

Fire Safety for All Conference

International Best Practices
The Asia High Density & High Rise Perspective

GOBIERNO de ESPAÑA
Ministerio de Educación, Política Y Deporte

Madrid Spain

23 March 2017

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Y2K

**Millennium Development Goals
2000 (MDG)**

Shortcomings of MDG (Non-Inclusive)



Y2K + 15

**Sustainable Development Goals
2015 (SDG)**

Address the Shortcomings of MDG



SUSTAINABLE DEVELOPMENT GOALS

17 GOALS TO TRANSFORM OUR WORLD

Half of humanity - 3.5 billion people - lives in cities today

By 2030, almost 60 per cent of the world's population will live in urban areas

95 per cent of urban expansion in the next decades will take place in developing world

828 million people live in slums today and the number keeps rising

The world's cities occupy just 3 per cent of the Earth's land, but account for 60-80 per cent of energy consumption and 75 per cent of carbon emissions

Rapid urbanization is exerting pressure on fresh water supplies, sewage, the living environment, and public health

But the high density of cities can bring efficiency gains and technological innovation while reducing resource and energy consumption

SDG 2015



50 YEARS

United Nations Development Programme

Our Work

Sustainable Development Goals

Blog

Home > Sustainable Development Goals >

Sustainable Development Goals (SDGs)

"World leaders have an unprecedented opportunity this year to shift the world onto a path of inclusive, sustainable and resilient development" - Helen Clark, UNDP Administrator.

At the United Nations Sustainable Development Summit on 25 September 2015, world leaders adopted the [2030 Agenda for Sustainable Development](#), which includes a set of 17 Sustainable Development Goals (SDGs) to end poverty, fight inequality and injustice, and tackle climate change by 2030.



What are the Sustainable Development Goals?



**Goal 11:
Sustainable Cities and
Communities**



GOAL 11

Make cities and human settlements **inclusive**, **safe**, resilient and sustainable



Make cities **inclusive, safe, resilient and sustainable**

- More than half of the world's population now live in urban areas
- By 2050, that figure will have risen to 6.5 billion people - two-thirds of humanity
- **Sustainable development cannot be achieved without significantly transforming the way we build and manage our urban spaces**
- The rapid growth of cities in the developing world, coupled with increasing rural to urban migration, has led to a boom in mega-cities
- In 1990, there were ten mega-cities with 10 million inhabitants or more. In 2014, there are 28 mega-cities, home to a total 453 million people

SDG 2015

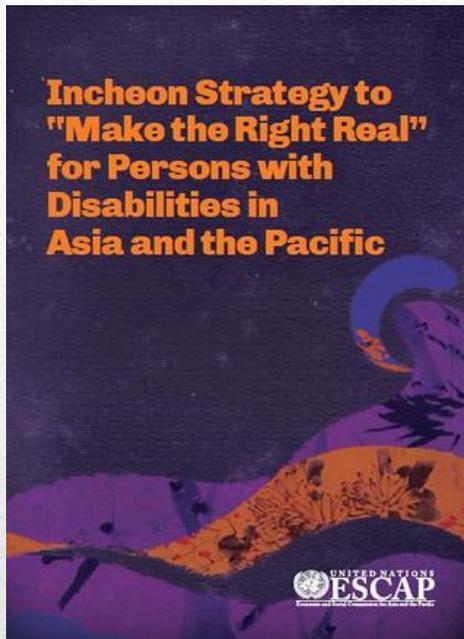
Goal 11. Make cities and human settlements **inclusive, safe, resilient and sustainable**

11.1: By 2030, ensure **access for all to** adequate, **safe and affordable housing** and basic services and upgrade slums

11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons

11.7: By 2030, provide **universal access** to **safe, inclusive** and **accessible**, green and **public spaces**, in particular for **women and children, older persons and persons with disabilities**

Disability in the SGD's Indicators



Incheon Strategy to “**Make the Right Real**” for Persons with Disabilities in Asia and the Pacific

Governments of the ESCAP region gathered in Incheon, Republic of Korea, from 29 October to 2 November 2012 to chart the course of the new Asian and Pacific Decade of Persons with Disabilities for the period 2013 to 2022

The Meeting marked the conclusion of the second Asian and Pacific Decade of Disabled Persons, 2003–2012, and launched the new Decade.



The Governments at the High-level Intergovernmental Meeting **adopted** the **Ministerial Declaration on the Asian and Pacific Decade of Persons with Disabilities**, 2013–2022, and the ***Incheon Strategy*** to ***“Make the Right Real”*** for Persons with Disabilities in Asia and the Pacific.

The ***Incheon Strategy*** provides the Asian and Pacific region, and the world, with the **first set of regionally agreed disability-inclusive development goals**. Developed over more than two years of consultations with governments and civil society stakeholders, the Incheon Strategy comprises 10 goals, 27 targets and 62 indicators

10 Goals to "Make the Right Real"

1 Reduce poverty and enhance work and employment prospects	2 Promote participation in political processes and in decision-making	3 Enhance access to the physical environment, public transportation, knowledge, information and communication
4 Strengthen social protection		5 Expand early intervention and education of children with disabilities
6 Ensure gender equality and women's empowerment	7 Ensure disability-inclusive disaster risk reduction and management	8 Improve the reliability and comparability of disability data
9 Accelerate the ratification and implementation of the Convention on the Rights of Persons with Disabilities and harmonization of national legislation with the Convention		10 Advance subregional, regional and interregional cooperation



Goal 1: Reduce poverty and enhance work and employment prospects

Goal 2: Promote participation in political processes and decision-making

Goal 3: Enhance access to the physical environment, public transportation, knowledge, information and communication

Goal 4: Strengthen social protection

Goal 5: Expand early intervention and education of children with disabilities

Goal 6: Ensure gender equality and women's empowerment

Goal 7: Ensure disability-inclusive disaster risk reduction

Goal 8: Improve the reliability and comparability of disability data

Goal 9: Accelerate the ratification and implementation of the Convention on the Rights of Persons with Disabilities and harmonization of national legislation with the Convention

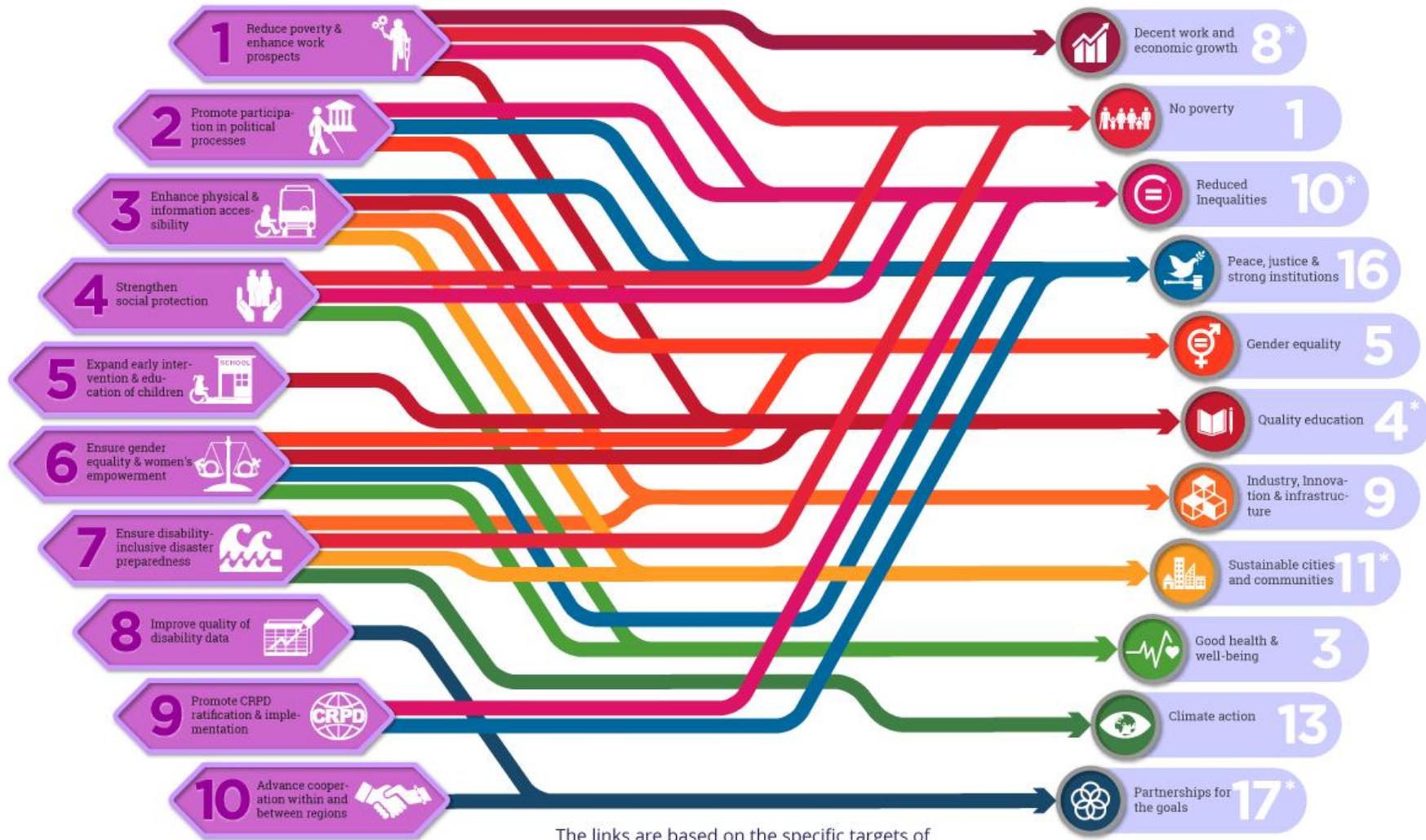
Goal 10: Advance sub regional, regional and interregional cooperation

Accessibility in Incheon Strategy

Incheon Strategy

To "Make the Right Real" for Persons with Disabilities in Asia and the Pacific 2013-2022

Disability-Inclusive Development: Incheon Strategy strengthening the 2030 Agenda



The links are based on the specific targets of the Incheon Strategy and Sustainable Development Goals

UN Convention on Rights of Persons with Disabilities

Adopted by UN GA 2006, Entry into force 2008

The Convention prohibits discrimination against persons with disabilities in all areas of life

- **Article 2: Definition - Universal Design**
- **Article 9: Accessibility**
- **Article 30: Participation in Cultural Life, Recreation, Leisure & Sport**

International Convention UN-CRPD

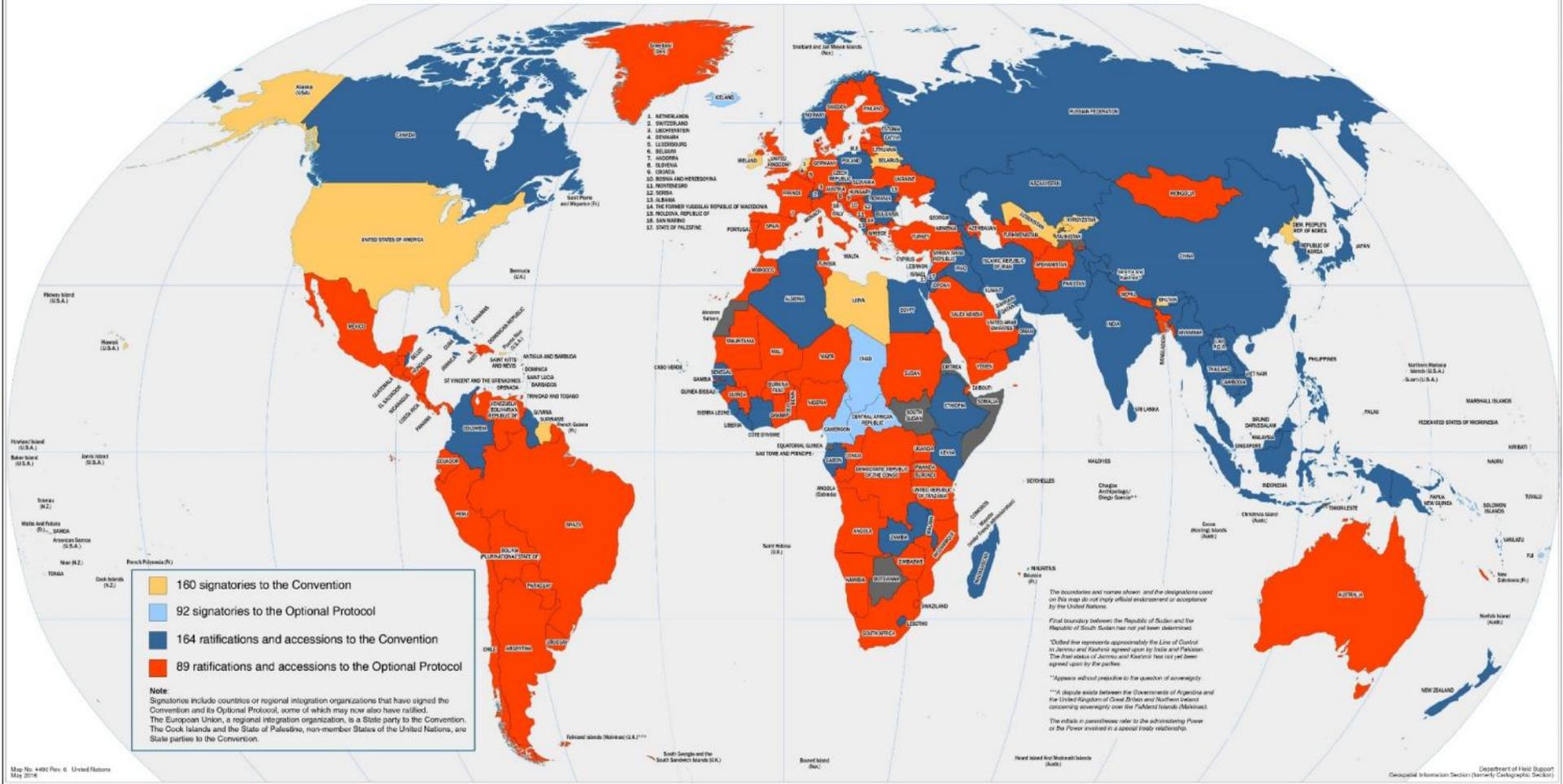
- 
- ❖ **160 signatories to the Convention**
(Spain - 30/3/2007)
 - ❖ **92 signatories to the Optional Protocol**
 - ❖ **172 ratifications of the Convention**
(Spain - 3/12/2007)
 - ❖ **92 ratifications of the Optional Protocol**



CRPD and Optional Protocol Signatures and Ratifications

■ Not Signed ■ Signed Convention ■ Signed Convention & Protocol ■ Ratified Convention ■ Ratified Convention & Protocol

As of 11 May 2016





"Universal Design" *means the design of products, environments, programmes & services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.*

(Ron Mace 1988)

Universal Design Definition

Aim: *To enable persons with disabilities to live independently and participate fully in all aspects of life*

Responsible Parties: *States Parties shall take appropriate measures to achieve the aim*

Coverage: *Equal access to the physical environment, transportation, information and communications, including ICT and systems ... both in urban and in rural areas*

Measures: *Identification and elimination of obstacles and barriers to accessibility*

Application: *Buildings, roads, transportation and other indoor and outdoor facilities, including schools, housing, medical facilities and workplaces; Information, communications and other services, including electronic services and emergency services*

UN - CRPD Article 9 : Accessibility

Others who would benefit from an *inclusive* environment

- **40% + of the population**



Source: Roland Wildberg, Hospitality, Hotel and Travel News, International Tourism Board, 2009

Who will benefit from UA?



