



VARIANCE SPV-003

August 1, 2018 (Revised February 12, 2025)

Subject: Construction of Exposed Building Face
(Wood Frame Encapsulation for Single Storey Group F, Division 3 Part 9 Buildings)

Background:

A variance is written permission to build, install, process, or otherwise act in a manner not consistent with the provisions of an applicable code but which provides, in the opinion of the Authority Having Jurisdiction (AHJ) or safety codes officer, an equivalent or greater level of safety to persons or property.

As stated in Sentence 1.2.1.1.(1). of Division A of the National Building Code – Alberta Edition (NBC-AE), compliance with this Code may be achieved by either of the following methods: a) Complying with the applicable acceptable solutions in Division B of the Code or b) Using alternative solutions that will achieve the approximate equivalent level of performance required by Division B in areas defined by the objective and functional statements attributed to the applicable acceptable solutions.

Note: *Standing Posted Variances (SPV) cannot be altered or deviated from. Any modification to the scope or application will require the prescriptive requirements of Division B to be followed or a site-specific variance to be applied for.*

Applicable regulatory requirements:

National Building Code – Alberta Edition, Division B, Article 9.10.14.2.

National Building Code – Alberta Edition, Division B, Article 9.10.14.5. Sentences (1).

Reason for the Variance:

A test report prepared by the National Research Council Canada titled *“Fire safety summary: Fire research conducted for the project on midrise wood construction: report to Research Consortium for Wood and Wood-Hybrid Mid-Rise Buildings”* evaluated the results of lightweight steel frame systems in large-scale apartment encapsulation tests, as a reference for a code-compliant noncombustible construction and compared the impacts of fire severity on encapsulated lightweight wood-frame systems.

The primary objective of the study was to determine the effectiveness of the encapsulation materials in protecting the combustible structural materials to delay the effects of the fire on the combustible structural elements and, as a result, delay the contribution of the combustible structural elements to the fire severity.

The test report concluded that *“The experimental results have demonstrated the effectiveness of the encapsulation approach in delaying the time at which the wood structural elements are affected by and eventually contribute to the growth and spread of fire, if at all.”* and that encapsulated *“lightweight wood-frame test structures performed at least as well as the lightweight steel frame structure (a code-conforming solution) in limiting the involvement of the structural materials in the fire”*. Additionally, the report stated that *“lightweight wood-frame apartment test results suggest that encapsulation should be addressed using a system approach, ensuring the junctions between the assemblies do not become the weak points for fire penetration”*.

This variance addresses the area and location of the exposing building face of single storey detached garages and other storage or accessory buildings classified as Group F, Division 3 - Low Hazard industrial

occupancies, serving multi-dwelling buildings governed by Division B Sub Section 9.10.15 in relation to Article 9.10.14.5.(1) for the construction of exterior walls of the Group F, Division 3 buildings, where these buildings do not directly serve the dwelling units which they face.

The intent of this variance is to facilitate, within the parameters listed below, the construction of the Group F, Division 3 buildings without the need for non-combustible construction methods as prescribed in Table 9.10.14.5.A - forming part of Sentence 9.10.14.5.(1). It will also clarify the limiting distance used to calculate the allowable area of unprotected openings on the wall of the dwelling units which face the Group F, Division 3 buildings.

The area of an exposing building face shall be:

Taken as the exterior wall area facing in one direction on any side of a building, and calculated as the total area measured from the finished ground level to the uppermost ceiling, or the area for each fire compartment, where a building is divided into fire compartments by fire separations with fire resistance ratings not less than 45 minutes.

Pursuant to Table 9.10.14.5.A, forming part of Sentence 9.10.14.5.(1) where the minimum requirements for the construction of exposing building faces shall be non-combustible, the following measures will be required as an accepted method of variance.

