IFSS INTERNATIONAL FIRE SAFETY STANDARDS

International Fire Safety Standards: Common Principles

Safe Buildings Save Lives

International Fire Safety Standards Coalition

1st edition

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Contents

Preface

On behalf of the members of the International Fire Safety Standards **Coalition** (IFSSC) we are pleased to present the *International Fire Safety Standards: Common Principles* (**IFSS-CP**). The **Coalition** comprises organisations from around the world who have worked together positively, constructively and collaboratively to create a high-level overarching performance framework based on **Common Principles** for fire safety engineering design, construction, occupation and ongoing management.

The overall objective of **IFSS-CP** is to prevent injury and death from fire in the built environment and minimise the impact on communities, society and the natural environment. We recognise that the past and current practices and application of fire safety standards across the globe would benefit significantly from consistency in terms of a set of **Common Principles**.

IFSS-CP will improve transparency and shared understanding and reduce risk caused by a fragmentation of processes that can lead to safety gaps. We believe that the public, society, economy and environment will all be better served by a set of **Common Principles** and a fire safety framework implemented worldwide that can be supported through and by public education.

The **Coalition** accepts that standard setting is a never-ending process of continuous change and improvement. We will observe, assess and evaluate the use, application and impact of **IFSS-CP** and its **Common Principles** and revise them as needed.

The **Coalition** is continuing the important work of implementing **IFSS-CP** through engaging with governments, occupiers, owners and other important stakeholders. For further information on IFSS, please visit https://ifss-coalition.org/

Gary Strong

Chair, IFSS Coalition

IFSS Coalition

The **Coalition** was launched on 9 July 2018 at a meeting at the UN Economic Commission for Europe (UNECE). The **Coalition** is a group of professional, not-for-profit organisations responsible for researching, developing, publicising and implementing **IFSS-CP** globally for the construction and real estate sectors. The **Coalition** aims to bring about universal and consistent fire safety for our shared built environment globally, given that fire safety is a very high societal concern. This is to be achieved through the creation and adoption of **IFSS-CP**.

The **Coalition** did not identify any singular, pre-existing overarching fire safety principles that would be suitable for adoption on a worldwide basis and would work in conjunction with other guidelines.

Following the establishment of the **Coalition**, members confirmed that they were committed to creating the **IFSS-CP** and encouraging world markets to accept and adopt this holistic approach as the primary overarching framework for fire safety engineering design, construction, occupation and ongoing management in every jurisdiction across the world. **IFSS-CP** supports and endorses the UN sustainable development goals.

Following the publication of **IFSS-CP**, the **Coalition** members may choose to issue further technical guidance to their members on the adoption and implementation of **IFSS-CP** within their local market(s). The **Coalition** has begun liaising with governments and other stakeholders at a project, local, regional, state, national, supranational and international level to seek adoption of the **IFSS-CP**. The **Coalition** members at the date of publication include:

- ABC – Association of Building Compliance
- ACAI – Association of Consultant Approved Inspectors
- AEEBC – The Association of European Experts in Building and Construction
- AMCA – Air Movement and Control Association International
- API – Australian Property Institute
- APS – Association for Project Safety
- ASFP – Association for Specialist Fire Protection
- ASID – American Society of Interior Designers
- BAFE – British Approvals for Fire Equipment
- BCA – Building Control Alliance
- BSSIG – Building Surveyors Special Interest Group
- CABE – Chartered Association of Building Engineers
- CASLE – Commonwealth Association of Surveying and Land Economy
- CEBC – Consortium of European Building Control bodies
- CFPA-Asia – Confederation of Fire Protection Associations – Asia
- CIAT – Chartered Institute of Architectural Technologists
- CIBSE – Chartered Institution of Building Services Engineers
- CIOB – Chartered Institute of Building
- CIRIA – Construction Industry Research and Information Association
- CTBUH – Council on Tall Buildings and Urban Habitat
- CTIF – International Association of Fire & Rescue Services
- Efectis
- EFSA – European Fire Safety Alliance

- Engineers Australia
- EPIC – Engineering Panels in Construction
- FIA – Fire Industry Association
- FIG – Federation International de Geometre
- FPA – Fire Protection Association
- FPA Australia – Fire Protection Association Australia
- FSEU – Fire Safe Europe
- FSF – Fire Sector Federation
- FSNA – Fire Safe North America
- GCCA – Global Cement and Concrete Association
- HKIS – Hong Kong Institute of Surveyors
- ICC – International Code Council
- IFE – Institution of Fire Engineers
- IFE (India) – Institution of Fire Engineers (India)
- IFMA – International Facility Management Association
- IFSM – Institute of Fire Safety Managers
- IMA – Insulation Manufacturers Association
- ISK – Institute of Surveyors of Kenya
- IWFM – Institute of Workplace and Facilities Management
- IPREA – Institute of Philippine Real Estate Appraisers
- LABC – Local Authority Building Control
- MBA – Modern Building Alliance
- NFIA – National Fire Industry Association
- NFPA – National Fire Protection Association
- NHBC – National House Building Council
- NIFHA – Northern Ireland Federation of Housing Associations
- NZIBS – New Zealand Institute of Building Surveyors
- PAM – Malaysian Institute of Architects
- PIMA – Polyisocyanurate Insulation Manufacturers Association
- RIBA – Royal Institute of British Architects
- RICS – Royal Institution of Chartered Surveyors
- RMIT University
- RTPI – Royal Town Planning Institute
- SBCA – Structural Building Components Association
- SCDF – Singapore Civil Defence Force
- SCSI – Society of Chartered Surveyors Ireland
- SFPE – Society of Fire Protection Engineers
- SGSA – Sports Ground Safety Authority
- SIA – Singapore Institute of Architects
- SIBL – Singapore Institute of Building Ltd
- The World Bank
- Underwriters Laboratories Inc
- United Nations

IFSS Standards Setting Committee

In recognition that developing the actual **Common Principles** would require the work and experience of experts in this field, the **Coalition** established a Standards Setting Committee (**SSC**) to create **IFSS-CP**. The **SSC** was formed on 6 December 2018 and was commissioned by the **Coalition** with the following aims and objectives:

- to research existing relevant fire safety principles and fire codes for **Buildings** to identify current good practice and to evaluate deficiencies in markets, and thereby establish different market needs
- to produce a conceptual framework to guide the drafting and understanding of **IFSS-CP** in the future. The conceptual framework will have the following key aims:
  - to establish a common set of internationally accepted **Common Principles** for fire safety aspects of engineering design, construction, occupation and ongoing management. It will be relevant to all real estate classes and all regions and nations regardless of the differing political, economic, social, technological, legal and environmental (PESTLE) differences between jurisdictions
  - to address the primary concern of life safety from fire, though future editions of **IFSS-CP** may also deal with **Building** protection, the impact on communities and the environment and societal loss of a **Building** (e.g. environmental impact, existential loss, contents, heritage, operations) and
  - to create a framework that will allow comparisons to be made on a like-for-like basis across countries globally and within the EU.
- to link **IFSS-CP** to the International Ethical Standards, the UN sustainable development goals and other relevant International Standards that exist.

The **SSC** is comprised of a cross-section of technical experts from 18 countries with a combined expertise covering over 100 different markets. The **SSC** acts independently of the **Coalition** and its members. At the time of publication, the **SSC** members include:

Chair: Timothy Neal FRICS (UK)

Executive secretary: Alexander Aronsohn FRICS (UK)

- Professor Sam Allwinkle (UK)
- Martin Conlon FRICS (UK)
- Bob Glendenning (UK)
- Kevin Hughes (UK)
- Daniel Joyeux (France)
- Dr Ales Jug (Slovenia)
- William Koffel (USA)
- Susan Lamont (Dubai)
- James Lane (UK)
- John Lewis (UK)
- Birgitte Messerschmidt (USA)
- Armelle Muller (France)
- Greg Payne (Australia)
- Frances Peacock (UK)
- Benjamin Ralph (UK)
- Malcolm Sharp (UK)
- Dwayne Sloan (USA)
- Dr Graham Smith (UK)
- Martin Taylor MRICS (UK)
- Robert Thilthorpe (UK)
- Beth Tubbs (USA)
- Jeff Wood (Australia)

Definitions

The definitions below define certain terms used in the International Fire Safety Standard Common Principles (**IFSS-CP**). These definitions are only applicable to the **IFSS-CP**. This section does not attempt to define basic fire safety terms as users are assumed to have an understanding of such terms.

Building

Any structure used or intended for supporting or sheltering any use or occupancy and its immediate surroundings.

Building Life Cycle

The stages that make up the life cycle of a **Building**. These are:

- Stage 1 – Design
- Stage 2 – Construct
- Stage 3 – In use
- Stage 4 – Change and
- Stage 5 – Demolish.

Coalition

The International Fire Safety Standards Coalition, comprising not-for-profit organisations each with a public interest mandate.

Common Principles

A common set of internationally accepted **Common Principles** for fire safety aspects of engineering design, construction, occupation and ongoing management. The **Common Principles** are relevant to all real estate classes and all regions and nations regardless of the differing political, economic, social, technological, legal or environmental differences between jurisdictions. The **Common Principles** are:

- **Prevention**
- **Detection and Communication**
- **Occupant Protection**
- **Containment** and
- **Extinguishment**.

Communication

The activation of mechanisms and alarms resulting from the detection of fire to alert all occupants and the fire service to the presence of fire.

Containment

Limiting of fire and all of its consequences to as small an area as possible.

Detection and Communication

Investigating and discovering of fire followed by informing occupants and the fire service.

Escape

The egress of occupants from a **Building**.

Evacuation

The procedures and processes used to enable people to leave a **Building**.

Extinguishment (also known as Fire Control)

Suppressing of fire and protecting of the surrounding environment.

IFSS-CP Framework

The collective application of the **Common Principles**. It enables evidence-based assessment to achieve fire safety engineering design, construction, occupation and ongoing management on a **Building** level.

Occupant

An individual who is present within the **Building** or premises.

Occupant Protection

Facilitating occupant avoidance of and escape from the effects of fire.

Person Responsible (also known as Responsible Person)

The individual responsible for fire safety in the **Building** (the duty-holder), usually the owner, landlord, developer or appointed building safety manager.

Prevention

Safeguarding against the outbreak of fire and/or limiting its effects.

Proprietary Rights

Legal rights over real property by an individual or organisation who is not an owner or occupier. This includes rights of way and rights or entry and land between buildings. Such rights are specified in covenants relating to the **Building**.

Resilience

The ability of a **Building** to resist and recover from the effects of fire.

SSC

The Standards Setting Committee (**SSC**) appointed by the IFSSC to develop global standards for fire safety.

