Application of Sustainable Building Design Guidelines and Case Studies

Jan 2016
Content

1. Overview Of Building Control In Hong Kong
2. New Arrangement For Building Development Control
   Introduced in year 2011 (PNAP APP-151 & 152)
3. Energy Efficiency of Buildings
4. Case Studies
Application of Sustainable Building Design Guidelines and Case Studies

Overview Of Building Control In Hong Kong
Development/Building Control

The HKSAR government controls Building development through the following means:

- **Lease Control**
  - Conditions in the land leases
  - Lands Department
- **Town Planning Control**
  - Town Planning Ordinance
  - Statutory development plans – Outline Zoning Plan
  - Town Planning Department
- **Building Control**
  - Buildings Ordinance
  - Approval, consent and occupation permit system for building works
  - Buildings Department
- Other Statutory and/or Administrative Control
Development/Building Control

- Town Planning
- Buildings Ordinance
- Lease
- Other Statutory and/or Administrative Controls

Permitted Development
Lands Department

Dispose of land of its appropriate use at the optimum price to the community use at nil or reduced premium

• Acquire land for the public purposes at a fair compensation for both landowner and the community

• Manage and control the use and development of land

• Provide the public with efficient surveying services and maintain an up to date computerized land information system of mapping

• Administer the Land Authority’s consent scheme for the pre-sale units in new development
Conditions of Grant

Lease of the land to ascertain the restrictions on the development including :

• Maximum plot ratio or gross floor area of the development
• Car park requirements
• Design, disposition and height of the development
• Building covenant which limits the development period
• Types of building and user
• Vehicular access to the site
• Height limit of the site
• Preservation of trees
Certificate of Compliance

Issued by the Lands Department

• All positive obligation have been complied with to the satisfaction of the District Land Office and other departments concerned

• A temporary or final OP has been issued

• All sums payable under the conditions have been demanded except the premium is payable by installments

• If the conditions make provision for the Director of Highways to confirm his acceptance of any area as a public road when the Director of Highways has so accepted the area
**Town Planning Submission**

Before making any building plan submission to the Building Authority

- Check – Outline Zoning Plan (OZP)
- Whether the proposed development will contravene the “designated user”?
- If there is contravention – application for permission under Section 16 of the Town Planning Ordinance
- Approved by the Town Planning Board
Other Planning Restrictions

- Scheduled Areas – Mid-levels, Yuen Long, Ma On Shan, etc.
- Mass Transit Railway route protection area
- Kowloon Canton Railway protection area
- Light Rail Transit Reserve
- Sewage Tunnel Works
- Country Parks Ordinance
- Antiquities and Monuments Ordinance
- Lands Development Corporation Development Area
- Ground Anchors either in or adjacent to the site
- Disused tunnels
- Water gathering ground
- Adjacent of affected by a nullah, box culvert, or streamcourse
- Height restriction under Hong Kong
- Airport (Control of Obstructions) Ordinance
Buildings Ordinance

Control the design, construction and maintenance of building works in Hong Kong through

- Registration of professionals and contractors responsible for design, supervision and carrying out of building works
- Approval of plans, issuing of consent to commence works and issuing of Occupation Permit to completed works
- Monitoring the implementation of Supervision Plan
- Issuance of various Orders in relation to existing works
Buildings Ordinance

• In its early stage of development, the primary concern is the health and safety of the occupants
• Focus its checking on the following fundamental issues
  • Building volume and density
    • Plot Ratio & Site Coverage
    • Building Projections
    • Open Space
    • Street/ Lane Provision
  • Safety
    • Means of Access & Escape in Case of Fire (MOA & MOE)
    • Fire Resistance & Compartmentation
  • Health
    • Lighting and Ventilation
Buildings Ordinance

- In response to the changing needs of the society, its jurisdiction has encroached on the following areas
  - Town planning issues
    - Under 16(1)(d), BA can refuse to approve building works that contravene and approved or draft plan prepared under TPO
    - Under 16(1)(g), BA can refuse to approve building works differing in height, design, type or intended use from the buildings in the intermediate neighbourhood or previously existing on the same site
  - Construction safety
    - Under 16(2)(bc), BA can refuse to issue consent if there is no supervision plan
    - BD will monitor the execution of the supervision plan (PNAP ADM-13)
  - Environmental and other issues
    - B(P)R 72 – Access for the Disabled
    - PNAP APP151 – Building Design to Foster and Sustainable Built Environment
Buildings Ordinance

- Major Sections
  - Section 14: Approval and consent required
  - Section 16: Grounds for refusal
  - Section 21: Occupation of new building
  - Section 24: C & E Orders
  - Section 41: Exemptions
Registered Professionals and Contractors

• One of the major means to control building works under the Buildings Ordinance is the registration system of construction professionals and contractors
  • Registration requirements and procedures
  • Appointment and duties of the registered professionals and contractors
  • Re-registration requirements
  • Disciplinary actions

• Although BD will check the plan, check the construction works, monitor the site supervision works and perform final inspection before issuance of OP, they are only “curtailed check”; and, the ultimate responsibilities for compliance with the Ordinance rest with the registered professionals and contractors
Registered Professionals and Contractors

- Currently BD keeps the following registrars
  - Authorized Person (AP)
    - Architect
    - Structural Engineer
    - Building Surveyor
  - Registered Structural Engineer (RSE)
  - Registered Geotechnical Engineer (RGE)
  - Registered Inspector (RI)
    - Architect
    - Structural Engineer
    - Building Surveyor
  - Registered General Building Contactor (RGBC)
  - Registered Specialist Contractors (RSC)
  - Registered Minor Works Contractor (RMWC)
Buildings Department

- Building Authority (BA) who is the Director of Buildings responsible for the execution of the BO
- Director of Buildings is the Head of the Building Department (BD) which is the department responsible to carry out the authority under BO in respect of prosecution, disciplinary actions, appeals and legislative review
- BD acts as the point of centralized processing of building plans
  - Examples of referrals via BD (details see PNAP ADM-02)
    - FSD for checking of provision of adequate fire services installation
    - GEO for checking of geotechnical assessment report for development in Scheduled Areas 1, 2 or 4
    - Education Bureau for checking on school development
    - HAD for checking on licensing requirements hotel development
Buildings Department

