

Orange County Fire Authority

Community Risk Reduction

1 Fire Authority Road, Building A, Irvine, CA. 92602 www.ocfa.org 714-573-6100

High-Rise Buildings



Guideline H-01

Serving the Cities of Aliso Viejo • Buena Park • Cypress • Dana Point • Garden Grove • Irvine • Laguna Hills • Laguna Niguel • Laguna Woods
Lake Forest • La Palma • Los Alamitos • Mission Viejo • Rancho Santa Margarita • San Clemente • San Juan Capistrano • Seal Beach
Santa Ana • Stanton • Tustin • Villa Park • Westminster • Yorba Linda and Unincorporated Areas of Orange County

High-Rise Buildings

PURPOSE

This document is intended to provide developers, building owners, property managers, and businesses with a comprehensive outline of the requirements for high-rise buildings as they pertain to plan submittal, inspection, emergency pre-fire planning, and maintenance of high-rise buildings.

SCOPE

This document has been broken down into 4 distinct sections:

1. **Section I – Plan Review:** This section provides a comprehensive outline of fire code requirements necessary for high-rise design.
2. **Section II – Construction:** This section provides the Orange County Fire Authority (OCFA) inspection and communication process that helps ensure the project manager is informed of and the steps necessary to allow OCFA staff to verify project compliance during the construction process.
3. **Section III – Emergency Incident Pre-Plan (under construction and subject to modification):** To provide property management teams and OCFA emergency responders with a guideline to assist in creating an emergency pre-plan document of the building's life safety systems for utilization prior to and during an incident.
4. **Section IV – Annual Maintenance (currently under revision):**
5. **Section V – Existing Buildings:** Buildings, facilities or conditions which were constructed or officially authorized prior to the adoption of the current code shall be maintained in accordance with the code they were constructed under. Alterations, repairs, additions, and changes of occupancy to existing structures shall comply with the provisions for alterations, repairs, additions, and changes of occupancy in accordance with the requirements of the code for new construction (see Part I – Plan Review).

New High-Rise Buildings

Section I – Plan Review

PURPOSE

This section describes the submittal requirements for high-rise buildings (HRB) which are buildings where the highest occupied floor is more than 75 feet above the lowest floor level having building access.

SCOPE

This guideline provides the requirements for all HRB within the jurisdiction of OCFA.

Definitions: For the purposes of this guideline, certain terms are as follows:

CBC: 2019 California Building Code

CFC: 2019 California Fire Code

High-Rise Building or Structure: A building where the highest occupied floor is more than 75 feet above the lowest floor level that provides access to the interior of the building.

Fire Command Center (FCC): The principal attended or unattended location where the status of the detection, alarm communications and control systems is displayed, and from which the system(s) can be manually controlled.

Fire Control Room: See Fire Command Center

NFPA 13: 2016 Edition of the National Fire Protection Association 13: Standard for the installation of Sprinkler Systems.

NFPA 14: 2016 Edition of the National Fire Protection Association 14: Standard for the installation of Standpipe, Private Hydrant, and Hose Systems

NFPA 20: 2016 Edition of the National Fire Protection Association 20: Standard for Stationary Pumps for Fire Protection.

NFPA 22: 2018 Edition of the National Fire Protection Association 22: Standard for Water Tanks for Private Fire Protection.

NFPA 24: 2016 Edition of the National Fire Protection Association 24: Standard for the installation of Private Fire Service Mains and Their Appurtenances.

NFPA 72: 2016 Edition of the National Fire Protection Association 72: National Fire Alarm Code.

Occupiable Space: A room or enclosed space designed for human occupancy in which individuals congregate for amusement, educational or similar purposes or in which occupants are engaged in labor and which is equipped with the means of egress and light and ventilation facilities meeting the requirements of the CBC.

Penthouse: An enclosed, unoccupied structure above the roof of a building, other than a tank, tower, spire, dome, cupola or bulkhead, occupying not more than one-third of the roof area.

PLAN SUBMITTAL REQUIREMENTS

1. **General Information:** All new plan submittals and revisions will consist of 2 plan copies and 1 electronic copy. All electronic formats will be accepted and may be submitted on **CD, DVD, or flash drive**. Plans will need the following information and items:
 - A. Complete address of the project, including the tract and lot numbers
 - B. Architect name, address and phone number with a wet signature
 - C. Occupancy classification(s)
 - D. Type of construction
 - E. Total square footage
 - F. Number of floors
 - G. Regulating codes and their edition, e.g. 2016 CBC, 2016 CFC, etc.
 - H. Deferred submittals, e.g. fire sprinklers, fire alarm, etc.
 - I. Architectural, mechanical, plumbing, and electrical sheets
 - J. Door schedule that identifies hardware and fire resistive ratings
 - K. OCFA architectural notes, which can be located at www.ocfa.org under the Planning and Development section in Fire Prevention

2. Specific Requirements:

Fire Department Access: Basic fire department access and hydrant requirements can be found in OCFA guideline B-09. However, tactics for emergency response at high-rise buildings focus more on aerial suppression and interior attack via the stairwells as opposed to ground-level operations. In light of this, portions of the high-rise building's perimeter that do not contain building entry points may be located up to 300 feet from a fire lane. In addition, the site design for high-rise buildings shall incorporate the specific provisions listed below to facilitate aerial operations and roof access. Where unique site or building conditions or restrictions prohibit compliance with these access and hydrant provisions, the fire code official may modify or exempt individual provisions provided that an acceptable level of alternative access, water availability, and safety is provided.

A. Vehicle laddering and staging areas:

- 1) A *minimum* of 2 laddering areas shall be provided for a high-rise building. The laddering areas shall meet the criteria in sections B, C, D.1 through D.5, and E.3. Buildings meeting the exception in D.1 or D.2 shall meet the criteria in B.2 through B.4, D.3 and D.5.
- 2) A staging area shall be provided for the FDC serving a high-rise building. The FDC staging area shall meet the criteria in sections B, D.3, D.4, D.6, E.1 and E.3.
- 3) A staging area shall be provided for the fire command center. This staging area shall meet the criteria in sections B, D.3, D.4, and D.7.

