3.3 Landscaped Spaces

3.3.1 Introduction

Accessibility to the natural and built environment is important and equal access should not be denied to anyone.

In Hong Kong, the Outline Zoning Plans provide a prime reference in basic provision of public and private open spaces, at both local and district-wide levels. Open spaces (Recreational Open Spaces) count as one of the statutory land use zones despite the fact that land is a very scarce resource with extremely high premium in Hong Kong[1] (3.3.1a). Nevertheless, quality open spaces should be provided, free of charge and with unrestricted access, in diverse forms and different categories to cater for the widest spectrum of users. Quality landscaped spaces in cities enhance the urban environment, improve microclimate and contribute towards healthy living.

The external areas and open spaces in Hong Kong serve a wide spectrum of usage. The built up areas are densely populated, especially in the Kowloon peninsula where the population has reached over 43,000 persons per square km in the year 2006.[2] High quality external landscaped spaces serving various functions are much needed. Designing public open spaces is not simply about meeting statutory code requirements. In this section, the importance of universal accessibility in provision of public landscaped spaces will be discussed under four key aspects — physiological, psychological, social, and economical (3.3.1b).

Statutory Standards for Provision of Open Space in Hong Kong

In the urban areas, including the Metro Area and the New Towns, the standard for provision of open space is a minimum of 20 ha. per 100,000 persons i.e. 2m^2 per person, apportioned as follows:

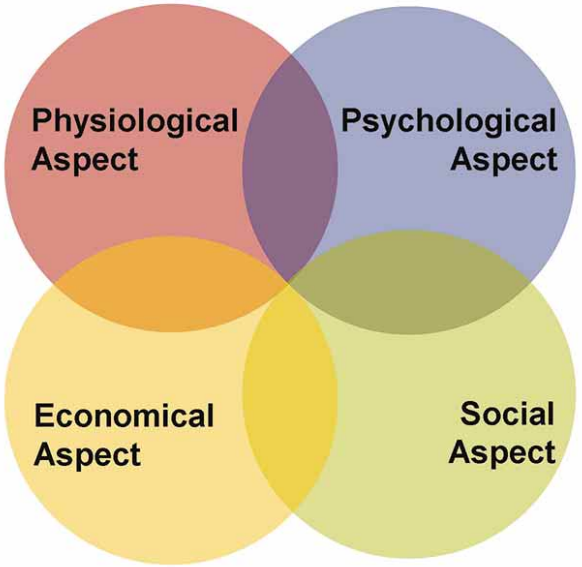
a. a minimum of 10 ha. per 100,000 persons (i.e. 1m^2 per person) for District Open Space;

and

b. a minimum of 10 ha. per 100,000 persons (i.e. 1m^2 per person) for Local Open Space.

Source: *Hong Kong Planning Standards and Guidelines Chapter 4, Subsection 1.8.2*

3.3.1a Provision level of open space for public use in Hong Kong



3.3.1b Four important aspects in provision of public landscaped spaces and external areas

[1] Hong Kong Planning Standards and Guidelines, Planning Department, the Hong Kong SAR Government
[2] Census and Statistics Department, the Hong Kong SAR Government

3.3.2 Physiological Aspect

3.3.2.1 Sunlight and Shade

Open outdoor space is much treasured by city dwellers (3.3.2.1a). Contact with nature is everyone's natural desire to a certain extent.

Fresh air and natural sunlight is vital for one's health and well-being. Nevertheless, in a city where ground-level radiation and glare can be very intense due to various factors, direct over-exposure to UV radiation can cause harm to the skin and eyes.

Due to global warming, protection from direct sunlight is essential for people doing either passive or active outdoor activities. In Hong Kong, average temperatures in the summer often exceed 31°C in the daytime and 28°C at night, with very high humidity[3]. The risk of heatstroke can be very high

Shaded areas created by trees are often very popular spots for people to stay or rest under on a hot sunny day (3.3.2.1b). Shading can also be provided by other landscape elements such as pergolas and trellises planted with climbers and/or vines (3.3.2.1c). Besides having visual merits, greening effect of vegetative covers also has environmental benefits.

3.3.2.2 Inclement Weather and Shelter

Protection from inclement weather is important when one is outdoors.

During the monsoon season, local weather can be very unpredictable and severe rainstorms can occur within a very short period of time (3.3.2.2a). There are also other natural forces such as lightning, thunderstorms, gale winds, landslips and floods. Such local weather conditions should be taken into consideration when

3.3.2.1a Opportunity to sunbathe on a lawn in a built-up city is highly treasured by city dwellers

3.3.2.1b On a hot sunny day, people often prefer staying under tree shading

3.3.2.1c Pergola and trellis with vegetation provide sunshading effect

[3] Local climatological information from Hong Kong Observatory, the Hong Kong SAR Government

designing external areas and open spaces. Appropriate protective provisions should be allowed during the construction stage (for the workers) and the commissioning stage (for both the users and the maintenance and operation staff) based on the specific site situation.

In public parks and gardens, shelters with direct and easy access to the main circulation route should be provided at reasonable intervals. In addition, the size of the shelters should be appropriate for the anticipated usage rate of the venue (3.3.2.2b). In urban parks or along country trails where natural terrain and other site conditions may dictate the location of shelters, clear signage indicating the walking distance to the nearest shelter location should be provided (3.3.2.2c).

3.3.2.3 Visual Relief

Lush vegetation has both environmental and visual merits. In built-up urban areas surrounded by high-rise buildings, pockets of green spaces, whether on ground level, podiums or rooftops, serve as pleasant visual relief for city dwellers (3.3.2.3a).

