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## Construction Fire Safety Plans

Buildings are most vulnerable to serious fire damage at the construction stage. Once built, their fire protection systems provide a minimum acceptable level of fire and life safety to the occupants of the building, and to nearby buildings. At the construction stage, however, fire-resistive walls and floors, sprinklers and fire alarm systems may not yet be in place or are incomplete.

Locally and around the world, several large fires have occurred at buildings under construction which have caused major damage to the building itself and to adjacent buildings. The focus on risk to workers on the construction site, to first responders, and to neighbouring buildings is greater now than ever. Consequently, a comprehensive Construction Fire Safety Plan is required to mitigate the risk.



### Background

Contractors are required by the Vancouver Building and Fire By-laws to have both a Construction Safety Plan (CSP) and a Construction Fire Safety Plan (CFSP) prior to the start of construction.

CSP's are described in the Building By-law Division B Subsection 8.1.3. and cover overall safety requirements for the site which may include site access, traffic control, scaffolding and swing stages, protection at excavations, hoisting equipment, waste material disposal, barricades, fire protection facilities, and so on. CSP's are usually prepared by the general contractor.

CFSP's are described in the Fire By-law Division B Section 5.6. and cover specifically the fire protection facilities required by the CSP. CFSP's may be prepared by the general contractor, a fire safety planner, or any person familiar with the requirements of the Fire By-law. However, where an assessment of fire risk to adjacent buildings is required, the assessment and resulting proposed design to mitigate the risk may be required to be provided by a registered professional.

### Sprinkler and Standpipe System

If the building is required to be provided with a fire sprinkler system, the sprinklers must be installed and activated as soon as practicable. If the building is required to be equipped with a standpipe system,

a temporary or permanent standpipe system that is installed progressively must be provided during construction as described in the NFPA 14 standard, Chapter 10.

A sprinkler permit application for the sprinklers and the temporary or permanent standpipe system will be required to be submitted to the Sprinkler Project Coordinator in the Building Review Branch as soon as possible. The sprinkler/standpipe plans are to be signed and sealed by a registered professional.

Furthermore, an application for a new water service to the property, if necessary, is to be made by the contractor or owner as soon as possible to facilitate the installation of the water supply for the sprinklers and standpipe systems.

A construction standpipe will be required to be operational before construction of the building exceeds 3 storeys above grade.

The construction standpipe must be in operable condition at all times after hours and at all times that it is not actively being worked on during the day.

Any of the following options for the construction standpipe could be accepted:

- A. Automatic wet standpipe hooked up to the city water supply, with freeze protection.
- B. Manual wet standpipe not connected to the city water supply, with freeze protection.
- C. Manual dry standpipe with each riser having an isolation valve at a manifold at the Siamese connection.
- D. Manual dry standpipe with each riser provided with a Siamese connection at a location accessible from the access route.

The standpipe shall be installed with the following features to ensure that it is ready for operation and is safe to use:

- 1) The fire department Siamese connection shall be accessible from the street at all times, and kept free of obstructions such as material storage or fencing.
- 2) An air or water gauge shall be installed at the fire department Siamese connection.
- 3) The standpipe system, for each new level of hose valves installed, shall be
  - a) pneumatically tested at 275 kPa (40 psi) for a period of not less than 24 hours when the standpipe is subject to freezing, or
  - b) hydrostatically tested at 1380 kPa (200 psi) for a period of not less than 2 hours when the standpipe is not subject to freezing
- 4) The standpipe system shall be corrected and re-tested if the drop in pressure after a test referred to in Sentence (3) is in excess of 35 kPa (5 psi) under a pneumatic test, or 70 kPa (10 psi) under a hydrostatic test.
- 5) Material and Test certificates shall be completed and signed by the contractor and owner's representative after each test.



- 6) Where a standpipe is pneumatically tested,
  - a) after each test, the air in the standpipe system shall be reduced to provide supervisory air of not greater than 172 kPa (25 psi) and not less than 35 kPa (5 psi),
  - b) a manual air release using one or more valves of a minimum 30 mm diameter shall be provided immediately adjacent to the fire department connection such that the air pressure from a pneumatic test is released in not more than 3 minutes,
  - c) signage shall be provided at the fire department connection indicating that the dry standpipe system is pressurized with air, and showing the location of the manual air release, and
  - d) provision shall be made to drain water in any trapped sections of the dry standpipe system that are subject to freezing.

### Construction Fire Safety Plan

Construction Fire Safety Plans are required by the Fire By-law for all building projects, including buildings of non-combustible construction, and must be prepared prior to the start of construction.

For a building that is 5 or 6 storeys in height of combustible or hybrid construction, the CFSP must be submitted to the Fire Prevention office of Vancouver Fire and Rescue Services (VFRS) for review and acceptance prior to issuance of the building permit. The submission must be accompanied by a cheque for \$105 (GST included) payable to the City of Vancouver.

The assessment of risk and the means of providing protection to adjacent buildings that would be exposed to fire originating from the building under construction shall be included in the CFSP. This assessment and the proposed design to mitigate the fire exposure risk may be provided in a report which shall be signed and sealed by a registered professional.



### During Construction

CFSP's are required to be on the construction site at all times. For a building that is 5 or 6 storeys in height of combustible or hybrid construction, a copy of the CFSP which is stamped and approved by VFRS must be on site at all times during construction.

The general contractor and the Construction Safety Officer should familiarize themselves with the requirements of the CFSP.

The methods to protect adjacent buildings should be identified and implemented at the appropriate stages of construction.

The Construction Safety Officer is responsible for ensuring work is proceeding safely and in conformance with the CSP and the CFSP, and for ensuring the CSP or CFSP is updated as necessary for the various

stages of construction. In accordance with the Building By-law, a full-time Construction Safety Officer is required to be present on the construction site at all times during construction.



VFRS may conduct periodic inspections to monitor the implementation of the CFSP. Failure by the contractor to have, or to adhere to the CFSP may result in re-check fees, issuance of municipal tickets, or a Fire Chief Order to shut down the construction site until the appropriate safety measures are in place.

Signed,

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