B. Laddering/Staging area design:

- 1) Laddering and FDC staging areas shall be rectangular with a length of at least 50 feet and a width of at least 16 feet; for buildings higher than 120', the laddering

area shall be at least 75 feet long. The staging area for the fire command center shall be at least 50 feet by 10 feet.

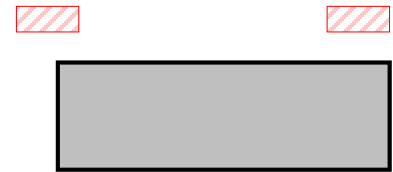
- 2) Laddering/staging areas and fire lane leading to them shall be a permanent, hard-surfaced material such as concrete, asphalt, or decorative pavers.
- 3) Laddering/staging areas are part of the fire lane and shall meet all standard fire lane criteria. They shall not be used for any purpose that may potentially delay or hinder emergency response by the fire department including, but not limited to: parking, loading/unloading zone, waiting/drop-off area, valet services, or other similar activities.
- 4) Laddering/staging areas shall be flat and provide with only enough slope/cross-slope to facilitate drainage (~2%).

C. Location of laddering areas:

1. Laddering areas shall be located near opposing corners of the high-rise building or near adjacent corners of one or more of the longest sides of the building in a manner that optimizes access to the building façades and roof areas.



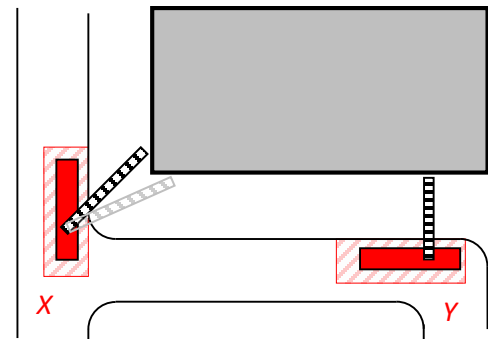
C.1: Laddering areas at opposing corners.



C.1: Laddering areas at adjacent corners of the longest side of the building.

2. At least one laddering area shall provide ladder access to two adjoining façades of the structure.
3. Where a high-rise structure has multiple roof levels that are not accessible from each other, all such independent roof areas shall be served by at least one laddering area.

Exception: roof levels higher than 90' to the top of the parapet or railing.



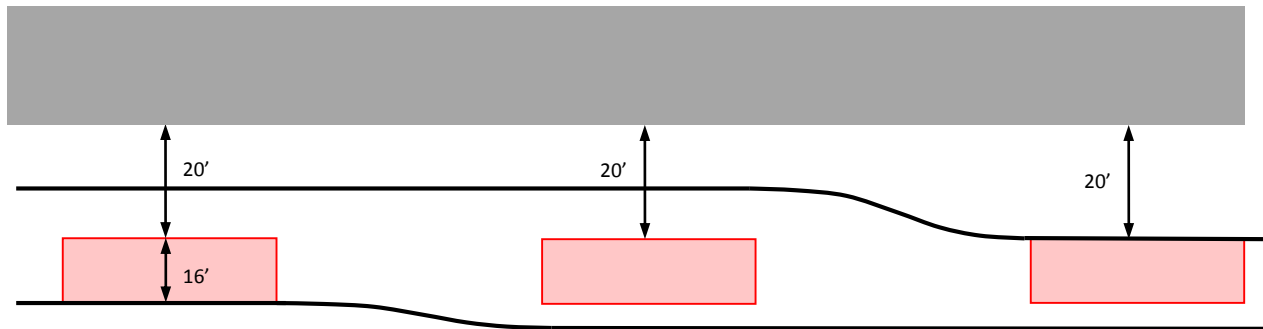
C.2: Laddering area X provides ladder access to two façades; laddering area Y provides access to one façade.

D. Laddering/Staging area setbacks:

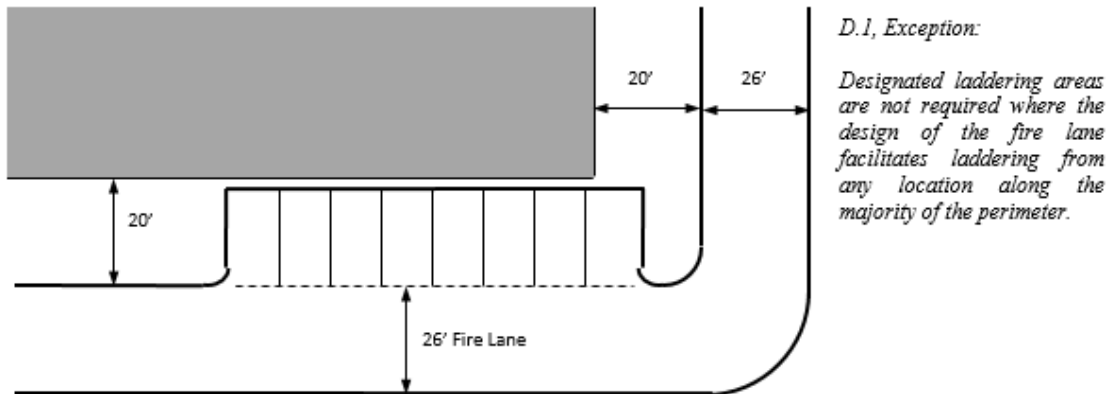
- 1) For buildings no more than 90 feet high, as measured from the fire lane to the top of the roof parapet or railing, laddering areas shall be provided 20 feet from the façade as measured from the nearest edge of the laddering area.

