

# Universal Design and Technical Requirements



## 2.1 Universal Accessibility

### 2.1.1 Introduction

### 2.1.2 Inaccessible design > > Disabled Access > > Barrier-Free Access > > Universal Design

### 2.1.3 Universal Design Approach

### 2.1.4 Travel chain analysis

## 2.1 Universal Accessibility

### 2.1.1 Introduction

The concept of Universal Design forms the backbone of Universal Accessibility. It is a design approach to a universally accessible standard in which all products, environments and communications will allow for the widest spectrum of people in our communities regardless of diversity, age and ability.

### 2.1.2 Inaccessible design > Disabled Access > Barrier-Free Access > Universal Design

Universal design requires a quantum leap in thinking from the concept of barrier-free access or disabled access. It is a positive approach of design to achieve an inclusive integral design that is not only accessible by the widest possible array of users based on their abilities but the solutions would also be beneficial to most of the users. Unlike disabled access or barrier-free access design, universal design is not about designing specialized features for access, it is a common practice design approach for achieving good and sustainable architectural accessibility.

### 2.1.3 Universal Design Approach

Universal design provides barrier-free environment allowing for the inclusion of the widest possible array of people of all diversity, age, ability or disability. It is recognized that universal design is not designing for “all” but for the widest spectrum of users.

### 2.1.4 Travel chain analysis

In order to achieve universal design accessibility, the complete travel chain must be considered from the person’s flat to the street; to the public transportation; on the transport vehicle; to the drop off point; to the destination building; inside the destination building to the room where the intended function would take place; and finally the function itself.

The whole effort spreads across different parts of the built environment designed by different disciplines. Architects safeguard the most important parts of all – the two ends of the travel chain – the departure points and the destinations. It is essential that the mini travel chains within each building are accessible. This mini travel chain would probably involve:

drop-off point > approach > main entrance > lobby information > lift or escalator or staircase > upper lift lobby > corridor > internal door > room > intended function > toilet > return route > exit

After gaining access to the right place inside the building, it is most important to enable the intended function to be performed.

Some provisions for persons with disability are covered in the Design Manual: Barrier Free Access 1997 to address the requirements, such as the obligatory requirements for wheelchair space in auditorium; low public services counter; disabled toilet, induction loop for auditorium; and the recommended requirements for low level switches, high position socket outlets, etc. However, some provisions in buildings are not covered, for example, there is no specific mention of requirements for accessible drinking fountain and access to auditorium stage.

## 2.1.5 Principles and Standards

### 2.1.6 Seven Principles of Universal Design<sup>1</sup>

#### 2.1.7 Key elements

#### 2.1.8 How safe, how comfortable and how user-friendly

### 2.1.5 Principles and Standards

Following the accessibility-functional-environmental assessment that helps in identifying the elements requiring attention, the seven principles of universal design provide the performance-based objectives for the design to achieve. There are many articles written about these principles developed by the Centre for Universal Design, North Carolina State University.

### 2.1.6 Seven Principles of Universal Design<sup>1</sup>

Principle 1: Equitable Use

Principle 2: Flexibility in Use

Principle 3: Simple and Intuitive Use

Principle 4: Perceptible Information

Principle 5: Tolerance for Error

Principle 6: Low Physical Effort

Principle 7: Size and Space for Approach and Use

The Principles of Universal Design (UD) were developed by a group of UD advocates. They are general high level principles which apply across environment, products and communication. Each project and each site offer a different opportunity for the designer to apply the UD concept and cast them into local perspectives.

### 2.1.7 Key elements

Some provisions are absolutely essential and they are the key elements or features in a design in terms of accessibility for the intended usage. With these provisions in place, they will enable at least a minimum degree of accessibility for the intended usage. On the contrary, if these provisions are missing, no matter how high the standards are applied to the rest of the design, accessibility and the intended usage cannot be achieved.

The essential provisions can be measurement, sound, image, material or compatibility. An example is the barrier-free access requirements for a lift.

The size of the clear door opening ; the lift car internal dimensions : the height of the control panel, the audio and visual signals ; and the tactile control are all essential items to contribute to a self-operable all-in-one design usable by a very wide range of users. If anyone of these standards is missing, one group of users will not be able to use the lift.

Sometimes, the provisions for different groups of users in the same design would result in an inconsistent or conflicting outcome but we can still have a universal design solution. In such a situation, the designer must maintain the essential standards and give them overriding priority and importance over other requirements, while at the same time devoting equal weight to each of them.

### 2.1.8 How safe, how comfortable and how user-friendly

The access requirements for a lift is well defined and standardized. However, not many architectural features have barrier free access requirements as well defined as for the lifts and even fewer are standardized.

Best practice would be to question yourself how safe, how comfortable and how user-friendly your design is. For example, a design with a gentle sloping main access route is obviously safer, more comfortable and more user-friendly than a design with a main access having a few steps together with an alternative ramped access. If barrier free access features are taken as the main access features, they not only provide a safer, more comfortable and user-friendlier design in most of the cases, but also result in a more aesthetically pleasing design.