[3] Local climatological information from Hong Kong Observatory, the Hong Kong SAR Government

3.3.2.2a During the monsoon season, it is not unusual to have heavy rainfall exceeding 30mm in an hour, or even up to 70mm in an hour [3]

3.3.2.2b Shelters should be centrally located along the access path and the size should cater to the anticipated user rate

3.3.2.2c In many popular country parks, signage identifying the site location has proven to be vital in enhancing safety and security for visitors, park rangers and the police

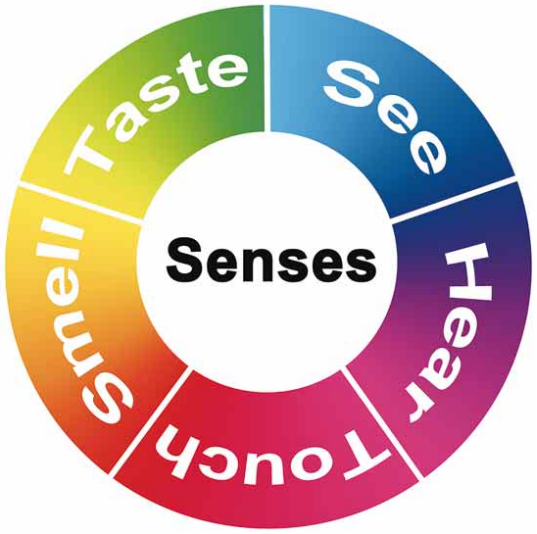
3.3.2.3a Mature trees offer much valued greening effect in Hong Kong

3.3.3 Psychological Aspect

3.3.3.1 Sensory Quality of Landscape Provision

Experience in open spaces ranges from passive engagement to active participation. The associated sensory experience varies between different people and depends on the individual's sensory abilities and response to external stimuli. Furthermore, the level of appreciation in response to sensory stimulation is not the same for everyone. Therefore, reliance on mono-sensory means for public spaces should be avoided.

Genius Locus (sense of a place) of our green spaces should be interpreted and enjoyed by the widest spectrum of users, by and beyond the "Five Senses"[4]. (3.3.3.1a and 3.3.3.2a).



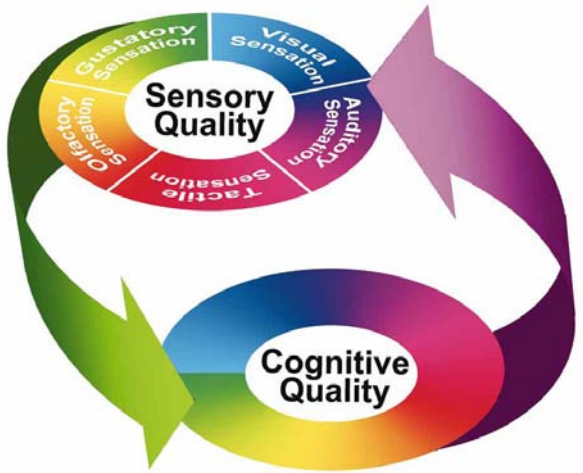
3.3.3.1a The five main senses

3.3.3.2 Cognitive Quality of Landscape Provision

In outdoor landscaped spaces, our pleasure ranges from passive (viewing) to active participation (gardening), and from spiritual rejuvenation (meditation) to physical exercises (ballgames) (3.3.3.2b).

All types of landscapes provoke some sensory response but it is the concentration of different experiences that sensory stimulations collectively give their spatial identity. Our experience of the world around us includes many other sensations that are not classified in one of our "Five Senses", such as orientation, temperature, change in gradient and altitude, gravity balance, spatial experiences and mood (3.3.3.2a).

A good combination of both sensory and cognitive qualities can create a comfortable, pleasant and inviting environment. However, an overload of sensory



3.3.3.2a Pushing beyond "Five Senses"

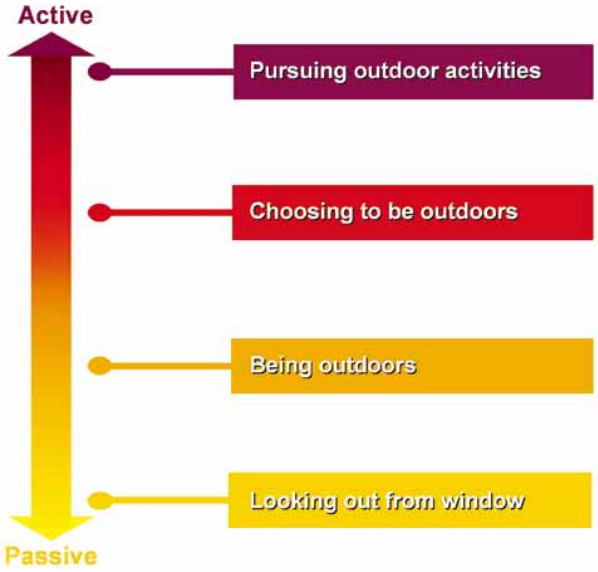
[4] The five main senses are also known as "Five Senses" that were firstly categorized by Aristotle — see (visual sensation), hear (auditory sensation), touch (tactile sensation), smell (olfactory sensation) and taste (gustatory sensation). Source from http://en.wikipedia.org/wiki/Sense

experience can also be confusing to some visitors. A successful design is largely based on imaginative approaches and normally requires full exploration.