- For new development or A&A works
  - Issue approval to building plans
  - Issue consent for commencement of building works
  - Issue Occupation Permit (OP) for completed work
- Issue orders in case of damaged buildings
- Emergency service to damaged building and scaffoldings, hoarding, signages, etc. in time of typhoon, flooding, fire damage, etc.
- Set up and administrate various committees for processing the registration, re-registration and disciplinary of registered professionals and contractors
Non-statutory Documents

• The Ordinance and Regulations are the statutory documents set out the performance requirements
  • It does not stipulate how to comply with the requirements
  • Amendment to the Ordinance and Regulations requires lengthy legislative procedures
• In order to facilitate compliance with the statutory requirements, BD issues the following non-statutory documents
  • Practice Notes (PNAP or PNRC)
    • Provide guidelines and advisory notes to elaborate the administration procedures, technical details, good practices, etc. for the Registered Professionals and Contractor to follow
  • Codes of Practices, Design Manual and Guidelines/Guidebooks
    • Provide technical standards, specification and good practices that are “deemed to satisfy” the requirements of the Ordinance
  • These documents can be updated regularly to reflect the changes in technologies and the needs of the society
B(A)R 8 prescribes the types of plan required to be submitted for approval

- General building plan
  - Block plan, floor plan, elevations and sections
  - PR and SC calculations
- Structural plan
- Site formation plan
- Foundation plan
- Drainage plan
- Ground investigation plan
- Demolition plan
General Building Plan

- GBP should contain and comply with the following
  - A Block Plan
    - Size and position of the site and proposed building and other buildings in immediate vicinity, and neighbouring streets
  - Floor Plans
    - Full dimensions, thickness of walls, position of windows, soil fitment, waste fitments, water storage tank, intended use of every part of the building
  - Sections and Elevations
    - Building height, street levels
    - Floor height, staircase arrangement
  - Ratio of Plan
    - Refer to B(A)R 13
General Building Plan

- Diagrammatic plan
  - Site coverage and Plot Ratio calculations
  - Open space
- Colouring of plan
  - Two set of plans coloured to differentiate the various materials used (PNAP ADM-09)
  - Two sets of plans with fire service installation highlighted
- No. of copies
  - Generally 6 copies
  - Additional copies for referral (details see PNAP ADM002)
Additional Documents

- Geotechnical Assessment Report for Slope Works
- OTTV Calculation forms in accordance with the Building (Energy Efficiency) Regulations
- Accompanied by a cheque ($) for fees charged by Building Authority for approval of plans
- The Building Authority will approve or disapprove the building plans in two months
- Once the general buildings plans have been approved, other submissions like drainage, site formation and structure plans can follow
Grounds of Refusal

• BA may refuse to approve any plans where
  • 16(1)a: The plans are not such plans prescribed by the regulation
    • Ensure all the information as required by the regulation are shown on the plans
  • 16(1)b: The plans are not endorsed by FSD (or no Fire Certificate)
    • Ensure all FSI provisions has been shown on the plans
    • Follow up with FSD in advance before the deadline of approval of plan by BA
  • 16(1)e: no other document as prescribed by regulations
    • E.g. geotechnical assessment report for slope
• Other grounds of refusal refer to BOs16
Exempted Works

• The following works are exempted by the BO (Details refer to BO41)
  • Works for Government Buildings including military establishment,
  • Government land, Housing authority buildings, and streets and roads maintained by the HKSAR Government
  • Building works in any building not involving the structure of the buildings
  • Drainage works (other than minor works) in any building if the works do not involve
    • the structure of any buildings
    • the discharge into the existing or proposed drains trade affluent and other environmental unfriendly chemicals
    • alterations of the last manhole, septic tank or cesspool
    • underground drainage works in Scheduled Areas 3 & 5
  • Temporary building to be used as a place of public entertainment
  • Nothing can be carried out in contravention of any regulations
BA's Power of Exemption

• According to BO 42, if the BA considers that special circumstances render it desirable, he may permit modifications of the provisions of the BO

• Examples of such modifications are as follows:-
  • To permit artificial lighting and mechanical ventilation to an office toilet where natural lighting and ventilation cannot be provided due to the layout constraints
  • To permit plans to be drawn to a different scale due to the size of the site
Building Regulations

- The 16 subsidiary legislations under the BO:
  - BUILDING (ADMINISTRATION) REGULATIONS
  - BUILDING (CONSTRUCTION) REGULATIONS
  - BUILDING (DEMOLITION WORKS) REGULATIONS
  - BUILDING (ESCALATORS) REGULATIONS
  - BUILDING (LIFTS) REGULATIONS
  - BUILDING (PLANNING) REGULATIONS
  - BUILDING (PRIVATE STREETS AND ACCESS ROADS) REGULATIONS
  - BUILDING (REFUSE STORAGE AND MATERIAL RECOVERY CHAMBERS AND REFUSE CHUTES) REGULATIONS
Building Regulations

• BUILDING (STANDARDS OF SANITARY FITMENTS, PLUMBING, DRAINAGE WORKS AND LATRINES) REGULATIONS
• BUILDING (VENTILATING SYSTEMS) REGULATIONS
• BUILDING (OIL STORAGE INSTALLATIONS) REGULATIONS
• BUILDING (APPEAL) REGULATION
• BUILDING (ENERGY EFFICIENCY) REGULATION
• BUILDING (MINOR WORKS) REGULATION
• BUILDING (MINOR WORKS) (FEES) REGULATION
Building Regulations

- BUILDING (REFUSE STORAGE AND MATERIAL RECOVERY) REGULATIONS
- CHAMBERS AND REFUSE CHUTES) REGULATIONS
- BUILDING (STANDARDS OF SANITARY FITMENTS, PLUMBING, DRAINAGE WORKS AND LATRINES) REGULATIONS
- BUILDING (VENTILATING SYSTEMS) REGULATIONS
- BUILDING (OIL STORAGE INSTALLATIONS) REGULATIONS
- BUILDING (APPEAL) REGULATION
- BUILDING (ENERGY EFFICIENCY) REGULATION
- BUILDING (MINOR WORKS) REGULATION
- BUILDING (MINOR WORKS) (FEES) REGULATION
- BUILDING (INSPECTION AND REPAIR) REGULATION
Application of Sustainable Building Design Guidelines and Case Studies

