

Social Performance of Communal Sky Garden in a
Dense Urban City - Hong Kong

Dr. Catherine CHAN

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Part One
Introduction + Background

Social Performance of Communal Sky Garden in a
Dense Urban City - Hong Kong

1

1. Background & Current Situations

Typical scenarios of a dense city

- Rapid urbanization in dense city → maximizing development potential
- High-rise residential development → typical quick-fit solution
- Opportunity cost of development → open spaces and greening spaces
- Limited open space results in → reduced communal gathering, leisure and greening

Hyper dense city



1. Background & Current Situations

Scenarios of Hong Kong

- High-rise residential buildings developed to meet the demand
- Critical periods of elevated green open space for high-rise residential building prototype:

1. **1980's** transfer-plate construction → podium offers alternative communal + greening space
2. **2001-02 JPN 1 + JPN 2** → sustainable features and communal sky-garden emerged

Communal Sky Garden (CSG) in high-rise residential building



Hong Kong

Compact + Dense populated:
Space for communal open spaces ?





Part Two

Research details

2

Social Performance of Communal Sky Garden in a
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2.0 Research Aim + Objectives

AIM

The study aims to examine the **design elements** which affect **social performance** of communal sky garden (CSG) for **high-rise residential buildings** in **dense city**.

OBJECTIVES

1. **Investigate:** different **forms** of sky gardens, their benefits and limitations;
2. **Understand:** **relationship** between green space and high-rise development in dense city
3. **Identify:** Constituents of a **quality** communal space;
4. **Establish:** Set of **design elements** for the provision of CSG; and
5. **Explore:** **Role** of CSG in a dense city.

2.1 Types of Sky Garden

1. Rooftop garden

- At building roof: extensive type: inaccessible by people; intensive type: accessible by people

2. Podium garden

- At podium: close to ground level and support both active and passive uses; common in Hong Kong residential development especially with transfer plate structure

3. Garden at intermediate level

- At intermediate level: mainly design for passive use as communal sky garden



Rooftop garden London
(Source: <http://media.tumblr.com>)



Podium garden in Palazzo



CSG in Palazzo

2.2 Scope of Research Works (Partial)

- 1 Examine the CSG of **residential building** located at the **intermediate floor**

