FIREHARD

WER SELF-ASSESSMENT GUIDE

FOR EXISTING HOMES

What's Your Wildfire Exposure Rating?

A plain-language guide for homeowners to assess wildfire risk, understand what it means for your home and your neighbourhood, and take practical steps to improve your odds.

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This guide is free. It always will be. Because every home that hardens makes every neighbouring home safer.

For new construction, see the separate WER New Construction Design Guide.

DISCLAIMER

This guide is published by FireHard Canada for general educational and informational purposes. It provides technical guidance on wildfire-resistant construction practices based on current Canadian building science, standards, and research. This guide is subject to the following conditions:

Not professional advice: This guide does not constitute professional engineering, architectural, or construction advice. It is not a substitute for the services of a licensed engineer, architect, or other qualified professional. Users should engage qualified professionals for design, specification, and construction of wildfire-resistant assemblies.

Building code responsibility: Building codes, standards, and regulations vary by province, territory, and municipality and are subject to change. This guide references specific code provisions for context but does not warrant that any specification contained herein satisfies the requirements of any specific jurisdiction. Compliance with applicable building codes is the responsibility of the property owner, their design professionals, their contractors, and local building authorities.

Site-specific conditions: The specifications and recommendations in this guide are general in nature. Actual wildfire resistance depends on site-specific conditions including but not limited to: topography, prevailing wind patterns, vegetation type and density, proximity to wildland fuels, local climate, neighbouring structures, and access to fire suppression services. A qualified professional familiar with local conditions should assess the applicability of any recommendation to a specific property.

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No guarantee of wildfire survival: Compliance with the recommendations in this guide does not guarantee that a property will survive a wildfire event. Wildfire outcomes depend on fire intensity, duration, wind

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1. Before You Start: The Honest Truth

IMPORTANT: PLEASE READ THIS FIRST

Wildfire hardening is not fireproofing. No building is fireproof. In extreme conditions, even well-hardened buildings can be lost. The measures in this guide reduce the probability that your home will ignite. They do not eliminate that risk. They are not engineered fire-rated assemblies and do not carry any guarantee of performance.

That said, the research is clear. Studies by the Insurance Institute for Business & Home Safety (IBHS) and the National Institute of Standards and Technology (NIST) consistently show that hardened homes survive wildfire at dramatically higher rates than unhardened homes — even when neighbouring homes burn around them.

Hardening works because it buys your home time. Time for the fire front to pass. Time for the radiant heat from a burning neighbour to peak and then decline as fuel is consumed. Time for the ember storm to subside. A home that can resist 30 to 60 minutes of sustained exposure will often survive because the threat is temporary — the fire moves on.

But your home does not exist in isolation. The biggest challenge in wildfire hardening is not your building — it is your neighbourhood. During a wildland-urban interface fire, an unhardened neighbouring home can catch fire and become a massive fuel source that burns for hours, generating embers and intense radiant heat that test your home's defences from close range. This guide addresses that reality directly in Section 8.

Here is the critical insight: one hardened home in a neighbourhood of unhardened homes has significantly better survival odds. But a neighbourhood where every home is hardened has dramatically better odds — because the fire cascade that destroys communities never starts. This is why our guides are free. Every home that hardens makes every neighbouring home safer.

2. Why This Matters

Canada has no mandatory building standard for wildfire. Our building and fire codes are designed to give people inside a burning building time to get out safely. They are not designed to prevent the building from igniting in the first place.

When wildfire reaches a community, the fire infrastructure we depend on every day — hydrants, pumper trucks, fire departments — is designed to manage one or two structure fires at a time. A wildfire can ignite dozens or hundreds of structures simultaneously. There are not enough trucks, not enough water, and not enough firefighters. Wildland firefighters who respond to forest fires do not have the equipment or training for structure fires.

In a wildland-urban interface event, every building is on its own.

What we need is a system that evaluates a building's risk from wildfire and provides appropriate, affordable solutions — so that each home does not become a structure fire. This is what the Wildfire Exposure Rating (WER) system does.

What the WER system is

WER is a four-level rating that describes the type and intensity of wildfire exposure your home may experience. It is based on the vegetation around your property, the distance to that vegetation, and the slope of the terrain. It then tells you what construction measures your home should have to resist that exposure.

