2021 International Sustainability V-Summit

Updated May 2023

Sustainable Human & Social Development

Building Energy

Road Map To A Safe, Resilient & Sustainable Built Environment For All

Sustainable Fire Engineering

www.sfe-fire.eu @sfe2016dublin

FireOx International

Inclusive Language of Sustainability

Complex Spatial Planning & Architectural Concepts ... **Innovative Building Forms**, Products & Systems
Minimal Compartmentation in order to use **Natural Patterns of Air Movement** for Heating, Cooling & Ventilation
'Positive Energy Buildings' producing more energy than they consume ... Excess returned to **Local or Regional Smart Grids**
Frontline Firefighters facing serious challenges ... **Not Yet Supported** by Specialist Structural Engineering & Hazard Appraisal Units
Conventional Fire Engineering does not understand this Language ... **Cannot Respond** Creatively or Collaboratively
Technical Control of Buildings **No** > Serious Fire Safety Issues ? **Yes** > Serious Design Compromises ?

Projects by Ar. Vincent Callebaut - Belgium & France

What is Sustainable Development ?

World **C**ommission on **E**nvironment & **D**evelopment [WCED]
1987 Report: 'Our Common Future' - Chapter 2, Paragraph #1

#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

[1992 United Nations Framework Convention on Climate Change + 1997 Kyoto Protocol]

1972 UN Stockholm Declaration on the Human Environment

[1985 UN Vienna Convention for the Protection of the Ozone Layer + 1987 Montreal Protocol]

Sustainable Human & Social Development

Sustainable Design International [SDI] - Ireland, Italy & Turkey

Development which meets the responsible needs of this generation - without stealing the life and living resources from future generations ... especially our children, their children, and the next five generations of children.

['Responsible Needs' are the fundamental rights, freedoms and protections defined and elaborated in the 1948 Universal Declaration of Human Rights, subsequent International Human Rights Instruments, and the United Nations 2015-2030 Sustainable Development Framework Agenda.]

Transforming Social Organization ...

The **Ultimate Goal** is to arrive, quickly, at a dynamic and harmonious balance between a Sustainable 'Human' Environment and a flourishing, not just a surviving, 'Natural' Environment ... with the **Overall Aim** of achieving Social Wellbeing for All in the 'Human' Environment.

Social Wellbeing for All

A general condition – for every person in a community, society or culture - of health, happiness, creativity, responsible fulfilment, and sustainable development.

The 'Human' Environment

[1972 UN Stockholm Declaration on the Human Environment]

Comprising ...

Social Environment

The complex network of real and virtual human interaction - at a communal or larger group level - which operates for reasons of tradition, culture, business, pleasure, information exchange, institutional organization, legal procedure, governance, human betterment, social progress and spiritual enlightenment, etc.

The Social Environment shapes, binds together, and directs the future development of the Built and Virtual Environments.

Built Environment

Anywhere there is, or has been, a man-made or wrought (worked) intervention by humans in the Natural Environment, e.g. cities, towns, villages, rural settlements, service utilities, transport systems, roads, bridges, tunnels, and cultivated lands, lakes, rivers, coasts, seas, etc ... including the Virtual Environment.

Virtual Environment

A designed environment, electronically generated from within the built environment, which may have the appearance, form, functionality and impact - to the person perceiving and actually experiencing it - of a real, imagined and/or utopian world.

The Virtual and Built Environments continue to merge into a new, Augmented Reality.

Economic Environment

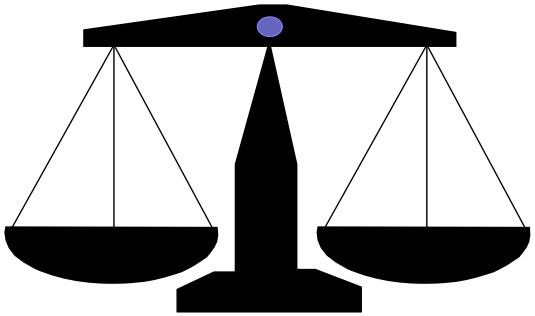
The intricate web of real and virtual human commercial activity – operating at micro and macro-economic levels – which facilitates, supports, but sometimes hampers or disrupts, human interaction in the Social Environment.

Many Aspects to Sustainable Development

Social + **Economic** + **Environmental** + **Institutional**
[Social Organization]

+ **Political** + **Legal** + **Judicial**
[Regional & National]

Robust International Law & **Lasting Peace** are Essential Prerequisites !



Synchronous, Balanced Implementation of All Aspects is a Fundamental Value & Overarching Principle

[Refer to 2012 Sofia Guiding Statements on the Judicial Elaboration of the 2002 New Delhi Declaration of Principles of International Law relating to Sustainable Development ... and also ...
2020 Leipzig Charter on Sustainable & Resilient European Cities]

Sustainable Fire Engineering #SFE

#EthicalDesign  #Beyond Codes

Definition: The creative, person-centred and ethical Fire Engineering response, in resilient built or wrought form and using smart systems, to the intricate, open, dynamic and continuously evolving concept of Sustainable Human & Social Development, the many aspects of which must receive synchronous and balanced consideration.

#SFE Network on LinkedIn > https://www.linkedin.com/groups/8390667/

[#SIA = Sustainability Impact Assessment]

Sustainable Fire Engineering's Aims

#SFE ... Robust Content, Clear Direction & Unified Terminology ... rooted in 'Real World' Empirical Evidence, Reliable Fire Statistics[1] & Principled Fire Research & Science[2]

> Establish Performance Benchmarks;
> Set down Performance Targets;
> Select pertinent Performance Indicators;
> Monitor Progress to Performance Targets.

