

1. Record Nr.	UNINA9910523751103321
Titolo	Fire safety for very tall buildings : engineering guide // SFPE, International Code Council
Pubbl/distr/stampa	Cham, Switzerland : , : Springer, , [2022] ©2022
ISBN	3-030-79014-2
Edizione	[Second edition.]
Descrizione fisica	1 online resource (278 pages)
Collana	Society of Fire Protection Engineers series
Disciplina	628.9
Soggetti	Tall buildings - Fires and fire prevention
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- SFPE Task Group on Fire Safety for Very Tall Buildings -- About SFPE -- About ICC -- Preface -- Acknowledgments -- Contents -- Chapter 1: Introduction -- Scope -- Purpose -- Background -- Chapter 2: History -- One New York Plaza, New York, USA - August 15, 1970 -- Lessons Learned -- MGM Grand Hotel, Las Vegas, USA - November 21, 1980 -- Lessons Learned -- First Interstate Bank, Los Angeles, USA - May 4, 1988 -- Lessons Learned -- One Meridian Plaza, Philadelphia, USA - February 23, 1991 -- Lessons Learned -- World Trade Center Terrorist Attack, New York, USA - February 26, 1993 -- Lessons Learned -- World Trade Center Buildings 1 and 2 Terrorist Attack, New York, USA - September 11, 2001 -- Lessons Learned -- World Trade Center Building 7 (WTC 7) Terrorist Attack, New York, USA - September 11, 2001 -- Lessons Learned -- Cook County Administration Building, Chicago, USA - October 17, 2003 -- Lessons Learned -- Caracas Tower Fire, Caracas, Venezuela - October 17, 2004 -- Lessons Learned -- Windsor Tower, Madrid, Spain - February 12, 2005 -- Lessons Learned -- The Mandarin Oriental Hotel Fire, Beijing, China - February 9, 2009 -- Lessons Learned -- Shanghai Apartment Tower Fire, Shanghai, China - November 15, 2010 -- Lessons Learned -- Lacrosse Fire, Melbourne, Australia - November 25, 2014 -- Lessons Learned -- The Address Downtown Hotel Fire, Dubai, UAE - December 31, 2015 -- Lessons Learned -- Torch Tower Fire, Dubai, UAE - February 21, 2015 and August 4, 2017 -- Lessons Learned --

Grenfell Tower Fire, London, England - June 14, 2017 -- Lessons Learned -- Performance-Based Approach to Building Fire Safety -- Chapter 3: Components of Performance-Based Design -- Peer Review -- Documentation -- Qualifications for Engineers -- Chapter 4: International Practices -- Key Considerations in International Design. Extreme Events in International Very Tall Building Designs -- Structural Hardening -- Robust and Redundant Life Safety Systems -- Egress -- Fire Fighter Access -- Building Materials -- Extreme Natural Events -- Chapter 5: Unique Features of Very Tall Buildings -- Height Beyond Reach of Fire Department Ladders -- Extended Evacuation Time -- Pronounced Stack Effect -- Water Supply Limitations -- Greater Challenges of Mixed Occupancies -- Iconic Nature -- Communication -- Chapter 6: Special Features and Attractions -- Types of Special Features -- Observation Decks/Restaurants/Night Clubs/Pool Decks -- Amusement/Entertainment Thrill Features -- Fireworks -- Special Life Safety Considerations -- Life Safety Systems -- Fall Hazards -- First Responders: Rescue and Recovery -- Chapter 7: Hazard, Risk, and Decision Analysis in Very Tall Building Design -- Hazards -- Fire -- Technological Events -- Extreme Natural Events -- Terrorism -- Risk Analysis -- Decision Analysis -- Uses and Applications of Hazard, Risk, and Decision Analysis for Very Tall Buildings -- Fire Strategy Development -- Fire Safety Goals and Objectives -- Fire and Egress Scenario Development -- Fire Size and Structural Response -- Multi-hazard Extreme Event Analysis -- Evaluation of Possible Mitigation Measures -- Identification and Selection of Evacuation Strategies -- Emergency Response -- Chapter 8: Integration of Building Design and Systems -- Interrelationship of Operation of Systems -- Emergency Response and Control of Systems -- The Building as a System -- Fire Safety Goals and Objectives -- Integrating Evacuation Strategies -- Chapter 9: System Reliability -- Chapter 10: Situation Awareness -- Situational Information -- Information Sources -- Effective Information Delivery -- Chapter 11: Emergency Egress -- Design Considerations for Very Tall Buildings. Fire Safety Goals and Objectives for Egress -- Evacuation Scenario Identification -- Human Behavior -- Occupant Functional Limitations [51, 80, 90, 91] -- Security and Fire Safety [73] -- Understanding Evacuation Times -- Why a Timed Egress Analysis? -- Egress Plan and Timed Egress Analysis -- Elevators -- Timed Egress Analysis Tools -- Review of Evacuation Model Characteristics -- Evacuation Strategies -- Simultaneous Evacuation -- Phased Evacuation -- Defend-in-Place -- Progressive Evacuation -- Full/Total Building Evacuation -- Hybrid/Combined Strategies -- Design Features Affecting Evacuation Times -- Components of Egress -- Exit Discounting -- Horizontal Stair Transfers -- Effective Wayfinding/Exit Signage -- Egress Discharge Locations -- Elevator Evacuation -- Safety -- Controls and Operations -- Communication -- Training -- Maintenance -- Supplementary Escape Equipment -- Methods for Protecting Building Occupants in Place -- Evacuation of the Mobility Impaired -- Refuge Spaces -- Sky Lobbies -- Impact of Emergency Responders -- Evacuation Management -- Development of Egress Plan -- Implementation -- Changes and Absentees -- Occupancy Types -- Assisted Evacuation -- Chapter 12: Fire Resistance -- Performance Objectives for Fire Resistance of Very Tall Buildings -- Impact on Fire Resistance of Extended Time and Effort for Egress and Fire-Fighting Operations -- Methods to Determine Fire Resistance -- Prescriptive Approach -- Performance-Based Structural Fire Analysis -- Metrics for Performance-Based Structural Analysis -- Stability -- Integrity -- Compartmentation -- Fire Scenarios to Consider in Fire Resistance Design --