Exception: When approved by the fire code official, designated laddering areas are not required provided that the nearest edge of the fire lane is located 20 feet from the structure along the entire length of at least 2 sides of the building, 1 of

which is the longest side of the structure, or along at least 50% of the perimeter of the structure, whichever is greater. An unobstructed minimum 26 foot wide fire lane shall be provided; parking and other obstructions shall not intrude into this clear width.

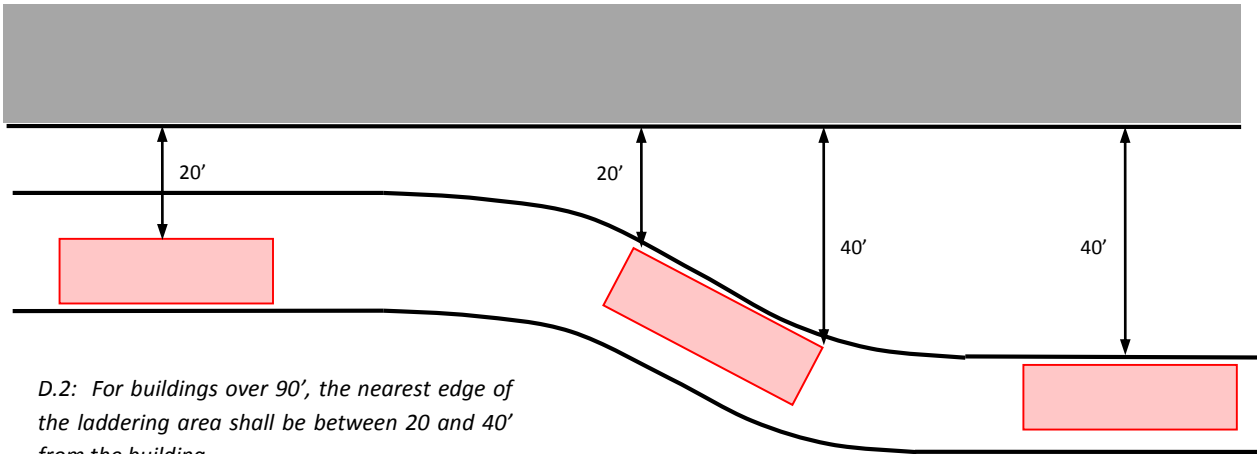


D.1: For buildings up to 90' tall, the nearest edge of the laddering area shall be 20' from the building.

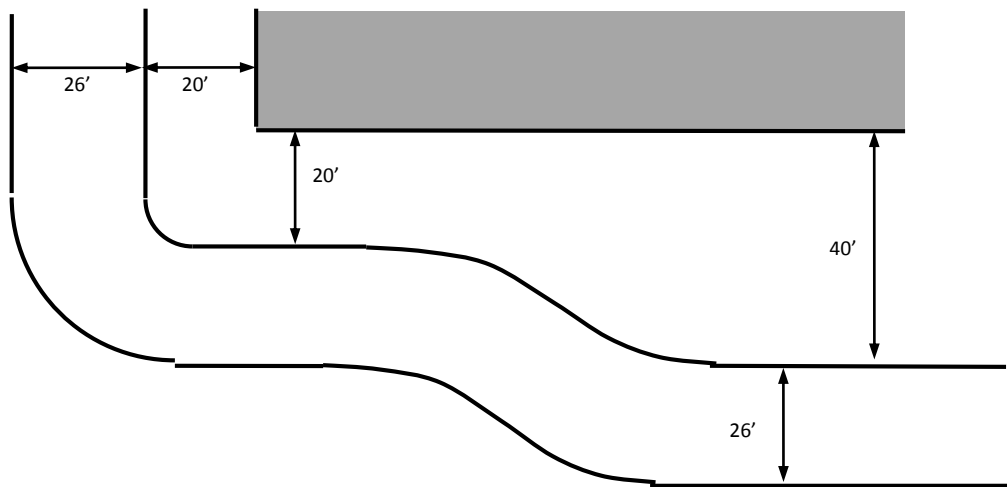


- 2) For buildings over 90 feet, the laddering areas shall be no less than 20 and no more than 40 feet from the façade.

Exception: When approved by the fire code official, designated laddering areas are not required provided that the nearest edge of the fire lane is located between 20 and 40 feet from the structure along the entire length of at least 2 sides of the building, 1 of which is the longest side of the structure, or for at least 50% of the perimeter of the structure, whichever is greater. An unobstructed minimum 26 foot wide fire lane shall be provided; parking and other obstructions shall not intrude into this clear width.



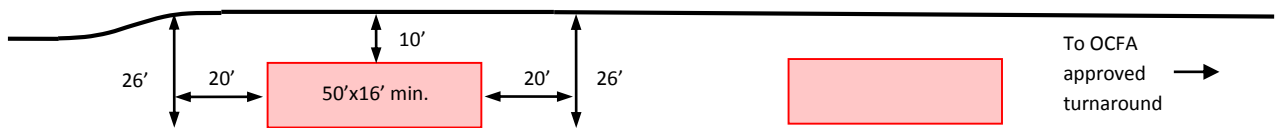
D.2: For buildings over 90', the nearest edge of the laddering area shall be between 20 and 40' from the building.



D.2, Exception:

Designated laddering areas are not required where the design of the fire lane facilitates laddering from any location along the majority of the building perimeter.

- 3) Apparatus shall not be required to travel within 20 feet of the structure to reach any required laddering/staging area.
- 4) Where only a single path of vehicle travel to a laddering/staging area is available, apparatus shall not have to pass one laddering/staging area to reach another laddering/staging area unless the roadway within 20 feet of the intervening laddering/staging area has a clear width of 10 feet to allow vehicles to pass. The intervening laddering area shall be located adjacent to the curb closest to the structure to permit apparatus to pass fire trucks laddering the building.