WER-1 (Basic): Embers may reach your home. Basic good practices and maintenance.

WER-2 (Moderate): Embers and moderate radiant heat. Targeted upgrades to the most vulnerable components.

WER-3 (High): Significant ember attack, radiant heat, and flying debris. Comprehensive hardening.

WER-4 (Extreme): Direct flame contact and extreme radiant heat. Professional engineering required.

What the WER system is not

WER is not a building code. It is not mandatory. It is not a guarantee that your home will survive a wildfire. It is a voluntary framework, grounded in the best available research, that gives you clear guidance on what to do and in what order. The underlying research comes from the National Research Council of Canada, the Australian Standard AS 3959, the California Building Code, and IBHS — the same sources used by jurisdictions around the world where wildfire construction standards are mandatory.

3. How This Assessment Works

This guide walks you through three steps to determine your WER level based on your property's vegetation exposure:

Step 1: What type of vegetation is near your home

Step 2: How close it is

Step 3: Whether the ground slopes toward your home

You will then look up your combination in a simple table to find your WER level.

After determining your vegetation-based WER level, Section 8 addresses a fourth factor that most guides ignore: the risk from neighbouring structures. Rather than inflating your WER level (which would place most Canadian homes at WER-4 and render the system useless), we provide a specific set of practical measures for homes built close together — the "CNEL system" — that you apply on top of your vegetation-based WER measures.

THE CONSERVATIVE PRINCIPLE

If you are between two levels in the vegetation assessment, always go with the higher one. It is better to be slightly over-protected than under-protected. You can always reduce your level later if a professional assessment confirms a lower rating — but you cannot undo a fire.

4. Step 1: What's Growing Near Your Home?

Walk around your home. Look at the vegetation within 100 metres (about 300 feet, or roughly the length of a football field) in every direction. What do you see?

Pick the category that best describes the dominant vegetation. If you see a mix, use the most dangerous type that covers a significant area.

Type A: Grass and Low Shrubs

Open areas with grass, crops, low shrubs (under knee height), or bare ground. No significant trees. Includes mowed lawns, agricultural fields, and open meadows.

Fire behaviour: Grass fires produce lower heat and shorter flames than forest fires. But they can move extremely fast in wind — faster than a person can run. The primary threat to your home is embers carried ahead of the fire.

Type B: Scattered Trees or Deciduous Forest

Deciduous trees (birch, aspen, poplar, maple — the kind that lose their leaves) with significant spacing between them. Or a mix of open areas and scattered trees. You can see between the trunks. Also includes orchards and well-maintained parks with mature deciduous trees.

Fire behaviour: Burns with less intensity than coniferous forest. The leaf litter is less flammable and the canopy is less dense. However, deciduous forests still produce embers and radiant heat, especially in drought conditions.

Type C: Dense Coniferous Forest

Coniferous trees (spruce, pine, fir, cedar — evergreens) with canopies that are close together or touching. This is the highest-risk vegetation type in Canada.

Fire behaviour: Produces the most intense fires, the tallest flames, the highest radiant heat, and the most embers. A crown fire in dense conifers can produce heat that ignites buildings 30 metres away and generate embers that travel over a kilometre. This is the dominant fuel type in most of interior British Columbia, northern Alberta, and much of boreal Canada.

Type D: Mixed Forest

A mix of coniferous and deciduous trees. If more than half the trees are coniferous (evergreen), treat this as Type C. If more than half are deciduous, treat this as Type B. When in doubt, treat it as Type C.

Write down your vegetation type: A, B, or C.

5. Step 2: How Close Is It?

Stand at the exterior wall of your home that is closest to the vegetation you identified in Step 1. Measure or estimate the distance from that wall to the nearest edge of the vegetation.

How to estimate distance without a tape measure

One normal adult pace is approximately 0.75 metres (about 2.5 feet). Walk from your wall toward the vegetation, counting paces. Multiply by 0.75 to get metres.

Example: 20 paces × 0.75 = about 15 metres. 40 paces × 0.75 = about 30 metres.

Distance categories

Close: Less than 10 metres (under 13 paces)

Moderate: 10 to 30 metres (13 to 40 paces)

Far: 30 to 100 metres (40 to 133 paces)

Very Far: More than 100 metres (over 133 paces)

MEASURE THE WORST SIDE

Use the shortest distance from any side of your home. If your front yard faces a road and your backyard borders forest 15 metres away, your distance is 15 metres. Fire attacks the weakest point.

