such structures or the covered areas under the canopy may be exempted from GFA calculation if it is designated as common parts accessible by occupants of the building and without any commercial activities.

³ Height of the building in this context is measured from the mean level of the *street* on which the building abuts to the mean height of the roof over the highest usable floor space in the building.

Table 2

Site Area	Minimum Site Coverage of Greenery	
	<i>Primary zone</i>	Overall
1,000 m ² – 20,000 m ²	10%	20%
≥ 20,000 m ²	15%	30%

11. This requirement is not applicable to sites with a single family house only.

Special Considerations

12. There are special circumstances in which genuine difficulties in complying with the SBD Guidelines may be encountered. Examples include new buildings serving special functions such as ferry piers, railway terminals, stadia; and conversion of existing buildings to new buildings especially the adaptive reuse of historic buildings where building façades or even layout are character defining elements. In recognition of such genuine constraints in meeting the prescriptive requirements, the BA takes a flexible and pragmatic stance when considering applicants' proposals holistically to achieve the objectives of the SBD Guidelines. Alternative approaches are provided in Appendix E.

Conditions for Approval

13. PNAP APP-151 specifies the compliance with the SBD guidelines as one of the pre-requisites for granting GFA concessions. When granting such modifications under section 42 of the Buildings Ordinance, the BA may impose relevant conditions for assuring the sustainability of the approved building design.

Information to be Submitted

14. To demonstrate compliance with the building separation, building setback and site coverage of greenery requirements, information as detailed in Appendix F should be submitted.

15. To increase the transparency of information to the public, plans and details showing the site coverage of greenery as described in Appendix F will be uploaded to the BD's website after the occupation permit is issued.

(HUI Siu-wai)
Building Authority

Ref. : BD GR/1-55/187/1
BD GP/BREG/P/49

First issue January 2011
This version January 2016 (AD/NB1) (General revision)

Terminology

<i>Air Ventilation Assessment (AVA)</i>	<i>Air ventilation assessment (AVA)</i> is a protocol to objectively assess the effects of planning and development proposals on external air movement for achieving a better pedestrian wind environment. An advisory framework for the methodology to undertake <i>AVA</i> has been outlined in the Technical Guideline for Air Ventilation Assessment available in the Planning Department's website under the Hong Kong Planning Standard and Guidelines.
<i>Assessment Zones</i>	<i>Assessment zones</i> demarcate the vertical spatial division for assessing fulfilment of the building separation requirement. The zonal division consists of low zone (within 20m from level zero), middle zone (20-60m from Level Zero) and high zone (higher than 60m from Level Zero). [Building Separation]
<i>Computational Fluid Dynamics (CFD)</i>	<i>CFD</i> is a branch of fluid mechanics using numerical methods and algorithms to solve and analyze problems that involve fluid flows. Computers are used to perform the millions of calculations required to simulate the interaction of fluids and gases with the complex surfaces used in engineering.
<i>Continuous projected facade length (Lp)</i>	The total projected length of facade of a building or a group of buildings if separation between them is less than 15m. (see Figures B2 & B3 of Appendix B) [Building Separation]
<i>Grass paving</i>	Paving having not less than 50% of floor designed for the growth of grass or groundcovers. [Site Coverage of Greenery]
<i>Greenery area</i>	Area with live plants and soil or similar base. Such area may include other greening features as per Appendix D. [Site Coverage of Greenery]
<i>Intervening Space (IS)</i>	Space that is open to above or have a clear height of not less than 2/3 of the height of the respective assessment zone. [Building Separation]
<i>Level Zero</i>	The mean <i>street</i> level on which the site abuts or where the site abuts <i>streets</i> having different levels, the mean level of the lower or lowest <i>street</i> . [Building Separation]
<i>Mean Width of Street Canyon (U)</i>	The mean distance between (i) an external wall of the subject building which is within 30m perpendicular from the centre line of a <i>street</i> and (ii) the boundary of the other site on the opposite side of the <i>street</i> , as shown in Figures B4 to B7 of Appendix B. It forms the basis for assessing the maximum permissible <i>Lp</i> of the building in the assessment zone, which is $5 \times U$. [Building Separation]
<i>Primary Zone</i>	The 15m vertical zone of a site along the abutting street level. The greenery in this zone is for providing visual contacts or access from a street through common parts of the building for enhancing the walkability of urban space to the public, visitors or occupiers. The top level of soil or similar base for planting should be taken as the reference level for inclusion in the Primary Zone. [Site Coverage of Greenery].
<i>Permeability (P)</i>	A percentage indicating how permeable a building or group of buildings in that assessment zone is. It is obtained by dividing the sum of the areas recognized as <i>intervening space</i> or <i>permeable elements</i> by the area of the assessment zone as shown in Figure B9 of Appendix B. [Building Separation].
<i>Permeable Element (PE)</i>	Space provided within, above, below or between buildings within the same site

with a minimum clear width and clear height of 3m as projected onto the chosen projection plan, e.g. refuge floors, communal sky gardens etc. [Building Separation]

Separating Distance (S)

This is the minimum width of an *IS* in the following scenarios:-

- (i) between end of the projected building façade and the site boundary;
- (ii) between end of the projected building façade and the centerline of adjoining *street*/lane where the site abuts; or
- (iii) between 2 projected building facades.

Where such distance varies for an *IS*, the method of arriving at the mean of such distance is shown in Figure B12 of Appendix B.

[Building Separation]

Site Coverage of Greenery

The percentage of total live *greenery area* divided by the area of the site.

Street

A *street* of width not less than 4.5m vested in the Government and maintained by the Highways Department or a private street on land held under the same Government lease as the site and under the terms of the lease, the lessee has to surrender (when required to do so) the land on which the street is situated to the Government, as described under B(P)R18A(3)(a)(i) & (ii). [Building Separation and Building Setback]

Vertical greening

Greenery that grows within the primary zone on a vertical surface abutting a street or public pedestrian way/public open space accessible from a street, and the top level of the soil or similar base including the frame for greenery is within the primary zone. [Site Coverage of Greenery]

Building Separation Requirements

1. Assessment and Method of Measurement

1.1 The design of building(s) above *Level Zero* of the site shall comply with the Design Requirements (1) and (2) below. They shall be assessed separately for each of the three *assessment zones* i.e. the low, middle and high zones.

1.2 In general, all measurements for building separation are taken from the external walls of the building. Minor building features that will not materially affect air ventilation around buildings, including single-storey footbridges across buildings (not shadowed vertically by other footbridges), signboards, minor projecting features as described in paragraph 3 of PNAP APP-19, open sided features such as balconies, utility platforms, covered walkways, trellises and other highly permeable features such as railing and perforated fence walls (with free area $\geq 2/3$ or equivalent) may be disregarded in the building separation assessment. Minor noise barriers that are not extensive in height and designed to permit air flow through or over the barriers may also be disregarded subject to the provision of appropriate building features or permeable elements such as communal podium gardens to compensate for the barrier's obstruction to free air flow to the satisfaction of the BA.

1.3 Effect on air ventilation around buildings due to topographical features in a site including any slope features and retaining walls may be disregarded. Any parts of a building that are below the original site topography may therefore be disregarded from the *assessment zone* (see Figure B1).

2. Design Requirement (1) - L_p of building(s) abutting a street

2.1 Design Requirement (1) controls the maximum L_p of a building or a group of buildings if any part of the building is within 30m from the centreline of the *street* on which the building(s) abuts.

2.2 The L_p of a building or a group of buildings along its long side shall not exceed the maximum permissible L_p which is obtained by multiplying 5 and the U on which the building(s) abuts. The U of such a street canyon in the *assessment zone* is measured perpendicular to the centreline of the *street* from the external wall of the building that is within 30m from the centreline of the *street*, to the site boundary of the other site on the opposite side of the *street* (see Figures B2 to B6). If the building or group of buildings abuts two or more *streets* having different U , the least U shall be adopted.

2.3 If the width of a street canyon varies (on plan), U is the width obtained by dividing the area of such a street canyon by its length as measured along the centreline of the *street*. If only a part of the building is within 30m from the centreline of the *street*, U is the mean width of the street canyon that abuts such part of the building. If there is more than one such street canyon along the same *street*, U is the width obtained by dividing the sum of the areas of such street canyons by the sum of the lengths, as measured along the centreline of the *street*, of such street canyons (see Figure B7).

2.4 For the purpose of measuring *L_p* of a building or a group of buildings along its long side, the part of the building(s) that is within the low zone and of a height of not more than 6.67m (i.e. 1/3 of 20m which is the height of the low zone) may be disregarded.

2.5 Maximum permissible *L_p* is not applicable for Design Requirement (1) in the following circumstances:

- (a) The subject site does not abut a *street*;
- (b) There is no building or no parts of building in the *assessment zone* within 30m from the centreline of any *streets* on which the site abuts.

3. Design Requirement (2) - *S* & *P* of Buildings (Projection Planes for Assessment)

3.1 Assessment on compliance with Design Requirement (2) shall be made through a pair of vertical projection planes (x, y) at an orthogonal relationship to each other (see Figure B8). At least one of the projection planes for the low zone shall be set parallel to a *street* on which the site abuts. For a site that abuts on a curvilinear *street*, the projection plane for the low zone shall be set along any tangent of the *street*. For the middle/high zones, such pair of projection planes may be set to suit the building disposition or the site wind environment.

3.2 To allow more flexibility in building design, the angle between each pair of projection planes may vary from 75 to 105 degrees.

3.3 For a site that is less than 20,000 m² and the total width of all projected building facades exceeds 60m along one projection plane only, assessment on compliance with Design Requirement (2) is only required for that projection plane.

4. Assessment of *S* and *P*

4.1 Elevation of all buildings within the site shall be projected onto the chosen projection planes. On each projection plane, the required *P* of buildings as stipulated in Table 1 of this PNAP shall be achieved (see Figure B9).

4.2 Not less than 2/3 of the required *P* shall be provided by *IS* between the ends of the projected building facades and the adjacent site boundaries or, where the site abuts a street or a lane, the centreline of adjoining *street* or lane¹. Save for the part of building disregarded in paragraph 2.4 above, such *IS* shall provide a *S* of not less than 7.5m wide. For *S* involving site boundary or adjoining street/lane, if it varies on plan, the mean of *S* shall not be less than 7.5m and no part of the building shall be within 3m from the boundary line. If such *IS* cannot meet 2/3 of the required *P*, additional *IS* can be provided between buildings. Such additional *IS* shall have an *S* of not less than 15m (see Figures B10 to B12).

¹ The *street*/lane of width less than 4.5m may also be included in the assessment of *S* and *P*. Open space outside the site boundary is not accountable for *P*. However, where an area is zoned as open space on the Outline Zoning Plan / Development Permission Area Plan and provided such area is a nullah or designated as promenade or non-building area on the aforesaid plan and / or in the explanatory notes of the aforesaid plan, such area may be treated as a lane for the purpose of assessing *S* and *P*.

4.3 Not more than 1/3 of the required *P* may be provided by *PE*. (see Figures B10 & B11)

4.4 To allow more design flexibility, the projection line of the *IS* within an *assessment zone* may follow the path of a notional air corridor that starts at 90° from the projection plane (on plan). The air corridor may flow between buildings and may change direction without changing its width, when it meets the boundary line or anywhere within the site, by not more than 15° provided the direction of the air corridor after the change of course is always within 15° from its original path before it enters the site. The minimum width of the air corridor along its path between buildings shall not be less than 15m (see Figures B13 to B16).

4.5 When the site is large and / or of irregular shape, the site may be subdivided into two or more notional sites provided that the line of the sub-division is located along the centreline of a notional wind path that complies with the following requirements:

- (a) the wind path is open to above from the lowest level of the subject *assessment zone* (disregarding the minor projecting features and permeable features mentioned in paragraph 1.2 above);
- (b) it is of a width of not less than 15m;
- (c) it is continuous across the site in one direction or it may change in direction by not more than 15 degrees provided its direction after the change of course is always within 15 degrees from its original path²;
- (d) where it meets the site boundaries, there is a street or lane with a mean width of not less than 7.5m.

4.6 After subdividing the site, the *P* may be assessed separately for each subdivided site using the same or a different pair of orthogonal projection planes (see Figures B17 & B18).

4.7 A sample case on assessment of building separation provisions is given in Figures B19 to B21.

(Rev. 1/2016)

² The wind path should preferably align with the summer prevailing wind direction or existing street pattern.

Site Topography & Sunken Buildings

Appendix B
(PNAP APP-152)

- “Level Zero” is the mean level of the lower or lowest street(s).
- The height of a building shall be measured from Level Zero to the mean height of the roof over the highest usable floor space.
- The effect on air ventilation around buildings due to topographical features or sunken part of a building below Level Zero shall be disregarded. (See Fig.B9-Fig.B11)

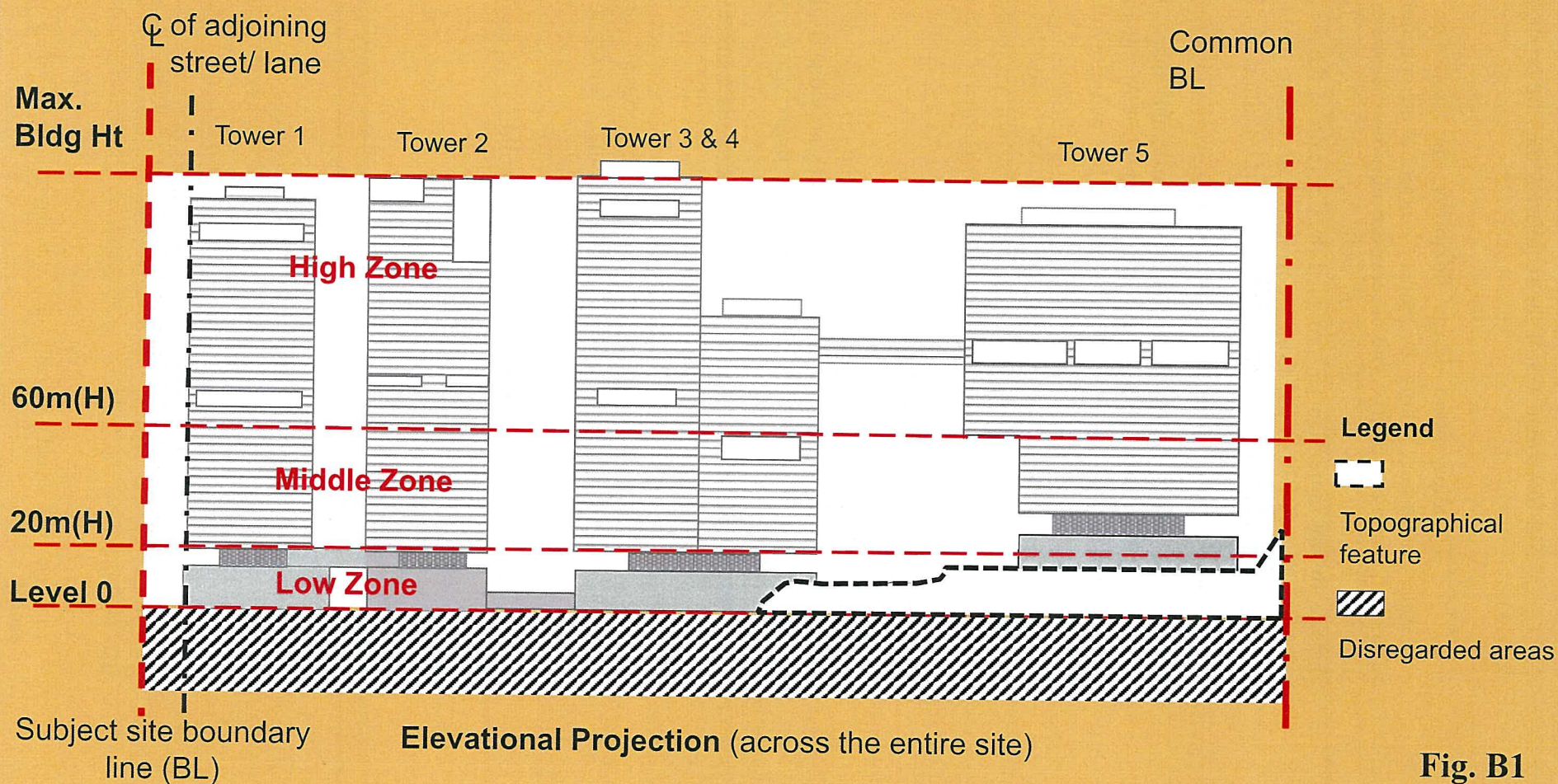
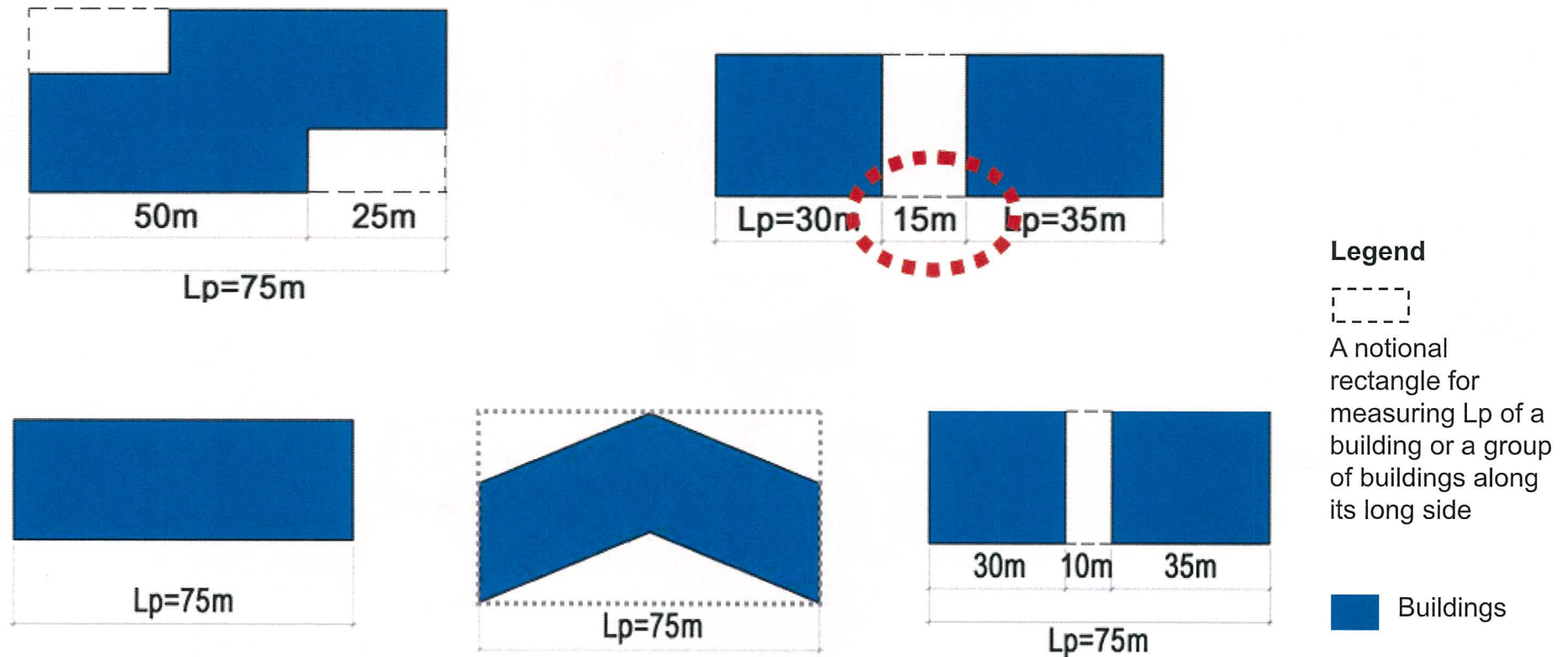


Fig. B1

Lp Examples of determining Lp

- Building portions at low zone of height $\leq 6.67\text{m}$ ($1/3H$ of low zone) are disregarded in Lp measurement

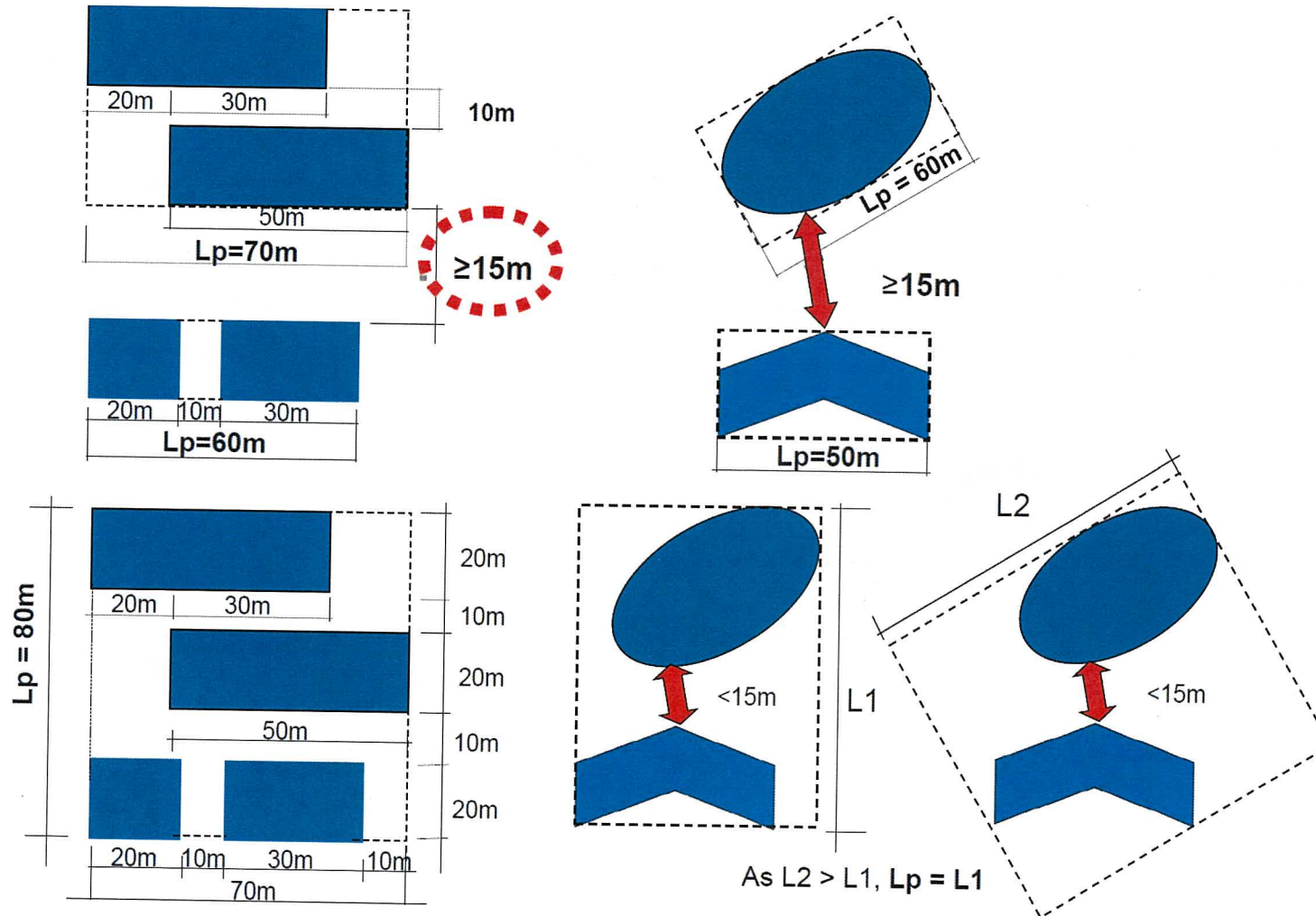


Diagrammatic Plans of Buildings

Fig. B2

Lp Examples of Lp of a building or group of buildings along its long side

Appendix B
(PNAP APP-152)

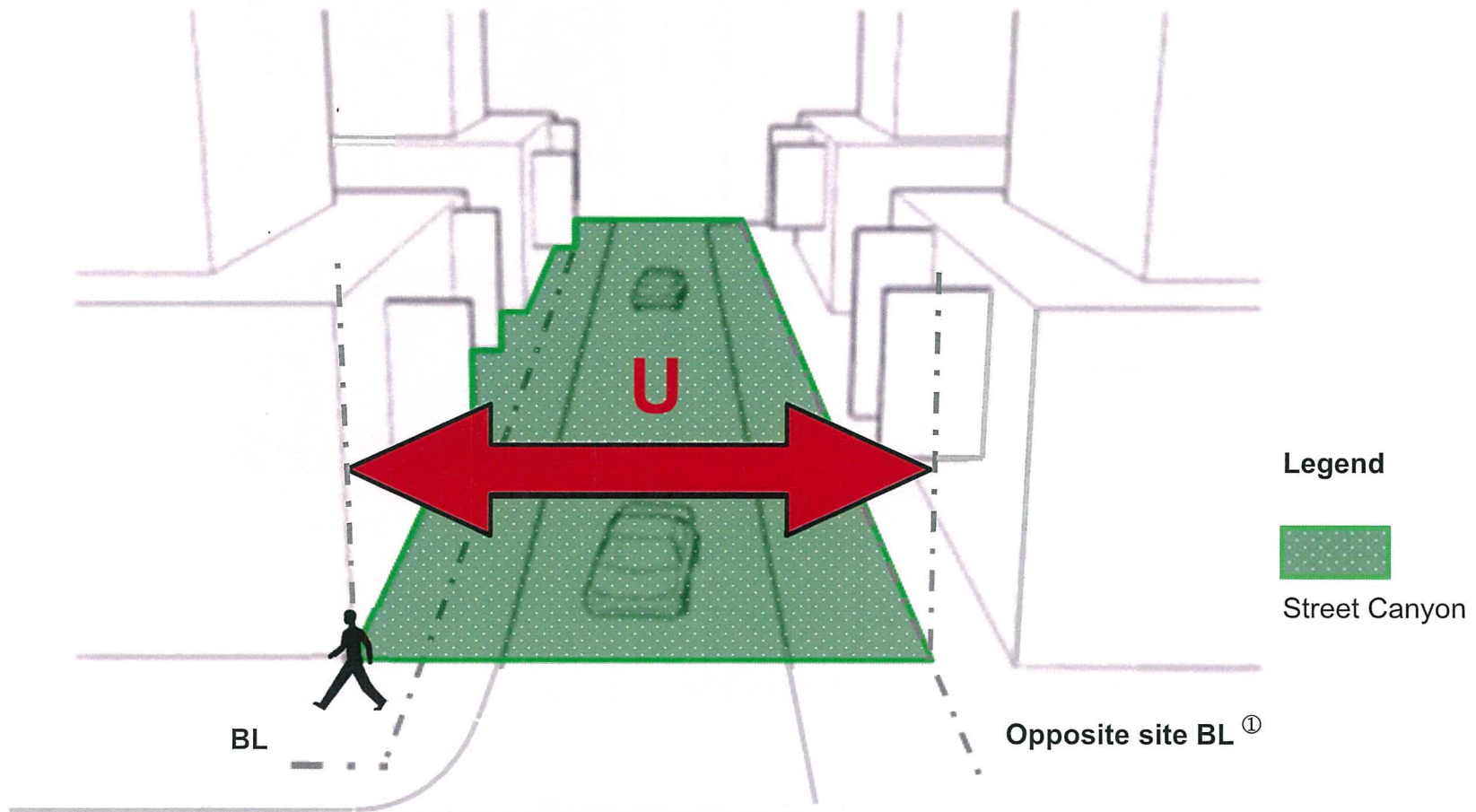


Diagrammatic Plans of Buildings

Fig. B3

Showing U

- Street canyon shall be vertically unobstructed. Minor projecting features, such as signboard, a covered footbridge and open sided features (balconies, utility platforms, covered walkways, trellises, etc.) may be disregarded.



① Opposite side of the street if no opposite site

Perspective Showing Width of Street Canyon

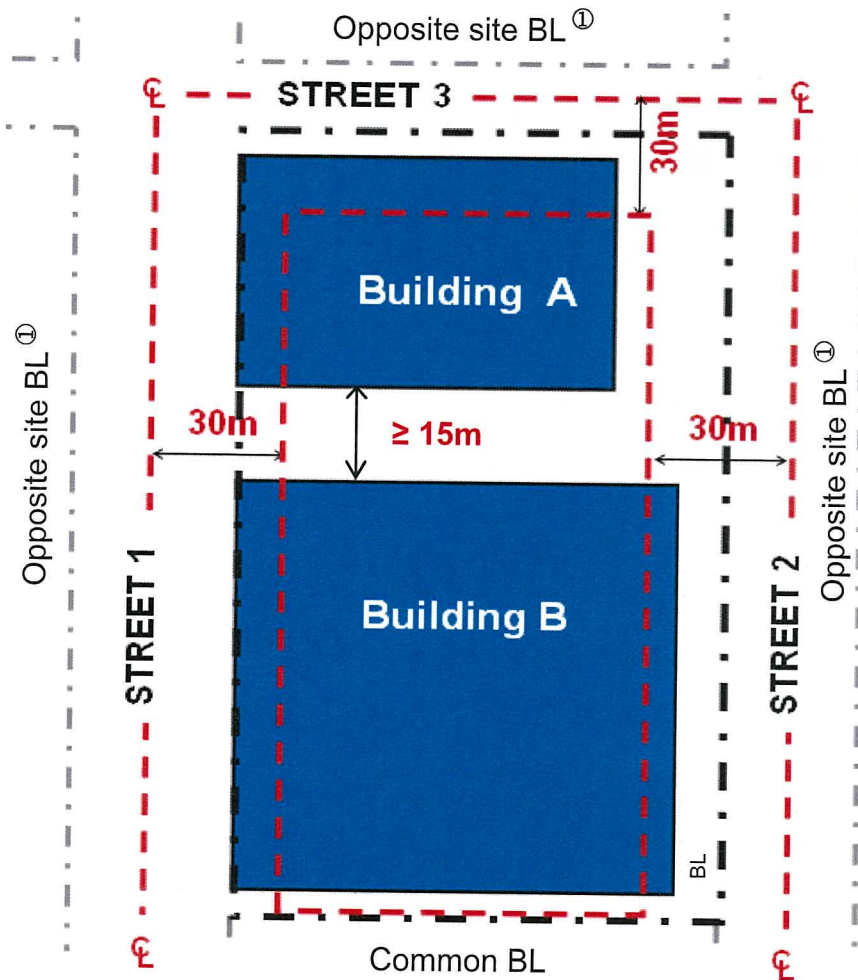
Fig. B4

Adjoining Street Canyons

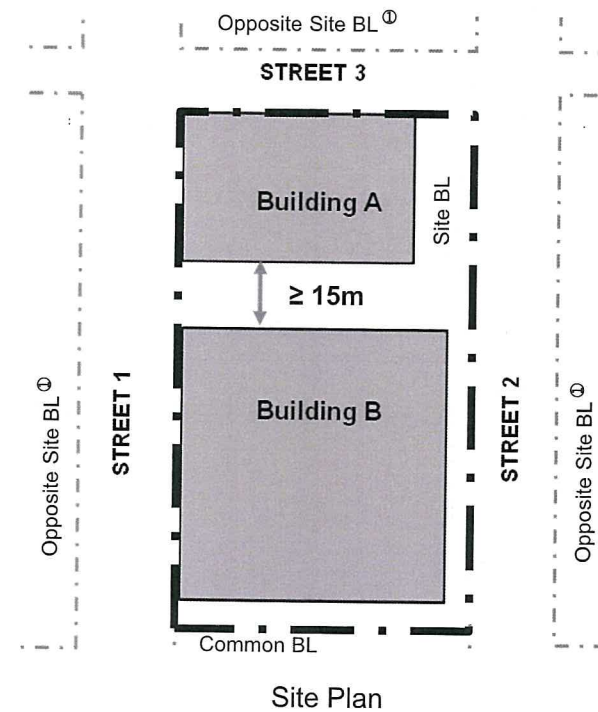
Appendix B
(PNAP APP-152)

Buildings subject to control on Lp

- Buildings/groups of buildings wholly or partly **within 30m** from the centreline of an adjoining street.



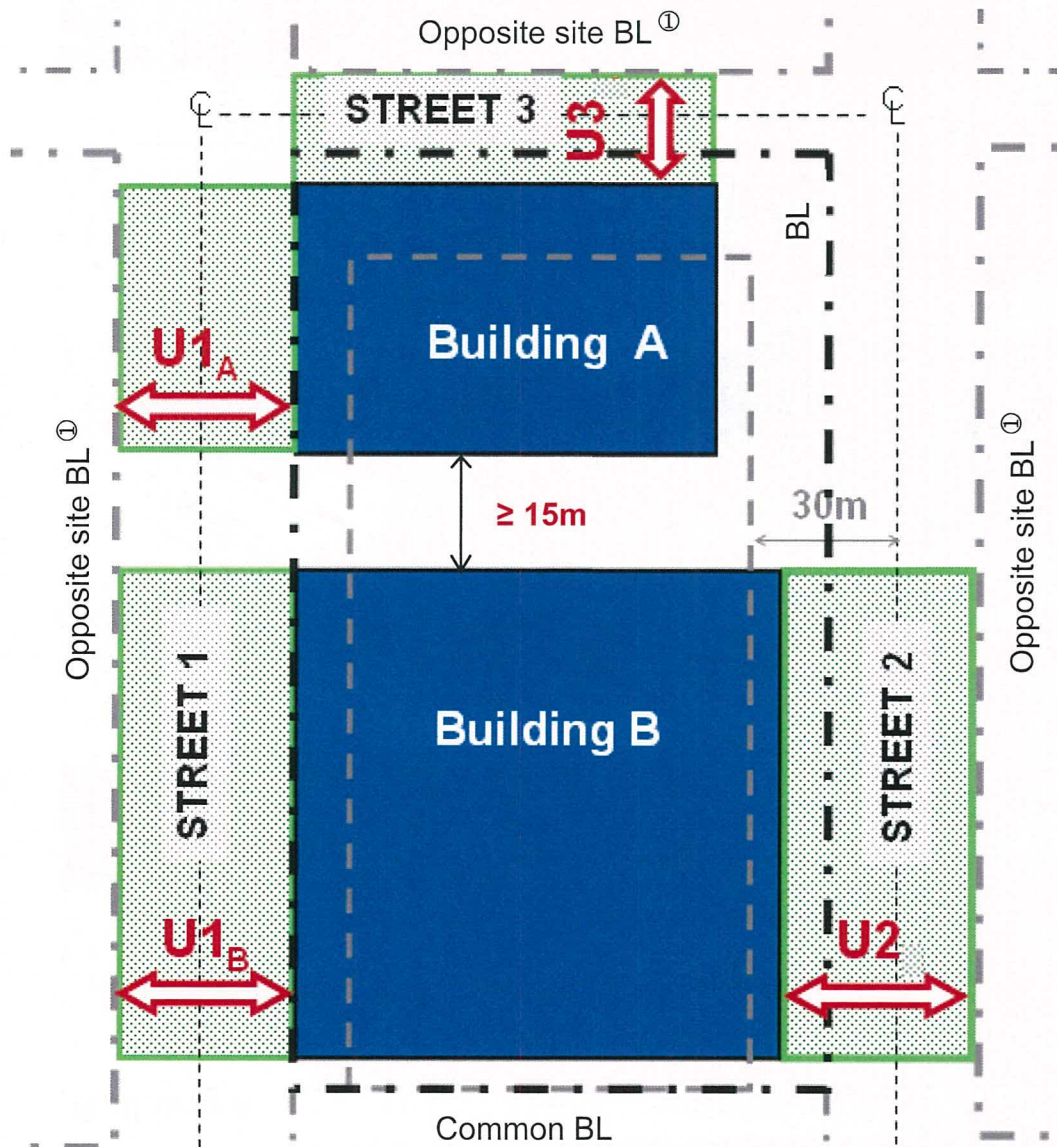
① Opposite side of the street if no opposite site.



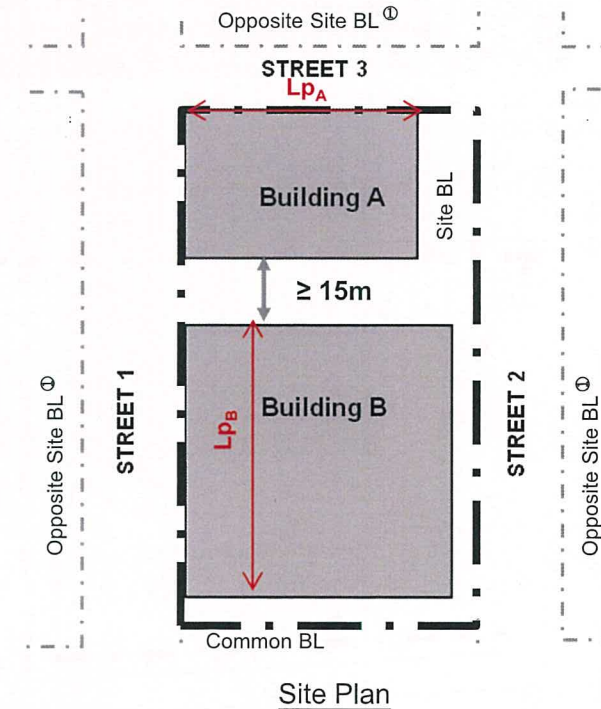
Diagrammatic Plans

Fig. B5

U & Max. Permissible Lp



① Opposite side of the street if no opposite site.



Max. $L_p = 5 \times U$

- If a building abuts two or more streets, use the least U.