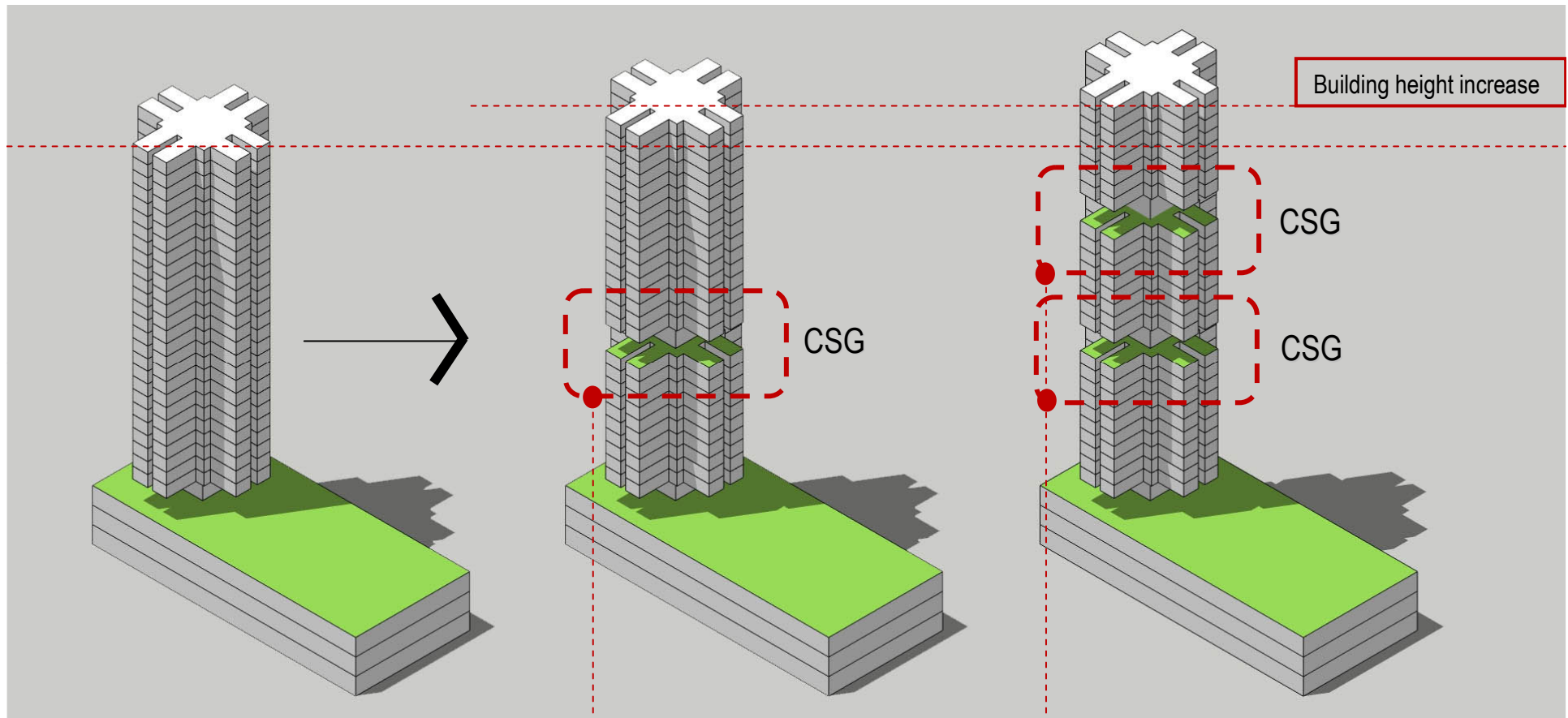


Diagram showing a residential building with CSGs

Research interest:
Intermediate floor

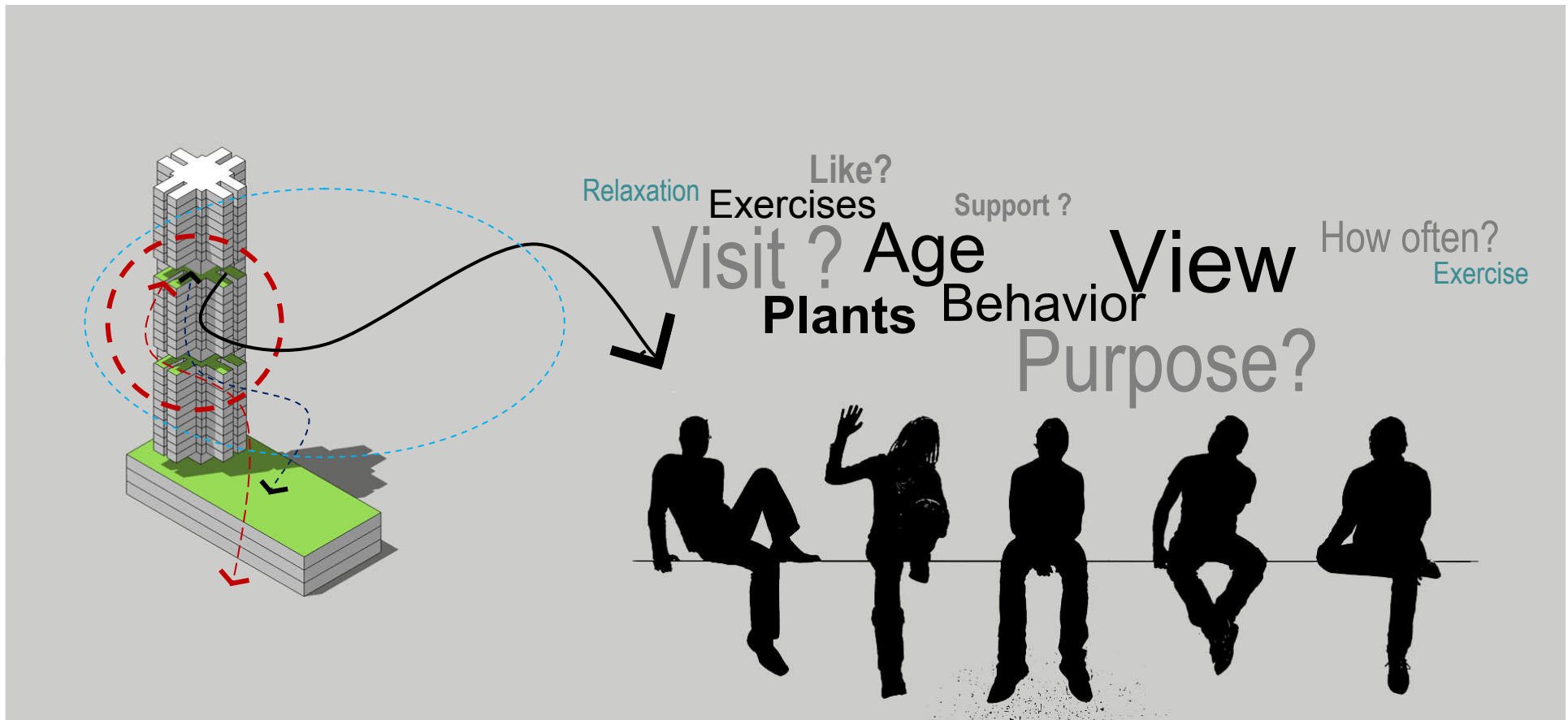
Research interest:
Intermediate floor

2.2 Scope of Research Works (Partial)

2

Evaluate **Social Performance of CSG** in high-rise residential building in Hong Kong

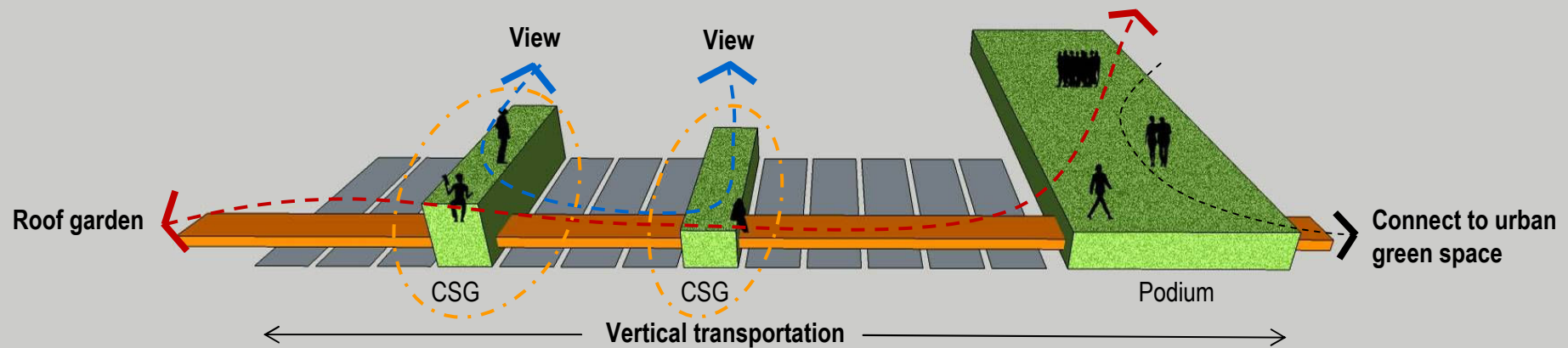
- Performance – perception & use pattern (by users)
- Social performance – on both personal health & well-being and social aspects



2.3 Research initiatives

1. Previous studies: importance of open/ public space in foster vital urban life.
2. Lack of greenery and open spaces in dense city → **CSG is a supplement provision?**
3. **Lack of research** on CSG provision at intermediate level of a residential building to support this argument.
4. **Pioneer study:** evaluating the social performance of CSG in Hong Kong

