Fire Sprinklers Working Group
Final Report

Introduction

The *Building Act* received Royal Assent on March 25, 2015. The Act aims to establish more consistent building requirements across British Columbia and create a more robust and modern building regulatory system.

Under the *Building Act*, the Province has sole authority to establish building requirements. Once the Act is brought into force, local governments will have two years to eliminate existing local building requirements that vary from those in the BC Building Code and other provincial regulations.

Although one of the major goals of the *Building Act* is to establish more consistent building requirements across British Columbia, the Province recognizes that some local governments may, in limited circumstances, have legitimate reasons for wanting more stringent requirements than those in the Building Code. To this end, the Province is establishing several working groups to address the types of building requirements that are found most often in local government bylaws, including fire sprinklers, energy efficiency, and accessibility. The Fire Sprinklers Working Group is the first group established by the Province for this purpose.

Fire Sprinklers Working Group

Currently, thirty local governments in British Columbia have bylaws that include fire sprinkler requirements that vary from the requirements of the 2012 BC Building Code. Furthermore, additional local governments have expressed an interest in establishing fire sprinkler requirements that exceed those in the Building Code.

To address the eventual elimination of fire sprinkler requirements in local government bylaws, the Building and Safety Standards Branch convened the Fire Sprinklers Working Group, which was co-chaired by the Branch and the Office of the Fire Commissioner. The objective of the working group was to develop recommendations on approaches to fire sprinkler requirements that increase consistency, while meeting the imperative of life safety and considering the needs of local governments and industry.

The working group was composed of members from the following organizations:

- Applied Science Technologists and Technicians of British Columbia
- Association of Professional Engineers and Geoscientists of BC
- Canadian Home Builders' Association of BC
- Fire Chiefs' Association of British Columbia
- Fire Underwriters Survey
- Insurance Bureau of Canada
- Local governments (District of North Vancouver, Regional District of Nanaimo, City of Kamloops)
- National Fire Protection Association
- Union of British Columbia Municipalities
- Urban Development Institute

The working group met six times between October 2014 and March 2015. Meetings were led by an external facilitator from KPMG LLP. The discussion and outcomes of each meeting are summarized below, followed by the working group's four recommendations to the Minister.

Meetings

Meeting 1 – Introduction of Fire Sprinklers Working Group

Fire Sprinkler Working Group members introduced themselves and were given the opportunity to express their position on fire sprinkler requirements. The co-chairs presented the reasons for convening a working group and reviewed the Terms of Reference (see Appendix). The facilitator set decision-making principles for the group, and all members agreed to work together in good faith.

Meeting 2 – Review firefighting assumptions in BC Building Code & BC Fire Code

The working group reviewed background research prepared and distributed prior to the meeting (see Appendix):

- Comparison of BC Building Code and BC Fire Code objectives regarding fire;
- Defining uniformity in the context of building requirements;
- Firefighting assumptions in the BC Building Code;
- Local government fire sprinkler bylaw comparison;
- Provisions for firefighting in the BC Building Code and BC Fire Code;
- Rationale for local fire sprinkler bylaws; and
- Relationship between BC Building Code and BC Fire Code.

The group finalized the Terms of Reference and identified key issues that the recommendations should address.

Meeting 3 – Analysis of trends in local fire sprinkler requirements

The Branch presented research that was prepared and distributed prior to the meeting on nine key trends in the fire sprinkler requirements of the thirty local government bylaws (see Appendix). The group identified reasons for why these thirty local governments have fire sprinkler requirements beyond those in the BC Building Code. Common reasons include risk management, current fire service model, firefighter safety, geography, proximity to fire halls, and property protection.

Meeting 4 – Development and review of possible opt-in regulation with tiered approach to fire sprinkler requirements

The working group reviewed two discussion documents (which were prepared and distributed by the Branch prior to the meeting), containing a draft objective, draft language for an opt-in regulation, and fire sprinkler requirements based on a four-tier model (see Appendix). Most, though not all, group members expressed support for an opt-in regulation as well as a multi-tier approach to fire sprinkler requirements, which would allow local governments to designate distinct tiers within their jurisdiction. Four tiers, however, were considered too many.