Stakeholder

An individual, or representative of same, having an interest in the **Building** and its operation.

Part 1 Introduction

1.1 Context

The complex interrelationships between fire and mankind transcend international borders and disciplinary boundaries. The science of fire knows no geographical or political limits. Over time we have learned fundamental fire safety principles for preventing fire events and managing their impact (i.e. the **Common Principles**: **Prevention**, **Detection and Communication**, **Occupant Protection**, **Containment** and **Extinguishment**) that can be consistently applied internationally. It is tragedy that has often compelled legislative changes – to continue in such a way is an abnegation of responsibility of first magnitude.

As the growth in global population drives towards greater urbanisation, more people are living in higher density, high-rise developments containing numerous uses and occupancy types. At the same time, our urban areas are encroaching on wildland spaces, creating increased areas of risk for wildland-urban and semi-urban interface fires.

New and emerging technologies pose electrical and other challenges that could initiate fires in ways that have never been seen before. New **Building** materials and systems are regularly introduced into the marketplace and are in need of assessment relative to their fire performance. Another challenge is the growing attention to **Building** envelope performance – including thermal performance, air leakage, permeability, water infiltration, etc. In some areas, this is even driven by changes to local codes and regulation.

This has led to the proliferation of insulation products with higher thermal properties and the use of materials to accomplish these additional **Building** performance characteristics. Climate change and the push for more sustainable construction also bring challenges to our built environment, and societies need to become more resilient to change and disruption.

In response to all of these challenging factors, construction products, processes and technologies continue to evolve. They aim to improve cost, business efficiency, quality, customer satisfaction, environmental performance, sustainability and the predictability of delivery timescales, but bring with them new fire safety challenges.

Much is known about the phenomena and effects of fire, as well as what needs to be done to protect people, **Buildings** and the environment from the destructive effects of fire. This knowledge, however, is not shared as effectively as it could be. A connected and more consistent approach will yield considerable benefits and improve our ability to:

- respond to events
- monitor ongoing developments
- anticipate future threats and opportunities and
- learn from past failures and successes.

At present, the many contrasting approaches and requirements across the world have resulted in significant variations in the design, approval, construction methods, products and operation of **Buildings**. This is due to local architecture and traditions and responses to local disasters. Hence a disaster experienced in one area has not necessarily impacted the codes and standards in other areas when relevant.

In some cases, certain regions or nations may not have their own **Building** regulatory documents and may depend on national and international references for the design and regulation of **Buildings** (e.g. the International Building Code (IBC) or the National Fire Protection Association (NFPA)). This is a valid and often necessary approach, but some caution is necessary to ensure that fire safety issues are fully addressed in the local context.

The development of a common understanding of **Building** design, construction and management and how the impact of fire affects these will help to build trust and confidence among the many and varied actors, including the public and finance industry, ultimately underpinning an improved quality of life and increased investment in line with UN sustainable development goals.

Fire safety relates to UN sustainable development goals 3, 4, 8, 9, 11, 12, 13, 16 and 17:

Figure 1: Applicable UN Sustainable Development Goals

Sharing knowledge of the principles of fire safety that have been adopted around the globe represents an important opportunity to educate stakeholders and improve protection for people and **Buildings** from the risk of fire and could help drive improvements in safety in both developed and developing economies.

IFSS-CP primarily focuses on the information required for life safety from fire and aims to minimise the social and economic impact of fire on communities.

The **IFSS-CP** is not intended or structured to supplant or replace existing fire safety related codes, standards and regulatory instruments ('codes'). Rather, it is designed to provide a framework to contextualise and guide codification within each jurisdiction. Existing codes within a given jurisdiction may therefore be shown to meet and satisfy one or more of the **IFSS-CP.** Conversely any 'gaps' created by unmet **IFSS-CP** may be identified. The **IFSS-CP** will therefore aid jurisdictions both in ensuring that their regulatory framework provides a comprehensive web of fire safety and in guiding future code development towards achieving that goal.

Future editions of **IFSS-CP** shall address wider issues such as **Building** preservation for communally and societally important **Buildings** and critical infrastructure, land administration, land governance, land policy, land reform and land tenure, resilience and recovery.

Furthermore, the **IFSS-CP** are looking to provide a directory of existing fire safety related codes, standards and regulatory instruments, and demonstrate how they fit within the framework by meeting and satisfying the **IFSS-CP**.

1.2 Fire Safety and Education

Appropriately targeted education of stakeholders is a powerful means to develop a culture of fire safety awareness throughout the built environment. Developing and maintaining that culture is complementary to the implementation of **IFSS-CP**.

Information and awareness programs underpinning **IFSS-CP** will need to be developed to reach the community in residences, workplaces and educational establishments, so that the population has the ability to make informed decisions throughout the life of **Buildings** and their interaction with them as practitioners, managers or occupants.

Implementing **IFSS-CP** will in many cases identify knowledge gaps that education will be required to fill. Those will include education in, about and in support of **IFSS-CP** of and by design and construction practitioners, **Building** and facility managers, developers and owners, firefighters and the general population.

Education and promulgation of information supporting **IFSS-CP** should therefore occur at the level of the broader community, direct facility use stakeholders and the professions influencing the initiation and operation of the facility as indicated in the diagram below.

Figure 2: Education and Promulgation of Information Supporting IFSS-CP

1.3 Using Other Standards and Codes of Practice

The **IFSS-CP** project incorporates the UN sustainable development goals (see section 1.1) and the following international standards:

- *International Ethics Standards*: *An ethical framework for the global property market* (IES): IES asserts and sustains the critical role of ethics in professional practice to meet the needs of the global market in maintaining public trust and confidence.
- *International Construction Measurement Standards: Global Consistency in Presenting Construction and Other Life Cycle Costs* (ICMS): ICMS establishes standards for the construction costs of **Buildings**.
- *International Property Measurement Standards* (IPMS): IPMS establishes standards for measuring the floor areas of **Buildings**.
- *International Financial Reporting Standards* (IFRS): IFRS is the international financial reporting standard produced by the International Accounting Standards Board and has been adopted by over 130 countries around the world as the basis for financial reporting.
- *International Valuation Standards* (IVS): IVS is the international valuation standard for businesses, real estate and financial instruments and has also been globally adopted.

Part 2 Common Principles Overview

IFSS-CP establishes overarching, performance-based **Common Principles** for fire safety engineering design, construction, occupation and ongoing management. The adoption of **IFSS-CP** will help protect people, **Buildings** and contents and the environment from the destructive effects of fire.

The following Figure 3 shows the interaction between laws, regulations, codes and standards and how the **Common Principles** outlined in this document can apply at each stage.

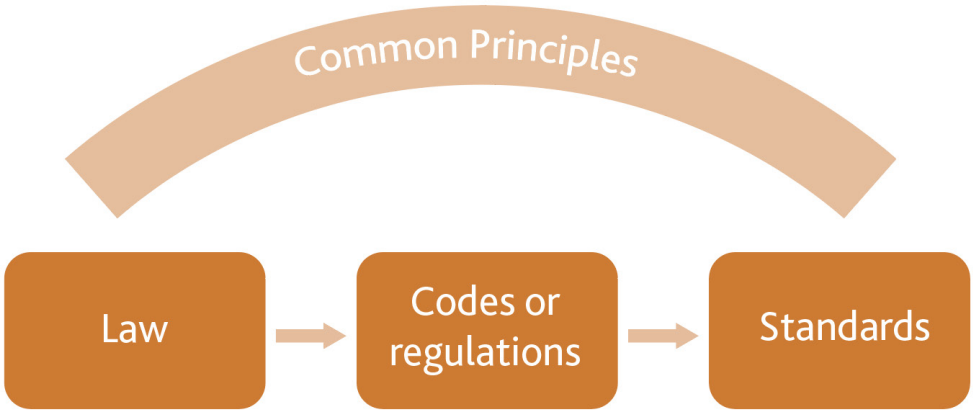

Figure 3: Interaction of Common Principles with Law, Codes or Regulations and Standards

2.1 The Common Principles

In all stages of a **Building's Life Cycle**, sufficient measures shall be taken to implement the following five **Common Principles**:

1 **Prevention** – Safeguarding against the outbreak of fire and/or limiting its effects.

2 **Detection and Communication** – Investigating and discovering of fire followed by informing occupants and the fire service.

3 **Occupant Protection** – Facilitating occupant avoidance of and escape from the effects of fire.

4 **Containment** – Limiting of fire and all of its consequences to as small an area as possible.

5 **Extinguishment** – Suppressing of fire and protecting of the surrounding environment.

IFSS-CP is intended to be flexible and non-prescriptive so that it can be adopted incrementally and will also advance good practice. The **Common Principles** have been developed so that they are universally applicable throughout the world, regardless of the existing codes, standards and guidance already in place.

The **Common Principles** are intended to apply to all types of **Building**, where this is possible.

Each **Common Principle** is interconnected and assigned equal importance and for each **Common Principle** listed in the **IFSS-CP Framework** users shall do the following, where applicable:

- incorporate facilities or procedures to address the **Common Principle** appropriate to the situation in accordance with a recognised code or principles and
- ensure that each **Common Principle** meets local regulatory requirements and is compatible with the code or principles selected.

2.2 Aims of the Common Principles

The **Coalition** directed that **IFSS-CP** shall:

- serve the public interest
- be primarily concerned with life safety from fire but, where practicable, also aim to limit or prevent the loss of **Buildings**
- establish a common set of internationally accepted, performance-based **Common Principles** for fire safety and
- create a framework that will allow comparisons to be made on a like-for-like basis across countries.

The **Coalition** advocates that the adoption of **IFSS-CP** will amongst other things:

- protect people in and around **Buildings**
- provide safe access and egress for firefighters
- allow for harmonisation of **Common Principles** and good practice
- be accessible to all relevant parties, commensurate with allowing robust comparisons to be made
- complement local and regional standards wherever possible
- accommodate the need for periodic innovation, refinement, updating and changes
- recommend a standard reporting format, where appropriate
- support the development of consistent language and terminology for the worldwide and increasingly mobile professions involved in fire safety
- enable global comparisons and benchmarking and provide a system benchmark for international good practice
- inform the development and review of government policy and
- support education and training in fire safety and fire safe design and construction to increase awareness among the population.

In practice, it is expected that **IFSS-CP** shall be adopted incrementally and systematically and that it is capable of being used in all markets and jurisdictions in conjunction with existing regulations and associated standards.

2.3 From the Common Principles to the IFSS-CP Framework

The **Common Principles** become actionable through the **IFSS-CP Framework**, which enables evidence-based assessment to achieve fire safety engineering design, construction, occupation and ongoing management on a **Building** level. The **IFSS-CP Framework** is the collective application of the **Common Principles**, which apply to different stages in the **Building Life Cycle**.