New Arrangement For Building Development Control Introduced in year 2011 (PNAP APP-151 & 152)
Introduction

As a follow up on its earlier public engagement process on urban living space, the Council of Sustainable Development (SDC) launched a public engagement process entitled “Building Design to Foster a Quality and Sustainable Built Environment” in collaboration with the Development Bureau (DEVB, 發展局) and Environment Bureau (ENB, 環保局) from June to October 2009.
Introduction

the SDC submitted the “Report on the Public Engagement Process on Building Design to Foster a Quality and Sustainable Build Environment” to the Government on 25 June 2010, containing recommendations concerning the following three core subjects:

i. GFA concessions for the provision of essential, green and amenity features in buildings (PNAP APP-151);

ii. Sustainable building design guidelines on building separation, building setback and site coverage of greenery (PNAP APP-152); and

Introduction

Revised practice notes were issued based on the recommendations made in the report, which has come into effect on 1 April 2011 and shall be applied to building plans submitted to the BD for approval on or after 1 April 2011.
GFA Concessions

Definition of GFA under Buildings Ordinance

Building (Planning) Regulations 23(3)
(a) Subject to sub-paragraph (b)…the gross floor area of a building shall be the area contained within the external walls of the building measured at each floor level (including any floor below the level of the ground), together with the area of each balcony in the building…and the thickness of the external walls of the building.
GFA Concessions

(b) In determining the gross floor area… the Building Authority may disregard any floor space that he is satisfied is constructed or intended to be used solely for parking motor vehicles, loading or unloading of motor vehicles, or for refuse storage chambers…and other types of facilities provided to facilitate the separation of refuse to the satisfaction of the Building Authority, or for access facilities for telecommunications and broadcasting services, or occupied solely by machinery or equipment for any lift, air-conditioning or heating system or any similar service.

• Formerly (before 1 April 2011), no cap on GFA concessions.
GFA Concessions

New Arrangement:

• GFA concession capped at **10% of total permitted GFA** (domestic and non-domestic areas calculated separately)

• Pre-requisites
  
  i. Compliance with the Sustainable Building Design Guidelines concerning building separation, building setback and site coverage of greenery where applicable (PNAP APP-152)

  ii. Submission of estimate energy performance / consumption for the common parts (for domestic developments) or entire building (for non-domestic developments)

  iii. Submission of provisional BEAM Plus Assessment (without mandating the grading obtained)
GFA Concessions

- Require disclosure of the following information in the sales brochure for non-mandatory features such as communal podium and sky gardens, green and amenity features and publicize such information on BD’s website after OP issuance:
  
  i. Estimated energy performance / consumption and provisional BEAM Plus Assessment
  
  ii. Formal BEAM Plus Assessment (within 6 months of OP issuance)
GFA Concessions

Green Features (subject to 10% overall cap)

- Balconies*
- Utility platforms*
- Wider common corridors*
- Lift lobbies*
- Non-structural prefabricated external walls*

*Subject to compliance with pre-requisites
GFA Concessions

Amenity Features (subject to 10% overall cap)

- Recreational facilities*
- Horizontal screens of covered walkways / trellis*
- Management facilities
- Larger lift shaft areas*
- Voids in duplex flats / houses*
- Pipe ducts / air ducts / chimney shafts*
- Non-mandatory plant rooms*
- Voids for entrances in non-domestic buildings*

*Subject to compliance with pre-requisites
GFA Concessions

Green / Amenity Features (NOT subject to 10% cap)

- Communal Sky Gardens*
- Covered Gardens / Play Areas / Communal Podium Gardens*
- High Headroom / Voids in Cinema, Shopping Arcades, etc.*
- Plant rooms and covered floor spaces to accommodate energy efficient or environmentally friendly systems / features*
- Wing walls
- Wind catchers and funnels
- Noise barriers
- Acoustic fins

*Subject to compliance with pre-requisites
GFA Concessions

Mandatory Features (NOT subject to 10% cap)

• Mandatory Plant Rooms
• Refuge Floors
• Public Passage

*Subject to compliance with pre-requisites*
GFA Concessions

Other Items (NOT subject to 10% cap)

• Car Parking and Loading / Unloading Areas (and associated ramps and facilities)
• Bay Windows
• Sunshades and Reflectors
• Horizontal Area of Staircases, Lift Shafts and Vertical Ducts Passing through GFA Non-accountable Floor
• Back-of-house Facilities of Hotels
GFA Concessions

Green / Amenity Features (no GFA concessions)

- Mail Rooms / Mail Delivery Rooms with mail boxes
- Miniature Logistic Services Rooms (for residential buildings)
- Entrance Voids / Prestigious Entrances (for residential buildings)
Green Features
(Subject To 10% Cap)

Balconies (JPN 1)

Formerly Exemption Criteria

• GFA concessions = 4% UFS* of unit (min. 2m², max. 5m²)

New Arrangement

• Exempt 50% of balcony area only
• GFA concession = 2.5% UFS of unit (min. 1m², max. 3m²)
• No restriction on subsequent merging of flats

*UFS means any floor space other than staircases, staircase halls, lift landings, the space used in providing water-closet fitments, urinals and lavatory basins and the space occupied by machinery for any lift, air-conditioning system or similar service
Green Features
(Subject To 10% Cap)

Utility Platforms (U.P.) (JPN 2)

Formerly Exemption Criteria

- GFA concessions max. 1.5m² of unit

New Arrangement

- Exempt 50% of U.P. area only
- GFA concession max. 0.75m²
- No restriction on subsequent merging of flats
Green Features
(Subject To 10% Cap)

Mail Rooms . Mail Delivery Rooms with Mail Boxes (PNAP APP-42)

Formerly Exemption Criteria

• 16m² for a block size of 320 domestic flats
• 60m² for non-domestic buildings

New Arrangement

• No GFA concessions
Green Features
(Subject To 10% Cap)

Wider Common Corridors and Lift Lobbies (JPN1)

