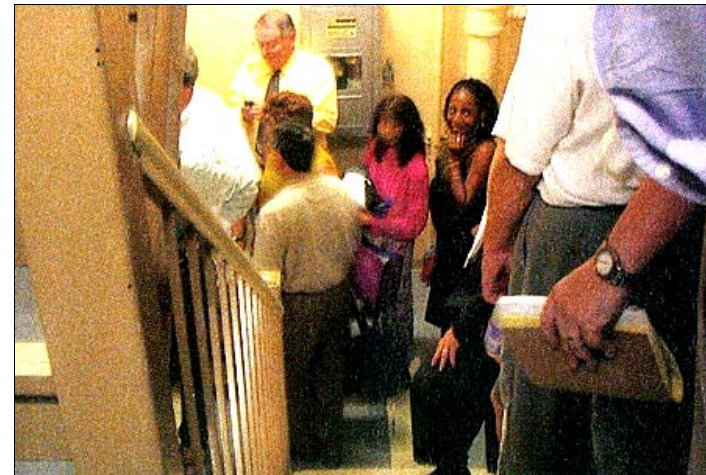


Wednesday, Thursday & Friday 27th-29th Junho 2007
OASRN Accessible Architecture Forum ~ Porto, Portugal



Facilitation Design & Fire Safety Integration
Sustainable Architecture

www.sustainable-design.eu

If Building Legislation (Legal Decree 163/2006 in Portugal) specifies only Minimum 'Access' Performance, what is the Bigger Picture ?



<http://www.sustainable-design.eu>

© Sustainable Design International Ltd. 2001-2007



Building Users ... Restricted? ... At Risk?



What is Sustainable Development ?

World Commission on Environment & Development
1987 Report: 'Our Common Future' - Chapter 2, Paragraph 1

"Sustainable Development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

It contains within it two key concepts :

- the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given ; and
- the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs."

1992 UN Rio Declaration on Environment & Development
[1972 UN Stockholm Declaration on the Human Environment]



Sustainable Human & Social Development

Sustainable Design International

2004 Rio de Janeiro Declaration on Sustainable Social Development, Disability & Ageing

Development which meets the responsible needs, i.e. the Human & Social Rights*, of this generation - without stealing the life and living resources from future generations, especially our children
.... and their children.

*As defined in the 1948 Universal Declaration of Human Rights

Our **Ultimate Goal** must be to achieve a dynamic and harmonious balance between a Sustainable 'Human' Environment and a flourishing, not just a surviving, 'Natural' Environment ... with the **Overall Aim** of attaining Social Wellbeing-for-All.

Sustainable Design

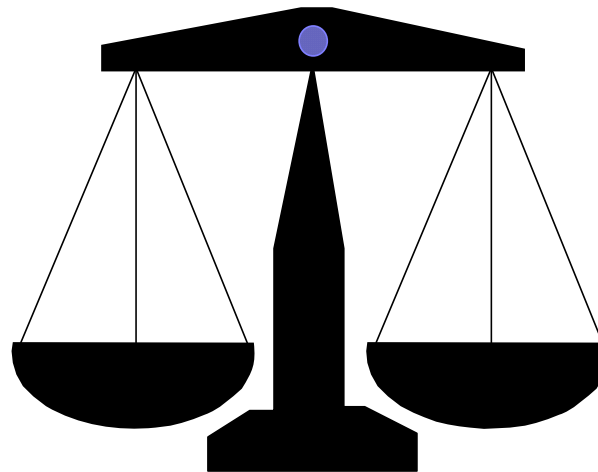
The ethical design response, in built form, to the concept of Sustainable Human & Social Development



Many Aspects of Sustainable Development

Social + **Environmental** + **Institutional** + **Economic**
+ **Political** + **Legal** + **Judicial**

in an agreed context of **International Law & Lasting Peace**



Balanced & Equitable Implementation !!



Accessibility-for-All

People with Activity Limitations, including younger children, women in the later stages of pregnancy, frail older people, people with disabilities, people with health conditions, ...

.... is a **Fundamental Attribute** of a
Sustainable Built (including Virtual) Environment

It is an essential prerequisite for protection against discrimination (direct/indirect), equality of opportunity, social development and inclusion-for-all in the community

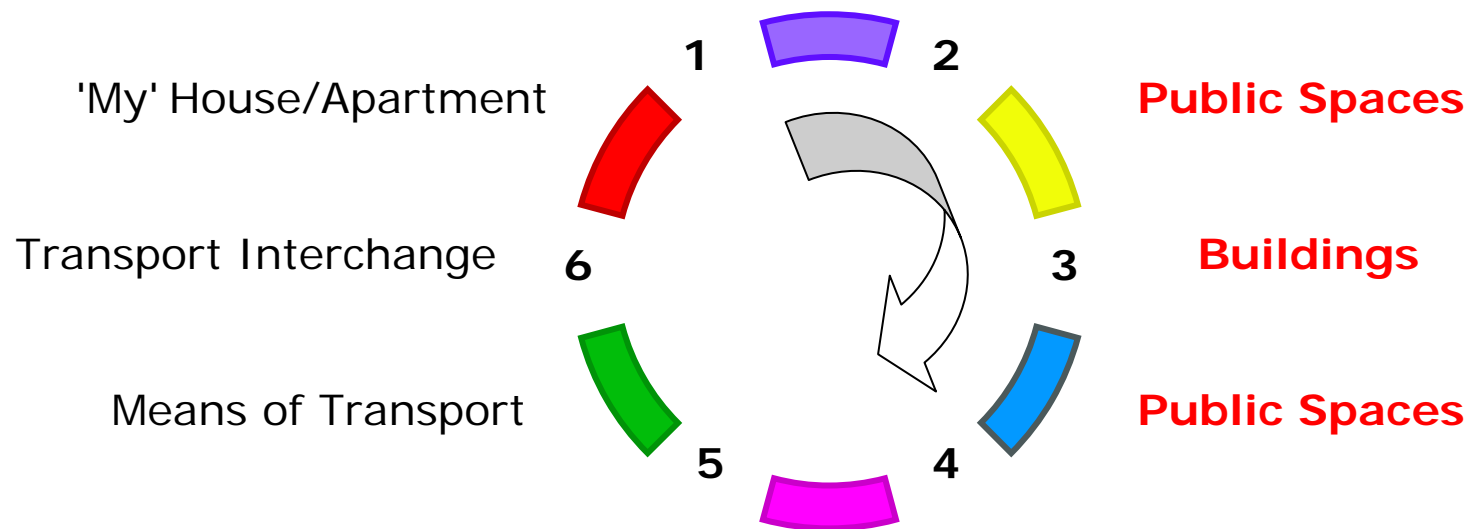
Social Justice, Solidarity & Inclusion are **Fundamental Values** in a Sustainable Social Environment

[Human Environment = Built, Social & Virtual Environments]



Dynamic Accessibility Cycle

A continuous process of independent activity and functioning - with confidence - in the 'human' environment, & positive participation in the general life of a community, on the basis of equal opportunity with every other person.