Write down your distance: Close, Moderate, Far, or Very Far.

6. Step 3: Does the Ground Slope Toward Your Home?

Fire travels faster and more intensely uphill. If the vegetation is downhill from your home, the fire will arrive faster, the flames will be taller, and the radiant heat will be higher.

Stand where the vegetation is and look toward your house:

Flat or downhill: Your house is at the same level or lower than the vegetation. Lowest-risk slope condition.

Gentle uphill (up to about 15%): Your house is slightly higher. You can tell it's uphill but you would not call it steep.

Moderate to steep uphill (over 15%): Noticeably to obviously steep. Fire intensity can double or triple on steep slopes compared to flat ground.

How to estimate slope

Walk 10 paces (about 7.5 metres) horizontally from the vegetation toward your house. How much did the ground rise?

Knee height (≈50 cm): About 7% — gentle

Waist height (≈1 m): About 13% — gentle

Chest height (≈1.5 m): About 20% — moderate

Above head (≈2 m+): 27%+ — steep

When in doubt, round up.

Write down your slope: Flat/Downhill, Gentle Uphill, or Moderate/Steep Uphill.

Slope Correction and Radiant Heat
Approximate radiant heat thresholds: WER-1 corresponds to less than 10 kW/m² (primarily ember attack). WER-2 corresponds to 10-19 kW/m². WER-3 corresponds to 19-40 kW/m². WER-4 corresponds to greater than 40 kW/m² (direct flame zone). Slope increases the effective radiant heat by increasing flame length and reducing the effective separation distance. These thresholds are aligned with AS 3959 BAL methodology.
The three WER tables in Section 7 already incorporate slope adjustment. The Flat/Downhill table is the base case. The Gentle Uphill table increases levels by approximately one step for closer vegetation. The Moderate/Steep table increases by approximately two steps. If your slope exceeds 20 degrees (36% grade) with dense coniferous fuel within 50 metres, default to WER-4 on the uphill face and seek professional assessment.

7. Find Your WER Level

Use the table that matches your slope. Find your vegetation type across the top and your distance down the left side. The intersection is your WER level.

7.1 Flat or Downhill Slope

Distance ↓ / Veg →	A: Grass	B: Scattered / Deciduous	C: Dense Coniferous
Very Far (>100m)	WER-1	WER-1	WER-1
Far (30–100m)	WER-1	WER-1	WER-2
Moderate (10–30m)	WER-1	WER-2	WER-3
Close (<10m)	WER-2	WER-3	WER-4

7.2 Gentle Uphill (up to 15%)

Distance ↓ / Veg →	A: Grass	B: Scattered / Deciduous	C: Dense Coniferous
Very Far (>100m)	WER-1	WER-1	WER-2
Far (30–100m)	WER-1	WER-2	WER-3
Moderate (10–30m)	WER-2	WER-3	WER-3
Close (<10m)	WER-2	WER-3	WER-4

7.3 Moderate to Steep Uphill (over 15%)

Distance ↓ / Veg →	A: Grass	B: Scattered / Deciduous	C: Dense Coniferous
Very Far (>100m)	WER-1	WER-2	WER-2
Far (30–100m)	WER-2	WER-2	WER-3
Moderate (10–30m)	WER-2	WER-3	WER-4
Close (<10m)	WER-3	WER-4	WER-4

My vegetation exposure WER level: _____

8. The Neighbourhood Factor

The WER level you just determined is based on your vegetation exposure — the type, distance, and slope of wildland fuels near your home. This is your primary wildfire threat. But there is a second threat that most wildfire guides do not adequately address: your neighbours.

8.1 The Problem

During a wildland-urban interface fire, structures that ignite become fuel sources. A burning wood-frame Canadian home — typical vinyl siding, asphalt shingle roof, wood deck, open eaves — generates intense radiant heat and produces embers continuously for hours. This is not theoretical. NIST investigations of the Marshall Fire in Colorado (2021) and the Camp Fire in California (2018) documented that structure-to-structure ignition was a primary mechanism of fire spread through entire neighbourhoods. Homes burned not because the wildfire reached them directly, but because a neighbouring home caught fire first.