Formerly Exemption Criteria

- GFA concession (floors other than main entrance hall of residential buildings only)
- Without natural ventilation:
  - Corridor width: 1200mm – 1800mm
  - Lobby width: 1650mm – 2200mm
- With natural ventilation:
  - Corridor width: 1200mm – 2200mm
  - Lobby width: 1650mm – 2500mm
Green Features
(Subject To 10% Cap)

Wider Common Corridors and Lift Lobbies (Cont’d)

New Arrangement

• Exempt ONLY with natural ventilation provided:
  • Corridor width: 1200mm – 2200mm
  • Lobby width: 1650mm – 2500mm
• Windows facing open area ≥ 5% of corridor / lobby UFS
Green Features
(Subject To 10% Cap)

Non-structural Prefabricated External Walls (JPN2)

Formerly Exemption Criteria

- Max. 300mm thick
- Structural justification if ≥ 150mm thick
- Not exempt for portion of wall formed with door opening to balcony or U.P. (BD’s internal guidelines)

New Arrangement

- Max. 150mm thick
- Not exempt for portion of wall formed with door opening to balcony or U.P. (Joint Practice Note)
Amenity Features
(Subject To 10% Cap)

Residential Recreational Facilities (PNAP APP-2, 42&104)

Formerly Exemption Criteria

- Max. 5% of domestic GFA
- Active / passive facilities
- Ancillary facilities:
  - Management offices / staff rooms
  - Snack bars and pantries
  - First-aid rooms
  - Pantries and mini-bars (max. 10m²)
  - Kitchens (max. 15m²) for sites without commercial floor space
- Substantial luxury clubs with restaurants and other facilities for exclusive memberships and commercial takings not acceptable
- For exclusive use by owners and residents and their visitors
Amenity Features
(Subject To 10% Cap)

Residential Recreational Facilities (Cont’d)

New Arrangement

• Cap with sliding scale:
  • \( \leq 25000 \text{m}^2 \) – 5% of total domestic GFA
  • 25001 ~ 50000m\(^2\) – 4.5% / 1250m\(^2\) (whichever is greater)
  • 50001 ~ 75000m\(^2\) – 4.0% / 2250m\(^2\) (whichever is greater)
  • 75001 ~ 100000m\(^2\) – 3.5% / 3000m\(^2\) (whichever is greater)
  • 10001 ~ 15000m\(^2\) – 3.0% / 3500m\(^2\) (whichever is greater)
  • > 125000m\(^2\) – 2.5% / 3750m\(^2\) (whichever is greater)

• All voids, plant rooms (including swimming pool filtration plant rooms), covered walkways, etc. serving solely for recreational facilities will be subject to the above cap

• Status quo (維持不變) otherwise
Amenity Features (Subject To 10% Cap)

Horizontal Screens of Covered Walkways, Trellis (PNAP APP-42)

Formerly Exemption Criteria

- Width ≤ 2m
- Situated in common area
- Population, size of the development and design of the screens will be taken into consideration

New Arrangement

- Horizontal screens of covered walkways – status quo
- Trellis
  - Max. 5% of roof area / 2m² (whichever is greater, max. 20m²)
  - N/A to small roof < 4m
Amenity Features (Subject To 10% Cap)

Management Facilities (PNAP APP-42)

Formerly Exemption Criteria

• Situated in common area
• Domestic: 5m² for every 50 flats (BD internal guideline)
• Non-domestic: not excessive in size

New Arrangement

• Situated in common area
• Domestic: 0.2% of total GFA or 5m² for every 50 flats whichever is smaller (PNAP APP-42)
• Non-domestic: 0.2% of total GFA or 120 m² whichever is smaller
Amenity Features
(Subject To 10% Cap)

Miniature Logistic Service Rooms (for residential buildings)
(PNAP APP-42)

Formerly Exemption Criteria

- 8m² for a block size of 240 flats

New Arrangement

- No GFA concessions
Amenity Features
(Subject To 10% Cap)

Larger Lift Shaft Areas (PNAP APP-89)

Formerly Exemption Criteria

• Lift car / lift shaft area:
  i.  $\geq 1.82m^2 / 4.12\text{ m}^2$ (domestic)
  ii. $\geq 2.1m^2 / 4.4\text{ m}^2$ (office / commercial)

• Exempted area allowed:
  i. Domestic: 3.5% of domestic GFA
  ii. Non-domestic:
    a. GFA $< 10000m^2$: 3% of total GFA
    b. GFA $\geq 10000m^2$: 2.5% of total GFA or max. 300m$^2$ whichever is greater

• Lift certificate required

New Arrangement

• Status quo
Amenity Features
(Subject To 10% Cap)

Entrance Voids / Prestigious Entrances (PNAP APP-2&42)

Formerly Exemption Criteria

• Genuine, not subject to misuse and based on individual merits

New Arrangement

• Domestic buildings – no GFA concessions
• Non-domestic buildings – status quo
Amenity Features
(Subject To 10% Cap)

Voids in Duplex Flats / Houses (PNAP APP-2)

Formerly Exemption Criteria

• Voids should be located at the living room, dining room or entrance foyer
• Measures to prevent abuse (inverted beam, large glazing, etc.)
• Duplex Flats
  i. UFS ≥ 150m²
  ii. Void ≤ 10% of UFS
  iii. Max. 2 levels of voids per building
  iv. Max. concession = 0.5% of total domestic GFA
  v. Headroom ≤ 6.5m
Amenity Features
(Subject To 10% Cap)

Voids in Duplex Flats / Houses (Cont’d)

Formerly Exemption Criteria (Cont’d)

- Houses
  - i. UFS ≥ 250m²
  - ii. Void ≤ 5% of UFS
  - iii. Headroom ≤ 7m

New Arrangement

- Status quo
- PNAP APP-002
Amenity Features (Subject To 10% Cap)

Pipe Ducts / Air Ducts / Chimney Shafts (PNAP APP-2 & 93)

Formerly Exemption Criteria

• Pipe Ducts / Air Ducts
  • Genuine & properly designed with adequate access for inspection and maintenance

• Chimney Shafts
  • Forming an integral part of a building

New Arrangement

• Status quo
Amenity Features (Subject To 10% Cap)

Non-mandatory Plant Rooms (e.g. AHU, AC plant rooms) (B(P)R23(3)(b), PNAP APP-2&42)

