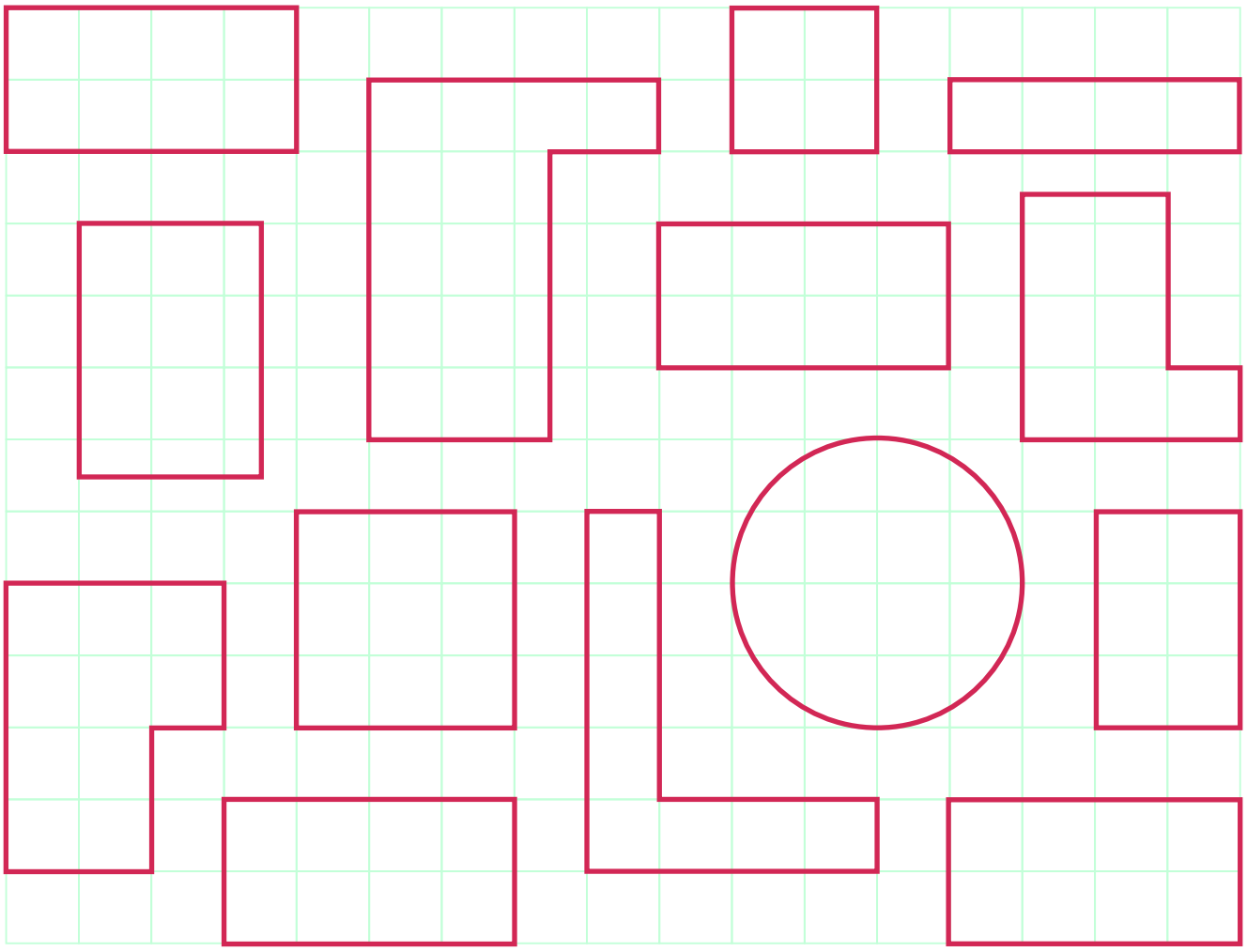
HONG KONG PLANNING
STANDARDS AND GUIDELINES

Chapter 2

Residential Densities



PLANNING DEPARTMENT
THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

CHAPTER 2 RESIDENTIAL DENSITIES

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Residential Densities

1. Introduction

1.1 Objectives and Functions of Residential Density Guidelines

1.1.1 Residential density is a quantitative measure of the intensity with which land is occupied by either development or population. Control of residential density is a fundamental component of effective land use planning, as the relative distribution of population has major implications for the provision of public facilities, such as transport, utilities and social infrastructure.

1.1.2 In order to boost the short- to medium- term land supply for housing use, there is a need to make efficient use of the scarce land resources, in particular land more immediately available for development within a shorter timeframe, by maximizing the residential density to the extent permitted by planning terms in order to augment the supply of land in Hong Kong and living space of Hong Kong people.

1.1.3 In the 2014 Policy Address, the Government announced that, except for the north of Hong Kong Island and Kowloon Peninsula which are more densely populated, the maximum domestic plot ratios that can be allowed for housing sites located in the other Density Zones of the Main Urban Areas and New Towns would be raised generally by about 20% as appropriate. In accordance with the established practice, the Government will duly consider factors such as traffic and infrastructural capacity, local characteristics, existing development intensity and various possible impacts of the proposed development in the area concerned. The 2015 Policy Address also mentions that the Government will increase development intensity as appropriate in order to optimize land use.

1.1.4 The maximum plot ratios in the relevant Density Zones should not be considered as an automatic and across-the-board specification, but a general guidance for the maximum plot ratio to be considered or tested for individual sites for residential development in the planning process where there is scope to allow such an increase in terms of infrastructure capacity and planning considerations, that is, where planning terms permit.

1.1.5 The main objectives of density policy are:

(a) to promote an acceptable standard of environment and amenity for the occupants of residential areas;

(b) to ensure an appropriate balance between the residential

population of an area and the capacity of the existing or planned facilities and infrastructure required to service it;

(c) to maintain an efficient intensity of land use and make the optimal use of land resources in the context of competing demands on a limited supply of developable land;

(d) to maintain safe levels of development and population in areas where there may be potential risks due to adverse geotechnical conditions, neighbouring hazardous installations, etc.;

(e) to provide for a variety of urban form for urban design reasons and to satisfy the demands of different market sectors; and

(f) particularly in rural and/or heritage and nature conservation areas, to ensure development is of an appropriate scale in relation to its setting.

1.1.6 Residential density guidelines promote these objectives by establishing a coherent framework of density standards for application to different types of area. These standards are used to guide planning at all levels from strategic planning to development control and they are applicable to both public and private housing. They should, however, be used flexibly to take account of variable local circumstances.

1.1.7 The primary purpose of the guidelines is to enable planners to make reliable estimates of the population capacities of areas zoned for residential development, or conversely to estimate the land area required to accommodate a given population. Such estimates are required to ensure that adequate infrastructure and services are planned to satisfy the needs of the future population and to indicate where densities may need to be restricted on a site or area basis to achieve this.

1.2 General Residential Density Principles

1.2.1 In applying residential development densities, there are a number of general principles which need to be considered coherently with a view to achieving integration of land use, transport, environmental and infrastructure planning. Through such integrated planning, residential developments of different densities can be planned to achieve the most efficient and functional disposition and economies of scale in terms of social, transport and infrastructure provisions while meeting environmental objectives.

1.2.2 The relevant principles guiding the residential densities with the above integrated approach are:

(a) there should be a hierarchy of residential densities to meet market needs for a diversity of housing types;

(b) residential densities should be commensurate with what the existing and planned infrastructure and environmental capacities can cope with;

(c) developments should be placed in such a way to encourage public transport and reduce the travel demand; and as such, higher density residential developments should be located near rail stations and major public transport interchanges wherever possible to capitalize development opportunities and to reduce reliance on road-based vehicular travel;

(d) there could be a decreasing gradation of residential development densities from the distances to the rail stations and public transport interchanges;

(e) higher density residential developments outside major transport corridors or the catchment areas of a rail station could be considered where there will be adequate feeder services from the rail stations and public transport interchanges;

(f) as putting higher density residential developments near high capacity transport node would imply more sensitive receivers being subject to environmental impact, careful consideration should be given to environmental planning to ensure meeting of environmental objectives with incorporation of environmental mitigation measures where appropriate;

(g) to avoid monotonous urban form and achieve a more interesting townscape, residential developments at different levels of density could be considered; and

(h) it would be more compatible to adopt a low density for residential developments which may be located close to environmentally sensitive areas e.g. wetland, conservation areas, country parks and Sites of Special Scientific Interest in order to conserve these areas and avoid human disturbance impact on them as far as possible.

1.3 Administrative Context

1.3.1 The administrative context for residential density controls in Hong Kong is mixed, being based partly on statutory powers and partly on administrative measures. The Buildings Ordinance, including its associated Building (Planning) Regulations (B(P)R), is the only statute which explicitly sets density limits and provides for their enforcement. The First Schedule of the B(P)R specifies the maximum plot ratios and site coverage permitted for domestic and non-domestic buildings in relation to building height.