- To dramatically reduce Fire Losses in the **Human Environment** (comprising the Social, Built, Virtual & Economic Environments) ... and to protect the **Natural Environment**[3];
- To realize Ethical[4], Practical and Reliable **Fire Engineering Design Solutions** ;
- To creatively support **21 Century Design**, in particular the inclusive language of 'Sustainability for People & a Better World' ... and **Resilient Adaptation** to Climate Disruption[5], Social Upheaval (e.g. mass migrations from MENA & Ukraine), and Extreme Events (e.g. 2001 WTC Building Collapses in New York City[6], 2008 Mumbai Hive Attacks, 2011 Fukushima Nuclear Incident & 2017 Grenfell Tower Fire[7]) ... and to collaborate on **Effective Implementation**.

Notes: **1.** Although Fire causes large economic losses, environmental damage and social upheaval ... reliable Fire Statistics do not exist. **2.** Hong Kong Principles: Responsible research/science practices; Transparent reporting; Open research/science; Valuing a diversity of research types; and Recognizing all contributions to research/science and scholarly activity. **3.** Including its Flora and Fauna. **4.** Refer to the 2016 Dublin Code of Ethics on Design, Engineering, Construction & Operation of a Safe, Resilient & Sustainable Built Environment for All. **5.** Refer to U.N. WMO's Greenhouse Gas Bulletins & International Panel on Climate Change (IPCC) Reports. **6.** Refer to NIST's 2005 & 2008 WTC 9-11 Recommendations. **7.** Refer to Recommendations of the Grenfell Tower Inquiry.

Sustainable Fire Engineering's Priority Themes

1. **Fire Safety for ALL, incl. PwAL & Other Vulnerable People** ... Nobody Left Behind.
2. **Assure Firefighter Safety** ... Begin with Building Design. Everyone Goes Home.
3. **Protect Property, incl. Cultural Heritage** ... Post-Fire Works are costly and unsustainable. Rapid Recovery, and Business Continuity are essential. Heritage losses cannot be replaced.
4. **Minimize Environmental Impact & Mitigate/Adapt to Climate Disruption**
5. **Person-Centred Design** ... Proprioception. Exploit Building & People Interaction for Safety.
6. **Nurture Sustainability** ... Infuse Fire Engineering. Statistics, Performance M&T, LCA, SIA.

Sustainable Fire Engineering Design Objectives

4 Conceptual Foundations: Reality - Reliability - Redundancy - Resilience

To foster Social Wellbeing, protect Building User Welfare and Client Best Interests ... to maintain Serviceability, i.e. minimum building functionality, under the dynamic, complex conditions of fire ... and to facilitate active collaboration at all stages of design, e.g. when using *BIM ... specified **Project-Specific Fire Engineering Design Objectives** must ethically resolve the following public health and safety, socio-economic, environmental, resilience, and sustainability issues :

- **Fire Safety for All** ... including **People with Activity Limitations** (facilitating effective Accessibility for All) & other **Vulnerable Building Occupants/Users** ... plus **Visitors** to the building or facility who may be unfamiliar with its layout, and **Product/Service Suppliers or Contractors** engaged in business, or work, on site ... Nobody Left Behind !
- **Protect Property from Loss or Damage, especially Cultural Heritage** ... including the **Building** or **Facility**, its **Contents**, and **Adjoining/Adjacent Properties**
- **Assure Firefighter & Other Emergency Responder Safety** ... Everyone Goes Home !
- **Shield the Natural Environment from Harm & Mitigate/Adapt to Climate Disruption**
- **Nurture Sustainability of the Human Environment** (i.e. the social, built, virtual, economic, and institutional environments) ... show **Product/System Fitness for Purpose/Intended Use**, minimize **Life Cycle Costs**, assess the **Sustainability Impact (SIA)** of fire engineering related products and systems fixed or installed in the building or facility, and monitor/target 'real' **Building Performance** (may later become 'reliable' input for Sustainable Building Rating Schemes)
- **Incorporate Ease & Reasonable Cost of Post-Fire Reconstruction & Recovery**

* Building Information Modelling/Management

Structural Reliability of Buildings in Fire

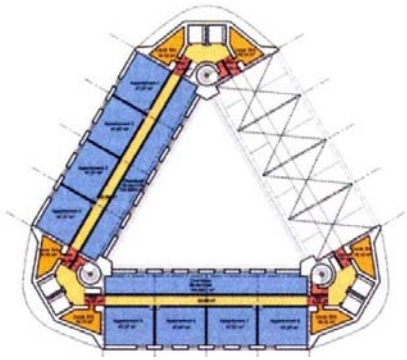
Fire Engineering Design Objectives must be specified at the beginning of the Design Process !

Buildings must remain 'Serviceable', and not merely 'Structurally Stable', for the following Required Period of Time ...

a) while people are waiting in **Areas of Rescue Assistance** and **Lift Lobbies** ; and
b) those people are evacuated, assisted by colleagues or rescued by firefighters ; and
c) until **Firefighting Operations** have ceased ; and
d) everybody, including occupants/users/firefighters, can reach a **Place of Safety**.

Buildings must be designed to adequately resist Fire-Induced Progressive Damage and Disproportionate Damage. A Collapse Level Event (CLE) is unacceptable.