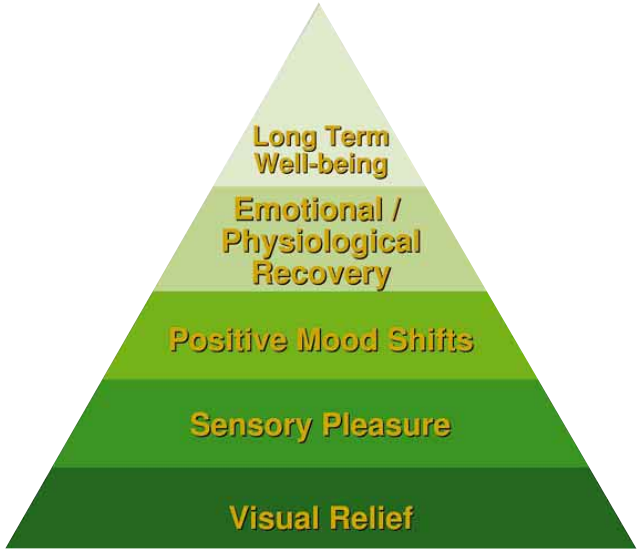
In the last few decades, there have been quite a few empirical studies from overseas countries with consistent findings showing a positive correlation between natural greenery and the emotional/physiological recovery rate of patients. Outdoor landscaped spaces have marked contribution towards other restorative and therapeutic functions inside hospital grounds and other health care facilities[5]. Both long-term and short-term benefits have also been identified in overseas research studies (3.3.3.2c). More importantly, these studies also revealed that visual and/or physical access to quality outdoor landscaped spaces could bring emotional and/or physiological benefits to all types of users — patients, staff, families, friends and visitors.

Contact with nature and appreciation of the outdoor scenery will provide natural cues to the passage of time. Having a sense of diurnal, seasonal and weather changes is integral to a quality life in terms of psychological well-being, especially in a high density built-up area.

Recognizing these findings is crucial in designing outdoor spaces in a high-density city like Hong Kong. Gaining access to quality landscaped spaces is especially important in Hong Kong since most people live in high-rise housing flats. Some may feel a sense of confinement staying indoors in their residential flats.



3.3.3.2b Range of experiencing green spaces [5]



3.3.3.2c Pyramid of benefits of quality green spaces [5]

[5] Based on the findings and review by Marcus and Barnes on the relevant research studies in overseas countries, 1995

3.3.4 Social Aspect

3.3.4.1 Multi-functional Use of Open Spaces

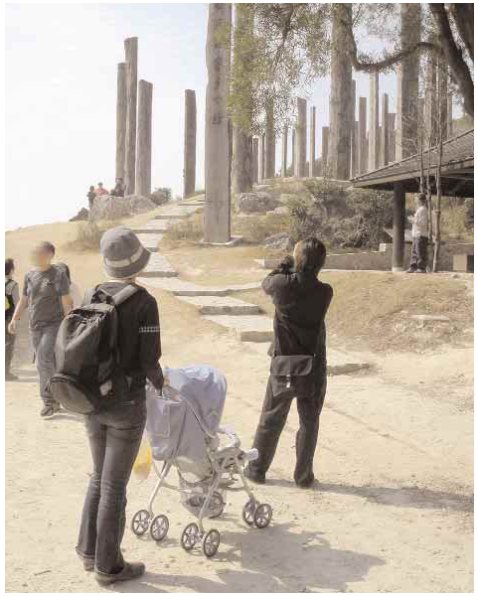
In many cities, communal external areas serve as multi-functional venues, for either formal or spontaneous use during different times of the day throughout the year. It is important that such facilities are safe and accessible to the widest spectrum of users.

External public spaces are integral to communal activities and street life. They form outdoor meeting points; morning exercise venues; family outing destinations; neighbourhood mingling spots; school picnic grounds; open arenas for informal cultural/religious events, sitting-out areas, etc. (3.3.4.1a, 3.3.4.1b, and 3.3.4.1c). Social needs vary amongst different people due to factors such as age, gender, culture, as well as physical, mental and economic abilities of individuals.

3.3.5 Economical Aspect

3.3.5.1 Economical Benefits of Improved Accessibility

There are overseas experiences that suggest a positive correlation between economical benefits and improved accessibility to business premises. Adoption of inclusive approach entails good accessibility as well as efficient and convenient usage of the facilities by a wide spectrum of users. Well-designed open spaces can serve as multi-purpose business venues supporting revenue-generating activities such as alfresco dinning, open-air trade shows, bazaars, etc. Commercial premises in the vicinity may also benefit from the expanded customer groups as a result of improved accessibility to the open areas.



3.3.4.1a External public spaces are integral to city life

3.3.4.1b Safe and accessible open spaces in the neighbourhood are important to the elderly

3.3.4.1c Accessible open spaces can serve as important places for social integration

3.3.6 Design Considerations for Landscaped Spaces

3.3.6.1 Soft Landscaping

Most people find soft landscaped areas appealing. In external spaces, planting of natural elements means more than cosmetic landscaping treatment to achieve a certain visual effect, or just to screen or improve the aesthetics of built elements. Soft landscaping plays an important role in enhancing our overall outdoor environment. By early planning and concerted effort of designers and all stakeholders, soft landscaping can fulfill various functions such as creating a sense of a place, indicating the flow of circulation or orientation, and meeting the therapeutic needs of specific user groups.

(a) Selection of planting materials

- Basic knowledge in plant anatomy is vital in landscape design (3.3.6.1a). There are quite a few plants that contain toxins or irritant substances in the natural outdoor environment. In Hong Kong, there is a wide range of such plants, trees, shrubs and climbers, etc. The symptoms of toxicities may range from allergies to potentially fatal poisoning risks. Ways of coming into contact with such plants are varied, and include ingestion and direct skin contact. Due care is therefore required in selecting and positioning the plant species that are within easy reach and in places where sensitive users are expected.

3.3.6.1a *Sapium sebiferum* (Chinese Tallow Tree), a commonly found native tree, has high amenity value with its spring/autumn colour, ecological importance to wildlife and other economic value. The bark and seed oil, however, are toxic

Rhus succedanea (Wax Tree), an indigenous tree, contributes to the natural landscape with its autumn leaf colours in our countryside. If tree sap comes into contact with the skin, it may cause skin irritation to some sensitive persons

- Future maintenance of the selected planting should also be considered. If there are any special maintenance requirements, they should be conveyed to the future operator or management team.