Formerly Exemption Criteria

- Subject to justification
- AHU ≤ 4% of GFA of each floor
- AC plant rooms ≤ 1% of total GFA

New Arrangement

- Status quo
Green & Amenity Features
(NOT Subject To 10% Cap)

Communal Sky Gardens (JPN1&2)

Formerly Exemption Criteria

- 1 no. per 15 storeys (residential)
- 1 no. per 20 storeys (non-residential)
- Greenery ≥ 25%
- Sky garden occupies ≥ 1/3 area of floor plate
- Accessible from common area only
- Clear height ≥ 4.5m
- May combine with refuge floor (避火層)
- Active recreational use not permitted for industrial building
- For exclusive use by owners and residents and their visitors
Communal Sky Gardens (Cont’d)

New Arrangement

- Sky garden and refuge floor should be combined if refuge floor is required and not proposed at roof
- No sky garden immediately above or below podium garden unless with sufficient environmental justifications
- Greenery ≥ 30%
- GFA concession may not be granted if there is concern on overall building height
- Status quo otherwise
Green & Amenity Features (NOT Subject To 10% Cap)

Covered Gardens / Play Areas / Communal Podium Gardens (PNAP APP-42&104, JPN2)

Formerly Exemption Criteria

• Only for areas under footprint of tower
• For exclusive use by owners and residents and their visitors
• Residential buildings
  • ≤ 5% of domestic GFA (BD’s internal guidelines)
  • Area is open in design
• Commercial / industrial buildings
  • Clear headroom ≥ 4.5m
  • Active use not permitted
  • Greenery ≥ 25%
Green & Amenity Features
(NOT Subject To 10% Cap)

Covered Gardens / Play Areas / Communal Podium Gardens
(Cont’d)

New Arrangement

• BD’s internal guidelines of 5% cap for residential buildings
to be publicized in JPN1

• Status quo otherwise
Green & Amenity Features (NOT Subject To 10% Cap)

Plant Rooms and Covered Floor Floor Spaces for Energy Efficient / Environmental Friendly System (e.g. rain water / grey water recycling systems, etc.) (PNAP APP-2)

Formerly Exemption Criteria

• Subject to justification

New Arrangement

• Require quantitative justifications on energy saving / benefit to the environment
Green & Amenity Features (NOT Subject To 10% Cap)

Wing Walls, Wind Catchers and Funnels (JPN1)

Formerly Exemption Criteria

- Max. projection 1.5m (justification required if exceeding 1.5m)
- Non-load bearing
- Wind catcher and funnel size considered on case-by-case basis
- Features should promote natural ventilation

New Arrangement

- Quantitative justifications on energy saving / enhancement of ventilation required
- Status quo otherwise
Green & Amenity Features (\textbf{NOT Subject To 10\% Cap})

\underline{Noise Barriers (JPN2)}

\textbf{Formerly Exemption Criteria}

\begin{itemize}
\item Exempted size considered on case-by-case basis
\item Not for commercial purposes
\item Stand-alone wall with / without projection and located away from main tower, or cantilevered from external walls of podium
\end{itemize}

\textbf{New Arrangement}

\begin{itemize}
\item Quantitative justifications on noise reduction required
\item Status quo otherwise
\end{itemize}
Green & Amenity Features (NOT Subject To 10% Cap)

Acoustic Fins (JPN1)

Formerly Exemption Criteria

- Max. projection 1.5m (justification required if exceeding 1.5m)
- Non-load bearing

New Arrangement

- Quantitative justification on noise reduction required
- Status quo otherwise
Mandatory Features
(Not Subject To 10% Cap)

Mandatory Plantrooms and Other Services* (B(P)R23(3)(b))

Formerly Exemption Criteria
- Subject to justifications

New Arrangement
- Status quo

* Including FS installations, RSC / RSMRC / RMRC, refuse chutes / hopper rooms, TBE, water tanks, electrical switch rooms, meter rooms, transformer rooms, generator rooms, FS / Potable / Flushing water pump rooms, CO₂ rooms, hose reel, sewage treatment plant, smoke extraction ducts and lift machine room
Mandatory Features
(Not Subject To 10% Cap)

Refuge Floors (PNAP APP-2, MOE para.21, FRC para18)

Formerly Exemption Criteria

- Comply with MOE*
- Maybe combined with sky garden

New Arrangement

- Shall be combined with sky gardens (if applicable)
- Status quo otherwise

Mandatory Features
(NOT Subject To 10% Cap)

Public Passage (PNAP APP-108)

Formerly Exemption Criteria

- Exempt dedicated area as required under lease / OZP (Outline Zoning Plan)

New Arrangement

- Status quo
Other Items
(Not Subject TO 10% Cap)

Carparking and Loading / Unloading Areas (and associated ramps and facilities) (B(P)R23(3)(b), PNAP APP-2)

Formerly Exemption Criteria

- For use of occupants and their bona fide visitors only
- No. determined by Transport Department and makes reference to HKPSG (Hong Kong Planning Standards and Guidelines)
Other Items
*(NOT Subject To 10% Cap)*

Carparking and Loading / Unloading Areas (and associated ramps and facilities) (Cont’d)

New Arrangement

- Design and layout to be justified, GFA concession to be based on actual demand if it is lower than that required by HKPSG
- 100% GFA concessions for underground carpark
- 50% GFA concessions for aboveground carpark
Other Items
(NOT Subject To 10% Cap)

Carparking and Loading / Unloading Areas (and associated ramps and facilities) (Cont’d)

New Arrangement (Cont’d)

• 100% GFA concessions for aboveground carpark if:
  i. Technically infeasible to construct underground carpark due to site constraints (e.g. Scheduled Area 1, 2 or 3, site with major underground utilities or complex geotechnical constraints)
  ii. Aboveground carparks will not pose adverse environmental or visual impact to surroundings (e.g. in remote area, density zone area 3 under OZP, etc)
• All parking spaces are electric vehicle (EV) charging enabling
Other Items (\textbf{NOT Subject To 10\% Cap})

Bay Windows (B.W.) (PNAP APP-19)