Safer Structural Forms & Design for Evacuation



Peripheral, Robust, Multi-Core Design

Central Cores Are Obsolete

PolyCentric **Tower**

French Design Team: Denis Sloan, architecte; Peter Terrell et Geoff Rooke, ingénieurs structures; et Claude Delalande, ingénieur sécurité (ex-Officier BSPP, Paris-Expo)

2005 NIST(USA) Report on 2001 WTC 1 & 2 Tower Collapses - Recommendation 18

Tall Buildings - Floors of Temporary Refuge

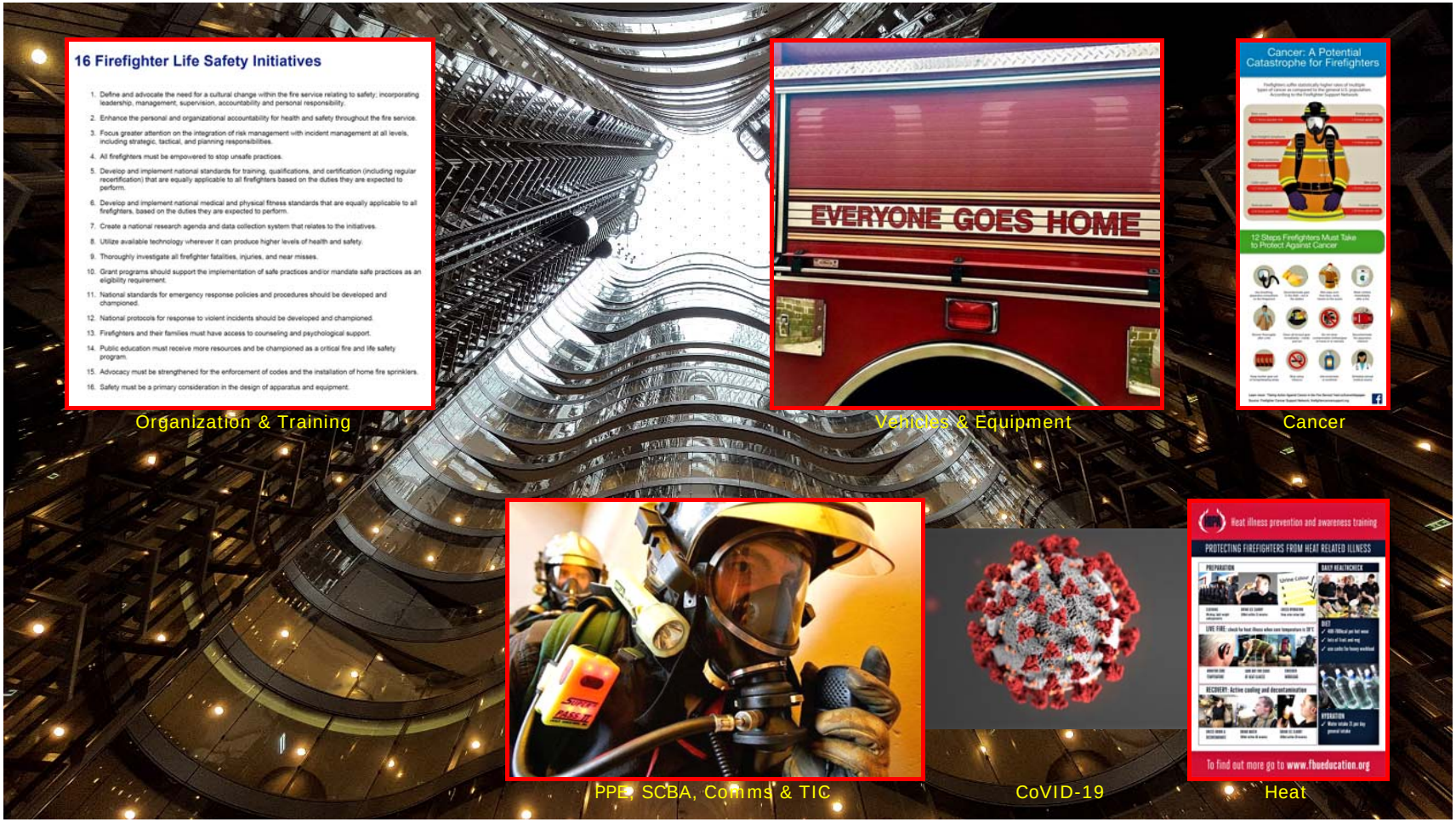
Roofs Must Be Capable Of Being Used For Aerial Fire Evacuation




Definition: An open, structurally robust floor/storey in a high-rise building - having an exceptionally low level of fire hazard and risk, 'intelligently' fitted with a suitable user-friendly and climate-friendly fire suppression system, e.g. water mist, and serviced by sufficient accessible, fire protected lifts/elevators capable of being used during a fire emergency ; it is designed to halt the spread of heat, smoke and flame beyond the floor/storey, and is intended as a place of temporary respite, rest and relative safety for building occupants/users before continuing with evacuation, and as a forward command and control base for firefighters.

In a high-rise, tall, super-tall or mega-tall building, **every 20th floor must be a 'Floor of Temporary Refuge'**, even if the building is co-joined with another building, or there are sky bridges linking the building with one or more other buildings. Special provision must be made, on these floors, for accommodating large numbers of building users with activity limitations.

Firefighter Safety Begins With Building Design



Firefighter & Fire Service Functions

BUILDINGS

TWO BASIC FUNCTIONS

a) to suppress and control fire in a building & to confirm extinguishment ; and
b) to rescue people in the building who are injured, trapped, or otherwise unable to independently evacuate, e.g. people waiting in areas of rescue assistance & lift lobbies.

Operational Basis > Assume Building Management is UnReliable !

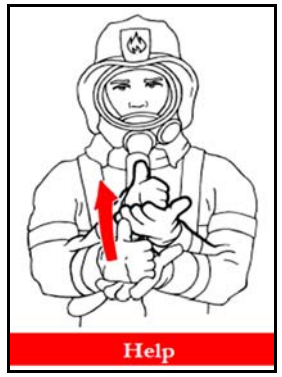
Firefighter Intervention & User Routes To Safety

'Places of Safety' must be located a remote distance from a Fire Building, and clearly indicated. User Routes to those Places must be Safe (e.g. from falling debris, flying glass, and firefighting equipment), Marked Out and Accessible for All, particularly for those with Activity Limitations. Firefighter Awareness of Building Users ?