• Building A

When $U_3 < U_{1A}$, max. $L_{pA} = 5 \times U_3$

• Building B

When $U_{1B} < U_2$, max $L_{pB} = 5 \times U_{1B}$

Diagrammatic Plans

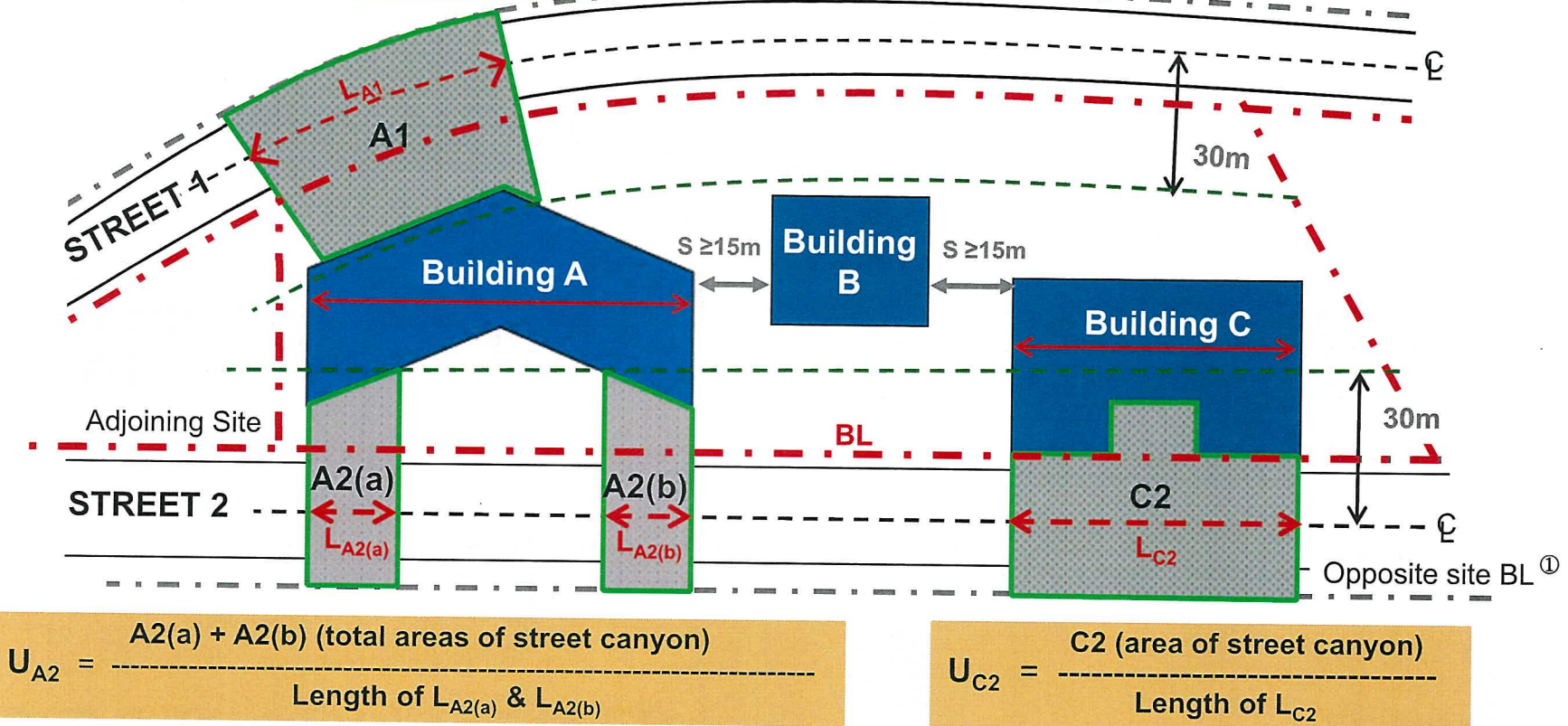
Fig. B6

U & Max. Permissible Lp

Building A

- When width of the adjoining street canyon varies, Lp is determined by the smallest U.
- When $U_{A1} < U_{A2}$, max. $L_{pA} = 5 \times U_{A1}$

$$U_{A1} = \frac{A1 \text{ (area of street canyon)}}{\text{Length of } L_{A1}}$$



① Opposite side of the street if no opposite site.

Building B

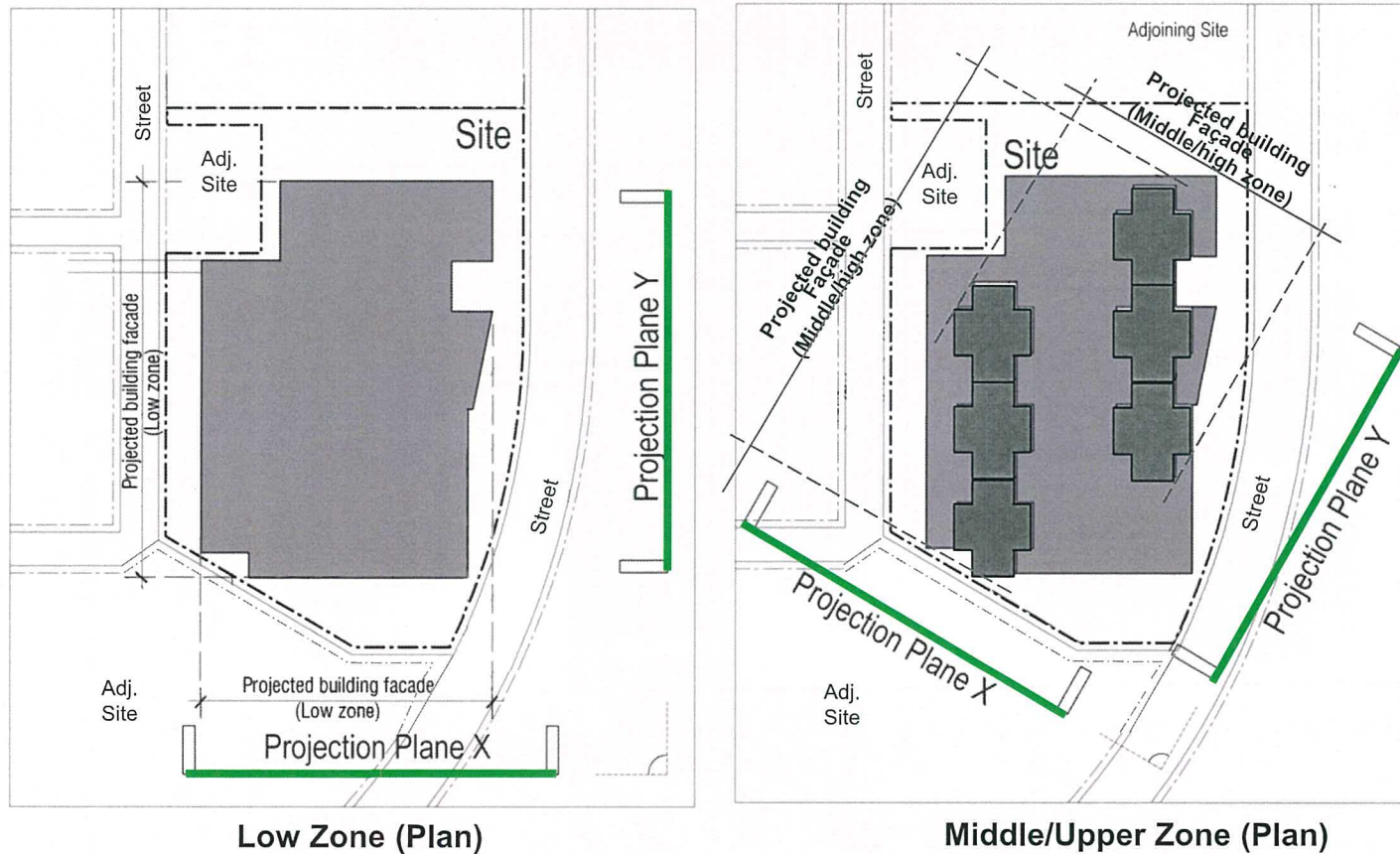
- No part of the building is closer than 30m to the street centrelines. Building B is not subject to Design Requirement (1).

Building C

- Lp is determined by the U at Street 2:
- $L_{pC} = 5 \times U_{C2}$

Diagrammatic Plan Fig. B7

Pair of Projection Planes for Assessment of P



Low Zone

- One of the planes^① parallel to an adjoining street

Middle/High Zone

- Any pair of chosen planes^① to suit the building disposition or environmental context e.g. prevailing wind direction

P assessment on one plane only if:

- Site < 2ha and $L_p > 60\text{m}$ on one projection plane only.

^① The angle between each pair of projection planes is **75-105°**.

Fig. B8

Assessment of P

Appendix B
(PNAP APP-152)

$$P = \frac{\text{Sum of areas of IS and PE}}{\text{Area of the assessment zone}} \times 100\%$$

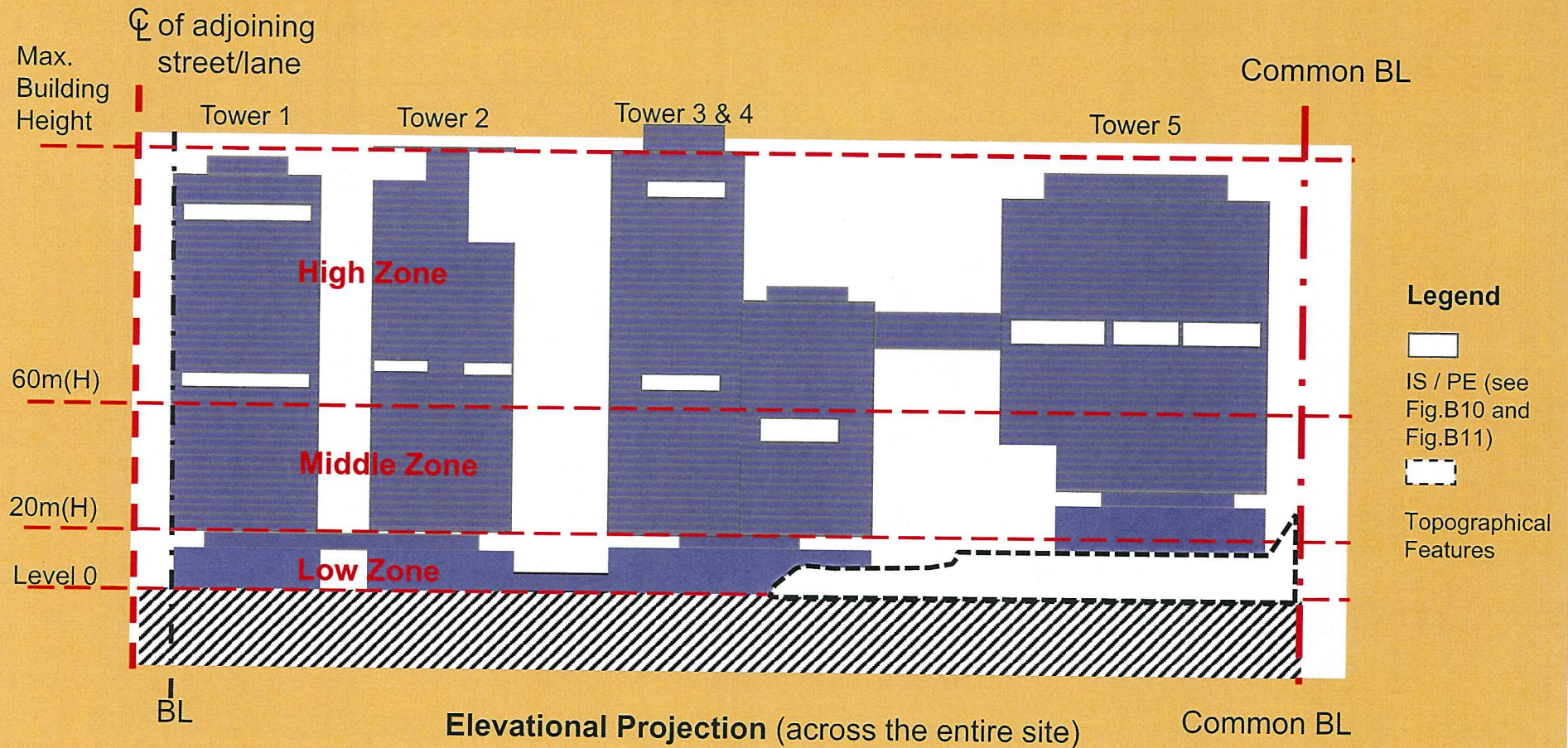


Fig. B9

IS & PE

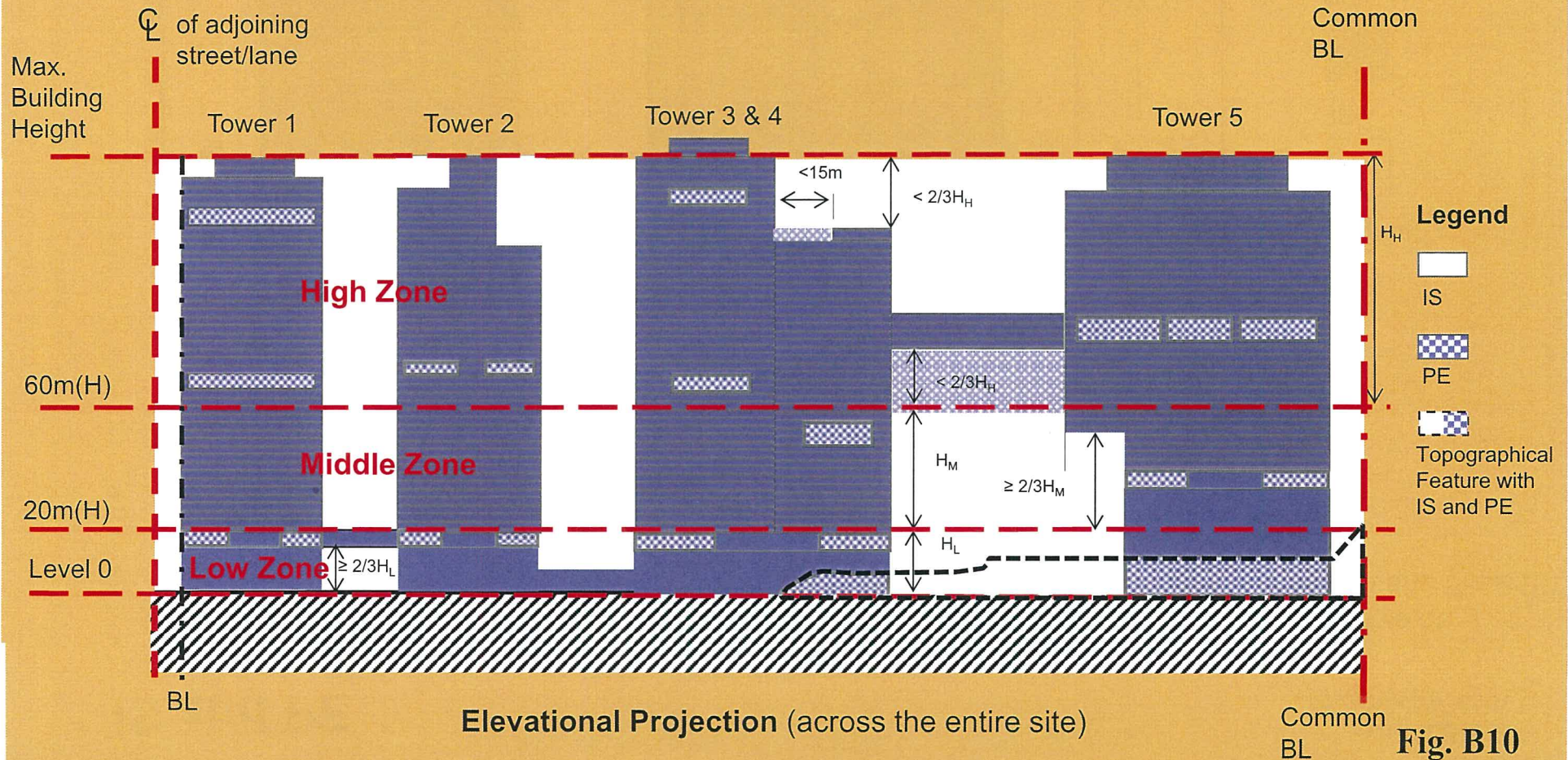
Appendix B
(PNAP APP-152)

IS shall account for min. 2/3 of the required P

PE may contribute to maximum 1/3 of the required P

$$\frac{\text{Sum of areas of IS}}{\text{Area of the assessment zone}} \times 100\% \geq 2/3 P$$

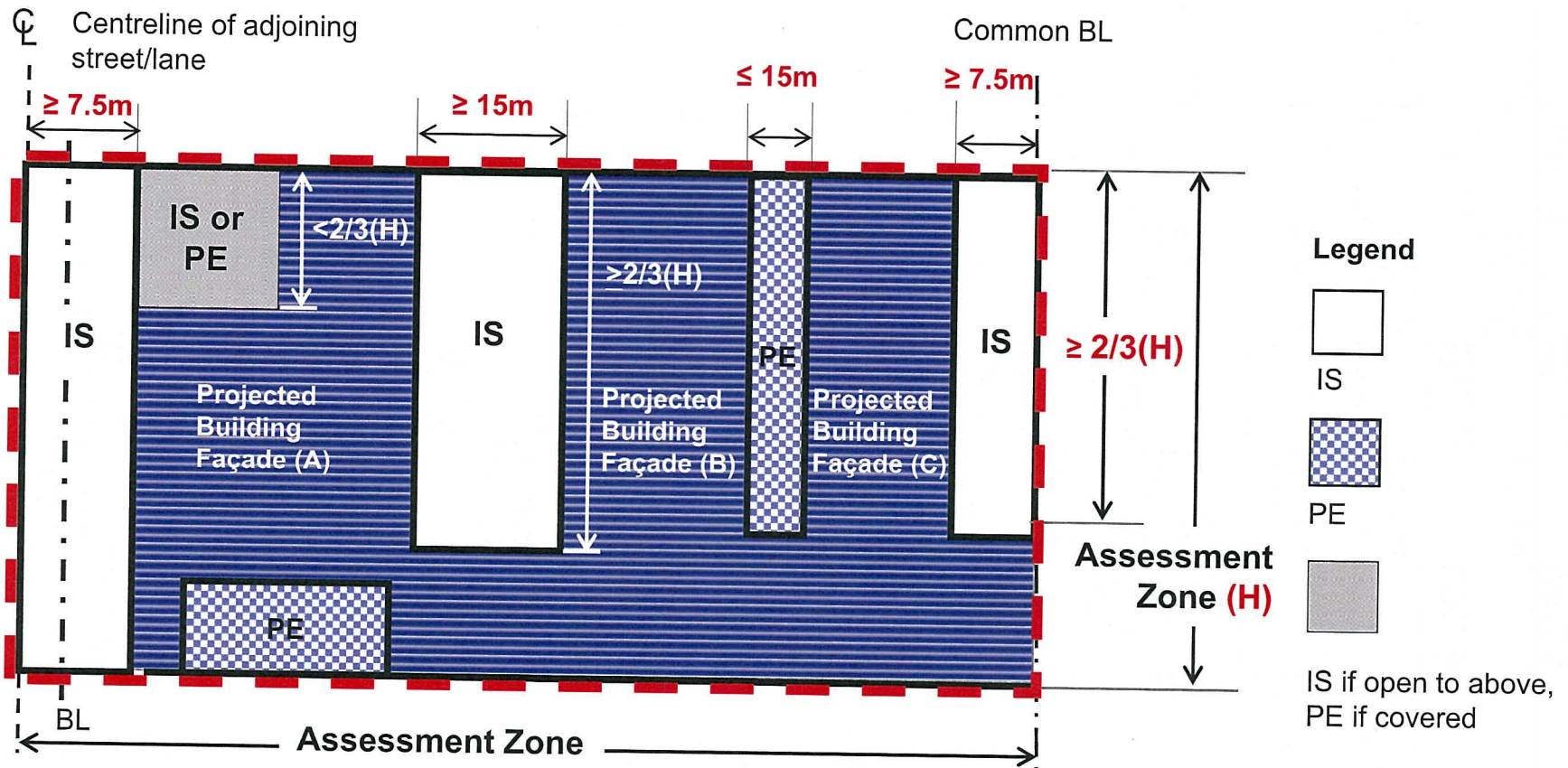
$$\frac{\text{Sum of areas of PE}}{\text{Area of the assessment zone}} \times 100\% \leq 1/3 P$$



IS and PE

Appendix B
(PNAP APP-152)

- IS shall be provided between end of a projected façade and adjacent common BL / centreline of adjoining street/lane and has a width or mean width $\geq 7.5\text{m}$ (see Fig.B12, Fig.B14, Fig.B15 and Fig.B16).
- Additional IS between end of projected façades shall be $\geq 15\text{m}$.
- Height of IS shall be $\geq 2/3H$ of the Assessment Zone or open to above.
- PE shall have clear width and clear height $\geq 3\text{m}$.



Elevational Projection (across the entire site)

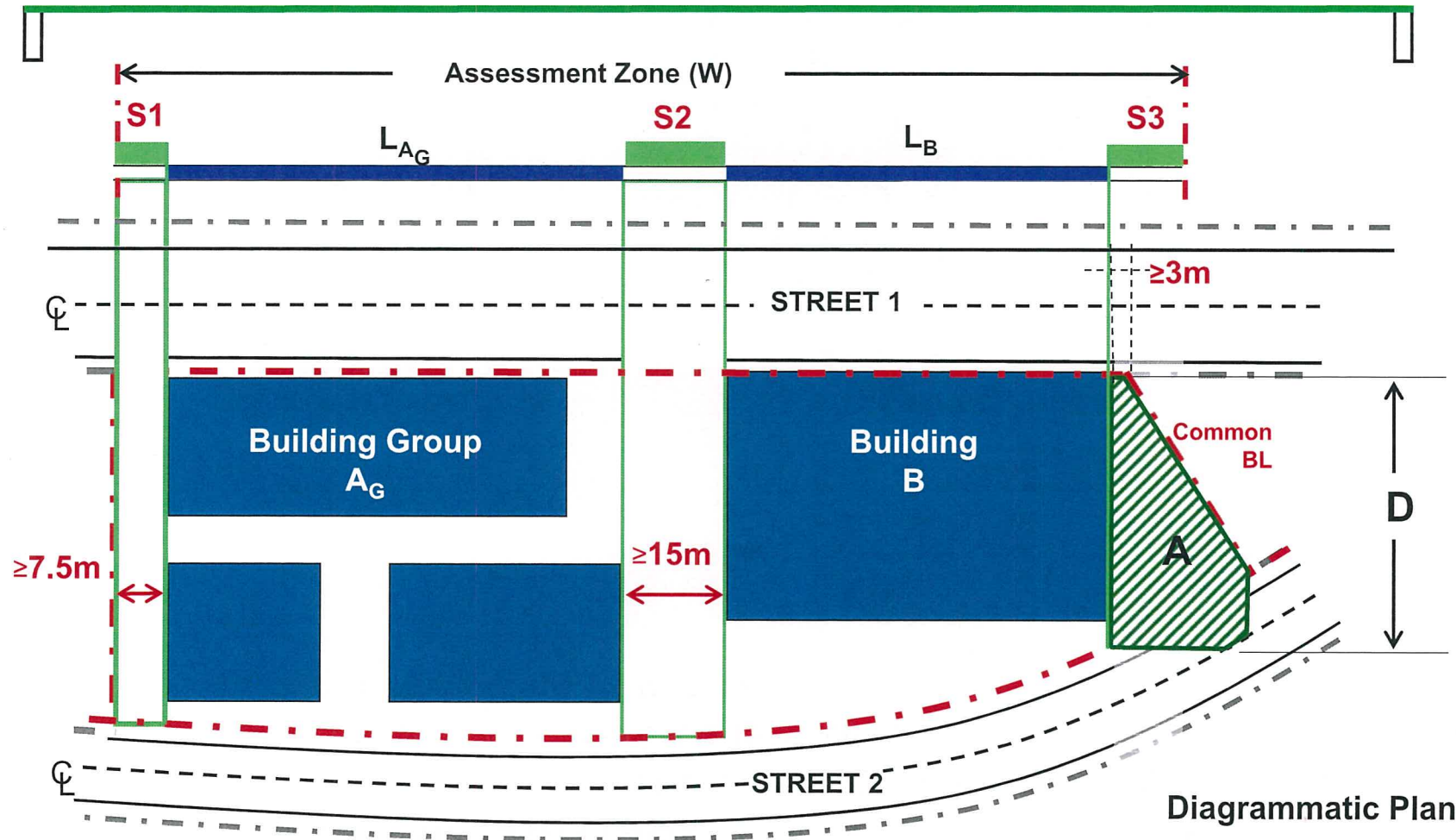
Fig. B11

S1 ≥ 7.5m

S2 ≥ 15m

$$S3^{①} = \frac{\text{Area (A)}}{\text{Depth (D)}} \quad (\geq 7.5\text{m})$$
$$S3^{①} = \frac{\text{Area (A)}}{\text{Depth (D)}} \quad (\geq 7.5\text{m})$$

Projection Plane X



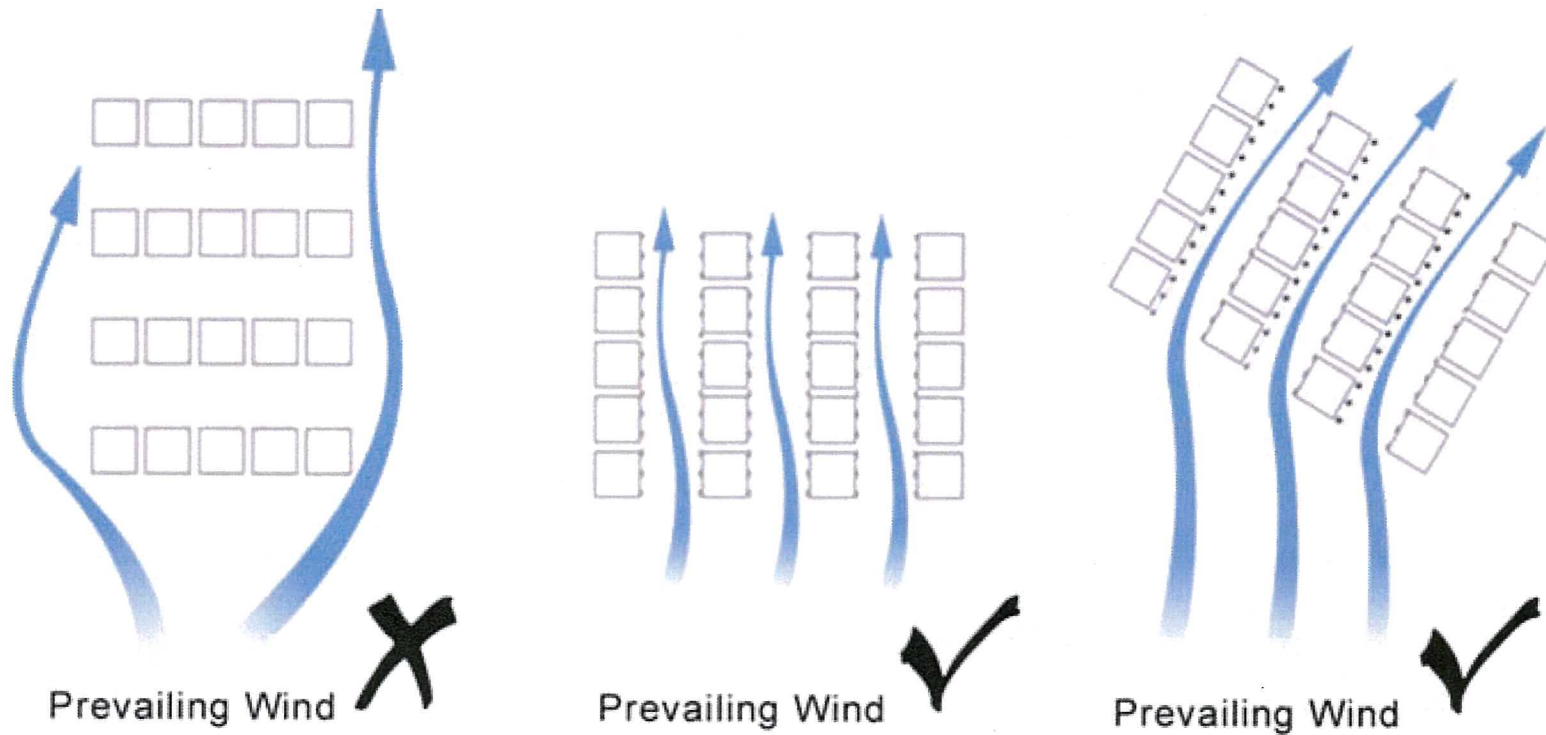
① No part of the building within 3m from the BL.

Fig. B12

Notional Air Corridor

Provided that the minimum required width of the IS / notional air corridor is maintained,

- Change in direction is permissible $\leq 15^\circ$ when it meets the BL or anywhere within the site, and
- Overall direction deviate $\leq 15^\circ$ from the original path



Diagrammatic Plan

Fig. B13

Notional Air Corridor S between buildings & at façade ends

Appendix B
(PNAP APP-152)

- When projection plane X is placed on either side of the site, length of a building façade so projected on the planes may vary.
- Assessment of P may be based on the projection on either Plane X(1) or X(2).
- S1 & S3^② ≥ 7.5m.
- S2 ≥ 15m

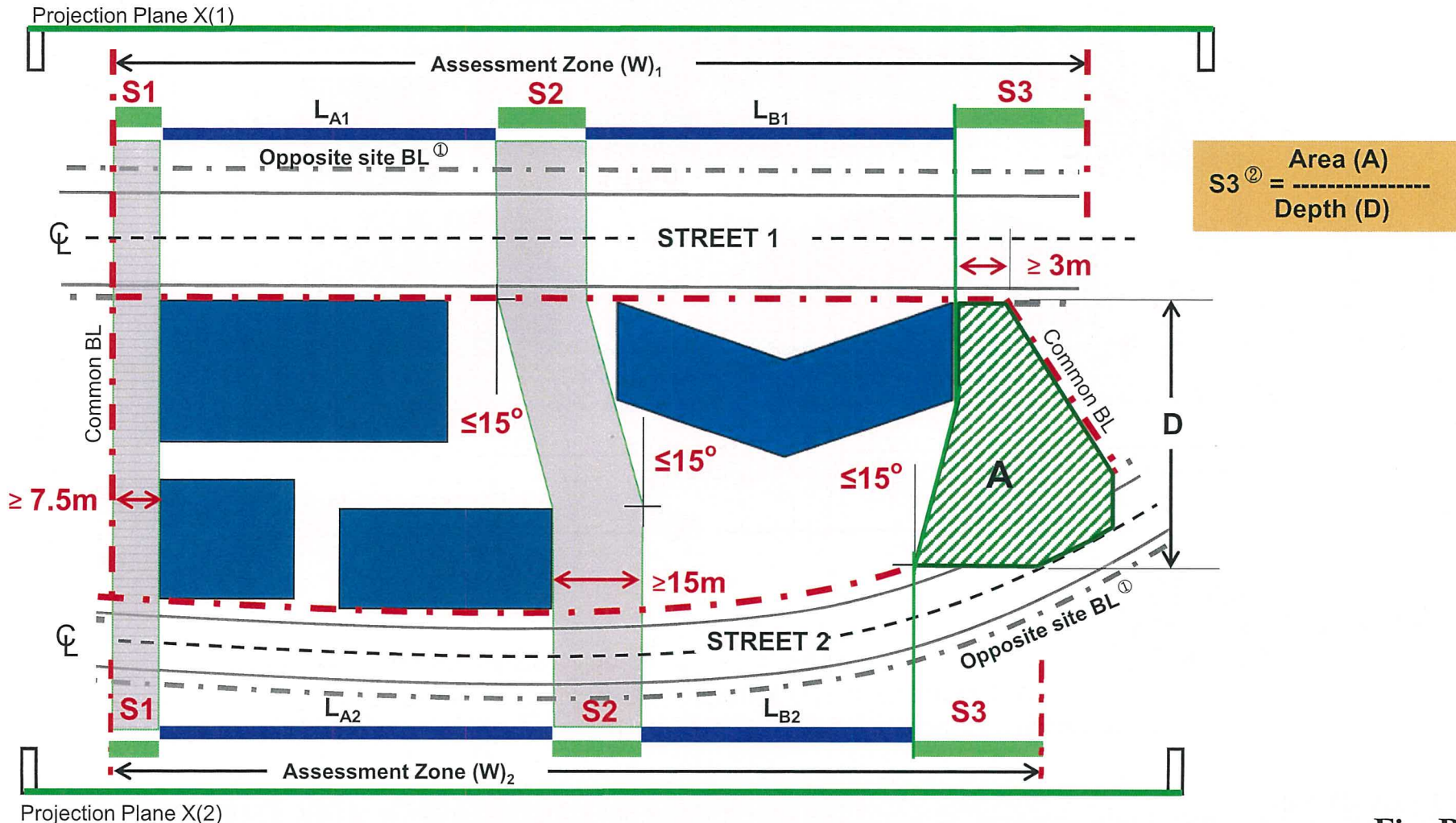


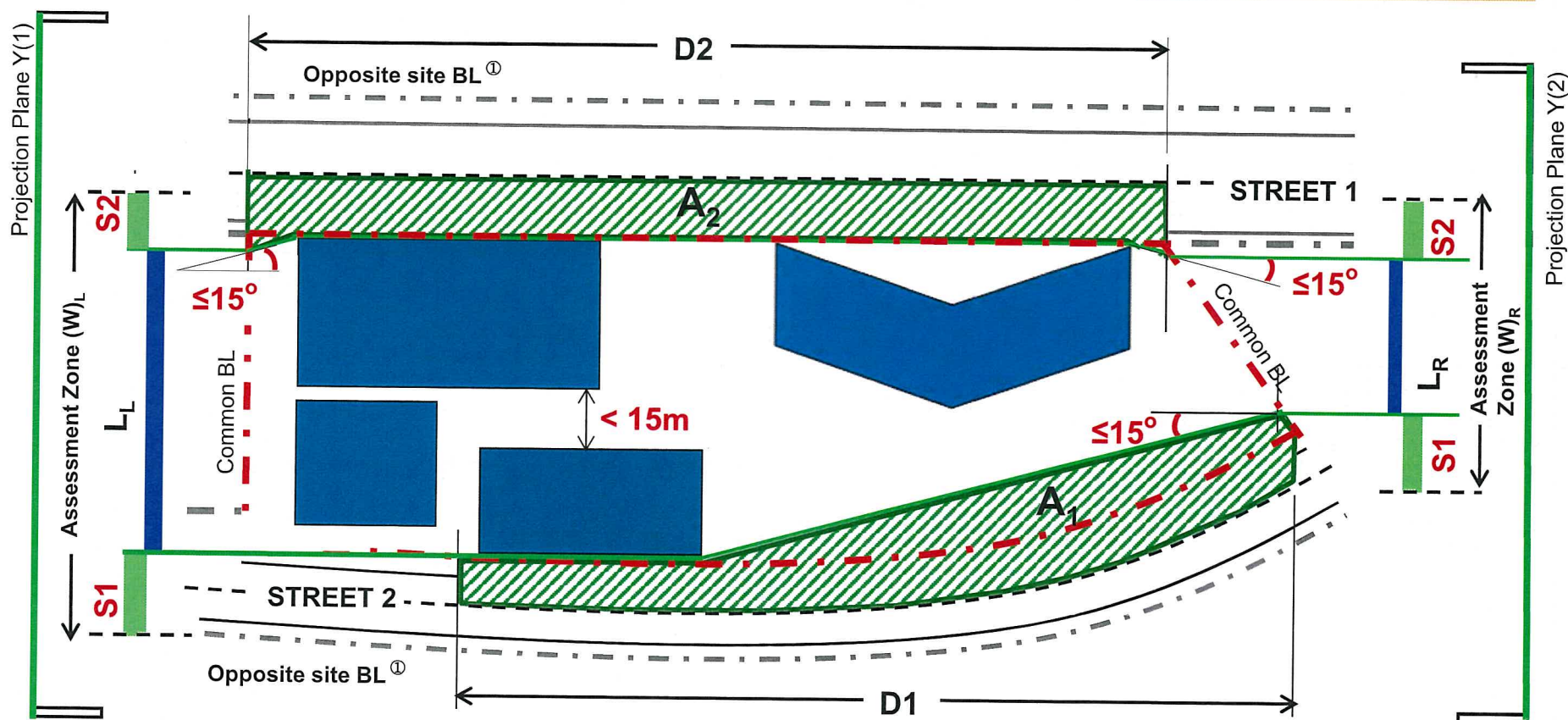
Fig. B14

Notional Air Corridor S at façade ends

Appendix B
(PNAP APP-152)

- When projection plane Y is placed on either side of the site, length of a building façade so projected on the planes may vary.
- Assessment of P may be based on the projection on either Y(1) or Y(2) as chosen.
- S1 & S2 between adjoining street/lane $\geq 7.5\text{m}$

$$S = \frac{\text{Area (A)}}{\text{Depth (D)}} (\geq 7.5\text{m})$$



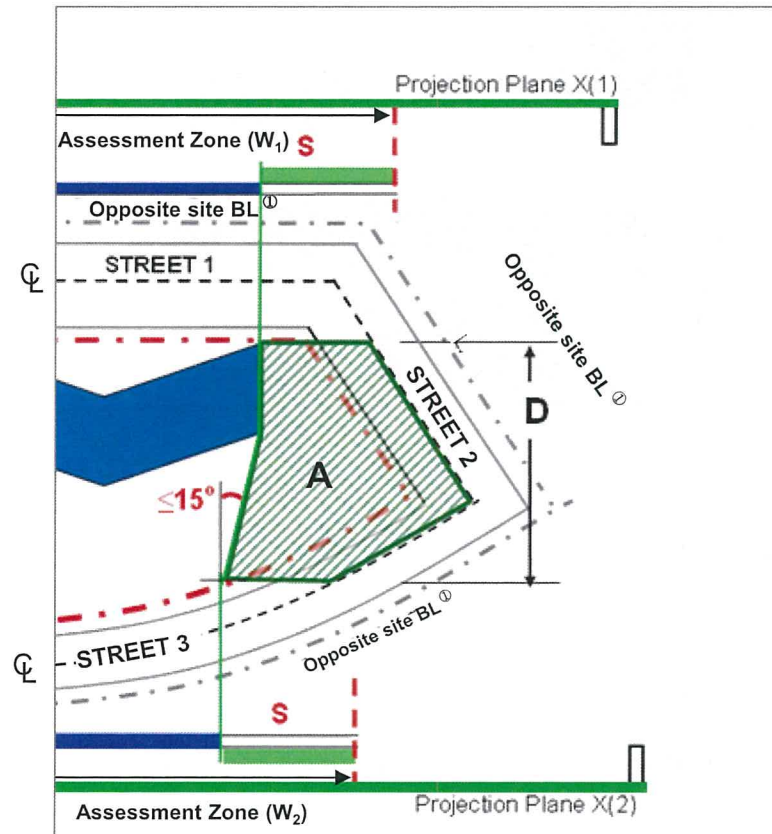
① Opposite side of the street if no opposite site.