DIAGRAM: Communal Sky Garden v.s. Vertical landscape planning strategy



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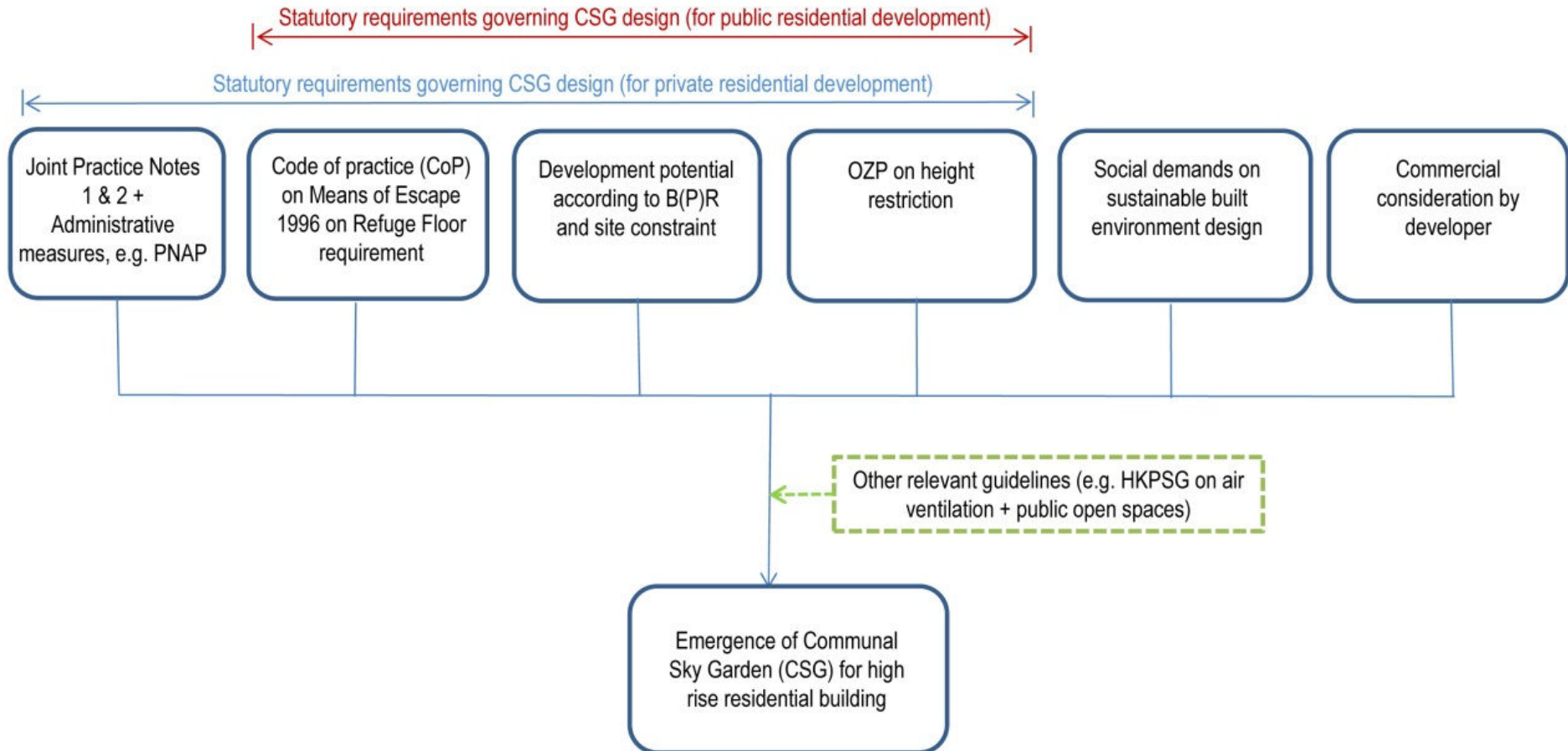


Part Three
Communal Sky Gardens Emergence in Hong Kong

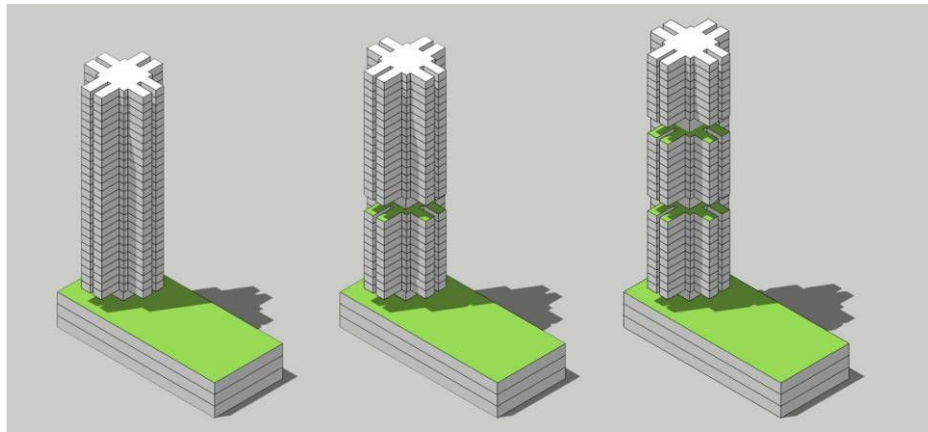
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3.1 Development control & CSG

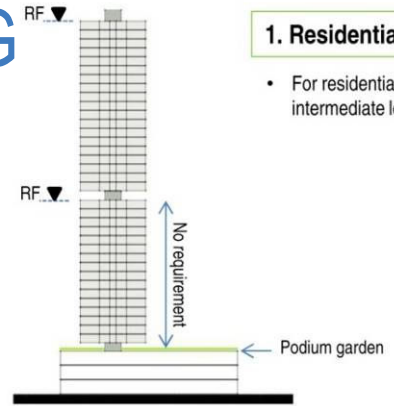


3.1 Development control & CSG



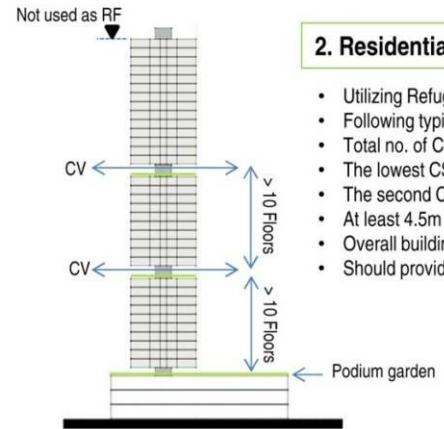
1. Residential Building with only Refuge Floor before JPN

- For residential building > 26 no. of floor, the Refuge floor (RF) is either located at intermediate level or at the roof.



2. Residential Building with CSG

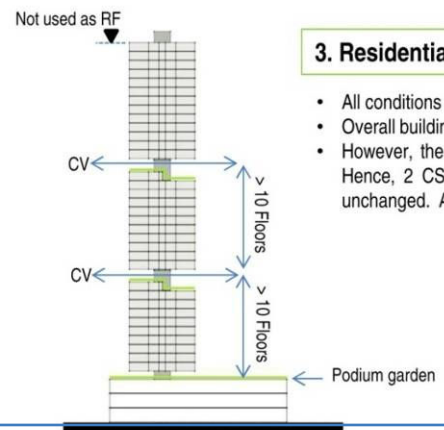
- Utilizing Refuge Floor for CSG according to JPN 1 and 2
- Following typical residential floor footprint
- Total no. of CSG = Total no. of Floor / 15
- The lowest CSG should be 10/F higher than podium
- The second CSG should be at least 10/F higher than previous CSG
- At least 4.5m height room
- Overall building height increase
- Should provide cross ventilation at both opposite sides



Key: CV Cross Ventilation
■ CSG level

3. Residential Building with modified CSG

- All conditions same as Item 2 above
- Overall building height increase
- However, the modified CSG should occupied only 50% of one typical floor plate. Hence, 2 CSG level can be provided given total RF and CSG areas remained unchanged. An external staircase can be provided for the connection.