Firefighter Awareness of Frailty/Disability ? Some common Firefighter Rescue Techniques are Dangerous (i.e. difficult, impractical, harmful, and even fatal) when used on People with Activity Limitations.

Firefighter Safe Search & Rapid Rescue Operations

Safe Firefighter Search Operations ... After 9-11 WTC (2001) & Tianjin Devastation (2015) in China ... Frontline Firefighters must be supported by Specialist Structural Engineering & Hazard Appraisal Units.



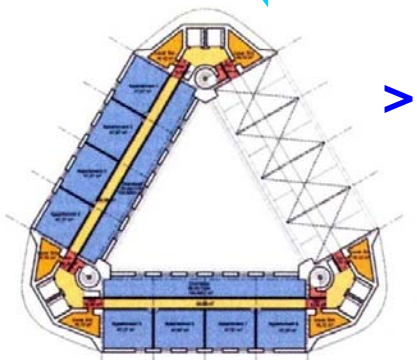
Rapid Rescue Operations (people are waiting in Areas of Rescue Assistance & Lift Lobbies) ... Evacuation Routes, including Staircases, must have adequate Clear Width for Contraflow ... Firefighters must be equipped with Thermal Imaging Cameras and be capable of Non-Verbal Communication with Hearing Impaired Users.

Building Cores, Circulation Routes & 'Contraflow'

> Peripheral Building Cores Facilitate ...

Alternative, Accessible 'Intuitive & Obvious' Evacuation

[Minimum 2 Fire Protected Staircases]



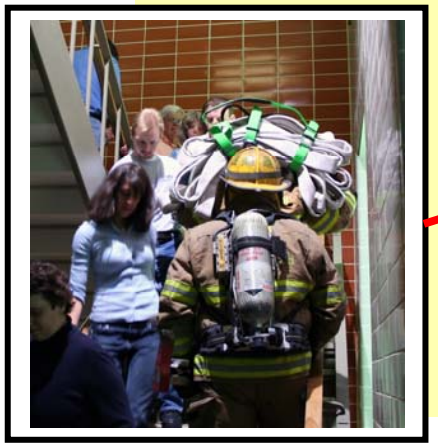
> Peripheral Building Cores Also Facilitate ...

Alternative 'Obvious & Safe' Firefighter Attack

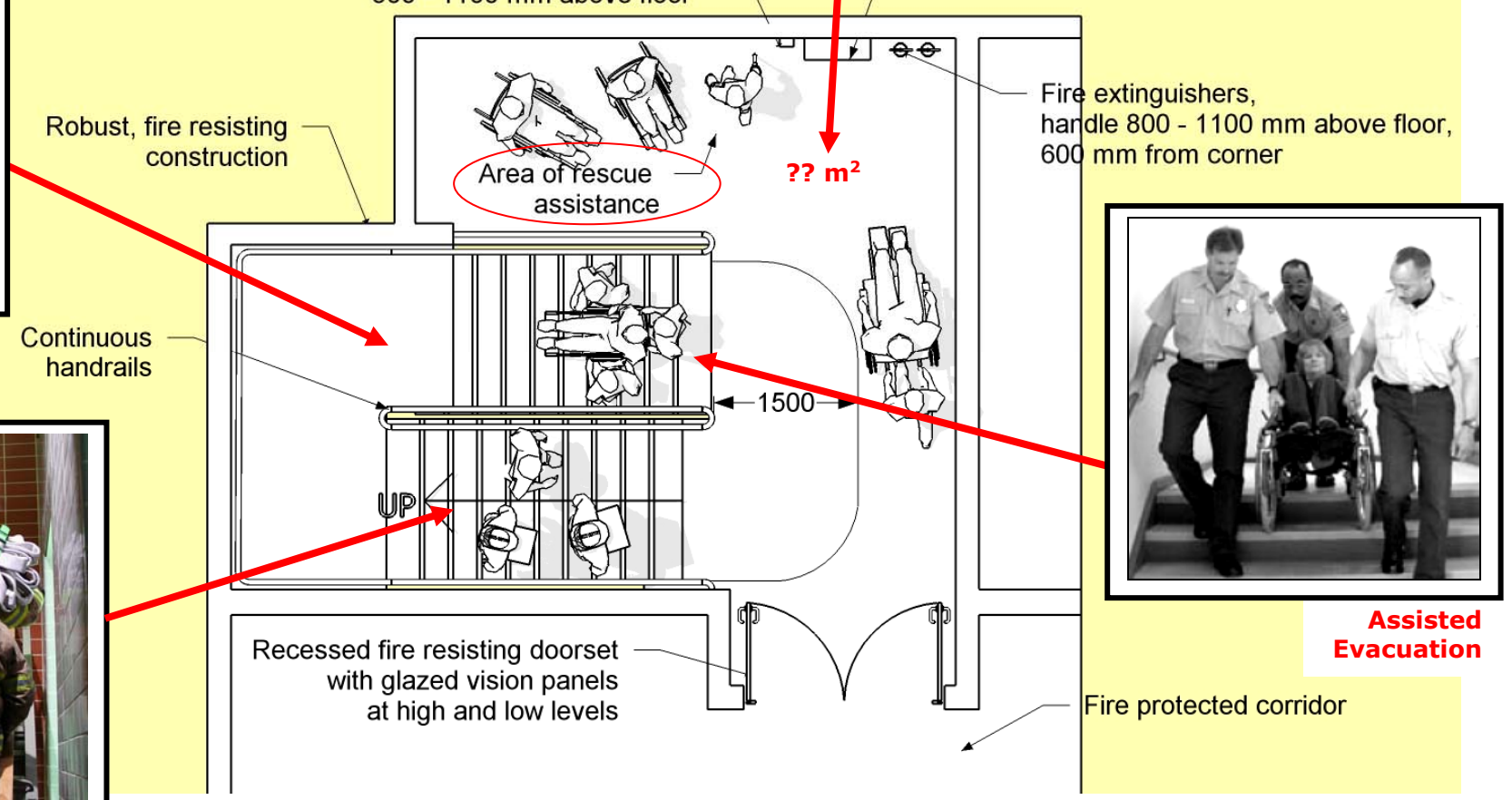
Breathing Apparatus/Thermal Imaging Cameras/Comms/User Interaction

Sufficient (not Token) Provision of Space Necessary !