Accepted method of Variance

All exterior walls of the Group F, Division 3 building facing a multi-dwelling building which is governed by Division B. Subsection 9.10.15. which they do not serve shall be constructed as follows:

- Non-combustible cladding as required by Article 9.10.14.5. installed in accordance with Section 9.27 and manufactures instructions.
- Sheathing membrane and it's installation in accordance with Article 9.27.3. and manufactures instructions.
- 1 layer 5/8" (15.9mm) Type X exterior gypsum board sheathing or equivalent. Sheathing panels are to extend to the underside of the roof sheathing with all joints to be on studs, top and bottom plates or otherwise fully supported⁽¹⁾. Joints are not required to be taped.
- Minimum 38mm x 89mm (2" x 4") wood studs at a maximum spacing of 400mm (16") on centre installed in accordance with Subsection 9.23.10.
- Exterior wall stud cavities to be filled with mineral fiber insulation conforming to CAN/ULC-S702, having a mass not less than 1.22 kg/m² of wall surface.
- Single ply 6mil (0.15mm) polyethylene vapour barrier conforming to CAN/CGSB-51.34M installed in accordance with Article 9.25.4.3.
- Interior sheathing to consist of 1 layer 5/8" (15.9mm) Type X gypsum board or equivalent with all joints fully supported⁽¹⁾ taped and finished taken to the underside of roof sheathing.
- The ceiling of the building shall be sheathed in 1 layer 5/8" (15.9mm) Type X gypsum board or equivalent.
- Limiting distance between dwelling unit and Group F, Division 3 building must be a minimum of 1.2m including from the face of any projections on the dwelling unit.

(1) National Building Code - Alberta Edition Division B, D-2.3.8. Edge Support for Wallboard – Gypsum board installed over framing or furring in a wall assembly shall be installed so that all edges are supported, except that 15.9 mm Type X gypsum board may be installed horizontally with the horizontal joints unsupported when framing members are at 400 mm on centre maximum.

The exposing building face of the Group F, Division 3 building which faces an adjacent dwelling unit shall have no unprotected openings. Doors in the wall facing the dwelling units shall have a fire protection rating of not less than 45 minutes and be equipped with a self-closing device. For all other walls of the Group F, Division 3 building, openings in the exposing building face shall conform to Article 9.10.14.4.

The limiting distance requirements between the Group F, Division 3 building and the residential building is assumed to be resolved when the adjacent building is constructed as per the requirements above. The windows of the dwelling units facing the Group F, Division 3 building need not to be reduced in size for this reason, in the same way that a single family dwelling is exempt from the garage that serves it.

Attributing Objective and Functional Statements:

OP3 Protection of Adjacent Buildings or Facilities from Fire

An objective of this code is to limit the probability that as a result of the design or construction of the building or facility, adjacent buildings or facilities will be exposed to an unacceptable risk of damage due to fire. The risks of damage to adjacent buildings or facilities due to fire addressed in this code are those caused by:

- OP3.1 – fire or explosion impacting areas beyond the building of origin.

Functional Statements

The objectives of this Code are achieved by measures, such as those described in the acceptable solutions in Division B, that are intended to allow the building or its elements to perform the following functions.

- F02 – To limit the severity and effects of fire or explosions.
- F03 – To retard the effects of fire on areas beyond its point of origin.

This Variance is based on the following:

- Table 9.10.14.5.A forming part of Sentence 9.10.14.5.(1) of Division B, NBC-AE
- National Research Council Canada
Fire safety summary: Fire research conducted for the project on midrise wood construction: report to Research Consortium for Wood and Wood-Hybrid Mid-Rise Buildings
Su, J. Z.; Lougheed, G. D.
<https://nrc-publications.canada.ca/eng/view/object/?id=bbc47a31-963d-4b21-8401-936de1ba03f4>
- Reference to Variance SPV-003 in the permit documents submitted by the applicant to obtain a building permit.
- Reference to Variance SPV-003 within the permit conditions of the building permit.

Address:

Where referenced as (SPV-003) within the building permit conditions, this variance shall be applicable to the address of the building permit.

Authority and conditions:

Under the authority of Section 38 of the Safety Codes Act, Chapter S-1 of the Statutes of Alberta 2000, this Variance is granted based on:

