

Sky Garden Design in High-density High-rise Residential Development

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The higher we live from the ground level, the more disconnected we feel from the natural world and even from each other within a community

Can sky gardens be an option of bridging nature with urban living in HK?



Objectives

- Investigate the characteristics of existing sky gardens
- Analyse environmental, social & economic performance
- Evaluate residents' experiences in sky gardens
- Discuss design of effective sky gardens in high-density high-rise residential developments

roof garden

sky garden

podium garden



Design Guidelines of Sky Gardens in HK (HKSAR, 2001)

- Wind tunnel testing or CFD modelling but not compulsory
- Max. no. of sky gardens \leq no. of storeys / 15
- Split into multi-levels but not less than 1/3 of floor plate
- 1st sky garden at not more than 10 storeys
- 4.5m min. headroom & open-sided for cross ventilation
- Sky garden can be coupled with refuge floor
- Not less than 25% floor plate area to be vegetated



Characteristics of Sky Gardens in High-rise Residential Developments in HK

Characteristics of Existing Sky Gardens in HK

- Height concession is the main driver
- 2/3 of SG at mid- & high-levels about 80-150m from the street
- SG at mid-levels act as refuge floors
- SG at low- & high-levels act as an extension of clubhouse areas or main circulation to clubhouses
- Total openness in proportion to the overall building height is merely 2-3%
- 15-20% of the NET floor areas are vegetated
- Sitting areas, viewing platform, strolling path & foot massage trails