[LEARN](#) [ACT](#) [SUMMIT](#) [KEY DOCUMENTS](#) [BLOG](#) [FAQ](#) [MEDIA](#) [CONTACT](#)

World Humanitarian Summit

MAY 23-24 ISTANBUL, TURKEY

33	03	36	32
DAYS	HOURS	MINS	SECONDS



World Humanitarian Summit - WHS



**AGENDA
FOR HUMANITY**
5 CORE RESPONSIBILITIES

**#1
PREVENT
AND END
CONFLICT**



Leaders must assume their responsibility to prevent and end conflict, working to find political solutions to end bloodshed and suffering

**#2
RESPECT
RULES OF
WAR**



States need to respect the rules they have endorsed in international humanitarian and human rights law

**#3
LEAVE NO
ONE
BEHIND**



Stakeholders must empower and protect the most vulnerable, including women and girls, young people, the displaced and people with disabilities, among others

**#4
WORKING
DIFFERENT
LY TO END
NEED**



Change people's lives by moving from delivering aid to ending the need for it

**#5
INVEST IN
HUMANITY**



Invest in enhancing local capacities, reducing risk and building effective and inclusive institutions, especially in fragile contexts



Stakeholders must empower and protect the most vulnerable, including:

- women and girls
- young people
- the displaced
- **people with disabilities**
- among others

#3 Core Responsibility - Leave NO One Behind



UN-DSPD/ DESA Forum

on

Disability-Inclusive Humanitarian Action

22 May, 2016

Istanbul Technical University (Ta k1 la Campus)

World Humanitarian Summit

Charter on Inclusion of Persons with Disabilities in Humanitarian Action

We commit to:

- 1. Non-discrimination**
- 2. Participation**
- 3. Inclusive policy**
- 4. Inclusive response and services**
- 5. Cooperation and coordination**

Charter on Inclusion in Humanitarian Action



Habitat III - United Nations Conference on Housing and Sustainable Urban Development

*17 - 20 October 2016
Quito, Ecuador*

The United Nations General Assembly decided to convene, the Habitat III Conference to reinvigorate the global commitment to sustainable urbanization, to focus on the implementation of a “***New Urban Agenda***” building on the Habitat Agenda of Istanbul in 1996.



Habitat III recognise the participation of the representatives of local authorities accredited to the Conference in rule 64, as it happened in Habitat II in 1996.

[Read more >](#)

Towards a New Urban Agenda

HABITAT I 1976

**WORLD URBAN
POPULATION 37.9%**

The United Nations General Assembly convened the [Habitat I conference in Vancouver](#) in 1976, as governments began to recognize the need for sustainable human settlements and the consequences of rapid urbanisation, especially in the developing world. At that time, urbanisation and its impacts were barely considered by the international community, but the world was starting to witness the greatest and fastest migration of people into cities and towns in history as well as rising urban population through natural growth resulting from advances in medicine.

HABITAT II 1996

**WORLD URBAN
POPULATION 45.1%**

The Vancouver commitments were reconfirmed twenty years later, at the Habitat II conference in Istanbul. World leaders adopted the [Habitat Agenda](#) as a global [plan of action](#) for adequate shelter for all, with the notion of sustainable human settlements driving development in an urbanising world.

[Main outcomes >](#)

HABITAT III 2016

**WORLD URBAN
POPULATION 54.5%**



THE NEW
URBAN AGENDA



The New Urban Agenda

Urbanization is an unprecedented challenge. By the middle of the century four of every five people might be living in towns and cities. Urbanization and development are inextricably linked and it is necessary to find a way of ensuring the sustainability of growth. Urbanization had become a driving force as well as a source of development with the power to change and improve lives.

Habitat III Conference has the convening power to bring together all actors to achieve these objectives. Solutions for the complex challenge of urbanization can only be found by bringing together Member States, multilateral organizations, local governments, private sector and civil society.

Rethinking the Urban Agenda is:

- › Embracing urbanization at all levels of human settlements, more appropriate policies can embrace urbanization across physical space, bridging urban, peri-urban and rural areas, and assist governments in addressing challenges through national and local development policy frameworks.
- › Integrating equity to the development agenda. Equity becomes an issue of social justice, ensures access to the public sphere, extends opportunities and increases the commons.
- › Fostering national urban planning and planned city extensions.
- › Deciding how relevant sustainable development goals will be supported through sustainable urbanization.
- › Aligning and strengthening institutional arrangements with the substantive outcomes of Habitat III, so as to ensure effective delivery of the new Urban Agenda.

Implementing the Urban Agenda means:

- › Urban Rules and Regulations. The outcomes in terms of quality of an urban settlement is dependent on the set of rules and regulations and its implementation. Proper urbanization requires the rule of law.
- › Urban Planning and Design. Establishing the adequate provision of common goods, including streets and open spaces, together with an efficient pattern of buildable plots.
- › Municipal Finance. For a good management and maintenance of the city, local fiscal systems should redistribute parts of the urban value generated.

With the consideration of:

- › National Urban Policies. These establish a connection between the dynamics of urbanization and the overall process of national development.



HABITAT III VILLAGE

Innovation and Urban Solutions

Quito, Ecuador, 17 to 20 October 2016



Deadline of Call for Proposals — Extended to May 2

[Encuentre aquí la solicitud de propuestas en español](#)



Introduction

Habitat III is the United Nations Conference on Housing and Sustainable Urban Development, taking place in Quito, Ecuador, 17–20 October 2016.

In [Resolution 66/207](#) and in line with the bi-decennial cycle (1976, 1996 and 2016), the United Nations General Assembly decided to convene the Habitat III Conference to reinvigorate the global commitment to sustainable urbanization, to focus on the implementation of a [New Urban Agenda](#), building on the [Habitat Agenda of Istanbul](#) in 1996. Member States of the General Assembly, decided that the objectives of the Conference are to secure renewed political commitment for sustainable urban development, assess accomplishments to date, address poverty and identify and address new and emerging challenges. The conference will result in a concise, focused, forward-looking and action-oriented outcome document.

The Conference welcomes the [participation](#) and contributions of all Member States and relevant stakeholders, including parliamentarians, civil society organizations, regional and local government and municipality representatives, professionals and researchers, academia, foundations, women and youth groups, trade unions, and the private sector, as well as organizations of the United Nations system and intergovernmental organizations.

Habitat III will be one of the first world summit of the United Nations after the adoption of the Agenda 2030 and the agreement on climate change COP21 in Paris.







UN Secretary-General Ban Ki Moon



UN DESA Under-Secretary-General Wu Hongbo



UN DESA - Ecuador High Level Forum

on

**Disability Inclusion and Accessible
Urban Development**

*In conjunction with the United Nations
Conference on Housing and Sustainable Urban
Development (Habitat III)*

Quito – Ecuador 16 October 2016



*“Achieving a truly **inclusive** and **transformative** New Urban Agenda requires a **holistic** and **people-centered** approach.*

We need to engage persons with disabilities as both agents and beneficiaries of change, and as leaders in the new urban development agenda”

UN DESA’s Under-Secretary-General Wu Hongbo,
addressed the Opening of the High Level Forum on
Disability Inclusion and Accessible Urban Development



Dear Habitat III Citizen,

The United Nations Conference on Housing and Sustainable Urban Development (Habitat III) held from 17 to 20 October 2016 in Quito, Ecuador, has successfully concluded with the adoption of the [New Urban Agenda](#).

The Habitat III Conference as a whole was a resounding success: 30,000 people, among them 10,000 international participants from 167 countries were accredited in the Conference. In the span of four days almost 1,000 events took place, including 8 Plenary sessions, 6 High-level Roundtable sessions, 4 Assemblies, 16 Stakeholders Roundtables, 10 Policy Dialogues, 22 Special Sessions, 3 Urban Talks, an Urban Journalism Academy, 59 United Nations events, 157 Exhibition booths, 42 Village projects and over 460 side, networking, training and parallel events were organized by various stakeholders.

Thank you for your participation at the Habitat III Conference. Our work here is far from over, and we look forward to our continued collaboration in following up on the New Urban Agenda, the commitments made for its implementation, and the legacy of Habitat III.

Sincerely,
The Habitat III Secretariat

United Nations

A/CONF.226/4*



General Assembly

Distr.: General
29 September 2016

Original: English

United Nations Conference on Housing
and Sustainable Urban Development (Habitat III)
Quito, 17–20 October 2016
Item 10 of the provisional agenda**

Adoption of the final outcome of the Conference

Draft outcome document of the United Nations Conference on Housing and Sustainable Urban Development (Habitat III)

Note by the secretariat

1. Pursuant to General Assembly resolution 70/210 of 22 December 2015, in which the Assembly reaffirmed its decision that the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) was to result in a concise, focused, forward-looking and action-oriented document, which should reinvigorate the global commitment to and support for housing and sustainable urban development and the implementation of the New Urban Agenda, the Co-Chairs of the Preparatory Committee for Habitat III, Maria Duarte (Ecuador) and Maryse Gautier (France), on behalf of the Bureau of the Preparatory Committee, circulated in a letter dated 6 May 2016 the draft outcome document of the Conference.
2. In accordance with resolution 70/210, the zero draft of the outcome document of the Conference was prepared by the Bureau of the Preparatory Committee on the basis of inputs from broad regional and thematic consultations, as well as the policy recommendations prepared by the policy units and comments thereon received by participating States¹ and all stakeholders.
3. Also, in accordance with General Assembly resolution 70/210, the Bureau of the Preparatory Committee convened informal hearings with representatives of local authorities' associations on 16 and 17 May 2016 and with the representatives of major groups and other stakeholders on 6 and 7 June 2016 to exchange views with countries on the zero draft of the outcome document of the Conference.
4. The Bureau of the Preparatory Committee also convened informal intergovernmental negotiations on the zero draft of the outcome document from 18 to 20 May 2016.
5. Subsequently, the Co-Chairs of the Preparatory Committee, in a letter dated 7 June 2016, announced that the Bureau of the Preparatory Committee had decided to appoint Juan José Gómez Camacho (Mexico) and Lourdes Ortiz Yparraguirre (Philippines) as co-facilitators of the negotiations on the draft outcome document of the Conference.

* Reissued for technical reasons on 13 October 2016.

** A/CONF/226/1.

¹ Pursuant to paragraph 8 of General Assembly resolution 67/216, participating States are all States Members of the United Nations and members of the specialized agencies and of the International Atomic Energy Agency.



Inclusive

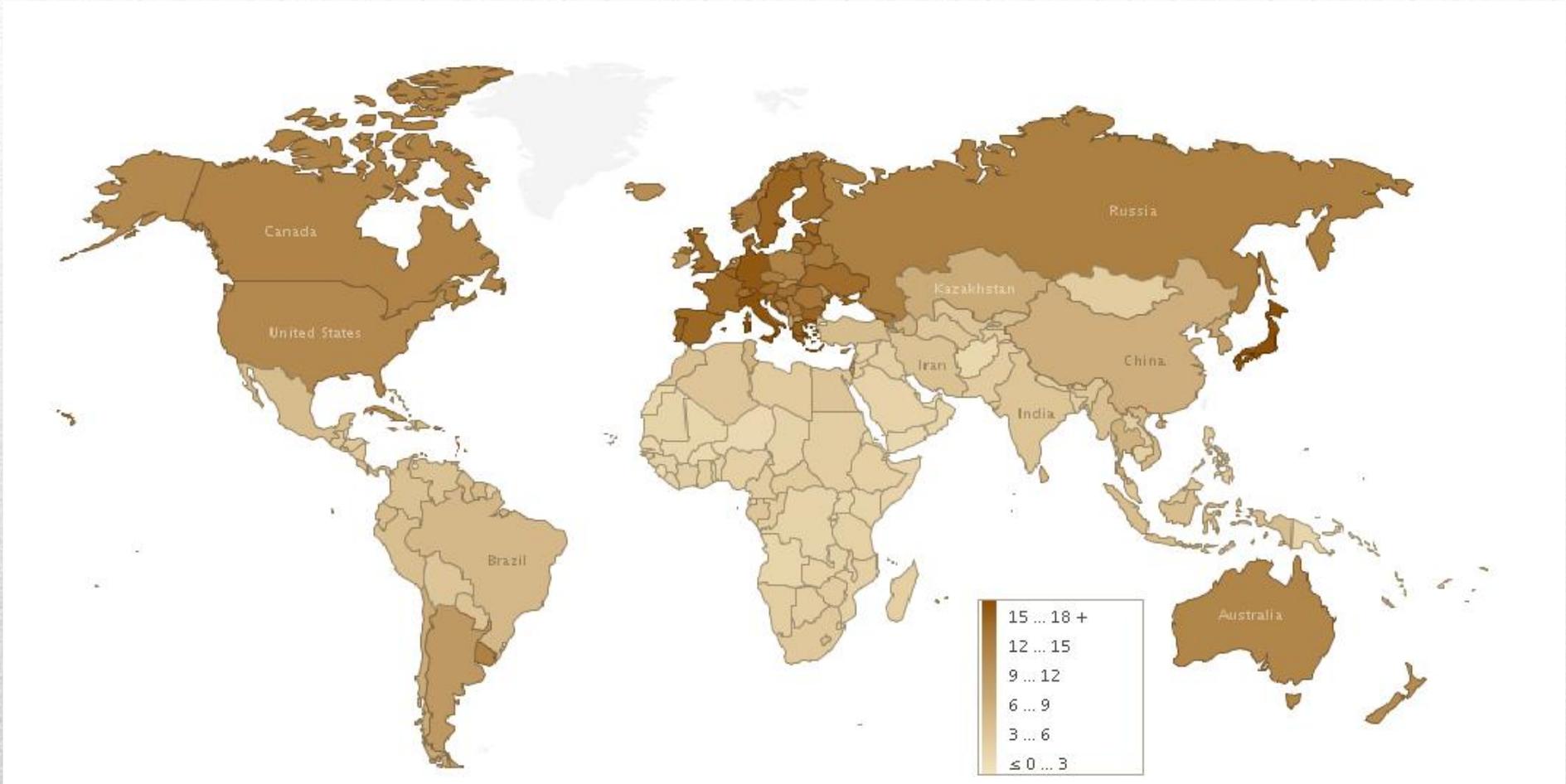
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Safe

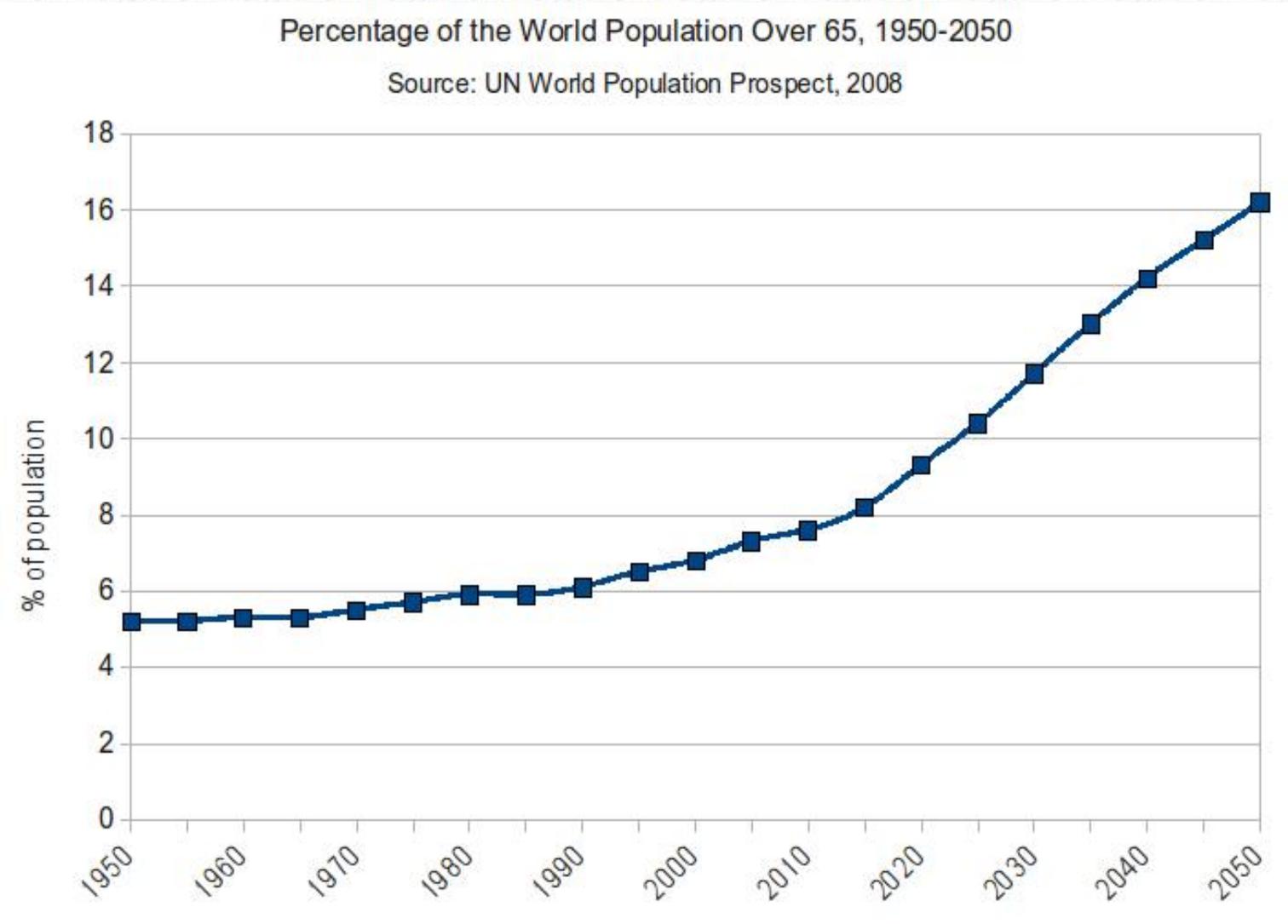
- Estimated **15%** of the world's population has a disability
- More than **one billion** people with special needs worldwide
- An estimated **80%** live in developing countries