Formerly Exemption Criteria

- Not accountable for GFA
- For domestic buildings only
- One B.W. per room
- $\leq 50\%$ of total façade areas
- $\leq 500\text{mm}$ projection from outer face of external wall
- $\geq 500\text{mm}$ above finished floor level
- $\geq 500\text{mm}$ from underside of finished ceiling
Other Items
(NOT Subject To 10% Cap)

Bay Windows (B.W.) (Cont’d)

New Arrangement

• Not accountable for GFA or site coverage (SC)
• For domestic buildings only
• One B.W. per room
• \( \leq 50\% \) of total façade areas
• \( \leq 100\text{mm} \) projection from outer face of external wall
• \( \geq 500\text{mm} \) above finished floor level
• \( \geq 500\text{mm} \) from underside of finished ceiling
Other Items

(NOT Subject To 10% Cap)

Sunshades and Reflectors (PNAP APP-67)

Formerly Exemption Criteria

• Projection ≤ 1.5m
• Larger projection requires justification
• Non-load bearing

New Arrangement

• Quantitative justifications required for projection ≥ 0.5m
• Status quo otherwise
• Not accountable for GFA / SC subject to compliance with Building (Energy Efficiency) Regulation
Other Items (NOT Subject To 10% Cap)

Horizontal Area of Staircases, Lift Shafts and Vertical Ducts Passing through GFA Non-accountable Floor (PNAP APP-2)

Formerly Exemption Criteria

• Considered on case-by-case basis

New Arrangement

• Non GFA exemption if also serve GFA accountable floors above or below
• Only applicable to floors accommodating communal sky gardens, covered gardens / play areas, communal podium gardens, essential plant rooms, plant rooms and covered floor spaces for energy efficient / environmentally friendly features, car parks and loading / unloading areas
• Status quo otherwise
Other Items *(NOT Subject To 10% Cap)*

Back-of-house Facilities of Hotels *(B(P)R23A(3), PNAP APP-40)*

**Formerly Exemption Criteria**

- \( \leq 5\% \) of hotel GFA
- Supporting facilities that are unique and integral to the normal operation of the hotel

**New Arrangement**

- Status quo
Case Study 01

1. List 5 items of GFA concessions in the typical floor plan.

2. Describe the difference between formerly exemption criteria and the new arrangement for each of the items.

3. Explain the reason for the Developer’s attempt to apply for these GFA concessions.
FLOOR PLAN (6/F TO 46/F TOTAL 35 STORIES)
Case Study 02

1. Identify 2 types of mandatory plant rooms in the carpark plan.

2. Name 2 items of GFA concession which appear in the previous example but not this one. Explain the reason.

3. Explain the difference of the precast façade in the 2 examples.

4. Suggest 1 more GFA concession item which is possible to be added to the building layout.
Case Study 03

1. What is the type of building works indicated on the drawing?
2. Identify any GFA concessions in this project.
Application of Sustainable Building Design Guidelines and Case Studies

Sustainable Building Design Guidelines
Sustainable Building Design Guidelines

Sustainable Building Design Guidelines (SBD Guidelines)

• Compliance as pre-requisite in exempting
  i. Green / amenity features;
  ii. Non-mandatory / non-essential plant rooms and services
Sustainable Building Design Guidelines

Objectives

i. Achieve better air ventilation
ii. Enhance environment quality of living space, particularly at pedestrian level
iii. Provide more greenery
iv. Mitigate heat island effect
Site Coverage of Greenery

- Required for sites of 1000m$^2$ or more
- Uncovered except at pedestrian zone, where clear height : width $\geq 8$ (App.E)
- Water features, grass paver, vertical greening, landscape-treated slopes, etc. to be $\leq 30\%$ (App. F)
- Designed as common areas
- Appropriate imposed load, irrigation points and drainage provisions
Site Coverage of Greenery Requirement

<table>
<thead>
<tr>
<th>Site Area (A)</th>
<th>Minimum Site Coverage of Greenery (i.e. percentage of greenery area over site area)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000 m² &lt; A &lt; 20,000 m²</td>
<td>Pedestrian zone: 10% Other locations: no limit Total greenery areas: 20%</td>
</tr>
<tr>
<td>A ≥ 20,000 m²</td>
<td>Pedestrian zone: 15% Other locations: no limit Total greenery areas: 30%</td>
</tr>
</tbody>
</table>
Site Coverage of Greenery

Greenery Area at Pedestrian Zone
## Site Coverage of Greenery

### Other Green Features

<table>
<thead>
<tr>
<th>Greening Features</th>
<th>Location</th>
<th>Reduction Factor in Computing the Greenery Areas</th>
<th>Site coverage of greenery</th>
</tr>
</thead>
<tbody>
<tr>
<td>²Water features</td>
<td>Pedestrian zone; uncovered communal podium roof</td>
<td>50%</td>
<td>Not more than 30% of the total greenery areas specified in Table 2</td>
</tr>
<tr>
<td>Grass paver</td>
<td>No restriction</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>³Vertical greening</td>
<td>Pedestrian zone</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>⁴Landscape-treated slopes/retaining structures with gradient steeper than 45°</td>
<td>No restriction</td>
<td>Not applicable</td>
<td></td>
</tr>
</tbody>
</table>
Site Coverage of Greenery

Relaxation for Single Family Houses

i. The followings are not applicable to Single Family houses:-
   • Location of greenery
   • Designation as common areas
Building Set Back

- Applicable to buildings abutting a street less than 15m wide
- Buildings shall be set back to allow air flowing through minimum 15m x 15m sectional area along the street
Building Set Back

Requirements (App. D)

i. Up to 15m above street level, no part shall be within 7.5m from centreline of the street; or

ii. Where a communal garden is provided, no part shall protrude above the 45 degree inclined plane with its base placed at street level at the boundary line of the lot on the opposite side of the street
Building Set Back

- Measures for Compliance

≥ Min. 7.5m (w) x 15m (H) sectional area
Building Set Back

Factors

i. Structures higher than 15m above street level may project over set back area

ii. Minor project features and structural columns allowed in set back area

iii. Set back areas shall be properly landscaped, paved and maintained, be open and without permanent building structures other than open ones
Building Set Back

Relaxation for Small Sites

i. Applicable if set back area required is more than 15% of site area

ii. Full height and frontage setback from site boundary by at least 15% of site area

iii. If site area ≤ 1000m², greenery ≥ 50% of set back area

iv. If site area > 1000m², greenery at pedestrian zone should be increased by 5%
Building Set Back

