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Construction Fire Safety

- The **fire hydrants** for the project must be installed and operational prior to commencement of wood frame construction
- Install fire doors, on fusible links, as early as possible. These doors must be closed when there is no construction activity.
- Activated (charged) standpipe installed progressively with building construction
- Activated (charged) sprinkler system upon installation of ceiling membrane
- **Wood Frame Construction** – Implementation of a 24/7 Fire Watch – once wood frame construction commences.
- Hot Works permits required – contact the Fire Department

This bulletin is provided to assist owners, contractors, and workers on the requirements of a Construction Fire Safety Plan (CFSP). The document is intended to provide a brief overview of existing information that has previously been developed. Each site and construction project will have site specific issues that will need to be addressed in the CFSP.

During the construction phase, a building is at its most vulnerable state. A CFSP is part of a system that is intended to protect the building during this vulnerable stage. Once a building is completed, there are a number of life safety systems in place to protect the building and its occupants. These include fire alarm systems, sprinklers, and fire compartmentalization. During construction these fire safety measures may or may not be installed or fully operational. Therefore, the CFSP must address hazards that could be present during construction.

The leading causes of fire in buildings under construction or demolition are: •

- Incendiary/suspicious events
- Smoking on site
- Open flames/embers
- Heating equipment

While minimizing the fire hazards at a construction site, the CFSP must also take into account the impact a fire would have on the neighboring building(s).

It is the owner's responsibility to develop a Construction Fire Safety Plan that meets the requirements of the B.C. Building and Fire Codes and the referenced standards and publications listed within this bulletin. It may be beneficial for owners or contractors to obtain the services of a Fire Safety Planning specialist to assist in ensuring an adequate plan is developed for their site.

In order to reduce hazards and the spread of fire, the following minimum requirements need to be reviewed and incorporated in your construction fire safety plan.

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Fire Safety Plan Minimum Requirements

Section 5.6, Division B of the B.C. Fire Code requires that for any building or parts of buildings undergoing construction, renovation, or demolition operation, a fire safety plan be prepared for the site prior to any work commencing. Part 8, Division B of the B.C. Building Code provides requirements for safety measures at construction and demolition sites. The fire safety plan shall be prepared by the owner or owner's authorized agent in cooperation with the New Westminster Fire & Rescue Services and shall be reviewed after any significant changes to the project. The minimum requirements for a fire safety plan shall include the following (BCFC, Div B, 5.6.1.3/2.8.2.1):

1. The designation and organization of site personnel to carry out fire safety duties.

2. The emergency procedures to be followed in the event of a fire, including:
    a. Sounding the alarm
    b. Notifying the Fire Department
    c. Instructing site personnel on the procedures to be followed when the alarm sounds,
    d. Firefighting procedures

3. Measures for controlling fire hazards in and around the building
4. A maintenance procedure for firefighting facilities
5. Documents, including diagrams, showing the type, location and operation of the building fire emergency systems
6. List of all emergency response numbers and list of names, addresses, and telephone numbers of persons to be contacted during and after normal operating hours in the event of an emergency.

Summary of Part 8, Division B, B.C. Building Code – Safety Measures at Construction and Demolition Sites

Part 8, Division B of the B.C. Building Code provides details for protection of the public and adjacent properties. Prescriptive requirements related to construction sites are addressed in the following Subsections:

- 8.2.1. Fencing and Barricades
- 8.2.2. Excavation
- 8.2.3. Use of Streets or Public Property
- 8.2.4. Direction of Vehicular Traffic
- 8.2.5. Waste Material

Unique Details for Construction Fire Safety Plans

Since projects vary in size and complexity, it is unreasonable to expect that a single template can serve to develop a CFSP for all projects. A more detailed CFSP may be necessary to meet the minimum fire safety requirements. A project specific CFSP will address items such as phases of construction (excavation, structure, etc…) or phased occupancies. The degree to which additional mitigating risk reduction measures are applicable will depend on the project size, scope, proximity to other buildings and unique site conditions.