Part Four
Urban Life + Communal Spaces

4

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4.1 Problems associate with urban life

A. Problems associate with urban life

- Lack of open space
- Crowding
- Lower physical activity
- Lack of personal space
- Inhibited social interactions

B. Importance of urban greening

- Benefits the urban environment
- Makes city livable
- Softening a highly built cityscape
- Provide green retreats for social, recreational & leisure needs
- Reduce stress of daily urban life
- Innate of human attraction to nature
- Higher well-being and public health
- Improve workplace quality & effectiveness of office working
- Enhancing quality of life

4.1 Problems associate with urban life

C. Importance of communal space

- City dweller's desire & basic need for sociability & community in public
- Balance of private & public experiences for a healthy city life
- Social interaction to help stimulating supports & sense of community
- People express greater happiness
- Improve social well-being of communities
- Susceptible to sickness if in short of connection/ meaningful social contacts
- Street crime reduced

D. Integration of green and communal space

- Play a vital & integrated role in cities and enhance urban vitality
- A pleasant environment which offers opportunities for relaxation & recreation → positive city image & sense of identity for the citizens
- Improve quality of life
- Physical characteristics of neighbourhood space mark a considerable influence on social interactions → Green space to increase informal contacts → social interaction and fostering community development
- Positive relationship between presence of green and amount of using outdoor spaces and social activity
- Crucial role in creating vital neighbourhood spaces & catalyst on fostering neighbourhood ties



Part Five

Relationship between Human + Environmental Design

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5

5.1 Association between human & environment

A. Human & environment

- **Environmental attributes** → dynamic & transactional engagement of people with space
→ either help or impede uses/ activities
- **Environmental psychology** – a framework to study & understand the performance of a space, i.e. reasons of use & types of activities

B. Quality of the environment – crux of users perception

- good design supports use
- Design parameters – physical components of a space design (i.e. location, accessibility, size & scale, naturalness, micro-climate, facilities, varieties of quality, attractiveness & safety)
- Spatial arrangement & landscape accessories → determine **potential activities** (response to needs)
- **Interpreted by users** – each place is unique
- An interrelationship between **physical features** & **perceived quality**

C. Environmental perceptions (theories & perspectives)

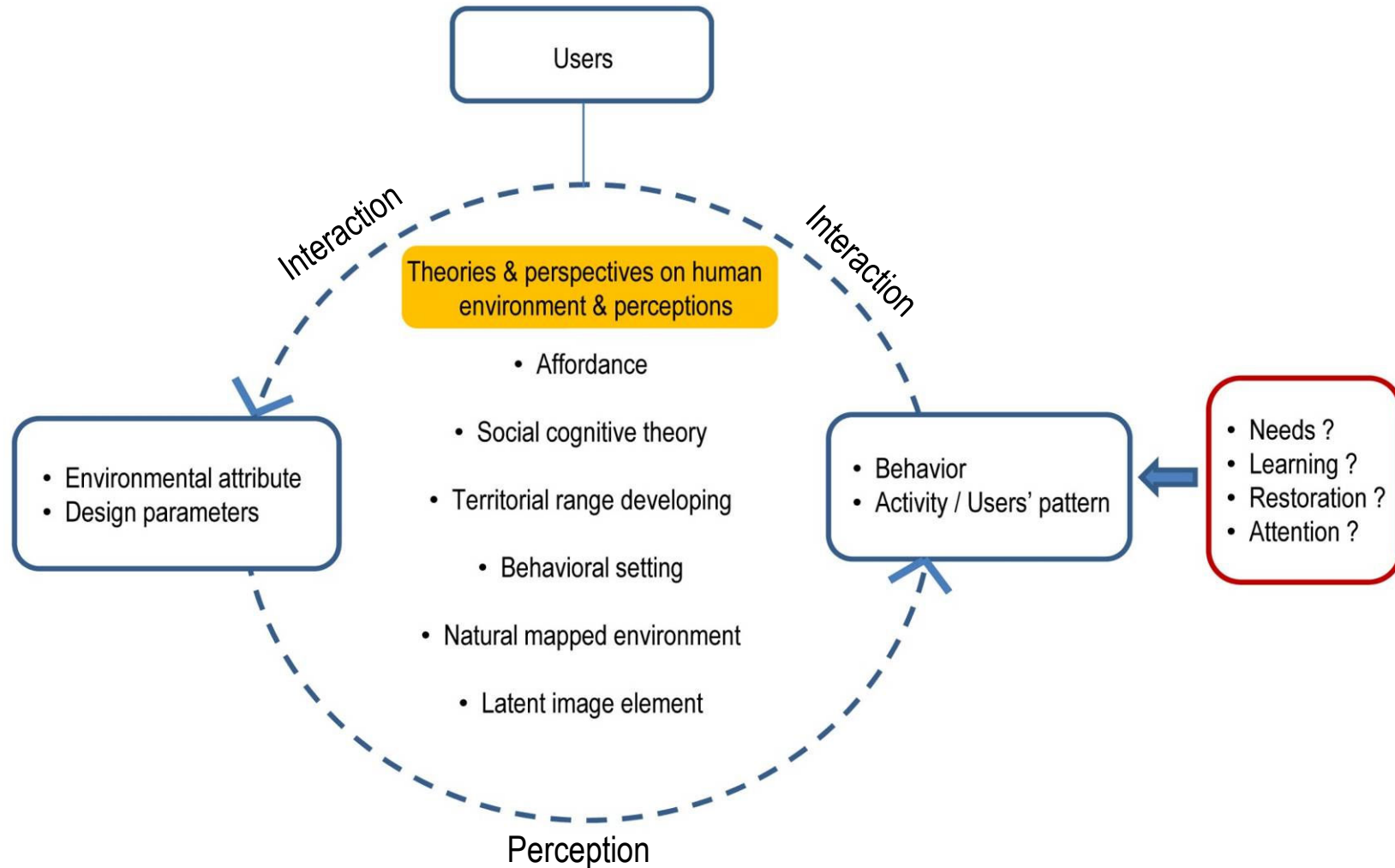
- When place is used → perception
- Interaction of behaviour, environment & personality → to perceive quality of space , i.e. support, afford, preference → satisfaction
- Environmental supportiveness, Territorial Range Development, Affordance, Pleasure-Arousal-Dominance Hypothesis, Kaplan's Preference Framework
- An interactive & dynamic process

Part Six
Conceptualizing the Theories

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6

6.1 Conceptual framework of the Study



6.2 Research Methods

Case Study Approach

→ Mixed method **qualitative** & **quantitative** sequential design

1. *Desktop research*
2. *On-site measurement*
3. *Unobtrusive observation*
4. *Questionnaire survey (total 498 respondents)*
5. *Semi-structured interviews*
6. *Design analysis*