Firefighter Rescue



Contraflow



Assisted Evacuation

All Lifts/Elevators Must Facilitate Fire Evacuation

Also Escalators & Travellators/Moving Walkways ... Without Interruption !

Safe & Efficient Fire Protected Staircases

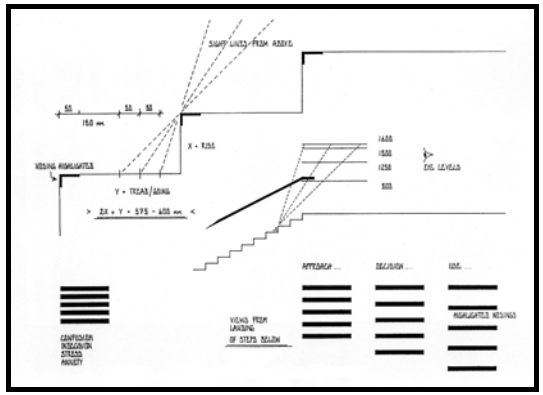
Accessible Building User Evacuation Staircase = Stress-Free Firefighter Attack Staircase

Table B4: Discharge Value of a Required Staircase in a Sprink

No. of storeys served	Width of required staircase			
	1050mm but under 1200mm	1200mm but under 1350mm	1350mm but under 1500mm	1500mm but under 1600mm
1				600
2				651
3				702
4	576	594	675	753
5	544	632	720	804
6	580	670	765	855
7	612	708	810	906
8	644	746	855	957
9	676	784	900	1008
10	708	822	945	1059
Each additional storey add	32	38	45	51

Too Narrow !

Staircases are a Hazard. Tactile warnings and information required - Always ! Handrails on both sides - Always !
Minimum Unobstructed Clear Width for Contraflow = 1.5m ... Between outside (stair side) edges of handrails.



Building Accessibility / Design-for-All / Universal Design Codes must be integrated into Building Fire Safety Codes !

Building Users / Fire Emergency / No Explosion Risk

Place(s) of Safety:

Any accessible 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 triage can safely be rendered ... and from where effective medical care and supervision can be organized and provided within one hour of injury (the 'golden hour') ;

and

Where people can be identified.

NOTE: When there is an Explosion Risk ... multiply the numbers in square brackets* above by 4

'Smart' Fire Emergency Management

Smart Entrance & (All) Egress Lobbies

Accessible Building User & Firefighter Interface Technologies

Air Sampling +
Video Surveillance

Improved Fire Detection Reliability !

Smart / Intelligent Fire Detection

Intelligent User Evacuation & Firefighter Attack

Location of Building Users ?
- able-bodied people
- people with activity limitations
- visitors / contractors / suppliers

Location of Firefighters ?
- search/rescue function
- firefighting function

Integrate Multi-Lingual Voice Fire Warnings with Public Address System + Dynamic Signage

Environmental Impact

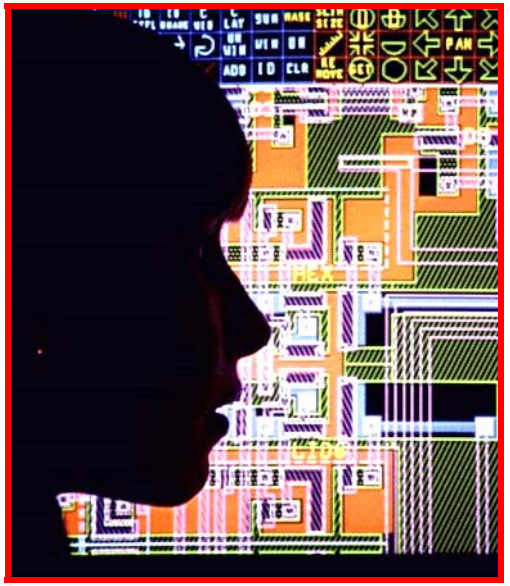
Security

Fire Safety & Protection

Location Based Services

Energy Conserve & Efficiency

Communications



Smart BMS

Indoor Air Quality

Reliable Operation during a Real Fire Emergency an earthquake, or other severe natural event ?

FireOx International

Fire Emergency Management Planning

Fire Emergency Management Plan (FEMP)

Elaborates the fire emergency response procedures for an **occupied building** ... and is produced by the Fire Emergency Control Manager, in liaison with **Local Fire Services**, after the building has been completed. The basis for a Management Plan is always the building's Fire Defence Plan*.

The FEMP's objectives are to ensure that, in the event of a fire emergency, the health and safety of all building occupants/users is protected, including visitors to the building, contractors, and product/service suppliers ... **and** to ensure easy access and safety for **Firefighters**.

In the Management Plan, attention must be paid to those occupants/users with activity limitations. **Personal Emergency Evacuation Plans** must be fully integrated into the FEMP. Building Performance, Buddy System effectiveness, and the readiness of Fire Wardens/Marshals to carry out their allocated tasks must be regularly monitored and reported. Consideration must also be given to what happens after people have reached a 'place(s) of safety'.

* Fire Defence Plan (FDP)

Specifies the particular fire safety, protection and evacuation strategy which has been developed for a specific building at **design stage**, i.e. prior to construction. In accessible hard copy and electronic formats, the FDP comprises fire engineering drawings, descriptive text (including the project's fire engineering design objectives), fire safety related product/system information, with supporting calculations, fire test/approval data showing 'fitness for purpose/intended use', and an assessment of the overall system life cycle and sustainability impact.