Accessibility & e-Accessibility - The 'Built' and 'Virtual' Environments continue, relentlessly, to merge into a new **Augmented Reality**.



'Accessibility-for-All' Matrix

Built, Social & Virtual Environments (including EICT's)		People with Activity Limitations (2001 WHO ICF)				
		All Users incl. children & frail, older people & late-stage pregnant women & people with health conditions, etc.	People with Disabilities / Impairments (2006 UN Disability Rights Convention)			
			Visual Impairment	Hearing Impairment	Physical Function Impairment	Mental / Cognitive Impairment
1. Buildings	i List A	Building Priorities - See 2004 Rio Declaration on Sustainable Social Development, Disability & Ageing				
	ii List B					
	iii List C					
2. Street Pavements & Public Spaces						
3. Means of Transport	a Buses					
	b Taxis					
	c Trains					
4. Transport Interchanges						
5. Miscellaneous						



'Accessibility' of a Building

Includes

- **Approach** to the building from the site boundary;
- **Entry** through principal entrance(s);
- **Health, Safety, Convenience & Comfort In Use**, including thermal comfort, indoor air quality, protection from fire, etc;
- **Egress** under normal conditions;
- **Evacuation in the Event of a Fire**, or other emergency;
- **Removal** from the vicinity of the building back to the site boundary;

and

- Each stage of a **Work Process**, at every level, in places of work;
- Use of **Electronic, Information & Communication Technologies (EICT's)** - at minimum, those permanently fixed in/to the building;

and

- **Management, Services & Attitudes of People** in the building;
- **Recruitment, Employment, Promotion & Training Practices.**



Universal Design, Design-for-All, Inclusive Design, Barrier-Free Design Adequacy Today ?

Facilitation Design

An ethical, rights-based approach to design, targeted at the elimination of **Participation Barriers** and the insertion of **Environmental Factors** which improve a person's activity and functioning, or reduce his/her disability, in the Built, Social or Virtual Environments.

'Facilitator' (2001 WHO ICF)

Any environmental factor which, through its presence or absence, improves activity and functioning, or reduces disability.

'Environmental Factors' (2001 WHO ICF)

Those factors which are external, or extrinsic, to the context of a person's life and living situation, e.g. the built environment and its features (real / virtual), other people in different roles, social attitudes and values, services, systems and policies.



'People with Activity Limitations'

[2001 WHO ICF is a classification of 'Health' ... not of 'Disability']

Those people, of all ages, who are unable to perform, independently and without aid, basic human activities or tasks - because of a health condition or physical/mental/cognitive/psychological impairment of a permanent or temporary nature.

- wheelchair users ;
- people who experience difficulty in walking, with or without aid, e.g. stick, crutch, calliper or walking frame ;
- frail, older people ;
- the very young (people under the age of 5 years) ;
- people who suffer from arthritis, asthma, or a heart condition ;
- the visually and/or hearing impaired ;
- people who have a cognitive impairment disorder, including dementia, amnesia, brain injury, or delirium ;
- women in the later stages of pregnancy ;
- people impaired following the use of alcohol, other 'social' drugs, e.g. cocaine and heroin, and some medicines, e.g. psychotropic drugs ;
- people who suffer any partial or complete loss of language related abilities, i.e. aphasia ;
- people impaired following exposure to environmental pollution and/or irresponsible human activity ;

and

- people who experience a panic attack in a fire situation or other emergency ;
- people, including firefighters, who suffer incapacitation as a result of exposure, during a fire, to poisonous or toxic substances, and/or elevated temperatures.



SDI WebSite Content & Navigation



www.sustainable-design.ie/fire
[fire engineering]



Sustainable Design International
Ireland, Italy & Turkey



www.sustainable-design.ie/arch
[architecture]

The **SDI HomePage** is located at www.sustainable-design.ie. This is the Foundation Domain Name for the whole WebSite '**.ie**' is the National Domain for Ireland. We also provide many shortcuts for user convenience e.g. www.accessibility-for-all.eu '**.eu**' is the New Regional Domain for the European Union.

For the purpose of **WebSite Content Authentication**, we continue to refer to
COM(2002) 667 final - Communication from the Commission to the Council, the European Parliament,
the Economic and Social Committee & the Committee of the Regions
e-Europe 2002: Quality Criteria for Health-Related WebSites



World Trade Center Complex, New York - Tuesday, 11th September, 2001 (9-11)



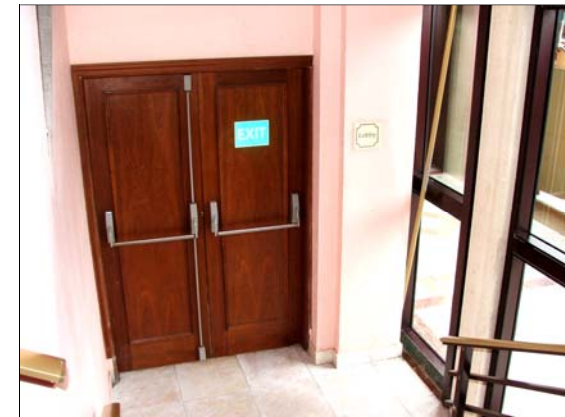
Staircases too steep & too narrow; **Steps** have projecting nosings; **Handrails** on only one side / not continuous; **Assisted Evacuation** not practical; **Contraflow** of firefighters not practical; **Evacuation Routes** disjointed; **Elevator/Lift Use** not permitted; **Building Design** not suitable for emergency evacuation, etc., etc.