(Source: WHO Report, 2011)

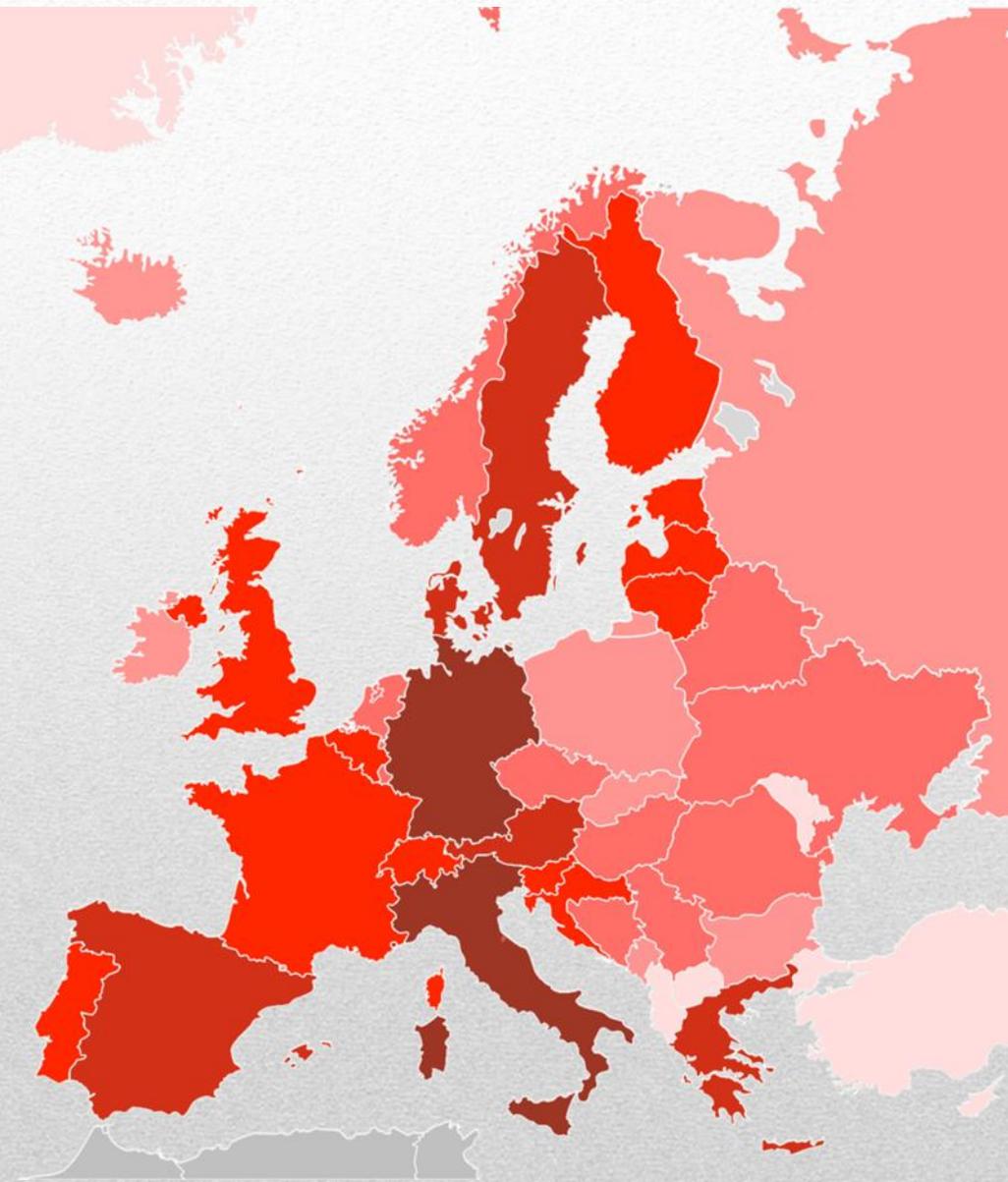
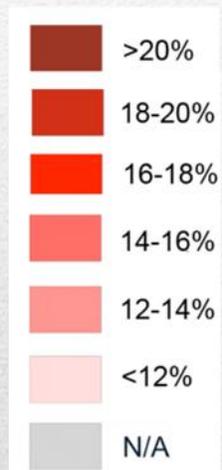
Global - People with Disabilities



Percentage of each country's population over the age of 65



Percentage of world population over 65

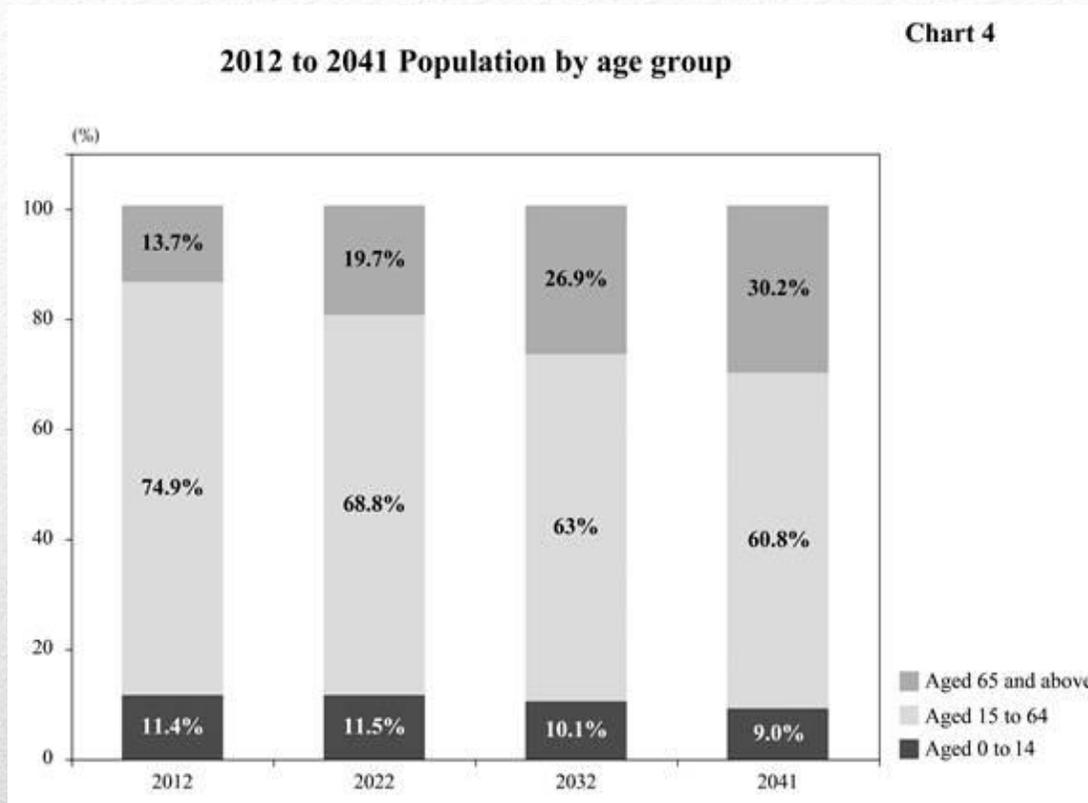


Percentage of the Population over 65 in Europe

Population ageing trends in Asia-Pacific 2050:

- ❖ The population of older persons will **triple** from close to 500 million today to **1.3 billion**
- ❖ Older people will make up **25%** of the population
- ❖ **25%** of older persons will be above **80 years** of age

Asia Pacific - Ageing Population



- 2012, elderly people aged 65 and over was **980 000**, **14%** of Hong Kong population.
- 2041, elderly people will increase significantly to **2.56 million**, **30%** of population.

(Source: Budget Speech 2013-14 HKSAR)

Aging Population - Hong Kong

- 
- ❖ **Safe**
 - ❖ **Inclusive**
 - ❖ **Resilient**
 - ❖ **Sustainable**
 - ❖ **Socially Responsible**

Built Environment for All



Social Responsibility *is an ethical ideology or theory that an entity, be it an organization or individual, has an obligation to act to benefit society at large*

Definition - Social Responsibility

The International Standard

ISO 26000: 2010

- **Guidance on Social Responsibility** *provides harmonized, globally relevant guidance for private and public sector organizations of all types based on international consensus among expert representatives of the main stakeholder groups, and so encourage the implementation of best practice in social responsibility worldwide.*

Guidance on Social Responsibility

Social responsibility: 7 core subjects



- ❖ **General**
- ❖ **Accountability**
- ❖ **Transparency**
- ❖ **Ethical Behaviour**
- ❖ **Respect for Stakeholder Interests**
- ❖ **Respect for Rule of law**
- ❖ **Respect for International Norms of Behaviour**
- ❖ **Respect for Human Rights**

Eight - Principles of Social Responsibility

ARCASIA Charter



ARCASIA Charter on Social Responsibility (ACSR)



Access . Egress . Evacuate

- **Emergency Evacuation**
 - **Fire in Buildings**
 - **Natural Disasters**
 - **DiDRR** (*Disability-inclusive Disaster Risk Reduction*)
-



Signage - International Pictogram



High Density

+

High Rise

Evacuation



Means of Evacuation

NIST Technical Note 1825

**The Use of Elevators for Evacuation in
Fire Emergencies in International
Buildings**

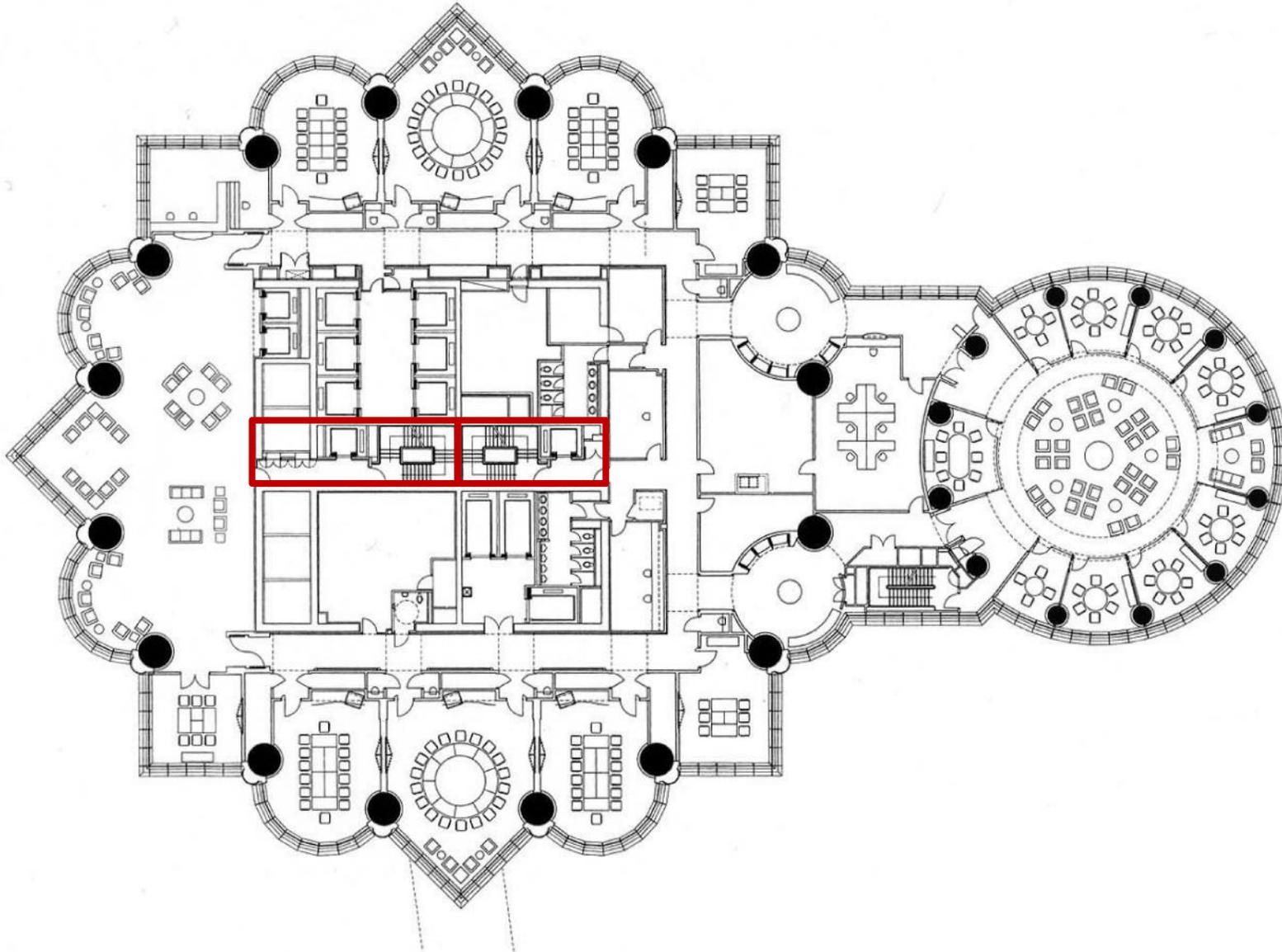
Max T. Kinateder
Hidemi Omori
Erica D. Kuligowski
*Fire Research Division
Engineering Laboratory*

This publication is available free of charge from:
<http://dx.doi.org/10.6028/NIST.TN.1825>

July 2014

- An alternative to stairs for egress
- Needed for High Rise buildings
- For Occupant use with no attendants
- Applies to all lifts /elevators in High Rise buildings
- Speeds up evacuation

Evacuation Lifts / Elevators



Evacuation Lifts



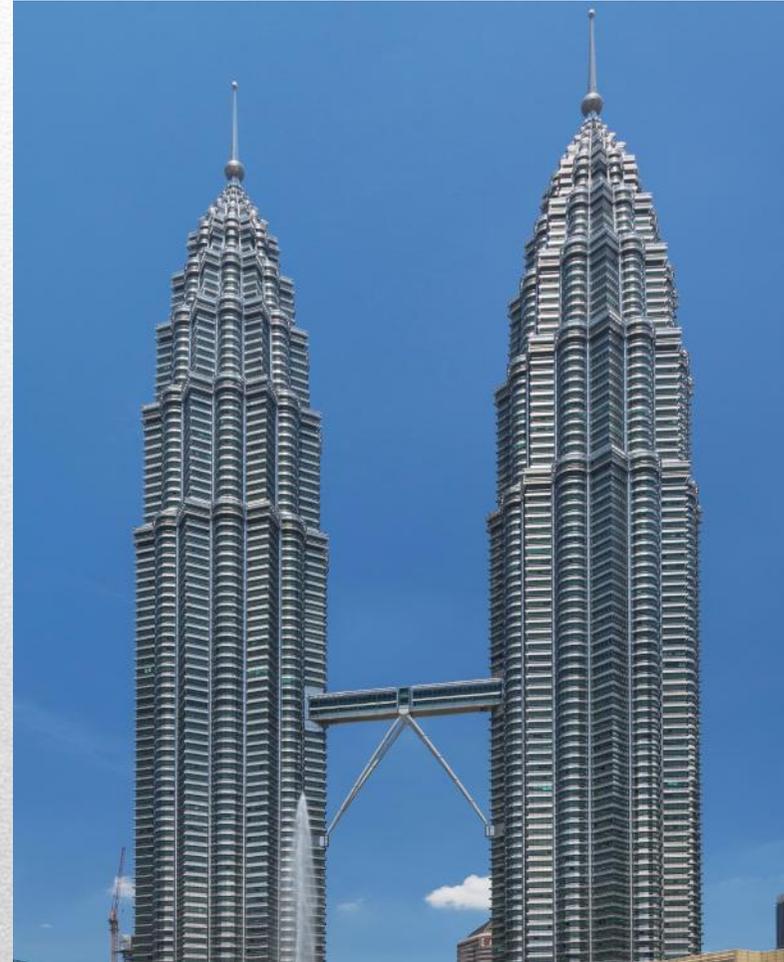
Evacuation - Sky Bridge

- A horizontal means of evacuation
- Improves the safety of high rise buildings
 - If one tower goes down, the rest can evacuate to the other tower by the skybridge



