

Catastrophic Fire Risk Mitigation for Wood-Framed Construction Projects





The Hazard and the Solution:

Fire risk remains a critical exposure for all construction projects. Prior to the installation of active and passive fire protection systems, Course of Construction (COC) projects are vulnerable to fire loss, which can affect soft costs, delay project completion and expose builders to liability lawsuits.

HUB International's Risk Services Division continually searches for innovative solutions and risk mitigation technology that can reduce exposures for builders, developers and purchasers.

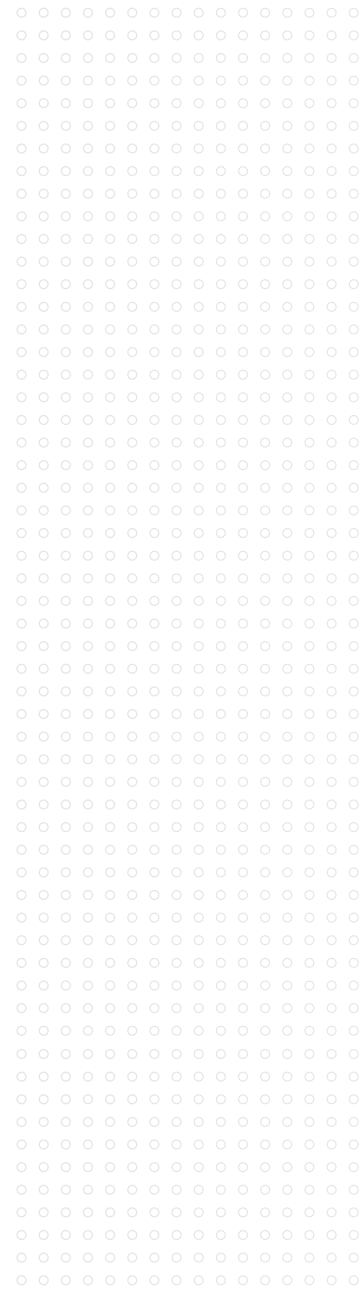
The development of fire-resistive wood treatment is a game changer. This critical technological innovation, when applied to wood products used in frame building construction, greatly reduces the risk of catastrophic fire loss.

FIRE RISK FOR WOOD-FRAMED CONSTRUCTION PROJECTS

Buildings under construction are significantly more vulnerable to fire than a completed structure. With minimal water supplies, a lack of fire protection and detection systems, and the accumulation of combustible scrap materials on site, construction site fires can spread at alarming rates.¹ The ignition of structural elements causes about a third of all fires to buildings under construction, and this is particularly true of wood-framed construction projects.²

For a builder or property developer, a catastrophic fire loss not only negatively impacts the project, but it also leads to massive financial losses, substantial development and timeline delays and negative reputational repercussions for the builder.

Today's supply chain delays and labour shortages have compounded the impact of a fire event. With supply chain logjams already delaying project timelines, the impact of a catastrophic fire on a construction schedule may be magnified. In the event of a fire loss, developers, builders and purchasers may see reconstruction delays due to criminal investigations, lawsuits, further supply chain backlogs and labour and contract issues. In many cases, the initial delivery and occupancy turnover dates may be postponed by 24 to 36 months, with some projects suspended or terminated due to chronic cost fluctuations and budget overruns.



¹ Canadian Wood Council, *Construction Sites*, accessed Jan. 10, 2023

² National Fire Protection Association, *"Fires in Structures Under Construction,"* October 2022.

Since 2014, construction fire losses have steadily increased in North America. In the U.S., about 4,300 structures under construction caught fire between 2016 and 2020, causing an estimated \$376 million in property damage annually.³

In Canada, while country-wide statistics are unavailable, the province of Alberta found that arson was the leading cause of loss for buildings under construction, contributing to more than a third of construction site fires. Other reasons for losses included:⁴

Cause of Loss	% of Fire Losses	% of Property Damage
Arson	35%	46%
Combustibles placed close to ignition source	11%	1.5%
Mechanical malfunction	7%	2%
Welding	7%	20%
Vandalism	5%	2%

These trends may be concerning, but because the major causes of construction site fires are well-established, they may be easier to prevent with a solid risk management strategy and safety protocols.