The Canadian Building Code includes spatial separation rules that limit how close unprotected walls can be to a property line. But these rules assume a fire department will arrive within minutes to contain a single structure fire. During a wildland-urban interface event, that assumption fails. Fire departments cannot respond to hundreds of simultaneous structure fires. The spatial separation provisions were never designed for this scenario.

In Canadian subdivisions built over the past 35 years, homes are commonly 1.5 to 6 metres apart. Under normal conditions, this is managed by the building code’s spatial separation rules. During a wildfire, it means that if one home ignites, every home within 10 metres is in immediate danger.

8.2 Why Hardening Still Works

This raises an understandable question: if my neighbour’s house is going to burn, what’s the point of hardening mine?

The answer comes from post-fire research. In every major wildland-urban interface fire that has been studied in detail — the Black Saturday fires in Australia (2009), the Waldo Canyon Fire (2012), the Fort McMurray fire (2016), the Camp Fire (2018), the Marshall Fire (2021) — investigators found hardened homes that survived while unhardened homes adjacent to them were destroyed.

Hardening works because a burning building is a temporary exposure. A typical Canadian wood-frame home takes 30 to 90 minutes to progress from ignition to structural collapse. During that time, it produces intense radiant heat and embers. After it collapses and the fuel is largely consumed, the heat output drops significantly. If your home can resist that 30 to 90 minute window of peak exposure without igniting, it will very likely survive.

This is not a guarantee. In extreme conditions — multiple neighbours igniting simultaneously, sustained ember storms, high winds driving flames directly at your walls — even well-hardened homes can be lost. But the probability of survival is dramatically higher for hardened homes than for unhardened homes. Research consistently shows this across every fire event studied.

8.3 The Close Neighbour Exposure Level (CNEL)

If you have neighbouring structures within 10 metres of any wall of your home, apply the following measures on those exposed faces in addition to the measures for your vegetation-based WER level. These are not fire-rated assemblies. They are practical, affordable measures designed to give your home the 30 to 60 minutes of resistance it needs to survive a neighbouring structure fire.

Non-combustible cladding on the exposed face

Replace vinyl or wood siding on walls facing close neighbours with non-combustible cladding: fibre cement board (such as James Hardie), metal panel, or stucco over masonry. Vinyl siding melts and deforms at temperatures well below the radiant heat produced by a burning structure at 6 metres. Fibre cement and metal do not. This is the single most important measure for structure-to-structure exposure.

Type X gypsum board sheathing

Install 15.9mm (5/8") Type X fire-rated gypsum board as sheathing under the exterior cladding on exposed faces. Type X drywall provides approximately 45 minutes of fire resistance before heat penetrates to the framing behind it. This is an off-the-shelf, readily available product that any contractor can install. It is not a formal fire-rated wall assembly — it is an additional layer of protection that significantly increases the time your wall can resist radiant heat from a burning neighbour.

Protected soffits and fascia

Enclose all soffits on exposed faces with non-combustible material (fibre cement or aluminium soffit). Replace wood fascia with aluminium-wrapped or fibre cement fascia. The soffit-fascia-eave junction is one of the most vulnerable points on your home — heat and embers from a burning neighbour rise and attack the eave from below. Unprotected wood soffits can ignite in minutes under moderate radiant heat.

Managed attic ventilation

Replace soffit and gable vents on exposed faces with ember-resistant vents tested to ASTM E2886. Consider baffled vent designs that prevent ember entry while maintaining adequate ventilation. During a neighbouring structure fire, your vents face sustained ember and heat exposure from close range. Standard vents allow embers to enter the attic space where they can ignite framing and insulation.

Wildfire shutters on all openings facing the neighbour

Install wildfire roller shutters on every window and door on walls facing close neighbours. Windows are the weakest point in any wall — single-pane glass can crack at radiant heat exposures well below what a burning structure at 6 metres produces. Even dual-pane tempered glass has limits. Shutters create a continuous metal barrier across the opening that reflects radiant heat, blocks embers, and resists flying debris. When your neighbour’s home is burning 4 metres away, shutters may be the difference between your windows holding and your home being lost.

Non-combustible ground cover in the gap

Replace any combustible material in the space between your home and your neighbour’s with non-combustible ground cover: gravel, concrete, stone, or bare mineral soil. Remove any

combustible fencing in the gap. Clear any storage, vegetation, or debris. The gap between buildings is the fire pathway — anything combustible in that space accelerates the transfer of fire from one structure to another.