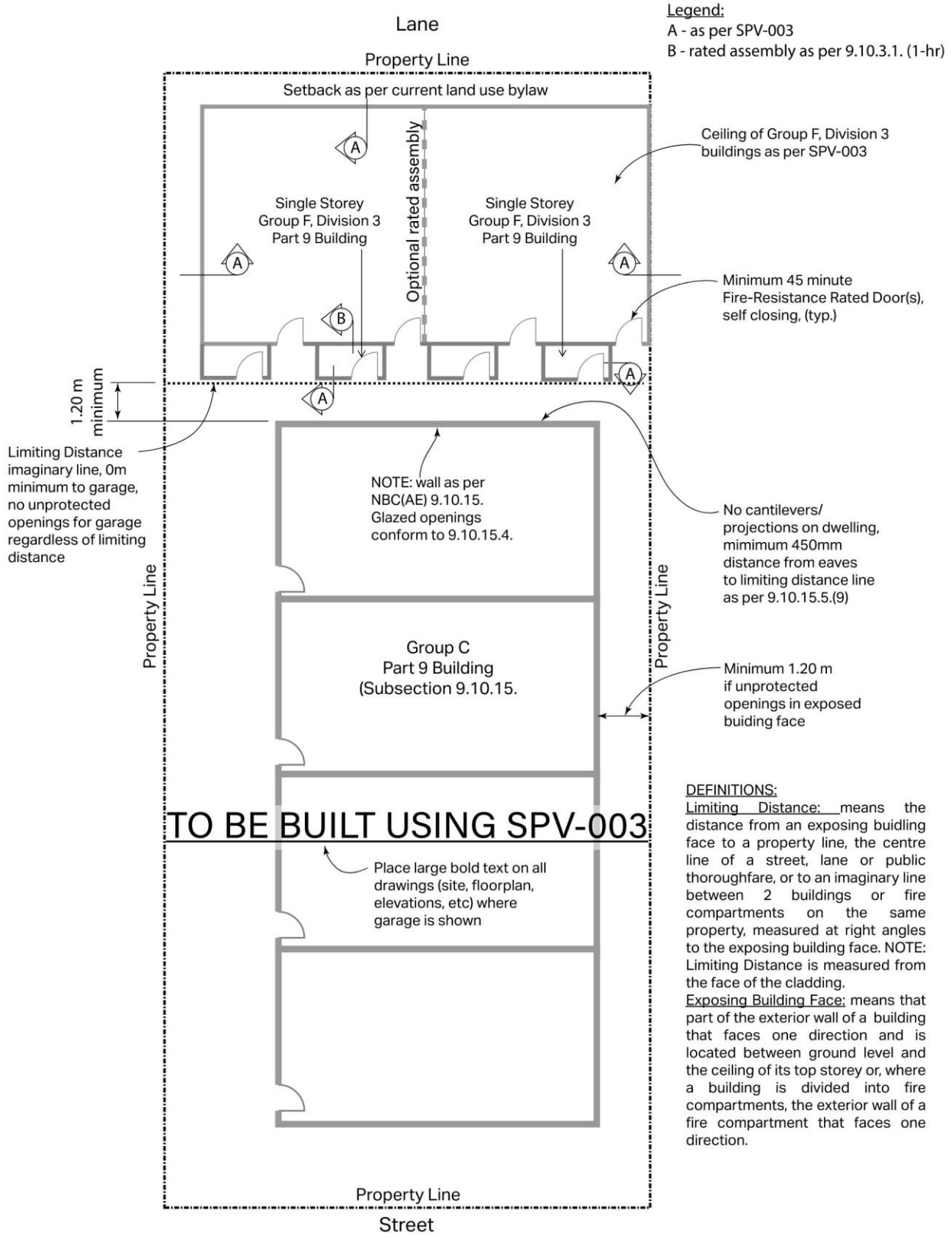
- The owner/contractor acknowledging the authority under which the variance is issued by virtue of referencing this Variance number (SPV-003) in the Building Permit documentation.
- The owner, and contractor ensuring that the project is carried out as outlined in this Variance.