Must Apply Accessibility Criteria To Fire Evacuation Routes & Fire Engineering



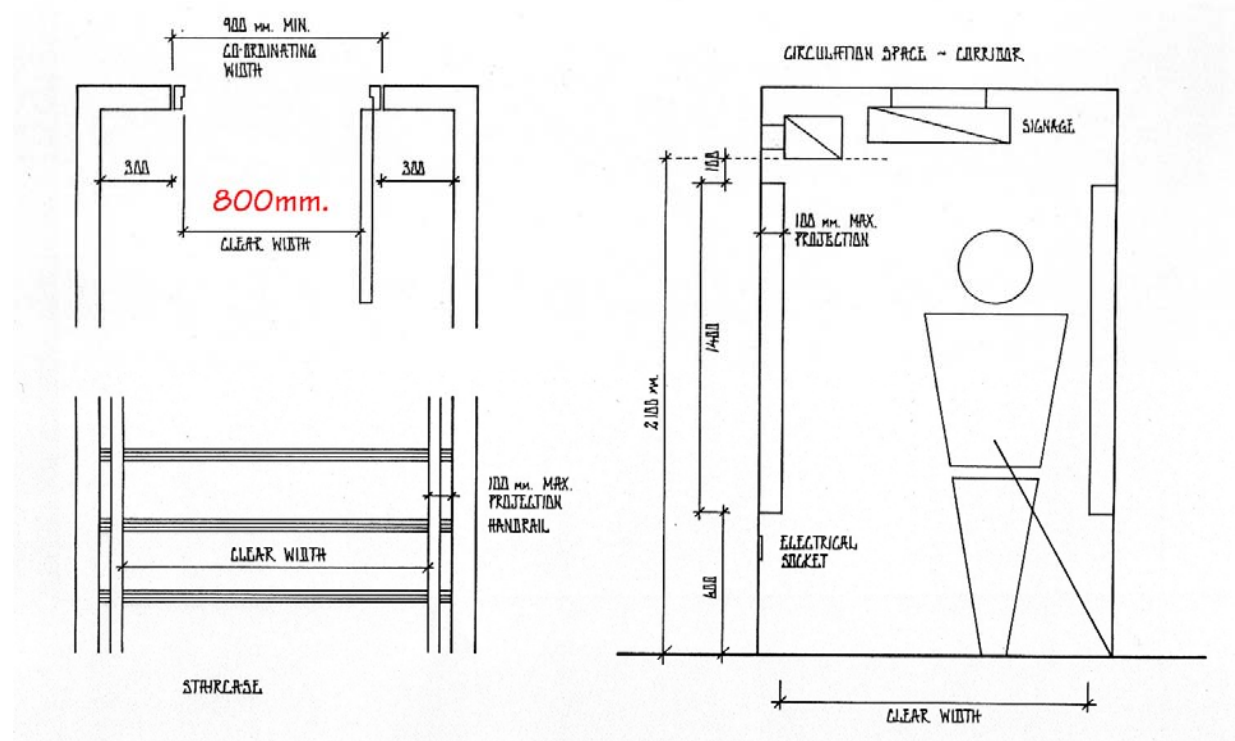
Good Management Is Important !

April 2007 - Clear Evacuation Staircase in the Hotel Parque Central, Havana, Cuba





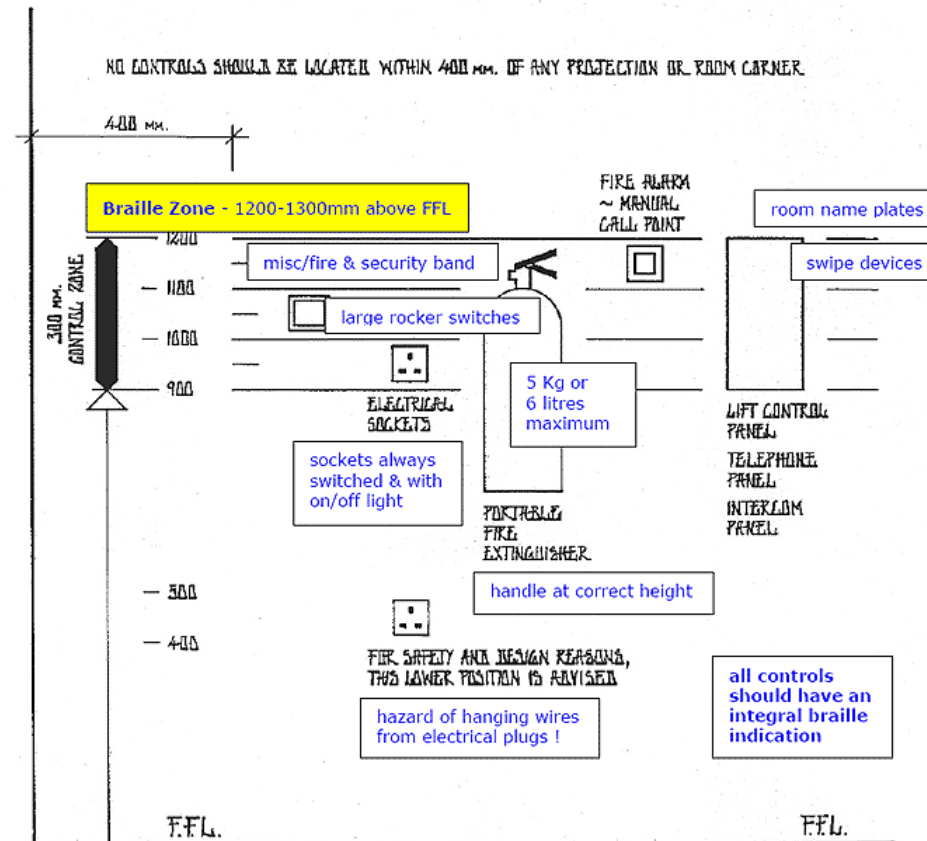
Clear Width ?



Clear Width must actually mean 'clear and unobstructed width from Finished Floor Level (FFL) to a height of 2.1 m. above floor level, i.e. doorhead height'.