- Competent knowledge in both horticulture and physiology of plants is required in the selection of planting materials for landscape design. With sensible judgment, cautious design detailing and appropriate management, some of the plants that contain toxins can still be used in our external landscaped spaces. For instance, Oleanders, (*Thevetia peruviana, Nerium oleander*) common shrubby plants, are often used in roadside planting in Hong Kong and other Mediterranean countries for their hardy and pollution-resistant properties (3.3.6.1b).

- Warning signs may sometimes be required in tourist spots or public parks to identify the plants. For example, overseas visitors or local children may mistake the poisonous fleshy fruits of Cerbera (*Cerbera manghas*), a self-seeded indigenous tree commonly found on beaches, for Mango (*Mangifera indica*), an edible tropical fruit (3.3.6.1c).

- Many plant species feature dispersal of seeds and/or pollens by wind. Some of those plants may cause potential health problems if they are planted over a large area where sensitive users are expected. For instance, the ubiquitous forestry plantation of Tsugi (*Cryptomeria japonica*) in many Japanese cities has caused problems of hay fever in early spring. Other species with wind-borne seeds such as Willows (*Salix spp.*) and Cotton Trees (*Bombax ceiba*) may cause similar problems (3.3.6.1d). If possible, use of these plants near facilities such as hospitals and schools should be avoided since the users are likely to be sensitive to them.

3.3.6.1b (top) *Thevetia peruviana* (Yellow Oleander); (bottom) *Nerium oleander* (Oleander)

3.3.6.1c (top) *Cerbera manghas* (Cerbera); (bottom) *Mangifera indica* (Mango)

3.3.6.1d Flowers and seeds of *Bombax ceiba* (Tree Cotton)

- The morphology of the plants should be considered in amenity planting design. Leaves or stems of some trees, shrubs or ground covers with sharp spikes render them unsuitable for planting at easily accessible areas, e.g. planters within children play areas, hedges along the access routes in public spaces, etc. (3.3.6.1e).

(b) Positioning of planting materials

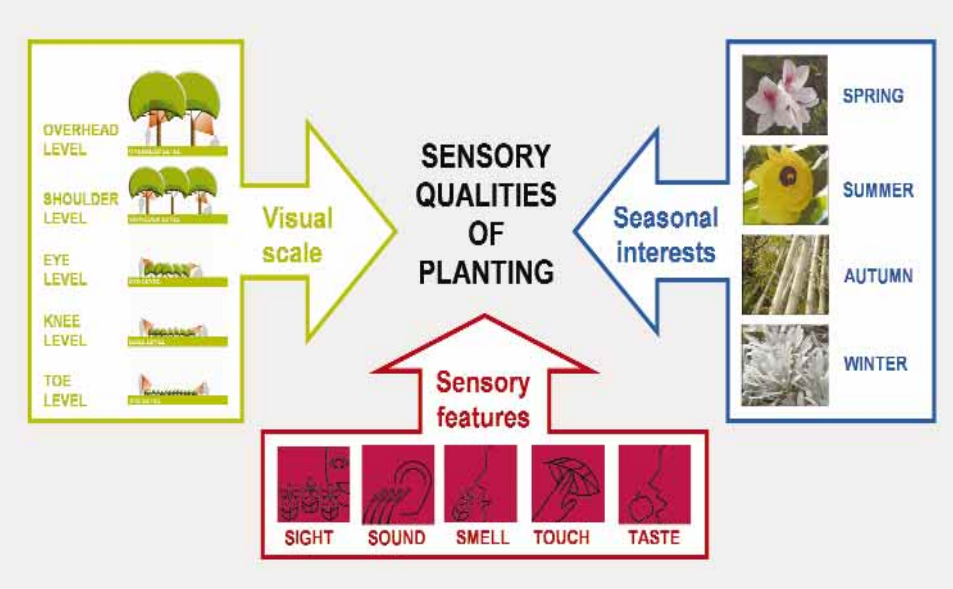
- **Safety Concern:** Low-branching trees should be regularly maintained with appropriate arboricultural practices, such as branch trimming or canopy lifting, so that they will not protrude onto seating areas or access routes. Similarly, climbers or trailers planted over the entrance gates or along footpaths should be regularly attended to (3.3.6.1f). A minimum clear height of 2 metres should be maintained; this is particularly important to protect those with visual impairment.

3.3.6.1e Some ornamental plants have spiky leaves or thorny stems

3.3.6.1f In public open spaces, tree branches or vigorous vine should not protrude onto the circulation spaces

- **Sensory Qualities:** Planting should be arranged in appropriate locations and heights such that they can be appreciated at their best angles (3.3.6.1g). The positioning of different planting materials such as trees, shrubs, groundcovers, etc. should not be dictated by aesthetic concerns alone. The sensory qualities of plants should also be considered during the planting design stage. In fact, different plant species have their own distinctive qualities in landscape use. Apart from giving visual/aesthetic merits (such as bright colour flowers), a tree species can be selected for a particular location for its shading effect; foliage texture; fragrant blossom/foliage; edible fruits; unique bark texture; or auditory effects of rustling foliage in the wind. In Hong Kong, many of the commonly found plants have multiple sensory qualities. The atmosphere of a place (*genius locus*) can be most effectively and distinctively created by making full use of the sensory qualities of the plants. Refer to Figure 3.3.6.1h for details.

3.3.6.1g Good design is required to display the unique sensory qualities of different plants in appropriate locations and at the best vantage points



3.3.6.1h Three important aspects contributing to the sensory qualities of planting

- **Visual Accessibility:** In most situations, it would be beneficial to bring the planting to the sightline of people while they are seated or when they are walking along a travel path. Amenity planting should take full advantage of the site condition, especially when there are potentially attractive vantage points nearby, so that the soft landscaping can complement its surroundings. In the urban areas, apart from the usual sightlines at ground level, those from high-rise buildings, podiums, elevated pedestrian walkways, etc. should also be considered when designing amenity planting (3.3.6.1i).