Meeting 5 – Feedback on opt-in regulation and tiers

Prior to meeting 5, the Branch sent working group members a) a revised discussion document containing a draft objective and proposed three-tier structure for fire sprinkler requirements; and b) a survey to gather feedback on the proposed objective, opt-in approach, community fire risk assessment, and tier structure (see Appendix). The Branch presented the results of the survey as well as an analysis of the trends in the responses. Support for the tier system included the rationale that tiers maintain flexibility while standardizing requirements across the province. Those who do not support a tier system expressed concern that it may result in complication in classifying building types, and applies risk inconsistently across a geographic area. All members agreed that a community fire risk assessment would provide local governments a valuable tool for analyzing risk in their communities.

Meeting 6 – Decision on recommendations to the Minister

Prior to meeting 6, the Branch sent members a document containing four draft recommendations to the Minister (see Appendix). The group agreed in principle, but not always on detail, on four recommendations to the Minister regarding

- the objective of the recommendation;
- an opt-in regulation as the means by which individual local governments could require fire sprinkler requirements that go beyond the BC Building Code;
- a tiered approach to fire sprinkler requirements; and
- the importance of community risk fire assessments.

Context

The use of fire sprinklers in British Columbia requires balanced consideration. The following issues were discussed by the Fire Sprinklers Working Group and provide important context for the group's recommendations. The two major areas of disagreement related to the objectives for fire protection and the allocation of costs and savings. The working group, however, was also able to agree on a number of points related to fire sprinklers and discussion of these commonalities encouraged the development of the recommendations.

Objectives for fire protection: BC Building Code and local governments

Central to the working group's discussion on fire sprinklers is the varying objectives for fire protection between the BC Building Code and local governments. National model codes, on which the BC Building Code is based, are developed through considerable research, cost-benefit analyses, consensus-based committees, and extensive public review. The building requirements that result from this process address the objectives of life safety and protection of property beyond the point of origin.

Some local governments, however, may have different objectives for fire protection within their communities. In fact, although there is no requirement in British Columbia for a community to have a fire department or to provide a minimum level of fire protection, many local governments choose to provide additional discretionary fire protection to their citizens. Consequently, some local governments wish to employ fire sprinklers in a way that exceeds the requirements established in the Building Code as a tool within their fire protection strategy.

Thus, a major point of discussion of the working group was fire protection objectives. To some members, limiting local governments to the fire sprinkler requirements in the BC Building Code interferes with their authority to establish the fire protection strategy appropriate for their community. On the other hand, by allowing local governments to require fire sprinkler requirements that exceed those in the Building Code, some members believe that the rigorous code development process is circumvented.

Allocation of costs and savings

Closely tied to the question of objectives is the question of how the costs of fire protection are allocated.

By requiring fire sprinklers in new construction, local governments may be able to economize on other aspects of fire protection, such as the construction of new fire halls and the provision of adequate water supply. Savings in these areas could potentially be reflected in lowered taxes. However, by requiring fire sprinklers in, for example, new single- and two-family houses, local governments are passing on that part of the upfront cost of fire protection to individual citizens, whereas lowered taxes would benefit all homeowners in the community. Thus, the question of equity was discussed, namely whether it is reasonable for buyers of new houses to assume the cost of mandatory sprinkler installation, when any potential tax benefits would apply community-wide.

While the upfront installation cost of sprinklers was discussed, working group members also raised the long-term savings that could accrue as a result of insurance rate reductions or other incentives for developers and builders to install sprinklers,

Points in common of the working group

The general discussion on the use of fire sprinklers in British Columbia revealed agreement on a number of matters:

1. **The very high effectiveness of fire sprinklers for fire suppression.** All members considered fire sprinklers to be highly effective in suppressing fire in buildings.
2. **The importance of community fire risk assessments.** Members also agreed that fire risk assessments are key for a community to consider all factors (including cost, geography, and capacity for manual fire protection services) when determining their fire protection strategy, including the use of fire sprinklers.
3. **The desirability of greater consistency in fire sprinkler requirements across British Columbia.** Overall, making fire sprinkler requirements more consistent across British Columbia was viewed positively. Those in favour of allowing local governments to set fire sprinkler requirements beyond the Building Code felt that a single set of provincially established requirements would be simpler for local governments to adopt, particularly those without resources to develop their own clear requirements. From the perspective of those who favour a more restrained approach to local governments requiring additional sprinklering, consistency in fire sprinkler requirements can provide greater cost certainty.
4. **The benefit of decisions on sprinkler requirements being appealable to the Building Code Appeal Board.** Currently, local government decisions regarding the application and enforcement of fire sprinkler requirements are not appealable to the Building Code Appeal Board, but would be if the additional sprinkler requirements were contained in a provincial building regulation.