Diagrammatic Plan Fig. B15

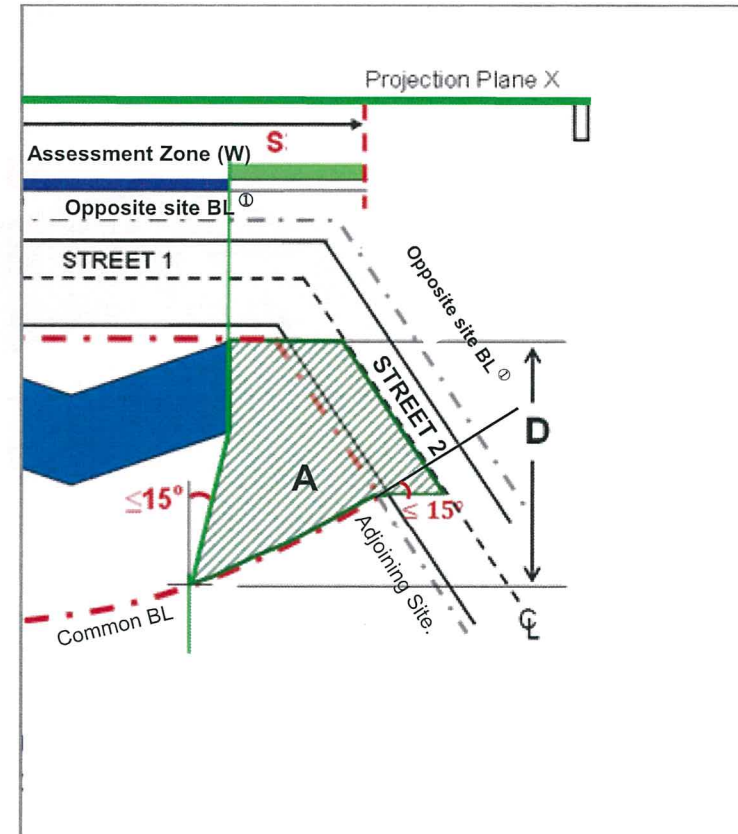
Notional Air Corridor S at façade ends

Appendix B
(PNAP APP-152)

$$S^{②} = \frac{\text{Area (A)}}{\text{Depth (D)}} \quad (\geq 7.5\text{m})$$



- When the site abuts three adjoining streets



- When the site abuts two adjoining streets

① Opposite side of the street if no opposite site.
② No part of the building within 3m from the BL.

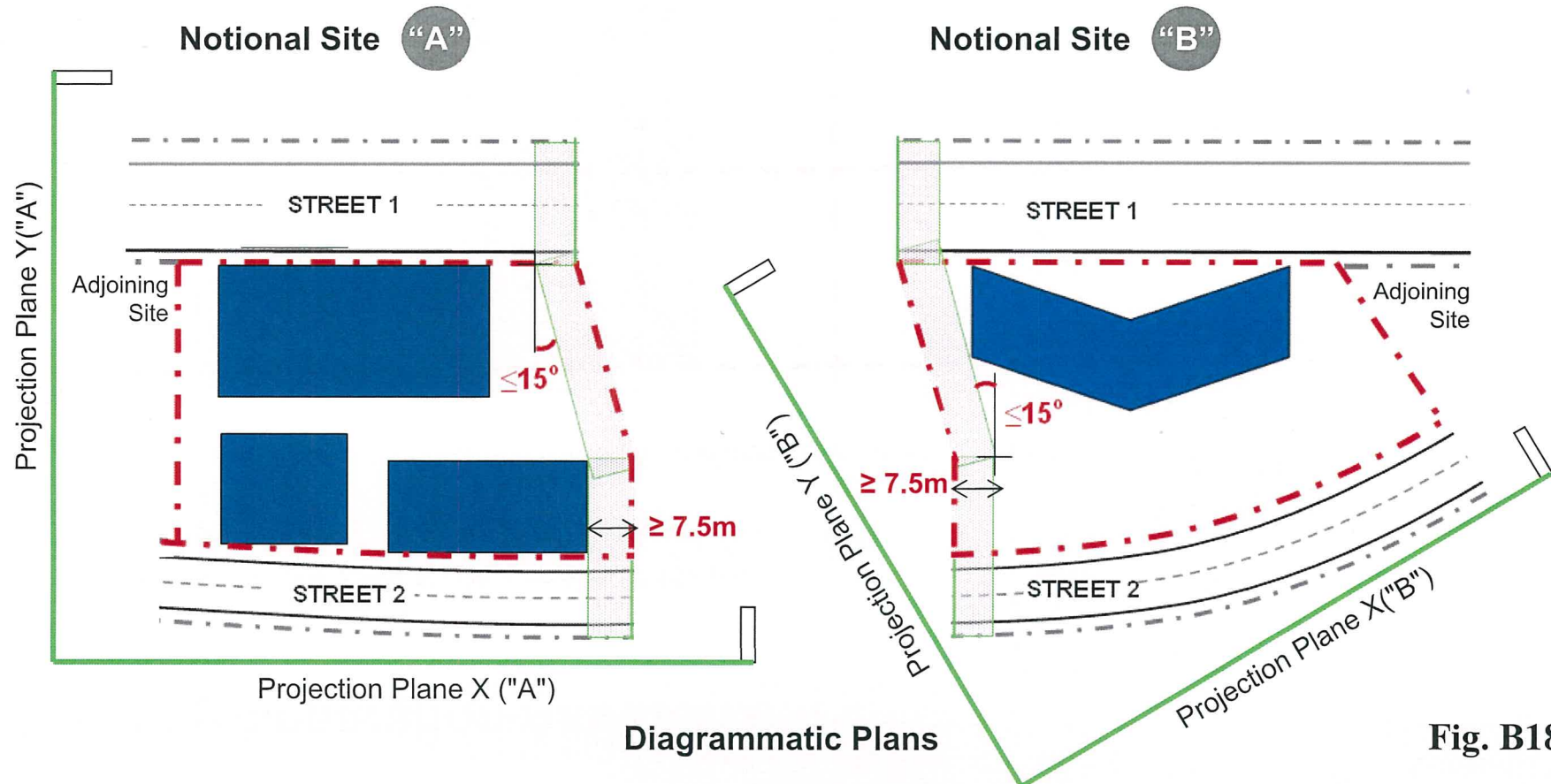
Diagrammatic Plans Fig. B16

- vertically uncovered and unobstructed above the lowest level of the assessment zone
- width $\geq 15\text{m}$
- leading to a street or lane of mean width $\geq 7.5\text{m}$ at both ends

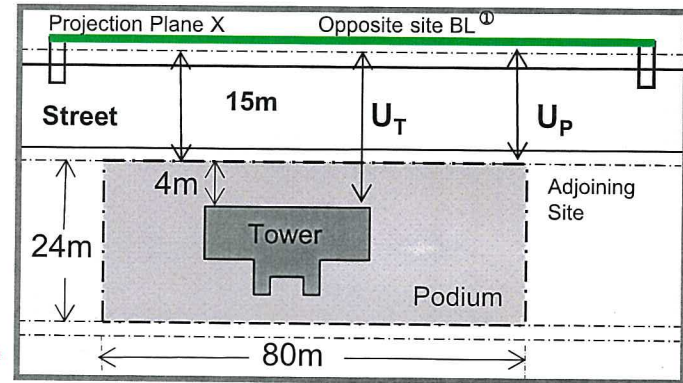


Sub-divided Notional Sites for Assessment of P

- S at the projected facade end shall be measured to the notional BL at centreline of the wind path.
- Individual pair of projection planes may be chosen for each of the TWO sub-divided sites for P assessment.
- "Level Zero" of the original undivided site shall be used for all notional sites.



- Site area = 1,920m² (< 20,000 m²)
- Proposed building: one tower above a podium of 15m(H)
- Max. building height = 78m (> 60m)
- The site abuts a street of 15m wide
- Lp of podium with full site coverage = 80m(>60m, *assessment required*)



Plan

Max. $L_p = 5 \times U$

- $U_P = 15\text{m}$, max. $L_P = U_P \times 5 = 75\text{m}$
- L_P of proposed podium = 80 m ($> 75\text{m}$)
(i.e. NOT OK)

- $U_T = 19\text{m}$, max. $L_T = U_T \times 5 = 95\text{m}$
- L_p of proposed tower = 32m ($< 95\text{m}$)
(i.e. OK)

- $U_T = 19\text{m}$, max. $L_T = U_T \times 5 = 95\text{m}$
- L_p of proposed tower = 32m ($< 95\text{m}$)
(i.e. OK)

Fig. B19

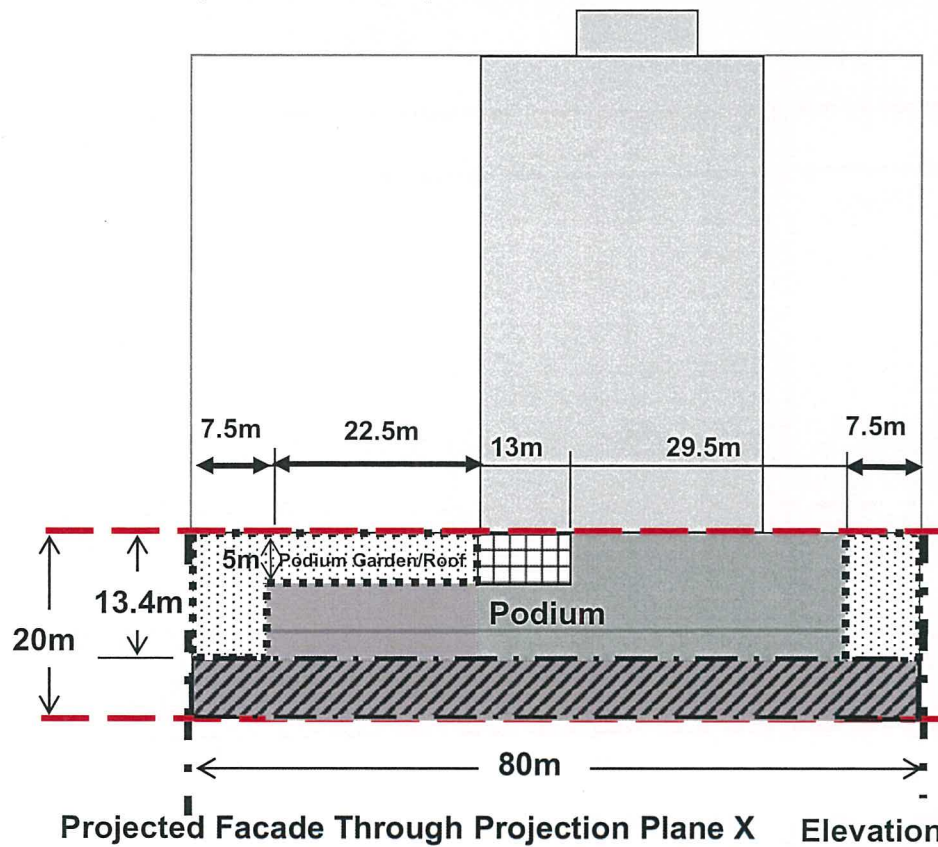
Building Separation Assessment

Design Requirement (1) - Low Zone

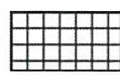
- $U_p = 15\text{m}$, max. $L_p = U_p \times 5 = 75\text{m}$
- $L_p = 80\text{m} - 7.5\text{m} \times 2 = 65\text{m} < 75\text{m}$

Design Requirement (2) - Low Zone

- Minimum $P = 20\%$ (from Table 2)
- Set Projection Plane X parallel to a Street



IS

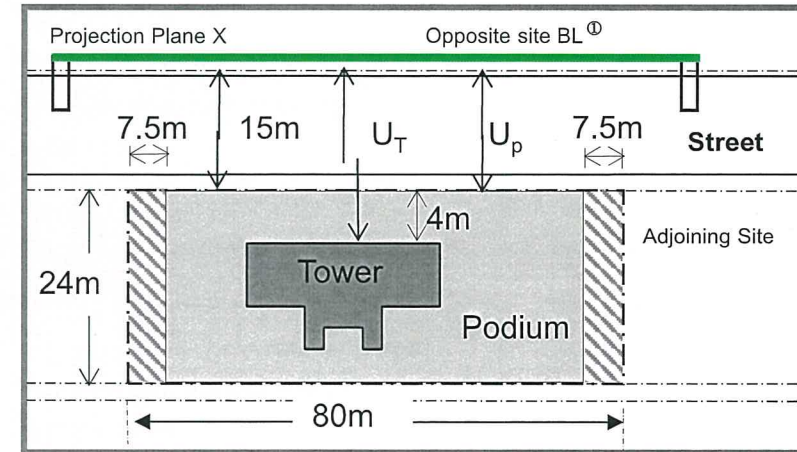


PE



Low zone portion $\leq 1/3H$ are disregarded in L_p measurement

① Opposite side of the street if no opposite site



IS & S

- min. 7.5m to common B.L.
- height $\geq 2/3$ of the Assessment Zone **or** open to above

Plan

Total facade area of the IS

$$= (7.5 \times 13.4)\text{m}^2 + (7.5 \times 13.4 + 22.5 \times 5)\text{m}^2 = 313.5\text{m}^2$$

P achieved by the IS

$$= 313.5\text{m}^2 / (20 \times 80)\text{m}^2 \times 100\% \\ = 19\% (< 20\%, \text{ but not less than } (2/3) \times 20\% = 13.33\%)$$

Facade area of the PE

$$= 13\text{m} \times 5\text{m} = 65\text{m}^2$$

P achieved by the PE

$$= 65\text{m}^2 / (20 \times 80)\text{m}^2 \times 100\% \\ = 4\% (< (1/3) \times 20\% = 6.66\%, \text{ i.e. all accountable})$$

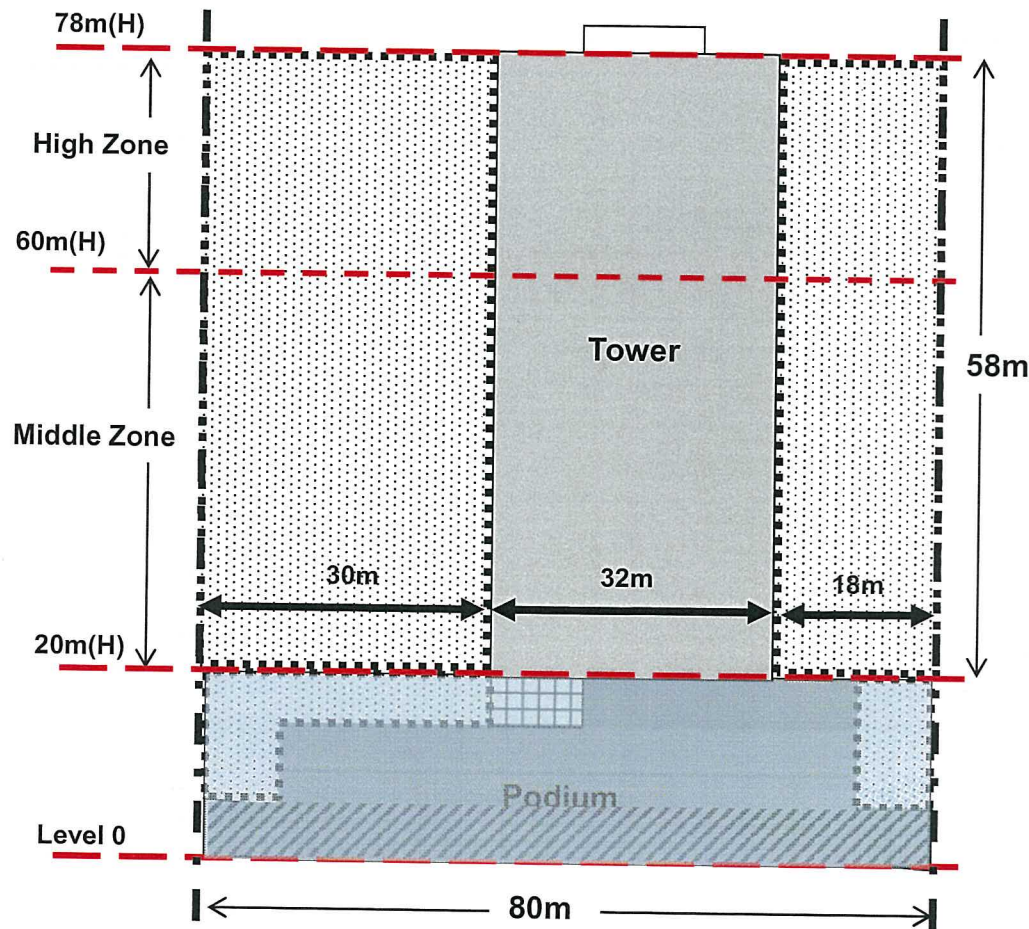
Overall P achieved at low zone

$$= 19\% + 4\% = 23\% (> 20\%, \text{ i.e. OK})$$

Fig. B20

Building Separation Assessment

Design Requirement (2) - Middle and High Zone

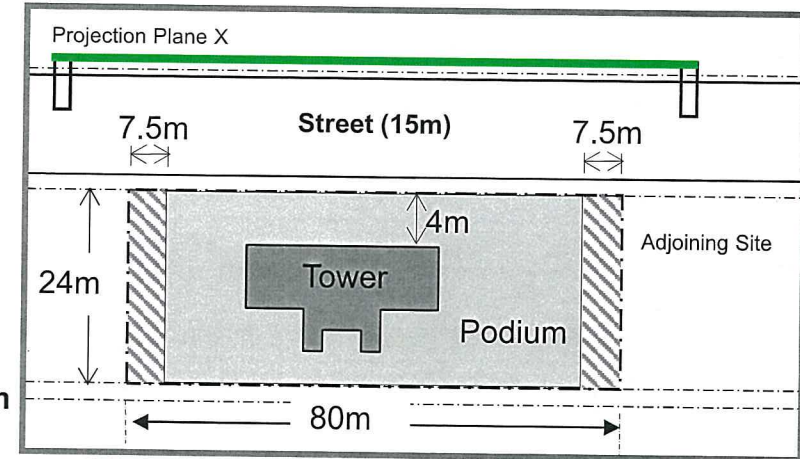


Projected Facade Through Projection Plane X

Elevational Projection



(Rev. 1/2016)



Plan

IS & S for middle & high zone

- min. 7.5m to common BL
- height $\geq 2/3$ of the Assessment Zone or open to above

Middle zone:

Total facade area of the IS

$$= (18 \times 40) \text{m}^2 + (30 \times 40) \text{m}^2 = 1920 \text{m}^2$$

P achieved by IS

$$= 1920 \text{m}^2 / (80 \times 40) \text{m}^2 \times 100\% \\ = 60\% (> 20\%, \text{ i.e. OK})$$

High zone:

Total facade area of the IS

$$= (18 \times 18) \text{m}^2 + (30 \times 18) \text{m}^2 = 864 \text{m}^2$$

P achieved by IS

$$= 864 \text{m}^2 / (80 \times 18) \text{m}^2 \times 100\% \\ = 60\% (> 20\%, \text{ i.e. OK})$$

Fig. B21

Building Setback Requirements

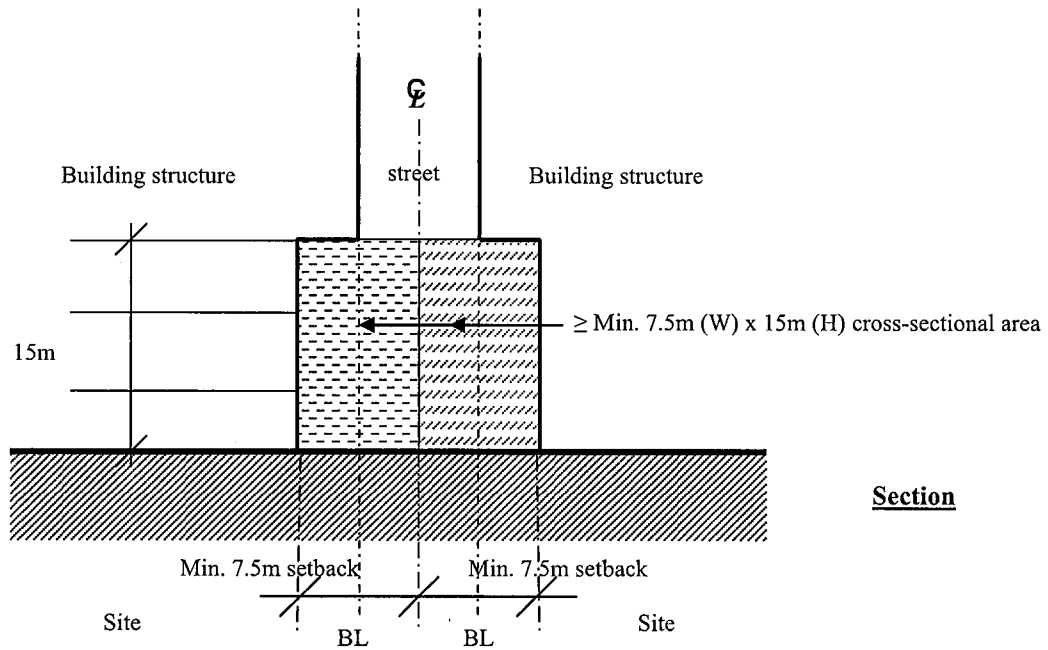


Fig. C1 Building setback as detailed in paragraph 7(a) of this PNAP

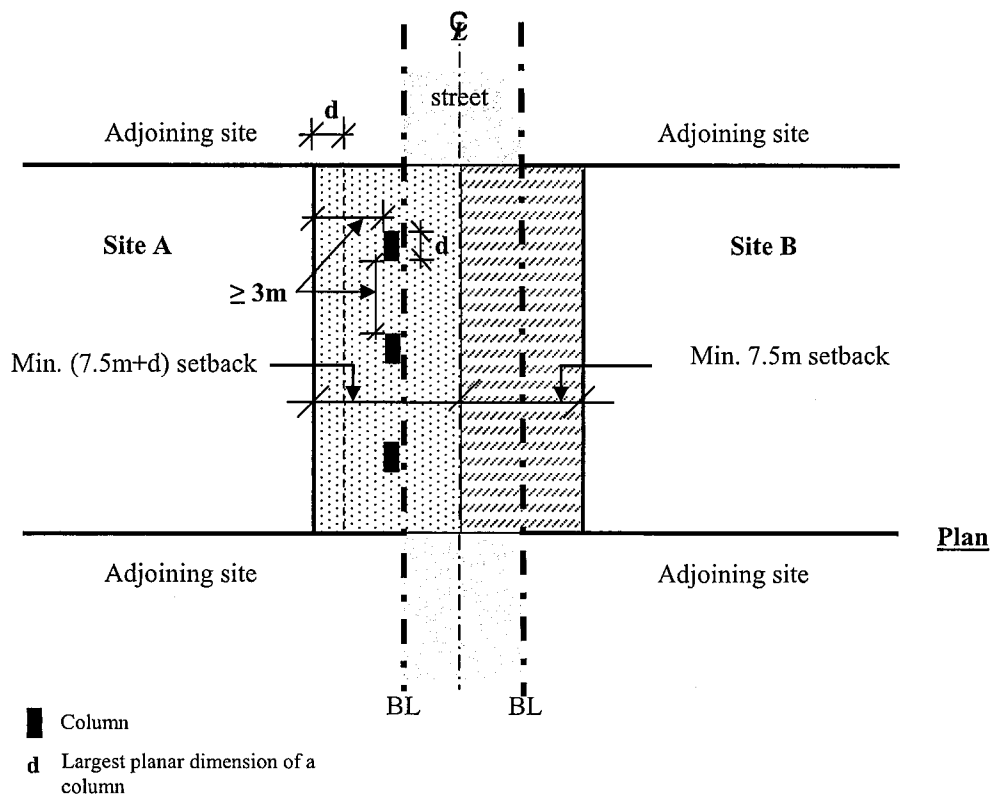


Fig. C2 Building setback as detailed in paragraphs 7(a) and 8(c)

Appendix C
(PNAP APP-152)

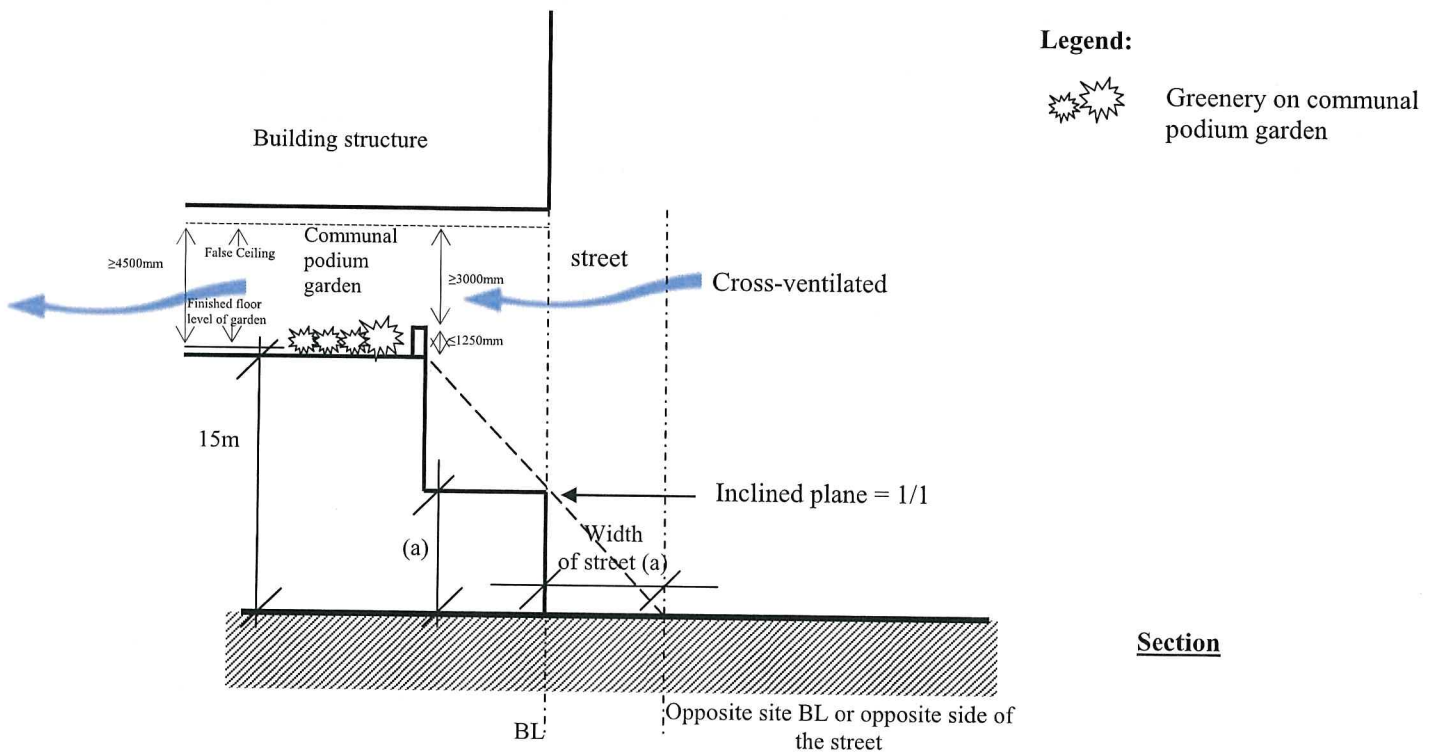


Fig. C3 Stepped building profile with communal podium garden as detailed in paragraph 7(b)

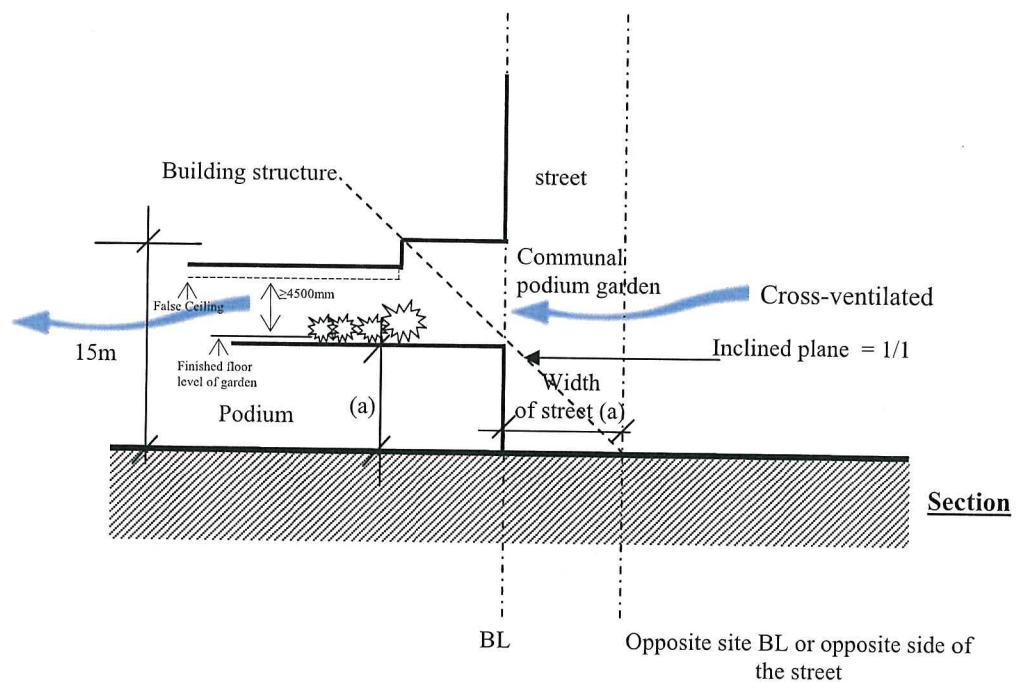
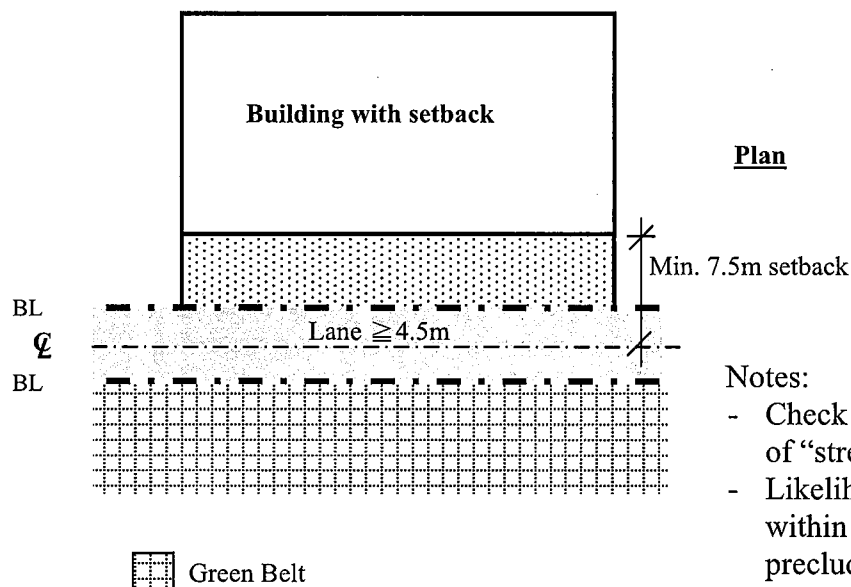


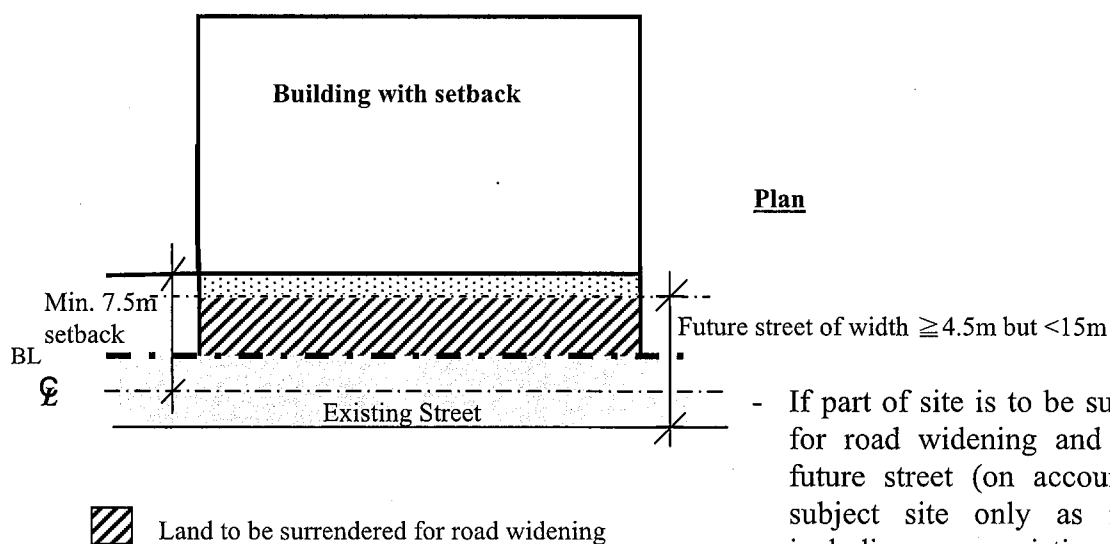
Fig. C4 Stepped building profile with communal podium garden as detailed in paragraph 7(b)



Notes:

- Check if lane falls under the definition of “street” in Appendix A
- Likelihood of future development within Green Belt cannot be precluded. Hence, Green Belt should not be regarded as lane
- If width of the lane is $\geq 4.5\text{m}$ but $< 15\text{m}$, building setback is required

Fig. C5 Example (1) of Building Setback - Site abutting narrow lane with Green Belt beyond



- If part of site is to be surrendered for road widening and width of future street (on account of the subject site only as indicated) including any existing street is $\geq 4.5\text{m}$ but $< 15\text{m}$, building setback is required from the centreline of the existing street.

Fig. C6 Example (2) of Building Setback – Portion of Site will be surrendered to form a future street

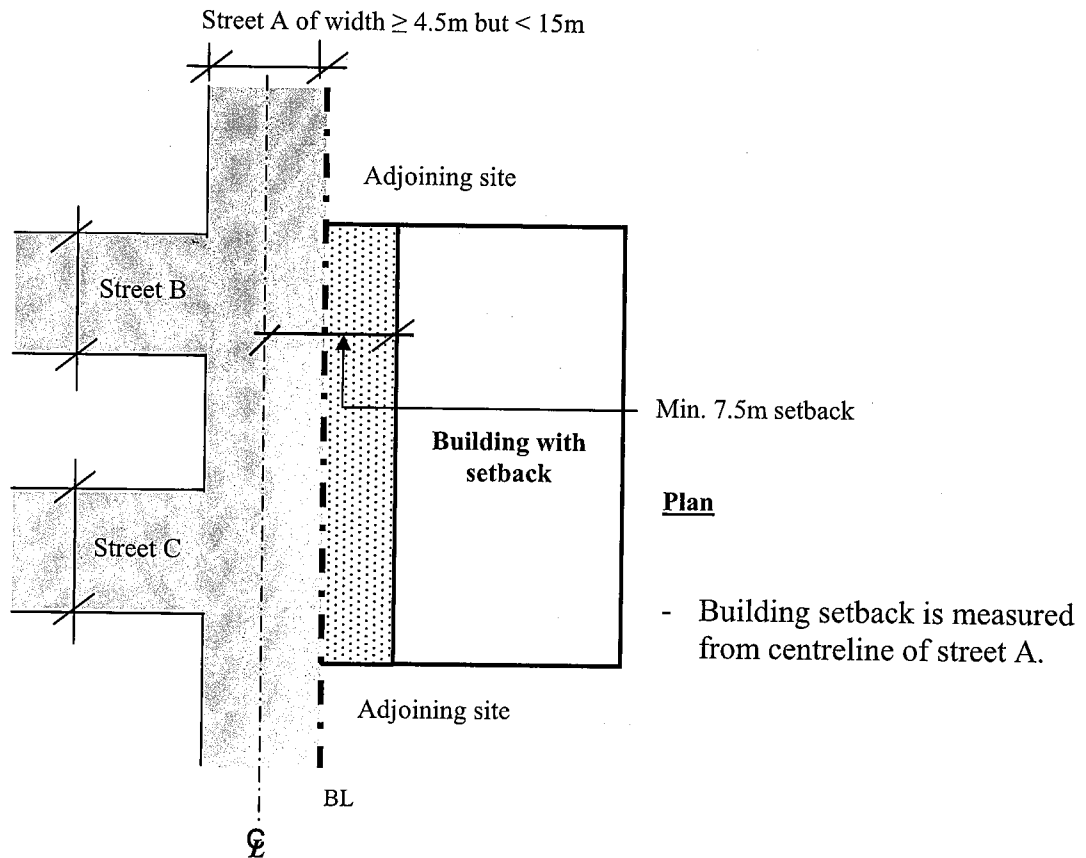


Fig. C7 Example (3) of Building Setback - Site abutting streets at intersections

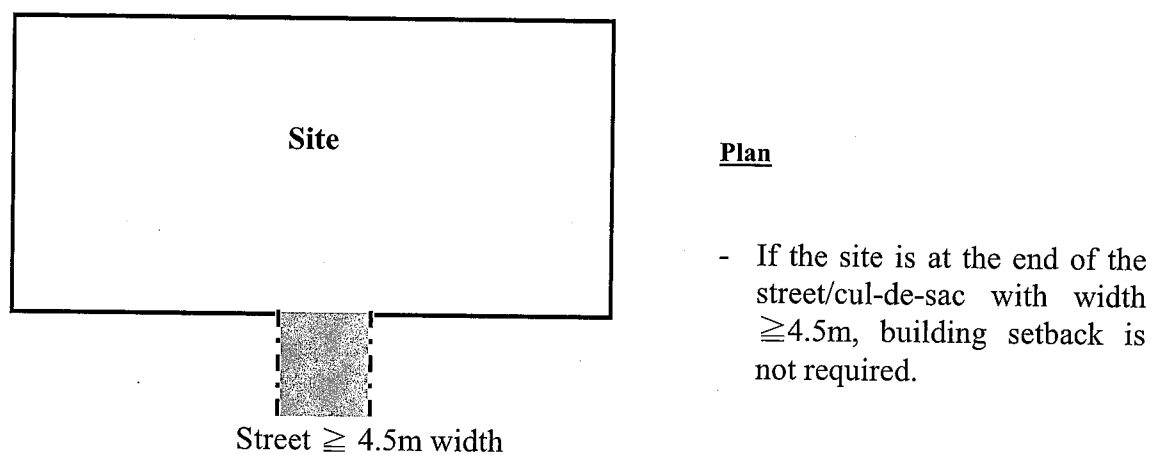
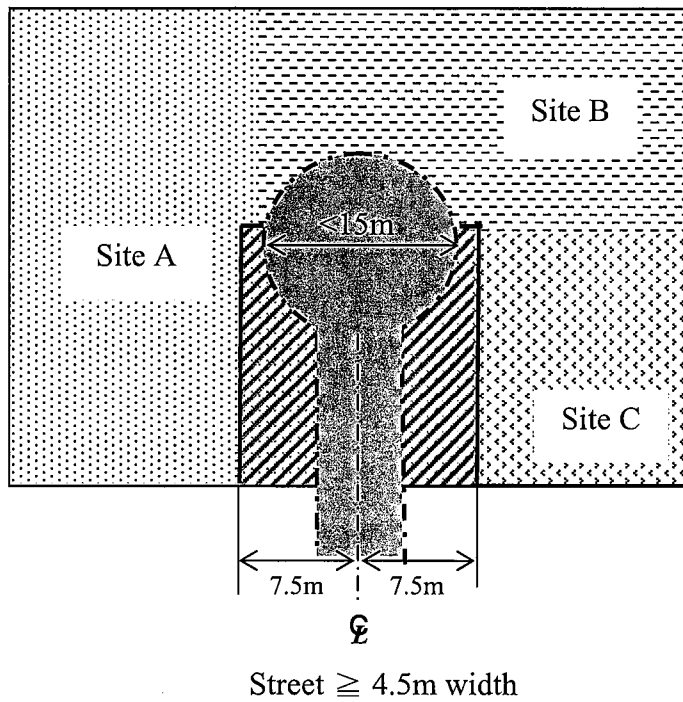


Fig. C8 Example (4) of Building Setback – Site at the end of the street/ cul-de-sac



Plan

- For Site B abutting the cul-de-sac, building setback is not required.
- For Site A & C abutting the street with width $\geq 4.5m$ but $<15m$, building setback (hatched area) is applicable.