Must Harmonize Definition of 'Clear Width'



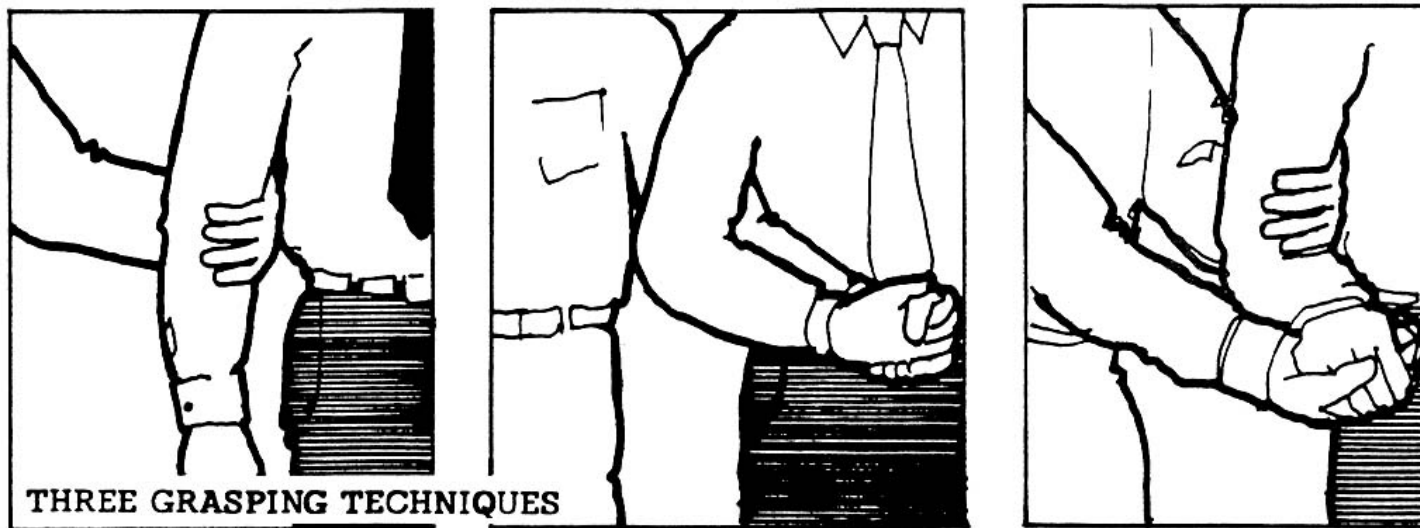


Must Integrate Fire Safety Controls



Assisted Evacuation Techniques I

Visual Impairment

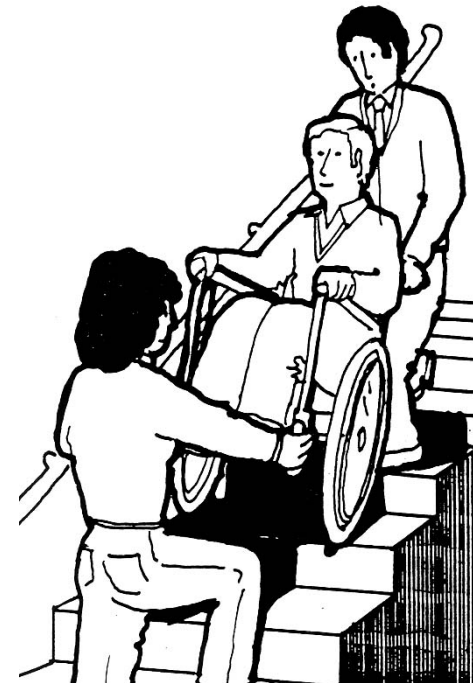


NRCC Report: 'Evacuation Techniques for Disabled People'. Byron Johnson. March 1983.