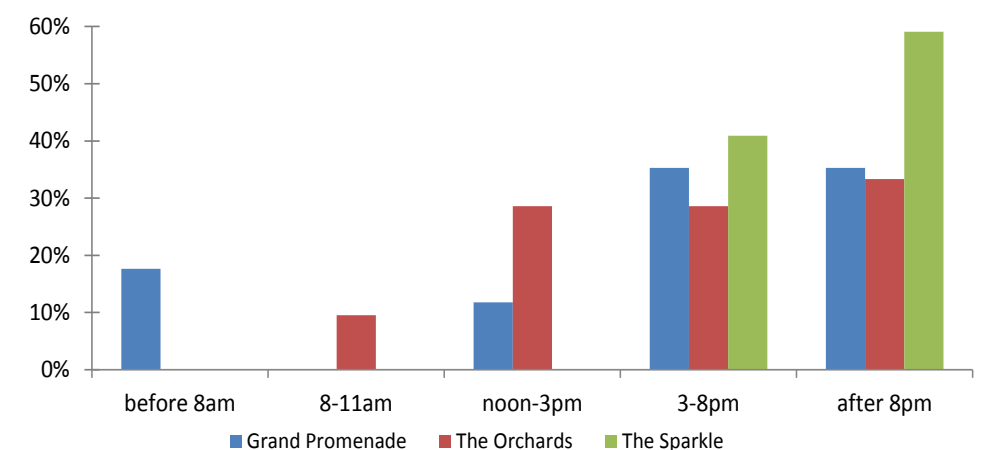
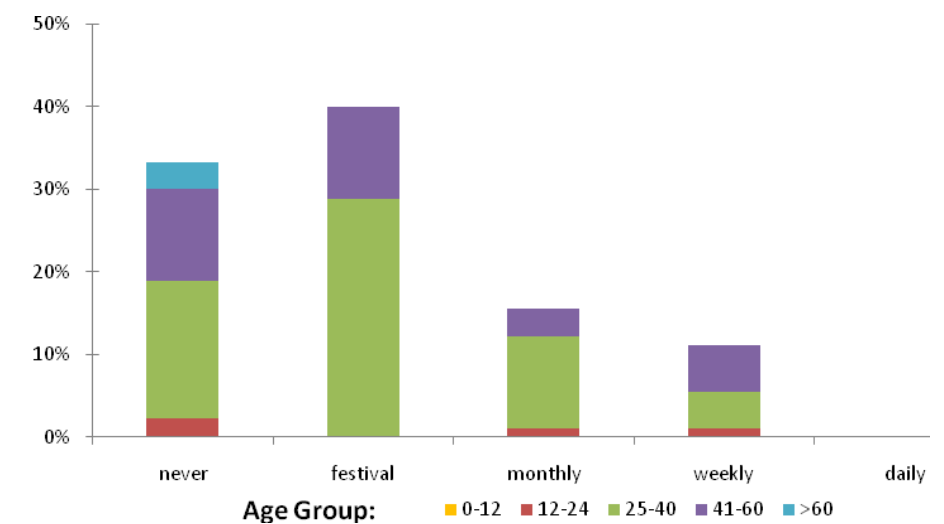
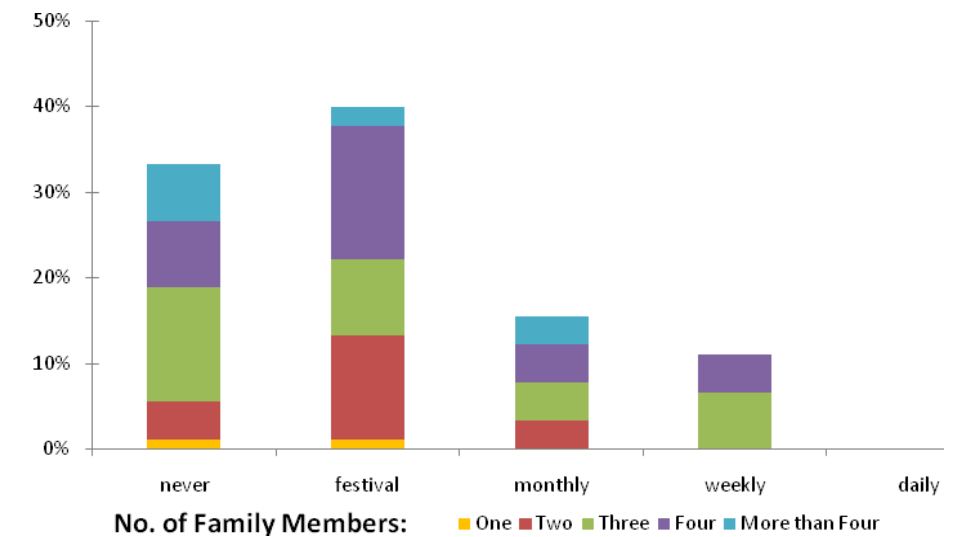
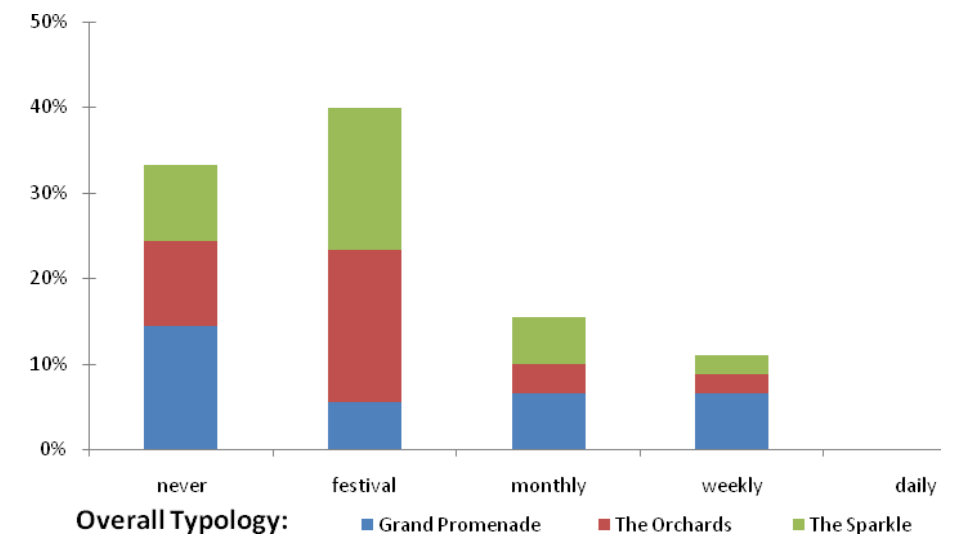
Residents' Experiences in Sky Gardens in HK