Evacuation - Sky Bridge

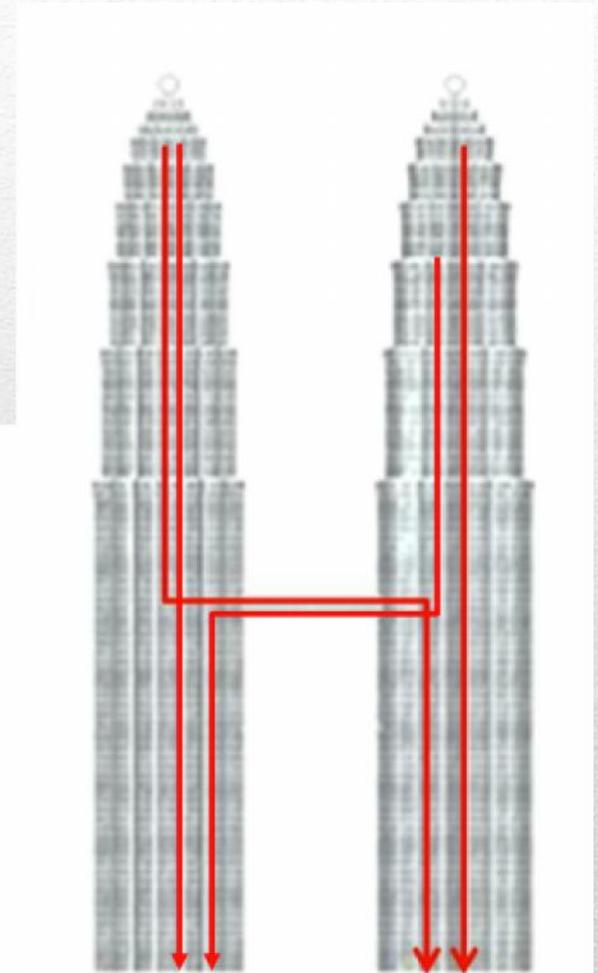
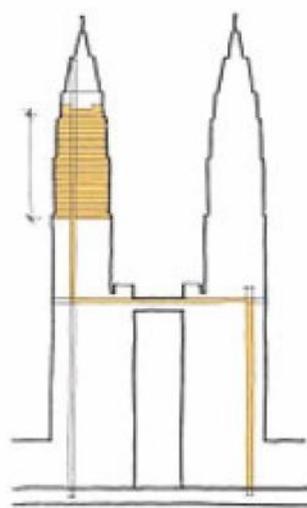
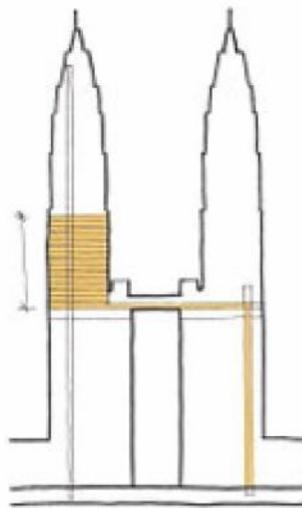
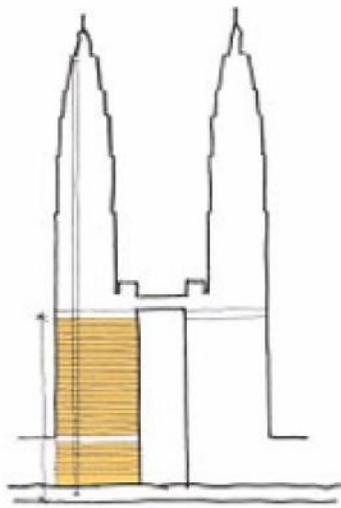
- Tallest in the world
(1998-2004)
- Located in Kuala Lumpur
Malaysia
 - Cost US\$1.6 billion
 - 451.9m/1,483ft height
 - 88 floors
 - 40 Lifts/Elevators
 - Architect - César Pelli



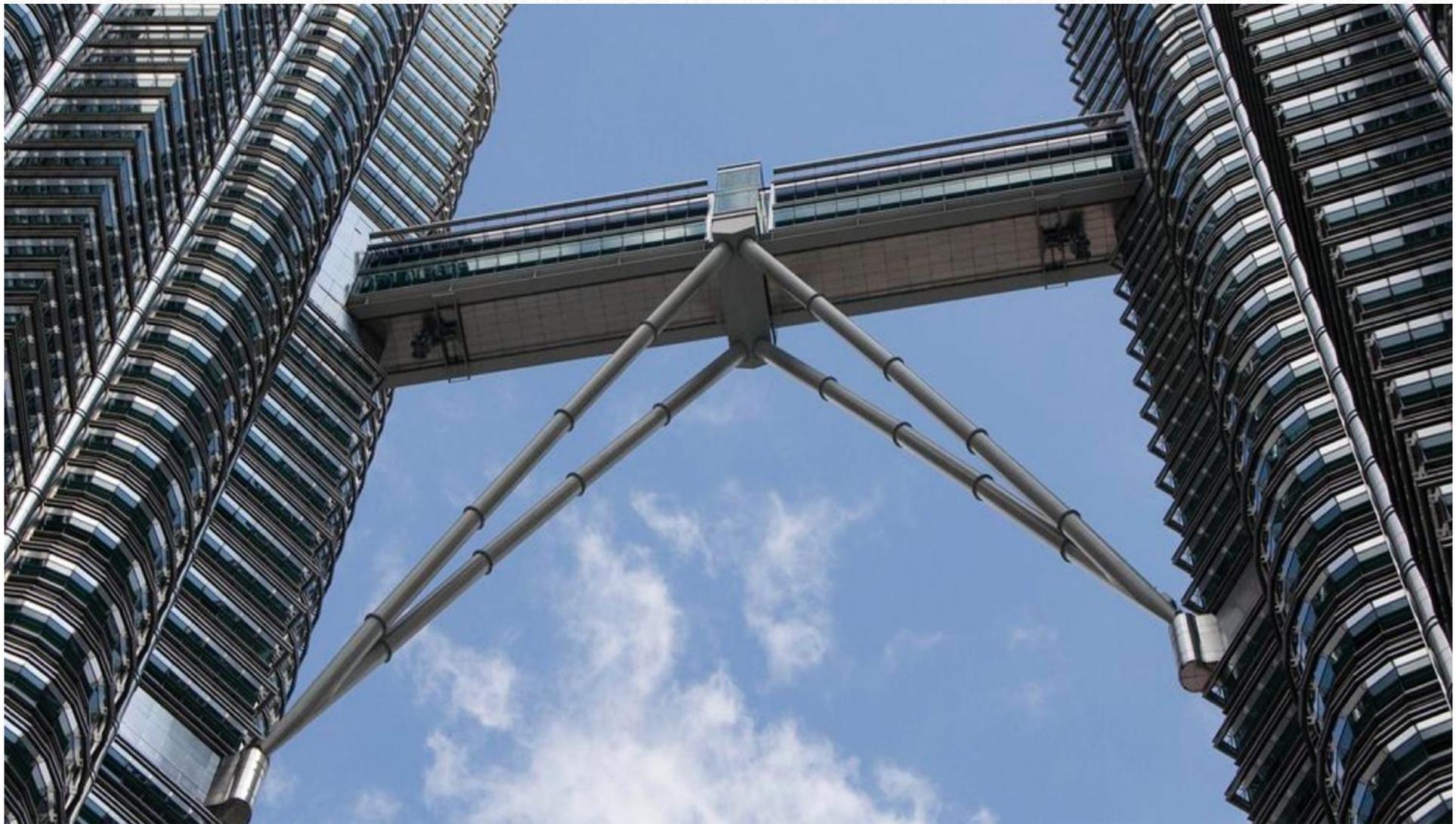
Petronas Towers Malaysia



- Sky Lobbies & Sky Bridge used as refuge floors
- Evacuation can be done through the sky bridge from either tower at 41/F & 42/F



Petronas Towers - Evacuation



Petronas Towers – Evacuation Sky Bridge



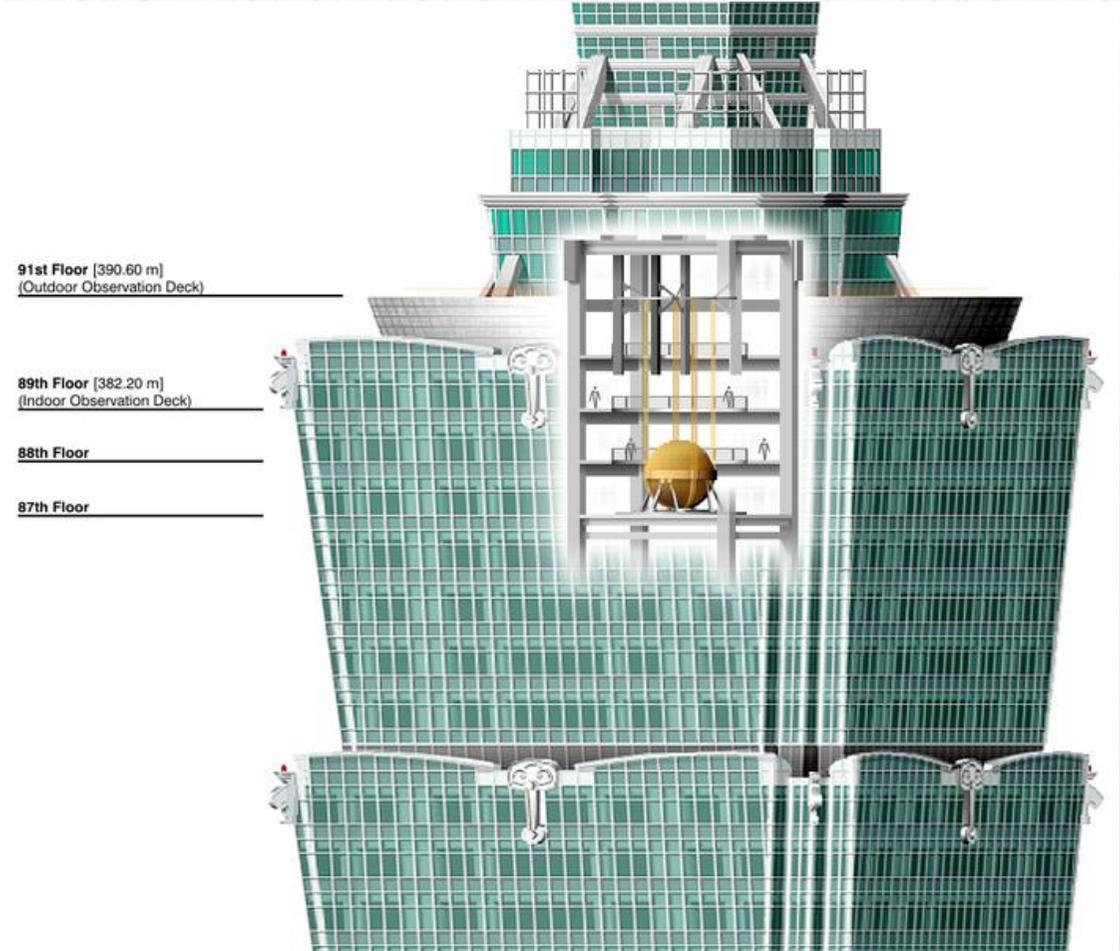
Evacuation - Sky Bridge



Taipei 101 Taiwan



Taipei 101 Taiwan



Wind Damper 660 m tonne

- **Taipei 101** is a supertall skyscraper located in the Xinyi District of Taipei, Taiwan. Designed to resemble an enormous bamboo stalk, it has a height of **508 m** and comprises **101 storeys above ground**, and 5 levels below ground.
 - On its completion in **2004**, it was the world's tallest building, beating the Petronas Twin Towers of Malaysia, before losing the title in **2010** to the Burj Khalifa in Dubai.
 - It was also the **first building in the world to break the half-kilometre mark**. It includes indoor and outdoor observation decks which offer 360-degree views of the city and are popular tourist attractions.
 - In 2011, it was awarded the **LEED platinum certification**, the highest award according to the LEED rating system, making it the world's tallest green building.
-

- **Building Height:** 508 meters, **World Record in 2004**
 - **Fastest Lifts/Elevators:** 1010 meters per minute
 - **Damper:** The world's biggest passive wind damper, dia. of 5.5m and weight 660 metric tons, cost of NT \$132 million
 - **Foundation Piles:** 380 piles driven 80m into ground & 30m into bedrock
 - **Earthquake Resistance:** The building's structure has been designed to withstand earthquake in 2500 year cycle
 - **Wind Resistance:** The structure can withstand gale winds of 60 meters per second
 - **Fire Safety Facilities:** **All floor are equipped with computerize fire prevention, extinguishing systems, safety evacuation corridors and staircases**
-

Lift / Elevator System

Observation Lifts/ Elevators

- 2 single-deck, 1,600 kg (24 persons) per deck
- 2004 Guinness Record fastest lifts/elevators in the world with aerodynamic pressure controlled cabs, ascend at 1,010 m/min

Passenger Lifts / Elevators

- **10 double-deck**, 2,040 kg (31 persons) per deck shuttle elevators serving the **transfer floors**
 - **24 double-deck**, 1,350 kg (20 persons) per deck, for access within **6 sub-zones** (4 in each sub-zone)
 - **3 single-deck** (various capacities)
-

Chien, S.-W. and Wen, W.-J.

Table 1. Floor usage of Taipei 101.

Floor	Usage
1F	Lobby entrance to odd numbered floors
2F	Lobby entrance to even numbered floors
3F-16F	Office
17F	Mechanical Floor
18F	Mechanical Floor
19F-24F	Office
25F	Mechanical Floor
26F	Mechanical Floor
27F-33F	Office
34F	Mechanical Floor
35F	Office/Sky Lobby
36F-41F	Office
42F	Mechanical Floor
43F-48F	Office
49F	Mechanical Floor
50F-57F	Office
58F	Mechanical Floor
59F	Office/Sky Lobby
60F	Office
61F-66F	Office
67F	Mechanical Floor
68F-73F	Office
74F	Mechanical Floor
75F-81F	Office
82F	Mechanical Floor
83F-84F	Office
85F	VIP Lounge

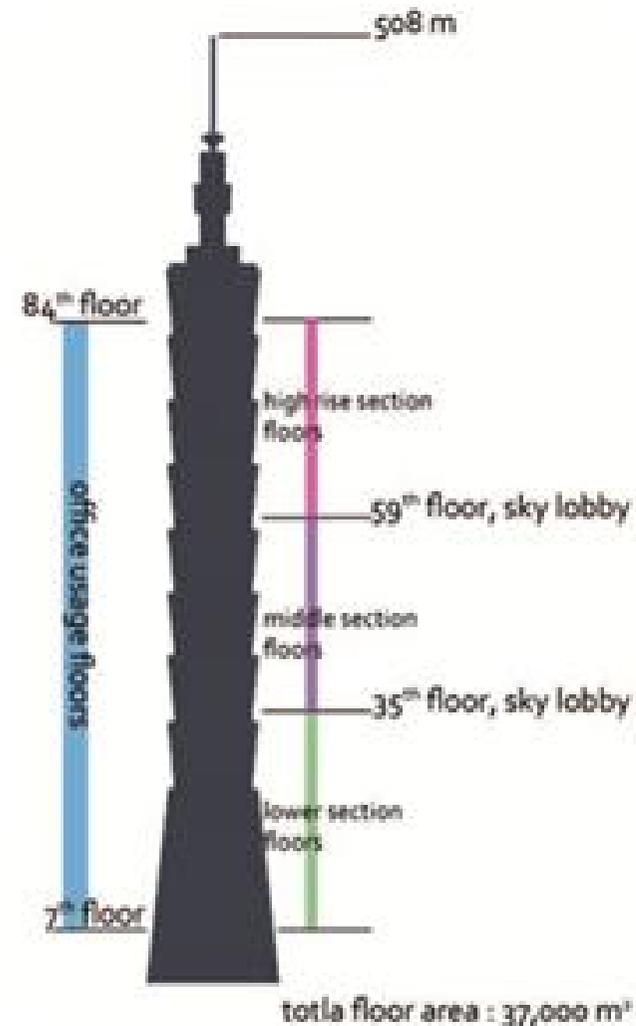


Fig. 1. different section floors of Taipei 101.

Fire Protection System

In case of emergency, an emergency response center will immediately be set up in this building to allow the fire brigade to enter the disaster prevention center and to set up a disaster prevention command center.

Fire Prevention

- Non-flammable materials specified for use for base building and fit-out work throughout building. The tenants' interior fit-out work must also use non-flammable materials.
- Firewalls, shutters and protective wall fillings divide building into discrete fire zones.
- Air conditioning automatically cut off where smoke detected.