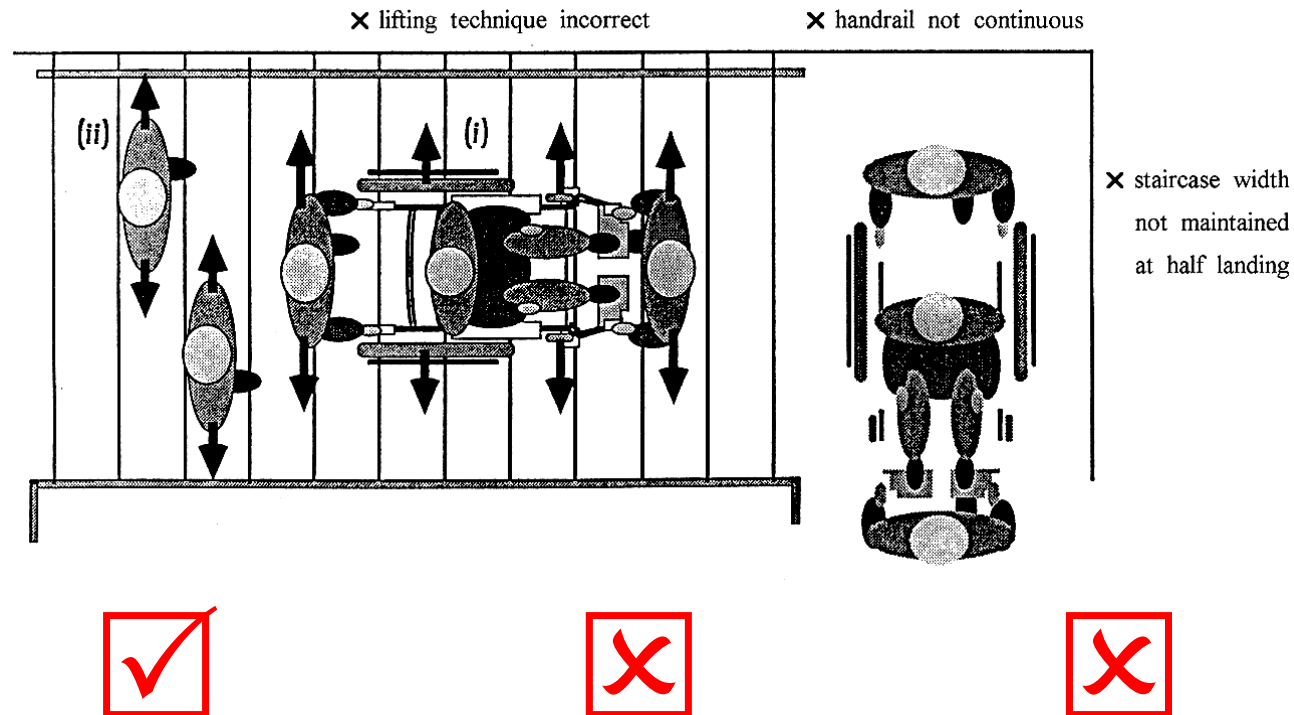
Assisted Evacuation Techniques II

Physical Function Impairment



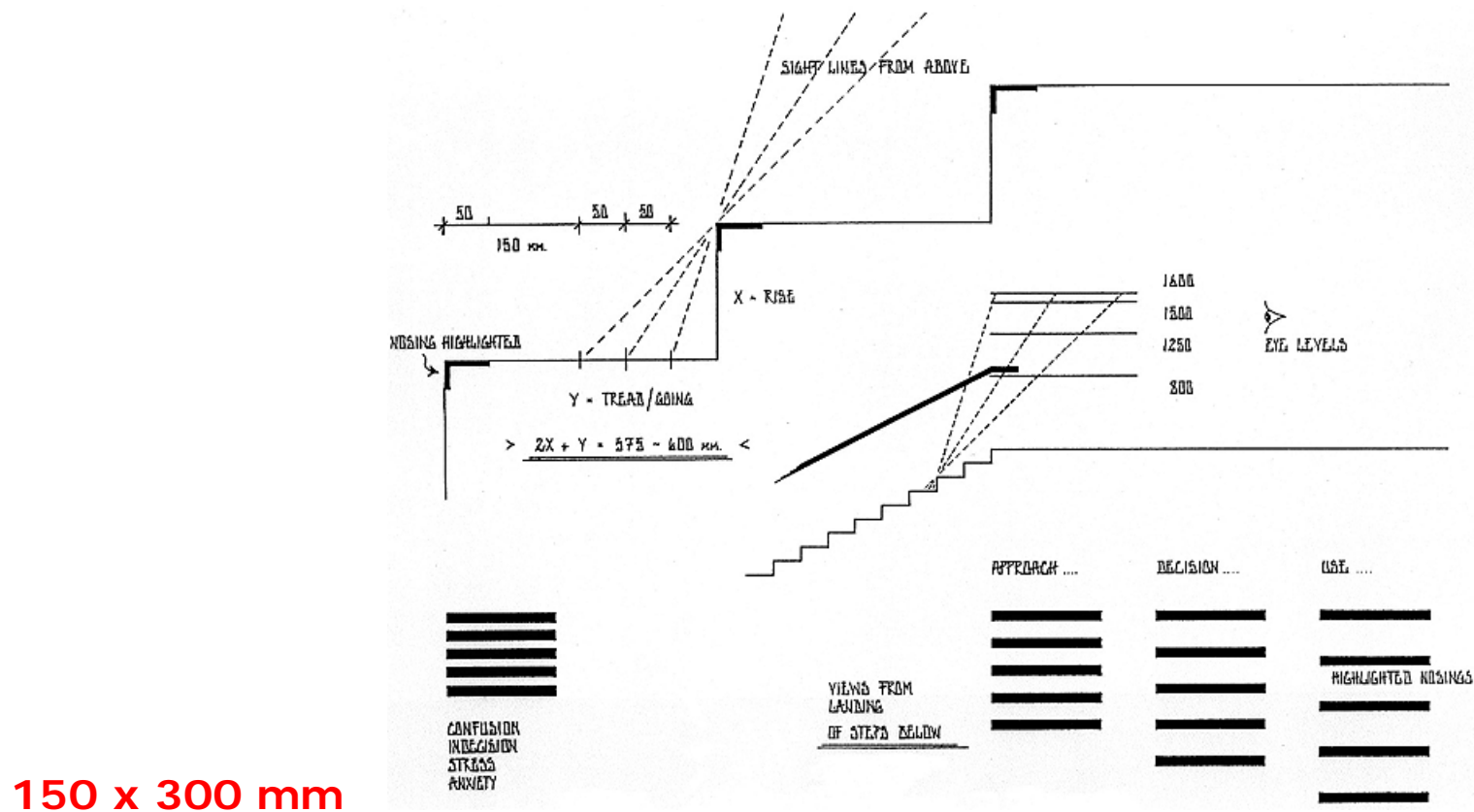
Correct Technique has One Person Behind the Wheelchair (as shown above), but with One Person at Each Side.
Will the Staircase be Wide Enough ?