Exemption

i. Height of building being less than 2 times mean width of street

ii. Parts of building with special constraint
Building Separation

Applicable for sites 2 hectares or above, and for sites less than two hectares with continuous projected façade length (Lp) of 60m or above

Two requirements:

i. Maximum permissible Lp

ii. Minimum separating distance and permeability

Separate assessment for Low (0-20m), Middle (20-60m) and High Zone (above 60m)
Building Set Back

Requirements

i. \( L_p \leq 5 \times \text{Mean Width of Street Canyon (U)} \)

ii. Separating Distance \( \geq 7.5m \)

iii. Minimum Permeability

<table>
<thead>
<tr>
<th>Height(^5) (H) of the tallest building</th>
<th>Permeability (P) of Buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site area &lt; 20,000 m(^2) and with building(s) of ( L_p \geq 60m ) long</td>
<td>Site area ( \geq 20,000 ) m(^2) (regardless of the length of buildings)</td>
</tr>
<tr>
<td>H \leq 60m</td>
<td>20%; 20%</td>
</tr>
<tr>
<td>H &gt; 60m</td>
<td>20%; 20%</td>
</tr>
</tbody>
</table>
Building Set Back

Exemptions

i. Waived at low zone if site coverage limited and full height of building set back (para. 8)

ii. Not applicable to domestic buildings not exceeding 15m or four storeys

iii. May be exempted for portion of building below raised pedestrian level
Buildings with Special Functional Requirements

i. Exemption may be granted (para. 11) if
   • AVA conducted and one of three BEAM Plus requirements under SA8 category (Microclimate Around Buildings) fulfilled
   • Building features to promote air flow at pedestrian level considered in assessment
   • Building separation requirement fully complied with for other buildings on the same site
Site Topography & Sunken Buildings

- Site “Level Zero” is the mean level of the lower or lowest street(s)
- The height of a building shall be measured to the mean height of the roof over the highest usable floor space
- Disregard any building below Level Zero or any sunken part of a building
- Disregard the effect on air ventilation around buildings due to topographical features of the site

Elevational Projection (across the entire site)
**Individual "Continuous Projected Façade Length (Lp)"**

The total projected length of façade of a building or a group of buildings if any separation in-between is <15m (as projected to the long side of a notional rectangle for measurement)

- Building portions at low zone of height ≤6.67m (1/3H of low zone) may be disregarded in (Lp) measurement (see Fig.11)

A notional rectangle for measuring (Lp) of a building or a group of buildings along its long side

**Fig. 2**
Individual (Lp) of a building or group of buildings along its long side.

- A notional rectangle for measuring (Lp) of a building or a group of buildings along its long side.
- Where the building or group of buildings is irregular in shape, the notional rectangle may be the smallest rectangle that contains the building or group of buildings.

Fig. 3
Width of Adjoining Street Canyon (U)

Distance from the external wall of a proposed building to the B.L. of the opposite site(s) across the street

- street canyon shall be vertically unobstructed. Signboards, minor projecting features, open sided features e.g. balconies, utility platforms, covered walkways and trellises may be disregarded.
Adjoining Street Canyon

Buildings subject to control on individual (Lp)
- buildings/groups of buildings wholly or partly within 30m from the centreline of an adjoining street.

Fig. 5
Max. Width of Adjoining Street Canyon (U) & Max. Individual (Lp)

- If the building abuts two or more streets, the lesser or least (U)

- Building A
  \[ U_{3A} < U_{1A}, \text{ max. } (Lp)_A = 5 \times U_{3A} \]

- Building B
  \[ U_{1B} < U_{2B}, \text{ max. } (Lp)_B = 5 \times U_{1B} \]

Fig. 6
Mean Width of Street Canyon (U)

Building A
When width of the adjoining street canyon varies, the mean width of (U) shall be determined as:

\[ U_{A1} = \frac{\text{Street Canyon Area (A1)}}{\text{Length (A1)}} \]

- When \( U_{A1} < U_{A2} \), max. \( (L_p)_A = 5 \times U_{A1} \)

Building B
No part of the building is closer than 30m to the street centreline. Building B is not subject to the Design Requirement on \( L_p \).

Building C
\( (L_p)_C \) is determined by the width of \( U \) at Street 2:

- \( (L_p)_C = 5 \times U_{c2} \)

\[ U_{A2} = \frac{\text{Street Canyon Area [A2(a) + A2(b)]}}{\text{Length [A2(a) + A2(b)]}} \]

\[ U_{c2} = \frac{\text{Street Canyon Area (C2)}}{\text{Length (C2)}} \]

Fig. 7
A pair of Projection Planes for (P) assessment

- Low Zone
  - one of the planes parallel to an adjoining street
- Middle/High Zone
  - any pair chosen to suit the building disposition or environmental context e.g. prevailing wind direction
- (P) assessment on one plane only if:
  (a) site < 2ha, and
  (b) the total width of all projected building facades as projected onto the other plane <60m
Permeability (P) of Buildings

(P) is the percentage area ratio of the sum of projected intervening spaces & permeable elements over individual assessment zone on a projection plane.

\[
(P) = \frac{\text{Sum of areas of intervening spaces & permeable elements}}{\text{Area of the assessment zone}} \times 100\%
\]

**Fig. 9**

**Elevational Projection** (across the entire site)
Permeability (P) of Buildings – Intervening Spaces

Intervening spaces shall account for min. 2/3 of the required (P)

Sum of areas of intervening spaces

\[ \times 100\% \geq \frac{2}{3} \times (P) \]

Area of the assessment zone

---

Elevational Projection (across the entire site)
Intervening Space

Provision of intervening spaces with separating distance (S) between projected facades $\geq 15\text{m}$, and between end of a projected façade and adjacent common B.L. or centreline of adj. street/lane $\geq 7.5\text{m}$

- Height of such intervening space $\geq 2/3H$ of the Assessment Zone, or
- It is open to above

Building portions at low zone of height $\leq 1/3H$ of the zone may be disregarded in (Lp) measurement (see Fig.2)