Fire Detection

- Addressable detectors distributed throughout building continuously take air samples to detect unusual fog.
 - CCTV cameras in tower are also used for fire monitoring.
-

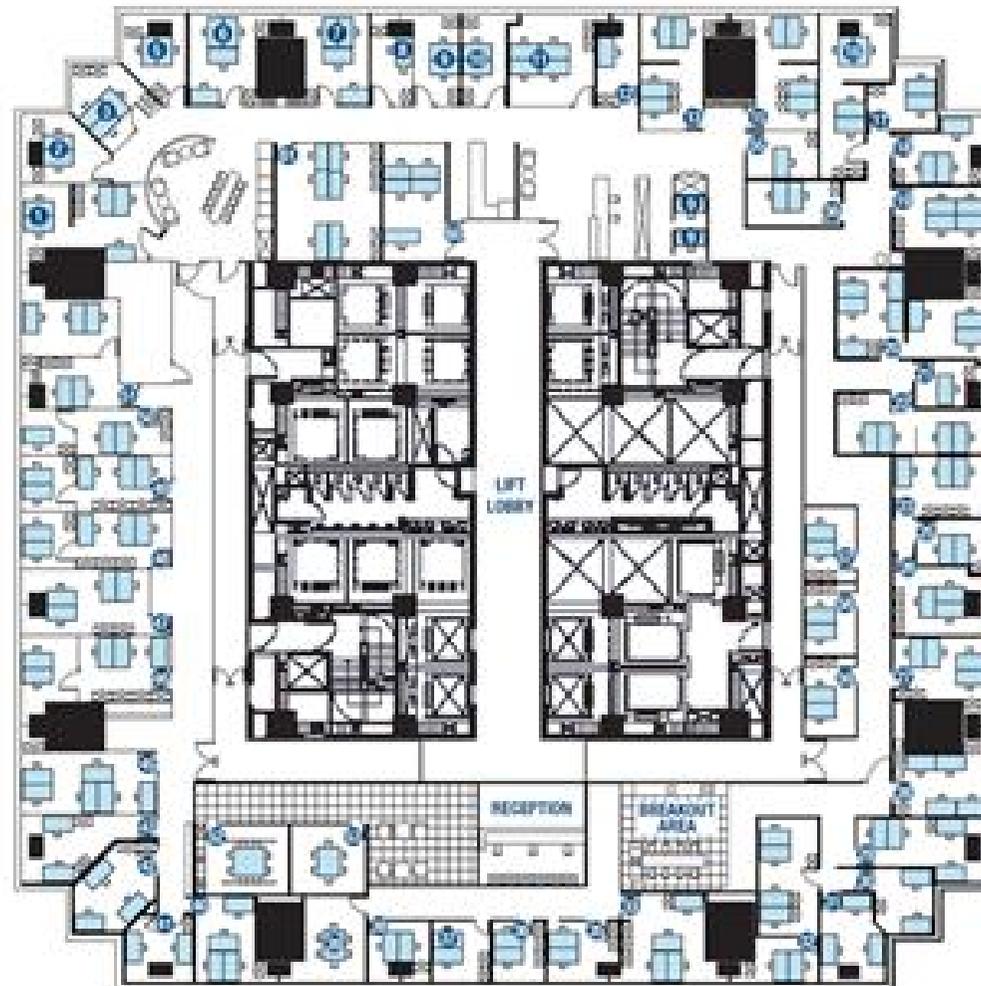
Fire Fighting

- Automatic sprinkler system throughout building. Basement & mechanical floor are equipped with water tanks
- The mechanical floor water tank is driven by gravity so that power failure does not interrupt water supply
- Each floor is equipped with fire hydrants and fire extinguishers, and parking lot uses foam fire extinguishers
- Transformer & power generator rooms is protected by CO2 & FM-200 gases

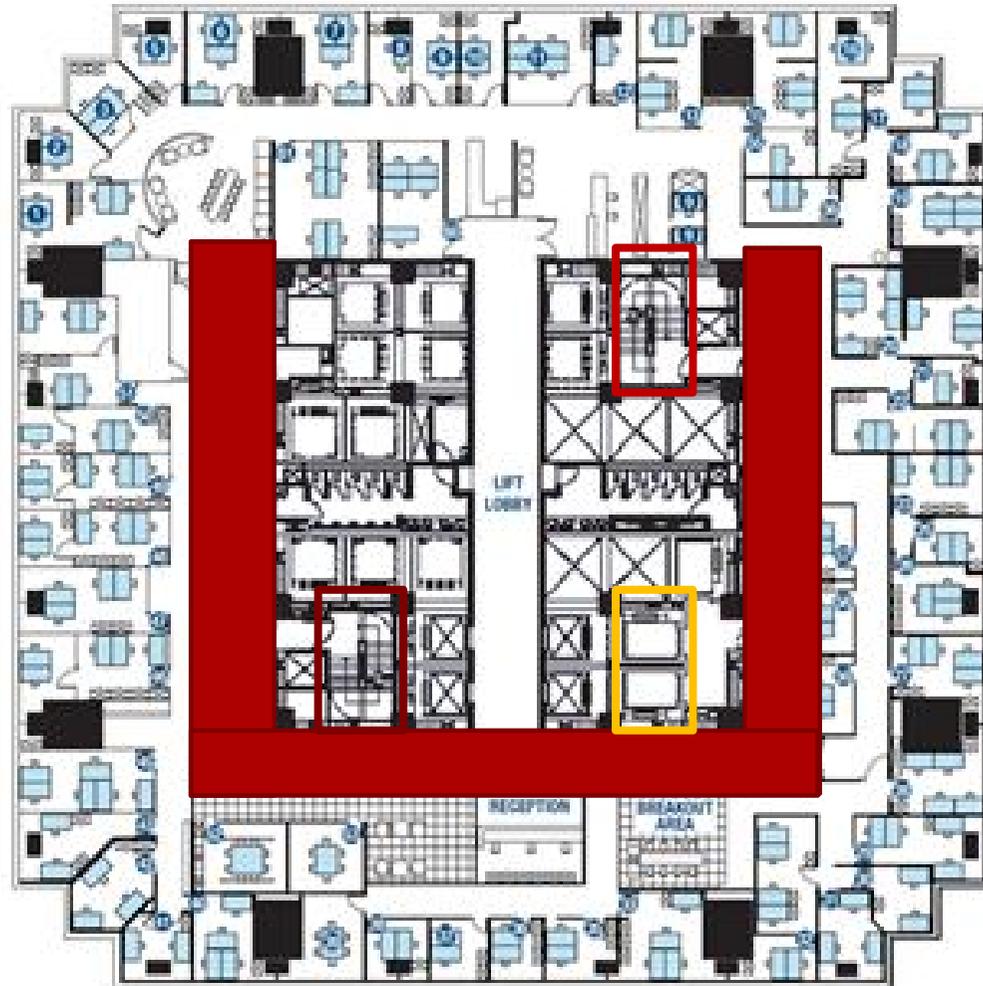
Evacuation

- **Pressurized corridors on two sides of each floor** and **pressurized staircases** provide emergency evacuation routes
 - **Two fireproof refuge rooms** on each mechanical floor on **every 8 levels**, which are **connected by an outdoor refuge balcony**, except for the refuge rooms on 25/F
 - The **refuge rooms** are **equipped with CCTV monitor, emergency phone, water and emergency kit**
 - **Office floors and key escape routes** are **protected by smoke exhaust system**
 - **Fireman's Lifts** serve from basement to the top floor
-

THE EXECUTIVE CENTRE | TAIPEI
LEVEL 37 TAIPEI 101 TOWER



THE EXECUTIVE CENTRE | TAIPEI
LEVEL 37 TAIPEI 101 TOWER





Petronas Towers (Kuala Lumpur, Malaysia)

- The new evacuation plan after 2001 was for the lower floors to evacuate by stair
- Above the skybridge, occupants were to use the lifts/elevators in their tower
- A drill to test the new plan resulted in total evacuation of both towers simultaneously in just **20 minutes**

Taipei 101 (Taipei, Taiwan)

- Traditional stair evacuation, a drill conducted resulted in an evacuation time of about **2 hours**
 - Another drill incorporating the elevators and the evacuation time of **57 minutes**
-



Madrid

- **Population 3,186,241** (2014)
- **Total land area 604.3 km²**
- **Population density 5,390 persons/km²**
(2015)
- **Majadahonda, most densely populated
sub-metropolitan area 3,595 persons/km²**

Madrid



Hong Kong



Image © 2016 TerraMetrics
Image Landsat / Copernicus
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Google Earth

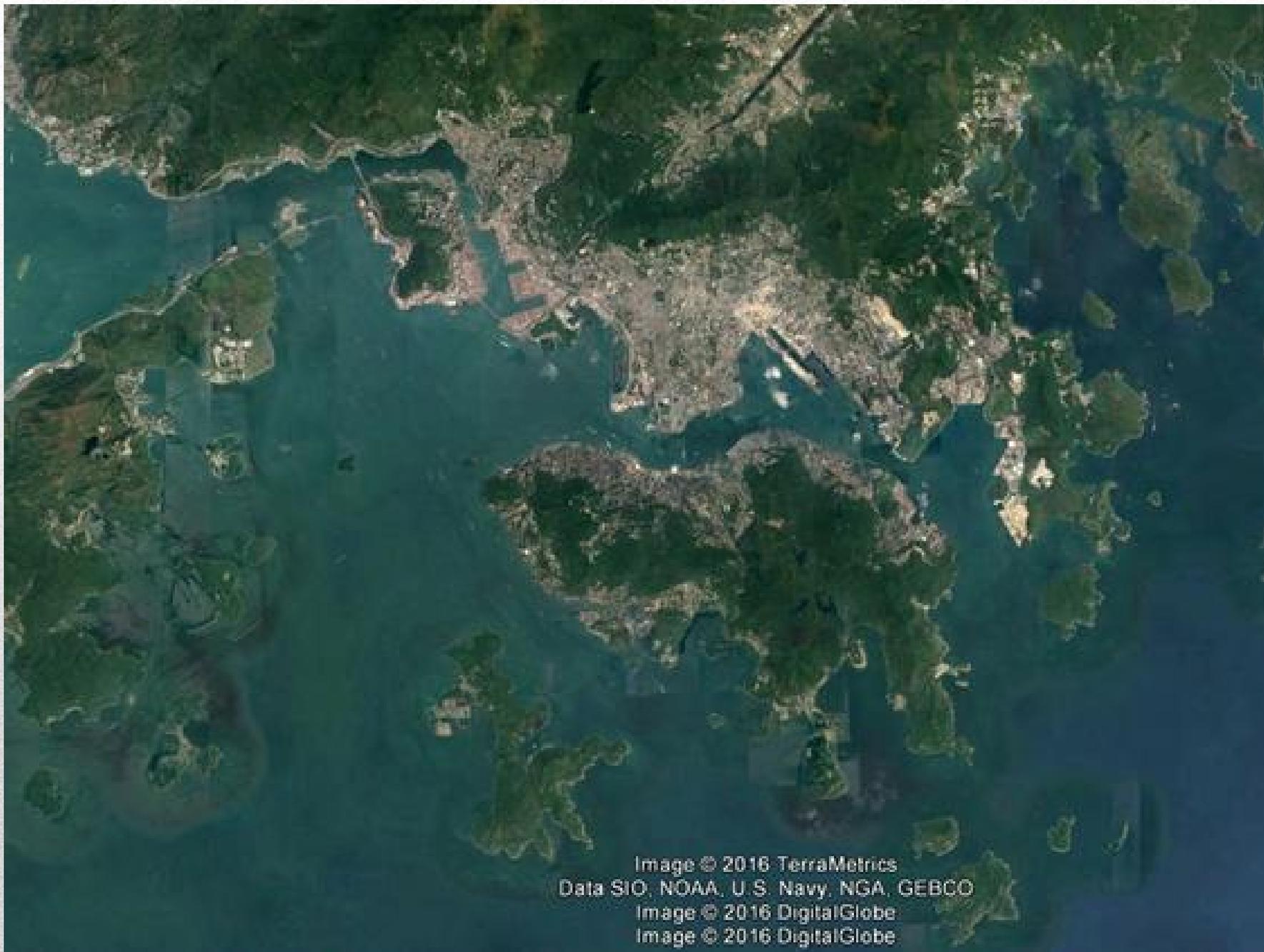


Image © 2016 TerraMetrics
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2016 DigitalGlobe
Image © 2016 DigitalGlobe

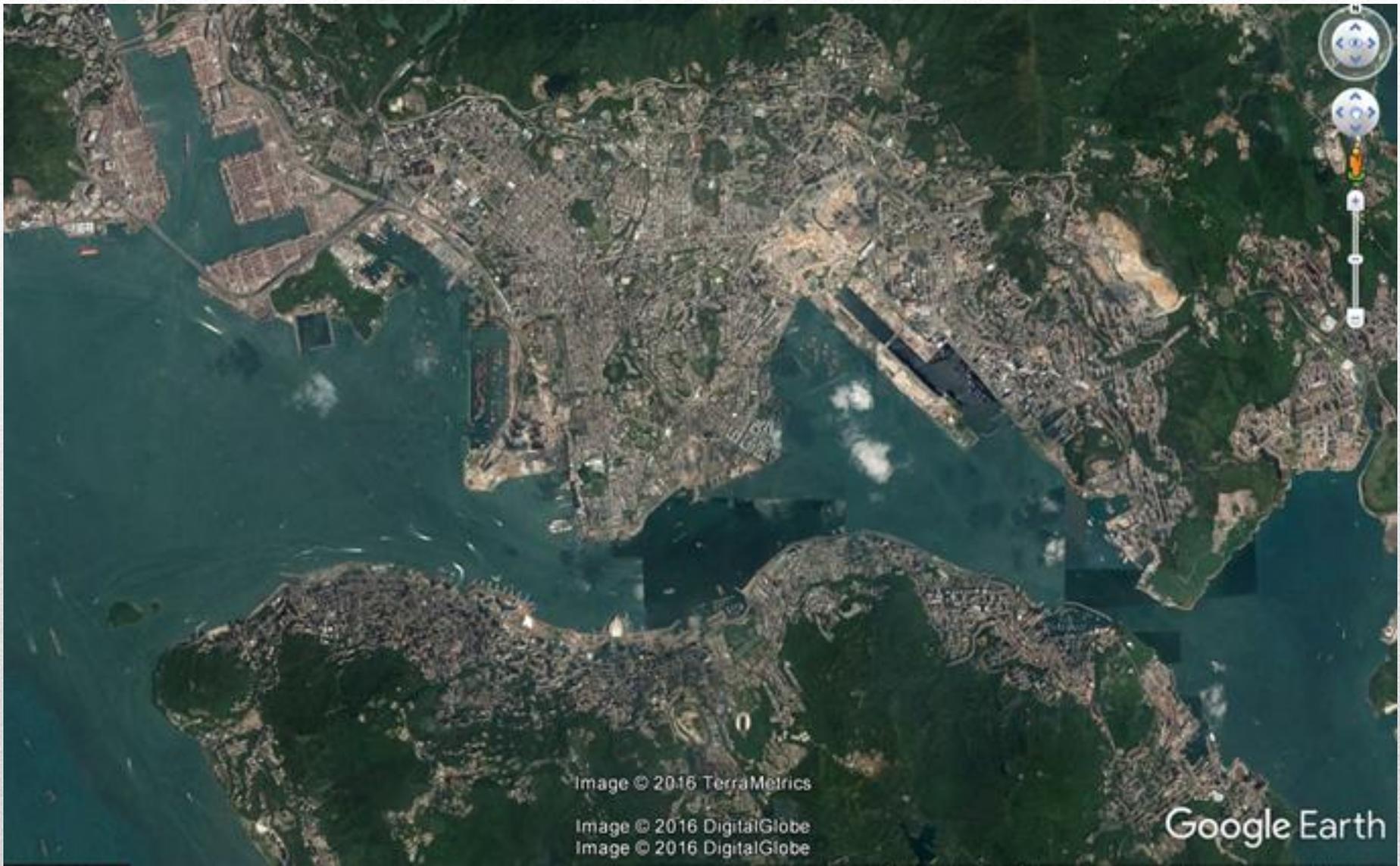


Image © 2016 TerraMetrics

Image © 2016 DigitalGlobe

Image © 2016 DigitalGlobe

Google Earth

- **One of the most densely populated cities in the world**
- **Population is 0.1% of total world population**
- **Current population 7,385,162** (March 2017)
- **Total land area 1050 km²**
- **Population density 7,050 persons/km²** (2017)
- **Kwun Tong District 57,250 persons/km²**

Hong Kong





Code of Practice

Fire Safety in Buildings
2015

Hong Kong

- 
- Part A *Introduction*
- Part B *Means of Escape*
- Part C *Fire Resistance Construction*
- Part D *Mean of Access*
- Part E *Fire Properties of Building Elements*
- Part F *Fire Safety Management*
- Part G *Guidelines for Fire Engineering*
- Annex A

Code of Practice: Fire Safety in Buildings 2015 Hong Kong

Occupant Capacity and Exit Doors Exit Routes

Table B2

Table B2: Minimum number and width of exit doors and exit routes from a room, fire compartment or storey

Occupant Capacity of room, fire compartment or storey (No. of persons)	Minimum No. of exit doors or exit routes	Minimum total width (in mm)		Minimum Width (in mm) of each	
		Exit doors	Exit routes	Exit door	Exit route
4-30	1			750	1050
31-200	2	1750	2100	850	1050
201-300	2	2500	2500	1050	1050
301-500	2	3000	3000	1050	1050
501-750	3	4500	4500	1200	1200
751-1000	4	6000	6000	1200	1200
1001-1250	5	7500	7500	1350	1350
1251-1500	6	9000	9000	1350	1350
1501-1750	7	10500	10500	1500	1500
1751-2000	8	12000	12000	1500	1500
2001-2250	9	13500	13500	1500	1500
2251-2500	10	15000	15000	1500	1500
2501-2750	11	16500	16500	1500	1500
2751-3000	12	18000	18000	1500	1500
>3000 persons - the number of exit doors, exit routes and their width to be determined by the Building Authority					

Notes:

1. In the case of Places of Public Entertainment (Use Classification 5a), the requirements in Section 3 should be complied with.
2. The width of an exit door should be the least clear width measured between the vertical members of the door frame.
3. The width of a required staircase, staircase landing, passage or corridor comprising an exit route should be measured between the finished surfaces of the walls or of the inner sides of any balustrade and should not be decreased by the introduction of any projections other than handrails the projection of which should not exceed 90mm.

