Greater Vancouver Fire Chiefs' Association

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August 6, 2024

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Re: Invitation to review draft code language and provide suggestions to describe an adequate level of fire service where Single Egress Stair buildings are built.

Thank you for the opportunity to review the draft code language for enabling Single Egress Stair (SES) and invitation to suggest how we can use existing standards, definitions, or benchmarks to describe an adequate level of fire service to be provided where SES buildings are built and other tools our organization feel may be helpful in doing our work in fire safety.

The Greater Vancouver Fire Chiefs Association solicited comments from its membership on the request received from the Ministry. The results of the solicitation were wholly consistent in that every comment made is opposed to the BC Building code being amended prior to a more fulsome review process such as the national building code amendment process. Changes in building practice and codes in Canada have traditionally followed an in-depth, consensus-based process that considers all perspectives, extensive research and evidence. Due to the important and wide-ranging implications, it is not a process to be rushed, considered incremental or driven by single-issue agendas.

Other comments were also included and are provided below for the GVFCA submission on this topic.

Adequate level of Fire Service

The current National Fire Protection Association (NFPA) 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments provides definitions and benchmarks related to fire response. Appendix I contains samples of the NFPA 1710 definitions and benchmarks for reference to the request and this submission.

Special attention should be given to the deployment requirements in section 5.2.4 of the NFPA 1710 standard. The difference in resources required for a three-story "Apartment Initial Full Alarm Assignment Capability" and a "High-Rise Initial Full Alarm Assignment Capability" (building with the highest floor greater than 75 ft (23 m) above the lowest level of fire department vehicle access), is 27 to 43 on-duty career firefighting staff.

Further, the standard provides when responding to fires in occupancies that present hazards greater than those found in the occupancies described in section 5.2.4 shall deploy additional resources on the initial alarm. The fire department shall have the capability to deploy additional alarm assignments that can provide for additional command staff, members, and additional services, including the application of water to the fire; engagement in search and rescue, forcible entry, ventilation, and preservation of property; safety and accountability for personnel; and provision of support activities for those situations that are beyond the capability of the initial full alarm assignment.

A potential six-story SES building would meet the criteria of presenting a greater hazard than a three-story apartment building with additional means of egress. Therefore, the resource requirements for deployment would fit somewhere in between the three-story requirement of 27 staff and the high-rise resource requirements of 43.

The NFPA standard also provides response time requirements. The first due engine company at a fire suppression incident has 240 seconds or less travel time for arrival. The arrival of the second company has 360 seconds or less travel time, with a minimum staffing of 4 personnel at a fire suppression incident. For fire suppression incidents other than high-rise, 480 seconds or less travel time is allowed for the deployment of an initial full alarm assignment.

All of these NFPA 1710 requirements rely on an adequate supply of water from fire hydrants in a municipal water distribution system.

If SES building code amendments were to be adopted, local government, at a minimum, would require an exemption from needing building code concurrent authority approval from the province, so local bylaws could be enacted to address geographical zoning areas which meet the NFPA 1710 standard requirements.

Conflict with Public Safety Operations

The single means of egress will significantly impede the firefighter's ability to assist occupant egress, especially if the stairway is required for suppression operations.

With respect to firefighting assumptions in particular the Jensen Hughes comment "additional building protection measures may be required". The AHJ should have the authority to either approve or not approve SES and impose the addition of a second exit as the "additional building protection measure". Municipalities should be allowed to develop bylaws restricting SES, as it is a life safety matter. At a minimum, local government would require an exemption from needing building code concurrent authority approval from the province, so local bylaws could be enacted to address geographical zoning areas which meet the NFPA 1710 standard requirements.

Police operations as well as Emergency Medical responses and patient transport are also restricted with a limited 1500 mm single exit stair for access or egress.

The SES design increases occupant and responder risk due to there being a single point of failure in the building protection system. Whether the single point of failure is the sprinkler system, ventilation for egress or accidental/intentional obstruction of the exit stair, there does not appear to be any other design features that can facilitate access/egress in the event of an emergency.

Fire risk of overwhelming one of the single points of failure is further increased as the building construction material is combustible, as opposed to non-combustible materials, as used in international jurisdictions or in a large majority of high-rise buildings.

Adequate level of prevention oversight

The proposed code amendments for SES rely heavily on all building systems functioning as intended for fire protection and life safety 100% of the time. If there is a single point of failure in the building design, the most effective alternate life safety design for occupant and responder safety is the second egress stair, and it is proposed to be removed. Other areas of potential single point of failure which significantly increase access/egress risk during an emergency are:

- The egress pathway must remain clear of parcels/packages, storage and other obstructions.
- The exit facility should be non-combustible construction to be safer for all, rather than the alternate described.
- The exit facility should be automatically pressurized and not rely on a vestibule on the public corridor side of the doorway.
- The behavior of persons during an emergency is invariably the biggest wildcard when expecting egress systems to work as designed.