Within the context of these issues, the Fire Sprinklers Working Group makes the following four recommendations to the Minister.

Recommendations

Recommendation 1: Objective

The working group identified a need for a unique objective for these recommendations for fire sprinkler requirements in British Columbia. This objective is independent of the BC Building Code objectives of health and life safety.

> **The objective of the recommendations of the Fire Sprinklers Working Group is to provide local governments with options to use fire sprinklers as part of their community fire protection strategy, while at the same time establishing greater consistency in fire sprinkler requirements across British Columbia.**

Rationale: Fire sprinklers are one of the methods of achieving the BC Building Code objectives of life safety for occupants and the protection of adjacent buildings. However, some local governments may wish to have a fire protection strategy whose objectives extend beyond those of the Code. Local government objectives may include:

- providing protection for emergency personnel;
- providing fire protection in a cost efficient manner;
- protection of the point of origin property; and
- additional life safety beyond the level provided by the Building Code.

Recommendation 2: Opt-In Regulation

The working group recommends that the Province establish a provincial building regulation containing fire sprinkler requirements that exceed those of the BC Building Code. Local governments would be able to opt into the regulation so that the sprinkler requirements would apply across their jurisdiction.

An opt-in regulation is one in which the provisions of the regulation would apply only to those local governments that have opted in. Typically, the opting in process is as follows:

- The Province notifies local governments of the opportunity to opt into the fire sprinkler regulation.
- Interested local governments notify the Province of their intention to opt into the regulation, typically by submitting a copy of a resolution in council and any other required supporting documentation.
- The local governments that have opted into the regulation are named in a schedule to the regulation.
- Once a local government has opted in and the regulation is enacted, the local government must comply with the provisions in the regulation. Opting out of the regulation is not an option until the regulation is reviewed and amended.
- The regulation would be reviewed on a regular basis and amended as necessary.

The Province currently has one opt-in building regulation, the Solar Hot Water Ready Regulation.

Rationale: A single provincial opt-in regulation containing fire sprinkler requirements would:

- replace thirty local government bylaws, each of which contains a different set of fire sprinkler requirements;
- establish a single set of fire sprinkler requirements that exceed those in the Building Code, thereby achieving greater consistency in sprinkler requirements across British Columbia;
- provide greater cost certainty for developers;
- clarify fire sprinkler requirements that developers are expected to comply with;
- provide local governments the flexibility to use fire sprinklers as part of their fire protection strategy; and
- enable the Building Code Appeal Board to decide appeals concerning the interpretation and application of the technical sprinkler requirements contained in the regulation.

The Fire Sprinkler Working Group identified two options for the implementation of an opt-in regulation:

Option 1: Province-wide approach to opting into the regulation

- All local governments in British Columbia are simultaneously provided the opportunity to opt into a new provincial fire sprinkler regulation.

Pros

- Local governments that do not currently have sprinkler requirements in bylaws but use alternative avenues to require additional sprinklers would be able to opt in to a transparent provincial regulation. The provincial objective of greater consistency in building requirements across British Columbia would be better fulfilled.
- Local governments would perceive the opting in process to be equitable, with no advantage given the 30 local governments that already have sprinkler requirements beyond the Building Code.

Cons

- The administrative burden on the Province to process local government requests to opt into the regulation could be higher if all local governments were allowed to opt in at the same time.

Option 2: Phased approach to opting into the regulation

- In a first phase, only the 30 existing local governments with fire sprinkler requirements in bylaws would be allowed to opt into the regulation.
- After an evaluation period, the Province would subsequently allow all remaining local governments to opt into the regulation.

Pros

- The regulation could be tested by the 30 local governments and any required amendments could be made before the regulation, and the fire sprinkler requirements within, are made available to all local governments.
- A phased approach would lower the administrative burden on the Province to process local government requests to opt into the fire sprinkler regulation.

Cons

- Local governments that cannot opt in immediately would likely continue to use alternative avenues for requiring additional fire sprinklers, maintaining significant variation among local governments and counteracting the objective of greater consistency.