As a result, **IFSS-CP** can either be used at government/regulatory level for making laws, codes/regulations and standards, or at an individual level for evaluating the international fire safety measures within a specific **Building** project at each stage of the **Building Life Cycle**.

The **IFSS-CP Framework** is an important first step in achieving consistent fire safety design and management in real estate during design, construction, use, change and demolition. It works with existing international, supranational and national standards to provide the basis for improving existing processes and to achieve greater transparency and consistency within and between jurisdictions (see Part 5).

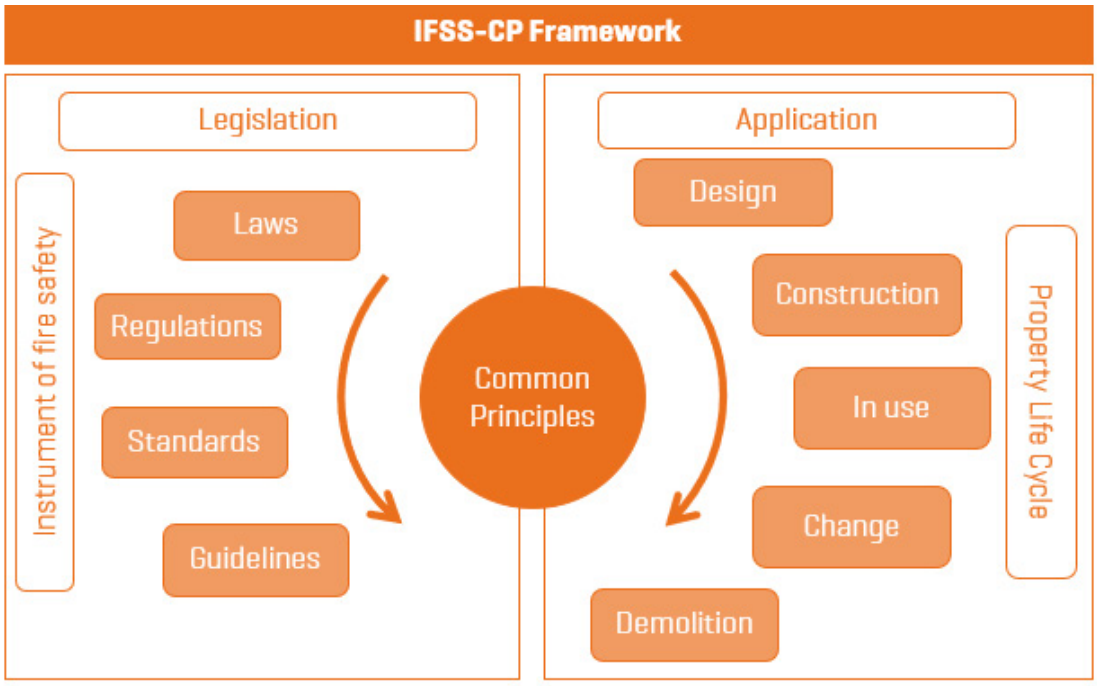

Figure 4: IFSS-CP Framework

IFSS-CP is relevant to individuals and communities and may be used by any individual with influence over the **Building's** fire safety arrangements.

IFSS-CP may assist in numerous circumstances, as illustrated in Figure 5 below.

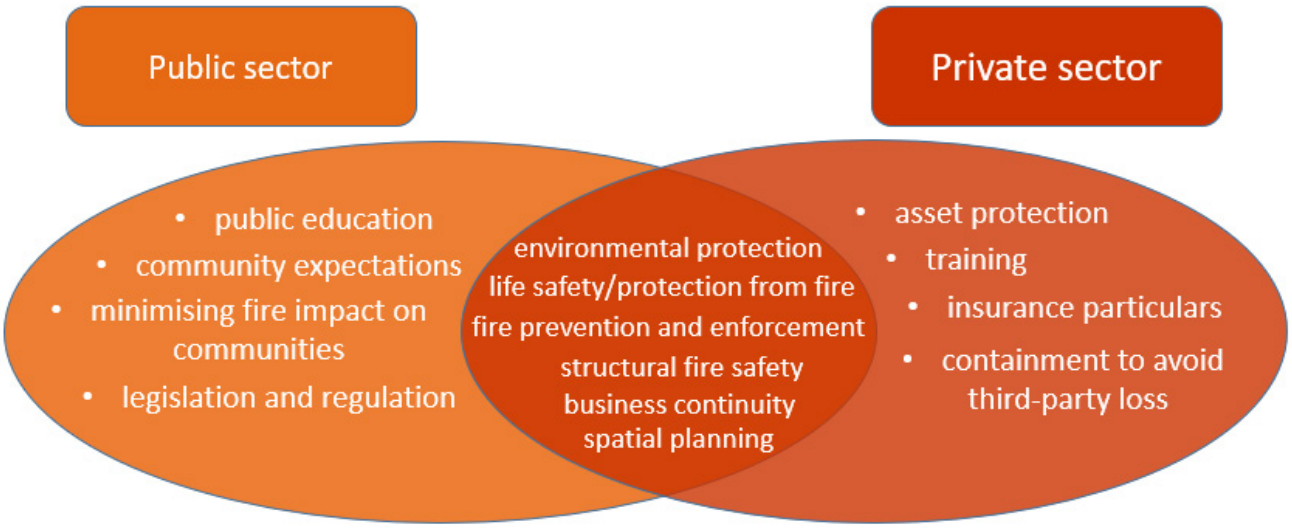

Figure 5: Circumstances IFSS-CP Framework

2.4 Building Life Cycle and IFSS-CP Framework

IFSS-CP applies the **Common Principles** at each stage of the **Building Life Cycle**, which can be explained in the following five stages:

- Stage 1 – Design
- Stage 2 – Construct
- Stage 3 – In use
- Stage 4 – Change
- Stage 5 – Demolish.

The five **Common Principles** shall be considered at each stage within the **Building Life Cycle**, which can be defined as follows:

Design: This is the preconstruction stage, which includes the conceptualisation, planning, drawing and specification of the **Building**.

Construct: This is the implementation stage, which includes every element of the building process from procurement to the final fitout.

In use: This is the occupation stage.

Change: This is the alteration, adaptation, refurbishment and repurposing stage.

Demolish: This relates to the **Building** being no longer fit for purpose in its current form and deconstructed and removed so the site can be reused or repurposed.

Enforcement shall apply at each stage with the **Building Life Cycle** as explained in Part 5.

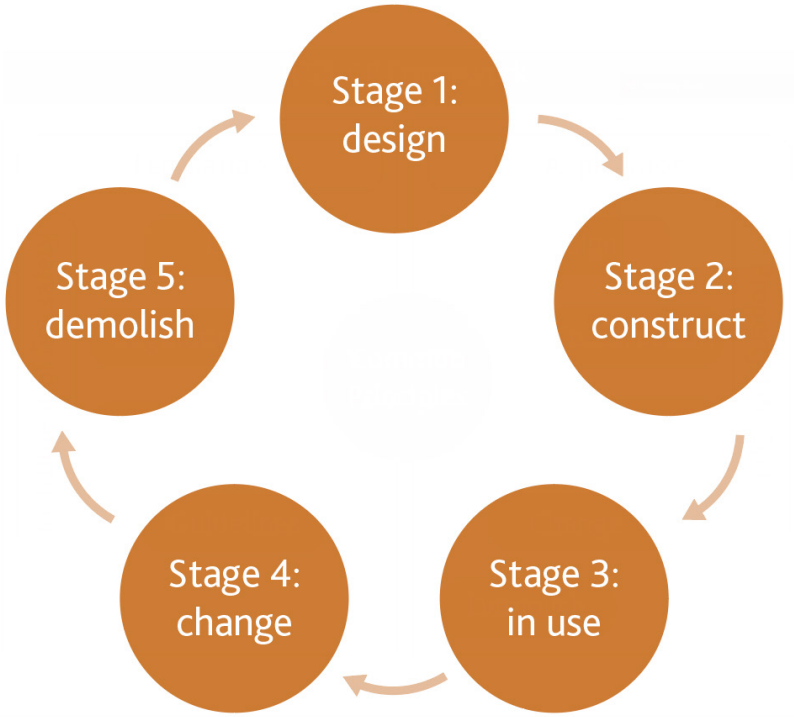

Figure 6: Building Life Cycle

2.5 Documentation Requirements

During an assessment under the **IFSS-CP Framework**, it is important that an adequate degree of documentation is prepared and retained for the duration of the **Building Life Cycle**.

The following list includes the type of information to be retained on file for the **Building** or in the report, subject to the **IFSS-CP Framework**:

- purpose of the instruction (fire safety engineering design, construction, occupation and ongoing management, etc.)
- date of the instruction
- name and address of the parties to the instruction
- address of the **Building**
- **Building** description – supplemented by plans/photos/digital clerk of work (drone) filming
- signature, complete with date, of the **Person Responsible**
- academic qualifications/professional qualifications and licence/registration number (if applicable, or appropriate competency/experience) as applicable in the local jurisdiction
- appendix including justifications of the performance of products, systems and overall construction, when appropriate provided by third party approval and
- appendix containing information used, referenced or relied on including author, date, purpose and methodology.

References should also be retained, including their date of creation, the author, their method of creation and any limitations.

2.6 Information Requirements

In some instances, the information required to complete and update the five **Common Principles** may also need to be derived from multiple different sources. Depending on the circumstances, some aspects of this information may not be available. The information relied on and used must remain relevant and shall be certified, validated and qualified.

IFSS-CP may also operate in jurisdictions without sufficient or functioning fire safety codes, regulations or principles. Where this is the case, it will still provide the parties and their professional advisers with a framework for fire safety in which information can be collected, verified and disclosed.

The referencing of all information is to enable current and future users to identify exactly what information was used and/or relied on to compile the assessment.

Compliance with **IFSS-CP** requires that all information sources compiled for the **IFSS-CP Framework** are disclosed. Where known, the information shall be clearly referenced and have the following attributes stated in the final report:

- the date the information was created and subsequently updated
- the source and provenance of the information creator/author
- the original purpose for which the information was created
- how the original information was compiled
- any limitations or exclusions in the information
- any assumptions made and how these are to be managed and validated and
- the adequacy of the **Common Principles**.

Part 3 Fire Safety Strategies and Measures

3.1 Introduction

As described in section 2.4, each of the five **Common Principles** outlined in 2.1 shall be reviewed at each stage of the **Building Life Cycle**. At each intersection between a **Common Principle** and a **Building Life Cycle** stage appropriate fire safety strategies and measures should be considered as outlined in section 3.3.