Fig. C9 Example (5) of Building Setback – Site abutting cul-de-sac

(Rev 1/2016)

Site Coverage of Greenery

1. All *greenery areas* should be measured horizontally based on the uncovered soil areas as shown on the plan except for the following scenarios in the *primary zone* :-
 - (i) greenery areas in the form of projecting planters (see Figure D1) may be shadowed vertically by other projecting features, provided that the clear height of the projecting features above the covered area is not less than 8 times the horizontal width of the covered area and fronting or visible to the public from a street/a public pedestrian way/ public open space; or
 - (ii) greenery areas may be shadowed vertically by buildings (including overhangs), provided that when measured from the 45° projected line taken from the edge of the building, they should fall within the area and be accessible to the public, visitors or occupiers from the adjoining open areas (see Figure D2).
2. The summation of following greening features may be accepted to contribute not more than 30% of the total required *greenery areas* of the overall provision as specified in Table 2 of this PNAP subject to its location and application of a reduction factor where applicable.

Greening Features	Location	Reduction Factor in Computing the Greenery Areas
Covered greenery areas ² accessible to public, occupiers or visitors from adjoining open space	<i>Primary zone</i> (measured from 45° projected line taken from the edge of building)	50%
Water features ³	<i>Primary zone</i> or uncovered communal roof	50%
<i>Grass paving</i>	Except carparking spaces or loading / unloading areas	50%
Planters along the perimeter of an inaccessible roof ⁴	Primary zone	50%
<i>Vertical greening</i> ⁵	Primary zone	Nil
Landscape-treated Greening on slopes / retaining structures ⁶ with gradient steeper than 45°	No restriction	Nil

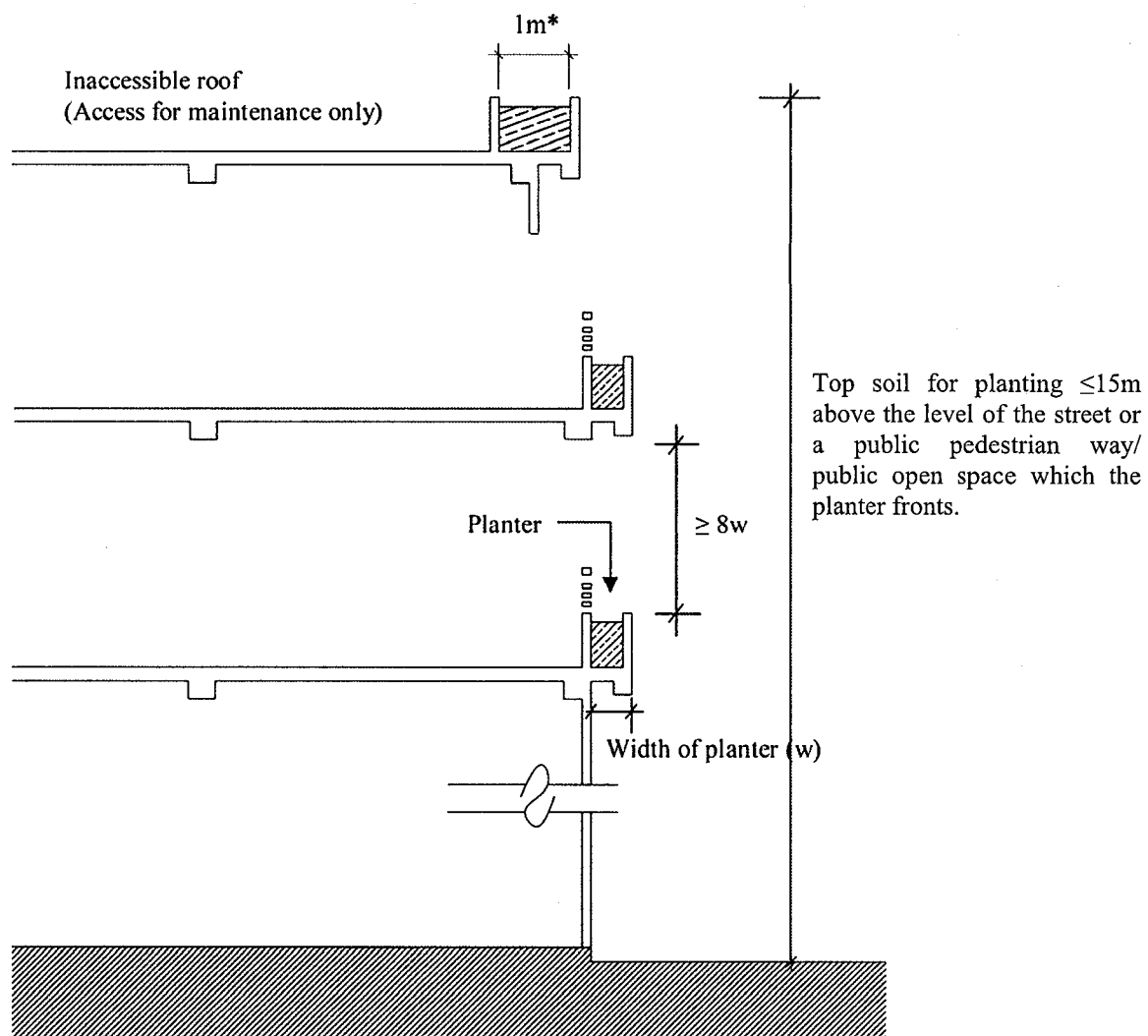
- 1 For reference, the recommended minimum soil depths for trees, shrubs, grass/ground covers are 1.2m, 0.6m and 0.3m respectively.
- 2 In planting design and species selection for covered greenery, reference should be made to “Proper Planting Practice – Provide Sufficient Growing Space between Trees and Adjacent Buildings / Structures” issued by Greening, Landscape & Tree Management Section of DEVB (www.greening.gov.hk).
- 3 Water features should be measured by the horizontal water surface area. Swimming pool and jacuzzi are not considered as water features. Filtration plant room for water feature may be exempted from

GFA but subject to compliance with the pre-requisites and the overall GFA cap on GFA concessions stipulated in PNAP APP-151.

3. Irrigation points and drainage provision should be provided at *greenery areas* to facilitate future maintenance. In addition, where greenery is provided on the roof, the roof should be of impervious construction and the design and calculation of the minimum imposed load on the roof should also take into account the anticipated loads of the soil, plants, trees, etc.
4. Greenery in removable pots/planters that are not permanently fixed or built into the development; and covered greenery above the *primary zone* such as in covered communal podium garden or sky garden cannot be counted as *greenery area*.
5. All *greenery areas* for the purpose of this PNAP should be designated as common part of the building. As for the perimeter planters on the inaccessible flat roofs, communal access paths should still be provided from the common areas for maintenance of the planters.
6. When granting modifications under section 42 of the Building Ordinance for GFA concessions applied under PNAP APP-151, the Building Authority (BA) may impose, but not limited to, the following conditions: -
 - (a) The *greenery areas* should not be used for any other purposes without the prior consent of the BA.
 - (b) The restriction on the use as stated in item (a) above and the *greenery areas* to be designated as common parts should be incorporated into the Deed of Mutual Covenant (DMC) with details of their size (in area), locations and the common access thereto clearly indicated on a plan(s). Where no DMC is to be in force, such restriction and designation should be incorporated into the Sales and Purchase Agreement, Assignment or Tenancy Agreement.
 - (c) The letter of undertaking for complying with the requirements as stated in items (a) and (b) above, submitted by the developer or owner in support of the application for GFA concessions should be registered in the Land Registry before applying for the occupation permit.

-
- 4 Irrespective of the size of planters, only the soil areas within 1m from the perimeter of the roof are accountable.
 - 5 *Vertical greening* should be measured by the elevational area of the vegetated panel/modular planter or panel, and the vertical frame (for climbing and/or weeping plants) where the greenery will grow. For *greenery areas* provided by climbing or weeping plants, vertical frames with a height more than 7.5m are not accountable. The horizontal area of soil in planters under the vertical frame/modular planter/panel already counted for vertical greening as aforesaid should be excluded from the *greenery area* calculation. Self-clinging climbing plants on hard surfaced walls should be measured horizontally based on the soil areas as shown on the plan (not counted as vertical greening and therefore not subject to the restriction in the table).
 - 6 Greening on slopes/retaining structures should be measured by the projected elevational area of the soil where the greenery will grow. Greening on slopes/retaining structures with gradient equal or less than 45° will be measured horizontally based on the soil area as shown on the plan.

Greenery Area at Primary Zone



Typical Section (not to scale)

- * Irrespective of the size of planters, only maximum 1m wide soil areas of planters along the perimeter of an inaccessible flat roof in the *primary zone* can be accountable.

Fig. D1 Greenery in *primary zone* as per paragraph 1(i) of this Appendix

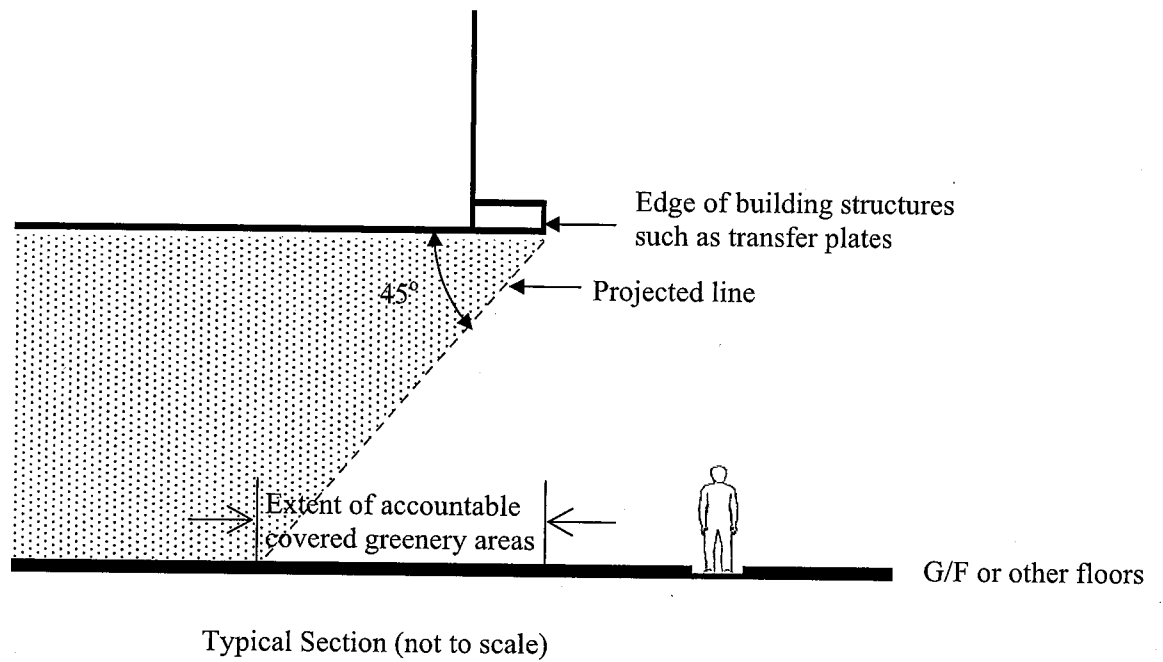


Fig. D2 Covered greenery in *primary zone* as per paragraph 1(ii)

Alternative Approaches

Principles

Pursuant to paragraph 12 of this PNAP, in recognition of the genuine constraints in compliance with the SBD Guidelines under the special circumstances of individual cases, the BA takes a flexible and pragmatic stance in accepting:

- (a) performance-based approach in justifying alternative designs that can achieve equivalent standards, or
 - (b) inadequate provisions of a particular key design element when mitigated by other effective compensatory measures such as enhancement in the provision of other key elements or by the consideration of the unique context of the site e.g. sites with unobstructed surrounds, such as piers.
2. Alternative design proposals and applications for exemption or modification of the building separation, building setback and site coverage of greenery requirements should be supported by justifications. Where necessary, such proposals and applications may be examined by the Building Committee or the Expanded Building Committee (collectively as BC) composing of external experts in the relevant fields. The BA may take into account recommendations from the BC and other relevant considerations in determining acceptance of the proposal.

Building Separation

Alternative Design for Waiving Low Zone Assessment

3. The building separation requirement at the low zone may be waived for buildings with:
- (a) less dominating building bulk – the site coverage for the building including any podium does not exceed 65% of the site; and
 - (b) adequate setback along *street* frontage – the full height of the building is set back¹ from a site boundary abutting any *street* such that the total frontage of such setback is not less than 50% of the length of that boundary and not less than 10m long or the full frontage for site with frontage less than 10m; and the total setback area is not less than 15% of the site area.

Performance-based Design Alternative

¹ Reference is made to the design criteria on the setback approach under PNAP APP-132

4. To allow for flexibility in building design where the prescriptive requirements specified in Design Requirements (1) and (2) as mentioned in paragraph 4 of this PNAP cannot be fully met, the adoption of performance-based design alternative on the provision of building separation may be accepted on the conditions that:-

- (a) Provision of the minimum P as specified in Table 1 for each assessment zone; and
- (b) Satisfactory demonstration by *air ventilation assessment (AVA)* that the buildings' potential impact on the local wind environment has been duly considered and that by comparing with a baseline case which complies with the above Design Requirements (1) and (2), the proposed design is equivalent or better in external air ventilation terms.

5. The *AVA* shall be done by referring to the latest methodology and requirements of Technical Guide for Air Ventilation Assessments² using wind tunnel modelling or digital representation of the physical and wind environment using *Computational Fluid Dynamics (CFD)* simulations.

6. For projects adopting a performance-based design alternative, the following information with full justifications for deviation from the prescribed requirements should be submitted preferably in two stages to avoid abortive work:

Stage 1 Submission

- (a) An expert evaluation on whether the tools and methodologies for *AVA* employed are fit for the purpose and are suitably verified and scientifically validated with practical merits shall be carried out. In this connection, submission for prior acceptance of all information listed below covering factors like site configuration, local topography, wind characteristic and sensitive receivers in the surrounding areas, relevant urban climatic considerations, etc. is required:
 - (i) a baseline case that fully complies with all the prescriptive Design Requirements (1) and (2);
 - (ii) details of scientific bases to assess performance;
 - (iii) analysis tools and/or design procedures;
 - (iv) modeling input, settings and parameters for the analysis and/or design;
 - (v) limitation and applicability of the proposal in context;
 - (vi) interpretation of results;
 - (vii) method of verification;
 - (viii) similar established standard and implementation in other places; and
 - (ix) documented references of the scientific bases.

² The Technical Guide is issued by the Planning Department and is available from the website at (http://www.pland.gov.hk/pland_en/p_study/comp_s/avas/avas_eng/avas_mtguide_p01.html)

Stage 2 Submission

- (b) A study report on whether the proposed scheme will be in line with urban climatic considerations and such similar requirements as imposed through the town planning approval process or in Government lease; and
- (c) An *AVA* report on whether the proposed scheme will perform better in external air ventilation terms, demonstrated by the simulation results of the proposed scheme as compared to the simulation results of the baseline case.

7. Upon approval of the proposal, additional three hard copies and an electronic copy in Acrobat format for each *AVA* report shall be submitted together with a copy of the completed *AVA* register³ for inclusion in the register kept by the Planning Department.

Special Considerations for Buildings with Unique Functional Requirements or Heritage Value

8. For alteration and addition of an existing building resulting in a new building involving the adaptive reuse of historic building or for certain new buildings with special functional requirements in building length and/or bulk e.g. infrastructural facilities, transport terminus, sports and civic facilities, the BA may exempt such historic buildings or special facilities from the building separation Design Requirements (1) & (2) if the equivalent performance is proven and compensatory measures are provided as follows:

- (a) An *AVA* by wind tunnel or *CFD* has been conducted to demonstrate that the design for the proposed new building has outperformed another viable notional scheme⁴ in accordance with the methodology and requirements stipulated under the category of Microclimate Around Buildings (S_A8) of the BEAM Plus⁵ certification; and either one of the following three requirements under the aforesaid category has been complied with; and the results of which are considered acceptable by the BA:
 - (i) wind amplification – no pedestrian areas will be subject to excessive wind speeds;
 - (ii) elevated temperatures – providing shade; or
 - (iii) elevated temperatures – providing suitable roofing material or vegetation roof.

³ AP is requested to seek consent from the owners to release the information contained in the *AVA* proforma (https://www.devb.gov.hk/filemanager/en/content_679/hplb-etwb-tc-01-06.pdf) and / or the *AVA* reports for public inspection. For projects which cannot be disclosed to the public due to confidentiality or consent from owners has not been given, the information would be kept solely for the government's internal reference.

⁴ Viable notional scheme is a practically viable scheme complying with relevant statutory and allied requirements but excluding those on building separation for demonstrating the improvements to be achieved by the proposed design.

⁵ BEAM Plus for New Buildings. (<http://www.hkgbc.org.hk/eng/beamplus-main.aspx>)

- (b) Building features such as additional building setback, stepped profile of the podium from the adjoining streets and communal podium garden to separate the podium from the tower above and to promote air flow at pedestrian level, etc. have been considered in the assessment described in item (a) above and incorporated in the design, where appropriate; and
- (c) Building separation requirement is fully complied with for other buildings on the same site or other parts of the building that are located above such special facilities or historic buildings, where applicable.

Proposal involving both new and existing buildings in a site

9. In principle, provided that new buildings will not increase the L_p of the existing building, the BA may exempt the existing building from the building separation requirement by disregarding them from the assessment zone.

Building Setback

10. Where the setback of a building will result in a setback area of more than 15% of the area of the site, requirement for building setback may be relaxed if the following compensatory measures are provided:

- (a) Full height and full frontage setback of the building from the site boundaries abutting any narrow streets from the respective site boundaries with a total setback area which is not less than 15% of the area of the site provided that such area will contribute to improving the street environment; and
- (b) For small sites not exceeding 1,000 m², greenery should be provided at the Primary Zone such that the greenery area is not less than 50% of the setback area. All greenery areas shall comply with the requirements in Appendix D where applicable.

Site Coverage of Greenery

11. For sites with genuine difficulties in providing greenery along the street frontage or in the primary zone but with abundance of sustainable natural landscape at the back, the BA may favourably consider the provision of welcoming “green” path to the street pedestrian for viewing such natural landscape as an alternative.

12. For sites with development in phases, while the level of provision of greenery should base on the area of the whole site, notional site area may be applicable to a certain phase of the development for the greenery area to be provided for that particular phase.

(1/2016)

Information and Documents to be Submitted

To demonstrate compliance with the building separation, building setback and site coverage of greenery requirements, the following information should be provided for consideration: -

Building Separation

- (a) 1:500 layout plans each showing the site in relation to its adjoining *streets* and surrounding buildings and features. The footprint (external walls) of the proposed buildings within the site, the provided *IS*, *PE*, the selected orthogonal projection planes, air corridors and air paths are to be clearly shown to demonstrate compliance with the building separation requirements for each low, middle and high zones.
- (b) Plans, elevations and sections at a legible ratio (preferably not less than 1:300) with supporting calculations showing the *U*, the maximum *L_p* of buildings and groups of buildings in comparison to the permissible *L_p*; *S* provided in comparison to the required *S*; and *P* of buildings achieved at each low, middle and high zone, in comparison to the minimum *P*.

Building Setback

- (c) A block plan showing the location of the subject site and the width of all adjoining *streets*;
- (d) Where the width of any *street* is less than 15m, further details such as level(s) of the *street* for computing the amount of required setback.
- (e) 1:100 plan(s) and section(s) with calculations demonstrating compliance with the building setback requirements.
- (f) Information showing the compliance of *greenery areas* requirement under paragraph 10(b) of Appendix E (as detailed in items (g) and (h) below).

Site Coverage of Greenery

- (g)* Plans at a legible ratio (preferably not less than 1:300) showing the locations of the proposed *greenery areas*, the common access thereto and details of relevant street, public pedestrian way, public open space for compliance with the requirement of *greenery areas* at *Primary Zone(s)*.
- (h)* A schedule with calculations and illustrated diagrams showing the area of proposed greenery at each location for compliance with the minimum site coverage of greenery requirements.

Note

- * Information to be updated and soft copy to be submitted at the time of submitting application for occupation permit. The soft copy should be in PDF format with 200 dpi resolution.

Implications of Sustainable Building Design Guidelines

1. Sustainable Building Design Guidelines

- 1.1 In October 2010, the Government promulgated that a series of measures would be put in place to enhance the design standard of new buildings to foster a quality and sustainable built environment as well as to address local concerns on excessive building bulk and height. The new requirements were subsequently imposed through administrative means by way of new practice notes for building professionals (i.e. PNAP APP-151 “Building Design to Foster a Quality and Sustainable Built Environment” (**Annex B1**) and APP-152 “Sustainable Building Design Guidelines” (SBDG) (**Annex B2**)) first issued by the Buildings Department in January 2011.
- 1.2 SBDG establishes 3 key building design elements, i.e. building separation, building setback and site coverage of greenery, with the objectives to achieve better air ventilation, enhance the environmental quality of living space, provide more greenery particularly at pedestrian level, and mitigate heat island effect (**Annex B2**).
 - (a) Building Separation – Building sites that are 20,000m² or above, or sites that are less than 20,000m² but proposed with a continuous building façade length of 60m or above are subject to maximum façade length control and the requirement to provide 20%, 25% or 33.3% permeability, depending on the site area, façade length and building height (BH), in the three assessment zones (i.e. 0-20m (Low Zone), 20-60m (Middle Zone) and above 60m (High Zone)).
 - (b) Building Setback – Buildings fronting a street less than 15m wide should be set back so that no part of the building up to a level of 15m above the street level is within 7.5m from the street centreline; or alternatively a cross-ventilated communal podium garden as specified and with a clear height of not less than 4.5m is to be provided.
 - (c) Site Coverage of Greenery – For sites not less than 1,000m², greenery areas of 20% or 30% of the site area should be provided depending on the size of site; and not less than half of greenery areas should be within a 15m vertical zone along the abutting street level (i.e. the Primary Zone).
- 1.3 Since there are special circumstances in which genuine difficulties in complying with the prescriptive requirements of SBDG may be encountered, a flexible and pragmatic stance has been taken by the Building Authority (BA) when considering proposals holistically to achieve the objectives of SBDG. Alternative approaches (e.g. performance-based design alternatives, mitigation by effective compensatory measures, or consideration of the unique context of the site) are provided in SBDG (**Appendix E** of APP-152 in **Annex B2**).

- 1.4 Compliance with SBDG is one of the pre-requisites for granting gross floor area (GFA) concessions for green/amenity features and non-mandatory/non-essential plant rooms and services by the BA (**Annex B1**). Such requirements would also be included in the lease conditions of new land sale sites or lease modifications/land exchanges.

2. **Implications on Building Profile**

- 2.1 Since the specific and relevant building design requirements under SBDG can only be determined at detailed building design stage and there are different options or alternative approaches to meet the requirements, it would be difficult to ascertain at the early planning stage precisely the implications on individual development such as its eventual built form, block layout and BH. As such, the extent of implications of SBDG on building profile can only be estimated in general terms by adopting typical assumptions.

Building Setback

- 2.2 For building setback, to maintain a building line of 7.5m from the street centreline up to 15m from the street level, the likely implication would be a reduction of site coverage (SC) of the podium/lower floors. The extent of building setback, however, depends on the width of the existing street.
- 2.3 In the situation where a significant portion of the site may be required to be set back resulting in development constraints particularly in cases of small sites or sites having a long street frontage, SBDG has made provision that the maximum land area to be set back could be capped at 15% of the site area if compensatory measures including full height/frontage setback and prescribed greenery areas are provided.
- 2.4 In this connection, the maximum reduction in SC in podium/lower floors to meet the building setback requirement would be 15% of the site area and the GFA incurred would depend on the number of podium storeys affected. In Ngau Tau Kok and Kowloon Bay, a composite development would generally involve residential tower(s) over a two-storey or three-storey podium¹. To accommodate the floor space so displaced, an additional storey may be required². See illustration (**Annex C1a**). The impact of the option of providing a cross-ventilated communal podium garden, if adopted, would be an additional storey with a BH of about 5m.

¹ The maximum PR for the "R(A)" sites in Ngau Tau Kok and Kowloon Bay is stipulated on the OZP (i.e. domestic PR 7.5 and total PR 9). A three-storey podium of 100% site coverage purely for commercial use for composite development is not so common unless the non-domestic PR is to be maximized and domestic PR is less than the maximum of 7.5 as permitted.

² The estimate is based on the assumption that the maximum domestic GFA will be adopted for a composite development. If non-domestic GFA is to be maximized instead, another additional storey may be required pending on site classification.

Building Separation

- 2.5 In devising building separation, there would be more variations in design options for the Low Zone (i.e. 0-20m) which is usually occupied by continuous podium floors having long façade length and 100% SC. Some of the floor space would need to be redistributed from lower to upper floors to allow for the prescribed building separations. For the tower block at the assessment zones above, the maximum façade length and the 20% to 33% permeability requirements could usually be met without much difficulty given that the size of tower block is already capped by the maximum permissible SC (i.e. 60% to 65% for non-domestic buildings and 33.33% to 40% for domestic buildings) under Building (Planning) Regulations (B(P)R).
- 2.6 To cater for possible difficulties in meeting the building separation requirement in the Low Zone, SBDG has allowed flexibility to waive such requirement if less dominating building bulk and adequate setback along street frontage are provided. The maximum SC allowed in this alternative design is set at 65%. The impact on BH for a composite development would be equivalent to about two storeys (**Annex C1b**). It should be noted that the above reduction in SC and setback could also be counted towards the building setback requirement mentioned in paragraphs 2.2 to 2.4 above. Hence, the cumulative impact of building setback and building separation on BH would be about two storeys³ or about 6m (depending on building types and floor-to-floor height (FTFH)).

Site Coverage of Greenery

- 2.7 Since greenery can usually be provided within the building setback area, at podium floors or in form of vertical greening etc., the requirement would unlikely have any significant implication on BH and building massing.

3. Assumptions for Assessment of Building Height

- 3.1 To estimate the implications of SBDG on BH, a conservative approach is adopted. It is assumed that the maximum achievable SC for the podium/lower floors to meet the building setback requirement is 85%, and that for meeting the building separation requirement is 65%. BH will then be derived based on the types of building (domestic, non-domestic or composite building), site classification and corresponding permissible PR and SC under B(P)R, possible GFA concessions, podium height up to 15m, FTFH, provision of carpark at basement level and refuge floor requirement.
- 3.2 With assumptions set out in **Annex C2**, where building setback and building separation requirements of SBDG are implemented, the BH of a typical commercial building at PR of 12 will be ranging from 91m to 103m and that of a composite building within an "R(A)" zone (with the podium floors for

³ The estimate is based on the assumption that the maximum domestic GFA will be adopted for a composite development. If non-domestic GFA is to be maximized instead, another additional storey may be required pending on site classification.

non-domestic use and upper portion for domestic use)⁴ will be ranging from 81m to 92m.⁵

- 3.3 However, it should be noted that the assessment is only generic one where site-specific constraints have not been factored. For sites with odd shape and constraints, for example, sites with narrow and elongated site configuration abutting narrow streets may constrain future redevelopment in achieving the building separation requirements under SBDG, notional schemes should be drawn up to review the possible building profiles and BH.

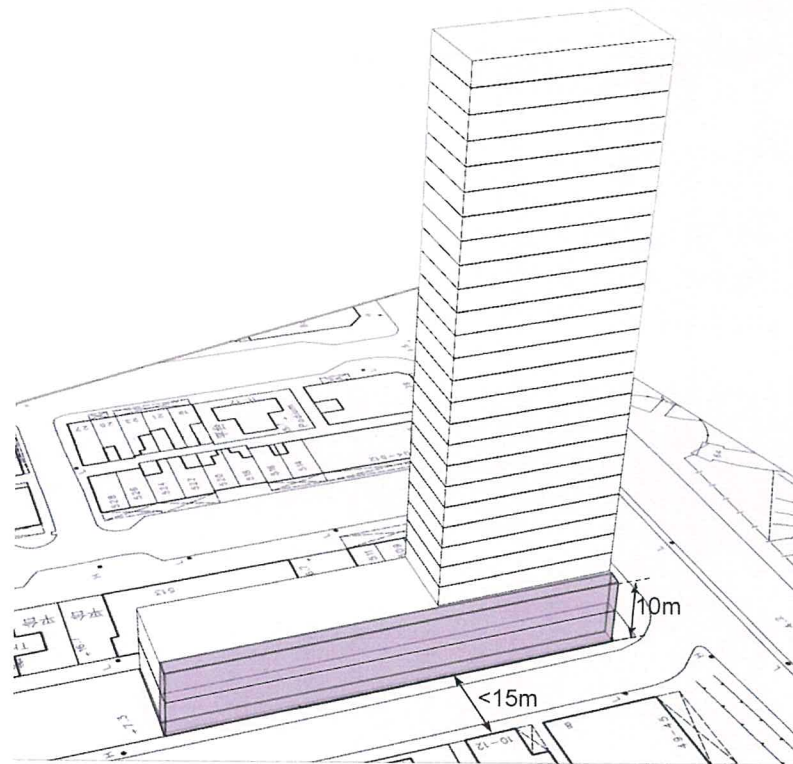
⁴ In actuality the podium also contains domestic use, for example entrance lobby and club house.

⁵ Estimates based on maximizing the domestic PR (i.e. 7.5) of a composite development under "R(A)" zone.

Sustainable Building Design Guidelines

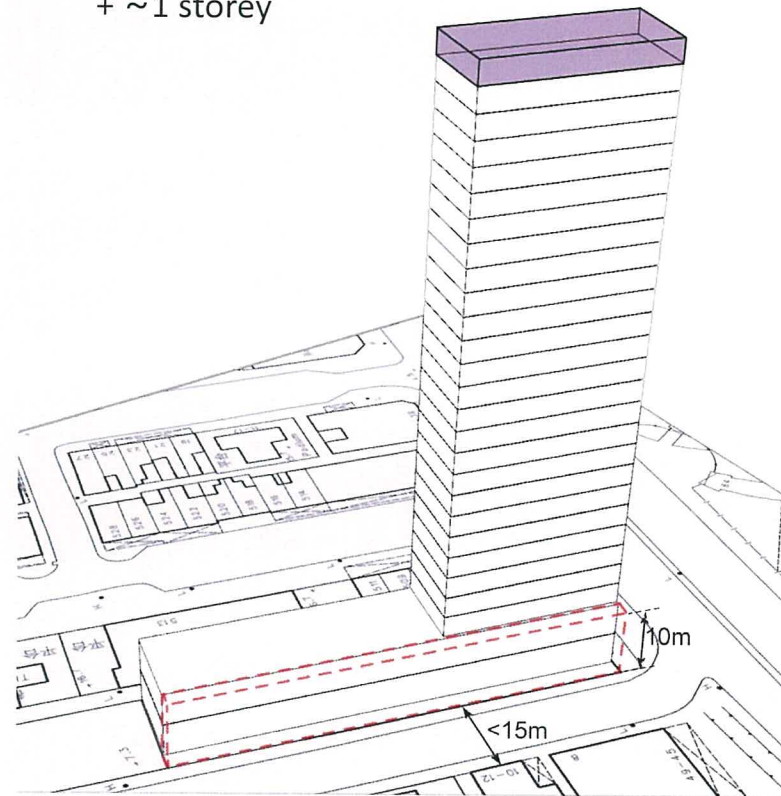
Implication of Building Setback Requirement

- Full height and full frontage setback from **narrow street(s)**
- Setback can be from **one or more** narrow street(s)
- Total setback area not less than **15%** of the site area
- Provides at least half of the setback area with greenery



Podium: 100 % SC

Additional Building Height
+ ~1 storey



Setback by 15% of Site Area

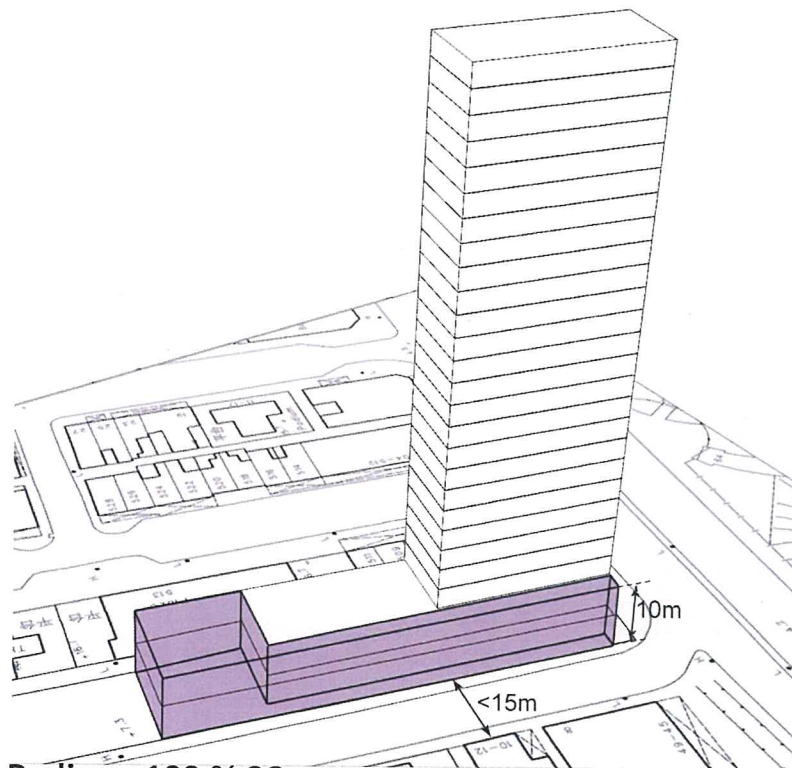
Illustration of a composite development

Annex C1a of TPB Paper
No. 10397

Sustainable Building Design Guidelines

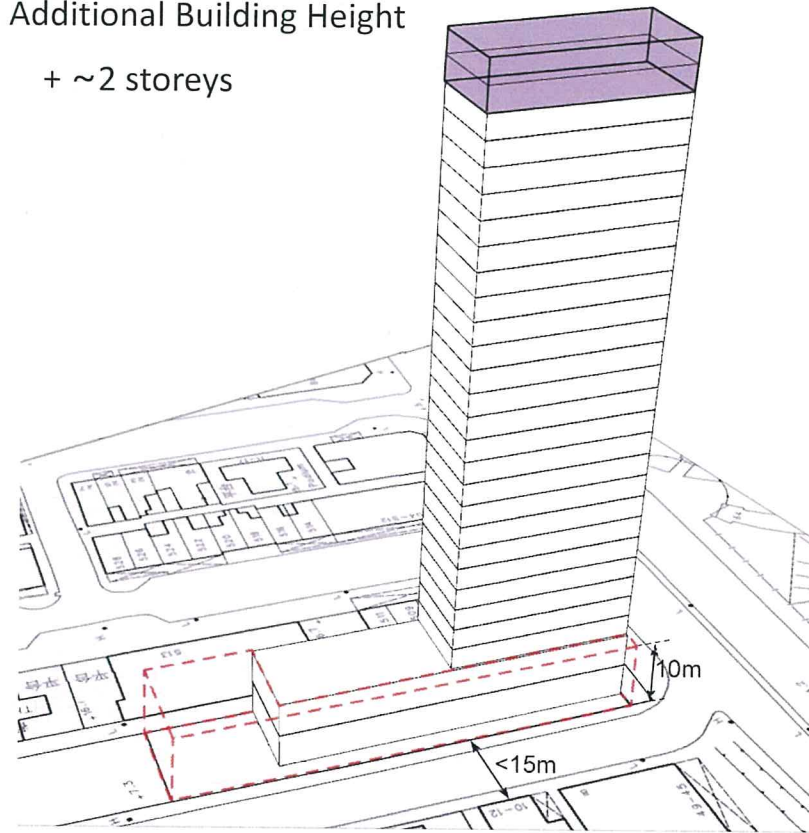
Implication of Building Separation Requirement

- Site coverage $\leq 65\%$
 - Setback area from street(s) $\geq 15\%$
($\geq 10\text{m}$ and $\geq 50\%$ of the site boundary length abutting street(s))
- Building separation requirement **at low zone may be waived**



Podium: 100 % SC

Additional Building Height
+ ~2 storeys



Podium: 65 % SC

Annex C1b of TPB Paper
No. 10397

Illustration of a composite development

Basic Assumptions and Implications of Sustainable Building Design Guidelines

Assumptions

Floor to Floor Height (m)									
Residential (private)				3.15					
Commercial				4					
Podium				5					
Plot Ratio				Class A		Class B		Class C	
“R(A)” (Dom / Non dom PR)				7.5 / 0.94		7.5 / 1.5		7.5 / 1.5	
“OU(B)”				12		12		12	
Other zones				GFA permissible under OZP					
GFA Concessions [a]									
Residential and Composite Commercial/				20%					
Residential									
Commercial				25%					
Site Coverage		Basic Building Profile		SBDG Building Setback + Basic Building Profile			SBDG Building Separation + Basic Building Profile		
Class of Site	A	B	C	A	B	C	A	B	C
Podium (%)	100			85			65		
Residential (%)	33.3	37.5	40	33.3	37.5	40	33.3	37.5	40
Commercial (%)	60	62.5	65	60	62.5	65	60	62.5	65

Estimated Absolute BH based on above Assumptions

	Basic Building Profile (m)			SBDG Building Setback + Basic Building Profile (m)			SBDG Building Separation + Basic Building Profile (m)		
Class of Site	A	B	C	A	B	C	A	B	C
Residential (“R(A)” - Private/PSPS/HOS)	86	82	79	89	84	81	92	91	84
“R(B)” - HOS	40	-	-	40	-	-	40	-	-
“OU(B)” and “C”	95	91	87	99	95	91	103	99	95

Estimated No. of Storeys based on above Assumptions

	Basic Building Profile (No. of storeys/ Over No. of podium) [b]			SBDG Building Setback + Basic Building Profile (No. of storeys/ Over No. of podium)			SBDG Building Separation + Basic Building Profile (No. of storeys/ Over No. of podium)		
Class of Site	A	B	C	A	B	C	A	B	C
Residential ("R(A)" - Private/PSPS/HOS)	24s/ 2p	23s/ 2p	22s/ 2p	25s/ 2p	22s/ 3p	21s/ 3p	26s/ 2p	24s/ 3p	22s/ 3p
"R(B)" - HOS	11s/ 1p	-	-	11s/ 1p	-	-	11s/ 1p	-	-
"OU(B)" and "C"	20s/ 3p	19s/ 3p	18s/ 3p	21s/ 3p	20s/ 3p	19s/ 3p	22s/ 3p	21s/ 3p	20s/ 3p

General Notes:

[a] The assumption takes into account (i) the average GFA (e.g. plant rooms, etc. other than carparks)" for non-domestic buildings of 15% under the "Sample Study on GFA Concessions Granted to Buildings" conducted by a Government inter-departmental working group led by the Buildings Department in 2006; and (ii) the overall cap of 10% for the total amount of GFA concession for green/amenity features and non-mandatory/non-essential plant rooms and services under APP-151.