Most members support Option 1, allowing all local governments to opt in at the same time. All members also noted the importance of local governments completing a community fire risk assessment prior to opting into the regulation (see Recommendation 4).

Recommendation 3: Tiered Structure

The working group recommends that the opt-in regulation include a limited number of tiers. Each tier would encompass an increasing number of types or occupancies of buildings that would be sprinklered. Fire sprinkler requirements in the regulation would be similar in type to those in Article 3.2.5.12. of the BC Building Code and would need to integrate seamlessly with any other relevant sections of the Building Code. They would address when sprinklers would be required and reference the relevant National Fire Protection Association (NFPA) standards.

Rationale: The proposed tier arrangement for sprinkler requirements reflects the trends identified in existing local government bylaws and relies on an understanding of buildings as

regulated by the BC Building Code. The tier system most simply and accurately reflects the fire sprinkler requirements of the thirty local governments' bylaws.

During the opting in period, local governments would determine which tier(s) to apply to specific areas within their jurisdiction, and would submit this information to the Province. The areas and corresponding tiers would then form part of the new opt-in fire sprinkler regulation. Local governments would be expected to apply different tiers to different areas based on the results of a community fire risk assessment (see Recommendation 4).

The following options list tiers that would contain requirements *in addition* to the existing requirements of the BC Building Code. They are not meant to replace Building Code sprinkler requirements.

Option 1: One-tier system

- Tier 1: All buildings, regardless of occupancy, are sprinklered.
- Required: Buildings are sprinklered in accordance with the existing BC Building Code.

Pro

- Statistically, most injuries and deaths from fire occur in single- and two-family dwellings. From a risk perspective, it is more consistent to sprinkler all buildings with no exemption for single- and two-family residential buildings.

Con

- Option 1 is an "all-or-nothing" approach of either sprinklering everything or just sprinklering to the Building Code. It does not provide local governments the flexibility to sprinkler only some types of buildings beyond those required in the Building Code.
- The one-tier system does not reflect the 30 sets of existing local fire sprinkler requirements.

Option 2: Two-tier system

- Tier 1: All buildings, regardless of occupancy, are sprinklered.
- Tier 2: All buildings are sprinklered *except* single- and two-family residential buildings.
- Required: Buildings are sprinklered in accordance with the existing BC Building Code.

Pro

- Providing local governments the ability to exempt single and two-family residential buildings enables them to balance the differing interests within their communities, including homeowners and homebuilders.
- Some local governments may not have the support of their citizens to require homeowners to sprinkler their new homes.
- Some smaller jurisdictions may have an interest in providing additional sprinkler protection only for commercial buildings to protect the businesses that are the basis of their communities' economies.
- The cost of sprinklering single-family homes can be significant. Exempting single- and two-family residential buildings on the basis of cost could help manage housing affordability.

Con

- Some of the 30 local governments with additional sprinkler requirements sprinkler only a few types of buildings. This option does not align well with the existing requirements of those local governments and provides local governments less flexibility overall compared to a three-tier approach.

Option 3: Three-tier system

- Tier 1: All buildings, regardless of occupancy, are sprinklered.
- Tier 2: All buildings are sprinklered except single- and two-family residential buildings.
- Tier 3: Specified occupancies in addition to the ones in the BC Building Code are sprinklered.
- Required: Buildings are sprinklered in accordance with the existing BC Building Code.

Pros

- The three tiers best reflect the range of local sprinkler requirements in the 30 existing bylaws.
- Some smaller jurisdictions may have an interest in providing sprinkler protection only to non-residential buildings that contain the businesses that are the basis of their communities' economies.
- The upfront cost of sprinklering single-family homes can be significant. Exempting single- and two-family residential buildings on the basis of cost could help manage housing affordability.

Con

- A tiered system for fire sprinklers could add another level of classification to buildings; already, buildings are categorized in terms of their occupancies and of their sizes (i.e., Part 3 or Part 9). Adding another classification criterion could add another level of complication.
- Should a three-tier system add complications, the fire protection strategy established by council may be inconsistently applied.

The majority of working group members supports Option 3. Two members support Option 1 due to concerns that Options 2 and 3 provide fire protection on the basis of building occupancy and not on actual risk determined on a geographical basis. Option 1 (a one-tier system) is essentially geography based in that a local government would designate an area for sprinklering, and all buildings within that area would be sprinklered.