	Prevention	Detection and communicaition	Occupant safety	Containment	Extinguishment
Design	3.3.1.1	3.3.2.1	3.3.3.1	3.3.4.1	3.3.5.1
Construct	3.3.1.2	3.3.2.2	3.3.3.2	3.3.4.2	3.3.5.2
In use	3.3.1.3	3.3.2.3	3.3.3.3	3.3.4.3	3.3.5.3
Change	3.3.1.4	3.3.2.4	3.3.3.4	3.3.4.4	3.3.5.4
Demolish	3.3.1.5	3.3.2.5	3.3.3.5	3.3.4.5	3.3.5.5

Table 1: IFSS-CP Matrix

Although each **Building Life Cycle** stage is important, there is a certain hierarchy in relation to them. For example, if the relevant strategies and measures have not been satisfactorily dealt with at the design stage due to cost or other considerations, such as the fire safety review in relation to an existing **Building**, then the fire safety strategies and measures contained within another **Building Life Cycle** stage may become increasingly important to ensure fire safety.

3.2 Achieving the Common Principles

Like many complex systems, fire safety measures in the built environment interact with each other at many different levels. While a holistic view is the ultimate goal of the **IFSS-CP Framework**, it is useful to focus on each **Common Principle** and consider which fire safety strategies and measures will meet its objectives.

In many cases, a fire safety strategy or measure that is able to assist in meeting the objectives of a particular **Common Principle** will also assist in meeting those of other **Common Principles**. It is not the intention of the **IFSS-CP Framework** to restrict a particular fire safety strategy or measure to being cited as meeting the objectives of only one **Common Principle**. Rather, the intention is to ensure that the objectives of each **Common Principle** are shown to be met by the most appropriate range of fire safety strategies and measures and that the fire safety strategies and measures which best meet the objectives of each **Common Principle** are identified.

For example, while passive fire-rated **Building** elements are an important measure in containing fire and its effects, active suppression systems such as automatic sprinklers can also assist with **Containment** – both by protecting passive elements and by controlling fire growth.

3.3 Applying Common Principles to the Building Life Cycle

3.3.1 Prevention Principle

Objective: Safeguarding against the outbreak of fire and/or limiting its effects.

The assessment of risks and proposed fire protection measures should take into account recognised causes of fire, including:

- arson
- electrical fires
- accidental fires *(e.g. caused by cooking, smoking, open flame, candles, bonfires, chemical spills, hot work, etc.)*
- explosions *(e.g. dust and gas explosions, fireworks, etc.)* and
- natural causes *(e.g. lightning strikes, wildfires, etc.)*.

At every stage of the **Building Life Cycle**, measures must be established within the **IFSS-CP Framework** process to prevent the occurrence of fire. With fire **Prevention**, the aim is to prevent and stop fires from happening. The **Prevention** principle has three main goals:

- life safety from fire
- **Building** damage **Prevention** and
- protection of operations.

To be successful, fire **Prevention** shall be considered at each stage of the **Building Life Cycle** and the **Building** shall be designed, constructed, used, changed and demolished so as to eliminate, as far as reasonably practicable, the outbreak of fire due to natural or human causes. This will include control of ignition sources and management of potential fuel sources. A proactive challenge culture that can support this premise is by asking 'what if?' type questions and providing room to consider failure modes of fire systems so that the defence in terms of the **Building's** resilience to fire is properly understood.

The fire safety strategies and measures listed in each stage of the **Building Life Cycle** shown below are indicative only; there may be additional fire safety strategies and measures that are necessary to add to this list or are required for legal or regulatory reasons.

3.3.1.1 Stage 1: design

This stage involves assessing risks and evaluating appropriate fire **Prevention** measures at the planning stage. The following fire safety strategies and measures should be considered:

- product safety
- electrical safety
- consideration of combustibility and smoke-producing characteristics of materials and systems:
  - interior finish materials
  - external building construction
  - room contents

- occupant behaviour:
  - smoking
  - cooking
  - use of medical oxygen
- natural and man-made disasters and intentional acts:
  - wildfires
  - arson
- process safety in industrial facilities:
  - chemical spills
  - high temperature processes
- distance to external hazards:
  - other buildings
  - parked cars
  - storage of combustible materials/gasses.

3.3.2.1 Stage 2: construct

This is applicable to the site personnel and the structure on which they are working. Risks and fire protection measures applicable to the construction stage should also consider the fire safety strategies and measures identified and applied to stage 1. In addition, the following fire safety strategies and measures should be considered:

- security:
  - prevent intruders who may deliberately or accidentally start a fire
- control of combustible materials on site:
  - waste control, storage and disposal away from potential sources of ignition
  - storage of construction materials
  - storage of combustible substances
  - control of all items stored or being used on site (those posing a fire risk should be highlighted and given specific fire protection)
- assessment of high-risk procedures:
  - hot work permit/controls (*e.g. for welding and grinding*)
- control of exposed combustible materials on structure due to different stages of construction:
  - protect exposed combustible materials
  - consider primary and secondary sources of ignition
- behaviour of construction workers:
  - smoking
  - cooking.

3.3.1.3 Stage 3: in use

Fire risk assessment and fire **Prevention** measures while the **Building** is in use should take into consideration all fire safety strategies and measures from stage 1. They must reflect the actual situation at the **Building**. In addition, the following fire safety strategies and measures must be considered:

- education of occupants:
  - on fire **Prevention** (*e.g. hot work processes*)
  - on safe **Evacuation** principles
  - on fire safe behaviours relating to smoking and cooking
- smoking controls
- electrical equipment safety
- identification of potential hazards:
  - hoarding
  - storage of easily ignited materials in common areas.

3.3.1.4 Stage 4: change

Fire risk assessment and fire **Prevention** measures while the **Building** is subject to change should take into consideration all fire safety strategies and measures from stage 1 and, as relevant, stage 2. This includes soft changes and physical **Building** changes such as changes to car parks, waste processing plants and plant and equipment upgrades.

3.3.1.5 Stage 5: demolish

This is applicable to the site personnel and the structure on which they are working. Risks and fire protection measures applicable to the demolition stage should also consider the fire safety strategies and measures identified and applied to stages 1 and 2.

3.3.2 Detection and Communication Principle

Objective: Investigating and discovering of fire followed by informing occupants and the fire service.

At every stage of the **Building Life Cycle** measures must be established within the **IFSS-CP Framework** to aid good **Communication** among all relevant stakeholders and between systems to prevent a fire or to minimise the impact of a fire. Furthermore, should an outbreak of fire occur, it should be, where relevant, automatically detected and the occupants and other agencies alerted by the **Communication** methods agreed as safe in the circumstances. Automatic systems shall be initiated if available, and external agencies informed.

The fire safety strategies and measures listed in each stage shown below are indicative only; there may be additional fire safety strategies and measures that are necessary to add to this list or are required for legal or regulatory reasons.

3.3.2.1 Stage 1: design

During the design stage the type of detection and alarm/communication systems available needs to be considered. For high-rise buildings the potential for communicating to all occupants at once as well as per evacuation zone should be considered.

The following fire safety strategies and measures should be considered at the planning stage:

- automatic systems:
  - **Detection**
  - **Communication**
  - suppression (often linked with detection system)
- warning systems:
  - warning activation
  - voice alarm systems
  - visual alarm systems
- fire service **Communication**
- **Building** configuration:
  - internal geometry
  - sight lines
  - spatial layout/wayfinding.

3.3.2.2 Stage 2: construct

During most of the construction stage most of the **Detection** and **Communication** systems designed for the final building will not be functional. Additional temporary systems might therefore be needed. The following fire safety strategies and measures must be considered:

- presence of **Detection** and **Communication** systems:
  - phased implementation of permanent systems
  - temporary systems for **Detection**, **Communication** and warning activations
  - fixed and mobile **Communication** systems
- presence of **Detection** and **Communication** systems in site offices
- fire service **Communications**
- Education of workers:
  - language barriers
  - signage.

3.3.2.3 Stage 3: in use

When the building is in use the focus will be on ensuring that the installed systems are available and functioning as intended. The following fire safety strategies and measures must be considered:

- inspection testing and maintenance (ITM) of:
  - **Communication** systems fixed and mobile
  - **Detection** systems
- education of staff/occupants:
  - system impairment procedures
- ensure compatibility of new modules/materials with existing system.

3.3.2.4 Stage 4: change

As stage 1 and 2, plus consideration of the following fire safety strategies and measures:

- continued function of existing systems during refurbishment:
  - if needed temporary systems should be added
- signage
- appropriateness of existing systems to changed **Building** layout and use.

3.3.2.5 Stage 5: demolish

As stage 2, but it should be considered that any automatic system is likely to have been decommissioned and not offer the previous protection.

3.3.3 Occupant Protection Principle

Objective: Facilitating occupant avoidance of and escape from the effects of fire.

At every stage of the **Building Life Cycle** measures must be established within the **IFSS-CP Framework** to enable the safe movement of all occupants to a safe location. In case of fire, the occupants shall have the time and the opportunity to reach a place of safety before being adversely affected by the products of combustion.

The fire safety strategies and measures listed in each stage shown below are indicative only; there may be additional fire safety strategies and measures that are necessary to add to this list or are required for legal or regulatory reasons.

3.3.3.1 Stage 1: design

The **Evacuation** strategy is a critical element of the design of the **Building**. Designing for the safe movement and potential refuge of occupants is linked to the design requirements for **Containment**, which is outlined in detail in 3.3.4.1. The **Evacuation** strategy chosen is also linked to the type of **Communication** system needed to alert the occupants as outlined in 3.3.2.1. The following fire safety strategies and measures should be considered at the design stage:

- **Evacuation** procedures:
  - simultaneous **Evacuation**
  - phased **Evacuation**
  - protect in place
  - protected lobbies
  - refuge areas
  - progressive horizontal **Evacuation Communication**
- **Building** configuration and features:
  - travel distances
  - means of egress
  - potential restrictions en route (*e.g. shared **Escape** and logistical corridors, mezzanine, protected areas/lobbies and gantry headroom, narrow walkways, etc.*)
  - final exit and stair capacities
  - merging population flows
  - corridor widths
  - **Evacuation** lifts

  - emergency lighting
  - **Escape** lighting
  - exit signage
  - assembly points
  - alternative means of escape
  - self-rescue equipment
  - areas of refuge
- fire and smoke **Containment** (see also 3.3.4.1):
  - fire/smoke barriers
  - sprinkler systems
  - automatic smoke control
- occupant characteristics:
  - time to egress (time to start to move and movement time)
  - crowd control
  - predicted behavioural response
  - awareness of outside assistance requirements (for disabled people) and
- fire service intervention:
  - rescue
  - coordination with fire service.