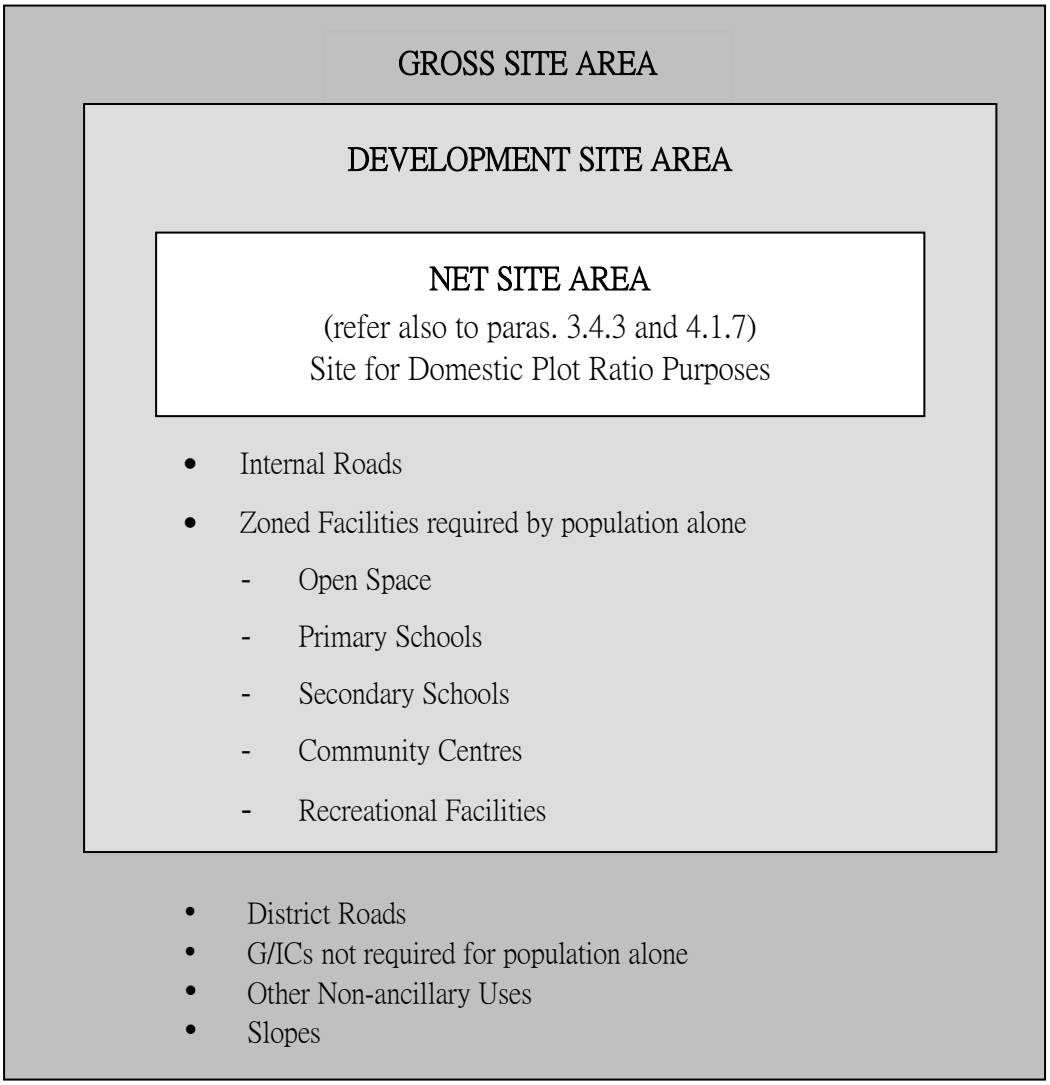
1.3.2 In addition, under the Town Planning Ordinance, enforceable plot ratio controls can be imposed through the notation and Notes on statutory town plans.

1.3.3 Other density measures which seek to restrict densities to below the statutory B(P)R maximum, are administrative in origin and can be incorporated in leases or reflected in statutory town plans for enforcement when needed. These include the Hong Kong Planning Standards and Guidelines (HKPSG) residential density guidelines and the Special Control Area provisions. Special Control Areas are designated in order to preserve areas with a special character or amenity or because of limitations in transport capacity.

2. Function of Residential Density Guidelines

2.1 The density of development in public and private residential areas in Hong Kong is guided by way of plot ratio. Plot ratio is defined as the ratio between the gross floor area (GFA as defined under B(P)R) of a building and the area of the site on which it is erected (the Net Site Area). The site area definitions are shown in Figure 1. Plot ratio governs the amount of GFA in buildings but affects population density only indirectly due to the interplay of other factors like, flat size and person per flat ratio.

Figure 1 Site Area Definitions



2.2 The key functions of residential density guidelines are therefore twofold:

(a) to set out the plot ratio controls relevant to different categories of development; and

(b) to show how these can be converted into the likely levels of population they may generate.

3. Building Density Guidelines

3.1 Enforcement of Building Development Intensity

3.1.1 The ultimate maximum domestic plot ratios permissible in Hong Kong are set by First Schedule of the B(P)R. Restrictions below this level can only be enforced through:

(a) statutory controls incorporated in statutory town plans;

(b) Airport Height Restrictions (indirectly);

(c) conditions imposed on development under new or modified land leases; or

(d) planning permissions granted under Section 16 of the Town Planning Ordinance.

3.1.2 Building density guidelines for different types of area, under the HKPSG or the Special Control Area provisions, can therefore only be implemented where one or other of these circumstances applies. It is therefore recommended that the maximum permissible plot ratios set out in these guidelines should be incorporated in statutory town plans wherever necessary and possible.

3.2 Main Urban Areas

3.2.1 The Main Urban Areas comprise Hong Kong Island, Kowloon and New Kowloon and the Districts of Tsuen Wan and Kwai Tsing. Metroplan establishes the following density principles for these areas:

(a) within acceptable environmental limits, to maximise the intensity of people and jobs close to high capacity transport systems (particularly rail);

(b) conversely, to limit densities in areas not well served by high capacity transport systems;

(c) wherever possible, to reduce densities in highly congested districts which are experiencing widespread environmental and operational problem; and

(d) to limit densities in areas where the visual impact of development will be the prime concern.

3.2.2 The Main Urban Areas are divided into three Residential Density Zones: R1, R2 and R3 (See Figure 2).

- Residential Zone 1 covers the highest density of residential development and applies to districts well served by high capacity public transport systems such as rail station or other major transport interchange. The buildings often incorporate a significant component of commercial floorspace on the lower one to three floors.

- Residential Zone 2 covers development at a medium

density and applies in locations less well served by high capacity public transport systems. There is usually no commercial floorspace component.

- Residential Zone 3 covers the lowest density of residential development and applies to districts with very limited public transport capacity or subject to special constraints for urban design, traffic or environmental reasons.

3.2.3 The maximum domestic plot ratios permissible in these zones are set out in Table 1.

Residential Zone 1

3.2.4 Within the existing built-up area, the plot ratios permitted on redevelopment of existing buildings in Residential Zone 1 vary between the major geographical areas. First Schedule of the B(P)R currently applies on Hong Kong Island while in Kowloon, the maximum domestic plot ratio is further restricted to 7.5 based on the recommendations of the Kowloon Density Study (KDS) Review. This maximum domestic plot ratio is implemented through the relevant statutory town plans. Tsuen Wan and Kwai Tsing are governed by the plot ratios for First Generation New Towns. Site Class is a relevant factor in determining permissible plot ratio under First Schedule of the B(P)R. Where a residential building also contains a non-domestic element, the maximum permissible domestic plot ratio may be further restricted, according to the provisions of the B(P)R composite building formula.

3.2.5. In new development areas which are not yet covered by statutory plans, including new reclamations and other newly formed areas, the maximum domestic plot ratio is 6.5. This plot ratio is lower than the statutory limit set by the B(P)R, in order to promote one of the key objectives of Metroplan, to bring about improvements in living conditions in the urban areas by reducing densities. Any non-domestic plot ratio component may be in addition to the domestic plot ratio of 6.5, up to the maximum permitted by the B(P)R composite building formula or those of the statutory town plans.

3.2.6 In "Comprehensive Development Areas" ("CDA"), the maximum domestic plot ratio will normally be 6.5 but higher plot ratios may be justified according to local circumstances where infrastructure capacity permits.

Residential Zones 2 and 3

3.2.7 Within the existing built-up area, the limitations on plot ratio for Residential Zones 2 and 3 set out in Table 1 can only be enforced through lease conditions and planning conditions, except where they are incorporated in the statutory town plans.

3.2.8 In new development areas, the maximum domestic plot ratios for Zones 2 and 3 are set at 6 and 3.6 respectively.

3.3 New Towns

3.3.1 The New Towns are also divided into three Residential Density Zones: R1, R2 and R3, on the same basis as those in the Main Urban Areas. In addition, a very low density zone, R4, may be designated where justified by severe geotechnical/ infrastructure constraints or compatibility with the adjacent rural low density developments. The maximum domestic plot ratios permissible in these zones are set out in Table 2.

3.3.2 The New Towns programme was designed to encourage the movement of population out of the congested Main Urban Areas by offering prospective residents a substantially better living environment. With the introduction of lower densities for new development areas in the Main Urban Areas, similar reductions may be called for in New Towns. A domestic plot ratio of 8 should only be permitted where there are no infrastructure constraints, e.g. close to high capacity transport systems. On the other hand, a maximum permitted domestic plot ratio for Residential Zone 1 in most existing New Towns should be optimized and increased generally from 5 to 6, where infrastructural capacity and planning considerations permit.

3.3.3 The maximum permitted domestic plot ratios for Residential Zones 2, 3 and 4 in New Towns are 5, 3.6 and 0.8 respectively.

3.4 Rural Areas

3.4.1 In the rural areas, densities need to be much lower than those in the urban areas, partly because of the limited capacity of transport, utility and social infrastructure but in many cases also because of the need to protect fine natural landscape from undesirable urban encroachment.

3.4.2 Six Rural Residential Density Zones cover those parts of the Rural Areas which may be designated as suitable for development: RR1 to RR5 and Village. Each relates broadly but not necessarily exclusively to a particular type of built form, and guidelines are given in Table 3 for both plot ratio and typical

number of domestic storeys.

- Rural Residential Density Zone 1 (RR1) relates to a medium rise residential block with up to 12 floors including at most two commercial lower floors. It is the highest density appropriate to non-urban areas, applicable in the commercial centres of Rural Townships such as: Sai Kung, Mui Wo, and Tai O. (Maximum plot ratio 3.6)

- Rural Residential Density Zone 2 (RR2) relates to a low-rise residential block with up to 6 floors and no commercial elements. It is applicable to areas within Rural Townships lying outside the commercial centre, and in other significant rural development areas served by medium capacity public transport, such as light rail systems. (Maximum plot ratio 2.1)

- Rural Residential Density Zone 3 (RR3) relates to terraced housing or flats on up to 3 residential floors (over car port). These may be in peripheral parts of Rural Townships or other rural development areas, or in locations away from existing settlements but with adequate infrastructure and no major landscape or environmental constraints. (Maximum plot ratio 0.75 over the Development Site Area)

- Rural Residential Density Zone 4 (RR4) relates to detached or semi-detached houses on up to 3 storeys (including carports), residential floors, in similar locations to RR3 but where development intensity is restricted by infrastructure or landscape constraints. (Maximum plot ratio 0.4 over the Development Site Area)

- Rural Residential Density Zone 5 (RR5) relates to small detached houses of up to 2 residential floors (over car port), permitted as replacements for temporary structures in areas requiring upgrading. (Maximum plot ratio 0.2 over the Development Site Area)

- Village Density Zone relates to New Territories Exempted Houses, which are permitted within the defined envelope of recognized villages. (Maximum plot ratio 3, i.e. 3 floors on 100% site coverage on a site area of 65.03m^2)

3.4.3 It should be noted that the plot ratios for RR3, RR4 and RR5 are calculated on the total available site, including roads and open space, to allow for the variable circumstances of rural sites and topography. Plot ratios for RR1 and RR2 relate to the Net Site Area (see Figure 1).

3.5 Plot Ratio Ranges

3.5.1 The maximum plot ratios set out in Tables 1, 2 and 3 are targets to be aimed for. However, where there are significant constraints on development capacity (such as transport or infrastructure limitations, environmental, topographical or geotechnical conditions, or heritage and nature conservation), other planning principles and urban design considerations (including local character and setting, building height profile and massing of the neighbourhood, air ventilation and visual impacts on the surroundings, protection of important physical features such as ridgelines), or special design considerations, a maximum plot ratio lower than this target may be applied. The range of acceptable plot ratios, however, should not extend below the maximum plot ratio for the next lower density zone. Where there are severe constraints on density, a density zone with a more appropriate plot ratio range should be selected for the site.