Recommendation 4: Community Fire Risk Assessment

The working group strongly recommends that local governments undertake a community risk assessment prior to making their decision to opt into a fire sprinkler regulation. The group recommends that guidelines be made available to local governments on how to complete a community fire risk assessment, and that the public be consulted throughout the process.

Good community fire risk assessment models help local governments identify and address all of the factors they should consider when determining their fire protection strategy, including their fire sprinkler requirements. These factors include topography, economics, existing manual fire service capacity, water supply, and anticipated areas of development. Working group members identified numerous existing fire risk assessment models that could be implemented or recommended for local government use.

Rationale: To make an informed decision on whether or not to opt into a sprinkler regulation and, if opting in, which tiers should apply to which areas, local governments should undertake a comprehensive fire risk assessment in their community. Thorough analysis of fire service capabilities and specific impacts within the community would inform local governments' decision to opt in.

Option 1:

- Local governments would be *expected but not required* to complete a community fire risk assessment prior to opting into a new provincial sprinkler regulation.
- There would be *no required evaluation or oversight* of the results of the risk assessment by the Province or other third parties.

Pros

- Since a local government must be able to justify to its citizens its decision to use sprinklers to achieve greater fire protection and life safety standards than those established by the BC Building Code, the responsibility of conducting a community fire risk assessment should rest with it.
- Local governments are best positioned to understand which community fire risk assessment model is best suited to their local conditions and needs.
- Local governments would conduct risk assessments without being obligated as part of their due diligence.

Cons

- Local governments *could* opt into a sprinkler regulation without the due diligence of first conducting a community fire risk assessment.
- The Province and the public could not be assured of the thoroughness or accuracy with which a local government has conducted the fire risk assessment. For instance, a local government could complete the assessment in a way that justifies a predetermined decision to opt into a new provincial sprinkler regulation.

Option 2:

- Local governments would be *required* to complete a community fire risk assessment prior to opting into a new provincial sprinkler regulation.
- There would be *no required evaluation or oversight* of the results of the risk assessment by the Province or other third parties.

Pro

- The Province and the public would have better assurance that a local government had considered all aspects of mandating additional sprinklering if it were first required to complete a community fire risk assessment.

Cons

- The Province and the public could not be assured of the thoroughness or accuracy with which a local government has conducted the fire risk assessment. For instance, a local government could complete the assessment in a way that justifies a predetermined decision to opt into a new provincial sprinkler regulation.
- Requiring local governments to conduct risk assessments without provincial or third party oversight of results could be perceived by local governments as an unnecessary level of bureaucracy.

Option 3:

- Local governments would be *required* to complete a community risk assessment prior to opting into a new provincial sprinkler regulation.
- A *third party would be required to evaluate* the completed assessment as part of approving the local government's application to opt into the regulation.

Pros

- Third party oversight would provide assurance that a local government properly considered all aspects of mandating additional sprinklering within its jurisdiction before opting into the regulation.

Cons

- Mandatory third-party oversight and evaluation would require significant additional resources, whether from local governments or the Province.
- Local governments that, for financial reasons, could not provide third-party oversight and evaluation would be refused the opportunity to opt into the sprinkler regulation.
- By requiring oversight, there could be liability implications for the Province.

The majority of members support Option 1. One member, however, supports Option 3 because third party verification of community risk assessments would bring greater consistency and rigour to local governments' decision making regarding the appropriate tiers for each area.

The working group reached consensus on the idea that community fire risk assessments would provide value in guiding local governments in their decision to opt into a fire sprinkler regulation. However, the group agreed that finalizing the contents of a potential community fire risk assessment could be done at a later date.

Appendix

- Meeting 1: Terms of Reference
- Meeting 2: Research on the following topics
    - Comparison of BC Building Code and BC Fire Code objectives regarding fire;
    - Defining uniformity in the context of building requirements;
    - Firefighting assumptions in the BC Building Code;
    - Local government fire sprinkler bylaw comparison;
    - Provisions for firefighting in the BC Building Code and BC Fire Codes;
    - Rationale for local fire sprinkler bylaws; and
    - Relationship between BC Building Code and BC Fire Code.
- Meeting 3: Key trends in local government fire sprinkler requirements
- Meeting 4: Discussion points and commentary on discussion points
- Meeting 5: Revised discussion points and member survey
- Meeting 6: Draft recommendations