For these few reasons, the proposed code amendments will increase the need for prevention compliance inspections and follow up to achieve compliance with any violations. While the newly enacted Fire Safety Act provides a risk-based approach to adapt the frequency of compliance inspections, this will create an additional burden on the existing prevention staff resources within fire departments, because SES buildings will be higher risk due to multiple points of single system failure.

Local governments should not be required to hire additional compliance inspection prevention resources for SES high risk buildings, outside of their normal workload to staffing ratios.

In closing, emerging technologies and new hazards such as those posed by lithium-ion battery-powered devices, solar power, and building energy storage systems, underscore the need to be able to exit a building quickly and safely in an emergency. The proliferation of such risks necessitates stringent adherence to building codes that prioritize occupant and firefighter safety, with the inclusion of a second staircase serving as a cornerstone of this protective framework.

Enhancing safety and accessibility beyond its life-saving implications, the provision of two staircases enhances the efficiency, convenience, and inclusivity of residential living environments. It mitigates congestion, promotes equitable access for individuals with mobility challenges, and fosters a more welcoming community for all residents. This is especially important when more and more combustible products, including delivered packages, adds potential fuel loads into the corridors and egress pathways.

The top three causes of fires are People, People and People. Despite fire prevention systems and educational efforts, fires are always caused by the behavior and actions of people. This is why fire and safety system redundancy is a best practice to preserve life and property.

The GVFCA and its members urge the Ministry to reconsider its initiative to adopt building code changes to enable SES building development for the many reasons we have provided.

Thank you for the opportunity to provide a submission on this important topic for public safety professionals.

Larry Thomas, President
Greater Vancouver Fire Chiefs Association

APPENDIX I

Definitions

3.3.13 Career Fire Department - A fire department that utilizes full-time or full-time-equivalent (FTE) station-based personnel immediately available to comprise at least 50 percent of an initial full alarm assignment.

3.3.15 Fire Company – A group of members:
(1) under the direct supervision of an officer;
(2) trained and equipped to perform assigned tasks;
(3) usually organized and identified as engine companies, ladder companies, rescue companies, squad companies, or multi-functional companies;
(4) operating with one piece of fire apparatus (pumper, aerial fire apparatus, elevating platform, quint, rescue, squad, ambulance) except where multiple apparatus are assigned that are dispatched and arrive together, continuously operate together, and are managed by a single company officer;
(5) arriving at the incident scene on fire apparatus. [1500, 2018]

3.3.16 Company Officer - A supervisor of a crew/company of personnel.

3.3.17 Crew - Two or more members who have been assigned a common task and are in communication with each other, coordinate their activities as a work group, and support the safety of one another. [1081, 2018]

3.3.27 Fire Suppression - Fire suppression includes all activities performed at the scene of a fire incident or training exercise that expose fire department members to the dangers of heat, flame, smoke, and other products of combustion, explosion, or structural collapse. [1500, 2018]

3.3.40 Initial Full Alarm Assignment - Those personnel, equipment, and resources ordinarily dispatched upon notification of a structure fire.

3.3.49.1 Emergency Operations - Activities of the fire department relating to rescue, fire suppression, emergency medical care, and special operations, including response to the scene of the incident and all functions performed at the scene. [1500, 2018]

3.3.53 Rapid Intervention Crew (RIC) – A dedicated crew of at least one officer and three members, positioned outside the IDLH, trained and equipped as specified in NFPA 1407, who are assigned for rapid deployment to rescue lost or trapped members.

3.3.54 Rescue - Those activities directed at locating endangered persons at an emergency incident, removing those persons from danger, treating the injured, and providing for transport to an appropriate health care facility. [1500, 2020]

3.3.64.7 Travel Time - The time interval that begins when a unit is enroute to the emergency incident and ends when the unit arrives at the scene.