SFE 'Reliable' Design, Supply & Construction

FireOx International [SDI's Fire Engineering Division] - Ireland, Italy & Turkey

1. Design of the works must be exercised by an independent, appropriately qualified and experienced architect/engineer/fire engineer, with design competence relating to the fire protection of buildings/facilities and the fire safety of people. A 'Design Professional in Responsible Charge' must be appointed.
2. Supply of fire engineering related construction products and systems to the works must be undertaken by reputable organizations with construction competence, particularly in relation to the fire protection of buildings/facilities. Any proposed product or system substitution must be properly authorized by the designer **prior** to installation.
3. Installation/fitting and maintenance of fire engineering related construction products and systems must be exercised by appropriately qualified and experienced personnel, with construction competence relating to the fire protection of buildings/facilities.
4. Supervision of the works is exercised by appropriately qualified and experienced personnel from the principal construction organization.
5. Rigorous inspections, without prior notice, by appropriately qualified and experienced personnel familiar with the design, and independent of both the design and construction organizations, must be regularly carried out to verify that the works are being executed in **strict** accordance with the design and good construction practice.

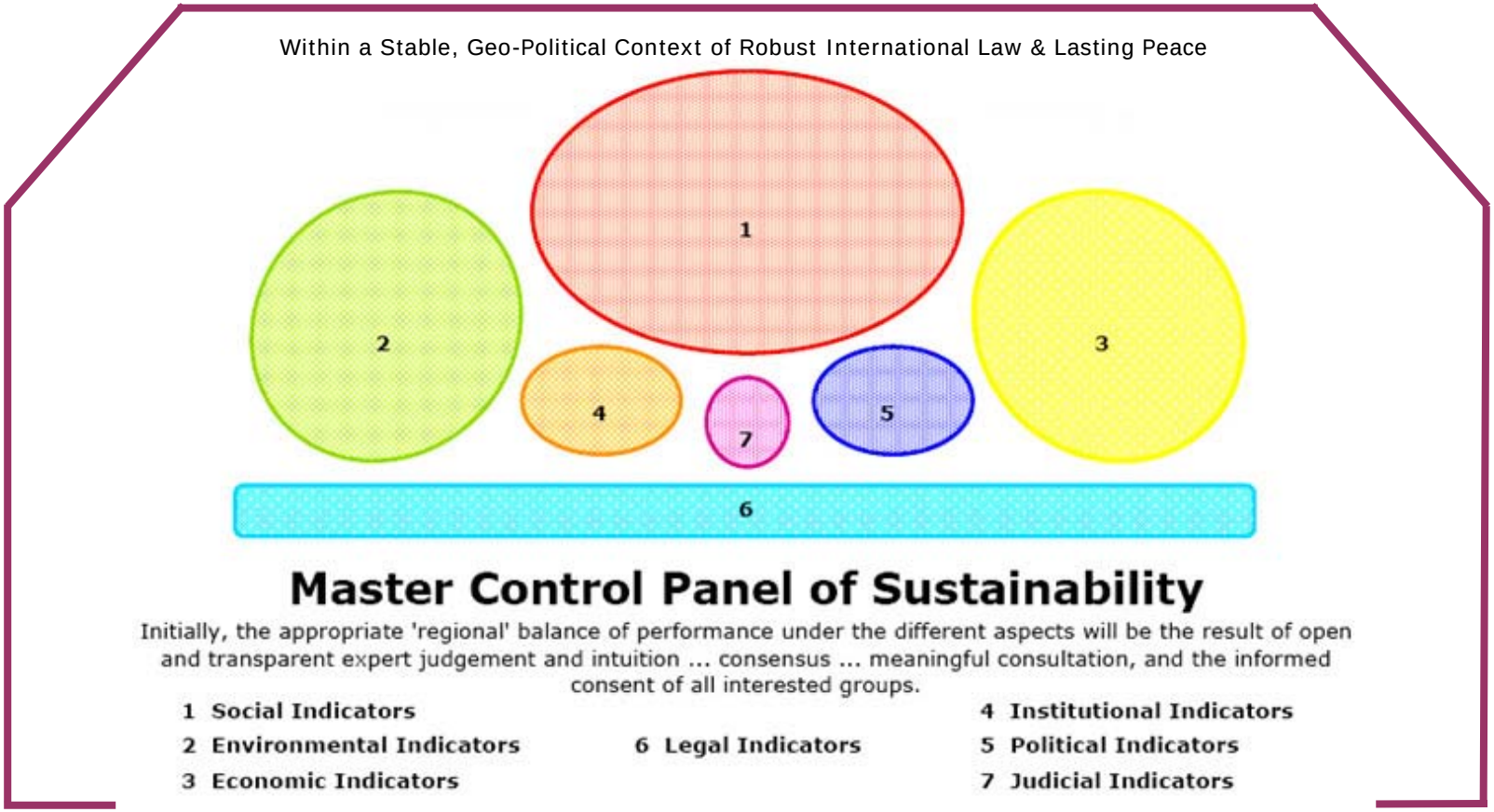
Fundamental Matrix of Construction Indicators

Sustainable Design International [SDI] - Ireland, Italy & Turkey

Sustainable Design, Construction & Logistics			Social			Economic			Environmental			Institutional			Political		
			Driving Force	State	Response	Driving Force	State	Response	Driving Force	State	Response	Driving Force	State	Response	Driving Force	State	Response
1 Design	a Spatial Planning	i Region															
		ii Urban															
		iii Rural															
		iv Marine															
	b Architectural					There Are No Reliable Fire Statistics. Eurostat ... ??											
	c Engineering																
	d Industrial																
2 Construction																	
3 Use																	
4 Maintenance																	
5 Adaptation																	
6 De-Construction																	
7 Disposal		i Re-Use															
		ii Recycle															
		iii Waste															
8 Products (EU Reg.305/2011)																	
9 Services																	
10 Incentives																	

Sustainability Monitoring & Targeting (M&T)

Sustainable Design International [SDI] - Ireland, Italy & Turkey



[Refer to - http://www.sustainable-design.ie/sustain/internationalpapers.htm#bari]

Sustainable Wildfire Management (1/2)

Sustainable Wildfire Management Strategies must ...