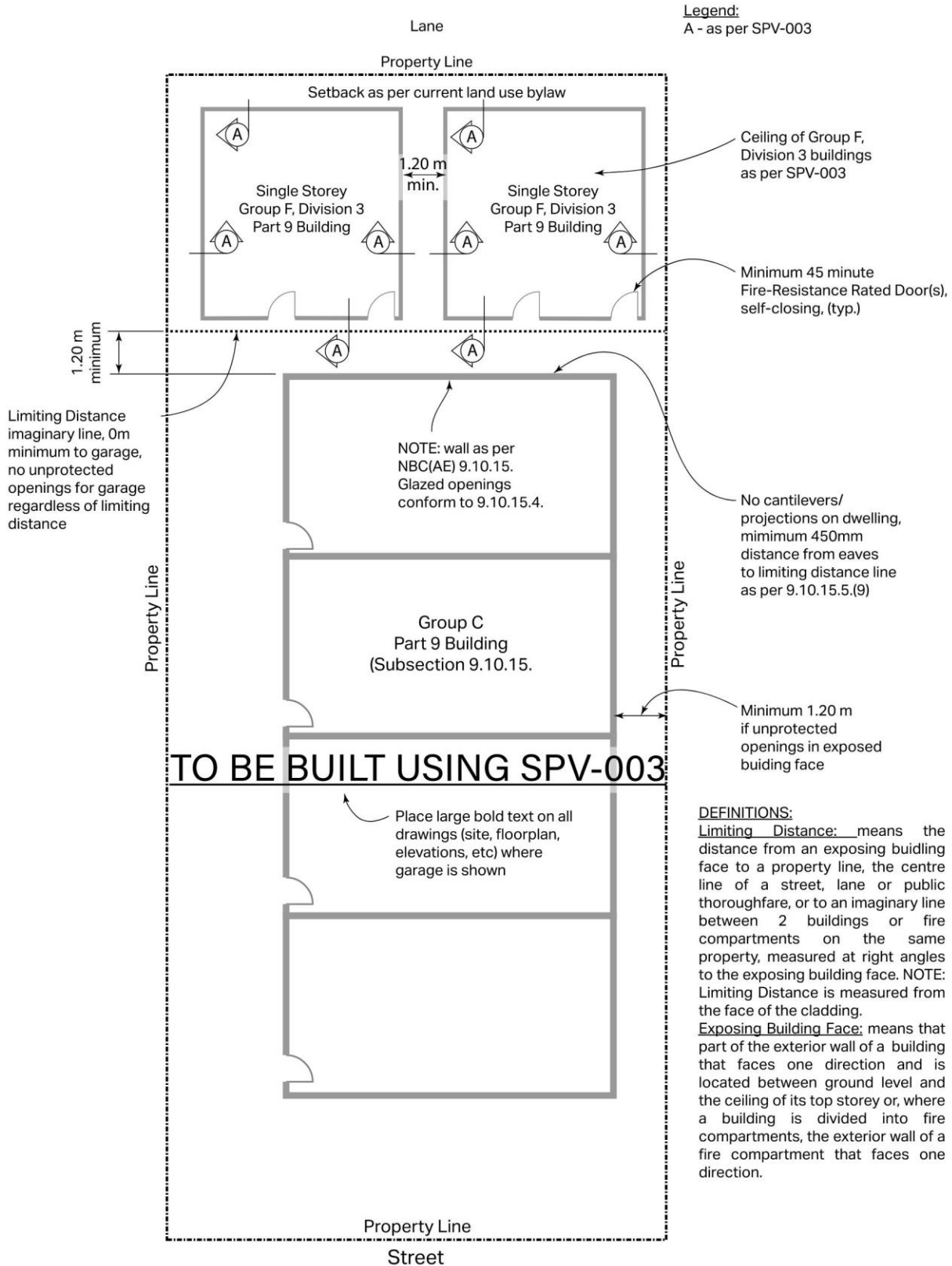
**Non-compliance with the requirements of this Variance
is an offence under the Safety Codes Act.**

This Standing Posted Variance (SPV) was accepted by the Codes and Standards Technical Interpretation Committee (CSTIC) meeting on February 12, 2025

SPV-003 First Edition August 1, 2018
SPV-003 Revision 1 - January 9, 2019
SPV-003 Revision 2 - August 15, 2023
SPV-003 Revision 3 - February 12, 2025

Chief Building Official
The City of Calgary





Legend:
A - as per SPV-003

DEFINITIONS:
Limiting Distance: means the distance from an exposing building face to a property line, the centre line of a street, lane or public thoroughfare, or to an imaginary line between 2 buildings or fire compartments on the same property, measured at right angles to the exposing building face. NOTE: Limiting Distance is measured from the face of the cladding.
Exposing Building Face: means that part of the exterior wall of a building that faces one direction and is located between ground level and the ceiling of its top storey or, where a building is divided into fire compartments, the exterior wall of a fire compartment that faces one direction.