3.6 Plot Ratio, Building Height and Site Coverage

3.6.1 The maximum permitted site coverage and resulting maximum plot ratio for domestic buildings of different heights in R1 zones are specified in First Schedule of the B(P)R and shown in Table 4. In existing development areas within the Main Urban Areas subject to old land leases, these vary according to Site Class, i.e. the number of streets onto which a site fronts. In new development areas subject to new land grants, the maximum plot ratios stipulated under First Schedule of the B(P)R may not always be achievable due to such reasons as infrastructure constraints, compatibility with adjoining development, environmental considerations and physical character of the site. A lower plot ratio may be imposed according to Tables 1 to 3 through the statutory town plans or land leases.

3.6.2 Table 5 shows how maximum domestic plot ratio varies with number of domestic floors in R2 and R3 zones. Site Class is not a relevant consideration. Maximum domestic plot ratio is achievable with buildings of 17 floors or higher, for R2 and R3.

4. Population Density Guidelines

4.1 Function and Estimation of Population Density

4.1.1 The function of residential population density guidelines is to convert building density in terms of plot ratio into the population that is likely to be accommodated on a site. This may be required for three purposes:

(a) to estimate the population capacity of a site area at a given plot ratio;

(b) to estimate the site area required to accommodate a given population at a given plot ratio; and

(c) to estimate the plot ratio required for a given population to be accommodated on a given site area.

4.1.2 Estimates of these kinds are mainly required at two different stages in the planning process:

(a) *Strategic and district planning*

4.1.3 At this stage, broad assessments of population or land area are required and little definite or site specific data is available. The main tasks are:

- making initial forecasts of the population capacity of potential development areas or sites (for example in Territorial Development Strategy Study), preparing development briefs, assessing infrastructure demand etc.; and

- estimating the area of land required to be released to accommodate a projected future population.

(b) *Site planning*

4.1.4 This is undertaken when more detailed and site-specific data is available. The purpose is to select a suitable plot ratio and to estimate site capacity for the preparation of development briefs or for vetting private sector proposals.

4.1.5 Different forms of density guidelines are required to meet the needs of these two stages in the planning process.

4.1.6 In practical terms, residential population density guidelines are only applicable where there is the likelihood of relatively large sites or areas being developed at a specified building density, i.e. new development areas or "CDA". They cannot be used effectively to assess population capacities resulting from the piecemeal redevelopment of existing built-up areas.

Factors affecting population capacity of a site

4.1.7 The population capacity of a site for residential development depends on:

(a) the developable area of the site or Development Site Area (DSA) (i.e. the Gross Site Area excluding slopes, infrastructure reserves, etc.);

(b) the area of the site which has to be devoted to ancillary facilities such as roads, open space and G/IC facilities required to serve the population;

(c) the permitted plot ratio to be applied to the remaining Net Site Area (NSA); and

(d) the occupancy rate of domestic GFA in m^2 per person, which is obtained by dividing the expected average GFA per flat (flat size) by the expected persons per flat (ppf).

4.1.8 The definitions of various site areas used in these guidelines are illustrated in Figure 1.

4.2 Treatment of Open Space

4.2.1 Open space generally refers to an area which would merit the "Open Space" ("O") zoning on town plans. In determining the development capacity of a site, the treatment of open space provision needs further elaboration since it may take various forms and can be more flexibly designed than other supporting G/IC facilities.

4.2.2 In new development areas**,** adequate provision of open space should normally be made on town plans at HKPSG standards, according to the project population. In such areas, therefore, the NSA should be used to calculate the gross floor area for a site, according to the provision of the B(P)R, subject to any control that may be stipulated in the land lease or the statutory town plan.

4.2.3 In those built-up areas where there is inadequate reservation of open space, residential development should as far as practicable not be allowed to aggravate this situation and consideration should be given to zoning additional open space, particularly with regard to District Open Space. However, if there are strong justifications for and significant planning benefits from a proposed housing development, the project may be permitted but the following should be considered:

(a) where it can be demonstrated that the layout can satisfactorily accommodate the Local Open Space (LOS) requirement relative to the assumed design population, the NSA can be used in full for plot ratio calculation purpose; and

(b) if the plot ratio generally applicable to the area would likely result in a population too high to permit such self-containment of LOS, consideration should be given to reducing the permissible GFA on the site to a level at which it can be achieved.

5. Residential Density Guidelines for Strategic and District Planning

5.1 The chart in Table 6 converts building density or plot ratio into population capacity on sites of different areas. It takes account of the effects of variations in occupancy rates (flat size and ppf) on the facilities required and therefore the NSA. It is intended to be used to obtain initial estimates of population capacity and land requirements for strategic and district planning purposes, when limited site-specific data is available. It incorporates fixed assumptions about standards for the provision of LOS and school facilities and roadspace (given in Table 7). It requires the input of assumed values for:

(a) development site area (the estimated developable part of the gross site area);

(b) plot ratio (according to the proposed density zoning);

(c) average domestic GFA per flat; and

(d) average persons per flat.

5.2 If no specific values are available for items (c) and (d) above, the latest available assumptions relevant to the area and the likely date of occupation should be used. Otherwise, the initial assumptions given in Tables 8 and 9 may be used as a rough guide. However, appropriate judgement should be made upon application of average flat sizes for planning purpose since those figures are highly volatile and would vary according to the factors like price, location and affordability, etc.

5.3 The key variable in the chart in Table 6 is NSA per person (NSApp). This is obtained from inputs (b), (c) and (d) above, by dividing average flat size by average persons per flat and dividing the result by plot ratio. The chart shows the population capacity of any DSA for a set of alternative NSApp values. If no portion of a site is required to be set aside for LOS, i.e. excluded from the NSA (see para 4.2.1), the NSApp value should be reduced by 1.0.

5.4 The chart can be used for the three purposes listed in section 4.1.1, as follows:

(a) to estimate the population capacity of a site area at a given plot

ratio, calculate the NSApp from the appropriate input values and select the curve on the chart with the closest NSApp value. Where this NSApp curve intersects with the given DSA on the horizontal axis, read off the corresponding population on the vertical axis. Values for intermediate NSApp levels may be obtained by interpolation;

(b) to estimate the site area required to accommodate a given population at a given plot ratio, select the curve for the appropriate NSApp value as in (a). Where this curve intersects with the given population on the vertical axis, read off the corresponding DSA on the horizontal axis, by interpolation if necessary; and

(c) to estimate the plot ratio required for a given population to be accommodated on a given site area, find the NSApp curve closest to the intersection of the DSA value on the horizontal axis and the population value on the vertical axis, by interpolation if necessary. Calculate the GFA per person (GFApp) value by dividing the appropriate flat size assumption by the ppf assumption. Divide the GFApp by the NSApp from the chart to give the required plot ratio. Examples of how the graphs are used are shown in Appendix 1, and an explanation of their form is given in Appendix 3.

5.5 The results derived from using the chart in these ways will show the combinations of population, site area and plot ratio necessary to achieve a comprehensive development which will satisfy HKPSG standards for the provision of open space and G/IC facilities, on the basis of average values for the key occupancy variables. Typical gross population densities for sites of different areas in Residential Zones R1, R2, R3, RR1 and RR2 are shown in Table 10. These population densities are for illustrative purposes only and do not represent targets.

Net to Gross Ratios

5.6 In considering the development capacity of a large site, it is useful to be able to make a broad assessment of the proportion of a site which will be available for residential development (NSA), and the proportion which will need to be set aside to accommodate roads, open space and G/IC facilities. The ratio of the NSA to the DSA varies with the NSApp and the gross area of the site. For Residential Density Zones R1, R2, R3, R4, RR1 and RR2, it can be read from the chart in Table 11. The specific G/IC facilities that are estimated to be required can be read from the population threshold levels set out in Table 7.

6. Residential Density Guidelines for Site Planning

6.1 For site planning, it is likely that more site-specific data will be available on, for example:

(a) the proportion of the gross site area not available for development due to slope, primary or secondary roads, and other uses not ancillary to the proposed development;

(b) the proportion of the developable area which will be required to accommodate internal roads; and

(c) the requirement for open space and G/IC facilities to serve the development, in the light of existing or proposed provision in the district as a whole.

6.2 If such information varies significantly from the average values for these items given in Table 7, the latter will not be an adequate guide for site planning purposes. A computer program has been developed which can convert building density to population using any values for the key variables, including those which were held constant for the chart. This program, entitled the SUM2 Model, is described in Appendix 2 and intended for reference only.

6.3 The SUM2 Model will also provide a preliminary assessment of the portion of the GSA which will be available for residential development, i.e. the NSA. The ultimate value for the NSA from which the permissible domestic GFA is calculated is derived by the iterative process of drawing up and refining a layout.

Table 1 Maximum Domestic Plot Ratios – Main Urban Areas

Density Zone	Type of Area	Location	Maximum Domestic Plot Ratio	Notes
R1	Existing Development Area	Hong Kong Island	8/9/10	(i) (ii)
		Kowloon & New Kowloon	7.5	(iii) (iv)
		Tsuen Wan New Town (covers Tsuen Wan, Kwai Chung & Tsing Yi Island)	8	(ii) (v)
	New Development Area and Comprehensive Development Area		6.5	(vi) (vii)
R2			6	(viii) (ix)
R3			3.6	(viii) (ix)

Notes:

General:

- The Table only gives an indication of the maximum plot ratio which may be allowed for a particular area. However, where there are significant constraints on development capacity (such as transport or infrastructure limitations, environmental, topographical or geotechnical conditions, or heritage and nature conservation), other planning principles and urban design considerations (including local character and setting, building height profile and massing of the neighbourhood, air ventilation and visual impacts on the surroundings, protection of important physical features such as ridgelines), or special design considerations, a lower plot ratio may be specified when considered appropriate and possible.

- In some areas, maximum plot ratios may not be achievable due to Airport Height Restrictions.

(i) Maximum domestic plot ratio of 8, 9 and 10 depends on Site Class A, B and C respectively.

(ii) If there is non-domestic floorspace, maximum domestic plot ratio will be reduced according to the provisions of the B(P)R composite building formula.

(iii) The maximum domestic plot ratio is in accordance with those stipulated on statutory town plans and site class is not relevant.

(iv) If there is non-domestic floorspace with a plot ratio in excess of 1.5, maximum domestic plot ratio will be reduced by the amount of this excess.