- always be adapted to a local/regional Context ;
- be capable of integration into a local/regional Sustainable Ecosystem Management Plan ;
- take full account of Resilient, Inclusive Disaster Risk Reduction Planning (UN Sendai Framework).

Mandatory Stage 1. All racism, discrimination and intolerance directed at Indigenous/Tribal Peoples must immediately cease. Their rich heritage and deep understanding of local/regional context - in this case, Forest Management - must be fostered, and put into practice for the benefit of everybody in society.

U.N. SDSN[a] SPA[b] 2021 Definition of Indigenous Peoples

Indigenous or Tribal Peoples: Ethnic groups whose social, cultural and/or economic conditions distinguish them from other sections of a community, society or culture, and whose status is regulated wholly or partially by their own customs or traditions, or by special laws or regulations. [a. SDSN - Sustainable Development Solutions Network b. SPA - Science Panel for the Amazon]

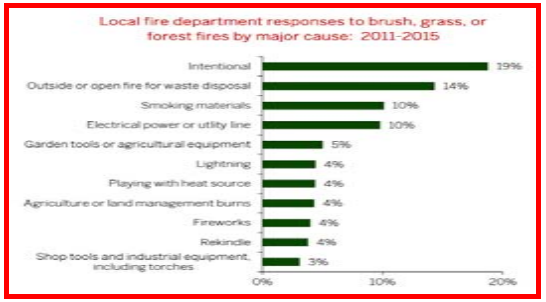
U.N. 2016 Definition of Indigenous & Local Knowledge (IPBES[c])

Indigenous and Local Knowledge Systems: Dynamic bodies of integrated, holistic, social and ecological knowledge, practices and beliefs pertaining to the relationship of living beings, including people, with one another and with their environment. Indigenous and local knowledge is grounded in territory, is highly diverse and is continuously evolving through the interaction of experiences, innovations and different types of knowledge (written, oral, visual, tacit, practical, and scientific). Such knowledge can provide information, methods, theory and practice for **Sustainable Ecosystem Management**. Indigenous and local knowledge systems have been, and continue to be, empirically tested, applied, contested and validated through different means in different contexts.
[c. IPBES - Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services]

Sustainable Wildfire Management (2/2)

Mandatory Stage 2. Stringently control Forest Interface Human Development and restrict all Human Intrusion into Wildland Forests ...

NFPA (USA)



Ahrens, 2018

Mandatory Stage 3. Properly resource Wildfire Firefighting with standardized, appropriate protection clothing, breathing and firefighting equipment, with continuous training and professional development ...

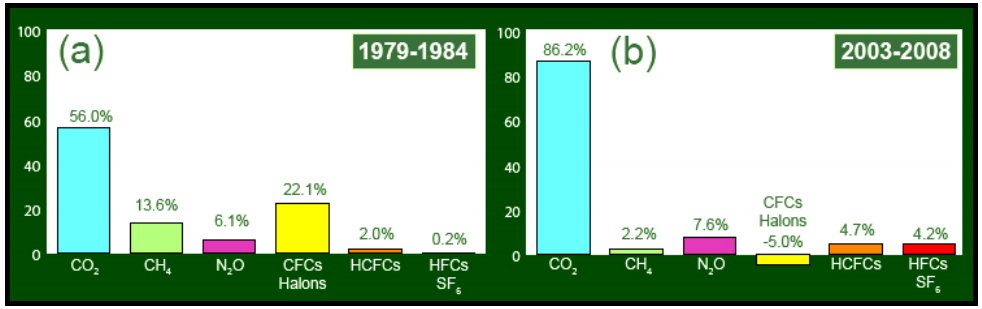
Mandatory Stage 4. Assess the Sustainable Wildfire Management Strategy for sustainability impact ...

Sustainability Impact Assessment (SIA)

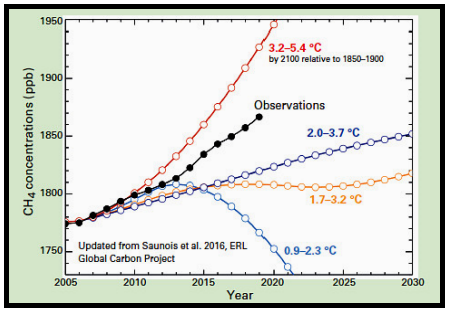
A continual evaluation and optimization process - informing initial decision-making, design, shaping activity / product / service realization, useful life, and termination or final disposal - of the interrelated positive and negative social, environmental, economic, institutional, political and legal impacts on balanced and equitable implementation of Sustainable Human & Social Development.

Wildfires, Drought, Tipping Points, Famine & War ?

The **CoVID-19 Pandemic** has caused enormous harm to the Human Environment, while observed and measured international 'efforts' at **Climate Disruption Mitigation** continue to fail miserably.



UN WMO Greenhouse Gas Bulletin No.5 (2009)



Bulletin No.16 (2020)

Our 'last chance' heavy recovery vehicle must be **Climate Disruption Adaptation** ... driving urgent action at all levels of society to reduce the **vulnerability** ... and strengthen the **resilience** of the **Human Environment**, including ecological and social systems, institutions and economic sectors ... to present/future adverse effects of climate disruption, severe events, and the impacts of response measure implementation ... in order to minimize threats to life, public health & safety, food security, ecosystems and biodiversity, critical infrastructure, and social wellbeing for all.