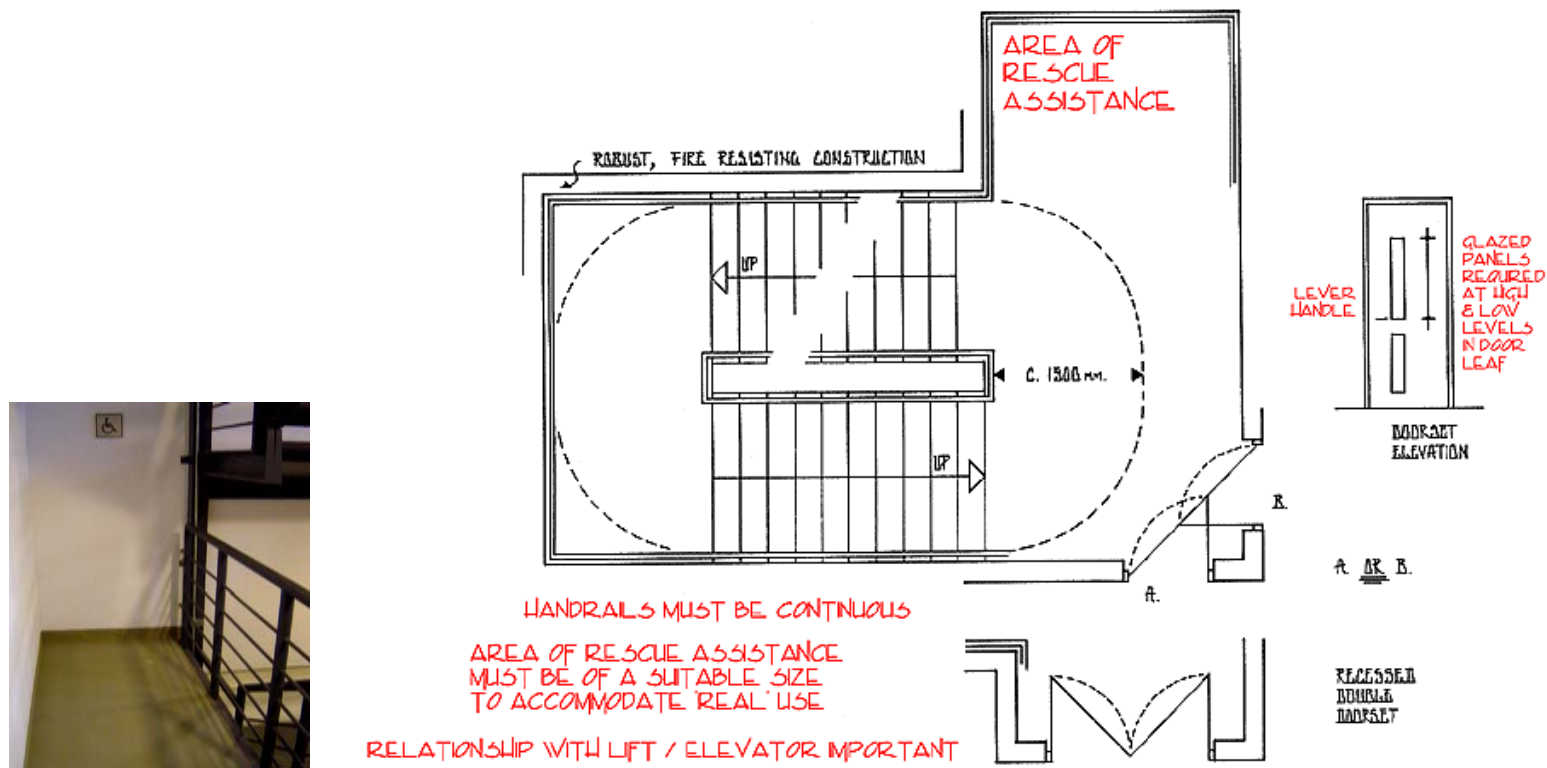
Assisted Evacuation on a Staircase





Steps for Safety & Assisted Evacuation





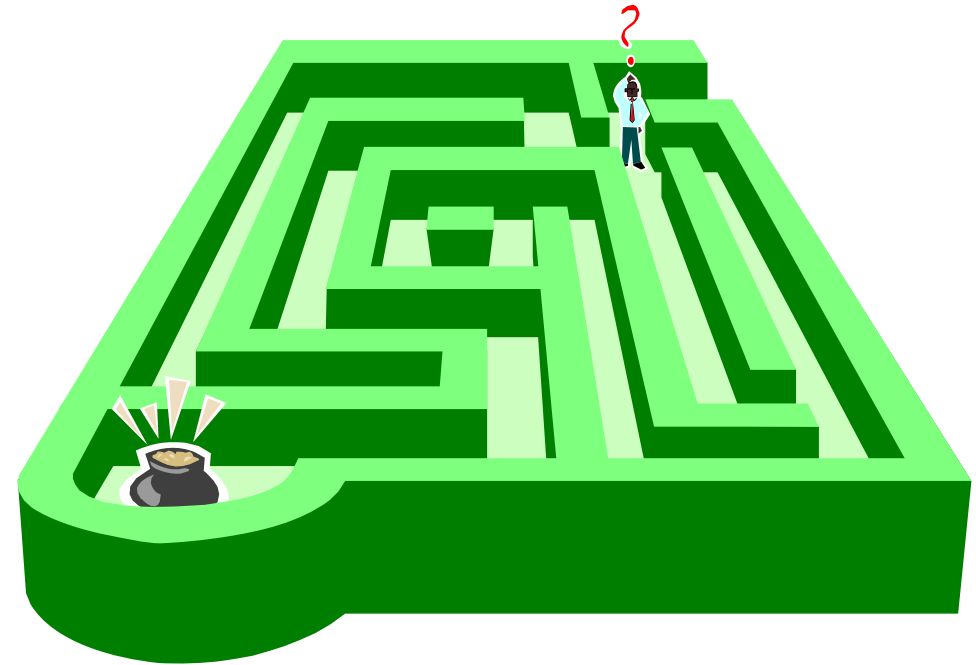
In 2005, NIST(USA) recommended that stairwell capacity and stair discharge door width should be adequate to accommodate **Contraflow**, i.e. emergency access by firefighters/rescue teams into the building and towards the fire, while people are still evacuating from the building.

Staircase for Assisted Evacuation & Contraflow

.... and also for Carrying a Person on a Stretcher !



- ◆ Building 'Understandability' ?
- ◆ Personal Orientation ?
- ◆ Relationship with Exterior ?
- ◆ 'Intuitive', Standard Signage ?
- ◆ Use of Elevators/Lifts in Fire ?
- ◆ Use of Escalators/Travelators ?
- ◆ Safe Evacuation Staircases ?



"where is the final exit ?"

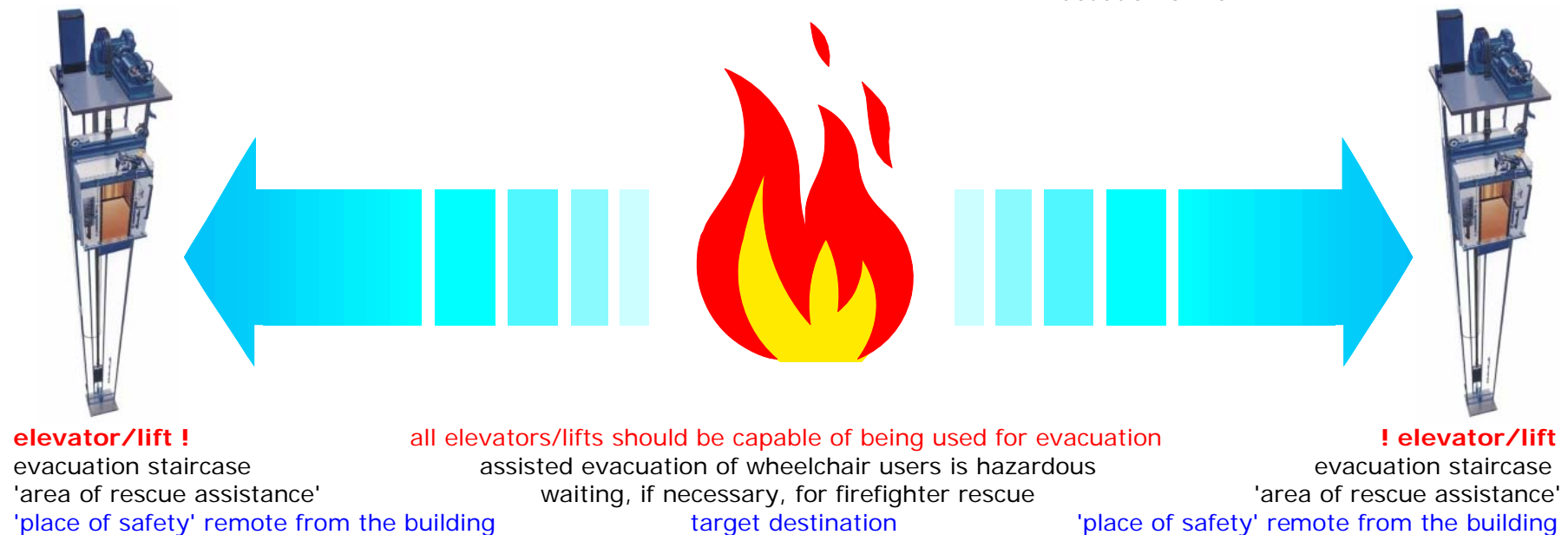
In 2005, NIST(USA) recommended that **evacuation routes** should have consistent layouts, and be 'intuitive and obvious' for all building users, including visitors, during evacuations.