(v) For this first generation New Towns (i.e. Tuen Mun, Sha Tin, Fanling / Sheung Shui, Tai Po, Yuen Long and Tsuen Wan), lease modifications for higher plot ratios than those applicable prior to September 1981 should be permitted only if the proposed development forms the whole or a substantial part of a comprehensive redevelopment plan prepared or approved by the planning authority.

(vi) Higher maximum domestic plot ratios may be permitted in Comprehensive Development Areas having regard to local circumstances, such as infrastructure capacities. However, for New Development Area and CDA for Tsuen Wan, Kwai Chung & Tsing Yi Island, the maximum plot ratio is normally 5.

(vii) Any non-domestic plot ratio component may be in addition to the domestic plot ratio, up to the maximum permitted by the B(P)R composite building formula or those of the statutory town plans.

(viii) In existing development areas this maximum domestic plot ratio can only be imposed in the case of lease modifications or Section 16 applications, unless it is incorporated in the statutory town plans.

(ix) In Special Control Areas, maximum domestic plot ratio may be further limited.

Table 2 Maximum Domestic Plot Ratios - New Towns (excluding Tsuen Wan)

Residential density zone	Maximum domestic plot ratio
R1	8 (i) (ii) (iii)
R2	5
R3	3.6
R4 (iv)	0.8

Notes:

General: The Table only gives an indication of the maximum plot ratio which may be allowed for a particular area. However, where there are significant constraints on development capacity (such as transport or infrastructure limitations, environmental, topographical or geotechnical conditions, or heritage and nature conservation), other planning principles and urban design considerations (including local character and setting, building height profile and massing of the neighbourhood, air ventilation and visual impacts on the surroundings, protection of important physical features such as ridgelines), or special design considerations, a lower plot ratio may be specified when considered appropriate and possible.

(i) Domestic plot ratio 8 should only be permitted where there are no infrastructure constraints, e.g. close to high capacity transport systems. Elsewhere, the plot ratio should be determined according to local circumstances. A maximum permitted plot ratio for R1 in most New Towns is 6, where infrastructural capacity and planning considerations permit.

(ii) In the first generation New Towns (i.e. Tuen Mun, Sha Tin, Fanling / Sheung Shui, Tai Po, Yuen Long and Tsuen Wan), lease modifications for higher plot ratios than those applicable prior to September 1981 should be permitted only if the proposed development forms the whole or a substantial part of a comprehensive redevelopment plan prepared or approved by the planning authority.

(iii) If there is non-domestic floor space, maximum domestic plot ratio will be reduced according to the provisions of the B(P)R composite building formula.

(iv) Sites in New Towns should only be designated R4 if there are special justifications such as severe geotechnical or infrastructural constraints.

Table 3 Maximum Domestic Plot Ratios - Rural Areas

Density zone	Maximum domestic plot ratio (i)	Maximum development site ratio (ii)	Typical total no of storeys	Locational criteria
RR1	3.6	-	12	Commercial centres of Rural Townships
RR2	2.1	-	6	Areas within Rural Townships lying outside the commercial centre, and in other significant rural development areas served by medium capacity public transport, such as light rail systems.
RR3	-	0.75	3 over car port	Peripheral parts of Rural Townships or other rural development areas, or in locations away from existing settlements but with adequate infrastructure and no major landscape or environmental constraints.
RR4	-	0.4	3 including car port	Similar locations to RR3 but where development intensity is restricted by infrastructure or landscape constraints.
RR5	-	0.2	2 over car port	Replacements for temporary structures in areas requiring upgrading.
Village	3.0 (iii)	-	3	Within the defined envelope of recognised villages.

Notes:

General: The Table only gives an indication of the maximum plot ratio which may be allowed for a particular area. However, where there are significant constraints on development capacity (such as transport or infrastructure limitations, environmental, topographical or geotechnical conditions, or heritage and nature conservation), other planning principles and urban design considerations (including local character and setting, building height profile and massing of the neighbourhood, air ventilation and visual impacts on the surroundings, protection of important physical features such as ridgelines), or special design considerations, a lower plot ratio may be specified when considered appropriate and possible.

(i) Domestic plot ratio is applied to the Net Site Area (i.e. excluding roads and zoned open space).

(ii) Development site ratio is applied to the whole site including those parts to be devoted to roads and open space, but excluding slopes (see definition of Development Site Area in Figure 1).

(iii) New Territories Exempted House, built on a site area of 65.03m^2.

Table 4 Maximum Permitted Site Coverage and Plot Ratio in Relation to Building Height for Domestic Buildings under First Schedule of B(P)R

Height of building as defined under B(P) R in metres	Maximum domestic site coverage (%)			Maximum domestic plot ratio		
	Class A Site	Class B Site	Class C Site	Class A Site	Class B Site	Class C Site
up to 15	66.6	75	80	3.3	3.75	4.0
up to 18	60	67	72	3.6	4.0	4.3
up to 21	56	62	67	3.9	4.3	4.7
up to 24	52	58	63	4.2	4.6	5.0
up to 27	49	55	59	4.4	4.9	5.3
up to 30	46	52	55	4.6	5.2	5.5
up to 36	42	47.5	50	5.0	5.7	6.0
up to 43	39	44	47	5.4	6.1	6.5
up to 49	37	41	44	5.9	6.5	7.0
up to 55	35	39	42	6.3	7.0	7.5
up to 61	34	38	41	6.8	7.6	8.0
over 61	33.33	37.5	40	8.0	9.0	10.0

Notes:

General: The Table sets out the statutory maximum site coverage and domestic plot ratio for buildings of different heights. The maximum plot ratio may be further limited by other controls as set out in Tables 1 to 3.

(i) Class A Site means a site, not being a Class B site or Class C site, that abuts on one specified street, as defined under B(P)R, not less than 4.5m wide.

(ii) Class B Site means a corner site that abuts on two specified streets, as defined under B(P)R, neither of which is less than 4.5m wide.

(iii) Class C Site means a corner site that abuts on three specified streets, as defined under B(P)R, none of which is less than 4.5m wide.

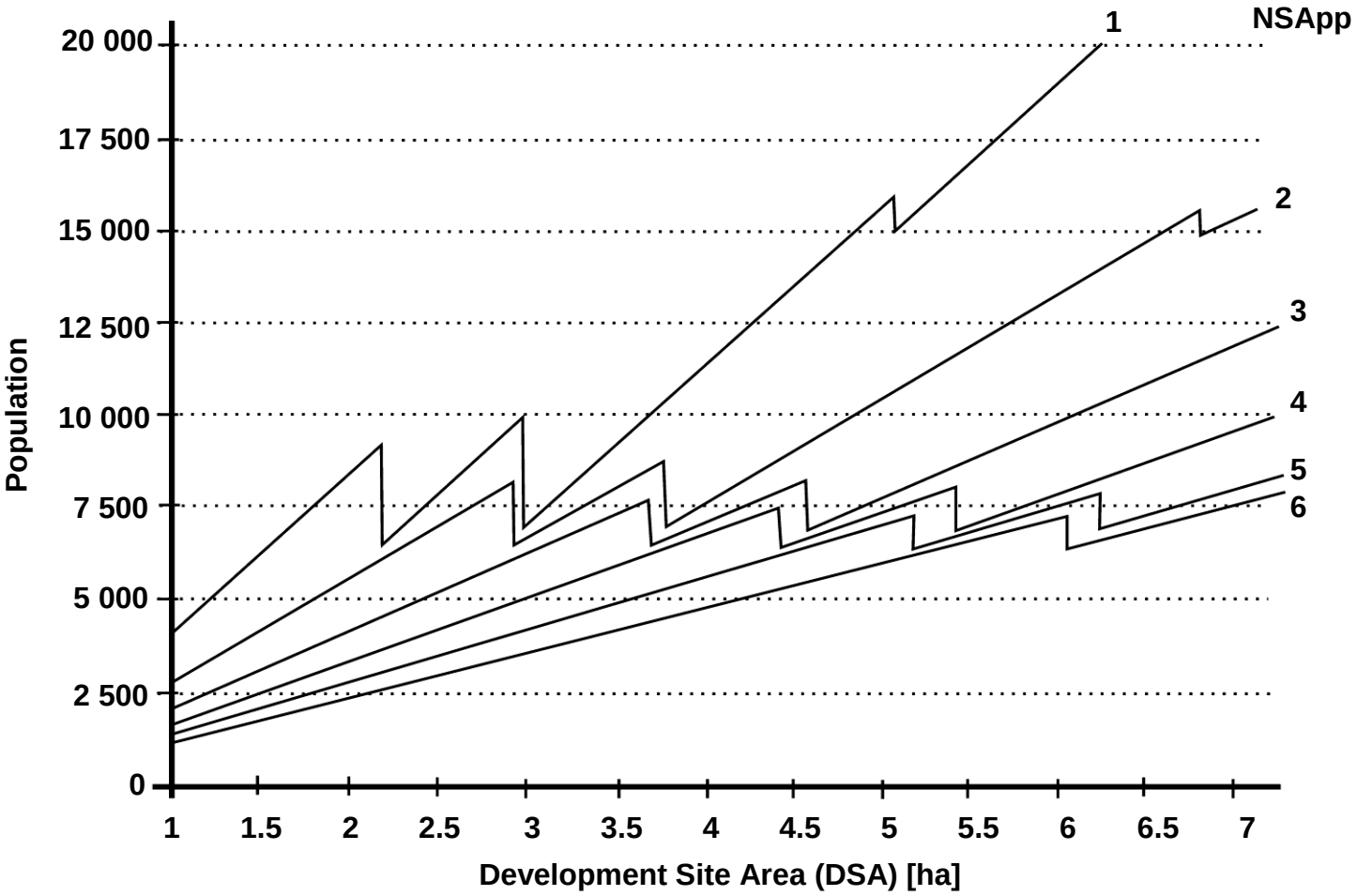
(iv) If there is non-domestic floor space, maximum domestic plot ratio will be reduced according to the provisions of the B(P)R composite building formula.