Consideration of Cooling Phase -- High Challenge Fire Hazards -- Coupling of Gravity and Lateral Load-Resisting Systems -- Structural Systems for Reducing Drift and Other Lateral Accelerations. Consideration for Timber: Combustibility -- Consideration for Concrete Spalling -- Consideration for Fire Protection Material: Robustness -- Post-fire Assessment -- Post-earthquake Fire Risk -- Chapter 13: Building Envelope/Enclosure -- Recent Fire Incidents and Lessons Learned -- Fire Safety Goals for New Construction -- Facade Types -- Curtain Walls -- Double-Skin Facades -- Built-Up Walls with a Cavity -- Built-Up Walls Without a Cavity -- Mechanisms of Fire Spread -- Fire Initiating Events -- Mechanisms of Fire Spread After Initiating Event -- Building Enclosure Design Considerations -- Combustible Components of the Enclosure: Material Considerations -- Cladding -- Insulation -- Membranes -- Framing -- Gaskets, Sealants, and Thermal Breaks -- Fire Barrier Systems at the Envelope-Floor Intersection -- Cavities in Facade Systems -- Double-Skinned Facade Considerations -- Vision Glass Considerations -- Geometry, Exterior Projections, and Windows -- Balconies and Building Exterior Appendages -- Use of Combustible Materials for Decorative Purposes -- Specialty Facade Systems: LED Display Screens, Photovoltaic (PV) Systems, and Vegetative Walls -- Fire Testing of Designs -- Reaction to Fire Tests of the Constituent Materials -- Fire Resistance Testing of Perimeter Fire Barriers With or Without Spandrels -- Fire Resistance Testing of Fire-Rated Facade Systems -- Large-Scale Fire Testing of the Facade System -- Fire Testing of the Roofing System -- Certification -- Risk Assessments -- Chapter 14: Suppression -- Risk Assessment -- Fire Strategy -- Reliability -- System Documentation -- Key Issues -- Water Supply -- Pressure Control -- Flow Control -- Fire Pumps -- Standpipe Systems -- Water Hammer -- Facilities for Testing -- Chapter 15: Detection and Alarm -- Reliability/Robustness -- Survivability -- Nuisance Alarms -- Voice Communication. Visual Notification -- Mass Notification -- Chapter 16: Smoke Control -- Factors that Influence Smoke Control in Very Tall Buildings -- Stack Effect -- Wind Effect -- Piston Effect of Elevators -- Building Environmental Control Systems (HVAC) -- Fire Safety Goals and Objectives for Smoke Control -- Sample Goals and Objectives -- Smoke Control Design Methods -- Passive Methods of or Approaches to Smoke Control -- Active Methods of or Approaches to Smoke Control -- Factors that Affect Analysis and Design of Smoke Control Systems -- Wind -- Operable Windows -- Reliability -- Stairway Pressurization -- Stairway Wall Construction -- Vestibule: Natural Ventilation -- Vestibule: Mechanical Ventilation -- Height Limit -- Open Doors -- Stacked Atria -- Fire-Fighting Operations -- Duration of Operations -- Protection of Elevators -- Extreme Climates -- Chapter 17: First Responder Considerations -- Command and Control -- Communication -- Building Access -- Initial Response -- Coordination with Building Egress -- Fire Control/Command Center -- Chapter 18: Electrical -- Emergency and Standby Power -- Emergency Lighting and Exit Signage -- Elevators -- Stay- or Defend-in-Place Coordination -- Chapter 19: Buildings Under Construction -- Fire Hazards -- Challenges in Buildings Under Construction -- Phased Occupancy -- Partial Occupancy -- Tenant Changes -- Change of Use/Occupancy -- Major Repairs -- Chapter 20: Building Life Cycle Management -- Building Operations -- Fire Wardens and Incident Management -- Chapter 21: Commissioning -- Commissioning Starts with the Design -- Commissioning and the Construction Phase -- Commissioning Prior to Occupancy -- Chapter 22: Existing Building Considerations -- Renovations and Additions -- Adaptive Reuse

and Change of Occupancy -- Chapter 23: Inspection, Testing,  
and Maintenance -- Integrated Systems.  
Operations and Maintenance Manual.

---