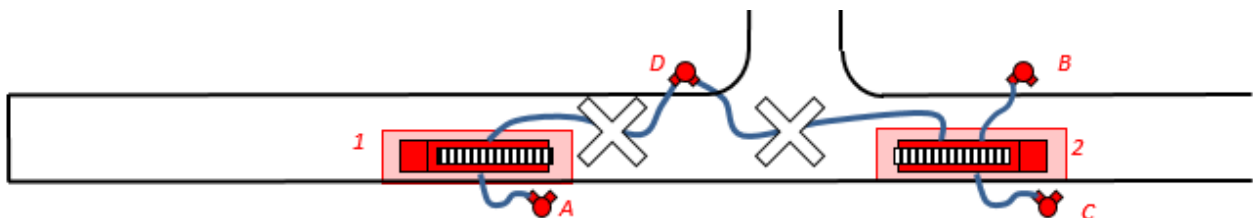


D.4: Additional width is required to bypass the first laddering area as this part of the fire lane provides the only access route to the second laddering area to the right.

- 5) Vegetation and other potential obstructions in the area between the building and any portion of the fire department access roadway within 40 feet from the structure shall not impede laddering operations and shall be restricted to 20 feet in height at maturity.
- 6) Where the dimensions and topography of the site permit, the FDC staging area shall be located at least 40 feet from the building and within 100 feet of the FDC. When it is necessary to place it closer than 40 feet, it shall be located in such a way as to minimize the potential for exposure to falling debris and heat/flame impingement, such as adjacent to a wall without windows or other openings or diagonally from a corner of the building.
- 7) A staging area shall be provided at least 20 but not more than 50 feet from the fire command center in a position that is clearly visible from the door providing access to that space.

E. Water:

- 1) Where the dimensions and topography of the site permit, the FDC and hydrant serving it shall be located at least 40 feet from the building. They may be located closer provided that they are located where exposure to falling debris or direct flame impingement is minimized.
- 2) At least half, but not less than 2, of the hydrants required by CFC Appendix C to serve the high-rise building shall be located at least 40 feet from the structure. Where the dimensions and topography of the site do not permit this and with approval of OCFA, they may be placed closer if they are in a location where exposure to falling debris or direct flame impingement is minimized, such as a wall without windows or other openings or diagonally from the corner of the building.
- 3) A hydrant shall be located adjacent to or within 100 feet of each laddering area and within 100 feet of an FDC staging area. Hydrants and FDCs shall be located so that a hose line run between the device and fire apparatus in a laddering/staging area does not obstruct the only means of vehicle access to the remainder of the fire lane(s) on either side of that hose line.



E.3: "A" would be an acceptable location for a hydrant serving laddering area 1. A hydrant could be located at either "B" or "C" to serve laddering area 2 since the roadway on either side of the hose line would remain accessible from at least one direction of travel. "D" would not be an acceptable hydrant location for either laddering area 1 or 2 as a hose line crossing the fire lane would block the only vehicle access route to a significant portion of the fire lane.

Fire Command Center (FCC): A FCC is required and shall be separated from the building by a 1 hour fire barrier constructed in accordance with CFC Section 508. The FCC shall be located so that it is accessible directly from the exterior door adjacent to the fire department access roadway. The size of the room shall be a minimum of 200 square feet with the minimum dimensions of 10 feet. The FCC shall contain the following equipment at a minimum:

- A. Emergency voice/alarm communications
- B. Fire alarm control panel (FACP)
- C. Fire alarm/detection system annunciator unit
- D. Elevator annunciator showing location and status
- E. Status indicators and controls for air handling systems
- F. Smoke control panel
- G. Sprinkler valve and water-flow detector display panel
- H. Emergency and standby power status indicators
- I. Generator status panel with manual start and transfer features
- J. Fire pump status panel
- K. Controls for unlocking all stairway doors simultaneously
- L. One work table (3' x 5') with 2 folding chairs
- M. Knox key locker
- N. Battery powered emergency lighting device (bug eyes)
- O. Emergency contact information (building engineer, maintenance, property management, security, alarm company, elevator company, major tenants point of contact)
- P. Schematic building plans in clearly labeled approved containers, indicating the typical floor plan and detailing the building core, fire resistive separations, exit facilities, on-site water supply, fire protection systems, firefighting equipment, and fire department access.
- Q. The entry door shall be provided with a Schlage lock with a "C" cylinder openable with an OCFA master key. Once it has been installed, a licensed locksmith shall key the cylinder. The locksmith shall contact OCFA fire prevention staff for the keying sequence.

The panels/equipment shall be arranged on the wall in the following order starting left of the entry door and proceeding in a clockwise direction.

- A. Knox box
- B. Controls for unlocking all stairway doors
- C. Fire alarm annunciator (graphic display)
- D. Fire alarm control panel (FACP)

- E. Voice evacuation panel
- F. Elevator status panel
- G. Emergency and standby power status
- H. Generator status panel
- I. Fire pump status panel
- J. Smoke control panel
- K. Air handling unit status panel
- L. Emergency contact information adjacent to telephone

Emergency Responder Radio Coverage System: 800 MHZ radio coverage shall be provided in the building. The owner is responsible to coordinate with Orange County Communication (OCC) and retain a certificate before an issuance of a Certification of Occupancy.

Fire Alarm System: HRBs shall be provided with an approved automatic fire alarm system meeting the requirements of 2019 CBC, 2019 CFC and 2016 NFPA 72. The alarm plans may be submitted separately from other submittals. Prior to submitting the alarm plans to OCFA, they shall be reviewed by the smoke control design engineer for compliance of the smoke control design. The design engineer shall provide a letter indicating compliance with the Smoke Control Rational Analysis.