Table 5 Maximum Plot Ratio and Site Coverage for Domestic Buildings in R2 and R3 Zones, Urban Areas and New Towns

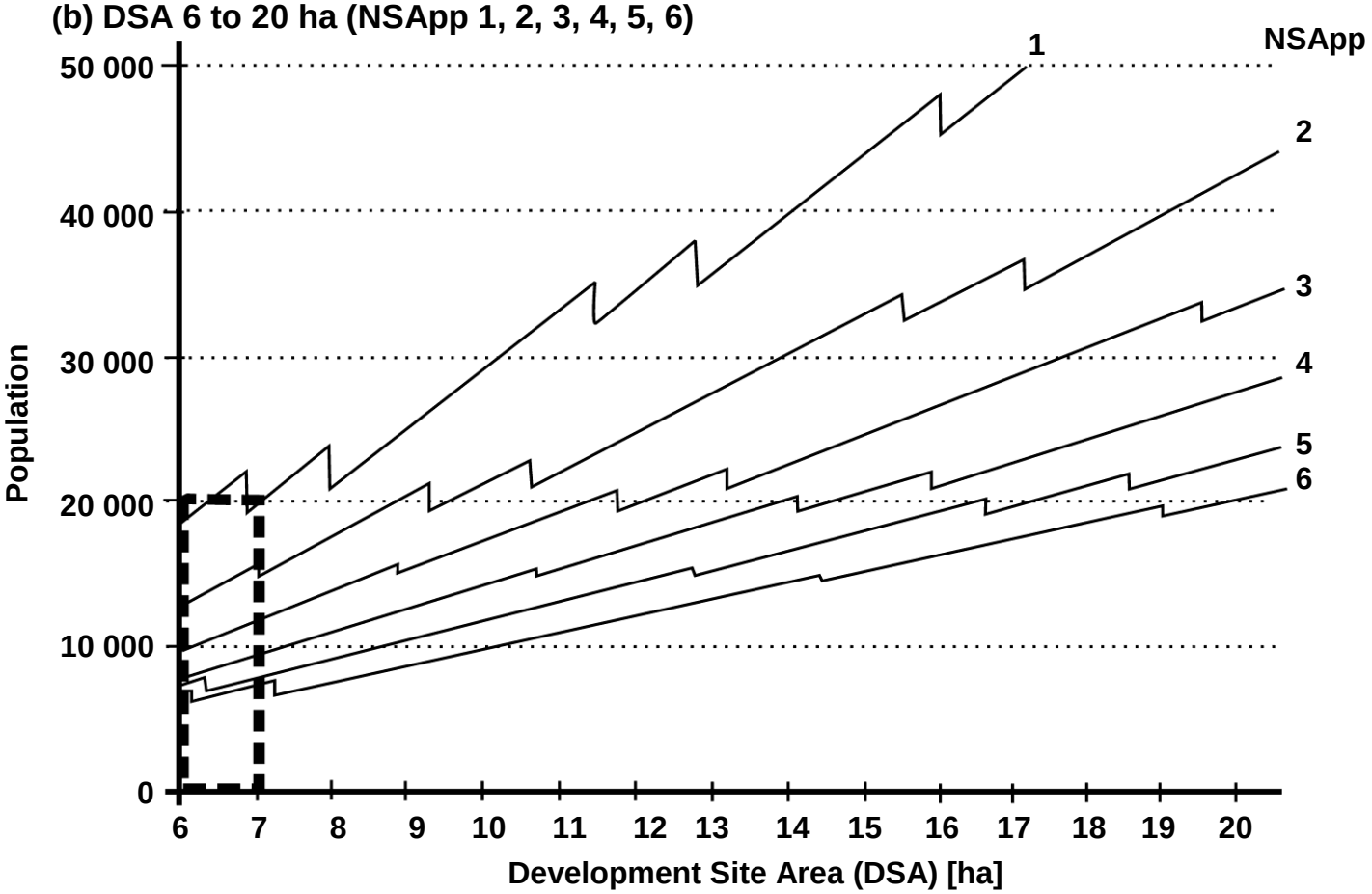
Number of domestic storeys	Residential Zone 2		Residential Zone 3	
	Plot ratio	Maximum site coverage (%)	Plot ratio	Maximum site coverage (%)
1	0.67	66.6	0.5	50
2	1.2	60	0.6	30
3	1.65	55	0.75	25
4	1.8	45	0.9	22.5
5	2.0	40	1.0	20
6	2.1	35	1.2	20
7	2.1	30	1.4	20
8	2.4	30	1.6	20
9	2.7	30	1.8	20
10	3.0	30	2.0	20
11	3.3	30	2.2	20
12	3.6	30	2.4	20
13	3.9	30	2.6	20
14	4.2	30	2.8	20
15	4.5	30	3.0	20
16	4.8	30	3.0	20
17 and over	5.0 (New Towns) and 6.0 (Main Urban Areas)	30	3.0 to 3.6	20

Table 6: Total Population, by DSA and NSApp

(a) DSA 1 to 7 ha (NSApp 1, 2, 3, 4, 5, 6)



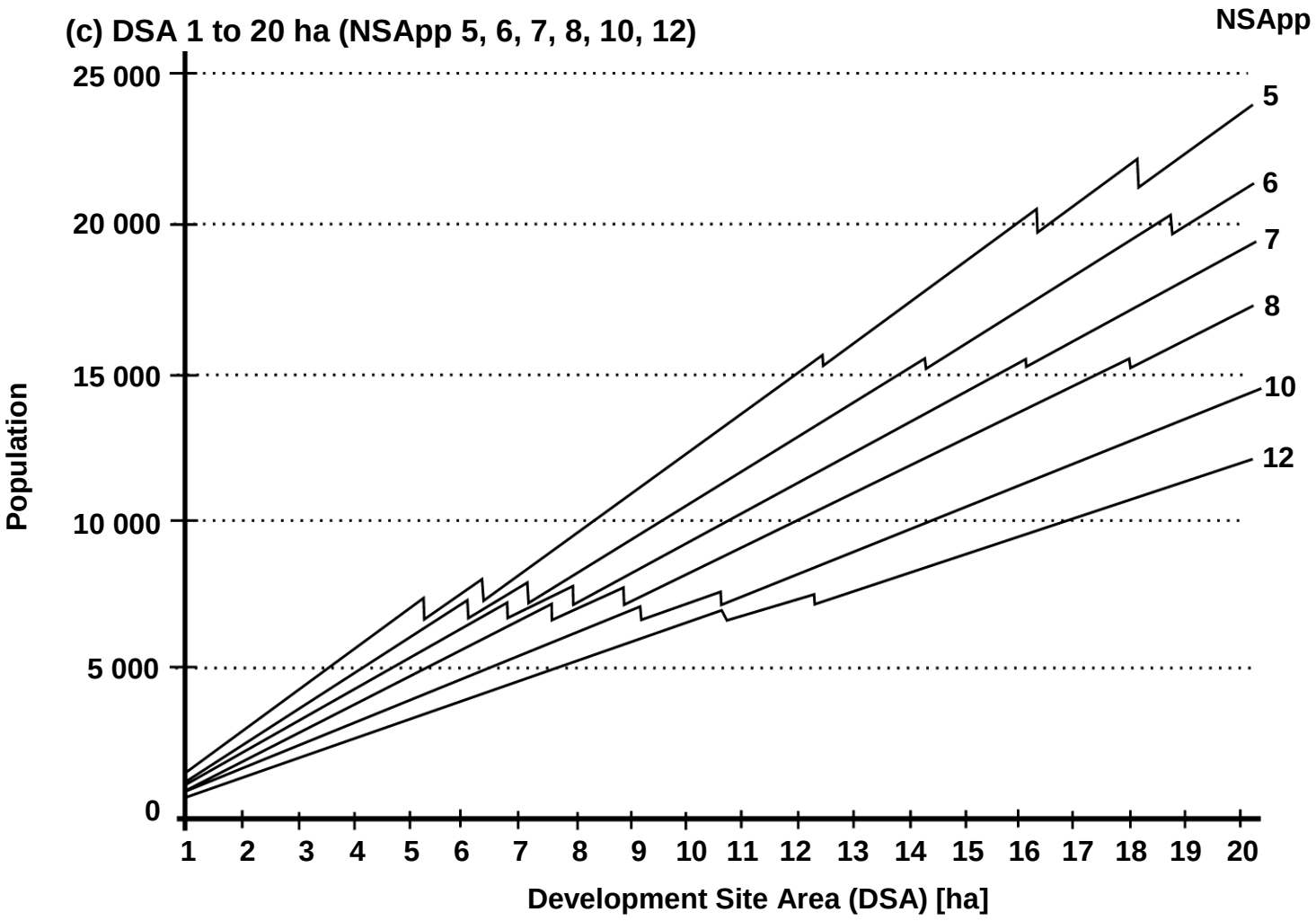
(b) DSA 6 to 20 ha (NSApp 1, 2, 3, 4, 5, 6)



Refer To Table 6(a) for details

Table 6: Total Population, by DSA and NSApp

(c) DSA 1 to 20 ha (NSApp 5, 6, 7, 8, 10, 12)



(d) DSA 1 to 20 ha (NSApp 10, 12, 15, 20, 30, 40)

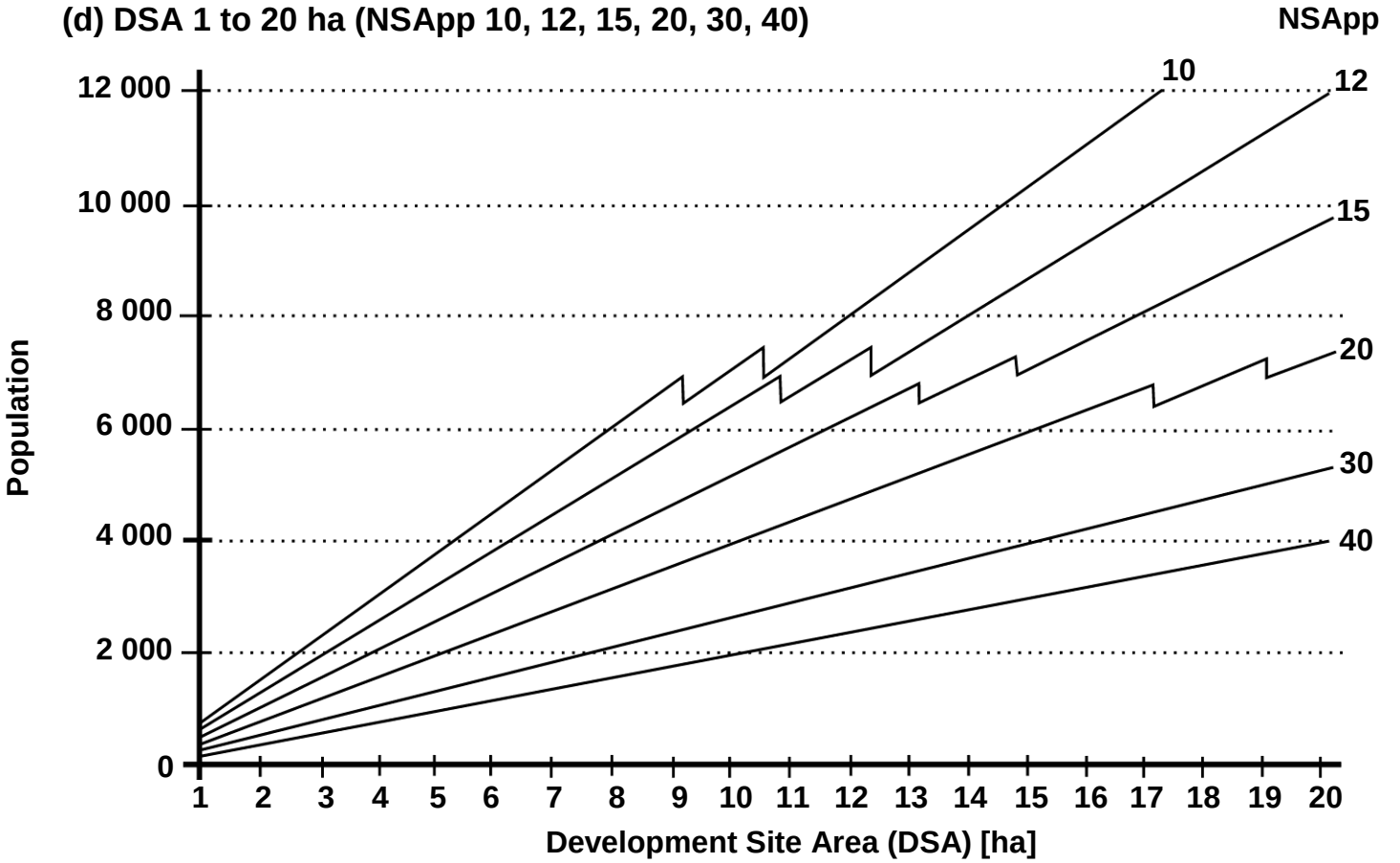


Table 7 Assumptions on Roadspace, Open Space and School Facility Provision

(a) *Roadspace*: Roadspace is assumed to be one sixth (16.7%) of DSA except for podium development in which no internal roads are required.