[b] In general, roof-top structures accommodating GFA exempted facilities and occupying not more than 50% of the area of the floor below will not be counted as a storey.

Review of Development Restrictions on Ngau Tau Kok & Kowloon Bay OZP

1. Overview

- 1.1 The assumptions adopted for the Review are explained in **Annex C1** and detailed in **Annex C2**. The scope of the Review covers the amendments stipulated under the Ngau Tau Kok & Kowloon Bay Outline Zoning Plan (OZP) No. S/K13/26 (the subject OZP), including building height restrictions (BHRs) in sites outside the Kowloon Bay Business Area (KBBA) as well as the non-building area (NBA) and building gap (BG) in areas both within and outside KBBA (see **Plans 3B** and **3C**).
- 1.2 The BHRs in KBBA exhibited in 2005 under OZP No. S/K13/22 and amendments made subsequent to the subject OZP i.e. No. S/K13/27 to 29 are excluded from the scope of the Review as they are not subject of REDA's representation. The amendments made under OZP No. S/K13/27 are mainly technical amendments to reflect the as-built conditions/lot boundaries and SBDG implications are not relevant. Amendments made under OZP Nos. S/K13/28 and S/K13/29 had taken into account the general implications of SBDG.
- 1.3 The Review concluded that no amendment to the BHR, and NBA and BG requirements in the OZP is required.

2. Review of Building Height Restrictions (BHRs)

"Residential (Group A)" ("R(A)") and "Residential (Group B)" ("R(B)") Sites for Private Developments or Home Ownership Schemes

- 2.1 For all "R(A)" sites and the "R(B)" site, the existing BHRs should be able to accommodate the permissible plot ratio (PR)/gross floor area (GFA) taking into account site classifications and sustainable building design guidelines (SBDG) requirements.

"R(A)"	Richland Gardens, Kai Tai Court, Tak Bo Garden, Amoy Garden, Amoycan Industrial Centre (Blk 1), Jade Field Garden, Wang Kwong Building, Lee Kee Building (Permissible Dom./Total PR – 7.5/9)	
	BHRs	100mPD and 120mPD
	Building heights (BHs) required to accommodate PRs permitted under OZP taking into account SBDG requirements	86mPD to 97mPD
"R(B)"	Shun Chi Court Permissible GFA – 89,900m ² (equivalent to 3 PR on net site area excluding the NBA and Shun Chi Street)	
	BHR	170mPD
	BHs required to accommodate GFA permitted under OZP taking into account SBDG requirements	159mPD

“R(A)” Sites for Public Housing Developments

- 2.2 The BHRs for the public housing sites stipulated under the subject OZP generally reflected existing/committed BHs of majority of the public housing estates. Housing Department (HD) has no programme to redevelop the housing estates at this juncture and has no comment on retaining the existing BHRs for the public housing sites. There is an established mechanism for considering redevelopment of public housing sites in which each site will be reviewed case-by-case for the optimal development intensities taking into account factors such as design considerations, site circumstances and requirements for government facilities when there are redevelopment plans in future;

“Other Specified Uses” (“OU”) annotated “Commercial/Residential Development with Public Car Park and Public Transport Interchange”

- 2.3 For the “OU” zone at 8 Clear Water Bay Road, the existing BHR can accommodate permissible GFA with reference to SBDG requirements.

8 Clear Water Bay Road Permissible dom. / non- dom. GFA – 19,138m ² / 13,360m ² (equivalent to dom./non-dom. PR of 6/4.1)	
BHR	180mPD
BH required to accommodate GFA permitted under OZP taking into account SBDG requirements	119mPD

- 2.4 The following should be noted:

- (a) the development is the subject of planning application No. A/K13/160 approved by TPB in 2002;
- (b) the BHR of 180mPD generally reflects the existing BH at 184.3mPD (on site level of 9.5mPD) of the residential development over a podium with commercial use, a public transport interchange (PTI), ancillary car parking and a park and ride facilities with 450 public car parking spaces; and
- (c) the development was built relatively recently in 2005. If there is redevelopment in future, there will be a need to review whether the special uses including the park and ride and PTI on the site should be retained.

“OU” annotated “Mass Transit Railway Depot with Commercial and Residential Development above”

- 2.5 For this zone, due to the specific uses that need to be accommodated on the site including a railway depot and a PTI, drawing up an indicative redevelopment scheme for BH review taking into account SBDG at this stage may be highly arbitrary. However, based on a broadbrush layout review, it

is considered that the existing BHRs will not render the permissible GFA under the OZP not attainable.

Telford Gardens and Telford Plaza above MTR depot Permissible dom. / non-dom. GFA – 278,703m ² / 177,031m ² (equivalent to dom./non-dom. PR of 1.72/0.96)	
BHR	60mPD and 100mPD
BH required to accommodate GFA permitted under OZP	BHR can accommodate the GFA permissible under OZP. The BHRs of 60mPD and 100mPD applicable to the Telford Gardens portion are generally 10m more than the existing BHs. The BHR of 100mPD at the Telford Plaza portion reflects the existing BH.
SBDG requirements	For redevelopment of the site, it may be difficult to meet the prescriptive SBDG requirements due to the long site frontage and special functional requirements for accommodating the MTR depot and PTI. A performance-based design alternative approach with support of an air ventilation assessment will likely be required.

“G/IC” Sites

- 2.6 For the “G/IC(3)” site, BHR can accommodate the permissible GFA. SBDG requirements are not applicable to the site.

Cheerful Court : Hong Kong Housing Society Senior Citizen Residence development Permissible dom. / non-dom. GFA – 16,500m ² / 4,125m ² (equivalent to dom./non-dom. PR of 5.9/1.5)	
BHR	100mPD
BH required to accommodate GFA permitted under OZP	95mPD
SBDG requirements	Not applicable as (i) the frontages of the site are shorter than 60m and (ii) abut more than 7.5m from the centreline of adjoining streets

- 2.7 For the “G/IC” site occupied by Shun Lee Disciplined Services Quarters, the existing BH is excessive. Upon redevelopment, there is a need to review the most suitable use and the optimal development intensities for the site. The existing BHR is imposed based on the intended BH profile for the Shun Lee Area, it should not be amended at this stage.

Shun Lee Disciplined Services Quarters No GFA restriction under OZP

Approved planning application No. A/K13/140 at 7.78 PR (approved in 2000)	
BHR	180mPD
Existing BH (on site level of 118mPD)	247 mPD to 251mPD

2.8 The following should be noted:

- (a) the existing development was built in 2001 before BHRs were stipulated on the OZP. The development is excessively tall and out of context with adjoining developments especially from the perspective of preserving open vista as viewed from Clear Water Bay Road that is at general level of around 100mPD;
- (b) the BHR of 180mPD was stipulated to reflect the intended BH profile in the Shun Lee area; and
- (c) the staff quarters development is on government land and it was only built in 2001. Should there be redevelopment plans in the longer term, the most suitable use for this “G/IC” site and scale of the development on the site would need to be reconsidered taking account of the optimal development intensity, built form, BH profile on the OZP with a view to achieving a more compatible built form on the site. Residential uses on the “G/IC” site will also require planning permission from the Board.

2.9 For the other “G/IC” and “OU” sites¹ that are not for residential/commercial uses, they have special functional and design requirements with great variation in floor-to-floor height or open air design to suit operational need; and provide spatial and visual relief amidst the densely built environment; and/or the BHRs mainly reflected their existing BHs and may be reviewed on a case-by-case basis when there are known committed redevelopment proposal with policy support.

3. Review of NBA and BG Requirements

3.1 NBAs and BGs are stipulated on the subject OZP taking into account recommendations in the Air Ventilation Assessment (AVA) in **Annex D** to improve permeability of sea breeze towards Kowloon Bay, the effectiveness of major breezeways and the overall wind environment in KBBA. These NBAs and BGs are stipulated to provide design guidance for future redevelopment proposals that will be beneficial to the wind environment in the planning area. In general, the NBAs and BGs are stipulated following the alignment of major roads in the area and serve to extend/widen these breezeways.

¹ These other “OU” sites are annotated for “Refuse Transfer Station”, “Petrol Filling Station”, “Landscape Elevated Walkway”, “Open Lorry Park” and “Railway”. The “G/IC” sites are mainly for schools, police stations, fire stations, reservoir, sports centre, swimming pool etc.

Within KBBA

3.2 Within KBBA, the following NBAs and BGs are stipulated in the subject OZP:

- (a) 3m-wide NBA are stipulated along both sides of Wang Chiu Road and Wang Kwong Road, within inter alias, “OU(B)”, “OU(B)2” and “G/IC(1)” zones. This serve to widen and enhance the effectiveness of the breezeways along these two major roads;
- (b) a 5m-wide NBA is stipulated along Wang Mau Road in the “OU(B)” zone occupied by Housing Authority’s Yip On Factory Building to enhance the breezeway along the linear open space from Kai Cheung Road in the north;
- (c) a 15m-wide NBA is stipulated within the “G/IC(1)” zone that is designated for the Hong Kong Post Central Mail Centre, to extend the breezeway along Lam Wah Street. The design of the mail centre development has already taken into account the NBA;
- (d) 15m/16m-wide BGs at 22mPD are stipulated on two sites zoned “OU(B)”, one site zoned “OU” annotated “Commercial Uses with Public Transport Interchange” and one site zoned “C”, which serve to extend the breezeway at Sheung Yee Road northwards to Lam Hing Street; and
- (e) the Mega Box development that is zoned “OU(B)2” was considered to be sizable with slab-type tower that is unfavourable for wind penetration. A 15m-wide BG at 22mPD was stipulated on the “OU(B)2” zone to introduce a wind corridor for incoming sea breeze upon its redevelopment to connect through the “Open Space” zone to Wang Kwun Street in the north.

3.3 These NBAs and BGs are stipulated based on the recommendations of the AVA to enhance the penetration of sea breeze to the inland and the wind environment in the planning area. They have been reviewed and it is considered that they are appropriate and should be retained, there is no changing circumstances that warrant their deletion or amendment. The permissible GFA under the respective zonings are attainable after taking into account the BHRs, NBAs/BGs as well as SBDG requirements as explained below.

Sites with BG only

3.4 Sites stipulated with BG at BHR of 22mPD are shown in **Plan 3C**.

Sites stipulated with BG	
Permissible non- dom. PR under all respective zones – 12	
Zonings of the three sites stipulated with BG	“C”, “OU(B)” and “OU” annotated “Commercial Uses with Public Transport Interchange” only
Width of BG	“C” – 16m

	"OU(B)" and "OU" zone – 15m
BHR at BG	22mPD
BHR	140mPD
BH required to accommodate PR permitted under OZP with BG	92mPD
BHs required to accommodate PR permitted under OZP taking into account BG and SBDG	96mPD / 100mPD

3.5 The following should be noted:

- (a) as the BG is stipulated with BHR of 22mPD, it will not affect the SBDG requirements at podium levels (assumed to be at a level below 20mPD); and
- (b) the area of the BG is only about 8% to 23% of the individual lots (i.e. developable area of 77% to 92% above 22mPD). This requirement should not affect achieving the maximum permissible non-domestic site coverage under the Buildings Ordinance above the podium level (i.e. 60%, 60.5% and 65% for Class A, B and C sites respectively).

Sites with NBA only

3.6 Sites stipulated with NBA in KBBA are shown in **Plan 3C²**.

Sites stipulated with NBAs zoned "OU(B)"		
Permissible non- dom. PR – 12		
	5m-wide NBA	3m-wide NBA
BHRs	120mPD	120mPD/140mPD/ 170mPD
BHs required to accommodate PR permitted under OZP with NBA	92mPD	92mPD/100mPD
BH required to accommodate PR permitted under OZP taking into account NBA and SBDG	96mPD/100mPD	96mPD/108mPD

3.7 The following should be noted:

For 5m-wide NBA:

- (a) the 5m-wide NBA along Wang Mau Street is within the site occupied by Housing Authority's Yip On Factory Estate;
- (b) Wang Mau Street is narrow of about 9m wide. According to the SBDG, developments need to be setback from centreline of street by 7.5m (i.e. setback of about 3m from the subject site boundary). The 5m-NBA

² A 15m-wide NBA is stipulated within the "G/IC(1)" zone that is designated for the Hong Kong Post Central Mail Centre, to extend the breezeway along Lam Wah Street. The design of the mail centre has already taken into account the NBA.

requirement is slightly wider than the SBDG requirement, this is justified as it generally aligns with and serves to extend the breezeway of the row of linear open space from Kai Cheung Road;

- (c) the area of the NBA is about 7% which is less than the overall setback area of 35% assumed for lower levels as a worst case scenario in **Annex C2**. BHRs can accommodate BH required under worst case scenario, hence, stipulation of NBA will not affect achieving the permissible PR and accommodation of SBDG requirements on the sites;

For 3m-wide NBAs:

- (d) the requirements for 3m-wide NBAs along both sides of Wang Chiu Road and Wang Kwong Road are stated in the Notes. This serves to enhance the effectiveness of the breezeways along these two major roads;
- (e) the areas of the NBAs are less than 1% to 9% of individual lots, which is less than the maximum setback area of 15% and 35% assumed for lower levels as worst case scenario in **Annex C2**. As the BHR can accommodate BH required under worst case scenario, stipulation of NBA will not affect achieving the permissible PR and accommodation of SBDG requirements on these sites; and

15m-wide NBA

- (f) a 15m-wide NBA is stipulated within the “G/IC(1)” zone that is designated for the Hong Kong Post Central Mail Centre development, to extend the breezeway along Lam Wah Street. The design of the mail centre has already taken into account the NBA.

“OU(B)2” zone with NBA and BG

3.8 An “OU(B)2” zone is stipulated with NBA and BG as shown in **Plan 3C**.

Megabox Permissible non- dom. PR – 12 15m-wide BG and 3m-NBA along Wang Chiu Road	
BHR	170mPD
BHR at BG	22mPD
BHs required to accommodate PRs permitted under OZP with BG and NBA	92mPD
BH required to accommodate PR permitted under OZP taking into account BG, NBA and SBDG	96mPD/100mPD

3.9 The following should be noted:

- (a) as the BG is stipulated with BHR of 22mPD, it will not affect the SBDG requirements at podium levels (assumed to be at a level below 20mPD);
- (b) the area of the BG is only about 13% of the lot i.e. developable area of 87% above 22mPD. This will not affect achieving the maximum

permissible non-domestic site coverage under the Buildings Ordinance above podium level (i.e. to 65% for Class C site);

- (c) the area of the NBA is about 2% of the lot which could be accommodated within the setback/separation requirements as per the SBDG under the assumptions set out in **Annex C2**; and
- (d) as BHR can accommodate the BH required under worst case scenarios, the cumulative effect of stipulating BG and NBA on the site will not affect achieving the permissible PR and accommodation of SBDG requirements on the site.

Outside KBBA

- 3.10 Designation of the existing vegetated slope at the eastern periphery of the “R(B)” zone covering Shun Chi Court as NBA will not affect the development potential of the site as the maximum GFA permitted under the OZP reflect the existing GFA built on the net site (i.e. excluding the slope and Shun Chi Street).
- 3.11 Designation of the existing vegetated slope in the “R(A)” zone covering Ping Shek Estate as NBA will not affect the development potential of the site as the slope area was excluded from net site area of PR calculation.
- 3.12 Designation of three BGs in “OU” annotated “Mass Transit Railway Depot with Commercial and Residential Development above” zone with BHR of 22mPD (i.e. height of the existing MTR depot) will not affect the development potential of the site. The BG covers an area of about 15% of the “OU” zone, which is low when compared to the existing as-built condition where about 69% of the podium is uncovered.

4. Conclusion

Based on the above findings, it is concluded that the BHRs, NBA and BG requirements stipulated under the subject OZP should be able to accommodate the permissible PR/GFA under the OZP with reference to the SBDG requirements. The NBA and BG requirements stipulated on the basis of the recommendations of the AVA conducted in 2010 are still valid given no change in the planning circumstances. Hence, there is no need to amend the extant OZP No. S/K13/29. Nevertheless, the land uses in the Kowloon Bay area are being reviewed in the context of initiatives of the Energizing Kowloon East Office for transformation of Kowloon East into CBD2 including land use restructuring for Kowloon Bay Action Area. In future amendments to the OZP, opportunity could be taken to review the appropriate land uses, development parameters as well as air ventilation measures for the area with reference to latest planning circumstances and requirements.

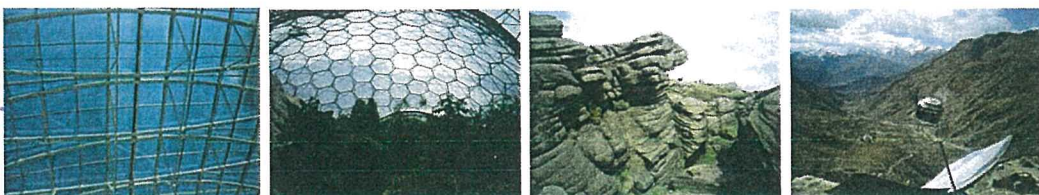
Term Consultancy for Expert Evaluation and Advisory Services on Air
Ventilation Assessment Services under Agreement No. PLNQ 35/2009

Expert Evaluation and Advisory Report for
Proposed Amendments to Ngau Tau Kok and Kowloon
Bay Outline Zoning Plan

Final

November 2010

CO₂nnsulting



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Remarks								
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Prepared by	various	various	various	various	various	various	various	various
Signature								
Checked by	Dr. C. Yuen	Dr. C. Yuen	Dr. C. Yuen	Dr. C. Yuen	Dr. C. Yuen	Dr. C. Yuen	Dr. C. Yuen	Dr. C. Yuen
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Authorised by	Dr. C. Yuen	Dr. C. Yuen	Dr. C. Yuen	Dr. C. Yuen	Dr. C. Yuen	Dr. C. Yuen	Dr. C. Yuen	Dr. C. Yuen
Signature								
Project number	J9008-07	J9008-07	J9008-07	J9008-07	J9008-07	J9008-07	J9008-07	J9008-07
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EXECUTIVE SUMMARY

CO₂nnsulting was commissioned by the Planning Department of HKSARG under the Term Consultancy for Expert Evaluation on Air Ventilation Assessment Services to assess the air ventilation impacts of the building height restrictions incorporated in the draft Ngau Tau Kok and Kowloon Bay Outline Zoning Plan No. S/K13/25 and recommend mitigation measures to alleviate the impacts.

The methodology adopted here follows that for an expert evaluation in the "Technical Guide for Air Ventilation Assessment for Developments in Hong Kong" as well as those requirements in the Project Brief.

The wind data in Ngau Tau Kok and Kowloon Bay is obtained from the CLP Power Wind / Wave Tunnel Facility (WWTF) at The Hong Kong University of Science and Technology. The annual prevailing wind directions for the Project Area are: north-easterlies, easterlies and south-easterlies. The summer prevailing wind directions for the Project Area are: easterlies, south-easterlies, southerlies, and south-westerlies.

The Project Area of Ngau Tau Kok and Kowloon Bay is hilly on the east and flat on the west. Region 1 of the Project Area is located at the east of Kai Tak Planning Area (former airport), adjacent to the Kwun Tong Typhoon Shelter, includes Kowloon Bay Business Area (KBBA) with maximum building height restriction of 170 mPD, and large-scale public housing estates and substantial private residential developments. Region 1 enjoys abundant sea breeze due to its proximity to the harbour. The majority of streets in Region 1 run north-south and east-west, channeling cooler sea breeze to the redevelopment area. As Region 1 is the gateway to sea breeze, it is essential that the OU and G/IC sites at the waterfront are maintained at 40mPD or below to allow permeability of sea breeze to Kowloon Bay. This strategy has already been adopted in the committed plan. Numerous sites in form of Residential, Commercial, G/IC and OU are planned to be developed in Kai Tak which is just southwest of Region 1, outside the Project Area. The majority of the buildings are in the range of 15mPD to 65mPD. Care should be exercised in the arrangement of building blocks in the Kai Tak area to minimise the adverse impact of air ventilation to the Kowloon Bay area.

The KBBA is densely packed with medium to high-rise commercial and industrial buildings (120 mPD to 170 mPD). Narrow roads are found in the KBBA. Given the maximum

building height and the width of the blocks, the negative impact on air ventilation cannot be mitigated unless the effective road spacing (measured from building face-to-building face) is increased from 10m - 25m to 30m or beyond. Since this mitigation measure is not practical, it is recommended to introduce and maintain several urban linear parks and open space within KBBA, as well as practical setbacks from the roads. These ventilation pockets include the CICTA Sheung Yuet Road Training Ground, Lam Wah Street Playground, Kowloon Bay Park, Kowloon Bay Sports Ground, Kowloon Bay Playground, a series of "linear open space", as well as numerous low-rise G/IC sites with building height restriction of 40mPD, help to improve air ventilation in the Kowloon Bay Area, and should be maintained.

The committed linear open spaces from Kai Cheung Road to Wang Yuen Street would better serve the business area if the further redeveloped building(s) are set back from Wang Mau Street by 5m. A building gap of around 15m is recommended along Sheung Yee Road and Lam Hing Street to extend the breezeway for better permeability in KBBA. Widening breezeways, Wang Kwong Road and Wang Chiu Road, by setting back three meters on each side of the road will improve the effectiveness of the major breezeways. The KBBA area lacks breezeways to funnel easterlies and sea breeze. The introduction of a non-building area at the proposed International Mail Centre to connect to the breezeway provided by Wang Tai Road and Lam Wah Street would improve the air ventilation in the KBBA. The site of Enterprise Square V is sizable with unfavourable slab-type towers. As Enterprise Square V sits on the waterfront, it presents an obstacle to permeability to KBBA. A slanting alignment of the 15m building gap is recommended at the 22mPD podium level of Enterprise Square V to introduce a wind corridor for the oncoming sea breeze. A permeable podium is recommended for the Enterprise Square V. It is also recommended that the building disposition should adopt a similar arrangement shown in the study report for air ventilation improvement.

Outside of the KBBA, the majority of the land consists of large-scale housing estates and residential developments, such as the Kai Yip Estate, the committed Lower Ngau Tau Kok Estate Redevelopment Project, and Richland Gardens. In general, building disposition should not form a wind wall to improve permeability. Furthermore, low-rise facilities should be located in the centre of these developments to maximise the size of the open courtyard to improve local ventilation. Recommendations for such sites have been provided in the study report.

Region 2 of the Project Area is hilly, with the majority of open space in the form of G/IC sites, green belts and open space areas, such as Jordan Valley Playground, Jordan Valley Leisure

Pool Complex, Ping Shek Recreational Ground, Former Jordan Valley Landfill Site, Service Reservoir, Shun Lee Tsuen Park, which provide pleasant air ventilation to the region, and should be maintained. Areas of larger-scale medium-rise residential developments are located along the eastern and western boundaries of Region 2, with maximum height from 80mPD to 250mPD. In general, there are no significant negative air ventilation impacts due to these estates because of the abundance of the surrounding open space, green belt and/or low-rise G/IC developments. These areas shall be maintained for better air ventilation. However, better arrangements in terms of air ventilation have been proposed in the study report for future redevelopments.

In the proposed plan, the proposed maximum building height of Telford Gardens remain unchanged (60mPD and 100mPD). The proposed plan also indicates that two corridors have been proposed to be introduced on the podium (22mPD). This strategy will help to provide a wind corridor connecting Wang Tai Road and Sheung Yuet Road. A 15m to 20m building gap is also recommended to connect Kwun Tong Road to Tai Yip Street to improve air ventilation.

The proposed maximum building height of Kai Yip Estate increased from 60mPD to 80mPD and 100mPD. The increased maximum height is acceptable, however it is recommended that the building disposition should adopt a similar arrangement shown in the study report for air ventilation improvement.

The maximum building height of 100mPD is retained for the site of Richland Gardens. The current disposition includes sizable building gaps in the range of 60m to 85m, maintenance of this space together with the unchanged building height will give a positive impact on air ventilation.

The proposed maximum building height of Shun Chi Court and Shun Tin Estate are kept at 170mPD and 160mPD/170mPD respectively. When the building disposition adopts a similar arrangement shown in the study report, the air ventilation effectiveness will be improved.

For specific sites where large-scale development or redevelopment may be possible, detailed AVAs on a site-by-site basis should be undertaken.

The baseline scenario and alternative option of Kai Tak Mansion site have been compared in terms of AVA. It is concluded that the alternative option with a building gap of 20m to 24m wide at 15mPD and non-building areas of 10m provides better air ventilation compared to the baseline option.

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1. INTRODUCTION

CO₂nnsulting was commissioned by the Planning Department of HKSARG under Category A Service of the Term Consultancies for Air Ventilation Assessment Services (AVAs). The objective is to assess the air ventilation impacts of the plot ratio / gross floor area and building height restrictions under the draft Outline Zoning Plan (OZP) No. S/K13/25 Ngau Tau Kok and Kowloon Bay Area and recommend mitigation measures to alleviate the impacts.

The main tasks are to provide the followings:

- Site inspection and analysis of the wind data and environment of the Project Area;
- A qualitative evaluation of the air ventilation impacts of the development as illustrated under the planned scenario as compared to the existing scenario;
- Recommendations of mitigation and improvement measures.

Figure 1 shows the boundary of the Project Area. Figure 2 shows satellite images of the Project Area. Figure 3 shows various views within the Project Area. The methodology adopted here follows that for an expert evaluation in the “Technical Guide for Air Ventilation Assessment for Developments in Hong Kong” as well as those requirements in the Project Brief.

2. SITE INFORMATION

The Project Area covers Ngau Tau Kok and Kowloon Bay area which is located at the South-east Kowloon within the Kwun Tong District, with an area of approximately 341 hectares (according to S/K13/25). See Figure 1. The Project Area descends from the foothills of Fei Ngo Shan and Tan Shan in the north and east respectively to the Kwun Tong Typhoon Shelter in the southwest. It is bounded by New Clear Water Bay Road and Clear Water Bay Road in the north, Kwun Tong By-pass in the west, Shun Yip Street and Chun Wah Road in the south, and Hong Ning Road, Sau Mau Ping Road and Lee On Road in the east. Kai Tak, Ngau Chi Wan and Kwun Tong (South) are the adjacent districts, outside of the Project Area, in the west, north-west and south-east directions respectively.

For the purpose of expert evaluation, the total Project Area is dissected into the following regions of similar topography, as shown in Figure 1.

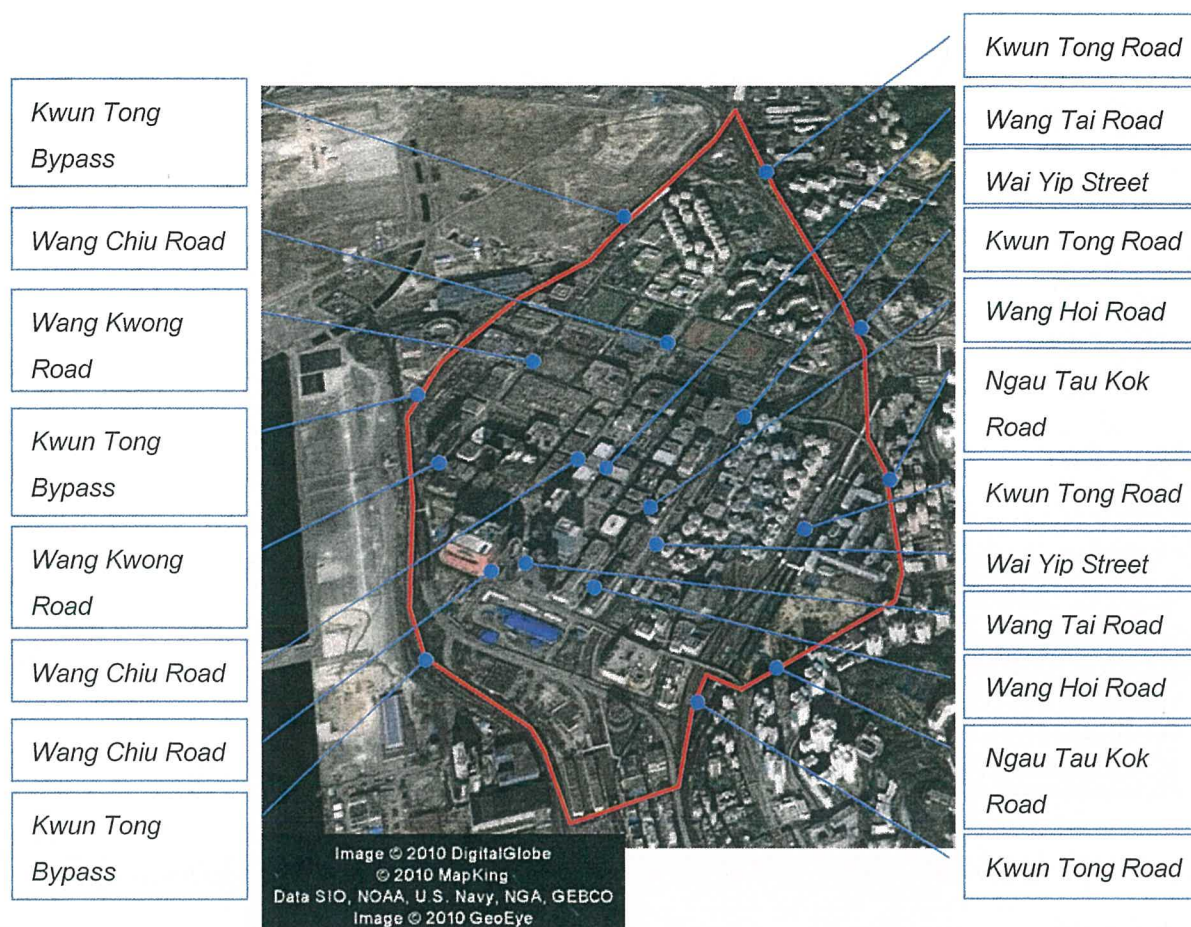
Sub areas	Location	Descriptions	Terrain
Region 1	Bounded by Kwun Tong Road, Ngau Tau Kok Road, Shun Yip Street and Kwun Tong Bypass	Mixed land use of residential developments, in terms of Residential (R(A)) and Other Specified Uses (OU); business developments, in terms of Commercial (C) and Other Specified Uses (OU); and Government /Institution or Community (G/IC), with some Open Space (O).	flat (4.6 mPD to 5.8 mPD)
Region 2	Bounded by Kwun Tong Road, Ngau Tau Kok Road, Chun Wah Road, Hong Ning Road, Sau Mau Ping Road, Lee On Road, New Clear Water Bay Road and Clear Water Bay Road.	Majority are open space, in terms of Green Belt (GB), Open Space (O), Government / Institution or Community (G/IC); Residential developments (R(A), R(B)).	hilly (8.5 mPD to 175.2 mPD)

Table 1 Characteristics of Sub-Regions within Project Area

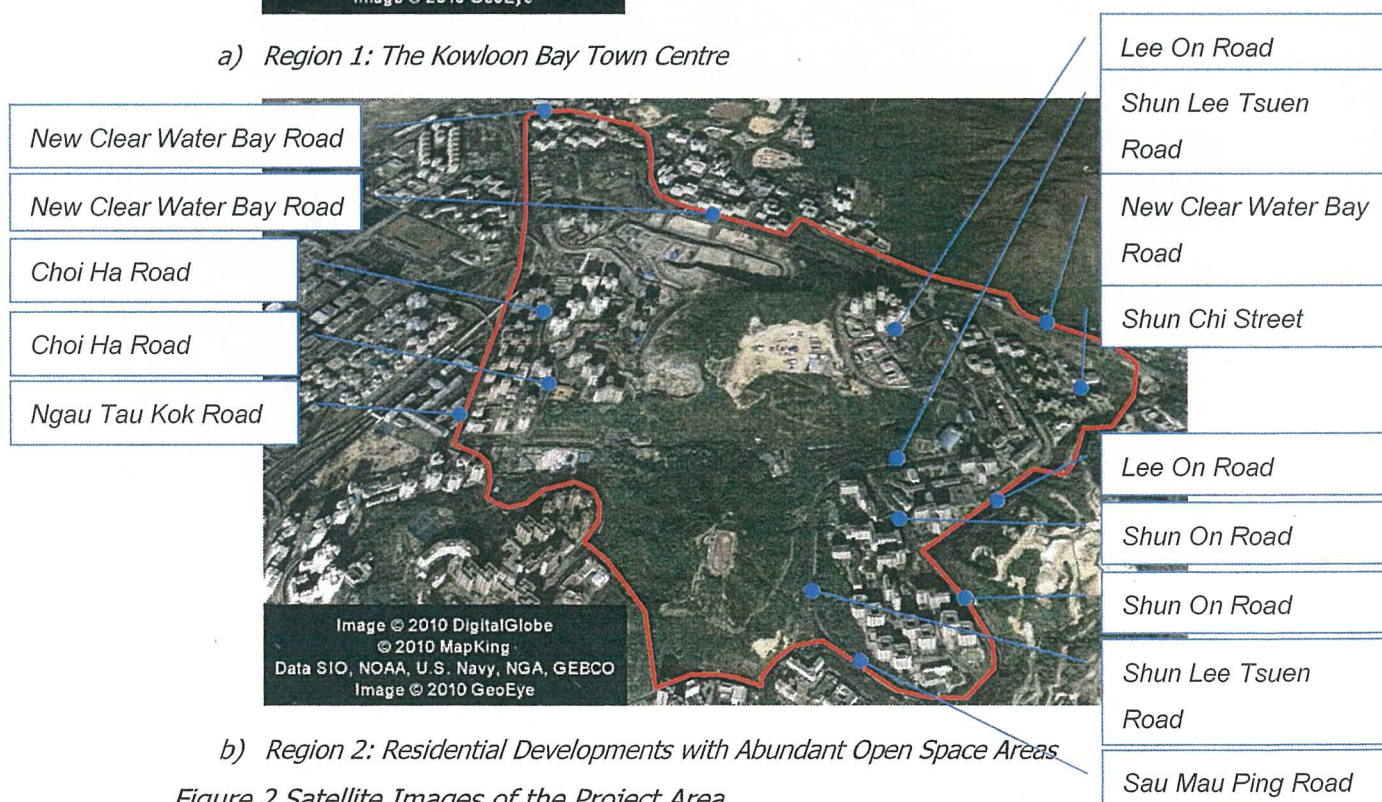


Figure 1 The Project Area of Ngau Tau Kok and Kowloon Bay

(Image source: Google maps, <http://maps.google.com.hk>)



a) Region 1: The Kowloon Bay Town Centre



b) Region 2: Residential Developments with Abundant Open Space Areas

Figure 2 Satellite Images of the Project Area

(Image source: Google maps, <http://maps.google.com.hk>)



Figure 3a Views of Ngau Tau Kok Road (a key breezeway) Looking Southeastward Showing Amoy Garden

(Image source: CO₂nnsulting Ltd.)



Figure 3b Views of CICTA Sheung Yuet Road Training Ground (a ventilation pocket)

(Image source: CO₂nnsulting Ltd.)



Figure 3c Views of Ping Shek Recreational Ground (ventilation pocket) on New Clear Water Bay Road (a key breezeway)

(Image source: CO₂nnsulting Ltd.)



Figure 3d Views of Shun On Road (a key breezeway) Looking Southeastward Showing Shun Tin Estate (right) and Foothill of Tan Shan (left)

(Image source: CO₂nnsulting Ltd.)



Figure 3e Views of Ventilation Pockets such as Jordan Valley Playground (left) and Jordan Valley Leisure Pool Complex (right)

(Image source: CO₂nnsulting Ltd.)



Figure 3f Views of Kwun Tong Road (a key breezeway) Looking Southward Showing Lower Ngau Tau Kok Estate (left)

(Image source: CO₂nnsulting Ltd.)

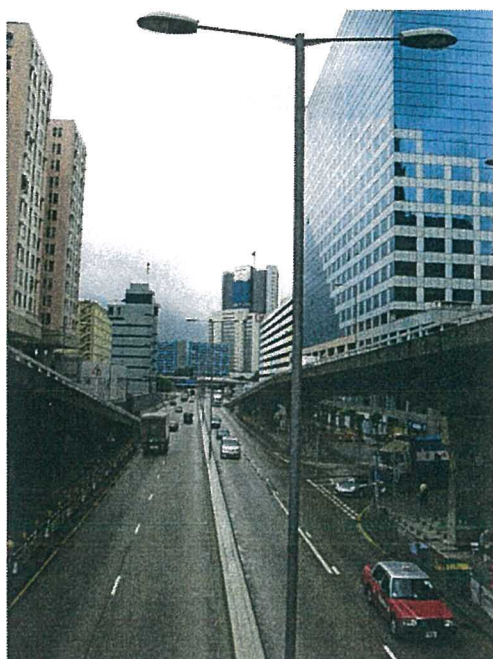


Figure 3g Views of Wai Yip Street (a key breezeway) Looking Southward

(Image source: CO₂nnsulting Ltd.)



Figure 3h Views of Wang Hoi Road (a key breezeway) Looking Northward

(Image source: CO₂nnsulting Ltd.)



*Figure 3i Views of Wang Tai Road (a key breezeway) Looking Northward
(Image source: CO₂nnsulting Ltd.)*



*Figure 3j Views of Wang Chiu Road (a key breezeway) Looking Northward Showing
Enterprise Square V (left) and Enterprise Square III (right) (Obstruction to breeze)
(Image source: CO₂nnsulting Ltd.)*



Figure 3k Views of Lam Wah Street Playground (ventilation pocket) on Wang Kwong Road

(Image source: CO₂nnsulting Ltd.)



Figure 3l Views of Kowloon Bay Sports Ground

(Image source: CO₂nnsulting Ltd.)

3. WIND ENVIRONMENT

The wind data at various heights refers to the experimental data conducted by the CLP Power Wind / Wave Tunnel Facility (WWTF) at The Hong Kong University of Science and Technology for the Ngau Tau Kok and Kowloon Bay Study Area. The annual and Summer wind roses at 60m, 120m and 450m are shown in Figure 4. The wind roses show that the wind data at the lowest levels of 60m and 120m are subject to more urban roughness, compared to the data at 450m, which is closer to the edge of the atmospheric boundary layer. Nonetheless, the annual prevailing wind directions for the Project Area are: north-easterlies, easterlies and south-easterlies. The summer prevailing winds are: easterlies, south-easterlies, southerlies and south-westerlies.