3.3.3.2 Stage 2: construct

During the construction phase the safety of the construction workers needs to be considered. The challenge during construction is that many of the building features as well as **Containment** measures are not yet installed and/or functional. The fire safety strategies and measures from stage 1 should be considered where relevant in addition to the following:

- worker characteristics:
  - number and type of workers
  - other personnel and their roles
  - staff training and accreditation
  - security guards
  - work procedures carried out by site personnel
  - ability to rescue
  - trained operatives
- temporary **Evacuation** plans and procedures
- adapt control and **Communication** procedures with respect to phased completion of **Escape** routes or temporary impairment
- Building configuration and features:
  - regular walk-downs.

3.3.3.3 Stage 3: in use

When the building is in use the focus should be on ensuring that the designed safety systems are in place and functioning as intended and that the occupants know what action to take in case of fire. The following fire safety strategies and measures should be considered:

- Education of occupants:
  - training and preparation for **Escape** and **Evacuation** (*i.e. fire drills*)
  - good housekeeping related to **Escape**
- designated fire warden's inspection, testing and maintenance of all fire systems
- procedures for extraordinary use or circumstances such as large gatherings or egress path impairment and
- coordination with fire service.

3.3.3.4 Stage 4: change

As stages 1, 2 or 3, as relevant, underpinned where practicable by a fire safety assurance workshop. An increase in the number of occupants or a change in the ability of occupants to **Escape** (e.g. disabled people, children, the elderly) shall be taken into account to adapt the occupant egress conditions. A modification of **Escape** routes (length, width, etc.) shall be studied.

3.3.3.5 Stage 5: demolish

As stage 2, including consideration that temporary modifications of **Escape** routes shall be communicated to the workers and occupants.

3.3.4 Containment Principle

Objective: Limiting of fire and all of its consequences to as small an area as possible.

Containment of a fire and products of combustion is essential to mitigate its consequences and ensure resilience. It can be achieved through different strategies including compartmentation, smoke control, fixed firefighting systems, structural integrity and controlling the combustibility and smoke performance of materials used. Most often a combination of these strategies is used. It is important to pay attention to potential trade-offs between the strategies as this can lead to weakening of the **Containment** principle if done without appropriate risk assessment.

At every stage of the **Building Life Cycle** measures must be established within the **IFSS-CP Framework** to ensure that fire and smoke spread is contained to prevent a threat to life and aid **Extinguishment**.

The fire safety strategies and measures listed in each stage shown below are indicative only; there may be additional fire safety strategies and measures that are necessary to add to this list or are required for legal or regulatory reasons.

3.3.4.1 Stage 1: design

At the design stage, both passive and active systems for containing the fire should be considered. Determining the time needed for the fire to be contained is critically linked to the principles of **Occupant Protection** and **Extinguishment**. How much time the occupants need to reach an area of safety and for how long the safety area remains safe as well as the response time of the fire service are critical factors when designing the needed fire and smoke containment measures.

The following fire safety strategies and measures should be considered:

- consideration of combustibility and smoke-producing characteristics of materials and systems:
  - internal linings
  - external fabric of the building

- content compartmentation:
  - fire door and shutter sets
  - fire resilient walls, ceilings and floors
  - fire-rated glazing
  - fire resilient ductwork and dampers
  - fire barriers
  - firestopping systems
  - distance between **Buildings** and services
- fixed firefighting systems
  - suppression systems
- structural integrity
  - structural fire protection
  - fire resilient structure, and compatibility with compartmentation design
- smoke control
  - smoke hazard management
  - automatic smoke control systems
  - smoke-protected lobbies.

3.3.4.2 Stage 2: construct

The construction stage is a time of extreme vulnerability to fire as the systems needed to maintain compartmentation are not fully installed. To mitigate the risk of fire the following fire safety strategies and measures should be considered:

- phasing construction:
  - fire protection to be installed shortly after installation of combustible materials, such as foam insulation and timber frame structures
  - finalise each fire compartment at a time
  - install fixed fire fighting systems in increments allowing for partial protection during construction
  - use temporary protection (detection, mobile or semi-fixed firefighting system) when appropriate
- inspections during construction:
  - sign-off by the relevant parties
- documentation of as-built conditions
- specific procedures avoiding fire ignition on specific works (like hot spot).

3.3.4.3 Stage 3: in use

When the **Building** is in use the strategies for ensuring containment of a fire as envisioned during the design stage are expected to be in place and functioning. To ensure their continued functionality when in use the following fire safety strategies and measures should be considered:

- inspection, testing and maintenance of all systems needed for **Containment** as documented during design and construction
- education of occupants:
  - how to avoid minor works (i.e. D.I.Y.) compromising compartmentation (*e.g. fire protection of combustible walls/floors, firestopping, etc.*)
  - good housekeeping related to **Containment**.

- recognise suppression systems and/or smoke control systems and avoid interference
- gap assessment between the existing provisions and the requirements in the current standards.

3.3.4.4 Stage 4: change

Change includes anything from a deep renovation to minor alterations. If the use category of the building changes it will be necessary to revisit the strategies outlined under the design phase to ensure they are appropriate for the updated use. Ensuring that **Containment** of fire is achieved during a change stage requires that the fire safety strategies and measures from the design stage and construction stage are all considered.

3.3.4.5 Stage 5: demolish

During demolition the same fire safety strategies used during construction are of relevance. In particular it is important that any demolition is done in phases allowing all **Containment** measures to remain present for as long as possible. Where **Containment** measures cannot be maintained, operational approaches such as a fire watch may be necessary to address these potential hazards.

3.3.5 Extinguishment Principle

Objective: Suppressing of fire and protecting of the surrounding environment.

While installed suppression and control systems, as addressed under the **Containment** principle, should be capable of controlling the fire the action of **Extinguishment** is done by the fire service. For smaller fires the action of **Extinguishment** can also be undertaken by occupants, though this is often not recommended due to the risk of injury and death.

The fire service should be considered the last line of defence against fire. If a **Building** is designed, constructed and maintained fully in accordance with the **IFSS-CP** the role of the fire service is to extinguish the fire within the compartment where it originated, or to avoid propagation to other compartments or neighbouring buildings. Unfortunately, many existing **Buildings** as well as future **Buildings** are not designed with the fire safety strategies and measures needed to prevent and contain the fire, making the role of the fire service much more complex. Firefighters should be aware that fire can behave and spread very differently in some situations and may be difficult to contain. They should therefore receive appropriate training to enable them to respond to unexpected situations with efficiency.

At every stage of the **Building Life Cycle**, measures must be established within the **IFSS-CP Framework** to aid **Extinguishment** and protect the surrounding environment. In the event of a fire provisions shall be made for it to be extinguished by the fire service as efficiently as possible.

The fire safety strategies and measures listed in each stage shown below are indicative only; there may be additional fire safety strategies and measures that are necessary to add to this list or are required for legal or regulatory reasons.

3.3.5.1 Stage 1: design

At the design stage the following fire safety strategies and measures should be considered:

- secure access routes for the fire service:
  - proximity to the nearest fire department and fire service arrival time
  - adapted parking conditions around the building and according to its access
  - protection to the firefighting access routes outside and inside the building
- facilties needed for firefighting:
  - dry risers
  - wet risers
  - water supply
  - lifts
  - lobbies
  - fire extinguishers
  - manual firefighting equipment
  - fire command centre
- availability of **Building** information:
  - digital **Building** information
  - clear signs within the **Building**
- environmental protection:
  - impact of water run-off
  - adjacent hazards and proximity of proposed construction to existing built environment, including considerations for interfacing or shared facilities
- secure the firefighters' safety with structural resilience and limiting critical phenomenon.

3.3.5.2 Stage 2: construct

The construction stage is a time of extreme vulnerability to fire and many of those strategies needed to control the fire are not yet available. To facilitate the **Extinguishment** of a fire during construction the following fire safety strategies and measures should be considered:

- secure access routes for the fire service
- facilities needed for firefighting:
  - water supply
  - vertical access
  - fire extinguishers
  - manual firefighting equipment
- site information:
  - clear signage of hazardous materials.

3.3.5.3 Stage 3: in use

While the **Building** is in use it is important to ensure that the facilities needed by the fire service are continuously available and functioning. The following fire safety strategies and measures should be considered:

- secure access routes for the fire service:
  - maintain clear fire lanes
- inspection, testing and maintenance of facilities needed for firefighting:
  - dry risers
  - wet risers
  - water supply
  - lifts
  - fire extinguishers
  - manual firefighting equipment
- availability of **Building** information:
  - inspect that signs are in place
- liaison with fire and rescue services:
  - training and preparation of occupants and residents/staff
- Good housekeeping relating to Extinguishment facilities, signage and fire service access.

3.3.5.4 Stage 4: change

Change includes anything from a deep renovation to minor alterations. If the use category of the **Building** changes it will be necessary to revisit the strategies outlined under the design stage to ensure they are appropriate for the updated use. In case of a deep renovation the strategies from the construction stage should also be considered. Additionally, the following fire safety strategies and measures should be considered:

- good housekeeping to ensure continuous fire service access
- availability of building information:
  - Temporary signage might be needed
- liaison with fire and rescue services
- appropriateness of existing firefighting facilities to changed **Building** layout and use
- gap assessment between the existing provisions and the requirements in the current standards.

3.3.5.5 Stage 5: demolish

During demolition the same fire safety strategies and measures used during construction are of relevance.

Part 4 IFSS-CP Framework

The **IFSS-CP Framework** articulates the functions, life span characteristics and attributes of fire safety in **Buildings**. It can be used to determine general and specific functions (**Building** and management), hierarchies, competencies, knowledge and skills. **IFSS-CP** has been designed for policy makers, professionals and others to ensure that they have considered the full breadth, depth and range of fire safety strategies and measures at each stage of the **Building Life Cycle**.

The steps to apply the **IFSS-CP Framework** are as follows:

1. Complete the summary checklist on the following page and the applicable checklists in the Appendices. Enter the details, date of recording and whether there is any documentary support and, if so, what form this takes.
2. Review the **Prevention** principle (see Part 3) to establish how accurate/reliable the information is within that **Common Principle** overall. Then use a traffic light system to report where the information comes from at every stage of the **Building Life Cycle**. Green (G) indicates high quality information, yellow (Y) indicates disputed or questionable information and red (R) indicates no information or unreliable information. This is a general indication of the possibility that the information relied on within the **IFSS-CP Framework** may not be up to date, may differ from an objective assessment, may have questionable content, may come from a source that is difficult to verify or may not exist (intrusive verification works might also be required).