Sequence of Operation:

- 1. General Alarm:** Activation of a water flow switch, manual fire alarm box (if any), smoke detector, or other fire protection or extinguishing system shall activate the following:
 - a) Activation of all audible/visual devices and automatic voice evacuation on the floor above, floor below, and the floor the initiating device is located
 - b) Activation of the stair pressurization fans
 - c) Activation of the smoke control system (if active system is provided) for the floor involved, the floor above, and the floor below the floor involved
 - d) Stairwell doors to unlock (as applicable)
 - e) Release of all door hold open devices
 - f) Shut down heating ventilation air conditioning (HVAC) system
 - g) Closure of all fire and smoke dampers
 - h) Alarm to display on the FACP
 - i) Alarm to display on the graphic annunciator panel
 - j) Alarm signal to be sent to the central station
- 2. Elevator Recall:** Smoke/heat detector activation in any elevator lobby, elevator machine room, or elevator shaft shall recall all elevators to the first floor. If the alarm initiates from the first floor, the elevator(s) shall recall to an

alternate floor approved by OCFA. Refer to 2019 CBC Sections 3003 and 3005 for elevator Phase I & II recall operation detail.

3. **Duct Detectors:** Activation of HVAC smoke detectors shall initiate the following:
 1. Shut down associated air handler system
 2. Release all door hold open devices
 3. Close all smoke dampers
 4. Shows supervisory alarm on the FACP
 5. Show supervisory alarm type on the graphic annunciator panel
 6. Send supervisory alarm signal to the central station

Smoke Detectors: Smoke detectors shall be provided in the following locations:

- A. Elevator machine rooms
- B. Elevator lobbies
- C. Telephone equipment rooms when not provided with sprinklers
- D. Air handler systems with $\geq 2,000$ CFM
 1. In the main return air
 2. Exhaust air plenum
 3. At each connection to a vertical duct or riser serving 2 or more stories from a return air duct or plenum of an air conditioning system

Audible Alarm & Voice Evacuation System: Activation of the audible fire alarm and voice evacuation system shall be as follows:

- A. Cycle: 3 slow-whoop tones (temporal pattern), electrically generated, and followed by a taped voice message.
- B. The above cycle shall continue to sound until manually terminated by fire department personnel. If the voice message fails to operate, the temporal pattern shall continue to sound until terminated.
- C. Unless an alternative message is approved by the OCFA, the voice message recording shall state, "Attention, attention: An emergency has been reported in the building. Please leave the building immediately through the marked exits. Do not use the elevators, use only the exit stairwells."
- D. Speakers shall be provided throughout the structure and set up in paging zones. At a minimum, the paging zones shall consist of:
 1. Elevator groups
 2. Exit stairways
 3. Each floor
 4. Areas of refuge
- E. The system shall have a "live voice message" feature that allows broadcasting of live voice messages through the paging zones on a selective and all-call basis.

Secondary Electrical Power Supply: A secondary electrical power supply shall be provided. The plan shall show the total load calculations for both emergency and standby power. If more than 1 generator is provided, calculations shall be provided for each. An on-site fuel supply for not less than 6 hours at the full rated power of the generated shall be provided. For a HRB that utilizes electric fire pump(s), sufficient fuel not less than 8 hours of fuel supply at 100 percent of the rated pump capacity shall be provided. The design shall be in accordance to 2019 CFC, NFPA 110, and Section 9.6 of NFPA 20.

Emergency power shall be provided within 10 seconds after primary power loss and be provided to the following system:

- A. Exit signs and means of egress illumination
- B. Emergency voice/alarm communication systems
- C. Elevator car lighting
- D. Automatic fire detection systems
- E. Fire alarm systems
- F. Electrically powered fire pumps
- G. Power and lighting for the fire command center

Standby power shall be provided within 60 seconds after primary power loss and be provided to the following system:

- A. Ventilation and automatic fire detection equipment for smoke-proof enclosures
- B. Elevators
- C. Where elevators are provided in a high-rise building for accessible means of egress, fire service access or occupied self-evacuation, the standby power system shall also comply with Sections 1009.4, 3007 or 3008, or 2019 CBC as applicable.

Stairway Floor Number Signs: Stairway identification signs shall be located in all enclosed stairways in HRBs as required per CBC 1022.8.

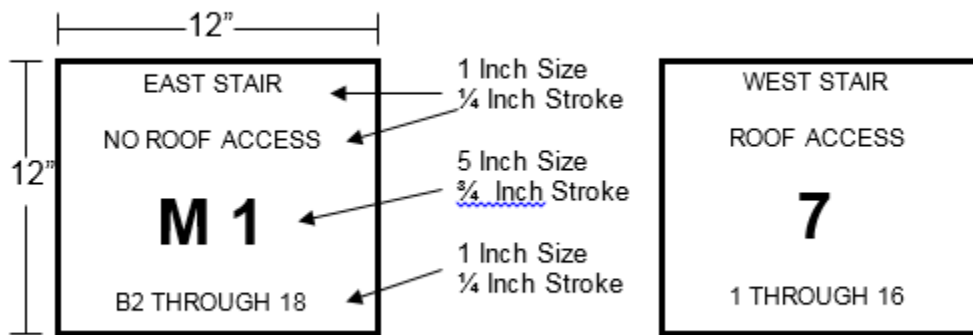
- A. Sign details
 1. A detail of the sign shall be provided on the plans for review.
 2. The size shall be a minimum of 12"x 12" and constructed of durable material.
 3. Font size shall be 5" with $\frac{3}{4}$ " stroke for the floor level and 1" with $\frac{1}{4}$ " stroke for the remaining information. See attachment #1 for example.
 4. All lettering to be in sharp contrast to the background.
 5. The following items shall be provided on stairway identification signs:
 - a. Stairway location – such as STAIR NO.1 or WEST STAIR
 - b. Each stair landing
 - i. Upper termination of the stairway
 - ii. Lower termination of the stairway

- c. The stairway upper terminus – such as ROOF ACCESS or NO ROOF ACCESS
- d. The stairway lower terminus – such as STAIR 3 ROOF ACCESS 1 THROUGH 12
- e. Floor level number
 - i. The mezzanine levels shall have the letter “M” preceding the floor number
 - ii. Basement levels shall have the letter “B” preceding the floor number

B. Sign location

- 1. The plan shall specify that the Stairway Identification signs shall be located at every stairway landing in buildings 4 or more stories in height.
 - a. Specify all signs shall be posted at a height no greater than 60” above the floor level
 - b. Tactile signage shall comply with the CBC 1022.8, 1117B.5.11

Example



Evacuation Signs: Evacuation signs are required per Title 19 Section 3.09 and Health and Safety Code Section 13220.