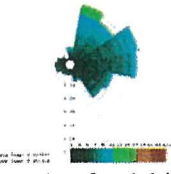
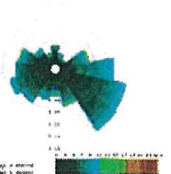
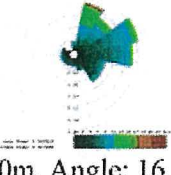
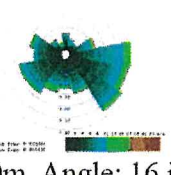
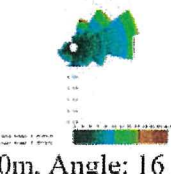
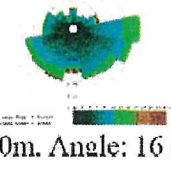
Height	Annual	Summer
60m	 <p>Height: 60m, Angle: 16 intervals</p>	 <p>Height: 60m, Angle: 16 intervals</p>
120m	 <p>Height: 120m, Angle: 16 intervals</p>	 <p>Height: 120m, Angle: 16 intervals</p>
450m	 <p>Height: 450m, Angle: 16 intervals</p>	 <p>Height: 450m, Angle: 16 intervals</p>

Figure 4 Annual and Summer Wind Roses for Ngau Tau Kok and Kowloon Bay

(Source: CLP Power Wind / Wave Tunnel Facility (WWTF) at The Hong Kong University of Science and Technology)

4. EXISTING SCENARIO

4.1 Topography

The following observations of the characteristics of the project area are noted:

- The Project Area is surrounded by Hammer Hill, Fei Ngo Shan and Tan Shan. It includes hilly Ngau Tau Kok and Jordan Valley. The Project Area is relatively flat north-west of Ngau Tau Kok and reclaimed Kowloon Bay. Kwun Tong (South) with development of up to 170 mPD is found at the south-east of the Project Area. It is adjacent to the Kai Tak Planning Area where the existing low-rise developments are to be redeveloped. The Project Area is dissected into two regions according to the topography for the purpose of the expert evaluation.
- Region 1, adjacent to the Kwun Tong Typhoon Shelter in the southwest, is relatively flat (4.6 mPD to 5.8 mPD), with low-rise developments at the waterfront. Region 1 consists of KBBA with maximum building height restriction of 170 mPD, and large-scale residential developments with maximum height up to 100mPD and OU sites up to 140 mPD. Region 1 also includes some open space areas in the form of open space and G/IC sites, such as Kowloon Bay Park, Kowloon Bay Sports Ground, Kowloon Bay Playground, Lam Wah Street Playground and CICTA Sheung Yuet Road Training Ground. Numerous sites in form of Residential (R(C)), Commercial, G/IC and OU are planned to be developed in Kai Tak which is just southwest of Region 1, outside the Project Area. The majority of the buildings are up in the range of 15 mPD to 65mPD, as shown in Figure 5. Care should be exercised in the arrangement of building blocks in the Kai Tak area to minimise the adverse impact of air ventilation to the Kowloon Bay area. A handful of sites are up to 100 mPD. These sites are surrounded by low-rise developments (up to 65mPD), the impact to air ventilation in Kowloon Bay would be minimal.
- Region 2 is hilly (8.5 mPD to 175.2 mPD), and consists of Ngau Tau Kok Valley east of Kowloon Bay and Jordan Valley with vast open space areas and green belts. Region 2 is adjacent to Fei Ngo Shan and Tan Shan in the respective north and east, and should enjoy the downhill winds. The centre of Region 2 is the natural green

belt of Jordan Valley, areas of larger-scale medium-rise residential developments are located along the eastern and western boundaries of Region 2, with existing building heights from 80mPD to 250mPD.

The wind flow in the Project Area is impacted not only by the disposition, massing, site coverage and height of buildings, but also the Victoria Harbour nearby and the surrounding hills, Fei Ngo Shan and Tan Shan. The proximity of water mass will bring cooler breeze. The land heats up more rapidly than the water, causing the air over the land to rise and be replaced by the cool air from over the water. Existing open areas in the form of green belt, open space and low-rise G/IC developments such as Kowloon Bay Park, Kowloon Bay Sports Ground, Kowloon Bay Playground, Lam Wah Street Playground and CICTA Sheung Yuet Road Training Ground, Jordan Valley, Jordan Valley Playground, Jordan Valley Leisure Pool Complex, Ping Shek Recreational Ground, Former Jordan Valley Landfill Site, Service Reservoir and Shun Lee Tsuen Park are essential ventilation pockets to the Project Area. These regions are recommended to be maintained to allow penetration of wind inland.

The Project Area benefits from Jordan Valley and the proximity of Hammer Hill, Fei Ngo Shan and Tan Shan. Even on a calm day, upward air movement can be created as the sun warms the hills slopes, and creates a thermal gradient between the top of the hill and its base. The air movement cycle reverses when the air cools in the evening; it descends the hills and brings cooler wind to the base of the hills. Winds descend the faces of these green slopes of Hammer Hill and Jordan Valley and bring coolth to the base of the hill.

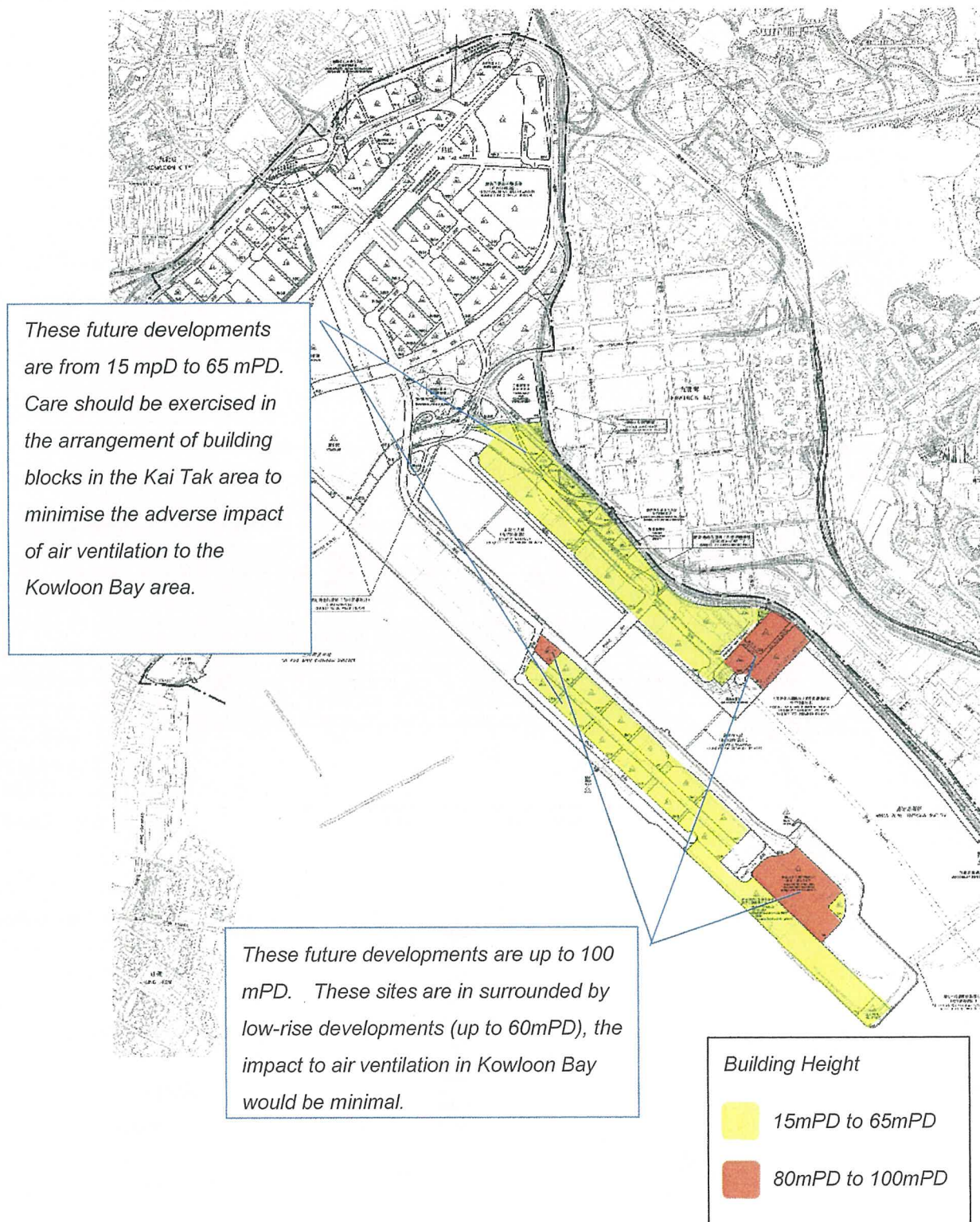


Figure 5 Kai Tak Outline Zoning

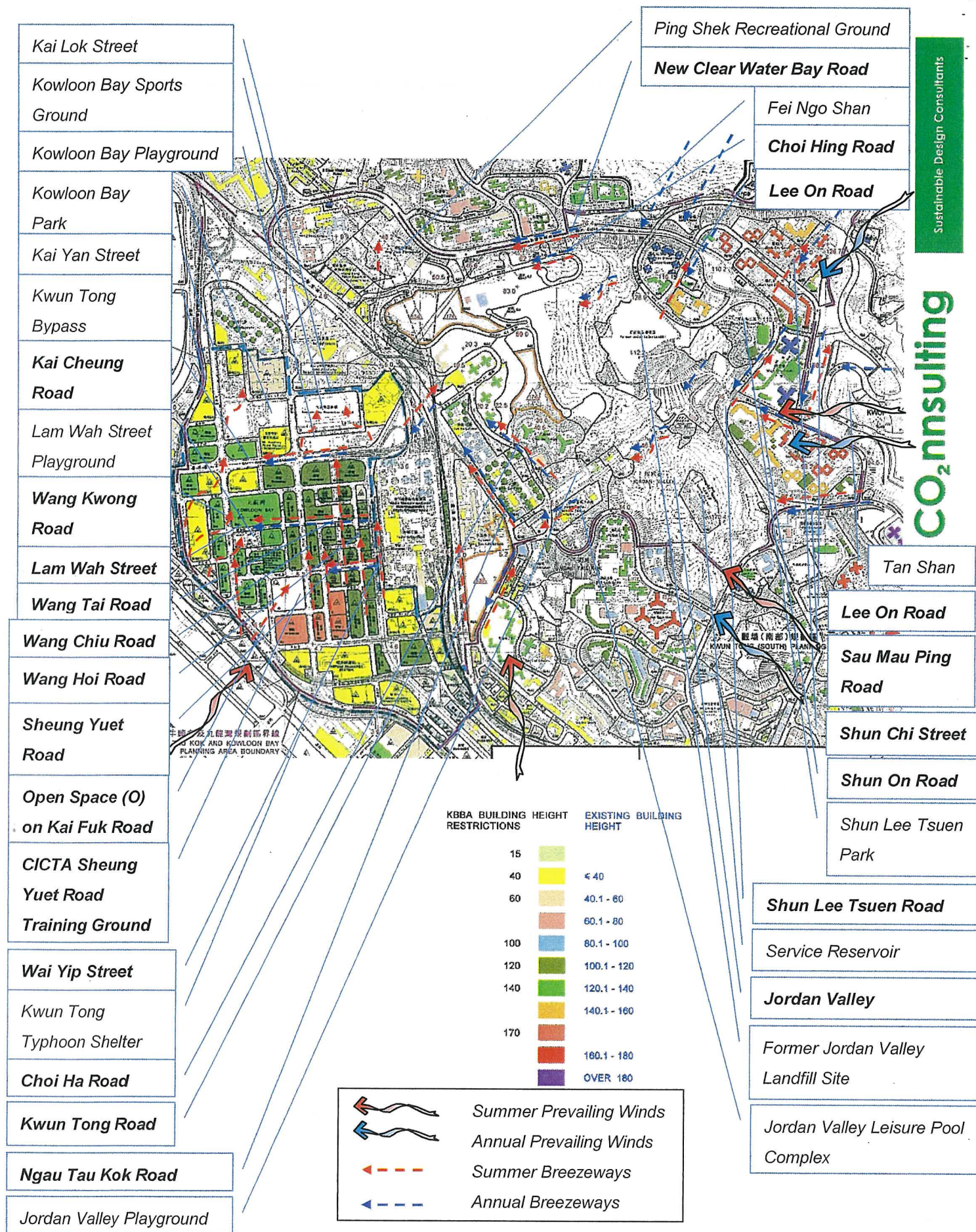


Figure 6a Existing Scenario showing Breezeways

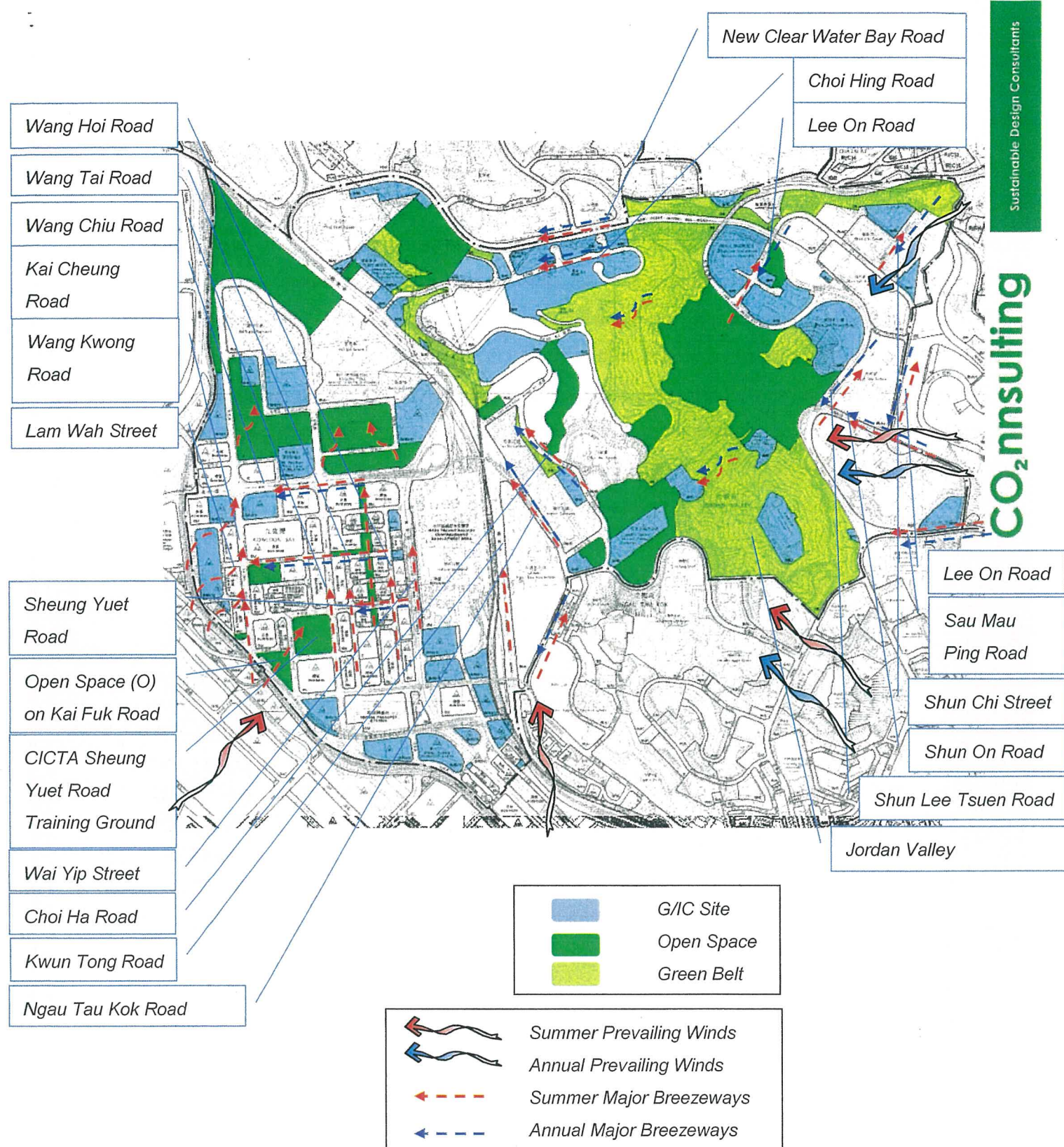


Figure 6b Existing Scenario with Major Breezeways

4.2 Existing Summer and Annual Scenarios

Section 3 has identified the annual prevailing wind directions are north-easterlies, easterlies and south-easterlies, whilst the summer prevailing wind directions are easterlies, south-easterlies, southerlies and south-westerlies. The information on the existing scenario, as provided by the Planning Department, presents the existing building profile including the approved and committed developments. It is used as a basis for appreciating the existing wind environment and understanding the effects of development restrictions. Figure 6 shows the prevailing winds for the existing scenario with breezeways marked by arrows. Table 2 summarises the major breezeways throughout the Project Area. It can be seen that these wind corridors are essential for air ventilation all year round.

Breezeways			
<i>Northeasterlies (annual) Southwesterlies (summer)</i>	<i>Easterlies (summer and annual)</i>	<i>Southeasterlies (summer and annual)</i>	<i>Southerlies (summer)</i>
Jordan Valley Ngau Tau Kok Road Lee On Road (adjacent to Shun Lee Discipline Services Quarters) Shun Chi Street Shun Lee Tsuen Road Open Space (O) on Kai Fuk Road and CITIA Sheung Yuet Road Training Ground	New Clear Water Bay Road Sau Mau Ping Road Wang Tai Road and Lam Wah Street Sheung Yuet Road Kai Cheung Road Choi Hing Road	Shun On Road Choi Ha Road Ngau Tau Kok Road	Ngau Tau Kok Road Kwun Tong Road Wai Yip Street Wang Hoi Road Wang Tai Road Wang Chiu Road Wang Kwong Road

Table 2 Major Breezeways in Ngau Tau Kok and Kowloon Bay

4.2.1 Region 1

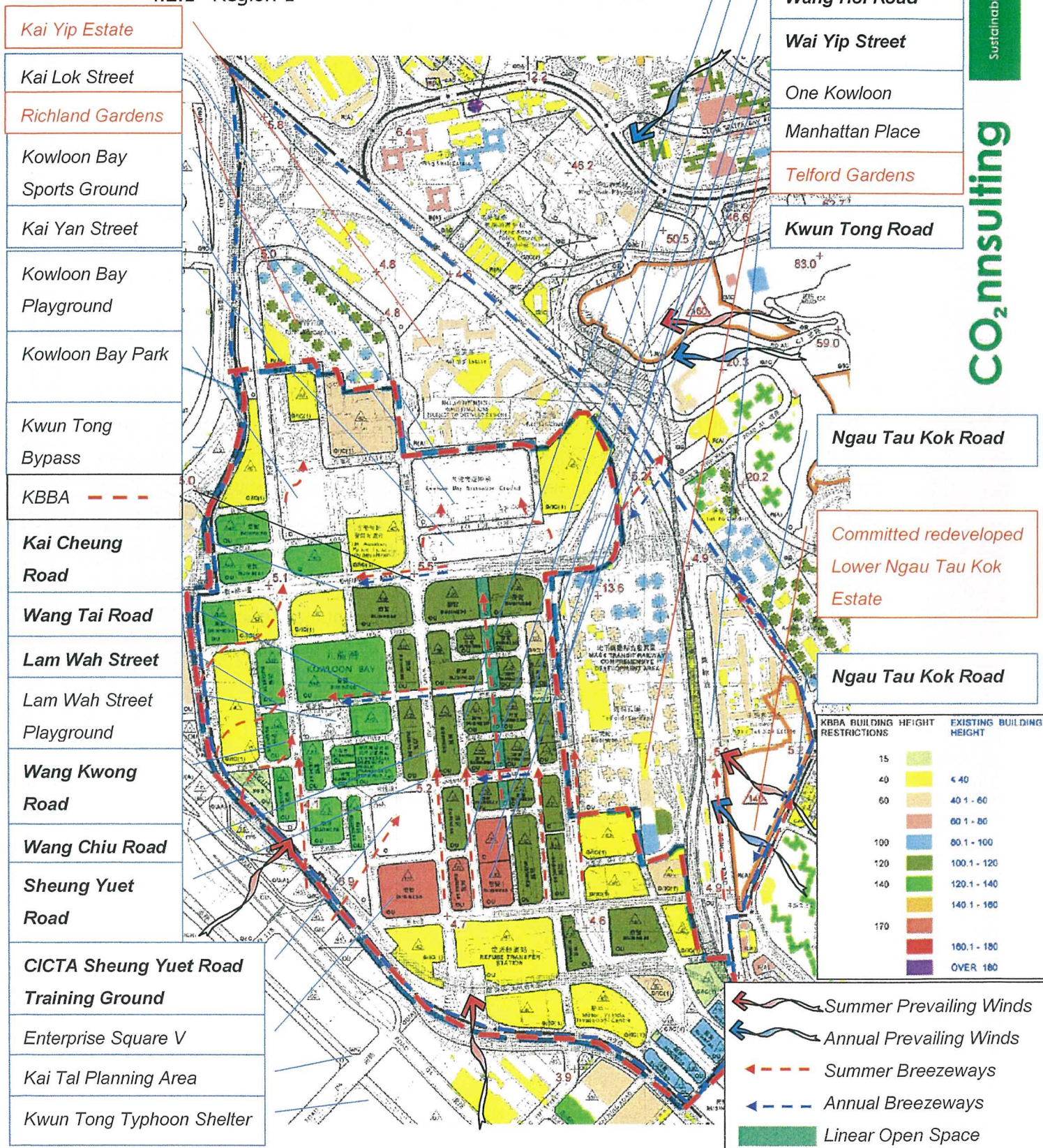


Figure 7 Existing/Committed Scenario in the Region 1 of Ngau Tau Kok and Kowloon Bay

Region 1 of the Project Area is located at the east of Kai Tak Planning Area (former airport), and adjacent to the Kwun Tong Typhoon Shelter. Region 1 includes KBBA with building height restrictions up to 170 mPD, and large-scale public housing estates and substantial private residential developments. See Figure 7.

Region 1 enjoys abundant sea breeze due to its proximity to the harbour. The majority of streets in Region 1 run north-south and east-west, channeling cooler sea breeze to the redevelopment area. As Region 1 is the gateway to sea breeze, it is essential that the OU and G/IC sites at the waterfront are maintained at 40mPD or below to allow permeability of sea breeze to Kowloon Bay. This strategy has already been adopted in the committed plan.

The KBBA is densely packed with medium to high-rise commercial and industrial buildings (120 mPD to 170 mPD). Narrow roads are found in the KBBA. Given the maximum building height and the width of the blocks, the negative impact on air ventilation cannot be mitigated unless the effective road spacing (measured from building face-to-building face) is increased from 10m - 25m to 30m or beyond. See Figure 8. Since this mitigation measure is not practical, it is recommended to introduce and maintain several urban linear parks and open space within KBBA, as well as practical setbacks from the roads. These ventilation pockets include the CICTA Sheung Yuet Road Training Ground, Lam Wah Street Playground, Kowloon Bay Park, Kowloon Bay Sports Ground, Kowloon Bay Playground, a series of "linear open space" as shown in Figure 9, as well as numerous low-rise G/IC sites with building height restriction of 40mPD, help to improve air ventilation in the Kowloon Bay Area, and should be maintained.

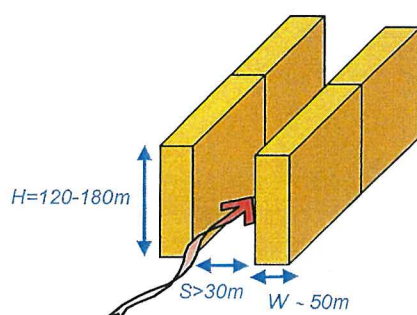


Figure 8 Planned Maximum Building Height with Recommended Road Spacing for Streets in KBBA

Enterprise Square III, Enterprise Square V, One Kowloon and Manhattan Place up to 170mPD stand tall amidst the committed 120mPD business developments should introduce

some downwash onto the pedestrian level with the sea breeze, and thus ventilate the Wang Tai Road, Wang Mau Street, Wang Chiu Road and Sheung Yee Road, however the podia are sizable and would cancel out the air ventilation benefits; the same buildings also create a stagnant area at its immediate north, along Wang Yuen Street; and CITIA Sheung Yuet Road Training Ground. The negative impact on AVA caused by this existing development is inevitable. The overall negative impact is minimised by the maintenance of the linear open space along Wang Mau Street, as well as the open space along Kai Fuk Road, as shown in Figure 9. Furthermore, the committed linear open spaces from Kai Cheung Road to Wang Yuen Street would better serve the business area if the further redeveloped building(s) are set back from Wang Mau Street by 5m. A building gap of around 15m is recommended along Sheung Yee Road and Lam Hing Street to extend the breezeway for better permeability in KBBA, as shown in Figure 10. Widening breezeways, Wang Kwong Road and Wang Chiu Road, by setting back three meters of each side of the road, will lead to road widths of 31m, and improve the effectiveness of the major breezeways. The KBBA area lacks breezeways to funnel easterlies and sea breeze. The introduction of a non-building area of 15m at the proposed International Mail Centre to connect to the breezeway provided by Wang Tai Road and Lam Wah Street would improve the air ventilation in the KBBA.

The site of Enterprise Square V is sizable with unfavourable slab-type towers. As Enterprise Square V sits on the waterfront, it presents an obstacle to permeability to KBBA. A slanting alignment of the 15m building gap is recommended at the 22mPD podium level of Enterprise Square V to introduce a wind corridor for the oncoming sea breeze. See Figure 11b. The lot in front (i.e. the "G/IC(1)" site) will have some impact on the air ventilation, but the impact is reduced by the height restriction of 40mPD. The wind can flow over the low-rise development of 40mPD and reach the Enterprise Square V. It is therefore essential to open up the Enterprise Square V to allow the wind to permeate to other areas in Kowloon Bay. It is recommended to arrange the buildings of the Enterprise Square V in the manner as shown in Figure 11b for air ventilation improvement. A permeable podium is recommended for the Enterprise Square V. See Figure 12. Figure 13 shows the committed plan of KBBA in Region 1 with recommendations.

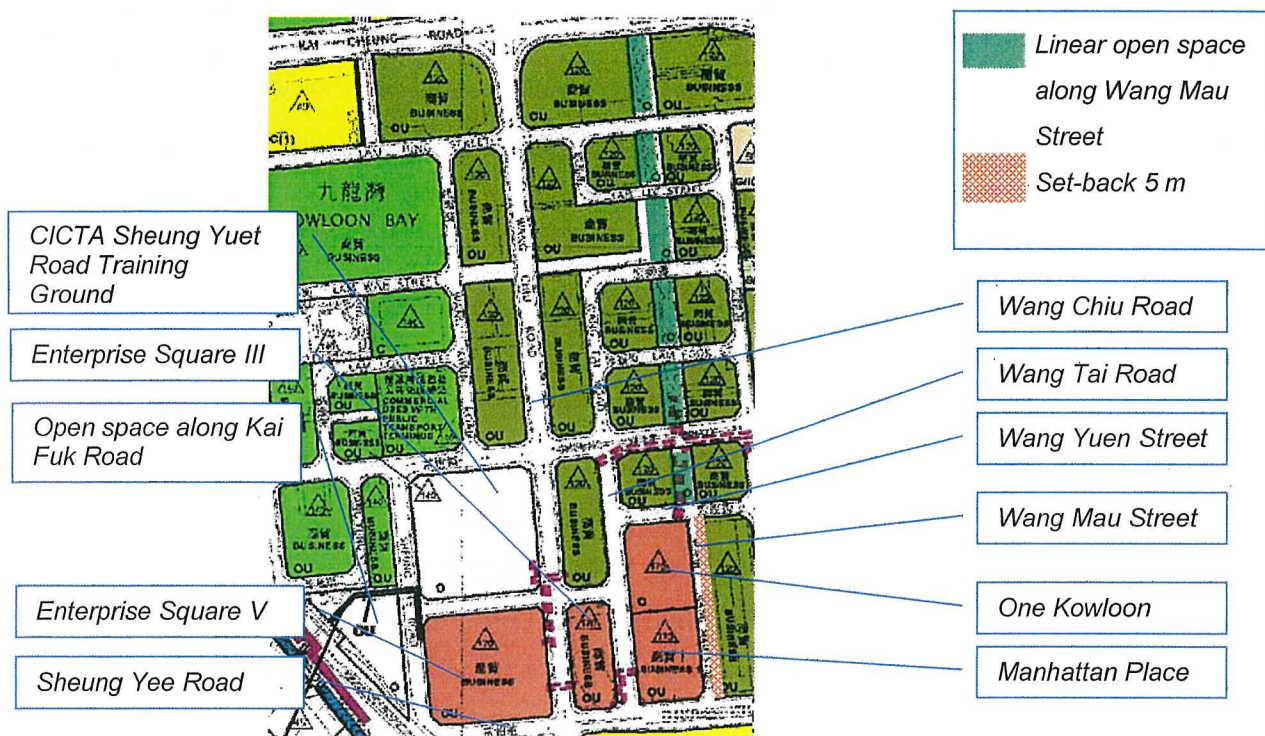


Figure 9 The Vicinity of One Kowloon

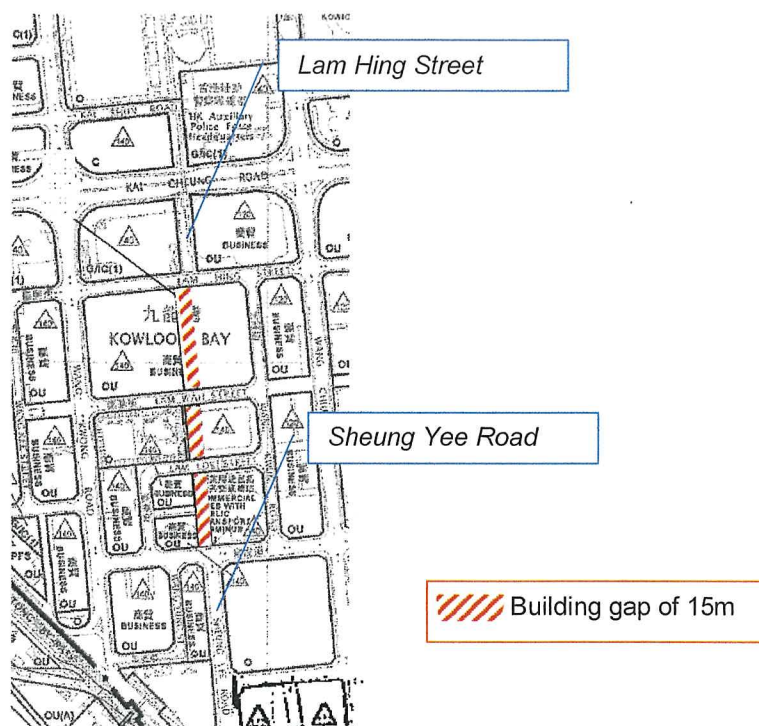


Figure 10 Recommendations of Building Gaps to connect to Sheung Yee Road and Lam Hing Street

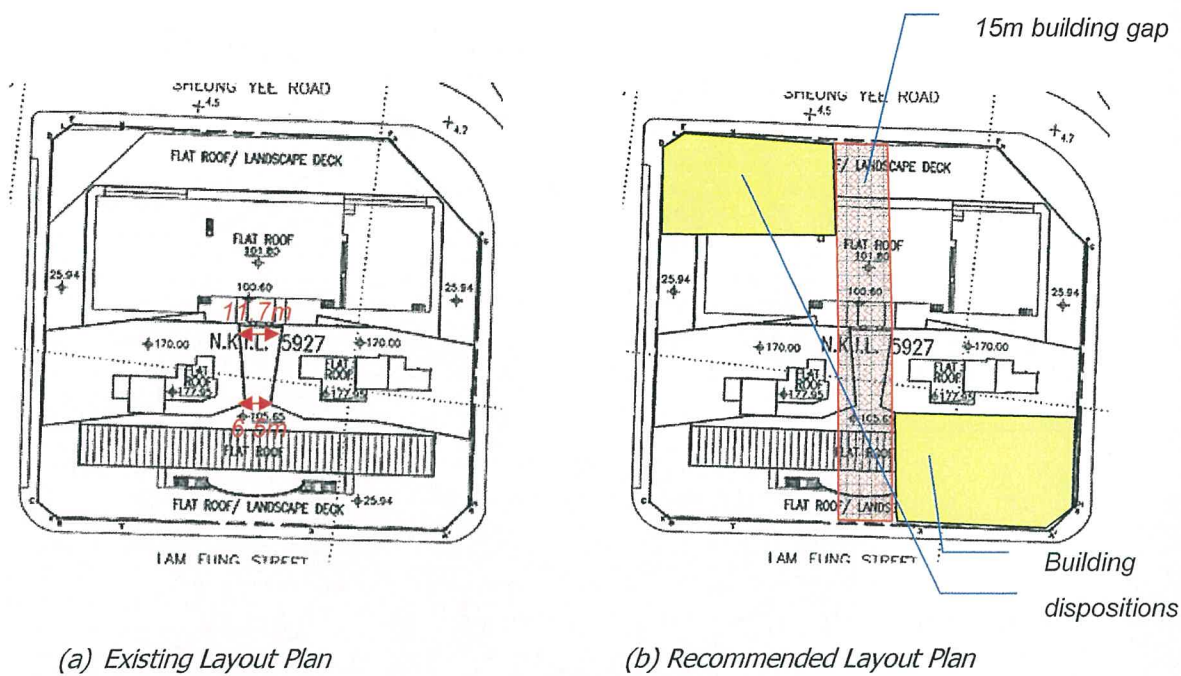


Figure 11 Enterprise Square V

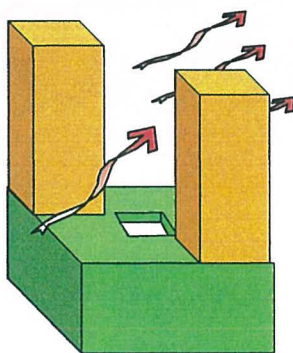


Figure 12 Recommendations for the site of Enterprise Square V

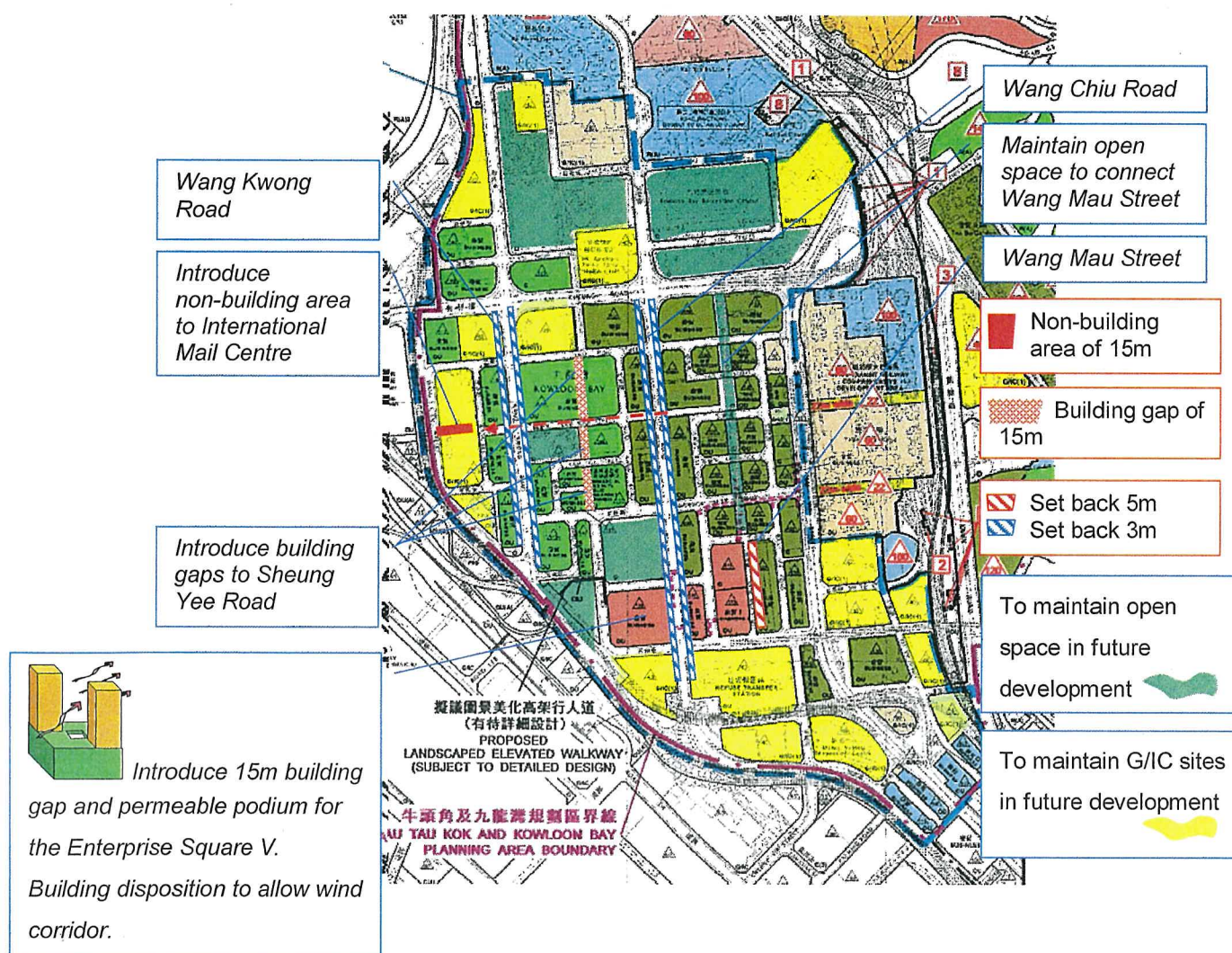


Figure 13 Committed Plan of KBBA in Region 1 with Recommendations

Outside of the KBBA, the majority of the land consists of large-scale housing estates and residential developments, such as the Kai Yip Estate, the committed Lower Ngau Tau Kok Estate Redevelopment Project, Richland Gardens and Telford Gardens. The building disposition and arrangement of Kai Yip Estate are slab-type and are not favourable to air ventilation as it impedes southerlies and northerlies. This existing arrangement will result in a large area with little wind movement at the site as well as up to a radius of 600m from the site. Figures 14 a and b show the existing building arrangement and the recommended principle for Kai Yip Estate. The principle shown in Figure 14b eliminates the slab-type

buildings and replace with smaller blocks with sufficient building spacing of 35m and a wide courtyard to improve ventilation. A series of 15 to 20m wide linear parks are recommended with the Telford site to allow permeability of southerlies. The committed Lower Ngau Tau Kok Estate Redevelopment Project includes a proposed G/IC development of the Cross District Community Cultural Centre (CDCCC) at 40mPD, a District Open Space and a road connecting Ngau Tau Kok Road and Kwun Tong Road. See Figure 15a. The maximum building heights of 100mPD to 140mPD is acceptable, but wider building-to-building gaps are recommended to improve permeability, as shown in Figure 15b. Further air ventilation assessment is recommended for the proposed built form and massing of the committed Lower Ngau Tau Kok Estate Redevelopment Project.