Table B3

Table B3: Discharge Value of a Required Staircase in a Non-Sprinkler Protected Building

No. of storeys served	Width of required staircase					
	1050mm but under 1200mm	1200mm but under 1350mm	1350mm but under 1500mm	1500mm but under 1600mm	1600mm but under 1700mm	1700mm to 1800mm
1	210	240	270	300	320	340
2	242	278	315	351	377	402
3	274	316	360	402	434	464
4	306	354	405	453	491	526
5	338	392	450	504	548	588
6	370	430	495	555	605	650
7	402	468	540	606	662	712
8	434	508	585	657	719	774
9	466	544	630	708	776	836
10	498	582	675	759	833	898
Each additional storey add	32	38	45	51	57	62

Note:

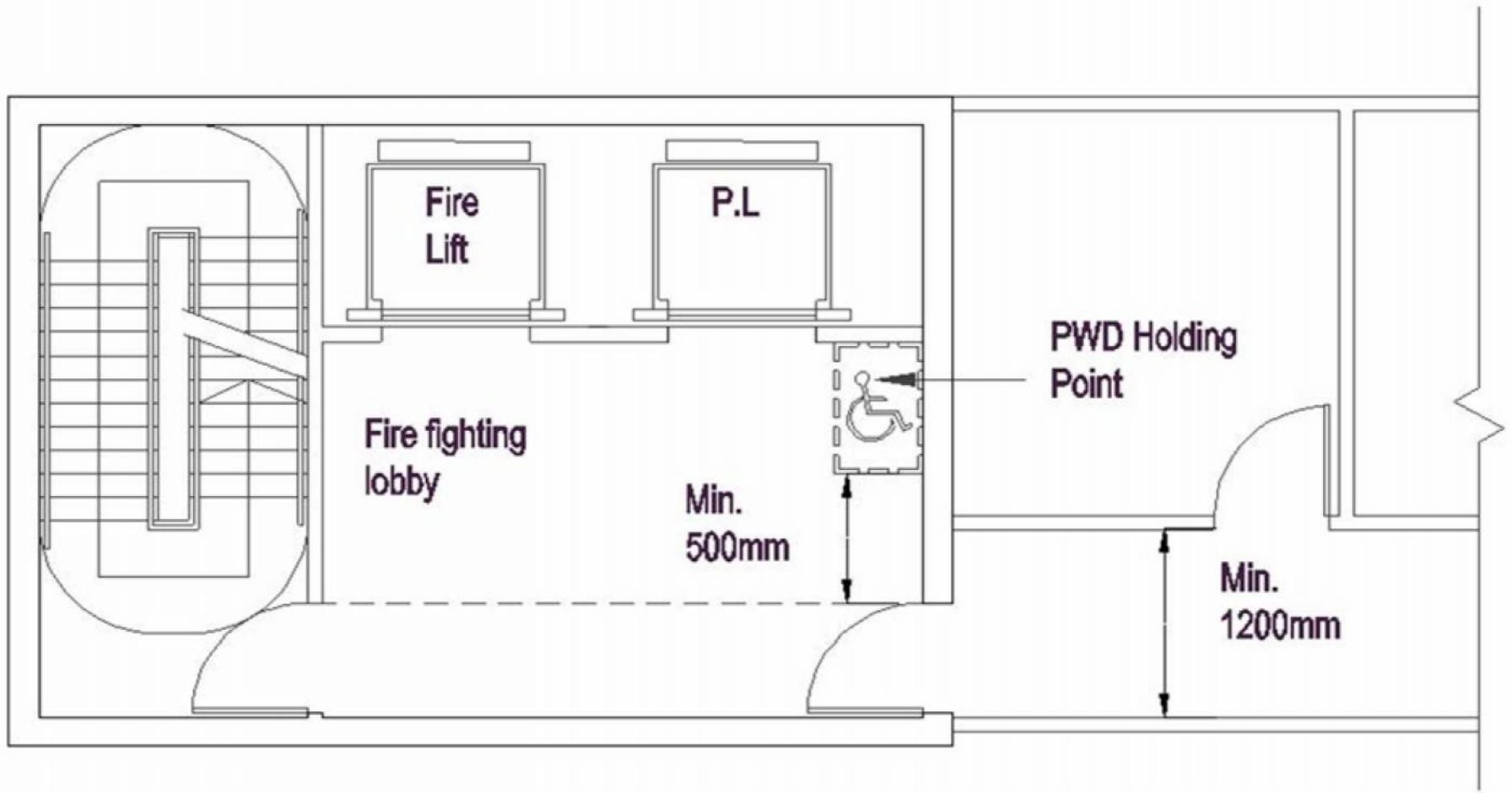
1. The discharge value of a required staircase having a width of more than 1800mm may be obtained by using linear projection from the table.

Table B4**Table B4: Discharge Value of a Required Staircase in a Sprinkler Protected Building**

No. of storeys served	Width of required staircase					
	1050mm but under 1200mm	1200mm but under 1350mm	1350mm but under 1500mm	1500mm but under 1600mm	1600mm but under 1700mm	1700mm to 1800mm
1	420	480	540	600	640	680
2	452	518	585	651	697	742
3	484	556	630	702	754	804
4	516	594	675	753	811	866
5	548	632	720	804	868	928
6	580	670	765	855	925	990
7	612	708	810	906	982	1052
8	644	746	855	957	1039	1114
9	676	784	900	1008	1096	1176
10	708	822	945	1059	1153	1238
Each additional storey add	32	38	45	51	57	62

Note:

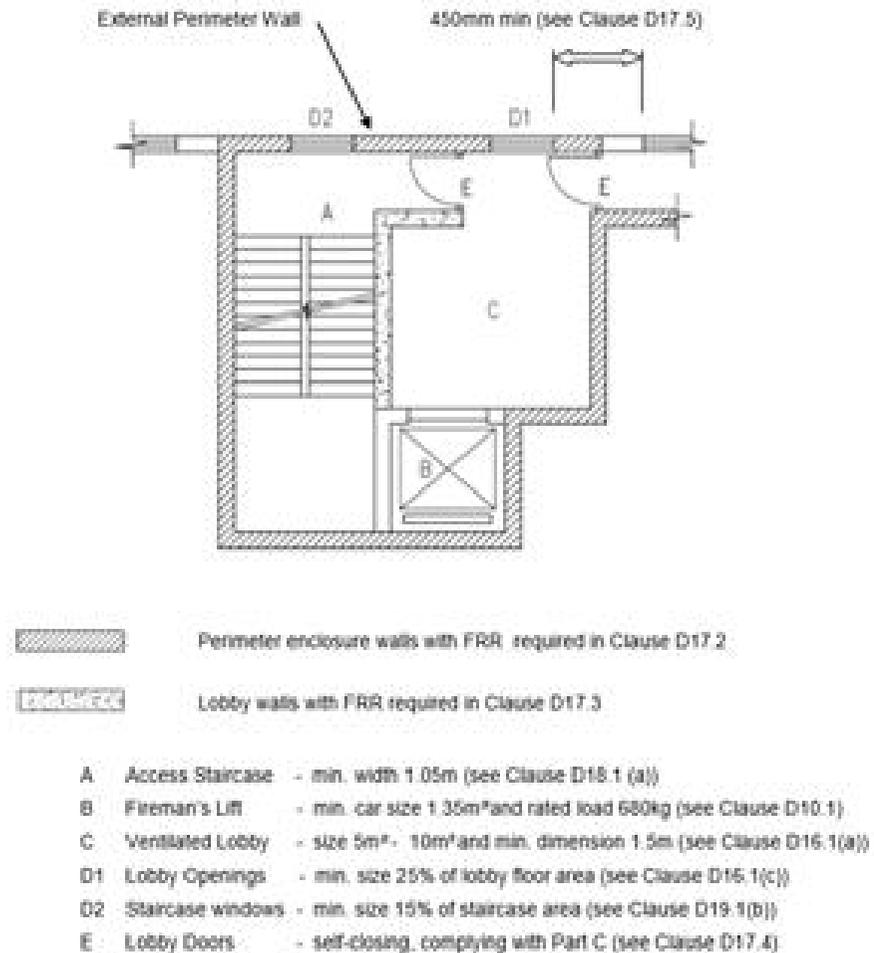
1. The discharge value of a required staircase having a width more than 1800mm may be obtained by using linear projection from the table.



Fire Resistant Lobby

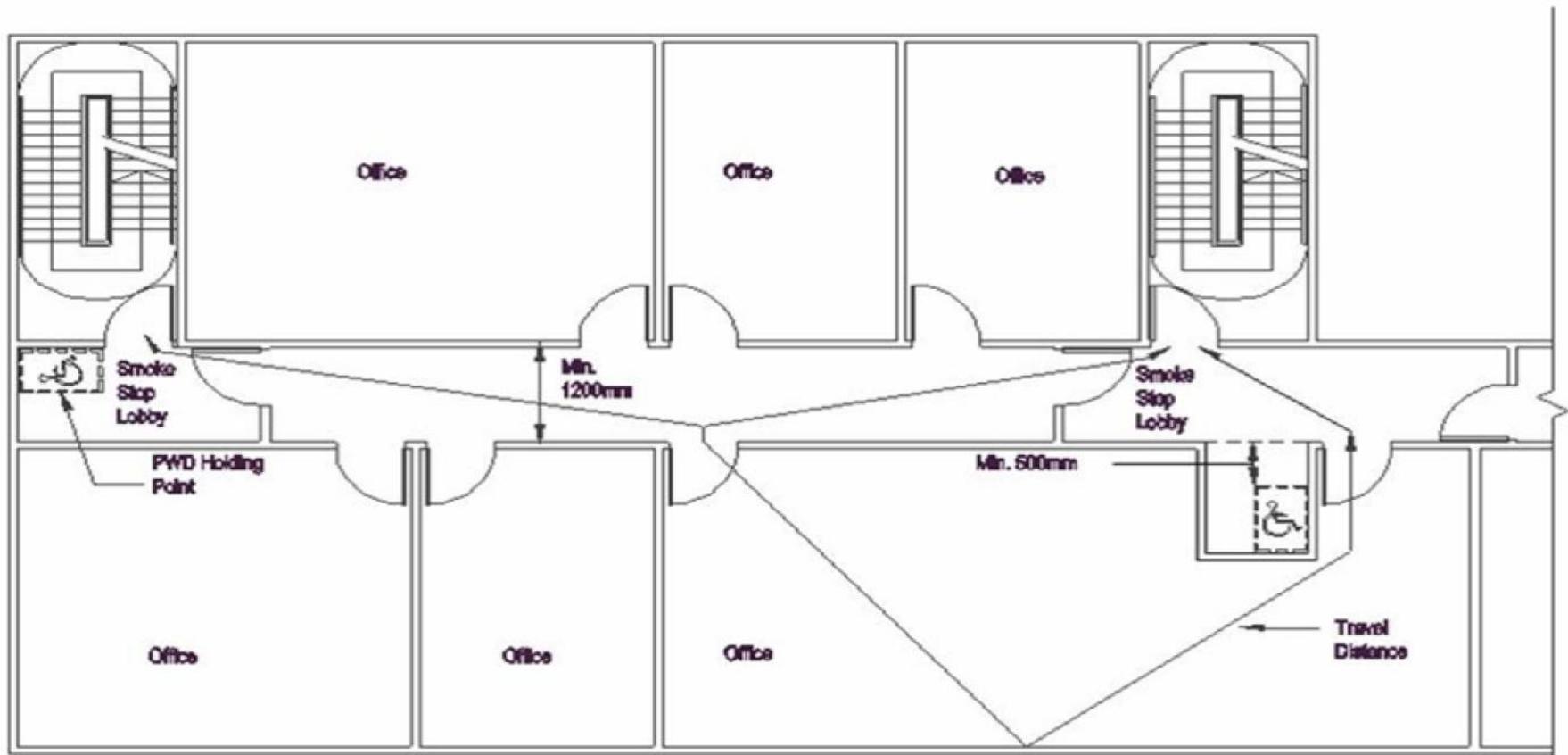
Firefighting & Rescue Staircase

Diagram D1: Requirements of a Firefighting and Rescue Stairway above Ground Storey



Note:

1. Ventilation may be omitted where a suitable mechanical system, such as pressurization, is provided to the satisfaction of the Director of Fire Services (see Clause D21.1)



Fire Egress Alternative Routes



Section 1 *General*

Section 2 *Provisions of Means of Escape*

Section 3 *Special Provisions on Means of Escape*

Section 4 *Provisions of Means of Escape
for Persons with a Disability*

Part B: Means of Escape

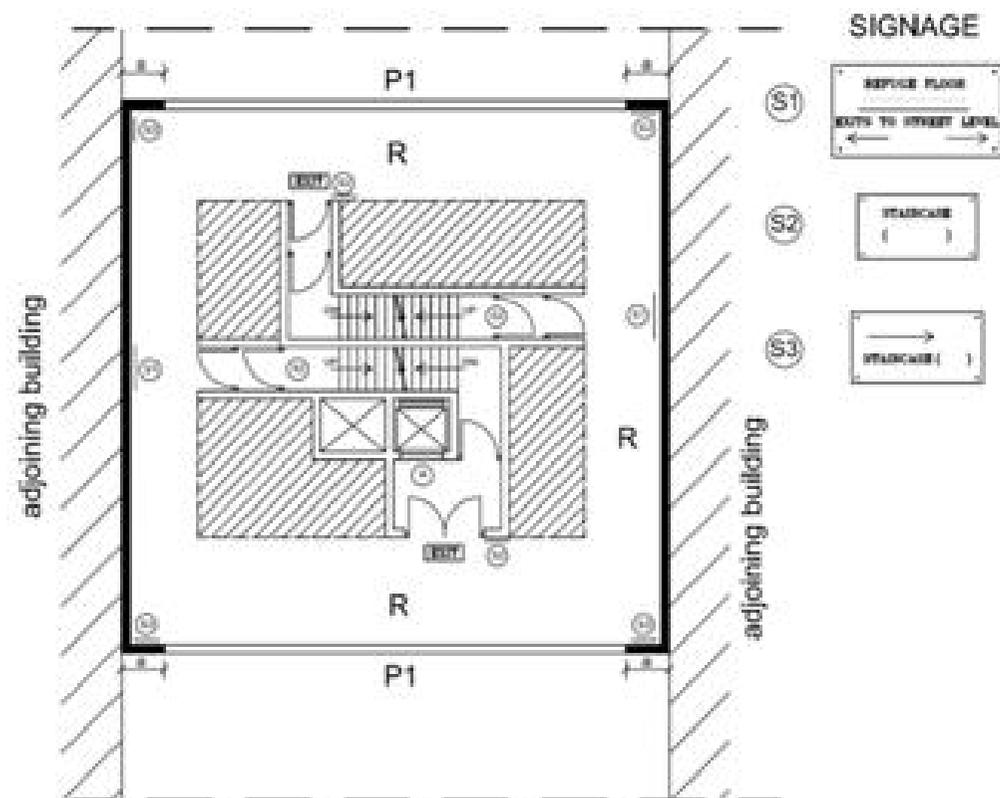
- Should be provided for all buildings **exceeding 25 storeys**
- RAF should only be served by controlled Fireman's Lift
- There is no other accommodation at the RAF
- Should be more than 50% of total GFA of the RAF
- Should have a clear headroom of not less than 2300mm
- The RAF should be open-sided above safe parapet height to provide good ventilation
- Should be provided with fire service installation and equipment as required by FSD

