



FIRE SERVICES LIAISON GROUP

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Fire Service Liaison Group comments re: Amending BC Building Code to allow for 6 storey wood-frame construction

This report has been prepared by the Fire Services Liaison Group, which is comprised of the five associations whose members are directly involved in fire service delivery in the Province of BC – Fire Chiefs' Association of BC; Volunteer Firefighters Association of BC; BC Fire Training Officers; Fire Prevention Officers of BC; Professional Fire Fighters Association of BC and a representative of the Union of BC Municipalities.

At a recent conference of Mayors in May of 2008, Premier Gordon Campbell stated that he wants to support the province's forest industry by allowing the construction of wood-framed condominiums above the current four-storey limit.

Housing Minister Rich Coleman advised the Canadian Home Builder's Association that he wants to see wood-framed buildings up to six storeys high. He also indicated that the necessary building code changes could be accomplished through regulatory change and could be in place by September 2008. Forests Minister Pat Bell supported the Premier's and Minister Coleman's position to change the building code to allow more height which will help revitalize the forestry industry.

Canadian Wood Council VP Etienne Lalonde has stated they have been lobbying for a change in the BC Building Code the past year and in a struggling forest industry, mid rise construction is a new and viable market.

Under the National Building Code wood framed construction has been limited to three storeys, whereas in BC, builders are allowed to go to four storeys. Architects have said that BC is already pushing the limit under the National Building Code by going as high as four storey's in wood specifically because any shrinkage in the thickness of floor joists tends to compound with each additional storey.

Recently in the PublicEyeonline.com, interim president David Davey of the Structural Engineers Association of BC, recommended that the government

conduct a “proper study on the effects of increasing the construction height of wood buildings” in BC.

The PublicEyeonline.com article goes on to say that “coincidentally, the government quietly announced it was looking for a consultant to review its planned code amendments”. The RFP states

“In May, 2008, the Minister announced plans to change the Building Code to allow for wood-framed residential occupancy buildings of up to and including six storeys. By late September, 2008, the Minister will announce details of the proposed changes.”

The RFP goes on to state,

“the project is divided into three phases, all of which are included in this RFP.” The first phase (to be completed by September 5, 2008) is a research phase, reviewing and identifying technical literature and risks associated with increasing the maximum number of storeys. The second phase (to be completed by October 31, 2008) will focus on developing a technical proposal for changing the Building Code to meet the government’s objective. The third phase (to be completed by November 30, 2008) is to prepare a presentation to multi-stakeholder workshops in conjunction with Building Safety and Policy Branch.

All of the above is not making the BC fire service comfortable.

A major concern for the fire service is the response capabilities many fire departments in BC. Most fire departments do not have the training or resources to respond to a high rise fire incident. Additionally, outside of municipal boundaries, there is no mandatory requirement for building inspections, so many small or rural fire departments end up responding to an incident where they have not conducted a pre-fire plan nor have they been consulted with as to the whether they have the capability to mitigate the incident.

UBCM has stated in a staff report that six storey structures require hi-rise firefighting tactics which are much different than those used for low-rise structures (1-4 storeys). The current 3 and 4 storey wooden structures provide for demanding challenges when fighting fires from an external upper floor access perspective as it is. Most fire departments are able to access 3rd floor balconies with ground ladders, but are challenged if they need to reach any higher. The more floors a building has, the longer it takes to escape and with our aging population more time will be needed in the future for occupants to safely exit a structure during a fire.

UBCM’s Executive indicated cautious support for the proposed six storey wood framed construction based on the following measures:

- Phased implementation – from four storey, to five storeys on top of one story non-combustible construction;

- Informed evidence based decision making – need to consider construction techniques, fire protection issues, enforcement/regulation issues, and potential liability concerns;
- Education/training and best practice guidelines for building industry, building officials and firefighters;
- Public review of proposed Building Code changes.

The Martin Lofts project in Kelowna is technically a four storey wood frame building but looks like a six storey structure. The under building concrete parking is mostly above ground, forming the first floor. There are four storeys of condominiums with a fifth storey of lofts, accessible only by stairs from the fourth storey units. Without corridor access, lofts are allowed and are not counted as an extra storey under the building code. Conceivably, if the building code starts to allow six storey wood buildings, they could stretch to eight storeys if exposed under building concrete parking and lofts are added. Assistant Fire Chief Bryan Collier, Kelowna stated that it is an issue of more property loss and greater risk for occupants and firefighters in the event of fire, as wood is more combustible than concrete and steel.

A recent paper by Sean Tracey, Canadian Regional Manager, NFPA, (*Comments regarding BC Proposal to Increase Lightweight Frame Construction to 6 Storeys*) raised the concern that expected building performance criteria must be established. Currently in the codes, the expectations for continuous structures above three storeys, is to require 2 hour fire resistive construction. This is intended to prevent the structure from collapse; to provide adequate time for occupants to safely evacuate; and to allow time for the fire service to conduct an interior search and rescue as well as fire attack. Tracey maintains if a combustible structure is to be permitted it should not go below the requirements of:

- Provide structural sufficiency for occupant evacuation and firefighter operations
- Minimize damage to the structure
- Limit or prevent damage to adjacent structures.

Tracey goes on to indicate that BC has a wide variety of fire department response capabilities and approvals of such structures must consider the fire department response capabilities. The Codes in BC make certain assumptions already on the adequacy of the fire department response, in regards to limiting distances, but does not define these.