A. Sign Details

- 1. Provide a detail of the signs for each floor-level
- 2. Specify that all signs shall include the following features:
 - a. Minimum lettering size 3/16 inch non decorative lettering
 - b. All lettering shall be in sharp contrast to the background
 - c. Constructed of durable material
 - d. Emergency exit routes, and map legend, shall include:
 - i. The pathway of the means of egress that indicates the evacuation routes
 - ii. Exit doors

- iii. Locations of manual fire alarm stations
- iv. Schematic of manual fire alarm stations
- v. Statements describing both audible and visual fire alarm systems
- vi. Fire Department emergency telephone number 911
- vii. Statement prohibiting the use of elevators in case of emergency

B. Sign Location

1. Identify the location of all evacuation signs for each floor. If the floor layout is identical for multiple stories, the plan can be so indicated. A separate floor plan for each subsequent identical floor-level will not be required.
2. Specify all signs shall be posed at a height no greater than 48" above the floor level measured to the top of the sign.
3. The floor plan diagram on the evacuation sign shall be oriented directionally as it is seen from the viewer's perspective.
4. The following locations must be provided with an emergency evacuation sign:
 - a. All elevator landings
 - b. Every stairway landing (on the corridor side)
 - c. Immediately inside all public entrances to a public building

Fire Sprinkler System: All HRBs shall be protected by an automatic fire sprinkler system. The sprinkler system design shall conform to NFPA 13, CBC Chapter 4 and Chapter 9, and CFC Chapter 9. In the shell building, only quick response sprinklers shall be used.

A fire pump shall be provided and rated to provide the demands of the sprinkler or standpipe system whichever is greater. If the fire pump is electric, it shall be connected to the emergency power system. The fire pump shall be designed and installed in accordance to NFPA 20. In HRBs having an occupied floor more than 200 feet above the lowest level of fire department vehicular access, 2 fire pumps shall be provided (2019 CBC 403.3.2.1) and arranged in such a configuration to minimize the number of pressure reducing valves or create multiple standpipe zones. Where a hose valve is provided with a pressure reducing valve, the minimum size of the express drain shall be 3" with a capped groove outlet to test the pressure reducing valve.

The sprinkler system design shall be designed to minimize the use of pressure regulating/reducing devices.

Standpipe System: The standpipe system shall be combined with the sprinkler system risers and shall be installed according to CFC Chapter 9 and NFPA 14. The combined systems shall be interconnected at the bottom between risers. Fire department standpipe connections and valves serving the floor shall be located within the vestibule

unless otherwise approved by the fire code official, in accordance with 2019 CBC Section 909.20.2.3.

2 outlets (2 ½ inch each) shall be provided at the roof. If all portions of the roof cannot be reached within 150 feet from the roof outlets, additional outlets shall be provided.

The system shall be designed so that the system is automatically capable of providing a minimum of 500 GPM from the outlets at the roof and a minimum of 250 GPM for all subsequent standpipe outlets, to a maximum of 1250 GPM. The residual pressure shall be 100 psi with full flow. A typical 2 stair HRB will have a total standpipe demand of 750 GPM. A listed pressure gauge shall be provided at the top of each standpipe.

A 3 inch express drain shall be provided adjacent to each standpipe. The express drain shall contain a 2 ½ inch inlet at each floor level. The drain shall be clearly marked "Drain" at each level. The drain is intended to allow testing of the standpipe system. The inspector's test valve shall be connected to the express drain.

On-Site Water Supply: An automatic secondary on-site water supply having a usable capacity of not less than the hydraulically calculated sprinkler demand, including 100 GPM of the hose stream requirement, shall be provided for HRBs. The secondary on-site water supply shall be a minimum of 15,000 gallons.

Smoke Control System: HRMs shall be provided with a smoke control system compliant with CFC 909. A Smoke Control/Rational Analysis Report shall be submitted with the architectural plan for OCFA review and approval. The report shall include but not be limited to the following:

- A. Design method
- B. Stack effect
- C. Temperature effect of fire
- D. Climate/wind effect
- E. HVAC system operation
- F. Duration of operation
- G. Design fire
 1. Factor considerations
 2. Separation distance
 3. Heat release assumptions
 4. Sprinkler effectiveness assumptions
- H. Detailed system test matrix

OCFA requires the use of a third party inspector for all smoke control systems. OCFA will complete the final inspections in conjunction with the third party inspector.

High-Rise Buildings Section II - Construction

PURPOSE

High rise construction sites are challenging to manage and inspect. This guideline is intended to assure that minimum requirements are communicated and that communication between the construction manager and the assigned OCFA inspectors are maintained throughout the construction process. This will allow issues to be resolved in ways that are beneficial to the building owner, developer, and OCFA.

SCOPE

This guideline addresses minimum concerns and requirements for high rise construction sites from an inspector and emergency response perspective. This document may not address all issues that may be encountered at a high rise construction site. In those instances, the CFC and assigned OCFA inspector should be consulted for guidance.