Sky Gardens selected for the Survey on Residents' Experiences

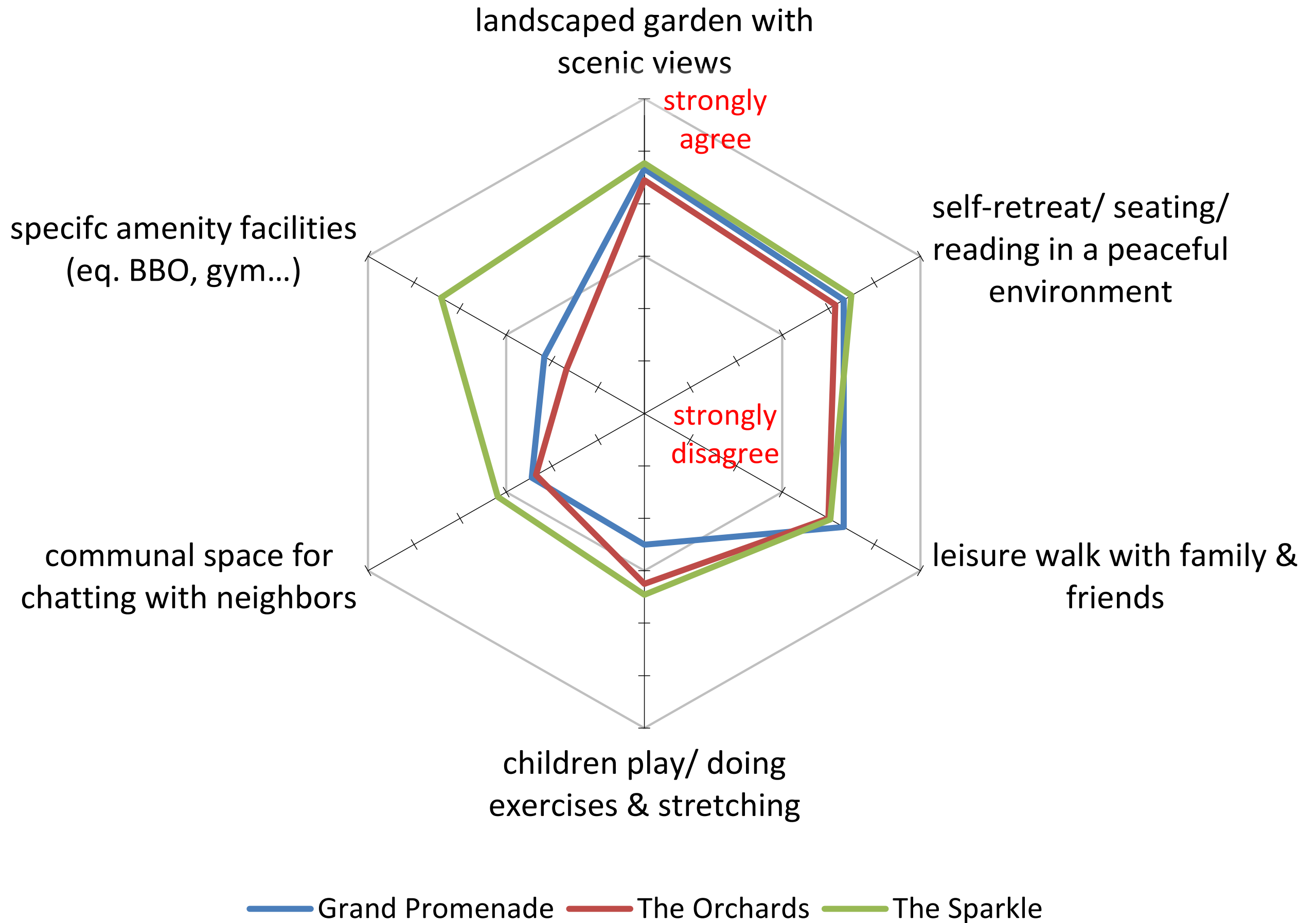
| | | | |
|----------------------|--|--|--|
| Typology | One mid-level sky garden | One low-level & one mid-level sky garden | One high-level sky garden connecting to sky clubhouse |
| Property Name | Grand Promenade | The Orchards | The Sparkle |
| Image |  |  |  |
| Location | Sai Wan Ho, HK (Harbour Front) | Quarry Bay, HK (Urban Area) | Cheung Sha Wan, HK (An Old District) |
| Completion | 2006 | 2003 | 2008 |
| Property Description | 5 blocks, 56-58 storeys, 2020 units (435-3,155 ft ²) | 2 blocks, 38 storeys, 442 units (790-1,737 ft ²) | 2 blocks, 37 storeys, 400 units (520-2,016 ft ²) |
| Design Theme | Art Garden (arts/sculpture) Sound Garden (bird /breeze) Tea Garden (tea/chess/bonsai) Scent Garden (flower scent, freshness & mist) | Japanese Garden British Garden Seating, strolling path, sculpture & planting | Soothing Green (music & lush greenery) Dancing Light (floor lights) Seating, audio devices, sculpture & planting |