ESTIMATED COST: CLOSE NEIGHBOUR PACKAGE

For a single exposed face of a typical home (30–40 linear feet): Non-combustible cladding: $3,000–$8,000. Type X gypsum sheathing: $500–$1,500. Soffit and fascia: $500–$1,500. Ember-resistant vents: $200–$600. Wildfire shutters: $2,000–$6,000. Ground cover: $200–$500. Total: approximately $6,000–$18,000 per exposed face. This is not trivial. But it is substantially less than losing your home.

8.4 Community Hardening: The Most Effective Strategy

Everything above describes what you can do individually. But the most effective strategy for structure-to-structure fire risk is not individual hardening — it is community hardening.

When one home in a neighbourhood is hardened, it improves that home's survival odds significantly. When every home is hardened, it transforms the entire neighbourhood's survival odds — because the fire cascade never starts. If your neighbour's home is hardened, it is far less likely to ignite. If it does not ignite, it does not threaten yours. And if your home is also hardened, it does not threaten theirs. Each hardened home protects its neighbours. The effect is multiplicative, not additive.

This is the strongest argument for free, accessible wildfire hardening guidance. The more homes that implement even basic WER-1 measures — clearing debris, replacing mulch with gravel, maintaining eaves — the lower the probability that any one home ignites and starts the cascade.

What you can do:

Talk to your neighbours. Share this guide. The most important conversation is not about building codes — it is about collective action. If you and your three closest neighbours all clear your Zone 1A and install ember-resistant vents, the entire cluster is dramatically safer.

Pursue FireSmart neighbourhood recognition. FireSmart Canada offers a neighbourhood recognition program that provides structure, guidance, and support for community-level wildfire preparation. Visit firesmartcanada.ca.

Engage your local government. Some BC municipalities (Lytton, West Kelowna, Logan Lake) have adopted WUI construction requirements based on the NRC Guide. Community-level adoption of wildfire construction standards is the single most effective policy intervention for reducing WUI fire losses.

Support community vegetation management. Fuel management on public land and rights-of-way reduces the intensity of wildfire approaching the community, which reduces the probability that any structure ignites in the first place. Advocate for community-level fuel management programs through your local government.

THE MULTIPLICATION EFFECT

If a hardened home has a 70% chance of surviving a wildfire event, and an unhardened home has a 10% chance, then a neighbourhood of 10 unhardened homes has a very high probability of cascading structure-to-structure loss. But a neighbourhood of 10 hardened homes has a dramatically lower probability of any cascade occurring — because each home's hardening reduces the probability that it becomes the fuel source that threatens its neighbours. Community hardening is exponentially more effective than individual hardening.

9. Retrofit Actions by WER Level

The following actions are organised from lowest cost to highest cost within each level. Start at the top. Every item you complete reduces your risk. You do not need to do everything at once.

For detailed technical specifications, material options, and product recommendations, download the free Construction Detail Guides (1–5) at firehard.ca. If your assessment identified close neighbours (within 10 metres), also apply the CNEL system from Section 8.3 to the affected faces.

9.1 WER-1 (Basic): Start Here Regardless of Your Level

Good practice for every home in or near wildfire-prone areas. Most measures cost nothing.

Free ($0)

Clear your roof and gutters. Remove leaves, needles, branches, and debris. Debris in gutters is one of the most common ignition points.

Clear debris from your deck. Sweep between deck boards and at the wall-to-deck junction. These are the two most common deck ignition points.

Move combustible items 1.5 metres from walls. Firewood, lumber, recycling bins, furniture cushions, welcome mats. This is FireSmart Zone 1A.

Clear under your deck. Remove plants, leaf litter, and debris from the space under your deck.

Low Cost ($100–$500)

Gravel within 1.5 metres. Replace mulch, bark, or vegetation with 75mm gravel. ~$50–80 per cubic yard, covers ~8 m².

Metal drip edge. Protect exposed wood at roof edge. $100–$300 for a typical home.

Moderate Cost ($500–$2,000)

Enclose open eaves. Non-combustible soffit (fibre cement or aluminium). Seals critical ember entry. $500–$2,000.