   This subjective assessment should be cross-examined in a fire safety assurance workshop, attended by suitably qualified and experienced personnel with decision-making powers and who are accountable for exercising such powers.
3. Repeat steps 1 to 2 above for each **Common Principle** and fire safety measure and strategy within the **IFSS-CP Framework**.
4. Disseminate all the information collected and delegate, as required in the circumstances, for competent individuals to examine the **Common Principles** and fire safety strategies and measures and act accordingly.
5. Using the information from the framework steps above, or other information available, a holistic judgement on the overall safety risk of the Building(s) should be made. The overall risk assessment should be reviewed with the owner, regulator or other parties as appropriate. The risk assessment will entail continual reviews of the existing or new design, construction, management and demolition proposals.

Common Principle	Fire safety strategies and measures	Building Life Cycle stage	Information	Information provenance (R/Y/G)
Prevention	Table A1: Prevention Principle – 3.3.1.1	Stage 1: design		
	Table A2: Prevention Principle – 3.3.1.2	Stage 2: construct		
	Table A3: Prevention Principle – 3.3.1.3	Stage 3: in use		
	Table A4: Prevention Principle – 3.3.1.4	Stage 4: change		
	Table A5: Prevention Principle – 3.3.1.5	Stage 5: demolish		
Detection and Communication	Table B1: Detection and Communication Principle – 3.3.2.1	Stage 1: design		
	Table B2: Detection and Communication Principle – 3.3.2.2	Stage 2: construct		
	Table B3: Detection and Communication Principle – 3.3.2.3	Stage 3: in use		
	Table B4: Detection and Communication Principle – 3.3.2.4	Stage 4: change		
	Table B5: Detection and Communication Principle – 3.3.2.5	Stage 5: demolish		
Occupant Protection	Table C1: Occupant Safety Principle – 3.3.3.1	Stage 1: design		
	Table C2: Occupant Safety Principle – 3.3.3.2	Stage 2: construct		
	Table C3: Occupant Safety Principle – 3.3.3.3	Stage 3: in use		
	Table C4: Occupant Safety Principle – 3.3.3.4	Stage 4: change		
	Table C5: Occupant Safety Principle – 3.3.3.5	Stage 5: demolish		

Common Principle	Fire safety strategies and measures	Building Life Cycle stage	Information	Information provenance (R/Y/G)
Containment	Table D1: Containment Principle – 3.3.4.1	Stage 1: design		
	Table D2: Containment Principle – 3.3.4.2	Stage 2: construct		
	Table D3: Containment Principle – 3.3.4.3	Stage 3: in use		
	Table D4: Containment Principle – 3.3.4.4	Stage 4: change		
	Table D5: Containment Principle – 3.3.4.5	Stage 5: demolish		
Extinguishment	Table E1: Extinguishment Principle – 3.3.5.1	Stage 1: design		
	Table E2: Extinguishment Principle – 3.3.5.2	Stage 2: construct		
	Table E3: Extinguishment Principle – 3.3.5.3	Stage 3: in use		
	Table E4: Extinguishment Principle – 3.3.5.4	Stage 4: change		
	Table E5: Extinguishment Principle – 3.3.5.5	Stage 5: demolish		

Table 2: IFSS-CP Framework summary checklist

Part 5 Accountability and Verification

5.1 Accountability

From the outset, as shown in Figure 2, the responsibility of states and governments in the establishment of a general education and a culture of engagement of populations in fire safety. It is also present in the training of its bodies acting as authorities and in the implementation of means to meet the needs for verification and control necessary and described in section 5.3. In general the implementation of the whole environment which consists of regulation, statistics, fire investigation, research, is an extension of the responsibility of government.

In order for the **IFSS-CP Framework** to operate effectively there must be an element of accountability and responsibility in terms of who fills it in. In many instances, there may be a number of key players involved in the different stages of the **IFSS-CP Framework**, including the client, principal designer, principal constructor and the maintainer/user.

However, before evoking construction accountability, it is essential to evoke the ethical and social responsibilities of the client, vis-à-vis the constructive choice and the stakeholders identified.

In some countries, accountability and responsibility is addressed through a market desire for fire safe **Buildings**, but in others a more restrictive regulatory approach may be necessary. There are other triggers, such as insurance, which may assist in driving safety outcomes. In some cases, such as after a major fire loss, accountability and responsibility are more readily addressed due to the willingness to avoid similar outcomes. However, it is often the case that the memory of such events fades and a lack of understanding of the risk subsequently returns. The key is that the regulatory culture and education must be well understood when establishing fire safety provisions to ensure they will be successfully implemented and maintained over time.

The accountability and responsibility for the contents of the **IFSS-CP Framework** primarily lies with the owner, duty holder or owner representative, **Building** certifier or the occupant in terms of maintenance of any fire safety systems or equipment.

5.2 Verification process

The key components of a good verification process must include the following:

- accountability (it must be comprehensive and visible)
- competency (e.g. qualification, assessment, regulation, validation and certification)
- quality assurance (i.e. validation and/or verification) and
- review cycle (i.e. in use and code cycle).

In addition, in order for the **IFSS-CP Framework** verification process to be carried out

effectively, the following parties shall be involved to ensure that there is no conflict of interest:

- reviewer (e.g. competent person(s) providing a third-party review)
- **Stakeholder** (e.g. individual(s) interested in the **Building** and its operation)
- independent certifier (e.g. engaged to assess/validate a **Building** against standards)
- verifier (e.g. society's representative/fire service/**Building** official).

In some instances, the independent certifier, reviewer and verifier, may be either the same person or separate individuals and this will largely depend on the market in which they operate. Furthermore, whether they are representatives of private or public interests will largely depend on their terms of engagement and the market in which they operate, but in either case they will be subject to an overriding legal duty of care.

5.3 Verification and enforcement at each Building Life Cycle stage

To ensure that a **Building** has the fire safety level intended it is necessary to implement verification and control processes at each **Building Life Cycle** stage. This is an ongoing process using different concepts, as outlined in Figure 7.

Moreover, it requires the existence of an established environment of third parties with

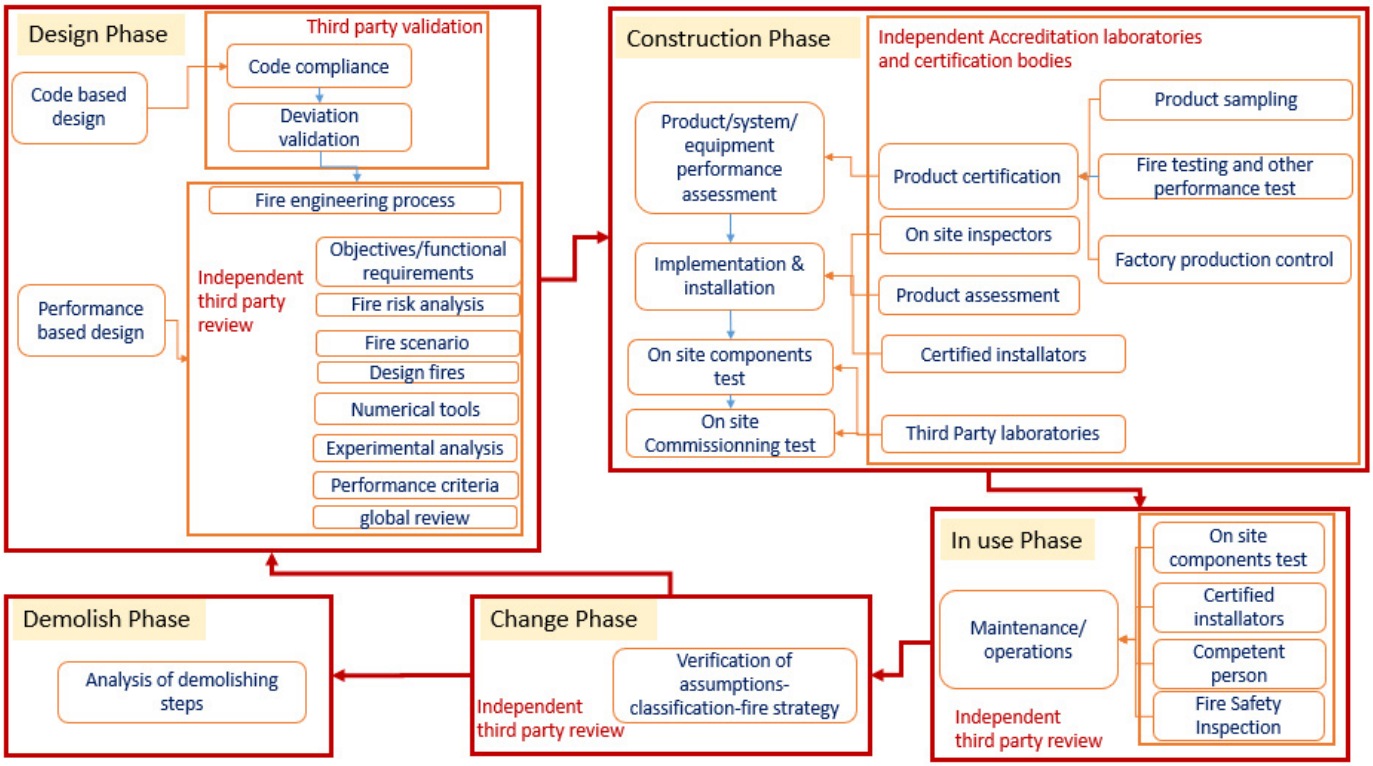

Figure 7: Verification and Enforcement at Each Stage

Part 6 Next Steps

Further to the publication of the **IFSS-CP**, the **IFSSC SSC** are planning the following next steps in relation to the development of future editions of the standard:

- A global directory of and roadmap to existing regulatory codes.
- A comparative dictionary for existing fire safety terms used in the **IFSS-CP**.

The global directory will not only provide a roadmap to existing fire safety codes around the world for those operating in other markets but will also act as a useful information tool to identify where there are either strong fire safety codes or gaps where further fire safety codes need to be developed. The roadmap can also be useful for emerging markets to study existing standards and where appropriate adopt them as part of a harmonisation process.

The **IFSS SSC** have also noted that many similarly defined fire safety terms have different nomenclature, which can lead to confusion when discussing or implementing fire safety codes within markets or across different markets. In order to provide additional clarity and transparency the **SSC** is planning to provide a comparative dictionary of fire safety terms to enable comparison of fire safety terms used in different markets and to act as a vital first step in the harmonisation of fire safety terms and standards across all markets.

Furthermore, as **IFSS-CP** becomes more widely adopted and implemented across markets, the **IFSSC SSC** in conjunction with the **Coalition** are planning to produce a rating system that will enable **Buildings** to display a certificate to show compliance with fire safety. Obviously this work will take some time as it will involve discussions with governments and other regulators and the published **IFSS-CP** will hopefully act as a positive catalyst for these future discussions.