- **Physical Accessibility:** If a planting or lawn area is intended to be physically accessible by visitors, a good design approach is to raise the lawn or a portion of that area to an accessible height. This will enable wheelchair users, as well as those park-goers who have difficulty in sitting and/or bending their knees to be within reach of the planting or lawn area and have the same tactile experience enjoyed by others (3.3.6.1j). Such raised lawn should also be provided with an accessible route so that all users can go on it.

3.3.6.1i Visual access to the landscaped areas should be considered in the landscaping design

3.3.6.1j Raised planting or lawn areas can facilitate physical access by people with different abilities

(c) Practicality and sustainability

- Many people find plants with colourful blossom, contrasting texture, and distinct foliage very attractive; people with low vision can also appreciate them. During summer time when tropical rainstorms are frequent, hardy groundcovers with bright colour foliages can be used to achieve a similar effect, but without the intensive attendance and high maintenance costs (3.3.6.1k). When planting on a large site area, contrasting effects in colours and/or texture offered by the relatively long-lasting foliages can be considered rather than seasonal blossoms.

- Seasonal flowers are best seen in groups/bands and within close physical distance to the viewers. To reduce resources required for maintenance, different species or cultivars of herbaceous plants in consecutive life cycles should be used to prolong the blooming period (3.3.6.1m).

(d) Safety aspect and public hygiene

- All natural vegetation attracts wildlife to a certain extent. Abundant blossoms or fleshy berries in particular attract birds, bats, or insects such as butterflies, bees or wasps (3.3.6.1n). Careful selection of plants as well as proper management control is therefore vital in the design and operation of public landscaped areas. Where exposure to risk is high in the countryside, appropriate multi-media signage should be provided to give warning (3.3.6.1p).

3.3.6.1k Attractive planting can be achieved with different approaches

3.3.6.1m Seasonal flowers are best seen in groups/bands and within close physical distance to the viewers

- Some groundcovers or shrubby plants feature vigorous growth and have positive amenity attributes. By producing fast-growing vegetation covers, they are valuable in erosion control. However, plants with this special growing habit cause vermin problem if left unattended. For example, *Wedelia trilobata*, a commonly used roadside plant, features an abundance of attractive yellow flowers (3.3.6.1q). If planted extensively, regular cutting would be required to avoid undesirable thatching effect.

(e) Horticultural operations

Natural vegetation, including amenity planting, requires regular attendance for upkeep and maintenance. In carrying out routine horticultural operations, the following best practices for universal accessibility should be noted:

- When pruning is required for trees planted near a walkway/footpath or near play/exercise areas, the branches should be properly trimmed according to good arboricultural/horticultural practices and be finished without any sharp edges that could form a safety hazard (3.3.6.1r).

3.3.6.1n Some plants have fruits and berries attractive to birds, bats or insects, for example *Punica granatum* (Pomegranate) and *Melia azedarach* (China-berry)

3.3.6.1p A warning sign with message in written text, Braille, and graphics

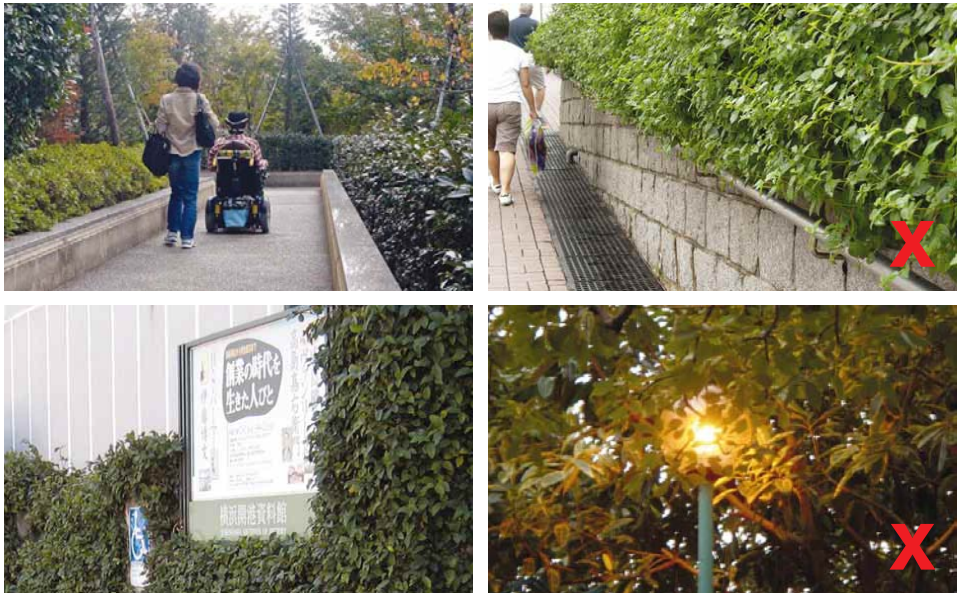
3.3.6.1q Plant the right species in right place with appropriate maintenance and management

3.3.6.1r Pruning works should be done correctly

- Regular pruning/trimming is required to ensure adequate clearance without any obstruction to crucial sightlines and passageways. Hedges along access route and at the junctions of passageways should always be kept below the sightline of wheelchair users and small children. Vegetations should not obstruct other functional provisions such as illumination, handrails, and signage, etc. (3.3.6.1s).

- If staking is required after tree planting, the metal or bamboo stakes should not have any exposed sharp edges or pointed ends. Any ties and wires should be appropriately placed to avoid tripping hazard if they are installed within reach of children playgrounds or sitting-out areas, etc. Bamboo poles used as tree stakes should be properly dressed and finished, and the top end should be sealed off to prevent mosquito breeding (3.3.6.1t).