Verify Class A roof. Most modern asphalt shingles and all metal roofing are Class A. If your roof is wood shakes, replacing it is the single most impactful upgrade.

9.2 WER-2 (Moderate): Targeted Hardening

Everything in WER-1, plus:

$100–$500

Seal all gaps to 3mm. Non-combustible caulk or metal flashing at soffits, fascia, wall-roof, wall-foundation, and penetrations. Embers enter through 3mm gaps.

Foil-tape deck joists. Foil-faced flashing tape on joist tops. Prevents ember gap fires from reaching the joist. $50–$150.

Metal flashing at deck-wall junction. Aluminium or galvanised angle. $100–$300.

$500–$2,000

Ember-resistant vents. Replace all vents with ASTM E2886 tested units. $40–$120 each, 6–12 vents typical.

Metal gutters with guards. Replace vinyl gutters. Add non-combustible guards. $500–$1,500.

Non-combustible fence section. Replace first 2.4m (8 ft) of any fence attached to building with metal. $200–$500 per connection.

$2,000–$10,000

Wildfire shutters on exposed faces. Ember protection, radiant heat reduction, debris resistance. Prioritise faces with vegetation or close neighbour exposure. See firehard.ca.

9.3 WER-3 (High): Comprehensive Hardening

Everything in WER-1 and WER-2, plus: Professional assessment recommended.

$1,000–$5,000

Non-combustible deck framing. Steel or aluminium joists/beams. The single most important factor in deck fire (IBHS).

Full sarking. Self-adhering underlayment over entire roof deck. $1,000–$3,000 at next re-roof.

$5,000–$20,000

Non-combustible cladding. Replace vinyl or wood siding. Fibre cement, metal panel, or masonry.

Wildfire shutters on all vulnerable openings. All windows and doors on exposed faces.

≤2mm mesh on all openings. Vents, weep holes, and any gap. Non-combustible, corrosion-resistant.

Fire-resistant wall assemblies. Type X gypsum, mineral wool insulation, non-combustible rain screen. P.Eng. to specify.

$10,000–$30,000+

Non-combustible deck surface. Aluminium, pavers, or stone. $15–$45/sq ft.

Non-combustible fencing within 3m. Steel panel, aluminium, masonry. $2,000–$10,000.

9.4 WER-4 (Extreme): Professional Engineering Required

P.ENG. ASSESSMENT REQUIRED

Do not attempt WER-4 hardening without professional engineering. Contact Bulkley Valley Engineering Services Ltd. (EGBC Permit No. 1001683) or another qualified P.Eng.

Performance targets: Fire-rated shutters on all openings. Non-combustible construction throughout. FRL –/30/– wall assemblies on exposed faces. BAL-40/FZ equivalence. Site-specific engineering for each face.

Estimated cost: $30,000–$100,000+. Some sites may not be cost-effective to harden. A P.Eng. assessment will provide an honest evaluation.

NOT EVERY HOME CAN BE SAVED

Some locations present extreme exposure. A responsible assessment will tell you this honestly. In some cases, the most rational investment is community-level mitigation rather than extreme individual hardening. Accepting that not every home can be economically hardened to survive every fire is part of an honest conversation about wildfire resilience.

10. Two Assessment Pathways

Self-Assessment (Free)

What you have just completed. Appropriate for most homes at WER-1 and WER-2. You can begin implementing measures immediately using the free guides and modules at firehard.ca.

Limitations: simplified vegetation categories, estimated distances, no micro-topography, no detailed wind analysis, no detailed neighbouring structure analysis. Deliberately conservative.

Professional P.Eng. Assessment

A registered Professional Engineer conducts a site visit and produces a stamped WER report with:

Confirmed WER level for each face individually

Neighbouring structure analysis — detailed evaluation of structure-to-structure risk

Prioritised retrofit plan ranked by cost-effectiveness

Contractor-ready specifications

Cost estimates for each measure

Recommended for WER-3. Required for WER-4. Also valuable for complex exposures, insurance documentation, and real estate transactions.

Available through: Bulkley Valley Engineering Services Ltd. (EGBC Permit No. 1001683)

Landscape design add-on: Lazzarin Svisdahl Landscape Architects

Contact: firehard.ca

11. Where This Comes From

The WER system is adapted from established, peer-reviewed frameworks:

National Research Council of Canada (NRC): Bénichou, N., et al. (2021). National Guide for Wildland-Urban Interface Fires. NRC: Ottawa. 192 pp. Free at nrc-publications.canada.ca.