Benchmarks

Response time:

4.1.2.1 - The fire department shall establish the following performance objectives for the first-due response zones that are identified by the AHJ:

(3) 240 seconds or less travel time for the arrival of the first engine company at a fire suppression incident

(4) 360 seconds or less travel time for the arrival of the second company with a minimum staffing of 4 personnel at a fire suppression incident

(5) For other than high-rise, 480 seconds or less travel time for the deployment of an initial full alarm assignment at a fire suppression incident

(6) For high-rise, 610 seconds or less travel time for the deployment of an initial full alarm assignment at a fire suppression incident

Fire Suppression Capability:

5.2.1.1 - Based on a formal community risk assessment, fire suppression operations shall be organized to ensure that the fire department's fire suppression capability encompasses deployment of personnel, equipment, and resources for an initial arriving company, the initial full alarm assignment, and additional alarm assignments.

5.2.2* Staffing - The number of on-duty fire suppression members shall be sufficient to perform the necessary fire-fighting operations given the expected fire-fighting conditions.

5.2.2.1 - These numbers shall be determined through task analyses that take the following factors into consideration:
(1) Life hazard to the populace protected
(2) Provisions of safe and effective fire-fighting performance conditions for the fire fighters
(3) Potential property loss
(4) Nature, configuration, hazards, and internal protection of the properties involved
(5) Types of fireground tactics and evolutions employed as standard procedure, type of apparatus used, and results expected to be obtained at the fire scene

5.2.2.2 - On-duty members assigned to fire suppression shall be organized into company units and shall have appropriate apparatus and equipment assigned to such companies.

5.2.2.2.1 - The fire department shall identify minimum company staffing levels as necessary to meet the deployment criteria required in 5.2.4 to ensure that a sufficient number of members are assigned, on duty, and available to respond with each company.

5.2.2.2.2 - Each company shall be led by an officer who shall be considered a part of the company.

5.2.2.2.3 - Supervisory chief officers shall be dispatched or notified to respond to all full alarm assignments.

5.2.3 Operating Units - Fire company staffing requirements shall be based on minimum levels necessary for safe, effective, and efficient emergency operations.

5.2.3.1 Engine Companies - Fire companies whose primary functions are to pump and deliver water and perform basic fire fighting at fires, including search and rescue, shall be known as engine companies.

> 5.2.3.1.1 - These companies shall be staffed with a minimum of four on-duty members.
> 5.2.3.1.2 - In first-due response zones with a high number of incidents, geographical restrictions, geographical isolation, or urban areas, as identified by the AHJ, these companies shall be staffed with a minimum of five on-duty members.
> 5.2.3.1.2.1- In first-due response zones with tactical hazards, high-hazard occupancies, or dense urban areas, as identified by the AHJ, these fire companies shall be staffed with a minimum of six on-duty members.

5.2.3.2 Ladder/Truck Companies - Fire companies whose primary functions are to perform the variety of services associated with truck work, such as forcible entry, ventilation, search and rescue, aerial operations for water delivery and rescue, utility control, illumination, overhaul, and salvage work, shall be known as ladder or truck companies.

5.2.3.2.1 - These fire companies shall be staffed with a minimum of four on-duty members.

5.2.3.2.2 - In first-due response zones with a high number of incidents, geographical restrictions, geographical isolation, or urban areas, as identified by the AHJ, these fire companies shall be staffed with a minimum of five on-duty members.

5.2.3.2.2.1 - In first-due response zones with tactical hazards, high-hazard occupancies, or dense urban areas, as identified by the AHJ, these fire companies shall be staffed with a minimum of six on-duty members.

5.2.3.3 Other Types of Companies.

5.2.3.3.1 - Other types of companies equipped with specialized apparatus and equipment shall be provided to assist engine and ladder companies where necessary to support the fire departments' SOPs.

5.2.3.3.2 - These companies shall be staffed with the minimum number of on-duty members required to deal with the tactical hazards, high-hazard occupancies, high incident frequencies, geographical restrictions, or other pertinent factors as identified by the AHJ.

5.2.3.4 Fire Companies with Quint Apparatus.

5.2.3.4.1 - A fire company that deploys with quint apparatus, designed to operate as either an engine company or a ladder company, shall be staffed as specified in 5.2.3.

5.2.3.4.2 - If the company is expected to perform multiple roles simultaneously, additional staffing, above the levels specified in 5.2.3, shall be provided to ensure that those operations can be performed as required.