Part Seven
Observations of CSG in Hong Kong

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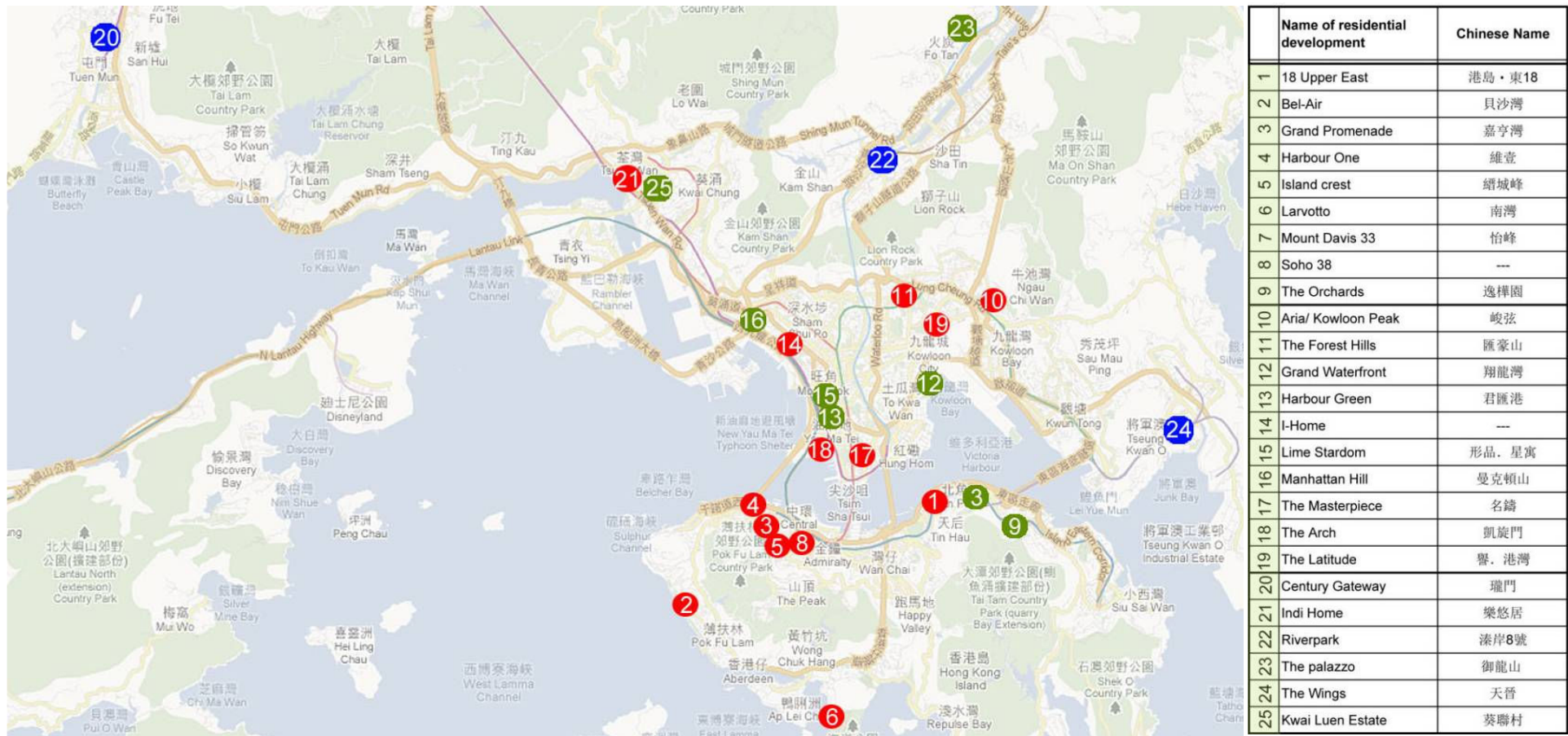
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7.1 CSG provision from 2001 - 2011

- 24 no. **private** residential developments
- 1 no. **public** rental housing development
- **4 CSG typologies** are observed

Legend

- Development with CSG (selected for case study)
- Development with CSG
- Development to be completed with CSG

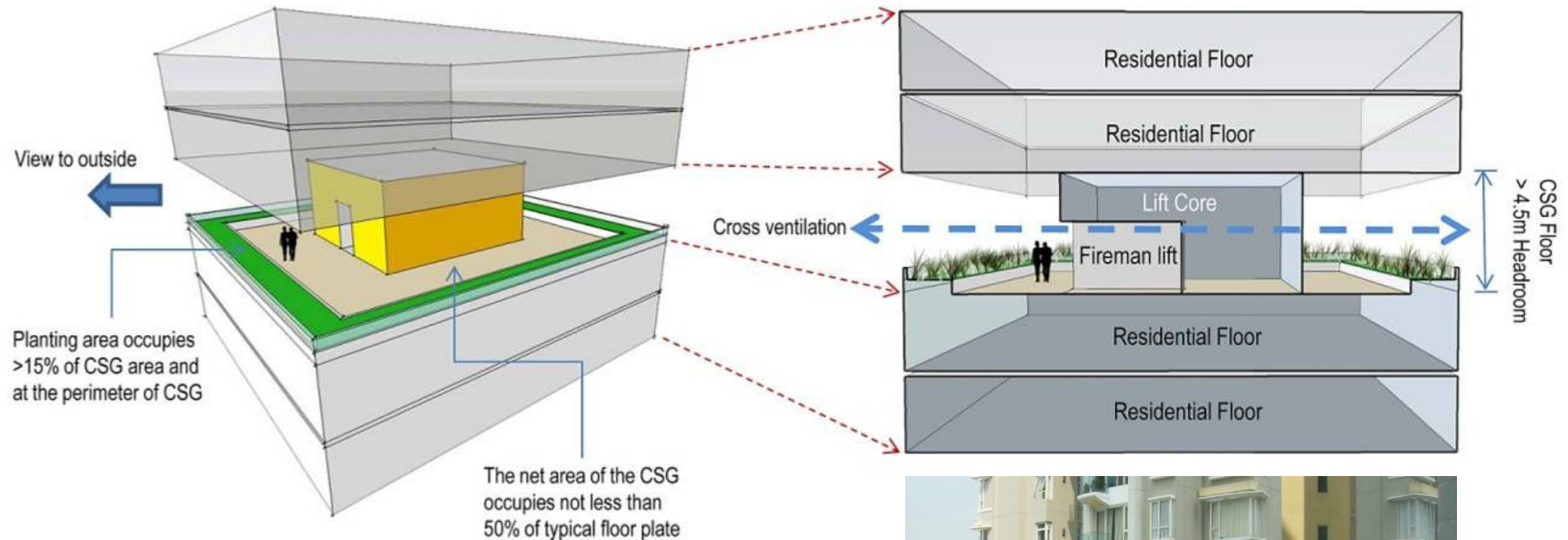


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7.2 Communal Sky Garden Design Typology

TYPICAL TYPE

- 1st type of CSG
- Coupled with refuge floor + follow guidelines of JPN 1 & 2
- Panoramic view: 4 sides