Occupancy Rate & Pattern

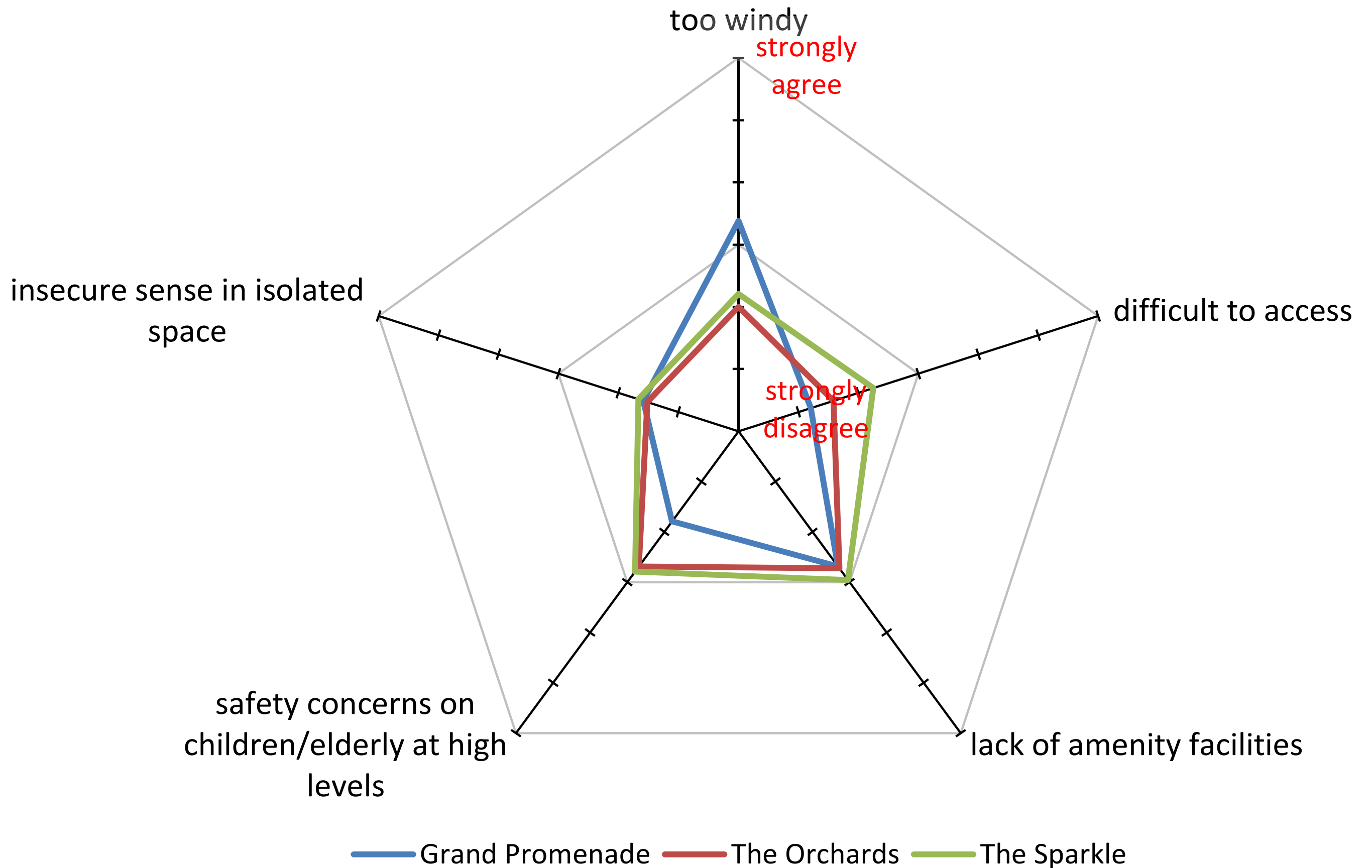
- 33% of residents never visit, 40% visit during festivals or special occasions, and 27% visit regularly on a weekly or monthly basis, but none on a daily basis
- The age of 25-40 are the main users
- Daytime visitors are not the majority: 43% after 8pm, 35% between 3-8pm and 13% between noon-3pm
- Different typologies pose slight variations



