



# PRACTICE ADVISORY

## ENGINEERING MODIFICATIONS TO FIRE-TESTED AND LISTED ASSEMBLIES

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This practice advisory has been issued for registrants and licensees of Engineers and Geoscientists BC (engineering professionals) to clarify professional engineering responsibility for modifications to fire-tested and listed assemblies used in the construction of buildings.

Practice-related questions continue to be asked regarding engineering responsibility for modifications to fire-tested and listed assemblies; that is, when a manufacturer, supplier, designer, contractor, or installer makes changes to an assembly that were not included and/or contemplated as part of the original testing and listing of that product.

Concerns about how and when responsibility was assumed were previously brought to the attention of the Engineers and Geoscientists BC (association) Building Codes Committee; in July 2006 the Committee issued a letter to several firestop manufacturers indicating that all “Engineering Judgments” should include confirmation of engineering review by an engineering professional. This topic was further discussed in an article in the January/February 2007 issue of the association’s *Innovation* magazine.

Details and the current standard of practice are described below. Briefly, if any modification is made to a fire-tested and listed assembly to address conditions outside a listing, or to address changes in materials or methods of installation to a fire-tested and listed assembly, then the design requires confirmation of engineering review, and all deviations from a fire-tested and listed assembly must be clearly identified as such. Confirmation of engineering review must be provided by an engineering professional who signs and seals the document in accordance with the association’s *Quality Management Guidelines – Use of Seal*. The only exception is where confirmation of the acceptability of the modifications has been provided by the appropriate listing agency accredited by the Standards Council of Canada.

## BACKGROUND

For both new and existing construction, the *British Columbia Building Code (BCBC)* and the *Vancouver Building By-law (VBBL)* (collectively referred to in this advisory as “the Codes”) mandate that some structural elements such as exterior walls, load-bearing walls, columns, beams, floor or ceiling assemblies, and roofs be designed and constructed to achieve a minimum fire-resistance rating.

Similarly, fire-rated separations or assemblies are also required between areas of different uses and occupancies. When a fire-rated assembly is penetrated by closures, doors, piping, wires, conduits, ducting, or other elements, it must include adequate protection systems to maintain the level of fire separation of the assembly. Typically, building designers either specify a design listed by a testing and certification agency or use generic designs or assemblies outlined in the Codes.

Fire-rated assemblies are tested in accordance with a standard fire test and are assigned an hourly fire-resistance rating based on time to failure. In Canada, this standard is CAN/ULC-S101 Standard Methods of Fire Endurance Tests of Building Construction and Materials. Similar standards are used in the United States (such as ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials, and UL 263 Standard for Fire Tests of Building Construction and Materials) to establish a fire-resistance rating for various building materials. Similarly, firestop systems are tested in accordance with CAN/ULC-S115 Standard Method of Fire Tests of Firestop Systems.

In Canada, these tests must be carried out by independent testing and certification agencies accredited by the Standards Council of Canada. These agencies play an important role in the certification and quality control of tested products. These certifications are then listed in the agencies' directories, and these listings may be used by architects, engineers, designers, authorities, or contractors when designing and assessing the fire-resistance rating of various assemblies and systems.

## REQUIREMENT

As noted above, questions still arise about engineering responsibility for modifications to fire-tested and listed assemblies; that is, when a manufacturer, supplier, designer, contractor, or installer makes changes to an assembly that were not included and/or contemplated as part of the original testing and listing of that product.

The ULC's list of equipment and materials includes supplementary information about acceptable deviations from the fire-tested and listed assemblies. These acceptable deviations are listed under the heading "Consideration of Variations from Tested Designs" and provide guidance on the limitations of variations and/or guidance on the transfer of components from one design to another before the changes adversely impact the performance of the assembly. Any modification to a fire-tested and listed assembly or system beyond that envisioned under the applicable standard should be assessed by an engineering professional to ensure that the level of performance expected by the listing will be met.

Modifications to fire-tested and listed assemblies, when required, are typically made during either the design or construction stages of building projects. As the manufacturers of various assemblies or systems have a vested interest in the use of their products, and generally have in-depth knowledge of them, they are often asked to evaluate and provide suggestions for modifying their fire-tested and listed assemblies to suit specific construction conditions. However, it is not feasible for manufacturers to test every variation of a product. To assist engineers and architects involved in the fire protection of building projects, some manufacturers have been known to formally comment on the performance of modifications to fire-tested and listed assemblies based on test results from similar tested assemblies, often without the consent of the listing agency that originally certified the product.

For example, in the firestop industry, some firestop manufacturers issue “Engineering Judgments,” which are commentaries on modifications to fire-tested and listed assemblies. However, the presentation of these “Engineering Judgments” often causes confusion about whether or not the modified assembly had passed a fire-rating test. In the past, engineers, architects, designers, authorities, and contractors were inclined to accept “Engineering Judgments” as confirmation that either the modified assembly represented a current listing, or the modifications had been appropriately reviewed by a qualified person who had taken responsibility for the modifications.

## STANDARD OF PRACTICE

The preparation of technical documents relating to fire protection applications in buildings and dealing with modifications to fire-tested and listed assemblies, or dealing with the development of new assemblies not specifically listed, constitutes the practice of professional engineering, as defined in the *Engineers and Geoscientists Act*. Therefore, those documents must be sealed by an engineering professional who is registered or licensed to engage in the practice of professional engineering in British Columbia, and who takes responsibility for the design.

A manufacturer-supplied “Engineering Judgment” contains engineering content, so an engineering professional must take responsibility for the content of the document and seal it according to the association’s *Quality Management Guidelines – Use of Seal*. Otherwise, responsibility for the modifications may be deemed to have been undertaken by the registered professional issuing the Letters of Assurance under the *Code*, when in fact the registered professional did not intend to undertake such responsibility.

# VERSION HISTORY

VERSION NUMBER	PUBLISHED DATE	DESCRIPTION OF CHANGES
1.0	April 6, 2020	Initial version.

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