The Orchards



7.2 Communal Sky Garden Design Typology

TYPICAL TYPE – The Orchards

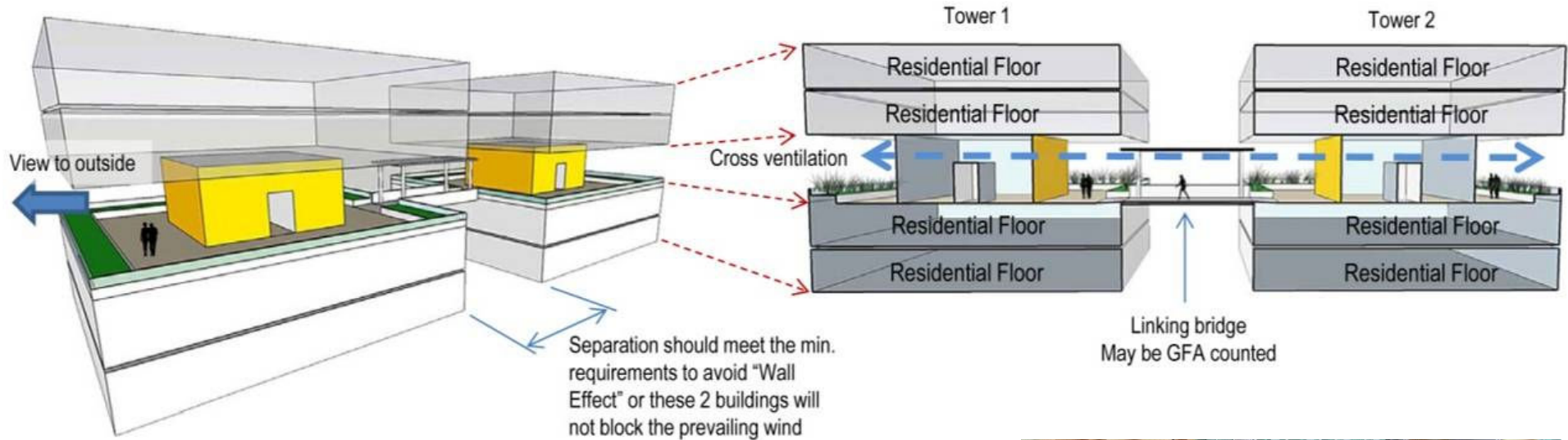


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7.2 Communal Sky Garden Design Typology

LINKED-TYPE

- Linking up more than 2 Typical-type CSGs
- Further extend the possible usage and area of CSG
- Panoramic view: 3 sides



Manhattan Hill

7.2 Communal Sky Garden Design Typology

LINKED-TYPE – Manhattan Hill

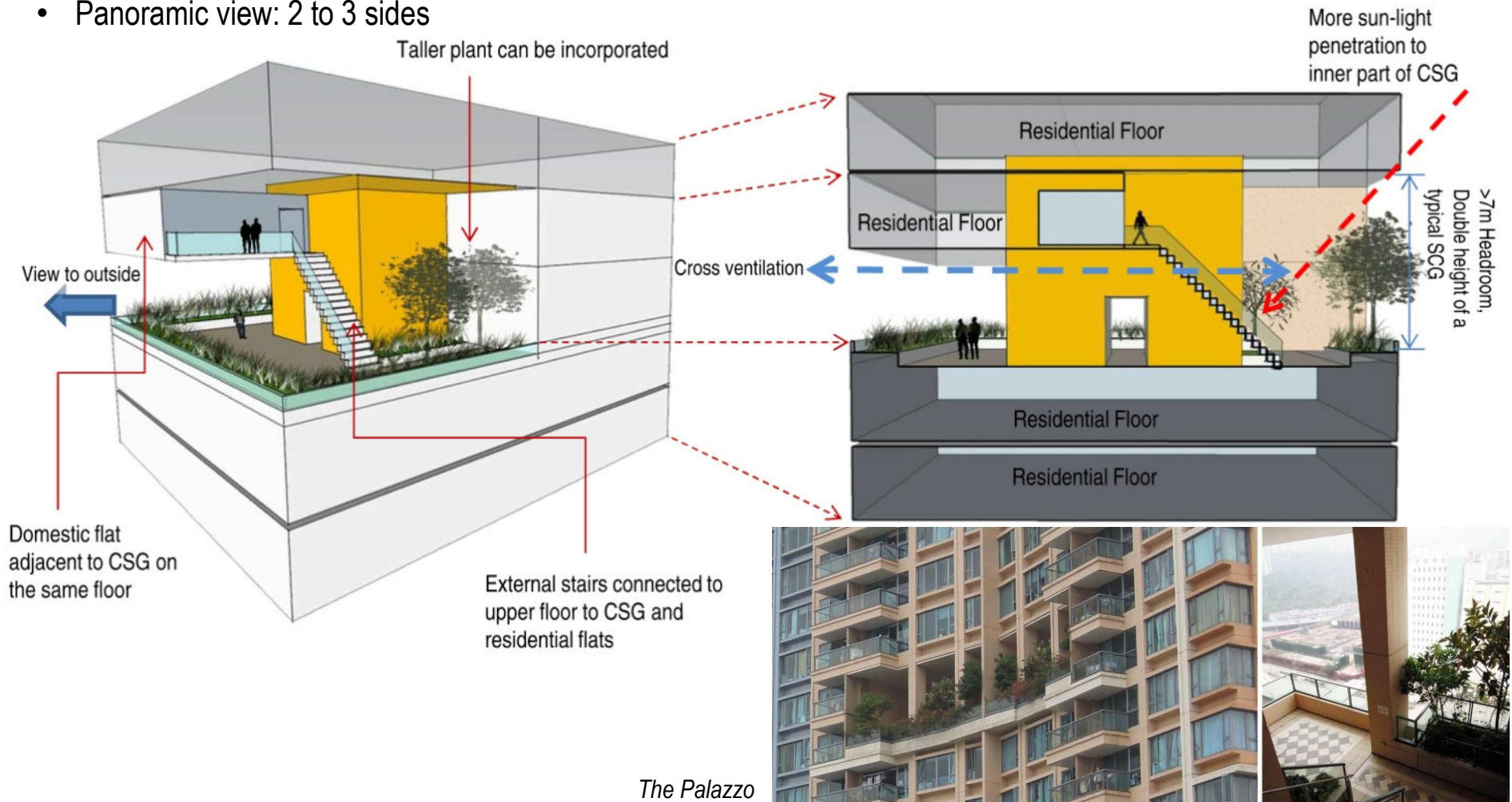


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7.2 Communal Sky Garden Design Typology

DUPLEX TYPE

- 2 levels of CSG connected by external stairs
- Higher headroom → promotes building permeability
- Panoramic view: 2 to 3 sides