AS 3959:2018 (Australia): Construction of Buildings in Bushfire-Prone Areas. Mandatory since 2009. Six-level BAL system.

California Building Code Chapter 7A: Materials and Construction Methods for Exterior Wildfire Exposure.

IBHS Wildfire Prepared Home: Research-based standard. 1.5m non-combustible zone, deck fire research, component testing.

NIST Technical Note 2228: Butler, K.M., et al. (2022). 187 fence fire experiments.

NIST Post-Fire Investigations: Maranghides, A., et al. Marshall Fire and Camp Fire. Structure-to-structure ignition documentation.

FireSmart Canada: Vegetation management and community preparation. firesmartcanada.ca.

Verification Pathways

The WER system recognizes three pathways to meet each specification. This mirrors how building codes work — a prescriptive path for straightforward compliance, and alternative solution paths for flexibility.

Deemed-to-Satisfy

Materials and assemblies explicitly named in the FireHard specification. If the design guide lists it, it meets the standard. Example: fibre cement panel, metal cladding, stucco, or masonry all satisfy “noncombustible cladding (or engineered equivalent)” without further testing.

Tested Equivalent

Products tested to the referenced standard by a recognized testing laboratory. The manufacturer’s test report is the evidence of compliance. Example: an ember-resistant vent not listed in this guide but tested to ASTM E2886 by an accredited lab meets the WER-2 vent specification.

Engineered Alternative

A P.Eng. assessment demonstrating equivalent performance through analysis. The engineer’s sealed report is the evidence. Example: a heavy-timber fence post (140×140mm minimum) may satisfy the WER-2 fencing specification through charring rate analysis, even though it is not noncombustible.

Fire-Rated Timber

Where a specification says “NC or fire-rated,” fire-rated timber is an acceptable alternative when it meets minimum section dimensions. Large-section timber chars at a predictable rate (approximately 0.65mm/min for softwood per Eurocode 5) and can maintain structural integrity for defined periods. For fencing, outbuilding framing, and deck substructure, timber sized to resist ignition for the design fire exposure period is acceptable at WER-1 through WER-3. Minimum section dimensions are specified in the relevant design guides. At WER-4, all exterior materials must be noncombustible — no timber alternatives.

Close Neighbour Exposure Level (CNEL)

Most Canadian subdivision homes are built 1.5–6 metres apart. If any face of your home is within 10 metres of a neighbouring structure, the CNEL system applies to that face. Measures scale with WER level. See the CNEL section in each FireHard design guide and Construction Detail Guide 6 for full technical details.

Important: Hardening Is Not Sheltering in Place

Hardening your home does not mean you should stay in it during a wildfire. Hardening and evacuation are complementary — not alternatives.

When an evacuation order is issued by your local authority, you must leave. What hardening does is allow you to evacuate with confidence that you have done everything within your control to give your

home the best chance of surviving while you are safely away. A hardened home does not need you in it to function.

Always follow evacuation alerts and orders from the appropriate authorities. Leave early. Trust the hardening you have invested in. Come back when authorities say it is safe.

12. About FireHard

FireHard is the public-facing brand of Wildernest Systems Inc., a Canadian company focused on wildfire hardening for residential buildings.

Free resources: Self-assessment guides, five Construction Detail Guides, FireHard Design Guides. All free at firehard.ca.

Products: Fire Hard exterior manual roller shutters.

Professional services: P.Eng. WER assessments through Bulkley Valley Engineering Services Ltd. (EGBC Permit No. 1001683).

Landscape architecture: Defensible-space design through Lazzarin Svisdahl Landscape Architects.

Contact: firehard.ca

DISCLAIMER

This guide provides general information about wildfire risk reduction for residential buildings. It is not professional engineering advice. The measures described reduce the probability of building ignition but do not guarantee survival in a wildfire event. No building is fireproof. Wildfire behaviour is unpredictable and influenced by factors beyond any individual homeowner's control. For site-specific professional assessment, contact a qualified Professional Engineer. Wildernest Systems Inc. and Bulkley Valley Engineering Services Ltd. accept no liability for losses arising from the use of this guide.

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