(b) *Open Space*: $1m^2$ of LOS per person when there are more than 500 persons.

(c) *School facilities*

Provision assumptions:

Facility	Site Area	Threshold for provision
First Primary School (30 classrooms)	6 200m^2	6 700 persons
Second Primary School (30 classrooms)	6 200m^2	20 100 persons
Third Primary School (30 classrooms)	6 200m^2	33 500 persons
First Secondary School	6 950m^2	7 500 persons
Second Secondary School	6 950m^2	22 500 persons
Third Secondary School	6 950m^2	37 500 persons

Notes: (i) Full population thresholds: 13 400 for 30-classrooms primary schools and 15 000 for secondary schools; based on 7.3% and 9.0% of the total population aged 6 to 11 and 12 to 18 respectively. The percentage shares of student age group are derived from population age structure and projected age structure of transients in mid-1999 from Census and Statistics Department.

(ii) Where a population generates sufficient pupils to take up over half the places in a school, a school is allowed for within the DSA of that development. The population thresholds for the first 30-classroom primary and secondary school are therefore 6 700 and 7 500 respectively, and for the second, 20 100 and 22 500, and so on.

Population thresholds for School site area increments:

Population threshold	Total School facilities	Total site area of School facilities (m^2)
6 700	1PS	6 200
7 500	1PS +1SS	13 150
20 100	2PS + 1SS	19 350
22 500	2PS + 2SS	26 300
33 500	3PS + 2SS	32 500

Notes: SS Secondary school
PS Primary school

Table 8 Initial Flat Size Assumptions

GFA per flat (m^2)

	Hong Kong & Kowloon	Tsuen Wan, Kwai Chung & Tsing Yi	Other New Towns
R1	50	45	45
R2	110	60	60
R3	210	130	130

Table 9 Initial Flat Occupancy Assumptions

Year	Housing Type	Hong Kong & Kowloon	Tsuen Wan, Kwai Chung & Tsing Yi	Other New Towns
1999	Public Rental Housing	3.3	3.4	3.6
	Subsidized Sales Flats	3.5	3.9	3.5
	Private Housing	3.1	3.2	2.7
2000	Public Rental Housing	3.1	3.5	3.4
	Subsidized Sales Flats	3.5	3.8	3.5
	Private Housing	3.0	3.2	2.5
2001	Public Rental Housing	3.1	3.5	3.3
	Subsidized Sales Flats	3.4	3.7	3.5
	Private Housing	2.8	3.0	2.4
2002	Public Rental Housing	3.2	3.4	3.4
	Subsidized Sales Flats	3.4	3.8	3.6
	Private Housing	2.6	2.9	2.2
2003	Public Rental Housing	3.2	3.4	3.3
	Subsidized Sales Flats	3.4	3.5	3.4
	Private Housing	2.5	2.7	2.1
2004	Public Rental Housing	3.1	3.3	3.4
	Subsidized Sales Flats	3.3	3.4	3.5
	Private Housing	2.3	2.5	2.0
2005	Public Rental Housing	3.0	3.3	3.3
	Subsidized Sales Flats	3.1	3.6	3.5
	Private Housing	2.3	2.5	1.9
2006	Public Rental Housing	3.0	3.2	3.2
	Subsidized Sales Flats	3.1	3.5	3.4
	Private Housing	2.2	2.4	1.9
2007	Public Rental Housing	3.0	3.2	3.2
	Subsidized Sales Flats	3.3	3.5	3.5
	Private Housing	2.2	2.4	1.8
2008	Public Rental Housing	2.9	3.1	3.1
	Subsidized Sales Flats	3.2	3.5	3.4
	Private Housing	2.2	2.5	1.9

Source: 1998-based projections of population distribution prepared by the Working Group on Population Distribution Projections in October 1999

Table 10 Illustrative Examples of Gross Population and Flat Densities for Sites in New Development Areas in Residential Zones

Persons per hectare of Development Site Area:

Location	Zone	R1			R2			R3
	DSA area	3 ha	5 ha	15 ha	3 ha	5 ha	15 ha	any
Main Urban Areas								
Hong Kong Island		1 950	1 450	1 600	900	900	800	300
Kowloon		2 450	1 800	2 000	900	900	800	300
Tsuen Wan/Kwai Tsing		2 200	1 650	1 800	1 450	1 450	1 300	450
New Towns								
R1 plot ratio 8		2 550	1 900	2 050	1 450	1 450	1 300	450
R1 plot ratio 6.5 (example)		2 300	1 700	1 850				

Other areas	RR1	RR2	RR3	RR4	RR5	V
	1 200	500	200	100	50	400

Flats per hectare of Development Site Area:

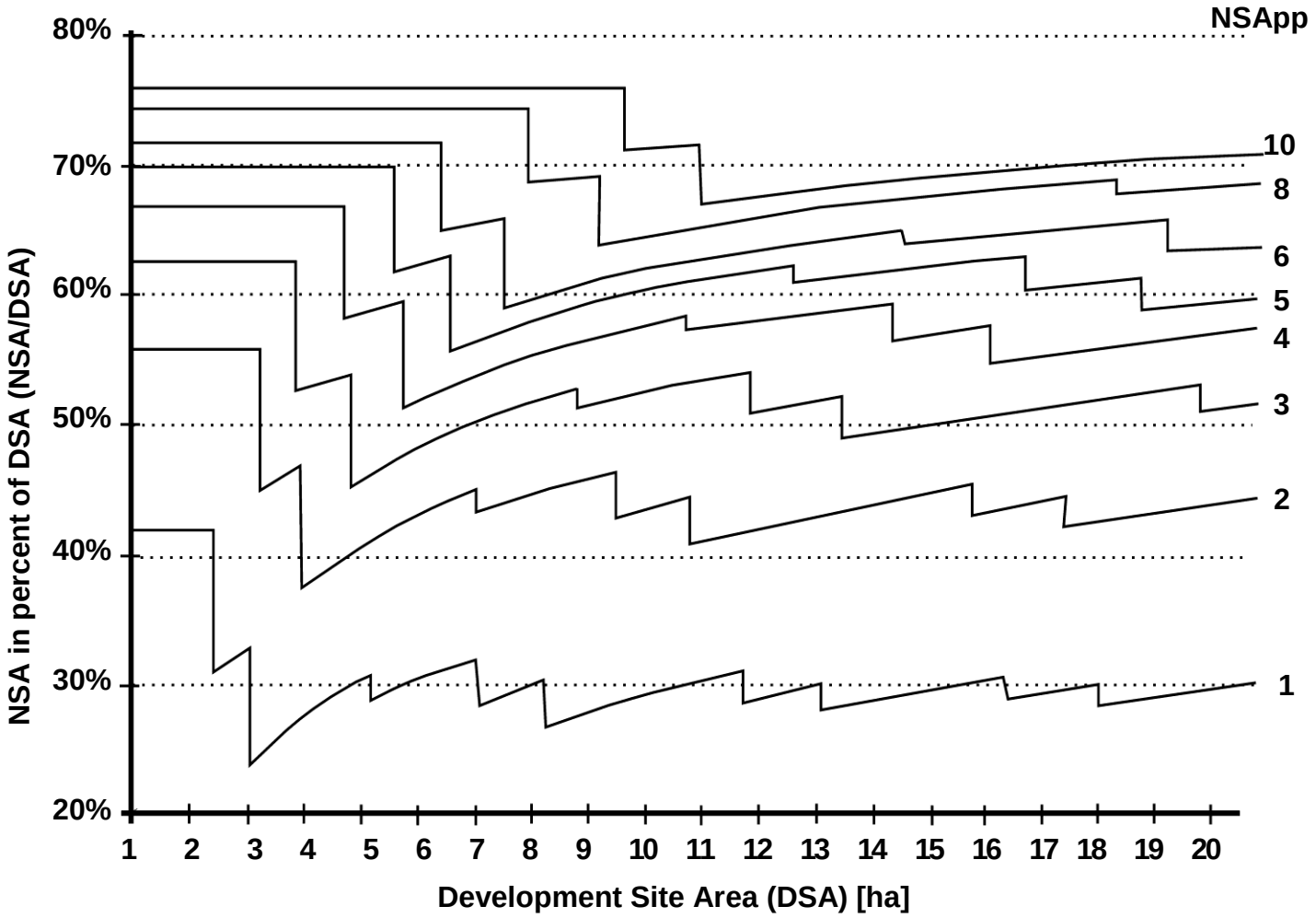
Location	Zone	R1			R2			R3
	DSA area	3 ha	5 ha	15 ha	3 ha	5 ha	15 ha	any
Main Urban Areas								
Hong Kong Island		750	560	610	340	340	310	120
Kowloon		950	700	770	340	340	310	120
Tsuen Wan/Kwai Tsing		880	650	620	580	580	520	180
New Towns								
R1 plot ratio 8		1 030	760	830	580	580	520	180
R1 plot ratio 6.5 (example)		880	650	710				