Yet, many developers believe that a catastrophic fire loss “can’t happen” to them — a perspective that impedes a careful consideration of the risk. Many of the largest and best-run organizations have sustained catastrophic fire losses, and the best strategy for an organization of any size is to consider how they are managing their exposure before they are faced with a loss event. All parties involved in the construction of a building need to evaluate how they manage fire risk and how a fire event could affect their financial results and reputation in the industry.

FIRE RISK MITIGATION SOLUTIONS

There is no shortage of advice on reducing the risk of fire in buildings under construction, particularly wood-framed buildings. Recommendations designed to prevent or mitigate losses include:

- Following National Fire Protection Association (NFPA) guideline 241: “Safeguarding Construction, Alteration, and Demolition Operations.”
- Maintaining a fully developed and implemented hot works permit program.
- Conducting regular inspections to ensure temporary heaters are placed far away from combustibles.
- Establishing and enforcing a strict smoking policy on the job site with adequate dispensers.
- Installing fencing and cameras with thermographic capabilities to secure the site from potential arson or vandalism.
- Employing security guards to walk/drive established rounds and deter vandals or arsonists.
- Limiting the storage and accumulation of flammable or combustible liquids on site.

While these mitigation efforts can prevent fires from occurring, accidents happen on even the best-protected sites. Engineering out the risk of fire is an additional layer of protection that should be considered for all construction projects.

³ National Fire Protection Association, *Fires in Structures Under Construction*, October 2022.

⁴ Government of Alberta, *Fire Losses in Buildings Under Construction*: Alberta, accessed January 11, 2023.



BarrierTek: Engineering Solutions to Prevent Fire Loss

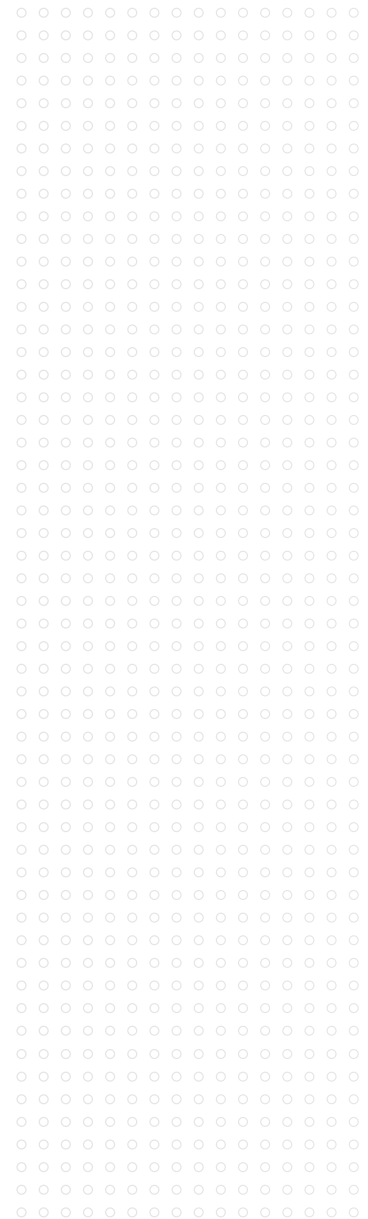
Engineering out hazards requires companies to anticipate possible loss scenarios, as well as design and select materials and processes to reduce the risk in the first place. Engineering risk management solutions have significant potential to mitigate loss at active construction sites.

HUB International's Risk Services Division works with leading industry experts to identify the latest technologies, tools and products to help construction clients reduce their risk. One such company, BarrierTek, has created products so successful at reducing the risk of catastrophic fire on multi-family wood-framed construction projects that HUB formed a partnership with the firm to investigate how the two companies can work together to engineer out even more catastrophic fire risk for clients.

The "science first" focus of BarrierTek has enabled the company to develop cost-effective, fire-retardant wood treatments. When applied to standard wood products, BarrierTek significantly slows the spread of fire at a project's most vulnerable stage — when the building is framed but before passive and active fire protection and detection systems are in place.

Prior to framing, fire-resistive coating is applied to all standard dimensional lumber, plywood/oriented strand board (OSB), engineered trusses and all other wood components. Once delivered to the site, normal framing processes occur. Not only is the resulting frame structure fire resistive, but the frame also will always have the coating, reducing the risk of catastrophic fire once the building is occupied. This dual benefit reduces exposure for the builder and future occupants, providing significant value and potential cost savings for all parties.