- Temporary closure may be required during and after certain horticultural operations such as application of fertilizer/pesticide, particularly at lawns or planting beds within activities areas such as children playgrounds and ball courts, etc. Adequate warning signs should be provided accordingly (3.3.6.1u).



3.3.6.1s Vegetation should not obstruct any crucial sightlines, passageways, or any other functional provisions

3.3.6.1t Some good examples of proper staking

3.3.6.1u Warning sign on planting treated with pesticide

- Proper tree maintenance with good arboricultural practices is required in avoiding potential hazards. Slanting trees growing within accessible areas should be treated with care, especially during and after typhoons. Remains of tree stump in tree pits within access routes should be properly removed and the surface should be promptly reinstated (3.3.6.1v).

- To improve visual accessibility and form a unique tactile experience, special horticultural practices can be adopted to create distinct feature planting. Examples worth exploring are espalier, topiary, pleached trees and plashed hedges (3.3.6.1.w).

3.3.6.1v Proper tree care is essential in avoiding potential hazards

3.3.6.1w Different horticultural practices can be adopted to create visual and tactile interest — espalier on wall, topiary in a park, pleached trees at sitting areas and plashed hedges along footpath

3.3.6.2 Hard Landscaping

Apart from vegetation, hard landscaping is also essential in the design of the external environment. Hard landscaping elements can offer vast sensory experiences. The design of such elements should be carefully considered so that they can be utilized to help enhance accessibility and maximize users' enjoyment of the open space.

(a) Fountains and water features

- Water, with its versatile quality, can provide multi-sensory experiences. Water features can add visual, tactile, and auditory interest to an outdoor space; they can serve as landmarks that offer visual and auditory clues for orientation; they can be features that allow close interactive play; they can provide cooling effect to the surrounding environment; etc. (3.3.6.2a). Sometimes, the flowing sounds of water can even trigger fond memories. However, close attention should be paid to safety when designing fountains and water features.

(b) Rockery works

- Natural rocks, boulders, stones and artificial rockery in landscaped areas provide both visual and tactile sensory excitement. Different forms, sizes, dispositions should be explored to match with the overall design theme and to suit actual site conditions. Rockeries can be arranged to frame, screen, direct views, or put up as a focal point to facilitate orientation. On the contrary, inappropriately placed rockeries can block out strategic sightlines or lead to the potential hazard of tumbling over (3.3.6.2b).

(c) Mounds and raised planters

- Mounds and raised planters can be incorporated to take full advantage of the site conditions (3.3.6.2c). If designed well, a new dimension of spatial experience can be created. Similar to rockeries, they can be deployed to

3.3.6.2a Water splashing down the feature provides exciting visual, tactile, and auditory experience

3.3.6.2b Examples of rockery works

3.3.6.2c An accessible lawn for group gathering

enhance views or to provide accessible route by thoughtful site planning.

(d) Sculptures and sensory features

- Natural forces such as wind, rain, light and shadow, etc. can be taken advantage of to create multi-sensory features that generate interest, assist in orientation, facilitate educational opportunity, and enhance the atmosphere of landscaped spaces. Diurnal, seasonal and climatic changes should also be taken into account. Apart from their sensory qualities, features such as tactile sculptures, wind chimes, windmills and weathervanes can also serve as educational tools for young children (3.3.6.2d).

(e) Landscaping furniture

- The planting and landscaping furniture should complement each other to create a coherent design. Planting arrangements should be optimized to provide the desirable greening effect, or to offer alternative view angles (at different postures) to users of different needs and abilities (3.3.6.2e).

3.3.6.2d Examples of multi-sensory features using various tactile and visual materials to stimulate visitors' sensory experience

3.3.6.2e Examples of integrating amenity planting with site furniture

(f) Safety and health

- Proper connection to subsoil drainage system is crucial in avoiding algae growth and/or mosquito breeding. Weep-hole outlets should not be positioned directly onto travel paths or seating surfaces (3.3.6.2f). This is particularly important in Hong Kong where raised planters with sealed bottoms are frequented used on podiums and roof gardens.

- Effective drainage is essential for any accessible grass areas or lawns. Such areas, when poorly drained, will encourage algae growth and become very slippery (3.3.6.2g).

(g) Educational value

- Outdoor spaces provide stimulating settings and excellent opportunities for learning. A wide range of educational activities can be integrated into the design of soft and hard landscaping elements to allow a wide spectrum of users to learn more about the natural environment.

- For example, leaves from trees grown inside a park can be cast into concrete panels as visual and tactile illustrations; fresh water habitat can be made reachable to visitors of different statures by growing aquatic plants in pots of different sizes; multi-media plant labels can be provided at different heights for various groups of visitors, etc. (3.3.6.2h).

3.3.6.2f Proper drainage design for raised planters is essential

3.3.6.2g Poorly drained lawns are hazardous

3.3.6.2h Educational aspect integrated into the landscaping design

3.3.7 Sensory Gardens

3.3.7.1 An Overseas Example — A Sensory Garden in a Public District Park

This sensory garden is perhaps one of the first few examples found overseas that adopts the concept of universal accessibility in creating and maintaining a public park/garden. The garden of about 2,000 sq.m. is situated within a public district park of nearly 90 hectares.

The original project brief was to renovate an existing Garden for the Blind [6], which had become rundown. However, the designer's vision extended further and he converted this reclusive place into a fully accessible landscaped garden for all potential visitors irrespective of their physical ability and age.

From overall site planning to detailed design, all aspects were thoroughly planned out (3.3.7.1a to 3.3.7.1y). Positive commitment from the local community and user groups was successfully solicited at the start of the project. Moreover, all provisions in the garden were fully tested during the commissioning stage, and the effort was further sustained in the operation and maintenance programme by means of volunteer support. The garden has now become a popular yet tranquil area within the district park.