Other areas	RR1	RR2	RR3	RR4	RR5	V
	500	200	60	30	20	130

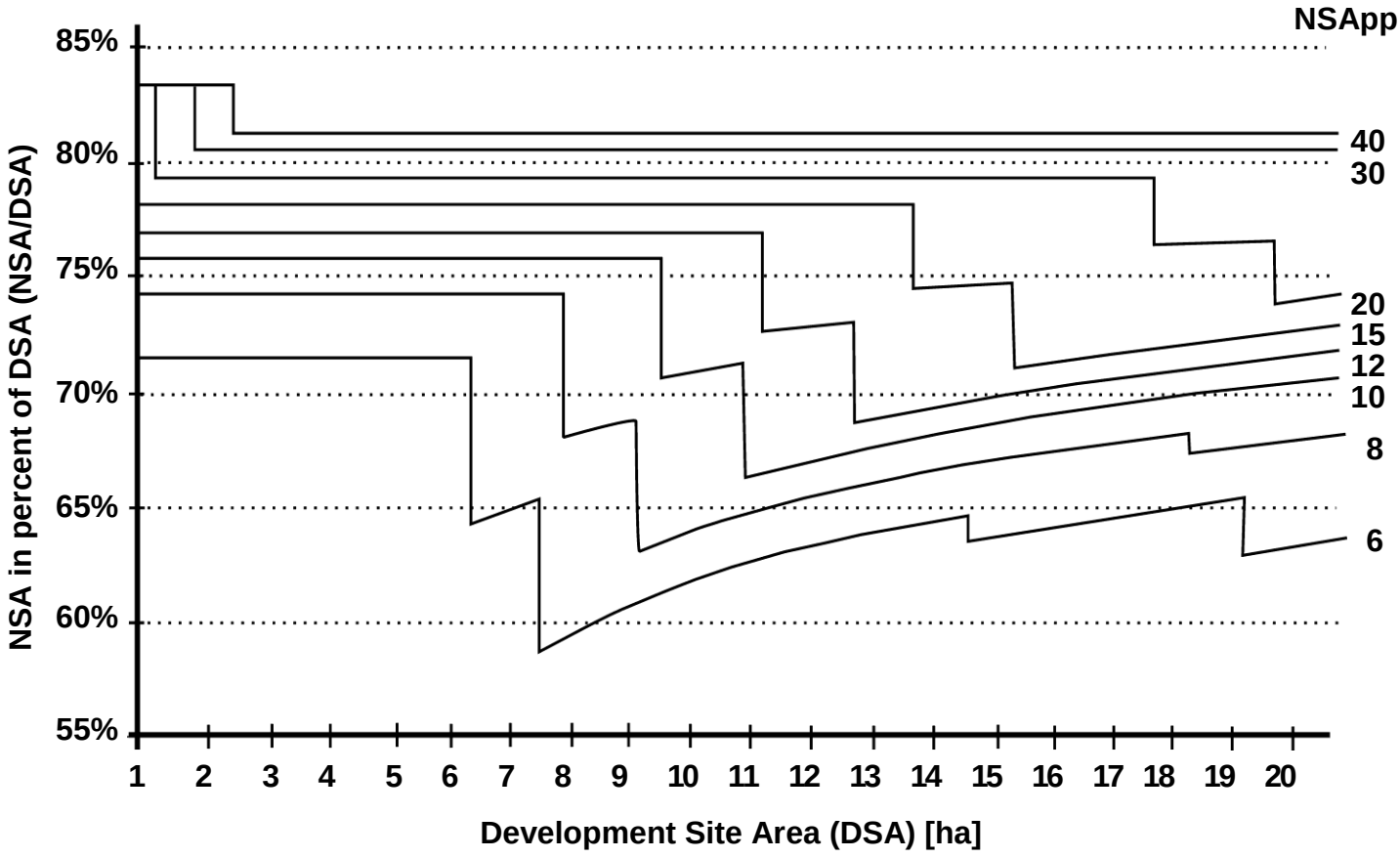
Note: These densities are for illustrative purposes only and do not represent targets. They are based on assumptions on typical flat size and persons per flat values and the recommended plot ratios from Tables 1, 2 and 3.

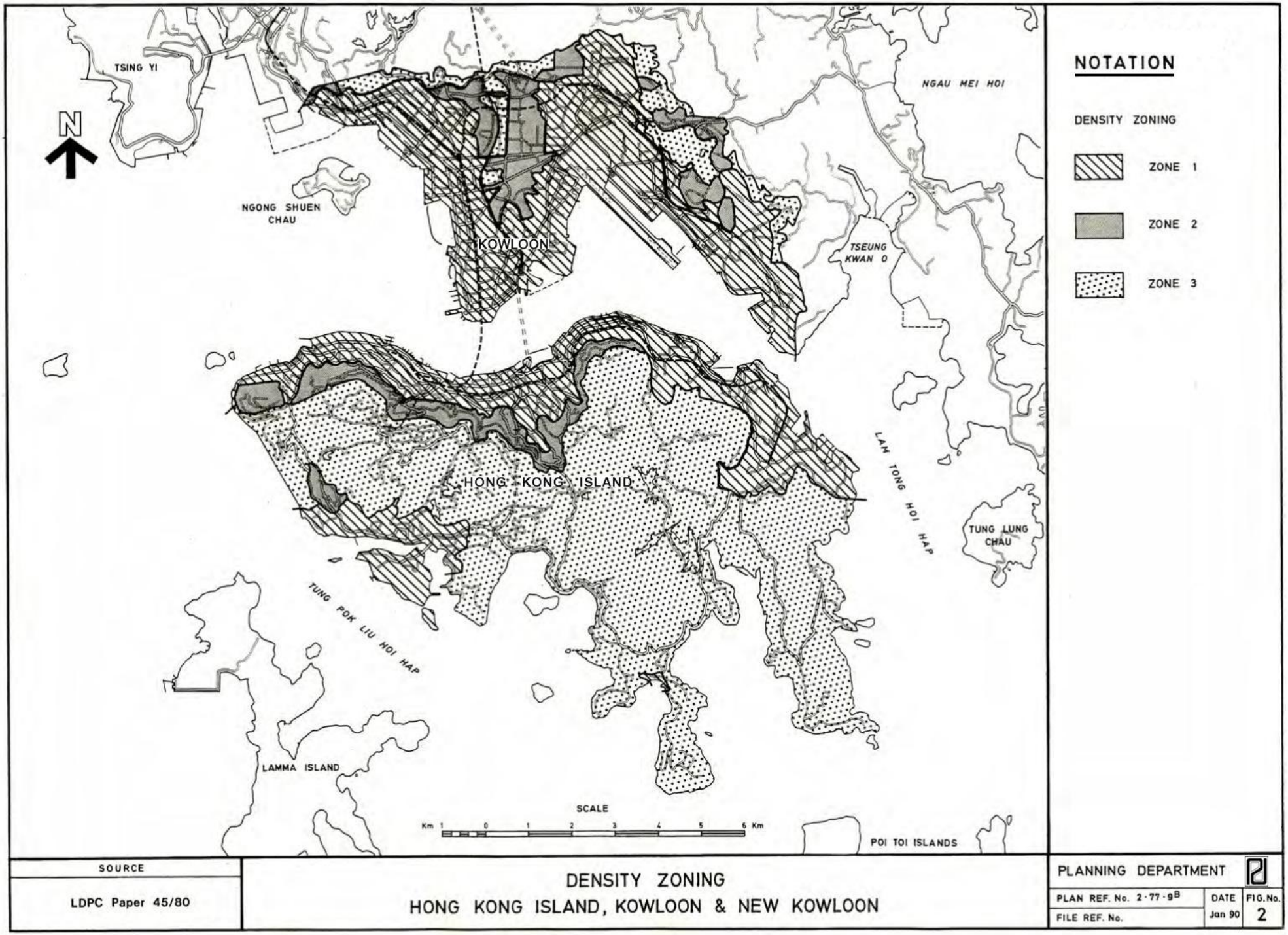
Table 11: NSA as a percentage of DSA, by DSA and NSApp

NSApp 1, 2, 3, 4, 6, 8, 10



NSApp 6, 8, 10, 12, 15, 20, 30, 40





SOURCE

LDPC Paper 45/80

DENSITY ZONING
HONG KONG ISLAND, KOWLOON & NEW KOWLOON

PLANNING DEPARTMENT

PLAN REF. No. 2·77·9B	DATE	FIG. No.
FILE REF. No.	Jan 90	2

Appendix 1 Example of Use of Table 6 to Relate Plot Ratio and Population Capacity

Table 6 can be used to solve the three types of problem set out below:

Item	Problem type		
	1	2	3
GFA per flat	Assumed	Assumed	Assumed
Persons per flat	Assumed	Assumed	Assumed
Plot Ratio	given (HKPSG)	given (HKPSG)	?
Gross Site Area	given	?	given
Population	?	given	given

The following examples illustrate how the graphs in Table 6 are used for each of the three types of problem (see Figure A1). It is assumed in these examples that an allowance will need to be made for the provision of LOS within the DSA but outside the NSA (see section 6.5).

Problem type 1 How much population can a given site area accommodate at a given plot ratio (PR)?

Example:

Given:	Site Area			14ha
	Ppf			3.5
	GFApf			50 m^2
	PR		6.5	
therefore	m^2 GFApp	= 50 ÷ 3.5	=	14.3
and	NSApp	= 14.3 ÷ 6.5	=	2.2

Strike a vertical line on the graph from 14ha on the X-axis. This meets the $2m^2$ NSApp curve at population 32 000 and the $3m^2$ NSApp curve at 25 000. The required population is therefore about 30 600.

Problem type 2 What site area is required for a fixed population at a given plot ratio?

Example:

Given:	Population			20 000
	Ppf			2.8
	GFApf			60m^2
	PR		5	
therefore	GFApp	= 60 ÷ 2.8	=	21.4m^2
and	NSApp	= 4.3		

Strike a horizontal line on the graph from 20 000 population on the Y-axis. This meets the $4m^2$ NSApp curve at 13.4ha, and the $5.0m^2$ NSApp curve at 15.7ha. The required area is therefore around 14.1ha.

Problem type 3 What Plot Ratio is required to accommodate a fixed population on a fixed site area?