Intervening space (I.S.) if open to above
Permeable elements (P.E.) if covered

Fig. 11
Mean Width of Separating Distance
Mean width between projection line at building ends to common B.L. or centreline of street/lane

\[ S_3 = \frac{\text{Area} \, (D)}{\text{Length} \, (D)} \geq 7.5m \]

Projection Plane X

Assessment Zone (W)

\( (Lp)A_G \)

\( (Lp)B \)

\( S_1 \)

\( S_2 \)

\( S_3 \)

\( \geq 7.5m \)

\( \geq 15m \)

Building Group \( A_G \)

Building \( B \)

\( \text{STREET 1} \)

\( \text{STREET 2} \)

D

Plan

Fig. 12
Permeability (P) of Buildings – Permeable Elements

Permeable elements may contribute to maximum 1/3 of the required (P)

Sum of areas of permeable elements

\[ \text{Area of the assessment zone} \times 100\% \leq \frac{1}{3} \times (P) \]

Elevational Projection (across the entire site)
Permeable Elements

Provision of permeable elements within, above, below or between buildings

- clear opening size of such a permeable element is not less than 3m

---

**Elevational Projection** (across the entire site)
Design Flexibility  notional air corridor / wind path

- Change in direction $\leq 15^\circ$ when it meets the boundary line or anywhere within the site
- Direction deviate $\leq 15^\circ$ from the original path
- Width of the intervening space / notional air corridor / wind path remains unchanged after such change in directions

Fig. 15
**Notional Air Corridor**  Separating distance (S) between buildings & at façade ends

- When projection plane X is placed on either side of the site, length of a building façade so projected on the planes may vary.
- (P) assessment may be based on the projection on either one of the planes X(1) or X(2) as chosen.
- Separating distance (S) between buildings ≥15m.
- Mean separating distance between the façade end and adjacent common B.L. or centreline of adj. street/lane ≥7.5m subject to the condition that no part of the building be closer than 3m from the common B.L. with adjoining lot.

![Diagram of Notional Air Corridor](image)

**Fig. 16**
Notional Air Corridor  Separating distance at façade ends

- When projection plane Y is placed on either side of the site, length of a building façade so projected on the planes may vary.
- (P) assessment may be based on the projection on either one of the planes Y(1) or Y(2) as chosen.
- mean separating distance between the facade end and centreline of the adjoining street/lane ≥ 7.5m subject to the condition that no part of the building be closer than 3m from the common B.L. with adjoining lot.

Fig. 17
**Notional Air Corridor** Separating distance at façade ends

- Mean separating distance (S) between the facade end and common B.L. or centreline of the adjoining street/lane $\geq 7.5m$ subject to the condition that no part of the building shall be closer than 3m from the common B.L. with adjoining lot.

- When the site abuts two adjoining streets

- When the site abuts a street and an adjoining lot

Fig. 18
Wind Path passing through the site
Dividing the site into TWO or more notional sites for (P) assessment
- vertically uncovered and unobstructed above the lowest level of the assessment zone
- width $\geq 15\text{m}$
- leading to a street or to a lane of mean width $\geq 7.5\text{m}$ at either ends
Sub-divided Notional Sites for (P) Assessment

- Separating distance (S) at the projected facade end shall be measured to the notional B.L. 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.
- Site "Level Zero" of the original undivided site shall be used for all notional sites.

![Diagram of Notional Sites A and B](image-url)
Building Separation Assessment

Sample Case
- 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 a podium with full site coverage = 80m (> 60m, assessment required)

**Appendix C**
(PNAP APP-152)

**Design Requirement (1)**
Max. (Lp) = 5 x U

Building at Low Zone
- U_p = 15m, max. (Lp)_p = U_p x 5 = 75m
- (Lp) of proposed podium = 80 m (> 75m)
  (i.e. NOT OK)

Building at Middle/High Zone
- U_T = 19m, max. (Lp)_T = U_T x 5 = 95m
- (Lp) of proposed tower = 32m (< 95m)
  (i.e. OK)

**Fig. 1**
Building Separation Assessment

**Design Requirement (2) - Low Zone**
- Minimum \( P \) = 20% (from Table 1)
- Set Projection Plane \( X \) parallel to the Street

---

**Intervening Space & Separating Distance**
- min. 7.5m to common B.L.
- open to above, or of height \( \geq \frac{2}{3} \) of the Assessment Zone
- \( (Lp)_P = 80m - (7.5m \times 2) = 65m \) (< 75m, i.e. OK)

**Total facade area of the intervening spaces**
\[
= (7.5 \times 13.4)m^2 + (7.5 \times 13.4 + 22.5 \times 5)m^2 = 313.5m^2
\]

**\( P \) achieved by the intervening spaces**
\[
= \frac{313.5m^2}{(20 \times 80)m^2} \times 100% = 19\% \ (> \ 20\%, \ but \ not \ less \ than \ (2/3) \times 20\% = 13.33\%)
\]

**Facade area of the permeable element**
\[
= 13m \times 5m = 65m^2
\]

**\( P \) achieved by the permeable element**
\[
= \frac{65m^2}{(20 \times 80)m^2} \times 100% = 4\% \ (< (1/3) \times 20% = 6.66\%, \ i.e. \ all \ accountable)
\]

**Overall \( P \) achieved at low zone**
\[
= 19\% + 4\% = 23\% \ (> 20\%, \ i.e. OK)
\]

---

Fig. 2
Building Separation Assessment

Design Requirement (2) - Middle/High Zone

Intervening Space & Separating Distance
- min. 7.5m to common B.L.
- open to above or of height ≥ 2/3 of the Assessment Zone
- (Lp)_T = 32m(< 95m, i.e. OK)

Total facade area of the intervening spaces
= (18x58)m² + (30x58)m² = 2784m²

Overall (P) achieved
= 2784m² / (80x58)m² x 100%
= 60% (> 20%, i.e. OK)
Application of Sustainable Building Design Guidelines and Case Studies

Energy Efficiency of Buildings
ENERGY EFFICIENCY OF BUILDINGS

Review of Existing Standards and Regulations (PNAP APP-67)

i. To tighten up the OTTV (Overall Thermal Transfer Value) standard by 20%

ii. Building towers – from 30w/m² to 24w/m²

iii. Podiums – from 70w/m² to 56w/m²