7.2 Communal Sky Garden Design Typology

DUPLEX TYPE – The Palazzo

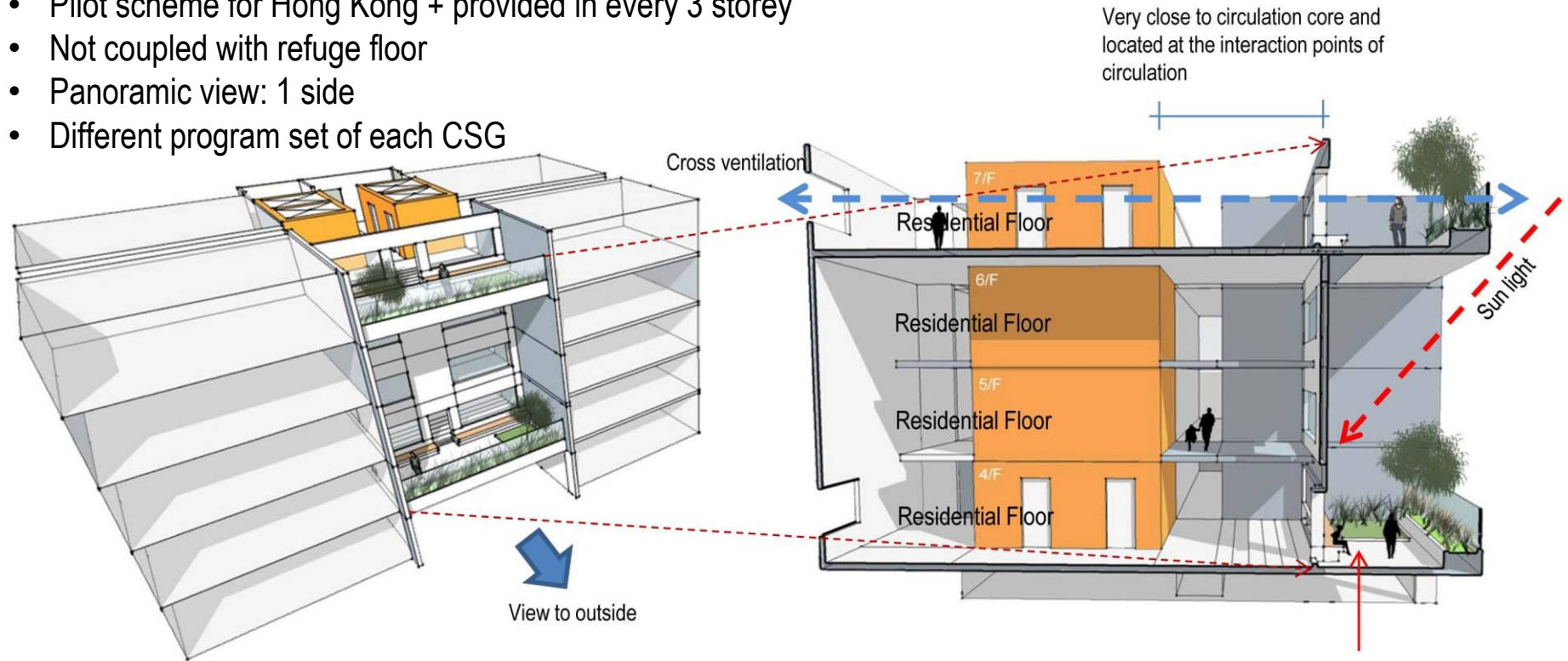


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7.2 Communal Sky Garden Design Typology

BALCONY TYPE

- Pilot scheme for Hong Kong + provided in every 3 storey
- Not coupled with refuge floor
- Panoramic view: 1 side
- Different program set of each CSG



CSG is provided in every 3 residential floors. Different activities for each CSG offers variety



Kwai Luen Estate

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7.2 Communal Sky Garden Design Typology

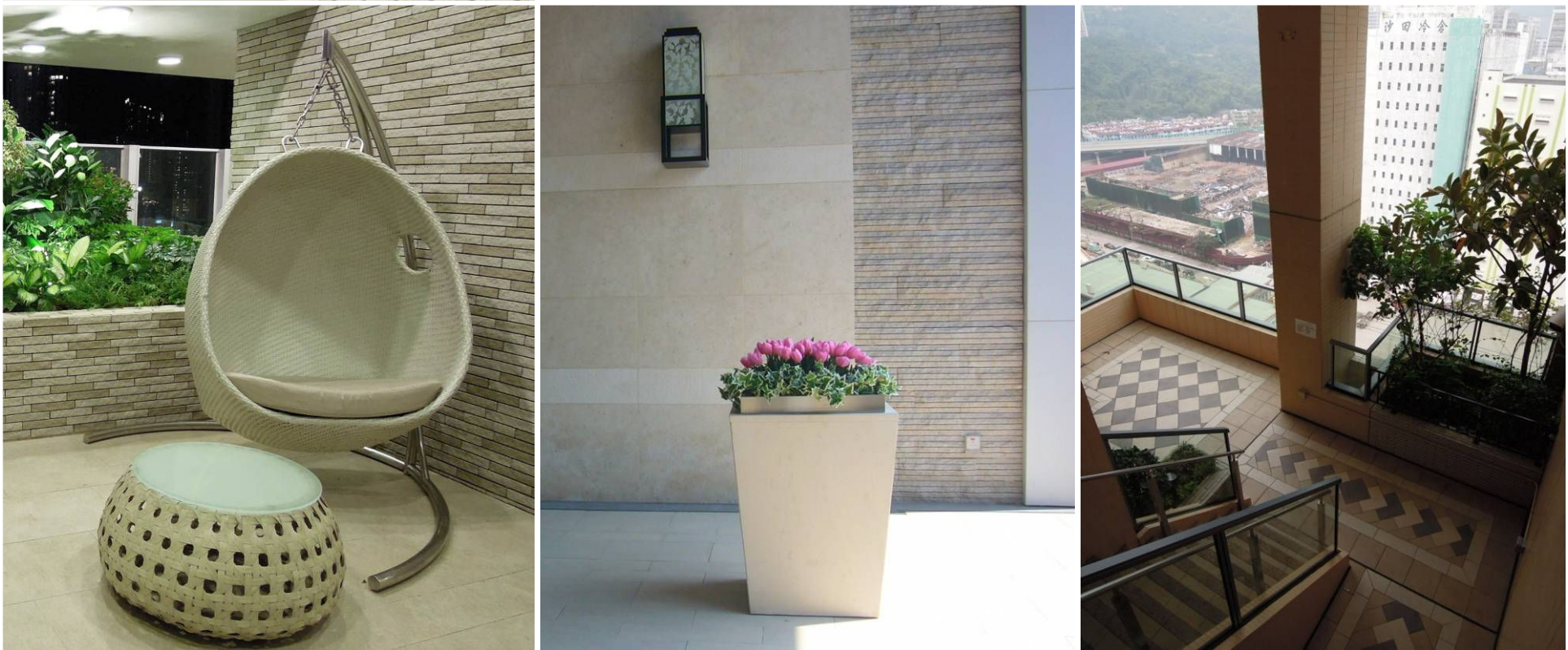
BALCONY TYPE – Kwai Luen Estate (Public Estate)