This is a very successful example of achieving universal accessibility in a public open space without undermining the aesthetic quality or the functional requirements.

[6] Y. Miyake, the designer of the project. See Preiser, 2001.

3.3.7.1a Large sign for visitors arriving by car

3.3.7.1b Multi-media directory that conveys information to all users

3.3.7.1c User-friendly devices

Best Practices Observed

(a) Multi-media information

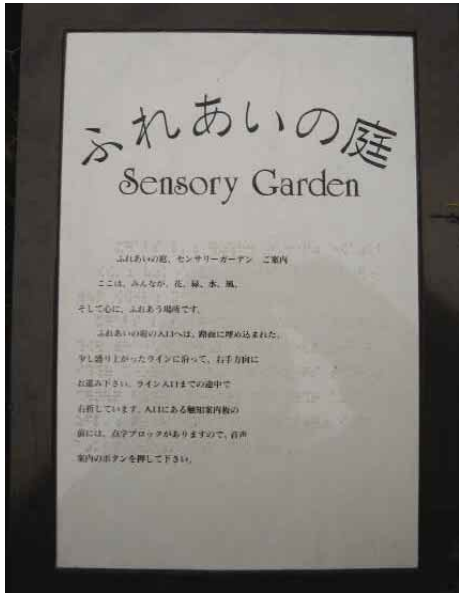
- A large eye-catching road sign shows visitors arriving by car the direction to the Park's main entrance (3.3.7.1a).
- Overall information about the Park is presented on a large directory mounted on a tilted plane (3.3.7.1b). The multi-media directory has a large coloured map and picture plates, audio devices activated by large buttons, as well as information in large text and Braille (3.3.7.1c). The directory is designed to be accessible to all visitors.
- Pictorial signs are located at major junctions throughout the park for easy way finding (3.3.7.1d).
- To facilitate appreciation by all visitors, relief clay tiles of feature plants grown in the garden are displayed along the entrance wall. The tiles indicate the outlines of both flower and leaf as well as the name of the plant. Information in Braille is also provided underneath the guide handrail (3.3.7.1e).
- At the entrance, signage both in written text and in Braille provides information about the garden (3.3.7.1f).
- To facilitate appreciation of the seasonal flowers by visitors, adaptable weatherproof plant labels are provided with the plant name in written text, syllabic writing and Braille (3.3.7.1g).

(b) Accessible design features and supporting services

- There is an unobstructed accessible entrance from the park into the sensory garden. A low feature wall together with a tactile guide path and handrails give clear direction into the garden (3.3.7.1h).

3.3.7.1d Pictorial signs that facilitate way finding

3.3.7.1e Landscape feature with visual and tactile sensory interest



3.3.7.1f Information provided in written text and in Braille

3.3.7.1g A good and simple example of plant label that can be flexibly used

3.3.7.1h Clear visual and tactile clues leading to the entrance gate of the garden

- At the main entrance of the garden, a multi-media information panel is placed at an accessible height. Information is presented in tactile graphics, written text and Braille; audio messages are activated by large push buttons (3.3.7.1i).

- At each junction along the travel route, a pair of unique eye-catching gateway features is placed on top of pillars to facilitate orientation and way finding (3.3.7.1j).

- An accessible pocket space with a timber bench is ingeniously designed along the accessible edge of a raised reflective pool. This provides a seamless visual link to the existing pond and brings the water surface (and aquatic plants) to an accessible level (3.3.7.1k).

- Seating benches are set back from the main circulation path and recessed into the raised flowerbeds, providing easy access to the low-lying herbaceous plants. Toe space provided at the bottom of the raised planters facilitate visitors to lean forward or to get some support from the planter edge (3.3.7.1m).

- Innovative design of a small water feature (a raised pond) provides both wheelchair access and visual link to the existing pond of the park. An overhanging edge brings the water surface to a reachable distance and enables the splashing of water by wheelchair-bound visitors, children, and those who have problems bending down (3.3.7.1n).

- Seating opportunity is maximized at locations where elements that stimulate sight and/or sound are provided. Wheelchair space is also provided next to the bench offering equal opportunity for every visitor to enjoy the pleasant experience (3.3.7.1p).

3.3.7.1i Multi-media information panel is very popular amongst visitors

3.3.7.1k Water surface is at a reachable range at this seating pocket, which is also provided with a wheelchair space

3.3.7.1n Carefully designed planters and water features with knee and toe space

3.3.7.1j Clear visual and tactile clues to facilitate way finding within the garden

3.3.7.1m Seating benches recessed into raised flowerbeds

3.3.7.1p Good spatial relationship between seating bench and sensory attractions

- Seating is provided to maximize enjoyment of the best views or scenery within the herbaceous garden. Armrests are spaced out at different intervals to meet diverse needs (3.3.7.1q).

- A toilet block is provided near the main entrance of the garden for convenience (3.3.7.1r). A full range of user-friendly provisions is found, including tactile guide path, floor plan with illustrations in written text and Braille, and large information signs, etc.

- An accessible and easy to operate turnstile is provided at the main park entrance from the car park area. It is a very useful device for controlling unauthorized vehicular access, while allowing free admission to visitors with bicycles, prams and wheelchairs (3.3.7.1s).

(c) Sensory stimulations for different experiences

Both natural and built elements with multi-sensory qualities are fully deployed and displayed throughout the garden.

For visual and tactile sensations — A small sculpture is displayed on top of a low pedestal, which is also accessible to wheelchair users. This artwork is accessible to all visitors for visual and tactile appreciation (3.3.7.1t).

For visual, tactile and gustatory sensations — A traditional culinary herb (*Borago officinalis*) with profuse vivid flowers is planted in groups along the edge of the accessible raised planters. Apart from being eye-catching and pleasant, the plant's leaves covered with silvery hairs provide an exciting sense of touch (3.3.7.1u).