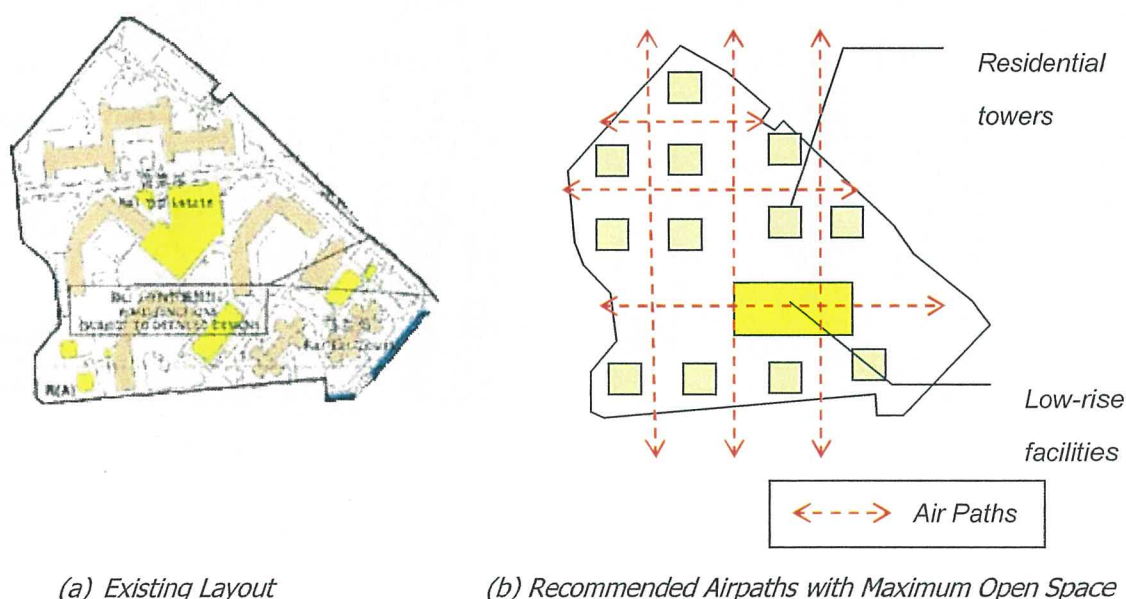


Figure 14 Kai Yip Estate

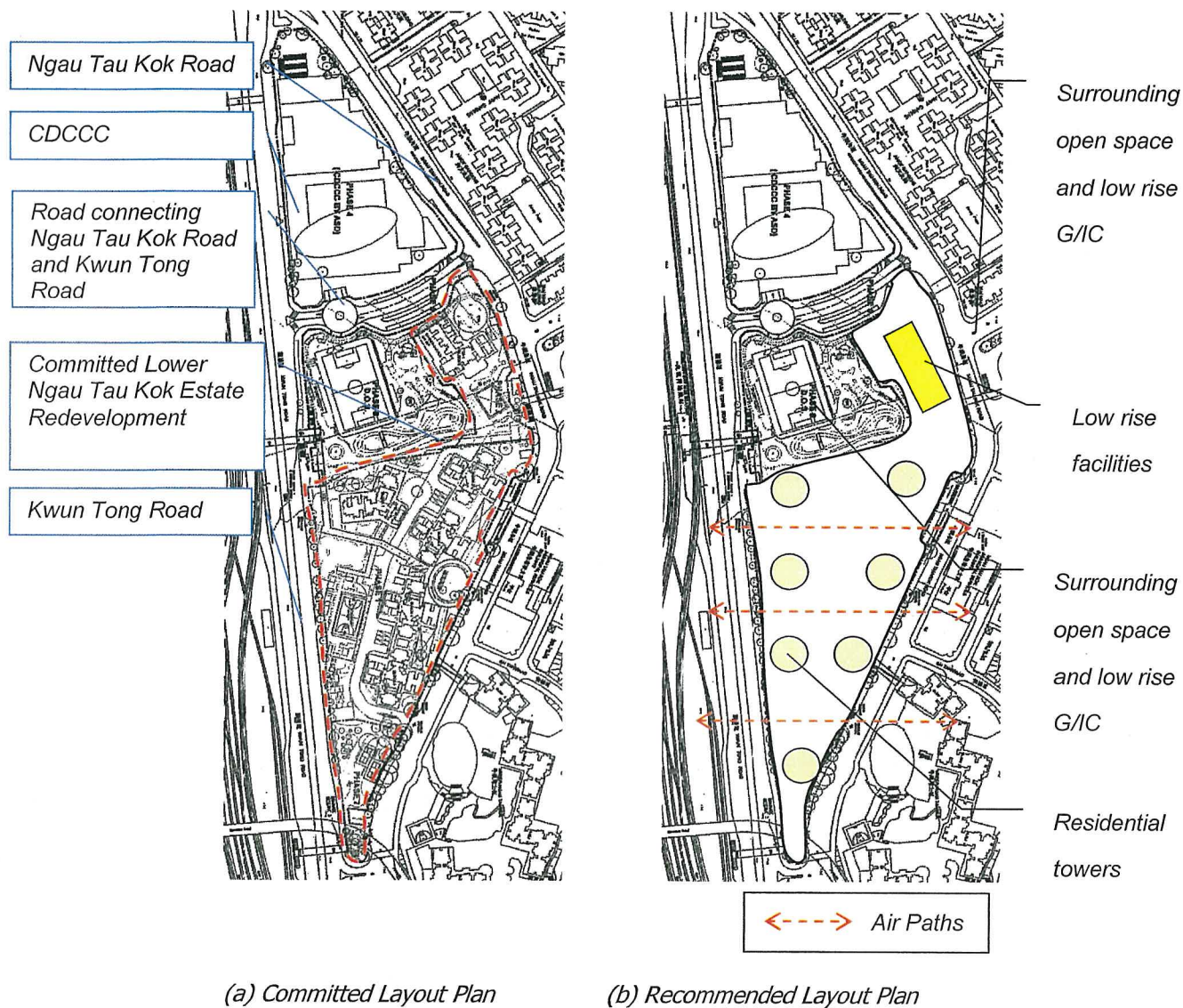


Figure 15 Committed Redevelopment of Lower Ngau Tau Kok Estate

4.2.2 Region 2

Region 2 of the Project Area is hilly, with the majority of open space in the form of G/IC sites, green belts and open space areas, such as Jordan Valley Playground, Jordan Valley Leisure Pool Complex, Ping Shek Recreational Ground, Former Jordan Valley Landfill Site, Service Reservoir, Shun Lee Tsuen Park, which provide pleasant air ventilation to the region, should be maintained. See Figure 16.

Region 2 enjoys pleasant air ventilation throughout the year, and benefits from any transpiration cooling effect from the vegetated hill sides. The large-scale public housing estates and the private residential developments are mainly located around the boundary of Region 2. Table 3 summarises the characteristics of the developments. The positive and negative impacts are highlighted in the following paragraphs with recommendations to improve air ventilation.

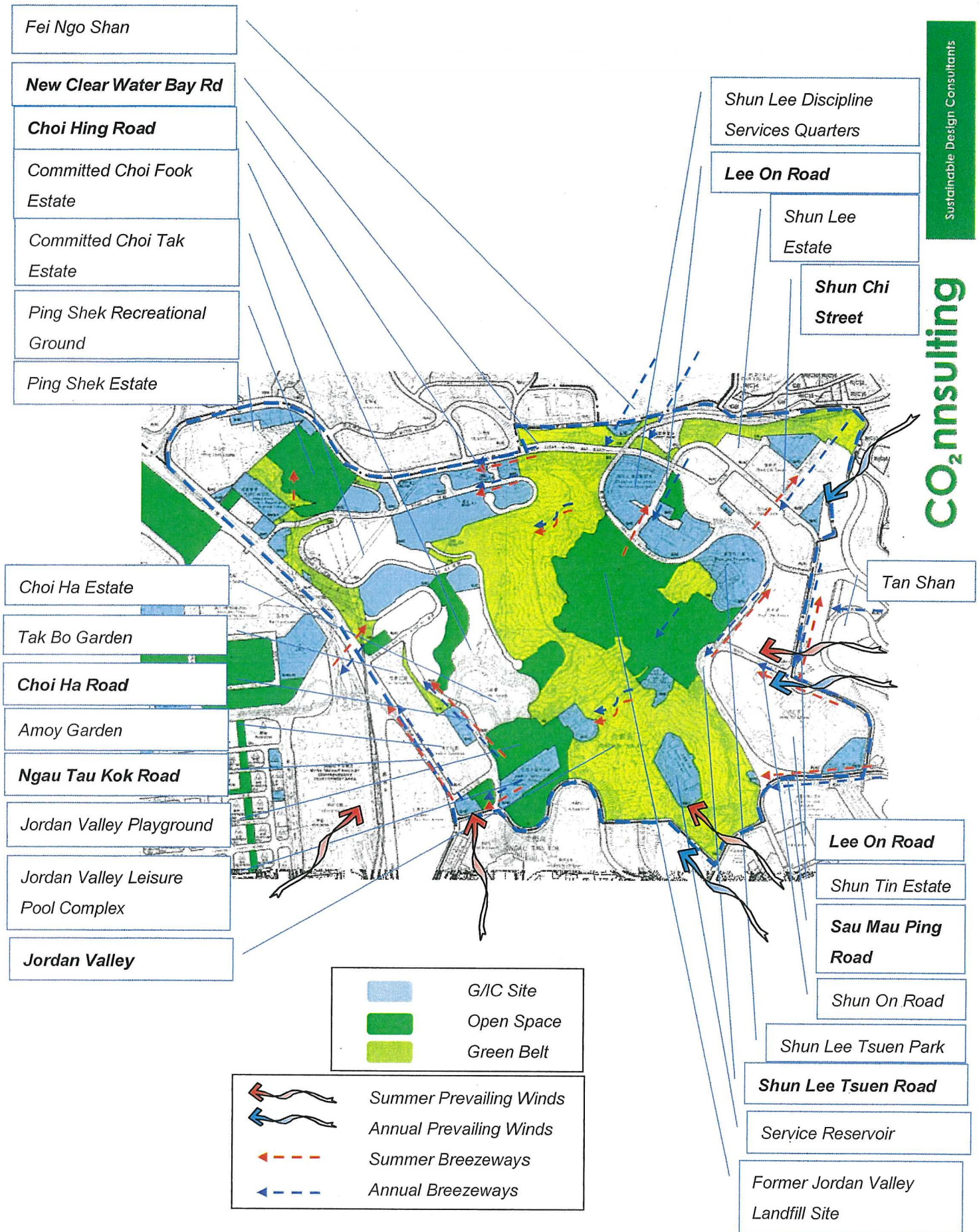


Figure 16 Existing/Committed Scenario in the Region 2 of Ngau Tau Kok and Kowloon Bay

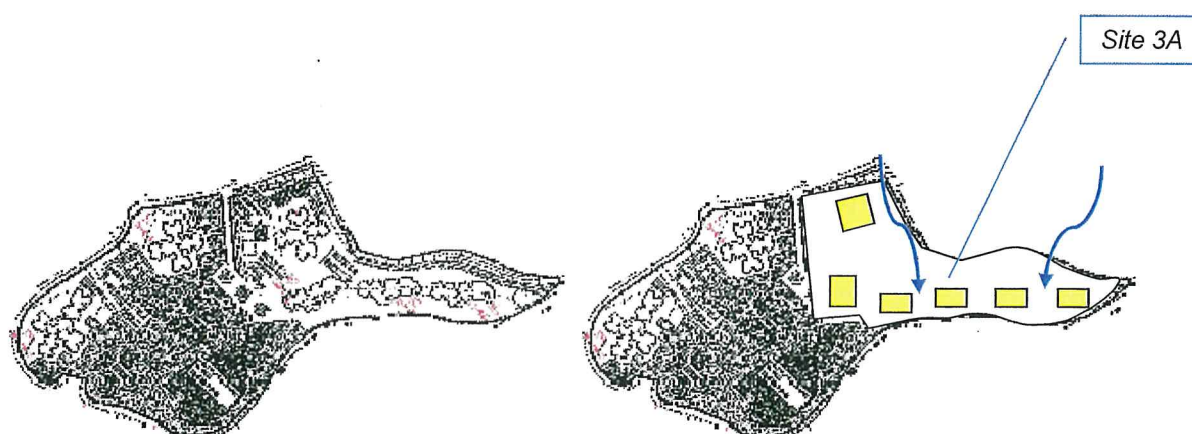
Developments	Housing Type	Existing / Committed Heights	Impacts
Committed Choi Tak Estate	Public	137-174 mPD, medium-rise	Some negative impacts. Recommendations provide to improve site 3A. See Figure 17b.
Committed Choi Fook Estate	Public	166-174 mPD, medium-rise	No major negative impact.
Choi Ha Estate	Public	138 mPD, medium-rise	Some negative impacts, but not severe due to abundant surrounding open space which acts as alternative breezeways. Recommendations provided in Figure 18.
Ping Shek Estate	Public	32-85 mPD, low to medium-rise	No major negative impact due to availability of sizable courtyards within the site and low building height. Recommendations provided in Figure 19.
Tak Bo Garden	Private	105-125 mPD, medium-rise	No major negative impact due to availability of low-rise development within site and open space in Choi Wan Road.
Amoy Garden	Private	100-119 mPD, medium-rise	Some negative impacts, but not severe due to availability of low-rise development within site and adjacent open space and G/IC site in Chun Wah Road. See Figure 20 for recommendations.
Shun Lee Estate	Public	160-175 mPD, medium-rise	Some negative impacts due to slab type buildings, but not significant due to low building height. Recommendations are provided in Figure 21.
Shun Chi Court	Public	168 mPD, medium-rise	Some negative impacts due to slab type buildings, but not significant due to low building height. Recommendations are provided in Figure 21.
Shun Tin Estate	Public	155-173 mPD, low to medium-rise	Some negative impacts, but not significant due to low building height. Recommendations are provided in Figure 21.
Shun Lee Discipline Services Quarters	Staff Quarters of Government	Over 180 mPD, high-rise	Some negative impacts, but not significant due to abundant surrounding open space which act as alternative breezeways. Recommendations are provided in Figure 21.

Table 3 Summary of Negative Impacts due to Existing / Committed¹ Residential Developments in Region 2

¹ Existing developments are developments that have already existed on site whereas committed developments are those approved by relevant authority for impending development.

(a) Committed Choi Tak Estate

Figure 17a shows the disposition of the committed Choi Tak Estate with 40 storeys. The current disposition forms a wind fence and blocks the north-easterlies, easterlies and downhill wind to permeate to Region 1. It is recommended to arrange the buildings in the manner as shown in Figure 17b. This principle shown reduces the resistance to coming wind and provides better permeability. Further air ventilation assessment is recommended for the proposed built form and massing.



(a) Existing Layout Plan

(b) Recommended Layout Plan

Figure 17 Committed Choi Tak Estate

(b) Choi Ha Estate and Committed Choi Fook Estate

These two public housing estates with around 40 storeys are located closely to each other and the current dispositions impede the north-easterlies and downhill wind as shown in Figure 18a. Figure 18b shows the recommended principle to improve air ventilation.

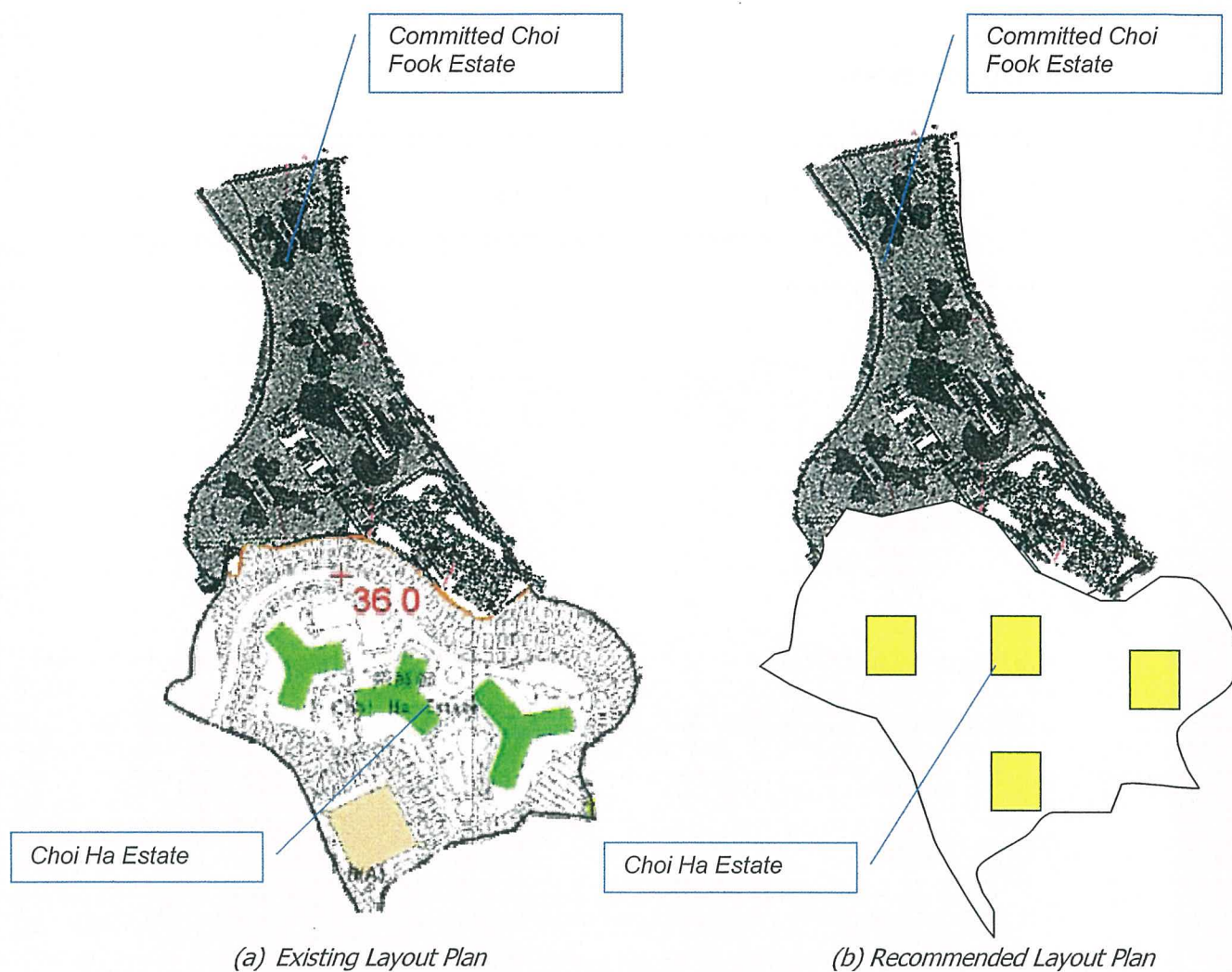
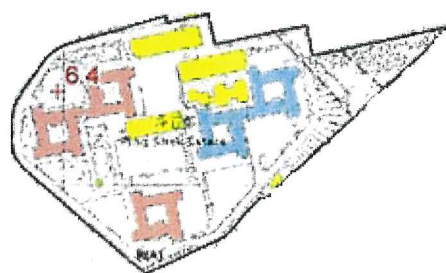


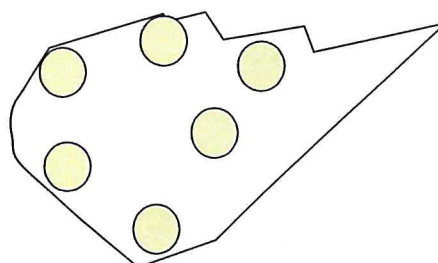
Figure 18 Choi Ha Estate and Committed Choi Fook Estate

(c) Ping Shek Estate

The current slab-type building disposition of Ping Shek Estate forms an obstacle to the winds. Figure 19 shows the existing scenario and the recommended disposition. Further air ventilation assessment is recommended for the proposed built form and massing.



(a) Existing Layout Plan



(b) Recommended Layout Plan

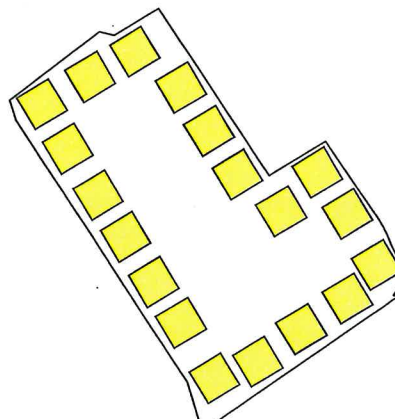
Figure 19 Ping Shek Estate

(d) Amoy Garden

It is recommended to rearrange the building blocks in order to maximise the open space within Amoy Garden as shown in Figure 20b. The courtyard shown in Figure 20b will help to improve the air ventilation within the estate.



(a) Existing Layout Plan



(b) Recommended Layout Plan

Figure 20 Amoy Garden

(e) Shun Lee Estate, Shun Chi Court, Shun Tin Estate and Shun Lee Discipline Services Quarters

Since the developments are aligned along the boundary of Region 2 and can impede downhill winds from Fei Ngo Shan and Tan Shan outside the Project Area, it is recommended that the redevelopment should follow the arrangement as demonstrated in Figure 21b.

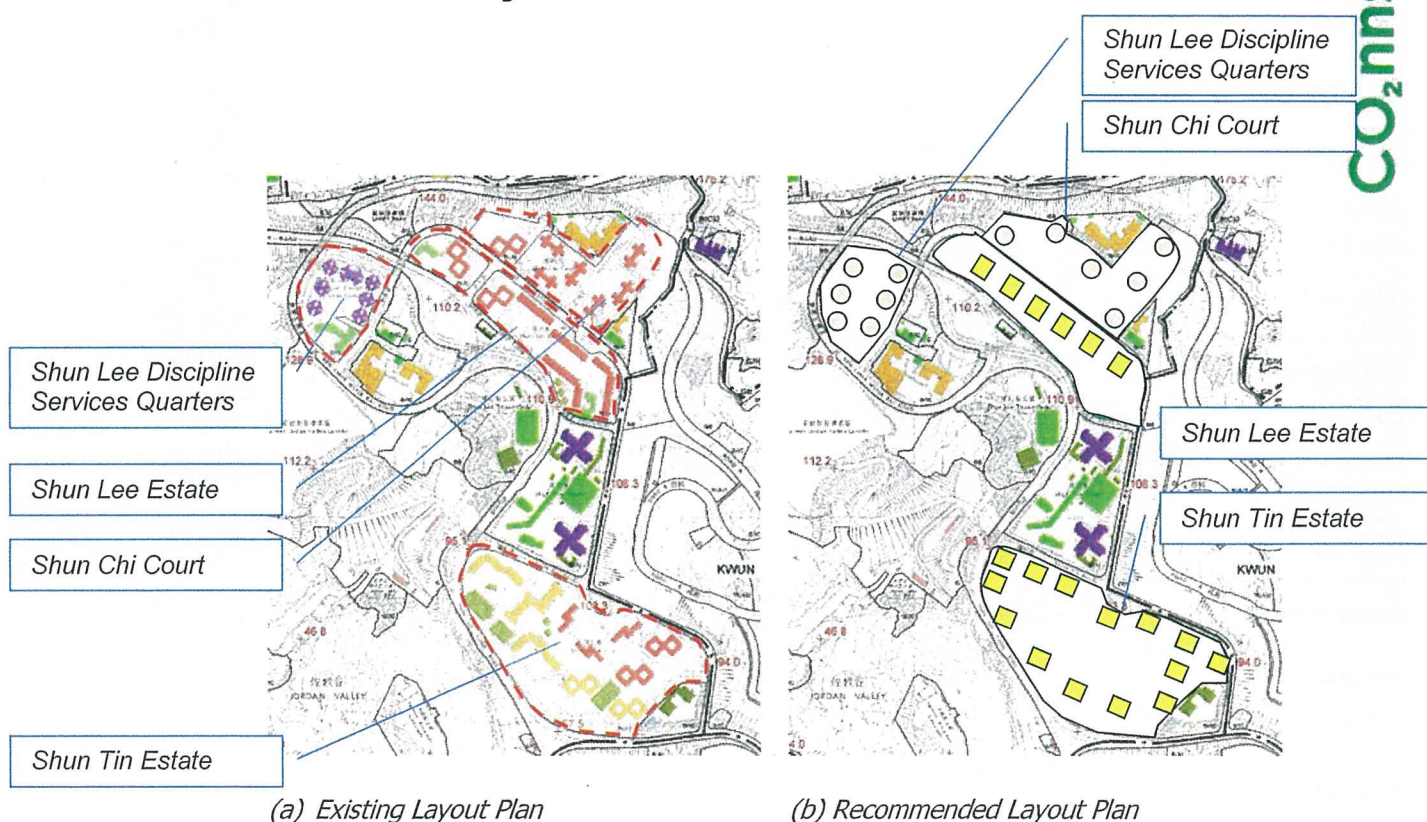


Figure 21 Recommended Disposition for Shun Lee Estate, Shun Chi Court, Shun Tin Estate and Shun Lee Discipline Services Quarters

5. PLANNED SCENARIO

5.1 Observations

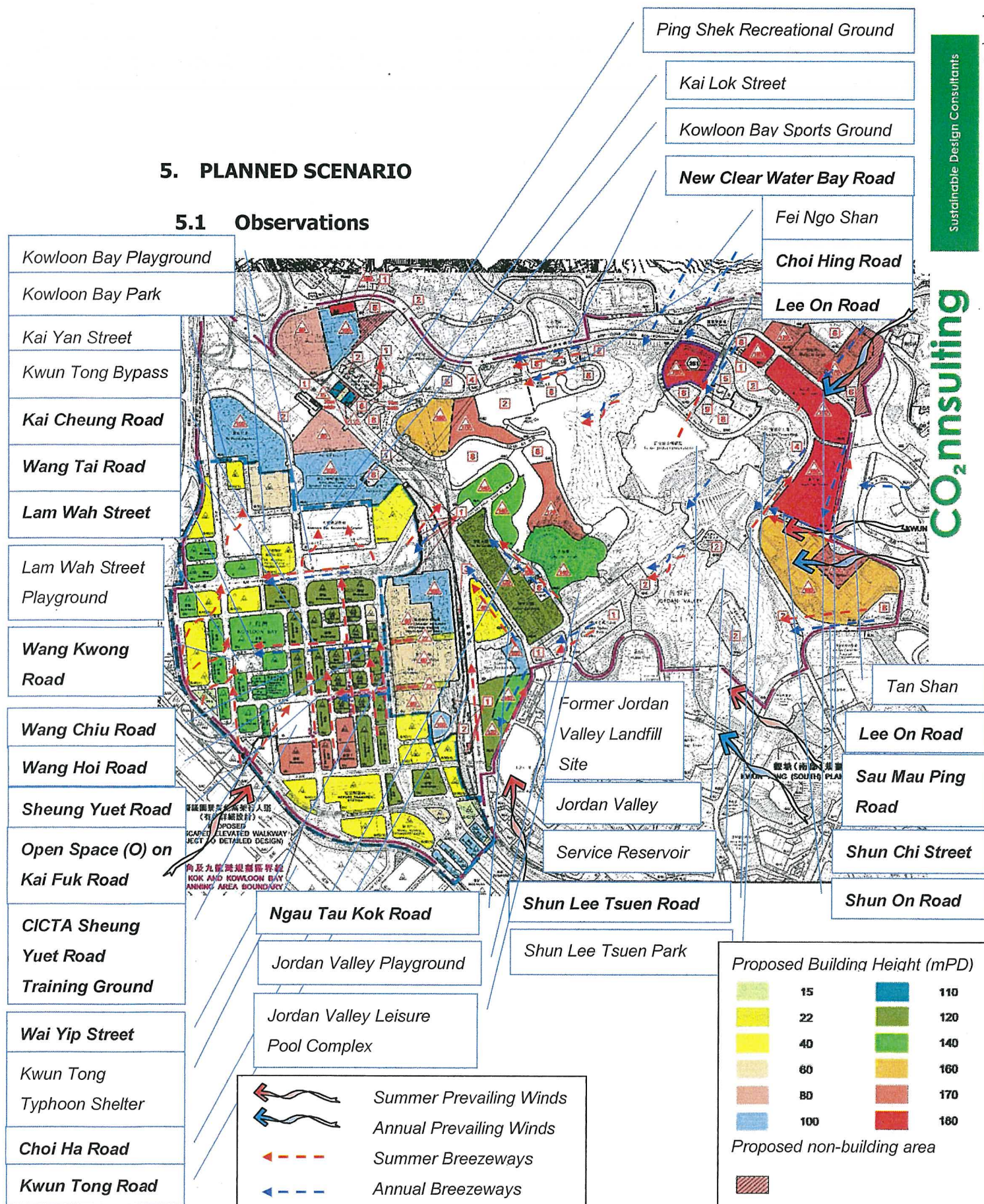


Figure 22a Building Blocks and Layout of Future Developments (Indicative)

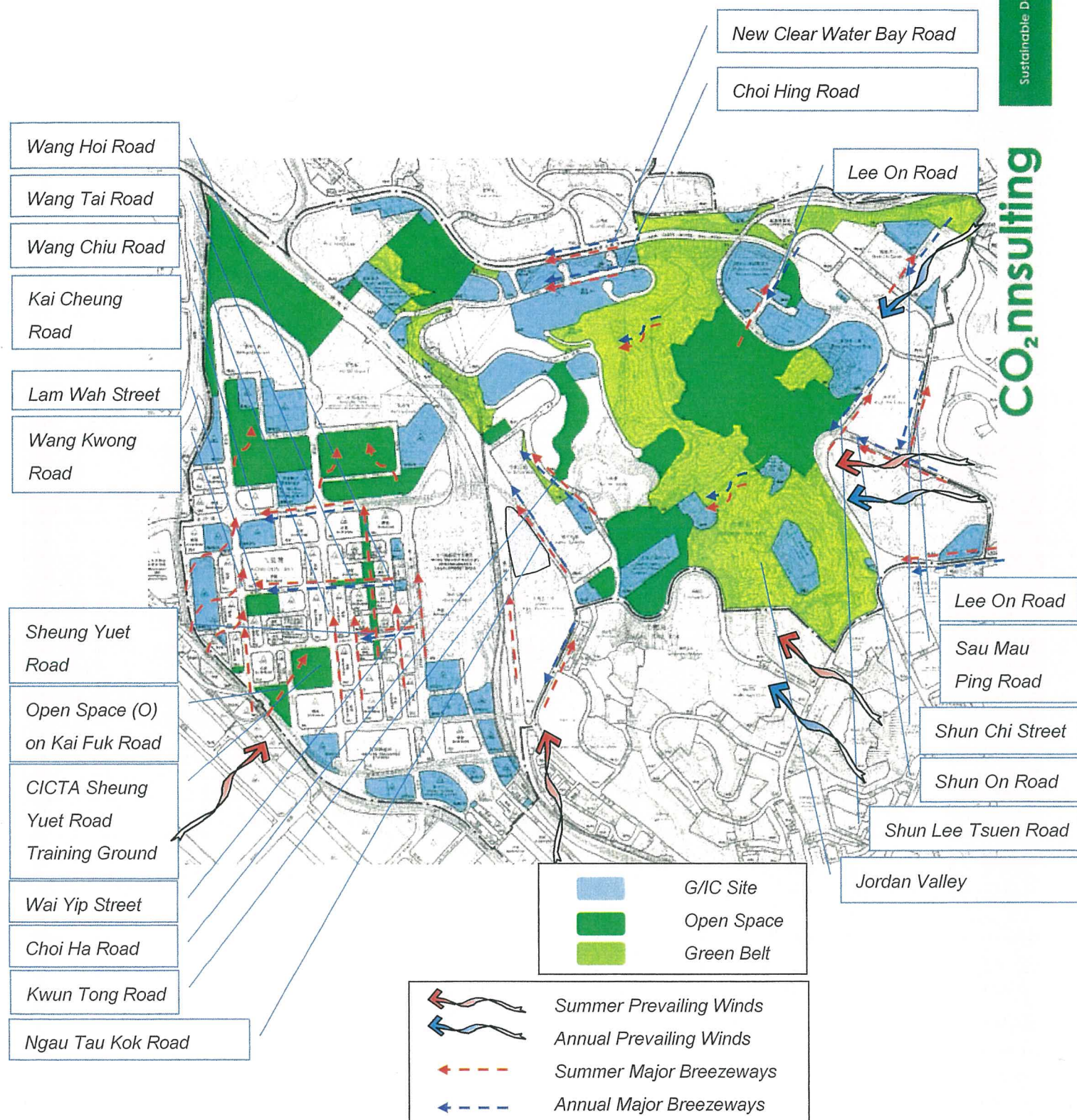


Figure 22b Proposed Plan with Major Breezeways

5.2 Areas of Concern

Figure 22a shows the proposed maximum building height restrictions on the OZP. The design, disposition and height of new development shown in this figure are hypothetical.

5.2.1 General

Where podia are allowed, it is recommended to provide set-back from the site boundary, or to recess the lower floors from these key wind corridors, or to align the podia edge with the building edge, to make the podia more permeable, by delineating non-building areas wherever possible, as shown in Figure 23.

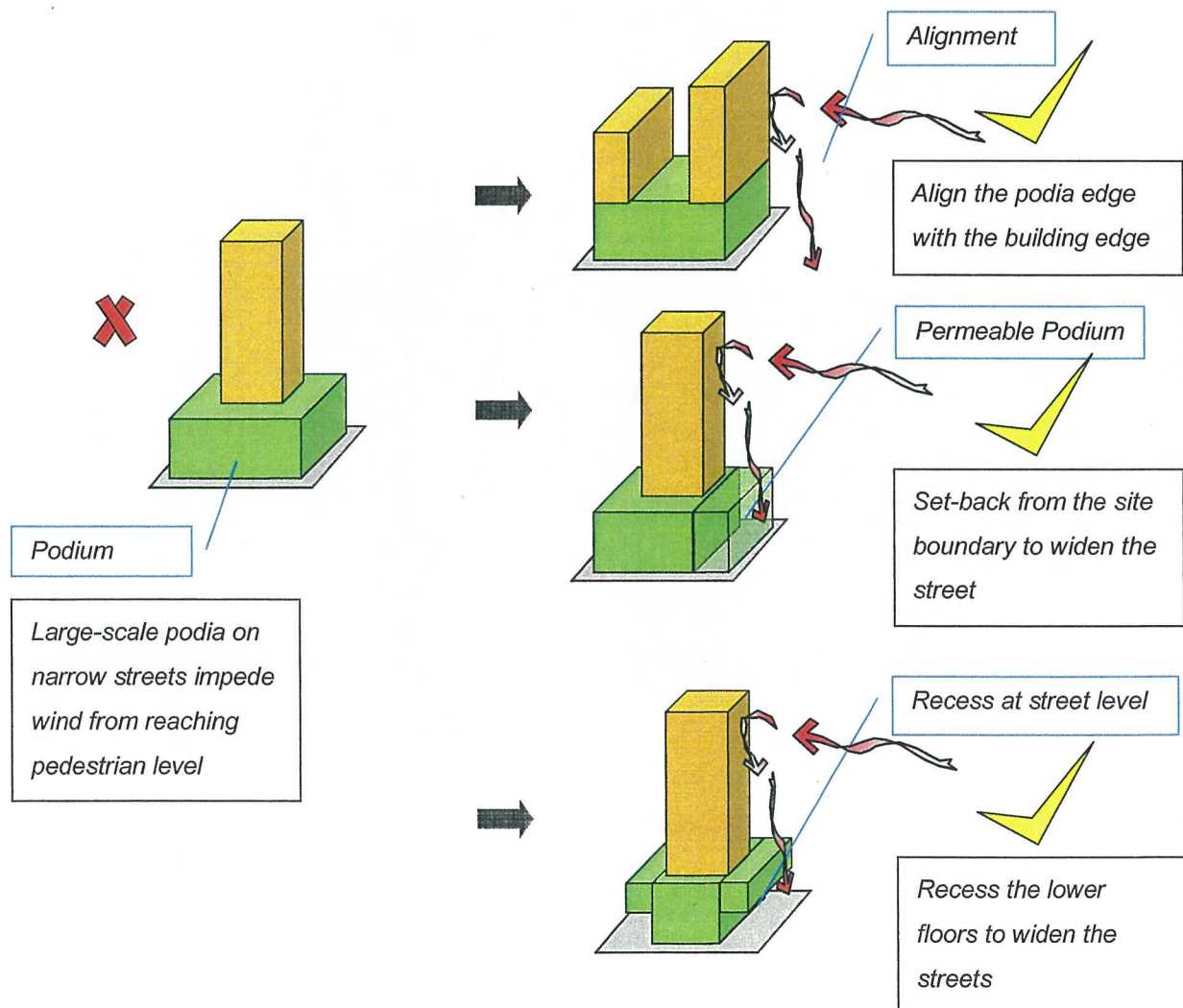
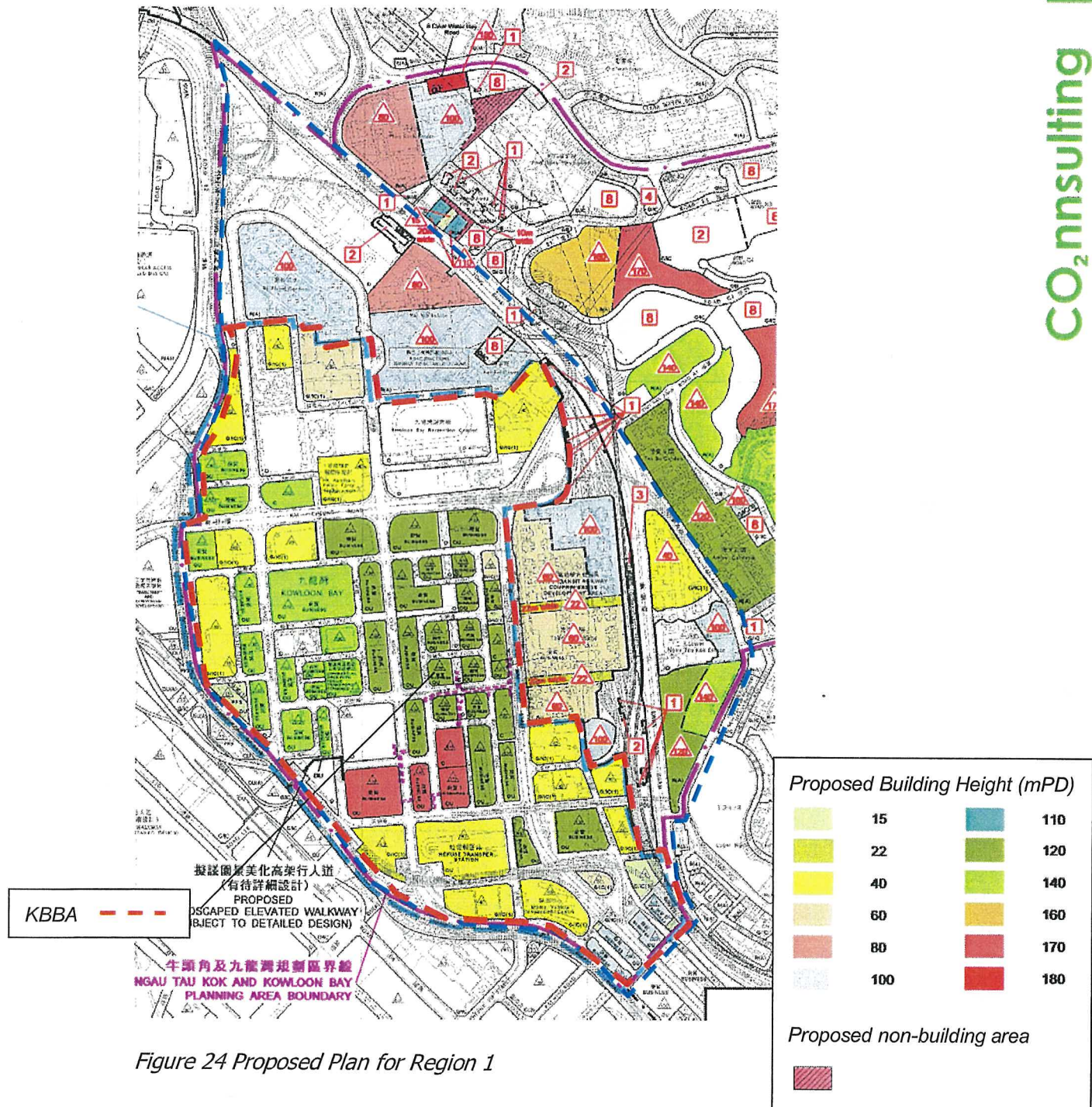


Figure 23 Recommendations for Podia

5.2.2 Region 1

Figure 24 shows the proposed plan for Region 1.