<sup>1</sup> The Principles of Universal Design, Version 2.0. Raleigh, NC: North Carolina State University. (Copyright © 1997 North Carolina State University, The Center for Universal Design)

### 2.1.9 Completion inspection on accessibility

## 2.2 Legislation and Standards

### 2.2.1 Legislation

### 2.2.2 Reference standards and guidelines

### 2.1.9 Completion inspection on accessibility

Evaluating how safe, how comfortable and how user-friendly is a continuous process throughout various stages. An inspection should be carried out near completion to test the accessibility of the whole travel chain. This inspection should not be treated the same as other normal site inspections because usually the building inspection will start after the architect arrives inside the premises. The external works are normally left to the last to finish. However, two small steps right at the boundary of the lot at the main access or at the vehicle drop-off point would declare the building totally inaccessible, no matter how accessible it is inside the building.

The essence is to carry through the concept to ensure all building works within the boundary are accessible.

## 2.2 Legislation and Standards

### 2.2.1 Legislation

The statutory requirements on disabled access have been in force since 1984 and subsequently the requirements have been revised to provide barrier-free access to buildings in 1997. The Disability Discrimination Ordinance has come into operation in 1996.

Other than these two Ordinances, there are also a number of other Ordinances with requirements specific for certain types of premises to cater for the need of specific groups of users, such as the requirements for wheelchair access in the Residential Care Homes (Elderly Persons) Ordinance.

All these statutory requirements intend to safeguard and ensure that the design of buildings will achieve a minimal level of accessibility enabling persons with disability, the elderly, pregnant women, children, and indeed a broad spectrum of the community to have greater independence and comfort in using the building.

Apart from the statutory requirements, there are also a number of reference standards providing guidelines on how to achieve the required or even higher standards of accessibility. These include:-

- The Design Manual: Barrier Free Access 1997;
- The relevant Practice Note for Authorized Persons and Registered Structural Engineers;
- The Code of Practice on various aspects related to the Disability Discrimination Ordinance issued by the Equal Opportunity Commission; and
- A vast amount of national and international standards available in China and overseas countries.

The local standards should be adopted in all Government buildings as far as practicable while the national and international standards can provide supplementary guidance in many of the areas not covered by the local standards.

In 2003, a consultancy study to “Draft a Design Manual on Barrier Free Access and Facilities for Persons with a Disability and for the Elderly” was commissioned by the Buildings Department. The draft revised Manual will be issued for consultation in 2005.

Legislations in Hong Kong will be keeping closer in pace with the rest of the world. The statutory requirements on accessibility will only become more comprehensive and demanding for architects’ design abilities. Direct and literal application of the requirements into the design without inspiration would only create unsatisfactory solutions. It is time to adopt a positive approach and to take the requirements as a challenge for innovative design by applying the universal design approach. Once the human accessibility factor is put back in the right and foremost place in the formulation of a design, a truly sustainable development may be achieved.

### 2.2.3 A list of some of the statutory requirements and standards applicable to majority of government buildings (non-exhaustive):

Description	Type	Reference
Buildings Ordinance Section 38	Statutory (CAP123)	
Buildings (Planning) Regulations 72	Statutory (CAP123F)	
Disability Discrimination Ordinance	Statutory (CAP487)	
Residential Care Home (Elderly Persons) Ordinance	Statutory (CAP459)	
Design Manual: Barrier Free Access 1997 (DMBFA97) Guidelines Practice Note for Authorized Persons and Registered Structural Engineers (PNAP)		
PNAP247 – Clarifications of DMBFA97 (Tactile warning strips for staircases, handrails, raised directional signs on handrails, tactile guide path, lift control buttons)	Guidelines related to statutory requirements	
PNAP266 – Level difference for floor adjoining external ground floor or flat roof	Guidelines related to statutory requirements	
Disability Discrimination Ordinance – Code of Practice on Education	Guidelines	
Amendment 10 on Stairlift - Code of Practice on the Design and Construction of Lifts and Escalators (1993 Edition) (pursuant to section 27G of the Lifts and Escalators (Safety) Ordinance)	Guidelines related to statutory requirements	
Hong Kong Planning Standards and Guidelines (HKPSG)	Guidelines	
Transport Planning and Design Manual (TPDM)	Guidelines	Transport Department
Principals of Universal Design <sup>1</sup>	Guidelines (international)	
Draft Design Manual on Barrier Free Access and Facilities for Persons with a Disability and for the Elderly	Guidelines (some of which may be enacted as statutory requirements later)	To be issued for consultation in 2005.

<sup>1</sup> The Principles of Universal Design, Version 2.0. Raleigh, NC: North Carolina State University. (Copyright ©1997 North Carolina State University, The Center for Universal Design)