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Fire Safety Training

The assignment of a WorkSafe BC qualified coordinator as required by the WorkSafe General Conditions Occupational Health & Safety (OHS) regulation should be complete prior to construction. The qualified coordinator should also address construction fire safety concerns and maintain a site copy of the accepted CFSP. Workers should be kept up to date with emergency procedures as per WorkSafe General Conditions OHS Part 4: 4.16 Training:

1. All workers must be given adequate instruction in the fire prevention and emergency evacuation procedures applicable to their workplace.
2. Workers assigned to firefighting duties in their workplace must be given adequate training, by a qualified instructor, in fire suppression methods, fire prevention, emergency procedures, organization and chain of command, firefighting crew safety and communications applicable to their workplace.
3. Retraining for firefighting duties must be provided periodically, but not less than once a year.
4. A worker not covered by Part 31 (Firefighting), who is assigned to firefighting duties, must be physically capable of performing the assigned duties safely and effectively before being permitted to do them.

Enforcement

Construction fire safety falls under numerous jurisdictions. Therefore, violations may result in enforcement from a number of different regulatory bodies or authorities, including insurance providers. Enforcement for violations may include:

- Issuance of an order by New Westminster Fire & Rescue Services under the Fire Code
- Issuance of a Stop Work Order or removal of Building Permit by the Building Division under the Building Bylaw
- Removal of Business License,
- Action by WorkSafe BC

Features for Coordination

A. Passive Protection:

1. Provision at each floor level of an unobstructed stair discharging to grade level.
2. Coordination during construction of fire compartments and fire walls. Fire doors, on fusible links, must be installed as early as possible and be in a closed position when active construction is not taking place.
3. Management of fuel fired equipment
4. Management of temporary heating equipment. All temporary heating equipment shall be listed and used in accordance with manufacturer's instructions.
5. Management of roofing operation involving heat sources and hot processes. These operations must be conducted by a qualified agency.
6. Maintaining a high standard of Housekeeping on site.
7. Providing and maintaining a Fire Department access to site complying with B.C. Building Code Division B subsection 3.2.5 (B.C. Fire Code Division B, Article 5.6.1.4)
8. Providing minimum 1 hour fire separation between occupied areas and areas under construction (B.C. Fire Code Division B, Article 5.6.1.14)

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B. **Fire Protection:**

1. Coordination such that the municipal water supply is available onsite when grade level construction begins (required by NFPA 1, Article 16.4.3.1.1 upon accumulation of combustible material). Fire Hydrants for the project, complying with B.C. Building Code Division B subsection 3.2.5, must be installed and operational prior to the commencement of wood frame construction.
2. Activated (charged) standpipe installed progressively with building construction.
3. Activated (charged) sprinkler system upon installation of ceiling membrane. Where practical, the system should be activated when construction is not taking place but may be turned off during operating hours.

4. Onsite fire protection stations that may include portable fire extinguishers possibly supplemented by garden hose for ease of use by all personnel.
5. Early installation of fire pumps where required for fire protection water supply.
6. Fire alert warning system (B.C. Fire Code, Division B, Article 5.6.1.9)
7. Temporary heating equipment to comply with B.C. Fire Code, Division B Articles 5.6.1.11 and 12

C. **Fire Watch:** (requirements will be reviewed on an individual project basis)

1. Implement a Fire Watch 24 hours per day, 7 days per week once wood frame construction commences. These operations must be conducted by qualified personnel. This Fire Watch shall remain in effect until the fire safety systems for the building are functional and
2. Implement a Fire Watch during demolition or construction with partially occupied buildings (B.C. Fire Code Article 5.6.1.15).

3. Fire watch during hot works operations and for a period not less than 60 minutes after, and a final watch 4 hours after completion (B.C. fire Code Division B, Articles 5.2.3.1 and 5.2.3.3). **please note:** a Hot Works permit is required prior to start of work. Contact the New Westminster Fire & Rescue Services for further information.

D. **Additional Items:**

1. Provide temporary water flow alarms on sprinklers
2. Timing for issuance of sprinkler permit (sprinkler drawings must be reviewed by numerous consultants and accepted by Municipal Authorities prior to issuance of permit and commencement of installation of sprinklers.)
3. Exposure protection sprinkler systems
4. Development of a fire risk assessment for more complex sites. This will identify time frames and processes where risk may be greater and extra measures may be required. (in accordance with the Society of Fire Protection engineers guidelines).