3.3.7.1q Adaptive seating

3.3.7.1r Toilet block located at the main entrance

3.3.7.1s Accessible turnstile that controls unauthorized vehicular access

For auditory and tactile sensations — A special courtyard, named after the main landscape feature of a "water harp", is accessible to all visitors; everyone can enjoy hearing the musical echoes of water dripping into a buried urn. This is an excellent example of modernizing the design of a traditional Japanese garden feature that is otherwise provided at ground level and not readily accessible (3.3.7.1v).

For visual and tactile sensations — A thick evergreen hedge with an opening is strategically located at the main entrance to create a visual surprise. This dramatic effect is also readily appreciated by visually impaired visitors who are sensitive to the contrast between solid and void (3.3.7.1w).

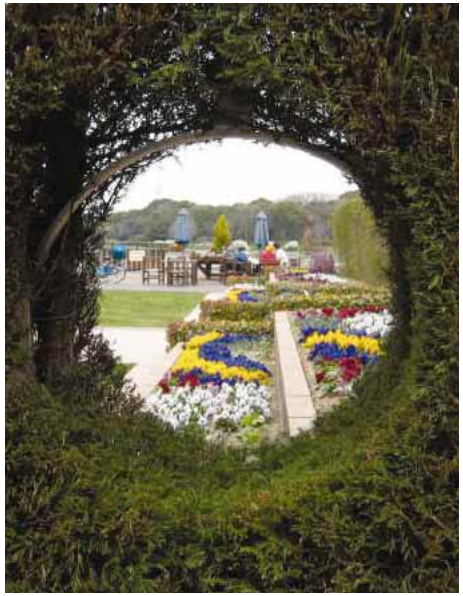
For visual, tactile and auditory sensations — Water cascade from the raised pond (a small elongated water feature) is accessible to wheelchair users and visually impaired visitors. Good drainage with appropriate size grating is provided (3.3.7.1x).

For visual, tactile and olfactory sensations — Seasonal planting is well planned to achieve a layering effect of contrasting colours at varying heights and in various visual distances. Mixed planting includes herbaceous with fragrant blossom and aromatic foliage (3.3.7.1y).

3.3.7.1t Rustic sculpture placed at reachable level

3.3.7.1u Attractive blossom of *Borago officinalis* (Common Borage)

3.3.7.1v Modern application of a traditional Japanese garden feature



3.3.7.1w Evergreen hedges clipped to give a dramatic effect

3.3.7.1x Water feature accessible to all visitors including children, adults, and people with disabilities

3.3.7.1y Attractive layering effect of colourful blossoms

3.3.7.2 A Local Example — A Sensory Garden in a Special School

This is a unique renovation project of an external space within the compound of a special school. In fact, it is the first purposely built sensory garden in Hong Kong providing holistic training in an outdoor environment. The garden was open for use by the students in January 2006. The objective of the project is to provide an outdoor environment that caters for a full range of educational and physical activities, and at the same time provides students the opportunity for rehabilitation and social skill training.

The school with boarding facilities has slightly over a hundred students, aged 6 to 16, with severe mental impairment. Many of them also have multiple physical disabilities. Therefore, both accessibility and sensory stimulation are given the highest priority in the design of the garden.

Various proprietary and tailor-made facilities are provided along the travel path amidst the serene landscaped setting. All the facilities are designed to cater for flexible use and the activities are suitable for various class sizes so as to tie in with the school's curriculum and events. The garden offers an inviting venue for enjoyment not only by the students but also for the staff, parents, volunteers and visitors.

Best Practices Observed

(a) Sensory stimulations for different experiences

- Multi-sensory features stimulate the students' senses of touch, hearing, and sight. However, features with components such as loosely laid pebbles would require close supervision when they are used by the school children (3.3.7.2a).

3.3.7.2a Outdoor multi-sensory feature

3.3.7.2b Different play modes to encourage physical and social interaction

3.3.7.2c Audio play components are provided at different range of reach

- Talking tubes promote various physical and social skills, such as speaking, listening, self-expression and communication (3.3.7.2b).

- Specially designed acoustic device is installed on colourful floor matting and set back in a spacious pocket from the main circulation path for easy access by the users (3.3.7.2c). Sensation awareness and connection with the surrounding environment and nature is positively promoted by listening to the sounds of the wind, blowing leaves, and singing birds, etc.

- Low-lying herbaceous flowers are planted within reach around seating benches that are inlaid with colourful tiles (3.3.7.2d). Integration of planting and seating promotes close contact with nature and appreciation of natural beauty.

(b) Wide spectrum of activities for users with different abilities

- The same multi-sensory feature is provided at various reachable heights to allow participation by different groups of users (3.3.7.2e). Seating is provided nearby for children with low physical strength; sharp edges and corners are avoided.

- Low-effort games offered by stimulating panels in bold graphic and bright colours (3.3.7.2f).

3.3.7.2d Playful seating bench

3.3.7.2e Play features with variety and diversity

3.3.7.2f Low-effort games to meet different needs

- A mini-grotto, installed in a safe and protected setting, evokes the urge to explore. The artificial rockery adds a new dimension to the garden. Inside the tunnel, children can appreciate the strong contrast with the outside — light verse dark, dry verses wet, busy verses tranquil, exposure verses enclosure (3.3.7.2g).

- The ballgame area is designed in an informal setting accessible via different pathways in different floor finishes. In addition, the large low-level goal fosters a positive sense of achievement for the players. Sizable openings with four outlets allow four users to play at the same time (3.3.7.2h).

- Unidirectional swings with adaptable seats equipped with special safety device cater for children with various special needs (3.3.7.2i).

3.3.7.2g A specially designed mini-grotto

3.3.7.2h Positive sense of achievement can be developed during playtime

3.3.7.2i Specially designed swings to meet special needs