To demonstrate the effectiveness of the product, BarrierTek organized a [Science vs. Fire⁵](#) event that showed how two multi-story structures — one coated with BarrierTek's fire protection and the other without — responded to fire. After unleashing one-half megawatt of heat energy to engulf both buildings in flames, the unprotected building quickly reached flashover and was burned to the ground in less than 30 minutes. The protected building burned for more than 35 minutes before the fire department extinguished the flames with minimal property damage. An independent claims adjuster reviewed the damage, finding just \$15,000 in damages in the BarrierTek-protected building, while the other was a total loss.



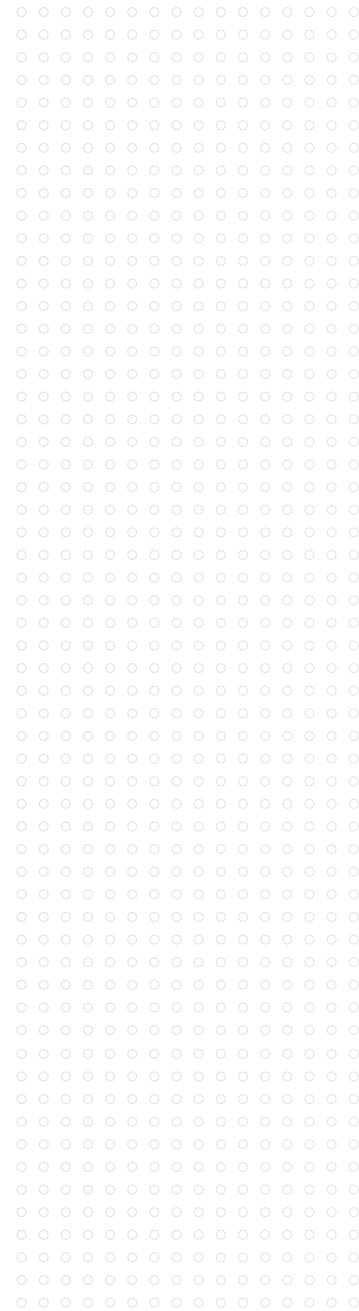
⁵ BarrierTek, [Science vs. Fire](#), accessed January 11, 2023.

SIGNIFICANT BENEFITS TO ENGINEERING OUT EXPOSURES

Catastrophic fire loss for wood-framed COC projects is a significant exposure for property developers, builders and purchasers. Using BarrierTek for wood-framed COC projects has huge benefits to all parties, including:

- **Reduced Insurance Costs.** Insurance for COC projects is a substantial and increasing soft cost for builders and developers. Applying a passive fire-resistive product like BarrierTek reduces the risk of catastrophic loss and may prompt insurance carriers to offer more capacity at lower rates due to the reduced exposure of large losses. This results in potentially lower insurance and soft costs for the developer, builder and even the buyer.
- **Better Insurance Terms and Conditions.** Due to the concern over catastrophic fire losses, many insurance carriers implement “warranties” or requirements that must be met over the life of the project. These can include longer fire watch requirements, additional security measures and more stringent risk management procedures. These measures can increase the cost of projects but may be eliminated in builds where the risk is reliably reduced, such as using BarrierTek coatings on frame components. A recent client who implemented BarrierTek for his project eliminated the need for on-site security guards and, instead, was able to use a remote-monitored security system. The change met all insurance carrier requirements and saved the contractor more than \$150,000 over the course of the project.
- **Enhanced Safety for Adjacent Buildings.** A catastrophic frame fire creates significant heat energy that negatively impacts surrounding buildings. Engineering out a large portion of the fire risk reduces the potential for neighbouring buildings and properties to be affected by any kind of fire event.
- **Improved Site Safety.** Engineering out a major portion of fire risk makes the construction site and the completed building safer for both workers and those who eventually occupy the space. While improving safety is always important, engineering out exposures makes risk management solutions easier to implement and manage.

Reducing risk is a critical goal for HUB International. Course of Construction projects, particularly wood-framed building projects, present a massive catastrophic fire exposure. Taking advantage of fire protection measures, such as BarrierTek’s fire-retardant treatments, present an opportunity to engineer out exposures and significantly change the risk profile for wood-framed construction projects. For property developers and builders, this creates a cost-savings opportunity and the potential for greater return on investment.



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