Adaptation to Climate Disruption is **Urgent** ... **Reliable Implementation** is the **Challenge** ... **Integration** into Resilient Sustainability Strategies is **Essential**.

[Refer to - http://www.cjwalsh.ie/cib-w108-climate-change-the-built-environment/]

Ethical Fire Engineering Design & Practice

LEGAL COMPLIANCE IS NOT ENOUGH !

And certainly NOT ETHICAL: Playing 'cat and mouse' with #FireCodes to ram together the cheapest solution ; Matching and mixing different #Codes to produce highly questionable #TradeOffs ; Ignoring risky #ProductSubstitution ; and Evading stringent #TechnicalControl on site.

#CodeOfEthics #EthicalDesign #BeyondCodes #DefenceInDepth

Actioning #SFE Road Map is Urgent

Harsh Reality: 2021/22 UNFCCC CoP Failures & Stringent 2022 IPCC AR 6 Revised Targets ...

1. **Fire Engineers must**, as Individuals and a Community, fully integrate into the Mainstream Construction Industrial Sector and meet that Sector's 21st Century Priority Performance Targets for Climate Disturbance Adaptation, Resilience, Sustainable Human & Social Development ... and operate to a common Code of Ethics and a unified Terminology. [Transformation is demanded !]

2. **Fire Research & Science must** be Socially Responsible ... focusing on 'Real World & Real People' empirical evidence ... and pursue Ethical Practices, be open and transparent, value a diversity of research types, and recognize all contributions to science and scholarly activity.

3. **Fire Statistics must** be professionally independent, impartial, objective, reliable, statistically confidential, and cost effective. Refer to the *2017 European Statistics Code of Practice.
[Few fire statistics adhere to these principles. This is a major barrier to sustainability progress, as no valid fire engineering performance indicators, targets or benchmarks can be developed.]

* European Statistics 2017 Code of Practice
[Legal Basis: EC Regulation No. 223/2009, amended by EU Regulation No. 2015/759]

#SFE: Realizing a Safe, Resilient & Sustainable Built Environment for ALL !

People with Activity Limitations (En)
Personnes à Performances Réduites (Fr)

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

This definition is derived from the World Health Organization's International Classification of Functioning, Disability & Health (ICF), which was adopted on 22 May 2001.

The above **Term**, in English and French, includes ...

- people who experience difficulty in walking, with or without a facilitation/mobility aid, e.g. stick, crutch, calliper or walking frame ;
- wheelchair users ;
- very young children (people under the age of 5 years) ;
- frail older people (not all older people) ;
- women in the later stages of pregnancy ;
- people who are visually and/or hearing impaired ;
- people who suffer from arthritis, asthma, or a heart condition ... or any partial or complete loss of language-related abilities, i.e. aphasia ;
- people who have a cognitive impairment disorder, including dementia, amnesia, brain injury, or delirium ;
- people impaired after the use of alcohol, other 'social' drugs e.g. cocaine and heroin, and some medicines ;
- people exposed to environmental pollution and/or other irresponsible human activity, e.g. war or terrorism ;
- people who experience a panic attack in a real fire incident or other emergency ;
- people, including firefighters, who suffer incapacitation as a result of exposure, during a fire, to smoke and poisonous/toxic substances and/or elevated temperatures.

#SFE Compatibility With Existing EU Law

E.U. Regulation No. 305/2011 of the European Parliament and of the Council, of 9 March 2011, laying down Harmonized Conditions for the Marketing of Construction Products and Repealing Council Directive 89/106/EEC

ANNEX I - 'Basic Requirements for Construction Works' 1 & 2 (of 7) ...

1. Mechanical Resistance & Stability

The construction works must be designed and built in such a way that the loadings that are liable to act on them during their construction and use will not lead to any of the following:
(a) collapse of the whole or part of the works ;
(b) major deformations to an inadmissible degree ;
(c) damage to other parts of the construction works or to fittings or installed equipment as a result of major deformation of the load-bearing construction ;
(d) damage by an event to an extent disproportionate to the original cause.

2. Safety in Case of Fire

The construction works must be designed and built in such a way that in the event of an outbreak of fire:
(a) the load-bearing capacity of the construction can be assumed for a specific period of time ;
(b) the generation and spread of fire and smoke within the construction works are limited ;
(c) the spread of fire to neighbouring construction works is limited ;
(d) occupants can leave the construction works or be rescued by other means ;
(e) the safety of rescue teams is taken into consideration.

... / ...

European Union Regulation 305/2011 (contd.)

ANNEX I - 'Basic Requirements for Construction Works' 3, 4 & 7 ... Selected Extracts ...

3. Hygiene, Health and the Environment

The construction works must be designed and built in such a way that they will, throughout their life cycle, not be a threat to the hygiene or health and safety of workers, occupants or neighbours, nor have an exceedingly high impact, over their entire life cycle, on the environmental quality or on the climate during their construction, use and demolition, in particular as a result of any of the following:

(b) the emissions of dangerous substances, volatile organic compounds (VOC's), greenhouse gases or dangerous particles into indoor or outdoor air ;

4. Safety and Accessibility in Use

The construction works must be designed and built in such a way that they do not present unacceptable risks of accidents or damage in service or in operation such as slipping, falling, collision, burns, electrocution, injury from explosion and burglaries. In particular, construction works must be designed and built taking into consideration accessibility and use for disabled persons.

7. Sustainable Use of Natural Resources

The construction works must be designed, built and demolished in such a way that the use of natural resources is sustainable and in particular ensure the following:

(a) re-use or recyclability of the construction works, their materials and parts after demolition ;

(b) durability of the construction works ;

(c) use of environmentally compatible raw and secondary materials in the construction works.

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