Building Design for Evacuation ?



Alternative, Safe & 'Intuitive'

Consider Human Perception & Behaviour
+ Evacuation Skills



Evacuation Routes For All Users

including 'people with activity limitations' & visitors to the building



Building Users / Fire Incident / No Explosion Hazard *



Place of Safety:

Any location beyond a perimeter which is [100] metres from the fire building or a distance of [10] times the height of such building, whichever is the greater
and
where necessary and effective medical care and attention can be provided, or organized, within one hour of injury
and
where people can be identified.

* Where there is a Risk of Explosion multiply the numbers in square brackets above by 4 (at least !)





Buildings Must Remain Structurally Stable

- ◆ While people are waiting in 'Areas of Rescue Assistance'
- +
- ◆ Until all of these people can be rescued by Firefighters
and can reach a 'Place of Safety'



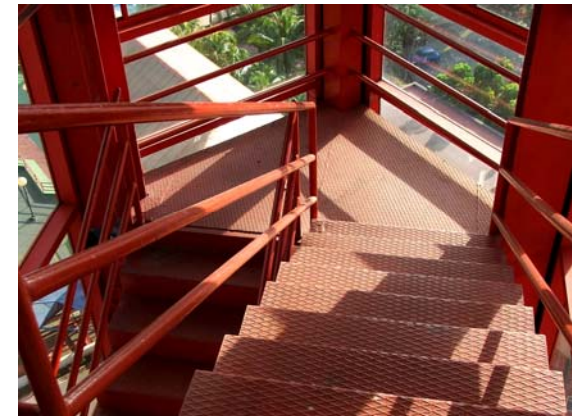
Evacuation Exercise in Dublin, Ireland

January 2002 - Developed for & Involved People with Cognitive Impairments



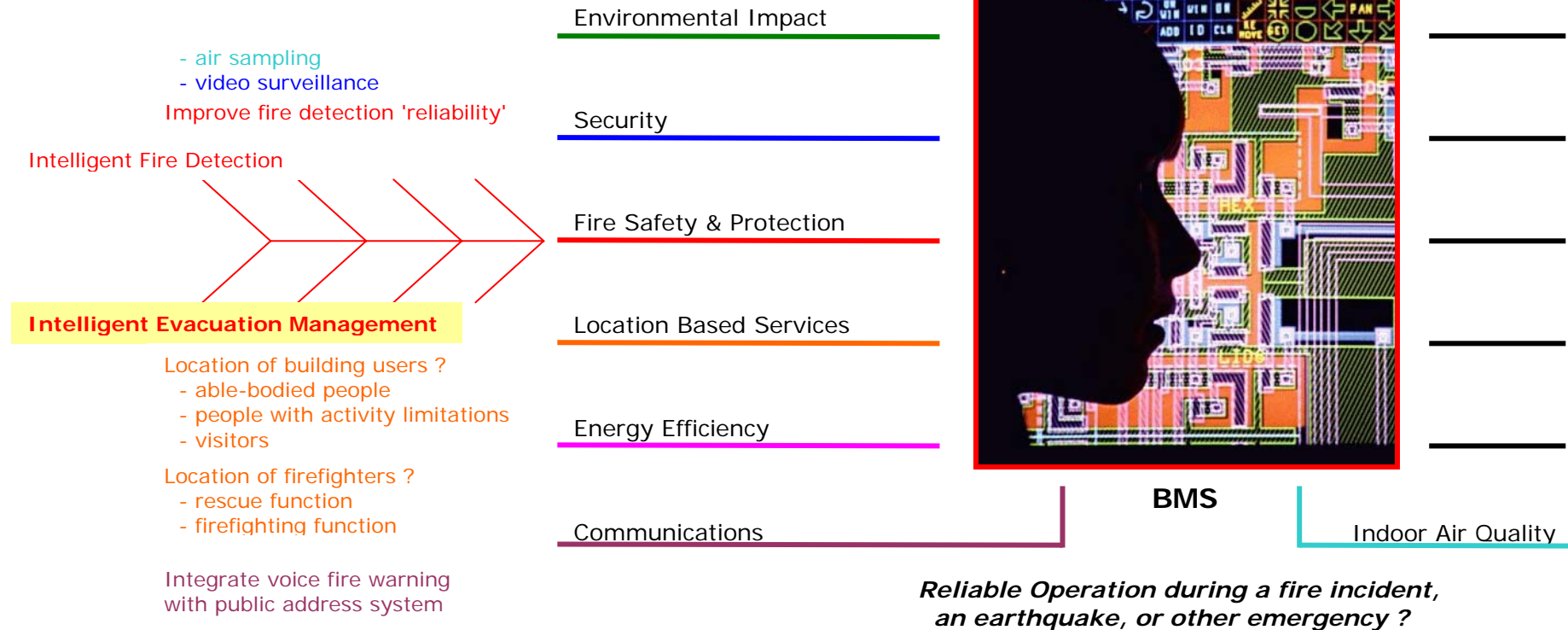
People with Psychological Impairments ?