Hong Kong Fire Safety Guidelines
(Refuge) Floor of Rescue Assistance - RAF

- Located every 20 – 25 storeys
- Whole floor provided with min. 30 lux at floor level
- Fire Stairs are discontinued at RAF
- Fire Safety Officer is present at each RAF
- Queuing point for Evacuation Lifts / Elevators
- Rescue assistance area should be separated from remainder of the building
- Main roof may be regarded as RAF

(Refuge) Floor of Rescue Assistance Requirements

Diagram B5: Typical Layout of Refuge Floor



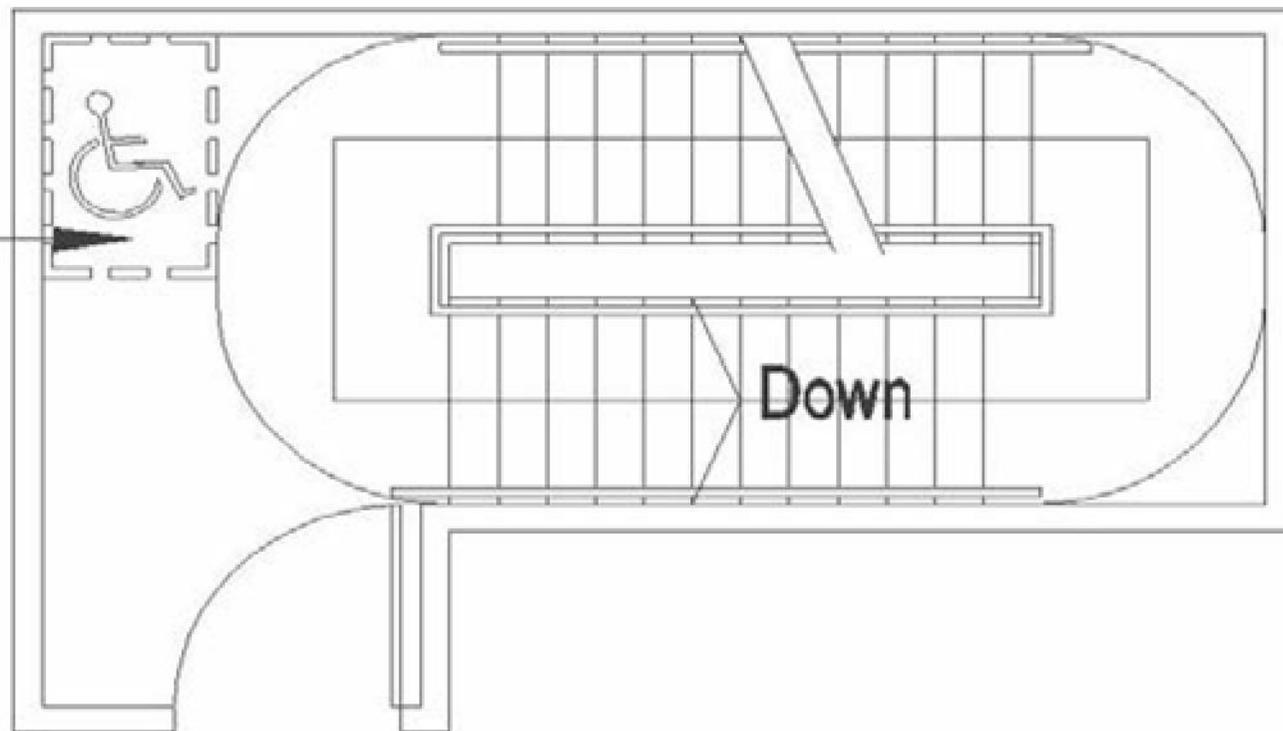
SIGNAGE

- (S1) REFUGE FLOOR
DOWN TO STREET LEVEL
- (S2) STAIRCASE
- (S3) STAIRCASE

KEY

- Permitted fire service water tank and associated fire service installation plant room; or other mechanical plant room (not accessible from refuge floor)
- R** Refuge floor (min. 50% of the floor area)
- P1** Open-sided above parapet height for cross-ventilation
- (A) Fireman's lift serves refuge floor but door locked during normal operation
- a** Fire rated wall [See Clause C5.2, C5.3 and C17.2 in Part C]

**PWD Holding
Point**



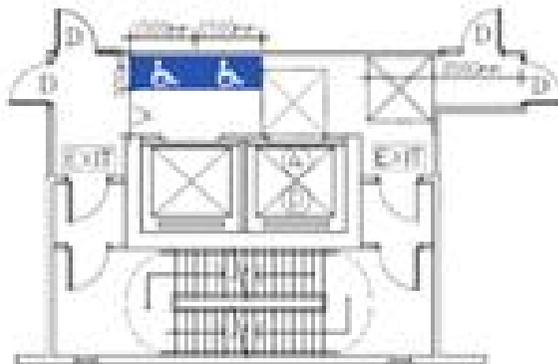
Area of Rescue Assistance

Diagram 8B: Temporary Refuge Spaces

Example (a): temporary refuge space in fireman's lift lobby

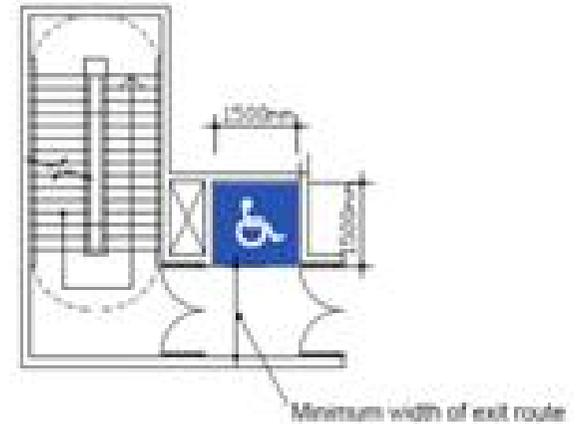


Example (b): temporary refuge spaces in fireman's lift lobby



-  Lobby to fireman's lift of minimum dimensions of 1.5m to be used as wheelchair manoeuvring space
-  1.5m x 1.5m wheelchair manoeuvring space of 1.5m clearances
-  Temporary refuge space (1.5m x 1.5m) in fireman's lift lobby
-  Minimum width of exit route
-  Fire rated door for accommodation
-  Accessible lift

Example (a): temporary refuge space in protected lobby



Example (b): temporary refuge space in landing of required staircase

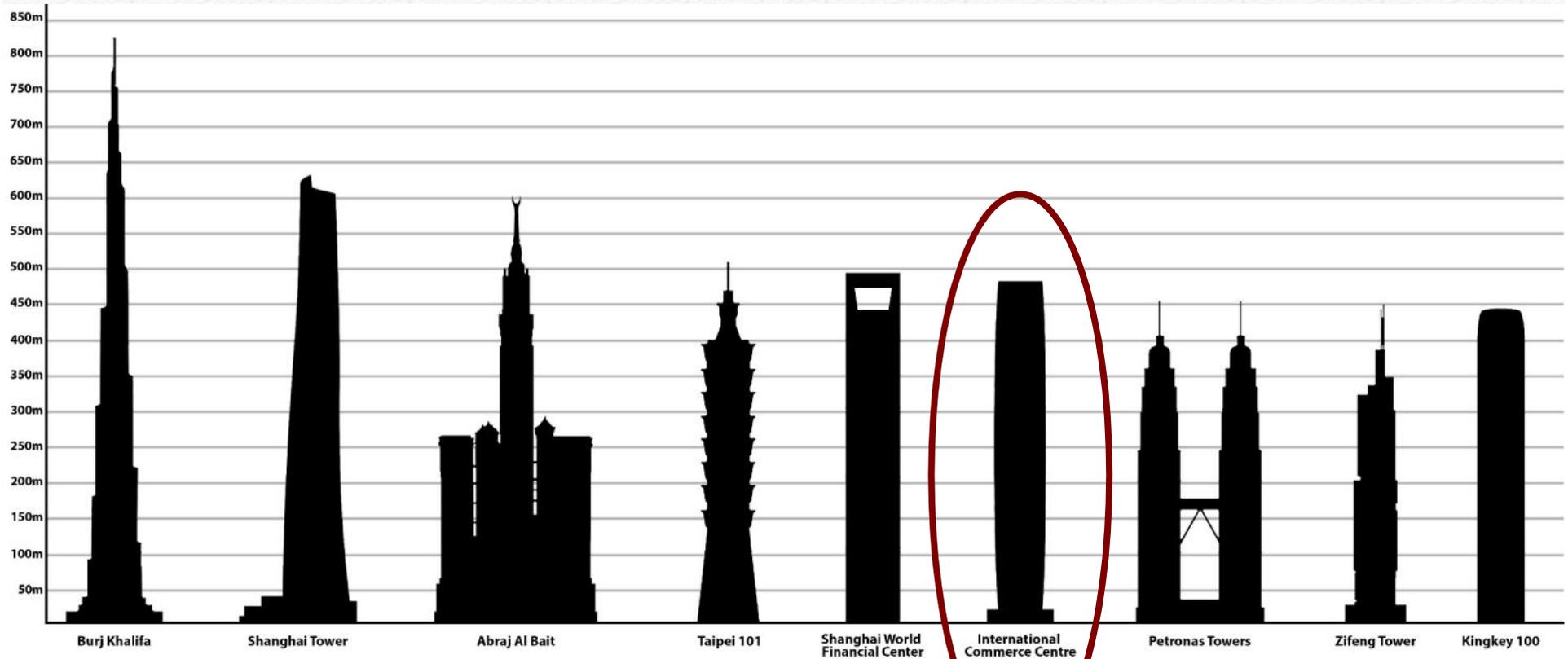


-  Minimum length of 1.2m for wheelchair users
-  Minimum width of exit route

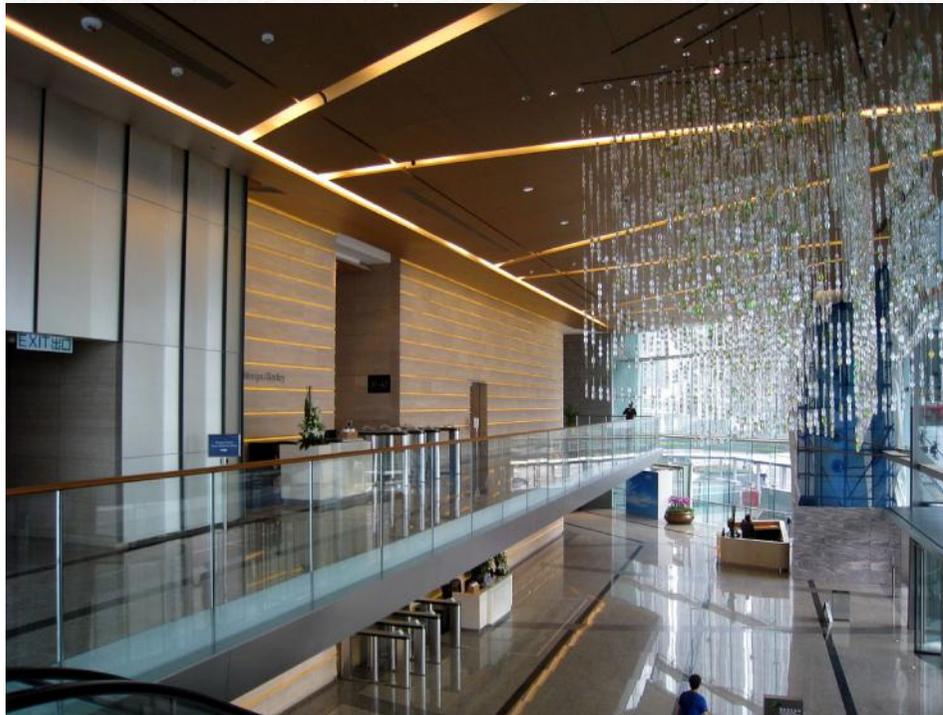
- World 10th Tallest by height
 - World 5th Tallest by floors
 - Located in Hong Kong
 - Completed: 2010
 - Retail, Office, 6-star Hotel
 - 484m/1,588ft height
 - 108 floors
 - 83 Lifts/Elevators in 5 zones
 - Architect – KPF Assoc.

ICC Tower Hong Kong





Tall Buildings in Asia

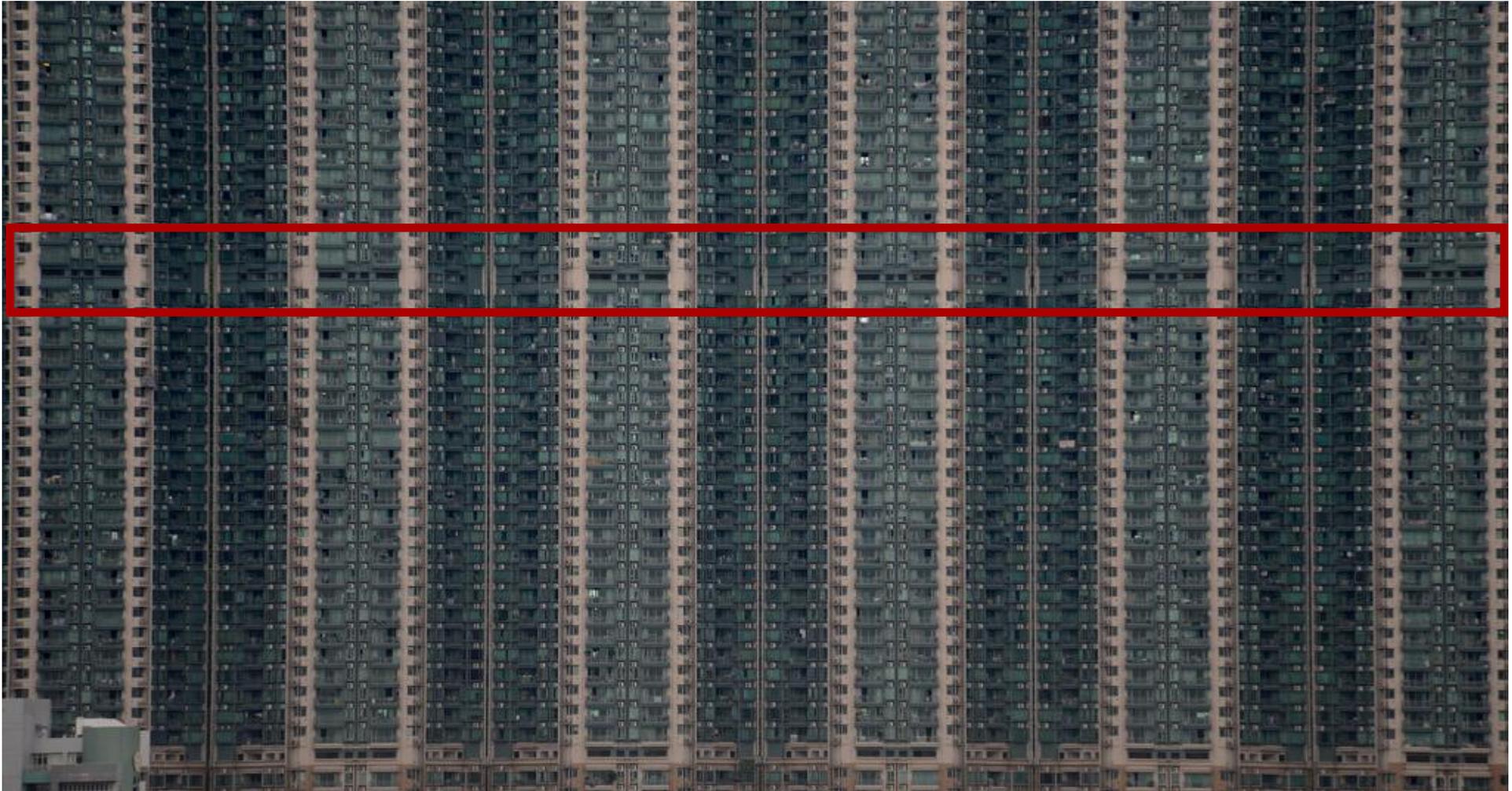


Lift Lobby – Double Deck Lifts





www.gamotama.com/real/taoyuan
Photo by taoyuan



Refuge Floor - High Rise Residential





Refuge Floor - High Rise Residential







**Means of Evacuation
for
People with Disabilities**

- 
- A temporary (refuge) space should be well-demarcated on floor by means of contrasting colour to clearly discern from the remainder areas of the storey
 - Only needed if there is no (refuge) floor or any safe passage to the ground floor
 - The (refuge) space should be cleared and there should be no obstruction
 - A sign should be placed to indicate the space for people with disabilities