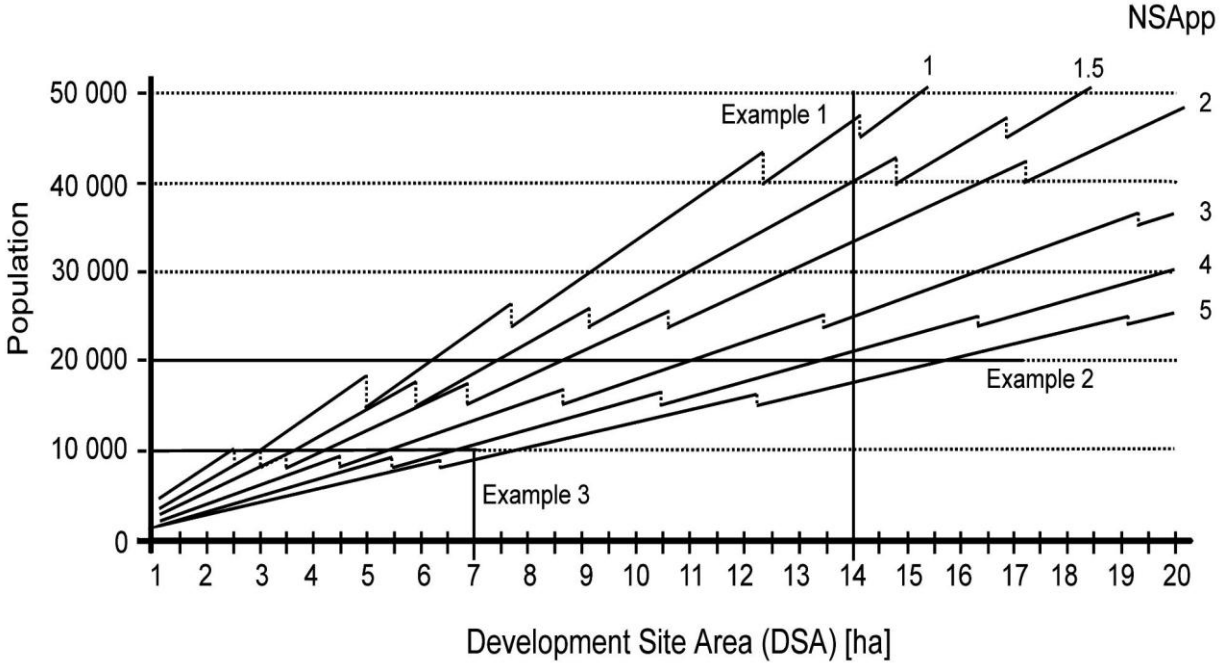
Example:	Given:	Population	10 000
		Site Area	7ha
		Ppf	3.0
		GFApf	$60m^2$
	therefore	GFApp	$20m^2$

Strike a horizontal line on the graph, from 10 000 population on the Y axis to meet a vertical line from 7ha on the X axis. These meet on the between the 4 and $5m^2$ NSApp curves, say NSApp is $4.3m^2$.

	NSApp	= GFApp ÷ PR
i.e.	4.3	= 20 ÷ PR
therefore	PR	= 4.65

It should be noted when interpolating between the curves for NSApp that some allowance may need to be made for the fact that the intervals between curves are not regular. Otherwise minor discrepancies may result, compared with the correct values.

Figure A-1 Examples of use of total population by DSA chart



Appendix 2 SUM2 Model for Converting Plot Ratio to Population Density (for reference only)

SUM2 is a computer program which has been developed to convert building density to population and vice versa, using site or area specific values for key variables. A data entry screen, illustrated in Figure A2, presents labelled boxes for the variables, into which known or assumed values can be entered. Default values are given for most of the key parameters, and in the cases of flat size, persons per flat and G/IC facility thresholds, potential alternatives are offered.

The input values to be entered are:

a) Flat size (average GFA per flat)

This can be entered in one of two ways: either a discrete value can be entered manually, or a distribution of percentages of flats between various suggested sizes can be entered.

b) Community centres

The need for these is likely to be affected by possible existing or planned provision on nearby sites, three choices are given:

- o include regardless of population level
- o exclude regardless of population level
- o allow Model to apply thresholds

c) Schools

This can be entered in one of two ways: either a discrete threshold value can be entered manually, or a choice made between a threshold appropriate to the Main Urban Areas or New Towns.

d) Gross Site Area (m^2)

e) Excluded Area (m^2)

The site area of any use or area within the GSA but not defined within the DSA, such as slope, non-ancillary G/IC facilities etc.

f) Roadspace

The percentage of the non-road DSA which is required for internal road access purposes.

g) Target population

h) Open Space

Hectares per 100 000 persons of open space to be provided within the site.

Figure A-2 Data Entry Screen

SUM2 Model : Data Entry Screen — Calculate

Flatsize:

Large flats	(120 m^2)		%
Medium to Large flats	(90 m^2)		%
Medium flats	(70 m^2)	100	%
Medium to Small flats	(50 m^2)		%
Small flats	(30 m^2)		%
Manual input :	[m^2]		

Persons per Flat:

Territorial average		x
Hong Kong average		
Kowloon average		
New Town average		
New Territorial average		
Manual input :	[ppt]	

Provision of Community Facilities :

A = Always / N = Never / D= Depends on population

Community Centres / Clinic	D	
Schools	D	
Open Space to be provided :	10	[ha per 100 000 pers]

Design Year (1991 to 2001): 1996

Type of Development: Highrise [%]: 100; Lowrise [%]:

Site Specifications :

Gross Site Area	120 000	[m^2]
Excluded Area		[m^2]
Roadspace	20	[% of DSA]
Target Population	18 000	
Plot Ratio		

Initial Parameters :

⇒ Average Flatsize (GFA) :	70 m^2
⇒ Average Occupancy Rate :	2.77 ppf
⇒ Domestic GFA per Person	25.27 m^2
⇒ Development Site Area :	120 000 m^2
⇒ Plot Ratio :	6.66

i) Persons per flat

This can be entered in one of two ways: either a discrete value can be entered manually, or the choice can be made between the average values for the Territory, Hong Kong Island, Kowloon, New Towns and New Territories.

j) Design year

The year of expected first occupancy (up to 2001) is entered. This determines the rate of decrease in the selected ppf if an area average was selected.

k) Type of development

The percentage of dwelling units in high-rise and low-rise buildings is entered. This affects the selected ppf if an area average was selected.

l) Plot ratio

The input screen then indicates, where applicable, the values for the key parameters which are calculated by the Model from the input data:

- o flat size (average GFA per flat)
- o persons per flat
- o domestic floorspace occupancy rate
- o Development Site Area
- o Net Site Area

The output of the SUM2 Model as used for individual sites is presented on an output screen as illustrated in Figure A3.

Figure A-3 Output Screen

SUM2 Model : Output Screen [Calculate]

Plot Ratio (calculated) : 6.66

Result for Population Input :

Population		18 000 pers
Plot Ratio (Input)		6.66
Domestic GFA		454 874 m^2
Number of Dwelling Units		6 498
Open Space		18 000 m^2
Community Facilities	No.	Area[m^2]
Primary School	1	5 500 m^2
Secondary School	1	5 850 m^2
Clinic	0	0 m^2
District Community Centre	0	0 m^2
Area Community Centre	0	0 m^2
Neighbd. Community Centre	1	2 350 m^2
Total		13 700 m^2
Total (ind. Open Space)		31 700 m^2
Net Site Area		68 300 m^2
Development Site Area		120 000 m^2
Gross Population Density (on DSA)		1 500 [ppha]
Net Population Density (on NSA)		2 635 [ppha]

Result for Site Input :

Development Site Area		120 000 m^2
Plot Ratio (Input)		6.66
Domestic GFA		454 874 m^2
Number of Dwelling Units		6 498
Open Space		18 000 m^2
Community Facilities	No.	Area[m^2]
Primary School	1	5 500 m^2
Secondary School	1	5 850 m^2
Clinic	0	0 m^2
District Community Centre	0	0 m^2
Area Community Centre	0	0 m^2
Neighbd. Community Centre	1	2 350 m^2
Total		13 700 m^2
Total (ind. Open Space)		31 700 m^2
Net Site Area		68 300 m^2
Population		18 000
Gross Population Density (on GSA)		1 500 [ppha]
Net Population Density (on NSA)		2 635 [ppha]

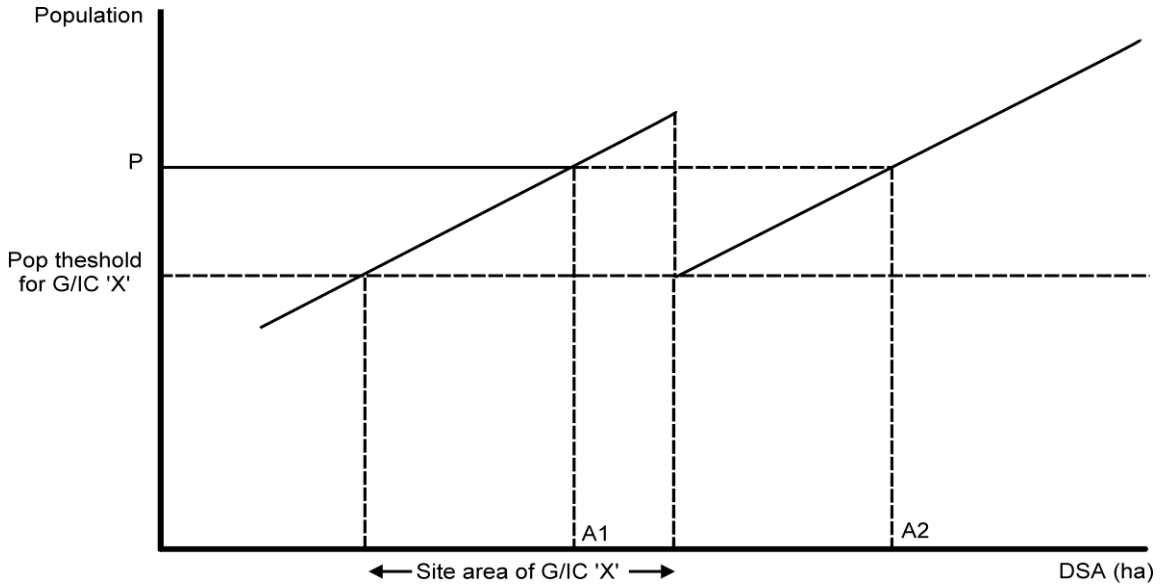
Appendix 3 Explanation of Form of Graphs in Table 6

Each NSApp curve in Table 6 is made up of alternating constant upward gradients and vertical drops. This form is explained in Figure A-4. As the population increases, the NSApp curve passes the threshold for a G/IC facility "X" until the DSA is large enough to accommodate the population and the full site area for "X". At this point the facility can be provided and the population that can be accommodated on the remaining DSA is reduced.

For each value of DSA there is only one value for population, except where there is a vertical step in the graph. In these cases, which are not likely to occur often in practice, the population capacity varies according to whether or not it is envisaged that the relevant G/IC facility will be provided. Should this situation arise the lower population figure should be selected as it reflects adequate provision in relation to HKPSG standards, whereas the higher figure will fail to meet the HKPSG standard.

For some population values (such as P in Figure A-4) there are two associated DSAs. The lower value (A_1) will result in underprovision of G/IC facilities and the higher (A_2) in full provision. The latter is the most appropriate choice for accommodating a fixed population.

Figure A-4



A1 DSA for population P without G/IC 'X'
A2 DSA for population P with G/IC 'X'