April 2007 - Hotel Meliá Santiago de Cuba, Cuba



**Large Scale Application of Full BMS Integration:
(‘Building Life Cycle’ Risk Specific)**

Accessible Building User Interface Technologies



Intelligent Evacuation Management



Some International Developments

◆ NIST(USA) 2005 Final Report on 9-11 WTC 1 & 2 Collapses

Introduced a **New Benchmark** for International Fire Engineering
30 Important Recommendations contained in Chapter 9

◆ U.N. 2006 Convention on the Rights of Persons with Disabilities

Article 9.1: " States Parties shall take appropriate measures to ensure
access, , to the *physical environment*, , both in *urban* and in *rural areas*. "

Article 11: " States Parties *shall take all necessary measures to ensure the protection and safety of persons with disabilities in situations of risk, including situations of armed conflict, humanitarian emergencies and the occurrence of natural disasters.* "

Article 4.3: " In the development and implementation of legislation and policies, and in other decision-making processes concerning issues relating to persons with disabilities, States Parties *shall closely consult with and actively involve persons with disabilities*, including children "

Preamble (g): " Emphasizing the importance of *mainstreaming disability issues* as an integral part of relevant strategies of *sustainable development*, "



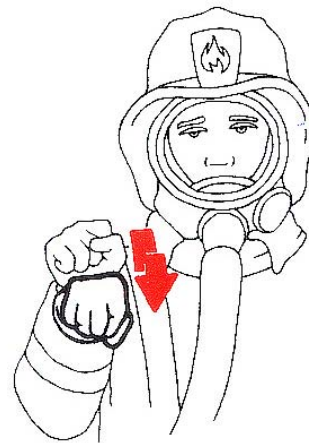
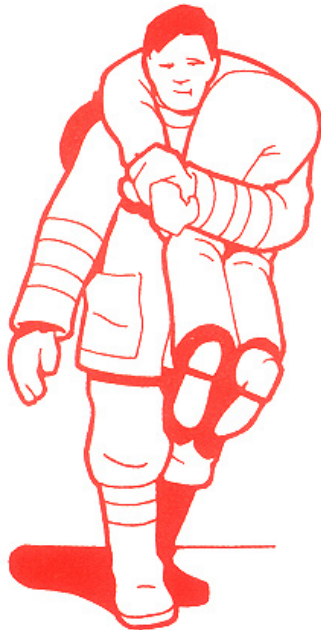


Competence ? Product 'Fitness for Use' ?

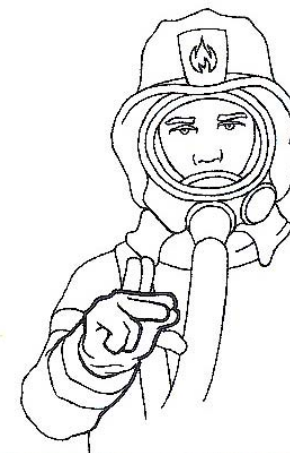


Firefighter Rescue Assistance ?

Some Issues for Examination ...



Yes



No

Firefighter Training Pack: 'Fire Safety for People with Disabilities'. BDE, Canada. 2004.

(MI) Standard Firefighter's Lift ?

(HI) Skeleton International Sign Language ?

(VI) Authentication of Identity ?



Accessible Routes to 'Places of Safety' ?



European Union Secondary Legislation

Where EU Law exists, it is Superior to the National Laws of the Union's Member States.

Published in the Official Journal of the European Communities

Available on the Internet: www.eur-lex.europa.eu

1. **Regulations** are of general application. They are binding in their entirety, and applicable in all Member States.
2. **Directives** are binding on the Member States to which they are addressed regarding a target or a result. The form and the methods of reaching that target, or achieving that result, are left to the discretion of National Authorities.
3. **Decisions** may be addressed to a Government, or to an enterprise or to a private individual. They are binding in their entirety on those to whom they are addressed.
4. **Recommendations** and **Opinions** are not binding.

National Gold-Plating & Divergent Implementation ?!?



European Union Directives I

◆ Construction Products 89/106/EEC

Construction Products are 'Fit for Use', if they allow the Building to comply with the 6 Essential Requirements in Annex I of the Directive. Disability ☒
Forerunner of Harmonized European Building Regulations.

[National Building Regulations in Europe]

Fire Safety Disability ☒; Disabled Access; Product 'Fitness for Use'.
National Levels of Safety are the Responsibility of the Member States.

◆ Safety & Health in the Workplace 89/391/EEC + 89/654/EEC

Fire Safety; Disabled Access; Consultation; Product 'Fitness for Use'.
Handicapped Workers ☑

◆ Safety in Road Tunnels 2004/54/EC

Annex II, Paragraph 2.2: " The safety documentation **shall describe** the measures needed to ensure the safety of users, taking into account **people with reduced mobility and disabled people** "

.... Confusing Disability Terminology !



European Union Directives II

◆ Equal Treatment in Employment & Occupation 2000/78/EC

Article 1: " a general framework for combating discrimination on the grounds of *disability* as regards employment and occupation, with a view to putting into effect the principle of equal treatment. "

Article 3: " In order to guarantee compliance with the principle of equal treatment in relation to persons with disabilities, *reasonable accommodation shall be provided*. "

◆ Public Works/Supply/Service Contracts 2004/18/EC (as amended)

Article 23, Paragraph 1: " The *technical specifications* as defined in point 1 of Annex VI shall be set out in the contract documentation, such as contract notices, contract documents or additional documents. *Whenever possible* these technical specifications *should* be defined so as to take into account *accessibility criteria for people with disabilities or design for all users*. "

[National Implementation in Ireland "shall, as far as practicable"]

[National Implementation in other Member States ? Accessibility Criteria ?]



Sustainable Architecture

"In its simplest form, **Architecture** is rooted in entirely functional, utilitarian and technological considerations"

[Walter Gropius, 1919]

Yet, to this day, **Architects** continue to ignore, and even resist, the basic, responsible 'needs' of many Building Users.

This is **Discrimination** ... and
a blatant violation of their **Human & Social Rights** !

In order to enter into the 'soul' of **Sustainable Architecture**,
Architects must begin to resolve these and other
Ethical Issues of Design.