Tracey references the TF2000 project in England where a concern about fire entering into wall cavities and thus spreading beyond the room of origin to other floors was raised. How many BC fire departments have infrared cameras to detect hotspots in wall cavities? He goes on to warn that if an Authority Having Jurisdiction permits such construction in their area, they will need to consider what resources their fire departments will need and at what level of service their firefighters are capable of providing, to properly address such fires. The National

Building Code does not define what an adequate fire department response capability is, so if the fire department does not perform interior fire attack, are they exposing their communities to increased civil litigation? Should a community such as Sechelt allow high rise construction without their fire department having the training, equipment, or sufficient number of firefighters to respond to a fire in that structure?

Tracey feels there is a serious potential disconnect in BC between the minimums in the building code and community expectations. He feels that a worst case scenario in analyzing the fire scenarios must be used. The building proposal must assume that the building will be constructed in a community with a volunteer response with limited resources and training.

NFPA 13R Sprinkler Systems are intended to cover residential occupancies up to 4 storeys. These new proposed structures would no longer be acceptable under NFPA 13R and therefore would be required to be designed to NFPA 13 throughout the structure. This means that all rooms and spaces would need to be sprinklered including attic spaces, all rooms, all closets, exterior balconies, etc. These would be areas that would have been excluded in residential construction up to and including four storeys. NFPA 13 R systems are considered life safety systems and are not installed for property protection.

Timber framed buildings are not resistant to fire until completed. The risky period is during the construction phase, because the timber frame goes up first and the fire protective cladding, plaster board and fire stops are added later. Two recent examples of timber frame fire destruction in New Westminster and Penticton, where fire not only destroyed the condo buildings under construction, but also impacted neighbouring structures and residences. Penticton Fire Chief Wayne Williams stated that, "the drywall wasn't in yet, so it was a fast moving fire, which also required evacuation of neighbouring structures and residences."

FCABC Building Codes & Life Safety Committee Chair, Deputy Chief Mike Helmer recommends that in addition to the current requirements for a 4 storey wood frame buildings the following items should be considered in a five or six storey wood frame building:

1. Fully sprinklered, including eaves and/or soffit area and attic space
2. Minimum 2 hour rated non-combustible exit stair shafts, minimum of two shafts (one for exiting and one for operations)
3. Non-combustible exterior cladding to prevent vertical fire travel
4. Fully addressable high rise type fire alarm system including firefighter telephones and voice communication systems
5. Smoke control measures to pressurize exit corridors and shafts
6. Emergency generators to supply emergency power for a 2 hour minimum
7. Ceilings rated for minimum 1 hour
8. Hose connections (minimum 1 3/4") in corridors adjacent to exit doors and additional locations if travel distance exceeds 30m.

Captain Doug Bell, President of the Fire Prevention Officers Association of BC has also raised the following concerns that need to be addressed:

1. Building to be sprinklered to NFPA 13 – no equivalencies – all balconies to be sprinklered
2. Stand pipes to be NFPA 14
3. Buildings to be classed as Ordinary Hazard Class 1
4. Hallway pressurization – NFPA has recently reviewed the requirements for hallway makeup air and fusible links – further research should be considered
5. Control room for fire department operations
6. Roof access on all stairways
7. Addressable alarm systems
8. Emergency lighting on standby generators
9. Firefighter elevators with elevators large enough for stretchers to fit, without using chair cots.

Smaller or rural fire departments will be challenged to provide higher building protection. The more protections built-in and/or installed, will allow the fire service to better protect BC residents.

Items that the FSLG feel need further consideration include:

1. Fire Department access to site
2. Are there any occupancy classification limitations/restrictions? (e.g. 6 storey assisted living facilities)
3. Does BCBC 3.2.6. high building requirements apply?
4. What are the increased occupant load impacts on evacuations?
5. Will there be a limited use of vinyl siding and other combustible materials used on the exterior of buildings?
6. Will the passive and active fire protection system be increased?
7. How will emergency power be addressed?
8. Will consideration be given to increase fire resistance of corridors and stairwells?
9. Will the jurisdiction where the building is built have adequate water supplies? Will fire pumps be required?
10. What effect will pre-engineered wood assemblies have on structural integrity in a fire? Will they be fire and load tested? Will the fire service have to change their current practices for this type of structure?
11. What are the impacts to existing neighbouring structures in the case of a fire in a wood frame structure still under construction?
12. Will there be a standard grade for height measurement? What are the impacts to height measurement standards if wood frame storeys are built over concrete storeys?
13. Will alternative solutions or performance design be allowed under “objective-based codes”?

14. Who will be responsible for the costs of firefighter training; materials; and resources?
15. If changes are made to allow higher wood frame buildings, will the insurance industry raise rates to property owners for increased risk?
16. Will there be consideration made in the Code to the capability of the local/responding fire department.
17. What methods/assurances will be made to ensure protection for openings and penetration of fire-rated membranes during the initial construction and later when the building is occupied?
18. How will the Building Code address the issue of 5 to 6 storey buildings becoming 7 & 8 storey buildings (over above ground non-combustible parking garages and the addition of lofts)?
19. Will the Building code changes be restricted to Group C, D, and E occupancies or are others groups being considered?

Two key items that the Fire Services Liaison Group would like to have considered before any changes are made to the BC Building Code are the mandatory inspection of buildings in Regional Districts and the ability for local governments to implement sprinkler bylaws in their local jurisdictions.

The FSLG would also like to see research on impacts done and then consultations with fire service providers and their Authorities Having Jurisdictions before any changes are made to the BC Building Codes and BC Fire Codes to accommodate any amendments.

The FSLG would like to leave the reader with one final thought – most fire deaths and injuries occur in residential wood frame construction – we need to ensure that the safe guards are in place **before** these residences are occupied.



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