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7.3 Common Features at CSG

- (1) **Development location:** Close to shoreline + connected to MTR station (except Kwai Luen Estate)
- (2) **CSG layout:** Follow existing typical floor foot-print + with a lot of partition structural walls + min. 4.5m headroom
- (3) **Hard landscape elements:** Easy cleansing and replacement materials, e.g. AGT
- (4) **Soft landscape elements:** Shrub planting + shaded tolerant + evergreen
- (5) **Management and maintenance consideration:** Proper signage + CCTV + Emergency lighting
- (6) **View:** Panoramic view



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7.3 Common Features at CSG Clear pathway + signage



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7.3 Common Features at CSG Sculpture + Neat materials

Harbour Green



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7.3 Common Features at CSG

High headroom + good ventilation

The Palazzo



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7.3 Common Features at CSG

Comfort site furniture

Lime Stardom



7.3 Common Features at CSG Panoramic view



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Part Eight

Findings of the Research Study

8

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Urban open/ green space & urban life

8.1

8.1 Green space + urban life

1. Use patterns of green space (485 respondents)

- **70%** of respondents visited CSG, podium gardens , nearby open space or other type of open spaces
- **80%** visited open space within development or nearby open space
- Visit during weekend and duration of **0.5 hour - 1 hour**
- **Visiting objectives:** relaxation, exercise, leisure & play, social interaction, sense of peaceful & tranquility

2. Urban problems encountered & use pattern

- Stressful urban life, lack of contact with nature/ greenery, lack of social interaction with neighbours, congested living condition & lack of privacy
- **“almost everyday”** – stressful urban life, lack of privacy, lack of contact with nature/ greenery
- **”at least once a week”** – lack of social interaction with neighbour, crowded living environment

3. Needs in daily life and needs addressed by Urban Open Space (UOS)

- Take exercise, enjoy nature, relax, enjoy sense of tranquility and leisure & play – similar ranking

4. Views on provision of UOS (98% & correlation between role & functions of UOS)

- **Strong correlation** among restoration, relaxation, get some exercise, enjoy outdoor setting/nature



Design & considering factors & CSG

8.2

8.2 Design & considering factors & CSG

1. Design & considering factors and its importance when visiting CSG

- Clean & tidy, well-maintained, tranquil environment, greening, openness, sufficient & nice seating

2. Correlation between design factors & performance

- **Strong** correlation among accessibility, location, lack of nuisance, safety and headroom

3. Correlation between design factors & provision of CSG

- **Strong** correlation among sufficient & nice seating, welcoming, well-maintained, greening, location, clean & tidy and openness

4. Design factor to be improved

- Facilities, planting, size, design & variety of quality



Needs & problems & CSG

8.3

8.3 Needs & problems addressed by CSG

- Addressed urban problems & needs by visiting CSG

1. to view nature
2. to relax
3. to enjoy sense of peacefulness and tranquility
4. to be alone
5. to meditate & gather with family

- Use pattern & user profile

- Vary among **frequency of use** - “almost everyday” – to get exercise, to relax, to be alone, to enjoy sense of peacefulness & gather with family)
- Vary among **age group & occupation**

- Among cases

- **Kwai Luen Estate**: highest – to exercise, to leisure & play & to enjoy nature
- **The Palazzo**: lowest – to exercise, to leisure & play, to enjoy view & to play with family
- Addressed needs tally with **design & surrounding environment** of the respective development



Urban open space system & CSG

8.4

8.4 Urban open space system & CSG

- Views on provision

- agree with provision of UOS : positively related to the provision of CSG
- users – “like” and “agree” with such provision

- Roles & functions of CSG – supplement insufficient open space within development

- Varies with the competing facilities, i.e. podium garden
- Lower ranking - development with large podium garden – the Palazzo, Grand Promenade & Manhattan Hill
- Public group ranks higher than user group

- Roles & functions of CSG – supplement insufficient open space within district

- Varies with the competing facilities, i.e. nearby open space
- Higher ranking - development without nearby open space – Grand Waterfront & Lime Stardom
- Public group ranks higher than user group.

- Role of CSG

- An extra merit
- A complementary role
- Cannot be overemphasized.



Part Nine

Conclusions

9

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9.1 Conclusions

(A) Design factors and Social Performance of CSG

1. Correlation (Design factors v.s. Users perception)

- Accessibility, location, lack of nuisance, safety and headroom

2. Design factors (First 5 Ranks)

- (1) openness, (2) greening, (3) tranquil environment, (4) clean/ tidy and (5) sufficient & nice seating

3. Performance correlates with

- Design factors and availability of competing facilities

4. SIX factors tally with those good ones generated from literature

- Accessibility, location, welcoming , greening (naturalness), safety and well-maintained

5. Unique and important factors to CSG (Affecting its performance)

- Headroom, openness, lack of nuisance, tranquil environment and sufficient & nice seating (facilities)

9.1 Conclusions

(A) Design factors and Social Performance of CSG (Con't)

6. Environmental attributes support to address problems/ needs of urban dwellers

- Arrangement of the settings & features
- Provide cues and interpreted by users as a doorstep communal space for relaxation and restoration
(Environmental perception theories & perspectives applied)

7. Perceptions/ importance of design factors in line with the roles & functions and visiting objectives of CSG

8. Considerations for future provision

- Size, greening and facilities
- Flexible design to address changing needs
- Design should subject to user types, site opportunities & constraints
(ambient environment & competing facilities)

9.1 Conclusions

(B) Role & function of CSG / Value of CSG

1. Strong linkage with urban daily life (problems & needs) and mainly focus on those personal health and well-being aspects ...

- i.e. to enjoy view, to relax, to restore & relieve stress, to enjoy nature and improve quality of life

2. Use & popularity as success of space ...

- NOT totally apply to CSG.
- Existence and value of CSG is confirmed... though low in using rate
- ... *“any place must involve & social use”*
- ... *“value of place does not rests on evidence of people on site”*.

9.1 Conclusions

(B) Role & function of CSG / Value of CSG (Con't)

3. Role of social aspects

- social interaction with neighbours, NOT significant.

4. A near home garden at doorstep

- for relaxation, privacy, releasing stress & restoration.

5. Establish a vertical greening network within a building and development

6. Complementary role in the urban open space system ...

- ... to offer an extra merit to the residents of the respective development

7. Existence and value of CSG is confirmed

- ... to improve cityscape and urban environment

Hong Kong

Compact + Densely populated:
Space for communal open spaces ?





... could it be ... ?