<u>Deployment</u>

5.2.4.3 Apartment Initial Full Alarm Assignment Capability.

5.2.4.3.1 - The initial full alarm assignment to a structure fire in a typical 1200 ft2 (111 m2) apartment within a three-story, garden-style apartment building shall provide for the following:

(1) Establishment of incident command outside the hazard area for the overall coordination, direction, and safety of the initial full alarm assignment with a minimum of two members dedicated to managing this task (2)

(2) Establishment of two uninterrupted water supplies at a minimum of 400 gpm (1520 L/min), with each supply line maintained by an operator (2)

(3) Establishment of an effective water flow application rate of 300 gpm (1140 L/min) from three handlines, each of which has a minimum flow rate of 100 gpm (380 L/min), with each handline operated by a minimum of two members to effectively and safely maintain each handline (6)

(4) Provision of one support member for each attack, backup, and exposure line deployed to provide hydrant hookup and to assist in laying of hose lines, utility control, and forcible entry (3)

(5) Provision of at least two victim search-and-rescue teams, each team consisting of a minimum of two members (4)

(6) Provision of at least two teams, each team consisting of a minimum of two members, to raise ground ladders and perform ventilation (4)

(7) If an aerial device is used in operations, one member to function as an aerial operator and maintain primary control of the aerial device at all times (1)

(8) At a minimum, an initial rapid intervention crew (IRIC) assembled from the initial attack crew and, as the initial alarm response arrives, a full and sustained rapid intervention crew (RIC) established (4).

(9) The establishment of an initial medical care component consisting of at least two members capable of providing immediate on-scene emergency medical support, and transport that provides rapid access to civilians or members potentially needing medical treatment (2)

(10) Total effective response force a minimum of 27 (28 if an aerial device is used)

5.2.4.4* High-Rise Initial Full Alarm Assignment Capability.

5.2.4.4.1 - Initial full alarm assignment to a fire in a building with the highest floor greater than 75 ft (23 m) above the lowest level of fire department vehicle access shall provide for the following:

(1) Establishment of a stationary incident command post outside the hazard area for overall coordination and direction of the initial full alarm assignment with a minimum of one officer with an aide dedicated to these tasks and all operations are to be conducted in compliance with the incident command system. (2)

(2) Establishment of an uninterrupted water supply to the building standpipe/sprinkler connection sufficient to support fire attack operations

maintained by an operator and if the building is equipped with a fire pump, one additional member with a radio to be sent to the fire pump location to monitor and maintain operation. (1/1)

(3) Establishment of an effective water flow application rate on the fire floor at a minimum of 500 gpm (1892 L/m) from two handlines, each operated by a minimum of two members to safely and effectively handle the line. (4)

(4) Establishment of an effective water flow application rate on the floor above the fire floor at a minimum of 250 gpm (946 L/m) from at least one handline, with each deployed handline operated by a minimum of two members to safely and effectively handle the line. (2)

(5) At a minimum, an initial rapid intervention crew (IRIC) assembled from the initial attack crew and, as the initial alarm response arrives, a full and sustained rapid intervention crew (RIC) established. (4)

(6) Provision of two or more search-and-rescue teams consisting of a minimum of two members each. (4)

(7) Provision of one officer, with an aide, dedicated to establishing an oversight at or near the entry point on the fire floor(s). (2)

(8) Provision of one officer, with an aide, dedicated to establishing an oversight at or near the point of entry on the floor above the fire. (2)

(9) Provision of two or more evacuation management teams to assist and direct building occupants with evacuation or sheltering actions, with each team consisting of a minimum of two members. (4)

(10) Provision of one or more members to account for and manage elevator operations. (1)

(11) Provision of a minimum of one trained incident safety officer. (1)

(12) Provision of a minimum of one officer two floors below the fire floor to manage the interior staging area. (1)

(13) Provision of a minimum of two members to manage member rehabilitation and at least one of the members to be trained to the ALS level. (2)

(14) Provision of an officer and a minimum of three members to conduct vertical ventilation operations. (4)

(15) Provision of a minimum of one officer to manage the building lobby operations. (1)

(16) Provision of a minimum of two members to transport equipment to a location below the fire floor. (2)

(17) Provision of one officer to manage external base operations. (1)

(18) The establishment of an initial medical care component consisting of a minimum of two crews with a minimum of two members each with one member trained to the ALS level capable of providing immediate on-scene emergency medical support, and transport that provides rapid access to civilians or members potentially needing medical treatment. (4)

(19) Total effective response force a minimum of 42 (43 if the building is equipped with a fire pump).

5.2.4.6 Additional Alarm Assignments.

5.2.4.6.1 - Fire departments that respond to fires in occupancies that present hazards greater than those found in the occupancy described in 5.2.4.1 shall deploy additional resources on the initial alarm.

5.2.4.6.2 - The fire department shall have the capability to deploy additional alarm assignments that can provide for additional command staff, members, and additional services, including the application of water to the fire; engagement in search and rescue, forcible entry, ventilation, and preservation of property; safety and accountability for personnel; and provision of support activities for those situations that are beyond the capability of the initial full alarm assignment.