REQUIREMENTS

1. **Pre-Construction:** A meeting between the lead OCFA inspector, project manager and job superintendent is strongly recommended to discuss all requirements including the following:
 - A. Site phasing that may be necessary due to the complexity or size of the site, business and/or construction needs. Phasing should be discussed during the review process for the Fire Master Plan, so that planning for emergency access can be addressed. A phasing plan may be required (see guideline B-09).
 - B. Inspection(s) scheduling will need to be adjusted based on phasing, number of stories, number of devices, specialty systems, etc. A representative who has a basic understanding of the information necessary to schedule the inspection should contact the scheduling office in order to avoid any undue confusion and delays. Additional fees may be due for phased or time intensive inspections.
 - C. Inspection Sequencing – A coordinated effort between automatic fire sprinkler, alarm, specialty system contractors is needed to determine the order in which inspection(s) should be completed. For example, the alarm system must be installed and functioning prior to the testing of the smoke control system. Any questions should be discussed with your inspector well in advance of the needed inspection date.
 - D. Temporary Certificate of Occupancy (TCO) requirements vary from project to project. At a minimum, fire and life safety systems and monitoring must be operational and acceptance tested. OCFA will not recommend, or concur with a

TCO issuance from the building department until all testing and inspections necessary for the high rise shell building has been completed. TCO and Certificate of Occupancy are issued by the building official; OCFA only provides recommendation to their issuance.

2. Access and Water:

- A. The street address of the site shall be posted in a conspicuous location facing the fire department access roadway and if an emergency phone is provided, adjacent to the phone. CFC 3309
- B. Access to the building for firefighting purposes shall be provided at all times. CFC 3311.1, Chapter 5
- C. A temporary standpipe system must be installed when construction progresses above 35 feet (typically at the time the deck for the 4th story is installed). Such standpipe will be provided in the stairwell and within 1 floor of the highest secure deck (standpipe shall be provided in the usable stairway as required below in "E"). CFC 3313.1
- D. At least one usable stairway must be provided. Stairs must extend to the highest level of construction having secured decking or flooring. CFC 3311
- E. At least one approved fire hydrant shall be located within 150 feet of the standpipe fire department connection. CFC 3312
- F. Portable fire extinguishers shall be provided in designated locations throughout the building as directed by the inspector. CFC 3315

3. Construction and Inspections

- A. Sprinkler systems must be acceptance tested in accordance with NFPA 13. Additional inspections that may be necessary include: dry-walled in areas (e.g. bathroom, elevator, lobby and corridors), and per floor inspections if phasing is necessary. The scheduling office requires the following information for the scheduling of inspections: service request number, type of inspection, number of floors, number of devices (sprinkler heads/alarm components), contact person, and contact phone number.
- B. Fire pump systems must be acceptance tested in accordance with NFPA 20.
- C. Standpipe systems must be acceptance tested in accordance with NFPA 14. All equipment necessary to conduct and complete the acceptance test and meet any water containment or diversion needs shall be provided by the contractor.
- D. Fire alarm systems must be acceptance tested in accordance with NFPA72. The scheduling office requires the following information for the scheduling of inspections: type of inspection, if a delated egress device(s) is/are included, number of floors, number of initiating devices, number of devices, contact person, and contact phone number.
- E. Fuel supplies for generators and/or fire pumps are separate inspections.

- F. Special equipment such as medical gas systems, hood/duct, assembly, architectural (including fire command center), require separate scheduling and inspections.
 - G. Smoke control – a smoke control rational analysis must be reviewed and accepted by the fire protection engineer from OCFA prior to inspection. OCFA requires the use of a third party inspector for all smoke control systems. OCFA will complete the final inspections in conjunction with the third party inspector.
 - H. Fire Master Site Plan final inspection for access, hydrants, fire lanes, signage, etc. is required.
- 4. Miscellaneous**
- A. Combustible debris shall not be accumulated within buildings. Waste shall be removed at the end of each work shift. CFC 3304.2
 - B. Motor equipment shall be located where exhausts do not discharge against combustible material. Exhausts shall be piped to the outside of the building when possible. Equipment shall not be refueled while in operation. Fuel for the equipment shall be stored in an approved area outside of the building. CFC 3316
 - C. Heating devices must be of an approved type, kept away from combustible material, and attended by competent personnel. CFC 3303
 - D. Smoking is prohibited within the building except in approved designated areas. Suitable signs shall be posted. CFC 3304.1
 - E. Use and storage of flammable liquids shall comply with CFC 3404. Permits and/or plans are required for the storage of more than 10 gallons of Class I flammable liquids, or to install or operate tank vehicles, equipment, tanks, or fuel-dispensing stations where flammable or combustible liquids are stored, dispensed, or used.
 - F. Asphalt kettles shall not be used inside or on the roof of a building. They shall not be located within 20 feet of any combustible material, combustible building surface or building opening and be equipped with a tight fitting cover, located and maintained according to Section 303.CFC 3303.2
 - G. Cutting, welding or flame producing devices (hot work) are a significant fire risk and are a major cause of fires during construction. Strict adherence to the fire code requirements for hot work shall be followed
 - 1) Hot work area shall not be located where flammable materials are being used or stored without a fire resistive shield. CFC 3504.1.1
 - 2) A minimum 2A:20BC extinguisher shall be provided within 30' of any hot work on the same floor. CFC 1408.5, 3504.2.6
 - 3) A fire watch shall be provided and remain in place for a minimum of 30 minutes after the hot work has concluded. CFC 3504.2
 - 4) Complete pre-hot check as outlined in CFC 3504.3.1

Additional information that may be helpful regarding site construction, phasing, fees, and temporary tanks can be found at www.ocfa.org.

High-Rise Buildings Section III – Emergency Incident Pre-Plan **(this section is under construction and subject to modification)**

PURPOSE

To provide property management teams and OCFA emergency responders with a guideline to assist in creating an emergency pre-plan document of the building's life safety systems for utilization prior to and during an incident.