There are no changes in the proposed outline plan in the KBBA between the committed and the proposed plans. The recommendations to the committed plan have been provided in Section 4.2.1.

Outside of the KBBA, the maximum proposed building height of Telford Gardens remain unchanged (60mPD and 100mPD). The proposed plan indicates that two corridors have been proposed to be introduced on the podium (22mPD) as shown in Figure 25. This strategy will help to provide a wind corridor connecting Wang Tai Road and Sheung Yuet Road. It is also recommended that a 15m to 20m building gap at 22mPD to be provided as shown in Figure 25, to connect to Kwun Tong Road Tai Yip Street, to improve air ventilation.

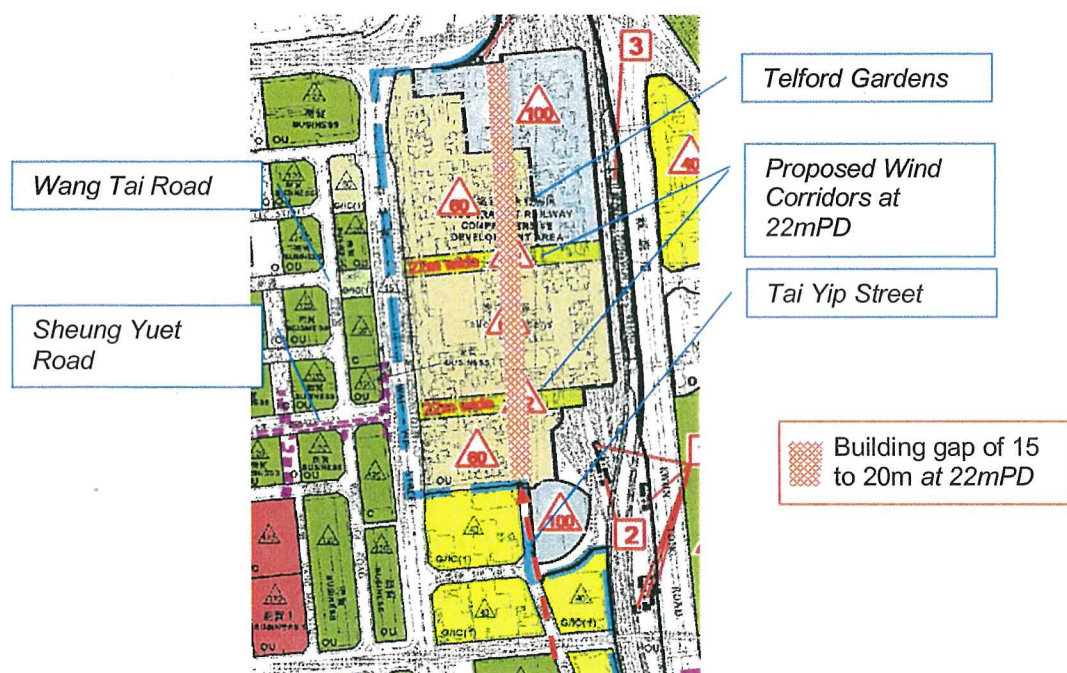


Figure 25 Recommended Building Gap for Telford Gardens

The maximum proposed building height of Kai Yip Estate increased from 60mPD to 100mPD. The increased maximum height is acceptable, however it is recommended that the building disposition should adopt a similar arrangement shown in Figure 14 in section 4.2.1.

The existing building height of Richland Gardens is about 100mPD. The current disposition includes sizable building gaps in the range of 60m to 85 m, maintenance of this space

together with the existing building height will give a positive impact on air ventilation, as shown in Figure 26.

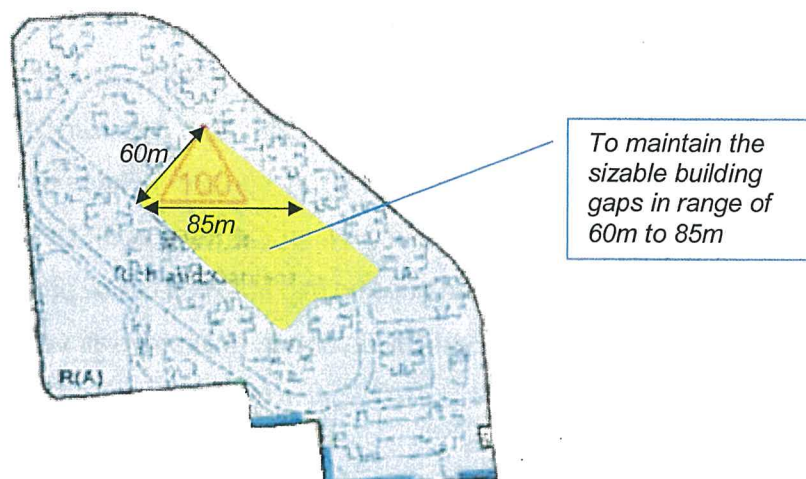


Figure 26 Richland Gardens

5.2.3 Region 2

There are no significant changes in Region 2. The proposed maximum building height of Shun Chi Court and Shun Tin Estate are kept at 170mPD and 160mPD/170mPD respectively. When the building disposition adopts a similar arrangement shown in Figure 21, discussed in section 4.2.2, the air ventilation effectiveness will be improved. The other recommendations have already been provided in Section 4.2.2.

Two non-building areas are proposed in Ping Shek Estate and Shun Chi Court, see Figure 27. It is recommended to maintain these two non-building areas for better air ventilation.

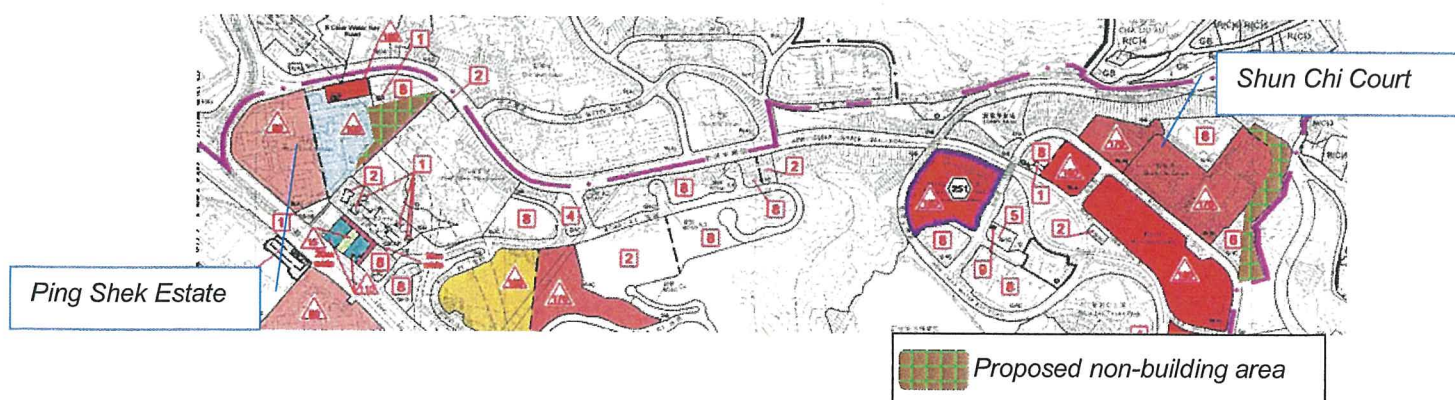


Figure 27 Proposed Non-building areas in Region 2

Notwithstanding the above, there is an area of concern in the future redevelopment of Kai Tak Mansion and the assessment is detailed in section 5.3.

5.3 Kai Tak Mansion

5.3.1 Background

The Kai Tak Mansion is located at the foothill of the slope adjoining the Hong Kong Baptist University Academy of Visual Arts to the south-east of Ping Shek Estate. The site consists of seven storeys with a building height of approximately 25.6mPD. The nearby spot height is approximately 4.6mPD. The "R(A)" site is surrounded by a number of historic buildings, G/IC facilities, open spaces and medium-rise public housing estates. Figure 29 shows the view of the Site and its surrounding. To its immediate north are two Grade I historic buildings of Ex-Royal Air Force (RAF) Officers' Quarters Compound (which include the two-storey RAF Officers Mess and an Annex Block) zoned "G/IC(2)", which are now being re-used as the Hong Kong Baptist University's (HKBU) Academy of Visual Arts, and to its immediate southwest is another two-storey Grade I historic building Ex-RAF Headquarters Building, which is currently zoned "O" and occupied by Caritas Family Crisis Support Centre. A one-storey Sam Shan Kwok Wong Temple (Grade III) and 8-storey St. Joseph Anglo-Chinese Primary School are located to its northwest and southeast respectively.

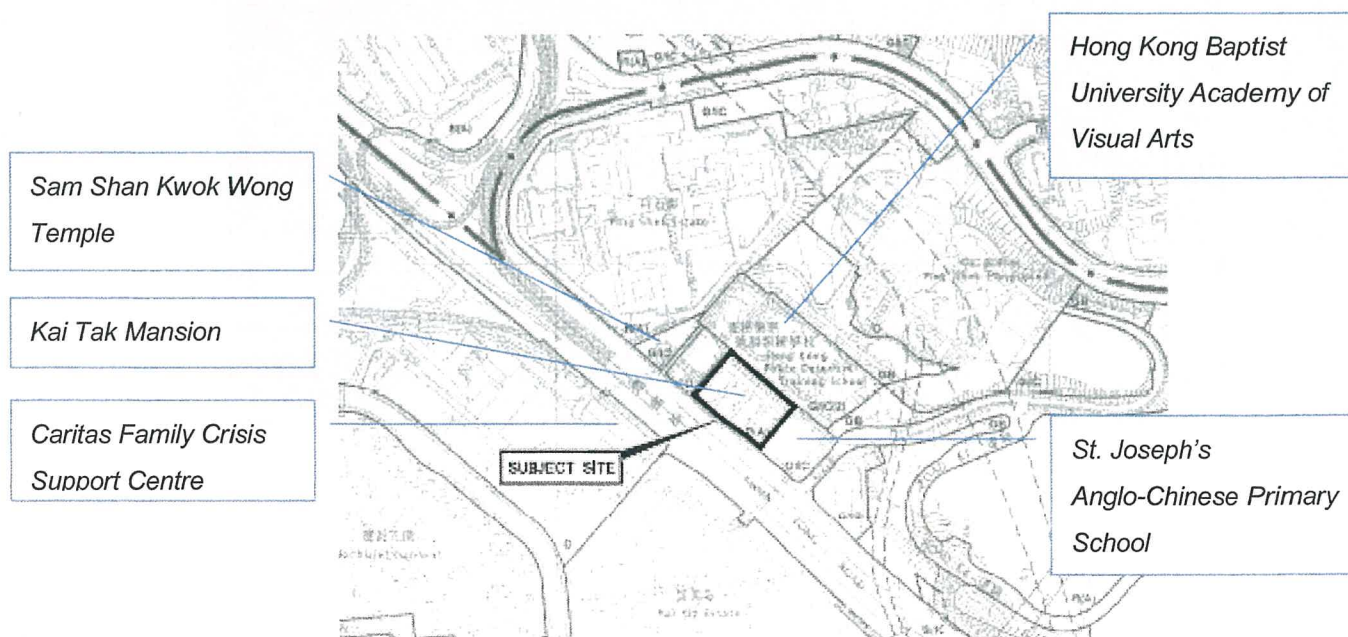


Figure 28 Project Site for Option Study

The building height of subject "R(A)" site, which could be built up to 110mPD, may have adverse impact on the air ventilation of the HKBU site at its rear and thus affecting students' activity. In order to minimise the potential adverse air ventilation impacts on the neighbours, development restrictions (NBAs and/or building gap) are proposed for future redevelopment of the "R(A)" site and tested in different options. Two development options: the baseline option (PR 9, BH 105mPD with no NBAs and building gap) and alternative option (PR 9, BH 105mPD with NBAs and building gap restrictions), are compared qualitatively in terms of the impacts on air ventilation in the surrounding developments in particular HKBU with the existing scenario (i.e. 7-storey building).

Figure 29 shows the view of the site and its surrounding.



Figure 29 Views of Kai Tak Mansion Site and its Surrounding Developments

5.3.2 Existing Scenarios of Kai Tak Mansion Site

Figure 30 shows the prevailing winds, identified in Section 3, for the existing scenario with breezeways.

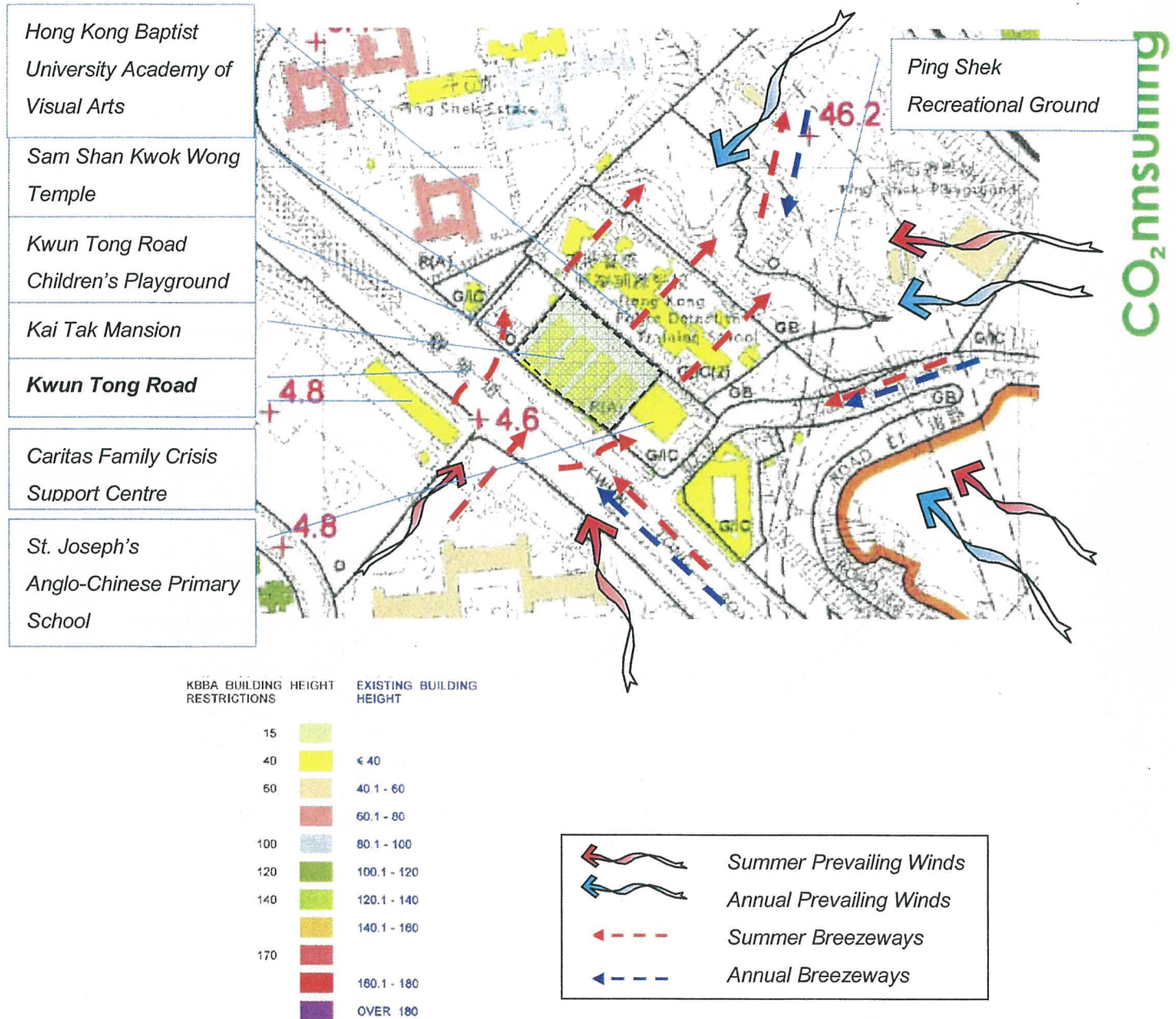


Figure 30 Existing Scenario at Kai Tai Mansion Site (highlighted in cross-hatched pattern) and its Surrounding Developments showing Major Breezeways

Figure 31 shows the building disposition of the existing Kai Tak Mansion. Some downdraft will also ventilate the area. The site includes four similar blocks with a 5m spacing. These narrow building gaps are insufficient to funnel the south-westerlies to the HKBU Academy of Visual Arts. However, this negative impact is not significant due to two reasons: the availability of the adjacent green belt and the large open space, Kwun Tong Road Children's Playground and Ping Shek Recreational Ground; as well as the limited building height of seven storeys (25.6mPD). It can therefore be said that the surrounding buildings have access to breeze.

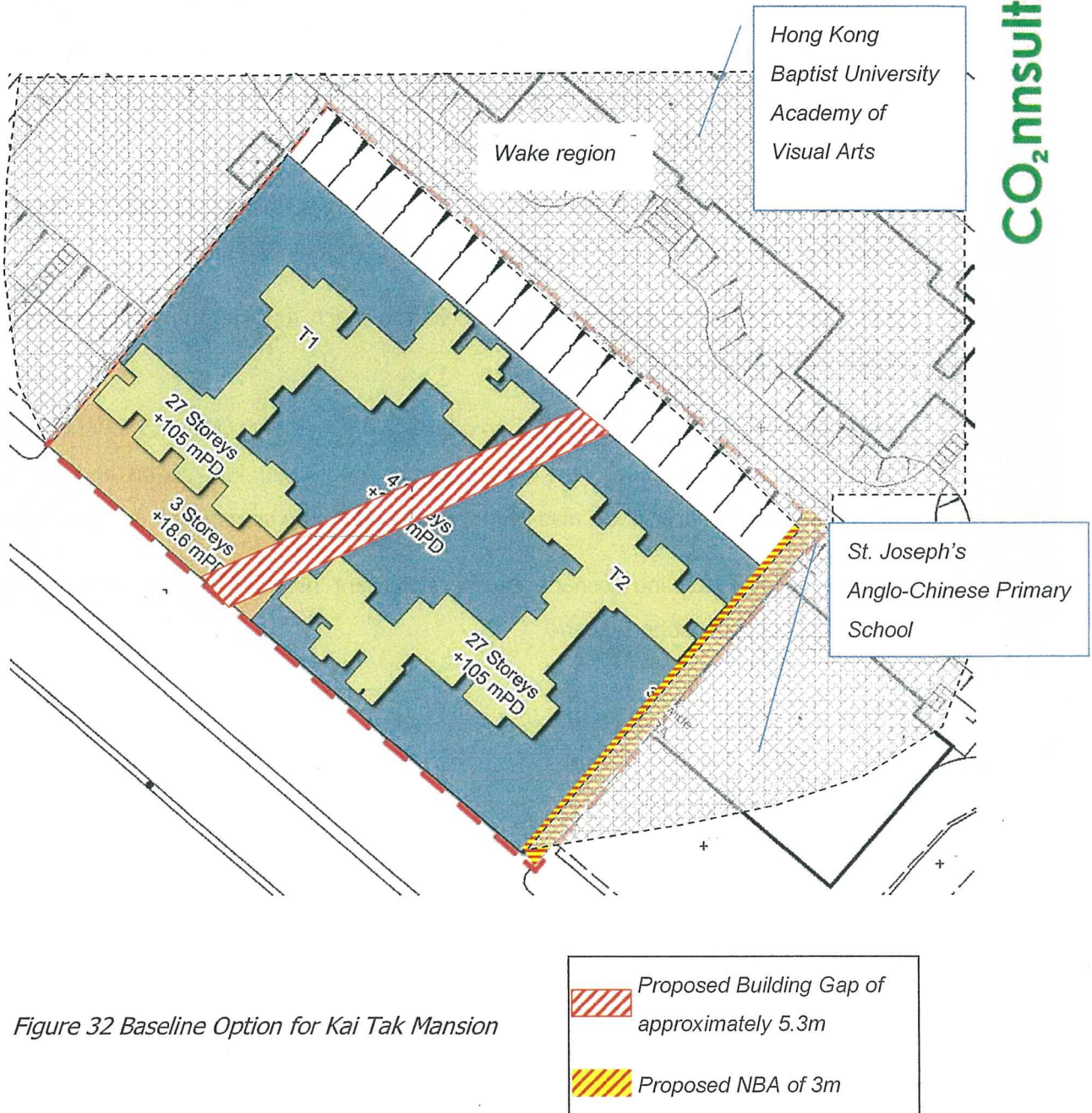


Figure 31 Existing Kai Tak Mansion

5.3.3 Options study of Kai Tak Mansion Site

(A) Baseline Option

Figure 32 shows the baseline option with a proposed building height of 105 mPD. Observations of the baseline option are described in the following paragraphs.



The large-scale podium would reduce the downdraft attributed by the subject towers with the south-westerlies and southerlies, and therefore minimise the ventilation on Kwun Tong Road.

The non-building area of 3m next to St. Joseph's Anglo-Chinese Primary School (approximately 37mPD), as shown in Figure 32, is insufficient to allow the south-westerlies to reach Hong Kong Baptist University Academy of Visual Arts, but will help to receive downdraft to ventilate the area with easterlies.

With the elevated height of 105 mPD (compared to approximately 25.6mPD of the existing scenario), the building gap of 5 m is not effective in ventilating the area.

The alignment of a building gap is directed too much towards the west to harvest the south-westerlies and southerlies.

The HKBU lies in the wake (area with no or little air movement) of the Kai Tak Mansion with diminished air ventilation. Part of the Kwun Tong Road Playground and St. Joseph Anglo-Chinese Primary School also lie in the area with little air movement. See Figure 32.

In general, the baseline scenario causes significant negative impact on air ventilation compared to the existing scenario.

(B) Alternative Option

Figure 33 shows alternative option for Kai Tak Mansion site. The proposed building height is at 105 mPD, similar to that in the baseline scenario.



Figure 33 Alternative Option for Kai Tak Mansion with Recommendations

Two non-building areas of 10m each are introduced as shown in Figure 33. The non-building area of 10m adjacent to St. Joseph's Anglo-Chinese Primary School is insufficient to ventilate the area with south-westerlies, but will encourage downdraft to reach the ground level and ventilate the area with easterlies.

The introduction of a 20m building gap between the four towers of 105mPD encourages the south-westerlies and north-easterlies to permeate. Nevertheless, it is recommended to widen the building gap to ideally 24m to further improve ventilation. See Figure 33.

The alignment of this 20m building gap also encourages south-westerlies and southerlies to permeate.

In general, alternative option provides better air ventilation to the vicinity than the baseline option.

5.4 Further Study

Given the consideration of development right which will lead to high-rise buildings, control of building height in itself is not an effective means for better air ventilation. This study has also included measures on set-backs, podia design, non-building areas to supplement with the height restriction. This study provides an overview of the existing wind environment and recommends broad measures to minimise negative impacts and where appropriate, improvement to the existing conditions.

The Project Area benefits from green belts, open spaces and low-rise G/IC sites, the sites should be maintained for better air ventilation. Building gaps and non-building areas have been recommended throughout the Project Area to improve permeability.

For specific sites where large-scale development or redevelopment may be possible, as shown in Figure 34, detailed AVAs on a site-by-site basis should be undertaken.

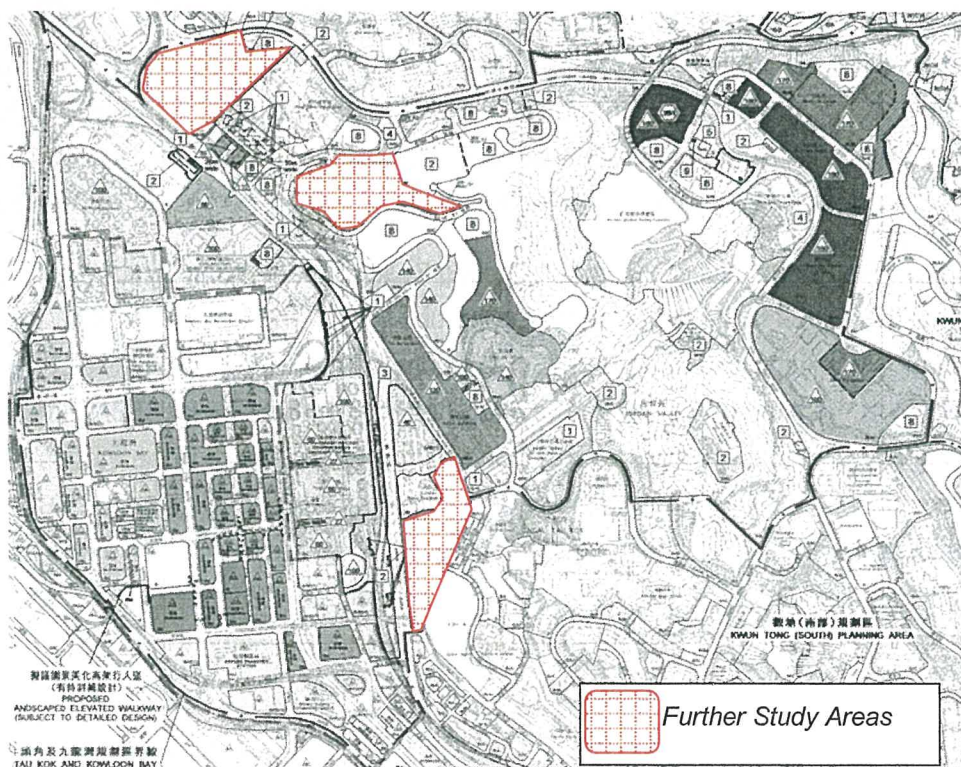


Figure 34 Recommended Sites for Detailed AVAs during Development / Redevelopment

6 CONCLUSIONS

As Region 1 is the gateway to sea breeze, it is essential that the OU and G/IC sites at the waterfront are maintained at 40mPD or below to allow permeability of sea breeze to Kowloon Bay. This strategy has already been adopted in the committed plan. Numerous sites in form of Residential, Commercial, G/IC and OU are planned to be developed in Kai Tak which is just southwest of Region 1, outside the Project Area. The majority of the buildings are up to in the range of 15mPD to 65mPD. Care should be exercised in the arrangement of building blocks in the Kai Tak area to minimise the adverse impact of air ventilation to the Kowloon Bay area.

The KBBA is densely packed with medium to high-rise commercial and industrial buildings (120 mPD to 170 mPD). Narrow roads are found in the KBBA. Given the maximum building height and the width of the blocks, the negative impact on air ventilation cannot be mitigated unless the effective road spacing (measured from building face-to-building face) is increased from 10m - 25m to 30m or beyond. Since this mitigation measure is not practical, it is recommended to introduce and maintain several urban linear parks and open space within KBBA, as well as practical setbacks from the roads. These ventilation pockets include the CICTA Sheung Yuet Road Training Ground, Lam Wah Street Playground, Kowloon Bay Park, Kowloon Bay Sports Ground, Kowloon Bay Playground, a series of "linear open space", as well as numerous low-rise G/IC sites with building height restriction of 40mPD, help to improve air ventilation in the Kowloon Bay Area, and should be maintained.

The committed linear open spaces from Kai Cheung Road to Wang Yuen Street would better serve the business area if the future redeveloped building(s) are set back from Wang Mau Street by 5m. A building gap of around 15m is recommended along Sheung Yee Road and Lam Hing Street to extend the breezeway for better permeability in KBBA. Widening breezeways, Wang Kwong Road and Wang Chiu Road, by setting back three meters of each side of the road will improve the effectiveness of the major breezeways. The KBBA area lacks breezeways to funnel easterlies and sea breeze. The introduction of a non-building area at the proposed International Mail Centre to connect to the breezeway provided by Wang Tai Road and Lam Wah Street would improve the air ventilation in the KBBA. The site of Enterprise Square V is sizable with unfavourable slab-type towers. As Enterprise Square V sits on the waterfront, it presents an obstacle to permeability to KBBA. A slanting alignment of the 15m building gap is recommended at the 22mPD podium level of Enterprise Square V to introduce a wind corridor for the oncoming sea breeze. A permeable podium is recommended for the Enterprise Square V. It is also recommended that the building

disposition should adopt a similar arrangement shown in the study report for air ventilation improvement.

Outside the KBBA, the majority of the land consists of large-scale housing estates and residential developments, such as Kai Yip Estate, the committed Lower Ngau Tau Kok Estate Redevelopment Project, and Richland Gardens. In general, building disposition should not form a wind wall to improve permeability. Furthermore, low-rise facilities should be located in the centre of these developments to maximise the size of the open courtyard to improve local ventilation. Recommendations for such sites have been provided in the study report.

Region 2 of the Project Area is hilly, with the majority of open space in the form of G/IC sites, green belts and open space areas, such as Jordan Valley Playground, Jordan Valley Leisure Pool Complex, Ping Shek Recreational Ground, Former Jordan Valley Landfill Site, Service Reservoir, Shun Lee Tsuen Park, which provide pleasant air ventilation to the region, and should be maintained. Areas of larger-scale medium-rise residential developments are located along the eastern and western boundaries of Region 2, with maximum height from 80mPD to 250mPD. In general, there are no significant negative air ventilation impacts due to these estates because of the abundant surrounding open space, green belt and/or low-rise G/IC developments. These areas shall be maintained for better air ventilation. However, better arrangements in terms of air ventilation have been proposed in the study report for future redevelopments.

In the proposed plan, the proposed maximum building height of Telford Gardens remain unchanged (60mPD and 100mPD). The proposed plan also indicates that two corridors have been proposed to be introduced on the podium (22mPD). This strategy will help to provide a wind corridor connecting Wang Tai Road and Sheung Yuet Road. A 15m to 20m building gap is also recommended to connect Kwun Tong Road to Tai Yip Street to improve air ventilation.

The proposed maximum building height of Kai Yip Estate increased from 60mPD to 80mPD and 100mPD. The increased maximum height is acceptable, however it is recommended that the building disposition should adopt a similar arrangement shown in the study report for air ventilation improvement.

The maximum building height of 100mPD is retained for the site of Richland Gardens. The current disposition includes sizable building gaps in the range of 60m to 85 m, maintenance

of this space together with the unchanged building height will give a positive impact on air ventilation.

The proposed maximum building heights of Shun Chi Court and Shun Tin Estate are kept at 170mPD and 160mPD/170mPD respectively. When the building disposition adopts a similar arrangement shown in the study report, the air ventilation effectiveness will be improved.

For specific sites where large-scale development or redevelopment may be possible, detailed AVAs on a site-by-site basis should be undertaken.

The summary of recommendations to minimise the impact of the overall Project Area are listed below and illustrated in Figure 35.

General:

- Provide set-back from the site boundary, or recess the lower floors from these key wind corridors, or align the podia edge with the building edge, to make the podia more permeable, by delineating non-building areas wherever possible

Region 1:

- Maintain the linear open spaces from Kai Cheung Road to Wang Yuen Street;
- Introduce a building gap of around 15m wide along Sheung Yee Road and Lam Hing Street to extend the breezeway for better permeability in KBBA;
- Introduce set-back of 5m to the building(s) on Wang Mau Street;
- Introduce a 15m building gap and a permeable podium for Enterprise Square V;
- Avoid slab-type building disposition in the Enterprise Square V. Buildings should be arranged in the manner as recommended in the report to allow wind corridor;
- Introduce a set-back of 3m on each side of Wang Kwong Road and Wang Chiu Road;
- Introduce a 15m non-building area at the proposed International Mail Centre;
- Widen the building-to-building gaps in the committed Lower Ngau Tau Kok Estate Redevelopment Project;
- Avoid slab-type building disposition in the Kai Yip Estate. Air paths should be introduced;
- Maximise the open space within the Amoy Garden;
- Introduce a building gap of 15 to 20m wide in Telford Gardens to connect Kwun Tong Road to Tai Yip Street;

- Maintain the sizable building gaps in range of 60m to 85m in the Richland Gardens;
- Maintain the open space and G/C sites in the future development;

Region 2:

- Avoid slab-type building disposition in the Ping Shek Estate. Air paths should be introduced;
- Maintain the non-building areas in the Ping Shek Estate and Shun Chi Court;
- Avoid wind wall building disposition in the committed Choi Tak Estate Site 3A. Air paths should be introduced;
- Introduce air paths in the Choi Ha Estate, the Shun Lee Estate, the Shun Chi Court, the Shun Tin Estate and the Shun Lee Discipline Services Quarters; and
- The baseline scenario and alternative option of Kai Tak Mansion site have been compared. It is concluded that the alternative option with building gap of 20m to 24m wide at 13.6mPD and non-building areas of 10m provides better air ventilation compared to the baseline option.

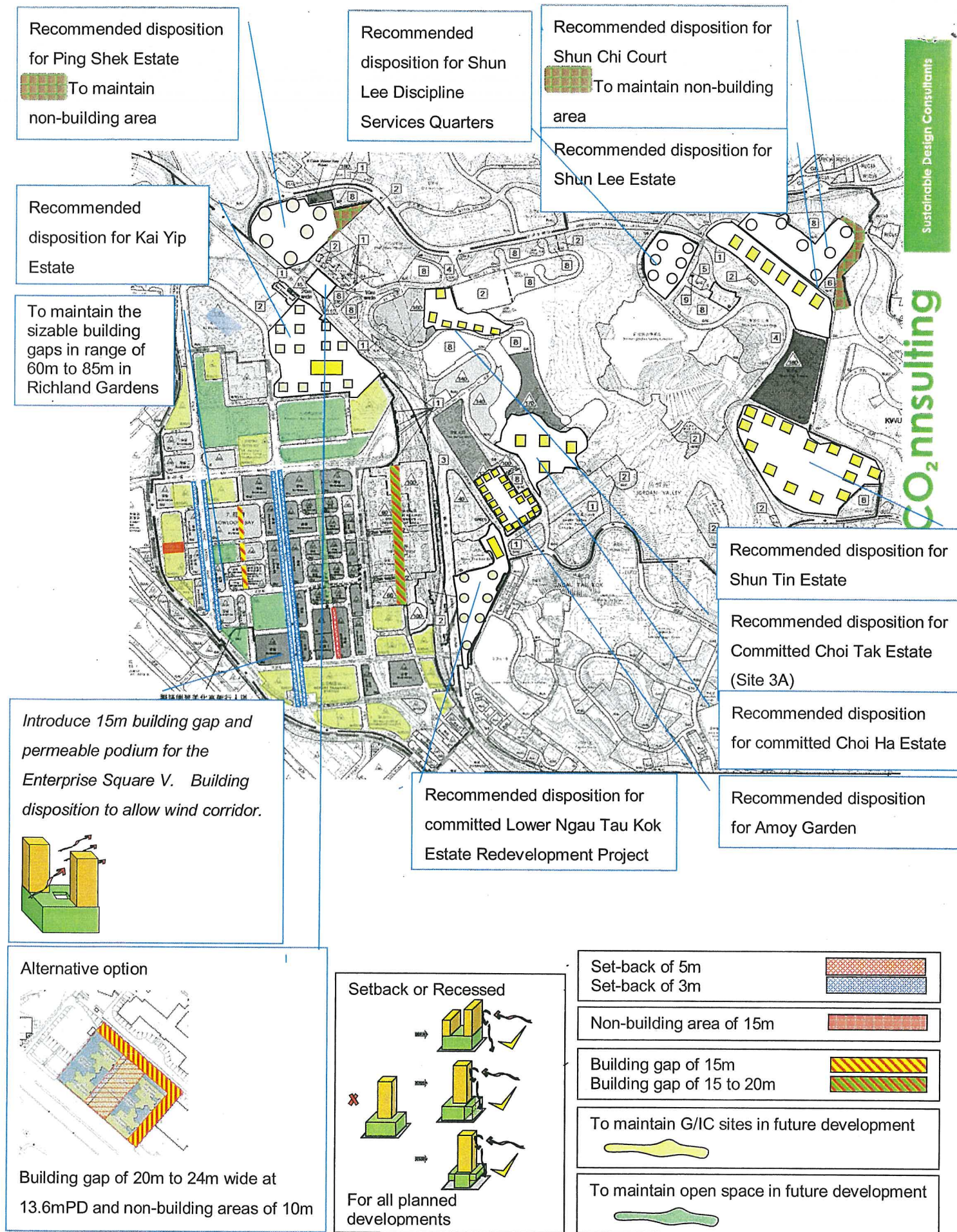


Figure 35 Summary of Recommendations to Minimise the Impact