Contents – IFSS-CP Framework

Appendix A Example Prevention checklists

Prevention principle – 3.3.1.1: Stage 1: design				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
General				
Product safety				
Electrical safety				
Consideration of combustibility and smoke-producing characteristics of materials and systems				
Interior finish materials				
External building construction				
Room contents				
Occupant behaviour				
Smoking				
Cooking				
Use of medical oxygen				
Natural and man-made disasters				
Wildfires				
Trickle-down effects from other natural disasters such as hurricanes and earthquakes				
Arson				
Process safety in industrial facilities				
Chemical spills				
High temperature processes				
Distance to external hazards				
Other buildings				
Parked vehicles				
Storage of combustible materials/gasses				

Table A1: Prevention principle – 3.3.1.1: Stage 1: design

Prevention principle – 3.3.1.2: Stage 2: construct				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
Security				
Prevent intruders who may deliberately or accidentally start a fire				
Control of combustible materials on site				
Waste control, storage and disposal away from potential sources of ignition				
Storage of construction materials				
Storage of combustible substances				
Control of all items stored or being used on site (those posing a fire risk should be highlighted and given specific fire protection)				
Assessment of high-risk procedures				
Hot work permit/controls e.g. for welding and grinding				
Control of exposed combustible materials on structure due to different stages of construction				
Protect exposed combustible materials				
Consider primary and secondary sources of ignition				
Behaviour of construction workers				
Smoking				
Cooking				

Table A2: Prevention principle – 3.3.1.2: Stage 2: construct

Prevention principle – 3.3.1.3: Stage 3: in use				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
Education of occupants				
Fire prevention, e.g. hot work processes				
Safe **Evacuation** principles				
Fire safe behaviours related to cooking and smoking				
Smoking controls				
Electrical equipment safety				
Identification of potential hazards				
Hoarding				
Storage of easily ignited materials in common areas				

Table A3: Prevention principle – 3.3.1.3: Stage 3: in use

Prevention principle – 3.3.1.4: Stage 4: change				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
As per prevention principle – 3.3.1.1: Stage 1: design				
General				
Electrical safety				
Product safety				
Selection of low combustibility and low smoke producing materials (ignition, flame spread, smoke)				
Interior finish materials				
External building construction				
Room contents				
Occupant behaviour				
Smoking				
Cooking				
Use of medical oxygen				
Natural and man-made disasters				
Wildfires				
Trickle down effects from other natural disasters such as hurricanes and earthquakes				
Arson				
Process safety in industrial facilities				
Checmical spills				
High temperature processes				
Distance to external hazards				
Other buildings				
Parked vehicles				
Storage of combustible materials/gasses				
As per prevention principle – 3.3.1.2: Stage 2: construct				
Security				
Prevent intruders who may deliberately or accidentally start a fire				
Control of combustible materials on site				
Waste control, storage and disposal away from potential sources of ignition				
Storage of construction materials				
Storage of combustible substances				
Control of all items stored or being used on site (those posing a fire risk should be highlighted and given specific fire protection)				

Prevention principle – 3.3.1.4: Stage 4: change				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
Assessment of high-risk procedures				
Hot work permit/controls e.g. for welding and grinding				
Control of exposed combustible materials on structure due to different stages of construction				
Protect exposed combustible materials				
Consider primary and secondary sources of ignition				
Behaviour of construction workers				
Smoking				
Cooking				

Table A4: Prevention principle – 3.3.1.4: Stage 4: change

Prevention principle – 3.3.1.5: Stage 5: demolish				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
As per prevention principle – 3.3.1.1: Stage 1: design				
General				
Electrical safety				
Product safety				
Selection of low combustibility and low smoke producing materials (ignition, flame spread, smoke production)				
Interior finish materials				
External building construction				
Rooms contents				
Occupant behaviour				
Smoking				
Cooking				
Use of medical oxygen				
Natural and man-made disasters				
Wildfires				
Trickle-down effects from other natural disasters such as hurricanes and earthquakes				
Arson				
Process safety in industrial facilities				
Chemical spills				
High temperature processes				

Prevention principle – 3.3.1.5: Stage 5: demolish				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
Distance to external hazards				
Other buildings				
Parked vehicles				
Storage of combustible materials/gasses				
As per prevention principle – 3.3.1.2: Stage 2: construct **Security**				
Prevent intruders who may deliberately or accidentally start a fire				
Control of combustible materials on site				
Waste control, storage and disposal away from potential sources of ignition				
Storage of construction materials				
Storage of combustible substances				
Control of all items stored or being used on site (those posing a fire risk should be highlighted and given specific fire protection)				
Assessment of high-risk procedures				
Hot work permit/controls e.g. for welding and grinding				
Control of exposed combustible materials on structure due to different stages of construction				
Protect exposed combustible materials				
Consider primary and secondary sources of ignition				
Behaviour of construction workers				
Smoking				
Cooking				

Table A5: Prevention principle – 3.3.1.5: Stage 5: demolish

Appendix B Example Detection and Communication checklists

Detection and Communication principle – 3.3.2.1: Stage 1: design				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
Automatic systems				
Detection				
Communication				
Suppression (often linked with detection system)				
Warning systems				
Warning activation				
Voice alarm systems				
Visual alarm systems				
Fire service communications				
Building configuration				
Internal geometry				
Sight lines				
Spatial layout/wayfinding				

Table B1: Detection and Communication principle – 3.3.2.1: Stage 1: design

Detection and Communication principle – 3.3.2.2: Stage 2: construct				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
General				
Presence of **Detection** and **Communication** systems in site offices				
Fire service **Communications**				
Presence of Detection and Communication systems				
Phased implementation of permanent systems				
Temporary systems for **Detection**, **Communication** and warning activations				
Fixed and mobile **Communication** systems				
Education of workers				
Language barriers				
Signage				

Table B2: Detection and Communication principle – 3.3.2.2: Stage 2: construct

Detection and Communication principle – 3.3.2.3: Stage 3: in use				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
Inspection, Testing and Maintenance (ITM)				
Communication systems fixed and mobile				
Detection systems				
Education of staff/occupants				
System impairment procedures				
Systems				
Ensure compatibility of new modules/materials with existing system				

Table B3: Detection and Communication principle – 3.3.2.3: Stage 3: in use

Detection and Communication principle – 3.3.2.4: Stage 4: change				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
As per Detection and Communication principle – 3.3.2.1: Stage 1: design				
Automatic systems				
Detection				
Communication				
Suppression (often linked with detection system)				
Warning systems				
Warning activation				
Voice alarm systems				
Visual alarm systems				
Fire service **Communication**				
Building configuration				
Internal geometry				
Sight lines				
Spatial layout/wayfinding				
As per Detection and Communication principle – 3.3.2.2: Stage 2: construct				
General				
Presence of **Detection** and **Communication** systems in site offices				
Fire service **Communications**				
Presence of Detection and Communication systems				
Phased implementation of permanent systems				
Temporary systems for **Detection**, **Communication** and warning activations				

Detection and Communication principle – 3.3.2.4: Stage 4: change				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
Fixed and mobile **Communication** systems				
Education of workers				
Language barriers				
Signage				
Continued function of existing systems during refurbishment				
If needed, temporary systems should be added				
Signage				
Appropriateness of existing systems to changed **Building** layout and use				

Table B4: Detection and Communication principle – 3.3.2.4: Stage 4: change

Detection and Communication principle – 3.3.2.5: Stage 5: demolish				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
As per Detection and Communication principle – 3.3.2.2: Stage 2: construct				
General				
Presence of **Detection** and **Communication** systems in site offices				
Fire service **Communications**				
Presence of Detection and Communication systems				
Phased implementation of permanent systems				
Temporary systems for **Detection**, **Communication** and warning activations				
Fixed and mobile **Communication** systems				
Education of workers				
Language barriers				
Signage				

Table B5: Detection and Communication principle – stage 5: demolish

Appendix C Example Occupant Protection checklists

Occupant Protection principle – 3.3.3.1: Stage 1: design				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
Evacuation procedures				
Simultaneous **Evacuation**				
Phased **Evacuation**				
Protect in place				
Protected lobbies				
Refuge areas				
Progressive horizontal **Evacuation Communication**				
Building configuration and features				
Travel distances				
Means of egress				
Potential restrictions en route (e.g. shared **Escape** and logistical corridors, mezzanine and gantry headroom, narrow walkways, etc.)				
Final exit and stair capacities				
Merging population flows				
Corridor widths				
Evacuation lifts				
Emergency lighting				
Escape lighting				
Exit signage				
Assembly points and alternative means of escape				
Self-rescue equipment				
Areas of refuge				
Fire and smoke Containment (see also 3.3.4.1)				
Fire/smoke barriers				
Automatic smoke control				
Sprinkler systems				
Occupant characteristics				
Time to egress (time to start to move and movement time)				
Crowd control				
Predicted behavioural response				

Occupant Protection principle – 3.3.3.1: Stage 1: design				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
Awareness of outside assistance requirements (for disabled people)				
Fire service intervention				
Rescue				
Coordination with fire service				

Table C1: Occupant Protection principle – 3.3.3.1: Stage 1: design

Occupant Protection principle – 3.3.3.2: Stage 2: construct				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
Worker characteristics				
Number and type of workers				
Other personnel and their roles				
Temporary **Evacuation** plans and procedures				
Staff training and accreditation				
Security guards				
Work procedures carried out by site personnel				
Ability to rescue				
Trained operatives				
Other personnel and their roles				
Temporary **Evacuation** plans and procedures				
Adapt control and **Communication** procedures with respect to phased completion of **Escape** routes or temporary impairment				
Building configuration and features				
Regular walk-downs				

Table C2: Occupant Protection principle – 3.3.3.2: Stage 2: construct

Occupant Protection principle – 3.3.3.3: Stage 3: in use				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
Education of occupants				
Training and preparation of occupants/residents/staff for **Escape** and **Evacuation** (i.e. fire drills)				
Good housekeeping related to **Escape**				
Other				
Designated fire warden's inspection, testing and maintenance of all fire systems				
Procedures for extraordinary use or circumstances such as large gatherings or egress path impairment				
Coordination with fire service				

Table C3: Occupant Protection principle – 3.3.3.3: Stage 3: in use

Occupant Protection principle – 3.3.3.4: Stage 4: change				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
As per Occupant Safety principle – 3.3.3.1: Stage 1: design				
Evacuation procedures				
Simultaneous **Evacuation**				
Phased **Evacuation**				
Protect in place				
Protected lobbies				
Refuge areas				
Progressive horizontal **Evacuation Communication**				
Building configuration and features				
Travel distances				
Means of egress				
Potential restrictions en route (e.g. shared **Escape** and logistical corridors, mezzanine and gantry headroom, narrow walkways, etc.)				
Final exit and stair capacities				
Merging population flows				
Corridor widths				
Evacuation lifts				
Emergency lighting				
Escape lighting				
Exit signage				