COORDINATION

The OCFA inspector will provide a copy of this document to the building representative during building construction (at least 60 days prior to expected building occupancy). In cooperation with OCFA operations department, the inspector will provide the name and phone number of the designated OCFA fire captain who will actively participate with the building representative in the development of the Emergency Incident Pre-Plan. The inspector will consult with the designated fire captain prior to the OCFA project final to ensure that the developer's portion of the Emergency Incident Pre-Plan has been completed.

REQUIREMENTS

Prior to OCFA concurrence for a release of a Certificate of Occupancy for any new high rise structure, the fire inspector will coordinate with the building owner or their representative and the fire captain to obtain specific information and documentation that will allow the development of an Emergency Response Pre-Plan (ERP). While a majority of the ERP is best developed by the property management team, some elements are more effective when coordinated with OCFA operations personnel. This document outlines the responsibilities of both parties.

Content Summary: The pre-plan will include 8 basic sections including:

1. *Section 1 Site Map
2. *Section 2 Face Page and Special Building Information
3. *Section 3 Floor Plans
4. *Section 4 Sprinkler Valve Locations
5. Section 5 Building Systems
6. *Section 6 Emergency Contacts
7. Section 7 Permits and Conditions
8. Section 8 Notes/Comments

Format:

Digitized Data

1. * The information contained in the Table of Contents (above), Sections 1-4 and Section 6 must be included on the CD.
2. Electronic drawing files to be provided in “.dwg” or “.dxf” and “.tif” or “.pdf” formats.
3. All information must be sized to allow the information to be clearly understood when printed in an 8.5” x 11” or 11” x 17” formats.
4. Text shall be standardized in Arial font (6 point or larger).
5. The CD must be labeled with the project name, date, project address (e.g. 123 Main Street), and City in which the project is located.

Hard Copy

1. All sections will be clearly divided numerically, tabbed, and section number with page numbers on provided, in a standard 3 ring binder, red in color, with the words “Emergency Pre-Plan” on both the cover and spine.
2. A minimum of 6 binders will be required for each building.
3. All 6 copies of the completed document must be retained in the Fire Control Room and readily available for use by emergency response personnel (6 binders are needed for the various operational teams that are formed during an incident and may be modified if special circumstances warrant more copies).

Content Details:Table of Contents (Responsibility – Applicant)

1. The Table of Contents will be a single page, clearly color-coded to identify each of the 8 sections contained in the document. A description of each section will be printed next to each section title number (i.e. Section 1 – Site Map).

Section 1 – Site Map (Responsibility – Applicant and OCFA operations personnel)

This section shall include:

1. A vicinity map indicating cross streets, interior roads, and driveways. The building footprints and general parking areas shall be indicated. Fire control features such as fire hydrants, fire department connections and emergency control room locations must also be noted. Any impedance to fire access shall also be noted, such as vertical or horizontal obstructions.
2. Special conditions affecting access, such as landscaping, including turf blocking must be noted. *Where possible, the OCFA captain will utilize the information that may have been previously provided to OCFA during the processing of the Fire Master Plan.*
3. The building owner is responsible to further prepare the drawing to meet the specific requirements contained within this section and any identified operational needs.

Section 2 – Face Page/General Information (Responsibility – Applicant and OCFA operations personnel)

The Face Page shall include:

1. An artist's rendering of the building including: address, building name, type of business (office, residential, mixed use), fire control systems, occupancy load, construction type (UBC descriptions), floors (number of floors above and below grade).
2. Information regarding special system, equipment or hazards. OCFA operations personnel will define this information during construction walk-through and training exercises and update the content accordingly.

Section 3 – Floor Plans (Responsibility – Applicant)

Floor plans shall include but not be limited to:

1. Show the basic footprint and plan of each floor with only the necessary detail to access, locate and control fires, areas of refuge, or provide medical assistance.
2. Show only as much interior wall detail as practical given the page restrictions, but should display firewalls.
3. Each residential unit (if applicable) shall be identified by its address and/or unit number.
4. The building facility rooms shall be identified by their individual use, such as laundry, electrical, mechanical, etc.
5. All floor plans shall use the standard OCFA pre-plan symbols (to be provided by the OCFA fire captain) to indicate interior features that are important to firefighting operations.
6. Every page of the floor plan section will have a "Floor Plan Level indicator" drawing in the upper left corner. This drawing will show the floor location in relation to the entire building.

Section 4 – Sprinkler Sectional Valves (Responsibility – Applicant)

This section will include:

1. A floor plan which indicates the location of sectional valves and the coverage area for each valve. The valve coverage area is to be indicated by gray shading.

Section 5 – Building Systems (Responsibility – OCFA operations personnel)

This section will include all systems related to fire protection and life safety equipment within the building. These systems may include but are not limited to:

Alarm systems	Fire pumps	Fire phones	Generators
Air handling systems	Elevators	Communication systems	Smoke Control System
Chemical Storage Areas	Areas of Refuge		

1. Include operating instructions, diagrams, photographs, and other pertinent information that could assist firefighters in the rapid interpretation and use of building systems.

Section 6 – Emergency Contacts (Responsibility – Applicant)

This section includes:

1. Emergency contact information: names, 24 hour phone numbers (can be broken into day and evening numbers), is knowledgeable about the building, has the codes or keys necessary for the building, and the authority to manage the building after hours.

Section 7 – Permits and Conditions (Responsibility – OCFA FPS (Fire Prevention Specialist))

This section will be left blank and will be used by the OCFA’s FPS (new construction or annual team) to provide documentation of the permits, conditions, and/or limitations allowed within the structure by the OCFA.

Section 8 – Notes/Comments (Responsibility – OCFA operations personnel)

This section is left blank and intended to be used at the time of an emergency incident for operations personnel utilizing the plan to keep notes and comments. Blank white paper is placed here.

High-Rise Buildings Section IV – Annual Maintenance
(This section is currently under revision)