Referenced Standards and additional North American Standards/Guides which relate to course of construction fire protection are listed below:

Existing Referenced Standards/Bulletins

- Section 2.8, 5.2 and 5.6, Division B of the 2006 BC Fire Code

- Part 8, Division B of the 2006 BC Building Code
- Office of the Fire Commissioner (OFC) of BC, OFC Bulletin- April 17, 2009
- Standata Fire Code Interpretation FCI-09-03 (AFC)

Further Resources and Additional Recognized North American Standards

- NFPA 1, Fire Code.
- NFPA 101, Life Safety Code
- NFPA 5000, Building Construction and Safety Code
- NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations
- SFPE Engineering Guide to Fire Risk Assessment

For complex sites where a more robust fire safety plan is required, review of further additional standards is recommended; see relevant items from NFPA 241 below.

Summary of NFPA 241, Standard for Safeguarding Construction, Alteration and Demolition Operations

NFPA 241 provides a comprehensive guide for construction, alteration, and demolition operations. This standard provides guidance on the construction of temporary offices and storage areas, typical processes and hazards such as temporary heating equipment, flammable and combustible liquids and flammable gas storage and handling, temporary electrical work and lighting, and requirements for fire protection. Some significant items to note from NFPA 241, Chapter 7:

- As noted in Article 7.5.6.1, in all buildings over one storey in height, at least one stairway shall be provided that is in usable condition at all times. This stairway is required to be extended upward as each floor is installed for new construction, and must be maintained for each floor remaining during demolition.
- As noted in Article 7.6, in all new buildings in which standpipes are required or where standpipes are existing in a building to be altered or demolished, such standpipes shall be maintained in conformity with the progress of the building construction in such a manner that they are ready for use.
- As noted in Article 7.7.4, at least one approved fire extinguisher shall be provided in plain sight on each floor at each usable stairway, as soon as combustible material accumulates.

Chapter 8 of NFPA 241 provides details on safeguarding construction and alteration operations, and provides comments on scaffolding, shoring and forms, construction material and equipment storage, building separation walls such as fire cut-offs and temporary separation walls. Some significant items to note from NFPA 241, Chapter 8:

- As noted in Section 8.2.5, portable fire extinguishers or charged hose lines are required during forming/stripping operations using combustible forming material.

- As noted in Section 8.6.1, firewalls and exit stairways where required for the completed building, shall be given construction priority for installation. Fire doors with approved closing devices and hardware shall be installed as soon as practical, and preferably before combustible material is introduced. Fire doors shall not be obstructed from closing.
- As noted in Article 8.7.2.1/.2, a water supply for fire protection, either temporary or permanent, shall be made available as soon as combustible material accumulates on the site, and there shall be no delay in the installation of fire protection equipment.
- As noted by Article 8.7.2.3, where underground water mains and hydrants are to be provided, they shall be installed, completed, and in service prior to construction work.
- As noted by Article 8.7.3.1, if automatic sprinkler protection is to be provided, the installation shall be placed in service as soon as practicable.
- Section 8.7.4 discusses the standpipe requirements.

Conclusion

The protection of a construction site from fire is paramount to the owners, contractors, the community and the City of New Westminster. The implementation of this bulletin can assist in reducing the inherent risks associated with construction sites.

The CFSP should take into account any potential hazards that may be present during the building's construction period. The CFSP should have the potential to be developed into the final Fire Safety Plan for the building and the occupants of the building upon completion.

It is the owner's responsibility to ensure the construction fire safety plan is developed for each project. When important components of the approved construction fire safety plan need to be altered, the owner or owner's authorized agent must consult with the New Westminster Fire & Rescue Service.

Please review the information within this bulletin when developing a fire safety plan.

Questions regarding Construction Fire Safety Plans can be directly addressed to the Prevention Office of the New Westminster Fire & Rescue Services at 604 519-1004.

For CFSP approval, please submit a digital copy to fire-fpo@newwestcity.ca