Means of Evacuation for people with disabilities

Temporary (Refuge) Space – Area of Rescue Assistance

Evac - Chair

- **Evac+Chair** is a universal evacuation solution for smooth stairway **descent** during an emergency
 - Single user operation ensures no heavy lifting or manual handling is required during emergency evacuation procedures
 - www.evac-chair.com
-

Emergency Stairway Descent & Evacuation



Evac - Chair





PEEP

Personal Emergency Evacuation Plan

- *Prepared for all building occupants & visitors*
-

Yokohama Japan











Public Buildings



Public Buildings





Public Buildings



Public Buildings





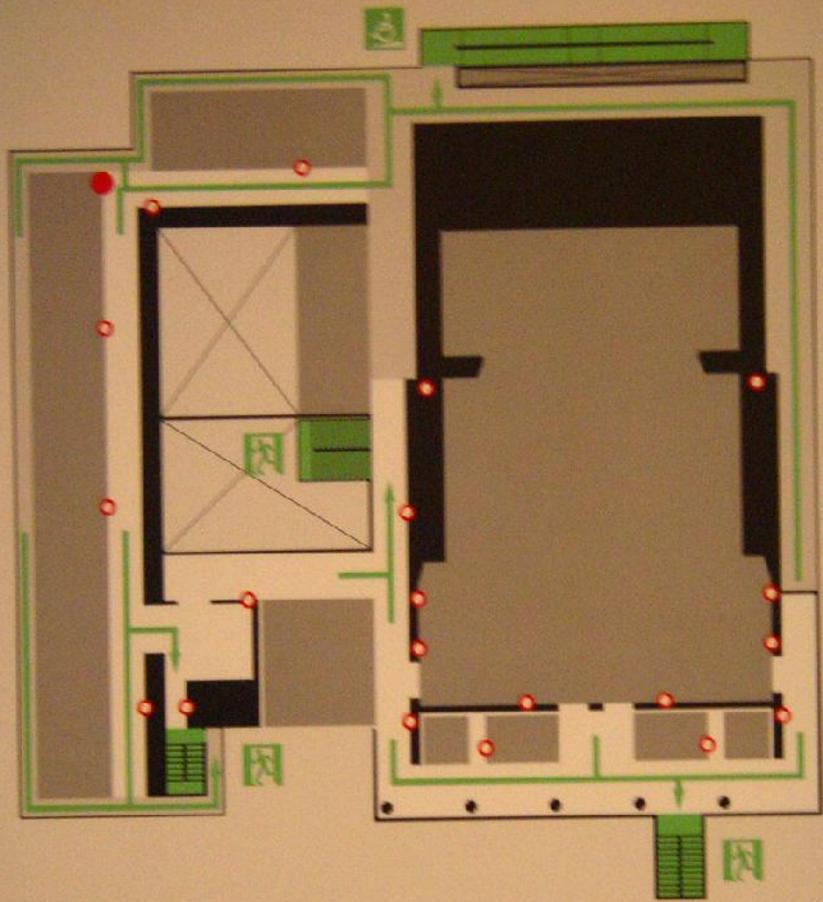
避難経路 ご案内

Emergency Exit.

安全のためにお願いします。
避難の際は周りの者の誘導に従い安全な場所へ避難してください。
避難する場合にはエレベーターを絶対に使用しないでください。

For your safety and security,
In case of emergency, follow the instructions of the staff.
In case of emergency, use the fire escape stairs.
Do not use the elevators.

- 現在位置
You are here
- 消火器
Fire Extinguisher
- 避難経路
Emergency Exit
- ⌘ 非常用階段
Emergency Stairs
- ⌘ 非常用スロープ
Emergency Slope



安全のためお願い致します。
 避難の際は係りの者の誘導に従い安全な
 場所へ避難してください。
 避難する場合にはエレベーターを絶対に
 使用しないでください。

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Fire Extinguisher
- 避難経路
Emergency Exit
- 非常用階段
Emergency Stairs
- 非常用スロープ
Emergency Slope





Way Forward

Accessibility & Safety in Architecture



Guiding Principles need to be applied:

- It should be possible to **reach** all places of the built environment
- It should be possible to **enter** all places within the built environment
- It should be possible to **make use** of all facilities within the built environment
- It should be possible to **leave or evacuate** all facilities in the built environment

General Planning & Design Considerations

- **Review & update** existing access legislations, standards, regulations, guidelines, manuals
- Apply to **new works** and **retrofitting of existing** built environment and infrastructure with **target dates** for implementation
- Establish **access committees** at central and municipal level with all stakeholders
- Establish **access officers/units** within Government Departments
- Include Universal Design in **university curriculum & Continuing Professional Development (CPD)**

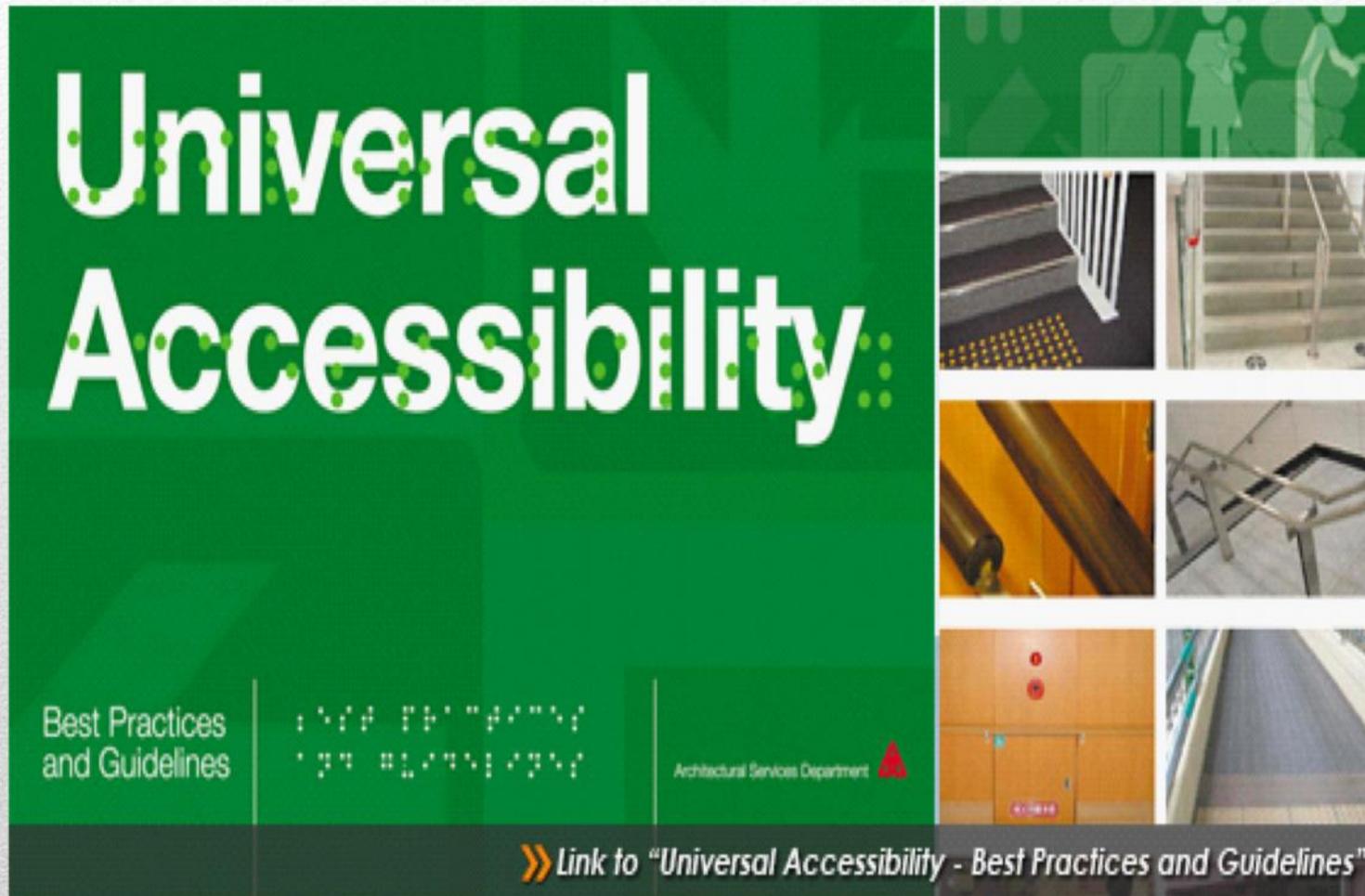
Way Forward

- Provide **capacity building** trainings - academics, trainers, professionals, practitioners...
- Provide **sensitivity trainings** to staff in related industries
- Confer **Accreditation** with star ratings and **Awards** for compliance with good/best practices (UD compliance) for all new buildings
- Complement access, egress and evacuation with **assistive devices** and technology, ICT, and services
- Engage **independent** and **qualified** Access and Fire Safety Consultants on all building and infrastructure developments

Way Forward

Universal Accessibility: Best Practices and Guidelines

ArchSD initiated the research on universal accessibility and published the first report of "Universal Accessibility: Best Practices and Guidelines" in 2004. The design considerations and best practice standards provide useful guidelines for professionals and architectural practitioners in their pursuit of a socially responsive building design.



Preface

Research Report on "Universal Accessibility: Best Practices and Guidelines"

Hong Kong similar to many other Countries is becoming an aging society. The proportion of our elderly is increasing rapidly. It is estimated that the elderly population in Hong Kong will increase to 21.5% of the total population by 2026. Since the 1970's, the Hong Kong Government has developed services for the elderly; and in 1994 adopted the "Aging in Place" policy regarding elderly services.

The concept of "Aging in Place" entails that the built environment provides a variety of choices in living arrangements, as well as be adaptable to the changing needs and health circumstance of residents without requiring drastic environmental changes. This concept can be further elaborated to encourage the elderly and people with disabilities to independently enjoy their living environment, instead of being restricted by potential physical barriers. It is understood that confining a person only in indoor activities is not a healthy habit, especially to people with disabilities and the elderly.

One of the major aims of a Barrier-free and Accessible environment is to facilitate and promote a healthy life style for all. The Concept of "Universal Design", "Inclusion by Design" and "Design-for-All" is to be the essence. Universal Accessibility is not a trend, but an enduring design approach which assumes that the range of human ability is ordinary, not special. It is all about integrating the continuum of the micro-and macro-perspectives of the surrounding world. It embodies universality by incorporating accessible facilities as well as accessible building features and equipment which, to the greatest extent possible, designs that can be used by everyone, regardless of age and physical abilities.

The approach to Universal Accessibility recognizes

that accessible systems, reliable information sources, and enabling environments can maximize choice and enhance the ability of a wider range of the population including the elderly and people with disabilities to live Independently, Proactively and hence Enjoyably.

The Architectural Services Department is to be highly commended for taking such initiative to research and publish this Report on "**Universal Accessibility: Best Practices and Guidelines**", possibly the first of its kind in Hong Kong. The design considerations and best practice standards will provide most useful and cutting edge guidelines for professionals and architectural practitioners in their pursuit of a socially responsive building design.

A barrier-free, accessible and user-friendly environment is the ideal to reach in any community. Our aim is to work towards an environment that is non-handicapping, that promotes freedom of choice and independence, and respects the individuals' right to live a full life with dignity irrespective of age and disability. This Research Report by the Architectural Services Department will greatly contribute towards achieving this common goal, thus is to be congratulated for initiating such major steps towards building an accessible and quality environment for a quality future for the people of Hong Kong.

Joseph Kwan, MH
Environmental Advisory Service
ReHabAid Society

23 November, 2004

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ISO/TC 59/SC 16 N 63

Date: 2008-12-12

DRAFT PROPOSAL 3rd ISO/CD 21542

ISO/TC 59/SC 16/WG 1 N 101

Secretariat: AENOR

Building construction — Accessibility and usability of the built environment

Construction — Accessibilité et facilité d'utilisation de l'environnement bâti

This document is not an ISO International Standard. It is distributed for review and comment. It is subject to change without notice and may not be referred to as an International Standard.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Document type: International standard
Document subtype: if applicable
Document stage: Committee Stage
Document language: E

ISO Standard: 21542

**Building Construction -
Accessibility and
Usability of the Built
Environment 2011**

International Standards



**MALAYSIAN
STANDARD**

MS 1184:2014

Universal design and accessibility in the built
environment - Code of practice
(Second revision)

ICS: 25.060.10

Description: universal design, disabled person, ambulant disabled, access, landscape, sign and symbol,
facility, lift, requirement

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DEPARTMENT OF STANDARDS MALAYSIA

Malaysian Standards

**MS 1184: 2014
Universal Design
and Accessibility in
Built Environment
Code of Practice**

(Second Revision) 4 Nov 2014

Malaysian Standards

CODE ON
ACCESSIBILITY
IN THE BUILT ENVIRONMENT 2013



**Singapore Code
Building and
Construction Authority**

**Code on
Accessibility in the
Built Environment
2013**

Singapore Code



**Singapore
Building and
Construction Authority**

**Universal Design
Mark Award**

BCA – UD Mark

BUILD FOR ALL

Promoting Accessibility for All to the Built Environment & Public Infrastructure

REFERENCE MANUAL

GOOD INTENTIONS ARE NOT ENOUGH
A Guide to the Implementation of Best Practice in Accessibility in Public Procurement



supported by the European Commission

Pilot project on actions to mainstream disability policies submitted under the open call for proposals for transnational projects VP/2004/008

Sole responsibility lies with the authors and the Commission is not responsible for any use that may be made of the information contained



THE BUILD-FOR-ALL REFERENCE MANUAL

Good intentions are not enough

The Build-for-All Reference Manual aims to provide assistance for the inclusion of accessibility criteria in public calls for tender under the Public Procurement Directive of the European Union. This Manual includes, in Part 1, a Handbook and, in Part 2, a Toolkit, that can be consulted independently from each other.

This Reference Manual is produced by:

The Architects' Council of Europe (ACE); Cooperative Integrate Onlus (CO.IN); The Council of European Municipalities and Regions (CEMR); EUROcities; The European Committee for Standardization (CEN); The European Construction Industry Federation (FIEC); The European Disability Forum (EDF); The European Institute for Design and Disability (EIDD); The European Lifts Association (ELA); AGE - The European Older People's Platform; The National Disability Council of Luxembourg (Info-Handicap); NEUMANNCONSULT; ProASolutions; The City of Gdynia

supported by the European Commission

Pilot project on actions to mainstream disability policies submitted under the open call for proposals for transnational projects VP/2004/008.



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Please visit www-build-for-all.net for updates.

- **Curriculum in Universal Design, Accessibility and Sustainable Fire Safety**
 - **Planning, Architecture**
 - **Interior Design, Landscape Architecture**
 - **Transportation Infrastructure**
 - **Inclusive Tourism**
 - **ICT (Information & Communication Technology)**
 - **Assistive Technology**
- **Professional CPD**
- **Professional Institute Universal Access Policy**

Education – University & Professional



Teaching Universal Design

Global Examples of Projects and Models for Teaching in Universal Design at Schools of Design and Architecture.

By B. Kennig and C. Ryhl
For AAoutils project

European Commission



Directorate-General
Education and Culture

Leonardo da Vinci Programme

Teaching Universal Design - European Commission

Action Plan

Norway universally designed by 2025

The Norwegian government's action plan for universal design
and increased accessibility 2009-2013





**Safe, Inclusive, Responsible
Architecture for Humanity**

Architecture for Humanity





Thank You

Ar. Joseph Kwan *MH*

RI

Deputy Vice President – Asia Pacific
Rehabilitation International (RI)

UIA

Director
International Union of Architects (UIA)
Region IV Work Programme
Architecture for All

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