Occupant Protection principle – 3.3.3.4: Stage 4: change				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
Assembly points and alternative means of escape				
Self-rescue equipment				
Areas of refuge				
Fire and smoke Containment (see also 3.3.4.1)				
Fire/smoke barriers				
Automatic smoke control				
Sprinkler systems				
Occupant characteristics				
Time to egress (time to start to move and movement time)				
Crowd control				
Predicted behavioural response				
Awareness of outside assistance requirements (for disabled people)				
Fire service intervention				
Rescue				
Coordination with fire service				
As per Occupant Safety principle – 3.3.3.2: Stage 2: construct				
Worker characteristics				
Number and type of workers				
Other personnel and their roles				
Temporary **Evacuation** plans and procedures				
Staff training and accreditation				
Security guards				
Work procedures carried out by site personnel				
Ability to rescue				
Trained operatives				
Other personnel and their roles				
Temporary **Evacuation** plans and procedures				
Adapt control and **Communication** procedures with respect to phased completion of **Escape** routes or temporary impairment				
Building configuration and features				

Occupant Protection principle – 3.3.3.4: Stage 4: change				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
Regular walk-downs				
As per Occupant Safety principle – 3.3.3.4: Stage 3: in use				
Education of occupants				
Training and preparation of occupants/residents/staff for **Escape** and **Evacuation** (i.e. fire drills)				
Good housekeeping related to **Escape**				
Other				
Designated fire warden's inspection, testing and maintenance of all fire systems				
Procedures for extraordinary use or circumstances such as large gatherings or egress path impairment				
Coordination with fire service				

Table C4: Occupant Protection principle – 3.3.3.4: Stage 4: change

Occupant Protection principle – 3.3.3.5: Stage 5: demolish				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
As per Occupant Safety principle – 3.3.3.2: Stage 2: construct				
Worker characteristics				
Number and type of workers				
Other personnel and their roles				
Temporary **Evacuation** plans and procedures				
Staff training and accreditation				
Security guards				
Work procedures carried out by site personnel				
Ability to rescue				
Trained operatives				
Other personnel and their roles				
Temporary **Evacuation** plans and procedures				
Adapt control and **Communication** procedures with respect to phased completion of **Escape** routes or temporary impairment				
Building configuration and features				
Regular walk-downs				

Table C5: Occupant Protection principle – 3.3.3.5: Sage 5: demolish

Appendix D Example Containment checklists

Containment principle – 3.3.4.1: Stage 1: design				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
Consideration of combustibility and smoke-producing characteristics of materials and systems				
Internal linings				
External fabric of the **Building**				
Content Compartmentation				
Fire door and shutter sets				
Fire resilient walls, ceiling and floors				
FIre-rated glazing				
Fire resilient ductwork and dampers				
Fire barriers				
Firestopping systems				
Distance between **Buildings** and services				
Fixed firefighting systems				
Suppression systems				
Structural integrity				
Structural fire protection				
Fire resilient structure and compatibility with compartmentation design				
Smoke control				
Smoke hazard management				
Automatic smoke control systems				
Smoke lobbies				

Table D1: Containment principle – 3.3.4.1: Stage 1: design

Containment principle – 3.3.4.2: Stage 2: construct				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
Phasing construction				
Fire protection to be installed shortly after installation of combustible materials like foam insulation and timber frame structures				
Finalise each fire compartment at a time				
Install fixed firefighting systems in increments allowing for partial protection during construction				
Use temporary protection (detection, mobile or semi-fixed firefighting system) when appropriate				
Inspections during construction				
Sign-off by the relevant parties				
Other				
Documentation of as-built conditions				
Specific procedures avoiding fire-ignition on specific works (like hot spot)				

Table D2: Containment principle – 3.3.4.2: Stage 2: construct

Containment principle – 3.3.4.3: Stage 3: in use				
Fire safety strategies and measures	Information	Information provenance (R/Y/G)		
		R	Y	G
General				
Inspection, testing and maintenance of all systems needed for containment as documented during design and construction				
Education of occupants				
How to avoid minor works (e.g. D.I.Y.) compromising compartmentation (e.g. fire protection of combustible walls/floors, firestopping, etc.)				
Good housekeeping related to **Containment**				
Other				
Recognise suppresion systems and/or smoke control systems and avoid interference				
Gap assessment between the existing provision and the requirements in the current standards				

Table D3: Containment principle – 3.3.4.3: Stage 3: in use

Containment principle – 3.3.4.4: Stage 4: change				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
As per Containment principle – 3.3.4.1: Stage 1: design				
Low combustibility materials (ignition, flame spread, smoke production)				
Internal linings				
External fabric of the building				
Content Compartmentation				
Fire door and shutter sets				
Fire resilient walls, ceiling and floors				
FIre-rated glazing				
Fire resilient ductwork and dampers				
Fire barriers				
Firestopping systems				
Distance between **Buildings** and services				
Fixed firefighting systems				
Suppression systems				
Structural integrity				
Structural fire protection				
Fire resilient structure and compatibility with compartmentation design				
Smoke control				
Smoke hazard management				
Automatic smoke control systems				
Smoke lobbies				
As per Containment principle – 3.3.4.2: Stage 2: construct				
Phasing construction				
Fire protection to be installed shortly after installation of combustible materials like foam insulation and timber frame structures				
Finalise each fire compartment at a time				
Install fixed firefighting systems in increments allowing for partial protection during construction				
Use temporary protection (detection, mobile or semi-fixed firefighting system) when appropriate				

Containment principle – 3.3.4.4: Stage 4: change				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
Inspections during construction				
Sign-off by the relevant parties				
Other				
Documentation of as-built conditions				
Specific procedures avoiding fire-ignition on specific works (like hot spot)				

Table D4: Containment principle – 3.3.4.4: Stage 4: change

Containment principle – 3.3.4.5: Stage 5: demolish		
Fire safety strategies and measures	Information	Information provenance (R/Y/G)
As per Containment principle – 3.3.4.2: Stage 2: construct		
Phasing construction		
Fire protection to be installed shortly after installation of combustible materials like foam insulation and timber frame structures		
Finalise each fire compartment at a time		
Install fixed firefighting systems in increments allowing for partial protection during construction		
Use temporary protection (detection, mobile or semi-fixed firefighting system) when appropriate		
Inspections during construction		
Sign-off by the relevant parties		
Other		
Documentation of as-built conditions		
Specific procedures avoiding fire-ignition on specific works (like hot spot)		

Table D5: Containment principle – 3.3.4.5: Stage 5: demolish

Appendix E Example Extinguishment checklists

Extinguishment principle – 3.3.5.1: Stage 1: design				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
Secure access routes for the fire service				
Proximity to the nearest fire department and fire service arrival time				
Adapted parking conditions around the **Building** and according to its access				
Protection to the firefighting access routes outside and inside the **Building**				
Facilities needed for firefighting				
Dry risers				
Wet risers				
Water supply				
Lifts				
Lobbies				
Fire extinguishers				
Manual firefighting equipment				
Availability of Building information				
Digital **Building** information				
Clear signs within the **Building**				
Environmental protection				
Impact of water run off				
Adjacent hazards and proximity of proposed construction to existing built environment, including considerations for interfacing or shared facilities				
Other				
Secure the firefighters' safety with structural resilience and limiting critical phenomenon				

Table E1: Extinguishment principle – 3.3.5.1: Stage 1: design

Extinguishment principle – 3.3.5.2: Stage 2: construct				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
General				
Secure access routes for the fire service				
Facilities needed for firefighting				
Water supply				
Vertical access				
Fire extinguishers				
Manual firefighting equipment				
Site information				
Clear signage of hazardous materials				

Table E2: Extinguishment principle – 3.3.5.2: Stage 2: construct

Extinguishment principle – 3.3.5.3: Stage 3: in use				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
Secure access routes for the fire service				
Maintain clear fire lanes				
Inspection, testing and maintenance of facilities needed for firefighting				
Dry risers				
Water risers				
Water supply				
Lifts				
Fire extinguishers				
Manual firefighting equipment				
Availability of Building information				
Inspect that signs are in place				
Liaison with fire and rescue services				
Training and preparation of occupants and residents/staff				
Other				
Good housekeeping related to **Extinguishment** facilities, signage and fire sevice access				

Table E3: Extinguishment principle – 3.3.5.3: Stage 3: in use

Extinguishment principle – 3.3.5.4: Stage 4: change				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
As per Extinguishment principle – 3.3.5.1: Stage 1: design				
Secure access routes for the fire service				
Proximity to the nearest fire department and fire service arrival time				
Adapted parking conditions around the Building and according to its access				
Protection to the firefighting access routes outside and inside the Building				
Facilities needed for firefighting				
Dry risers				
Wet risers				
Water supply				
Lifts				
Lobbies				
Fire extinguishers				
Manual firefighting equipment				
Availability of Building information				
Digital **Building** information				
Clear signs within the **Building**				
Environmental protection				
Impact of water run off				
Adjacent hazards and proximity of proposed construction to existing built environment, including considerations for interfacing or shared facilities				
Other				
Secure the firefighters' safety with structural resilience and limiting critical phenomenon				
As per Extinguishment principle – 3.3.5.2: Stage 2: construct				
General				
Secure access routes for the fire service				
Facilities needed for firefighting				
Water supply				
Vertical access				
Fire extinguishers				
Manual firefighting equipment				
Site information				
Clear signage of hazardous materials				

Extinguishment principle – 3.3.5.4: Stage 4: change				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
General				
Good housekeeping to ensure continuous fire service access				
Liason with fire and rescue services				
Appropriateness of existing firefighting facilities to changed **Building** layout and use				
Gap assessment between the existing provisions and the requirements in the current standards				
Availability of Building information				
Temporary signage might be needed				

Table E4: Extinguishment principle – 3.3.5.4: Stage 4: change

Extinguishment principle – 3.3.5.5: Stage 5: demolish				
Fire safety strategies and measures	Information	Information provenance		
		R	Y	G
As per Extinguishment principle – 3.3.5.2: Stage 2: construct **General**				
Secure access routes for the fire service				
Facilities needed for firefighting				
Water supply				
Vertical access				
Fire extinguishers				
Manual firefighting equipment				
Site information				
Clear signage of hazardous materials				

Table E5: Extinguishment principle – 3.3.5.5: Stage 5: demolish