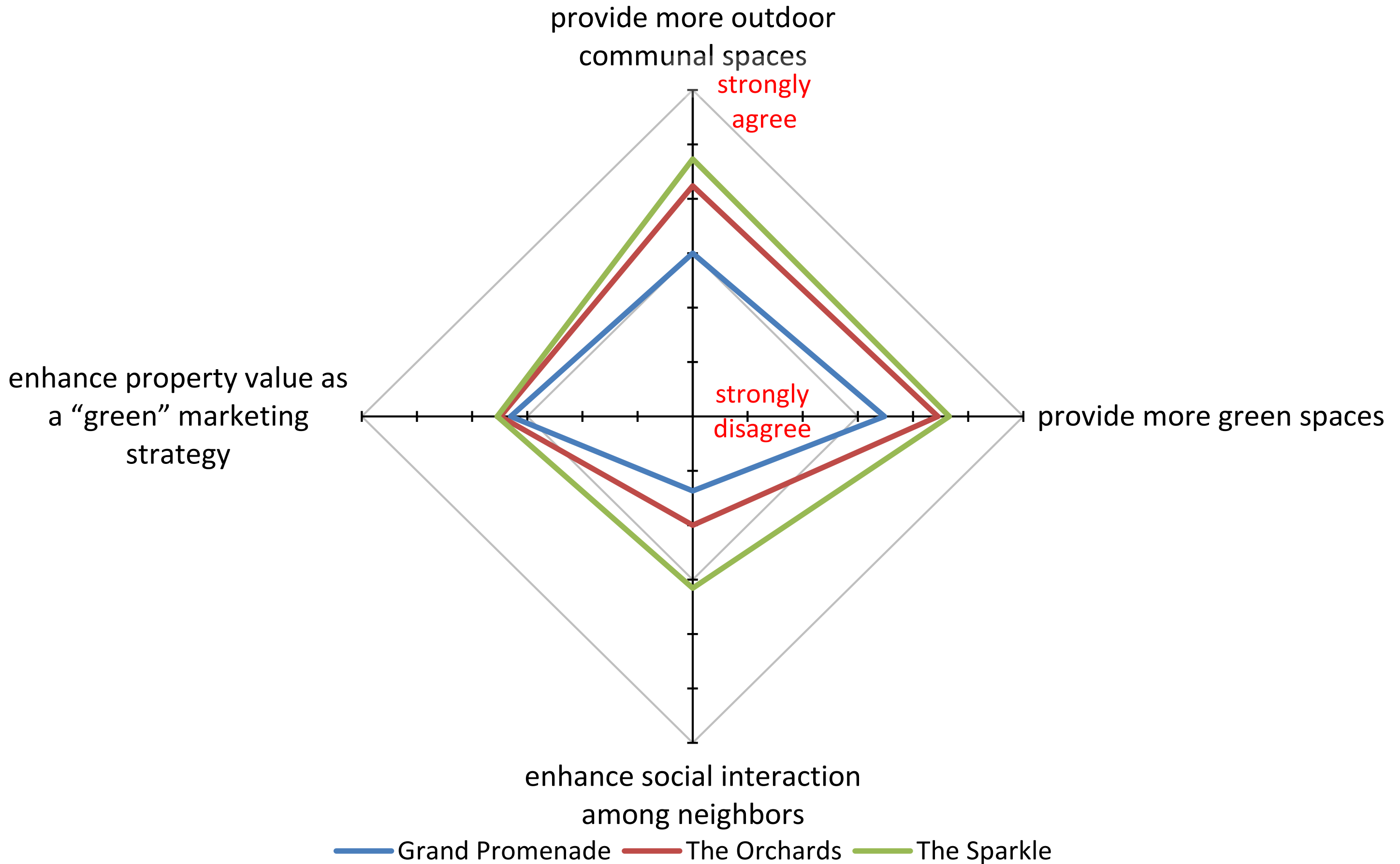
Reasons for Visiting Sky Gardens



Reasons for Not / Seldom Visiting Sky Gardens



Values of Sky Gardens



Can the existing sky gardens
improve the quality of urban
living?



Environmental

- Not obvious increase of building permeability and greenery ratio

Social

- Agree for self-retreat & leisure walk with family but not enhancing social interaction among neighbors
- Elderly & children are not frequent users

Economic

- Value of more pleasant communal spaces & greenery

Implementation of Current Guidelines

- No wind tunnel testing/CFD; No multi-levels; nominal provision for height concession

How can sky gardens maximize benefits for urban living?



How can sky gardens maximize benefits for urban living?



Building Permeability & Greenery

- Over 13m high SG at low-levels to alleviate urban ventilation; 4.5-6m high SG at mid- or high-levels
- Greenery is a perquisite not a by-product; greenery ratio in relation to population, enhancing chances of physical contact with greenery

Amenity & Spatial Quality

- SG act as a naturally-ventilated sky clubhouse
- Attractive elderly friendly facilities & children's play amenities
- Spacious event spaces with high headroom
- Scattered SG at multi-levels offer more chances of social interactions amongst neighbors & facilitate impromptu extension of living spaces

Summary

- Design of sky gardens needs to consider SPECIFIC environmental and social functions
- Qualitative & quantitative design of sky gardens are equally important
- Sky gardens at relatively low-levels emphasize building permeability with sufficient headroom
- Sky gardens at high-levels serve the purposes of recreation, social gathering and ambient cooling
- Scattered sky gardens with extensive planting integrate well with circulation spaces at multi-levels



Thank you