THE RESILIENCY COMPANY

Rebuilding with Resilience

A practical guide to designing and rebuilding homes for wildfire-prone environments



archi craft

Author:
Marija Volkman, Archicraft
In collaboration with The Resiliency Company
Informed by IBHS Wildfire Prepared Home™ standards

THE RESILIENCY COMPANY | archi craft

May 2026.

Marija Volkman

Licensed Architect, State of California

This information is provided for educational and informational purposes only and is not a substitute for professional advice regarding legal, engineering, insurance or fire-risk. You are responsible for consulting qualified professionals when making decisions about any construction project. The authors do not warrant the accuracy, or completeness of the information provided here, or whether the information provided is relevant to your project

A Note from the Author

The January 2025 wildfires changed Los Angeles forever.

Like many architects, builders, and homeowners, I spent the months that followed helping people navigate an overwhelming rebuilding process—insurance claims, permitting, design decisions, construction costs, changing regulations, and countless questions about how to rebuild safely and responsibly.

One question came up repeatedly:

If we are rebuilding anyway, how can we build better?

As our office worked on post-fire rebuilding projects, we found ourselves studying not only the rebuilding process itself, but also the growing body of research on wildfire resilience. We spoke with homeowners, builders, engineers, manufacturers, and resilience experts. We reviewed emerging policies, evolving building requirements, and real-world lessons from communities that had rebuilt before us.

What became clear was that resilience is not a single product, material, or construction detail. It is the result of hundreds of decisions made throughout the design, construction, and maintenance of a home.

This guide was created to help homeowners better understand those decisions and navigate the rebuilding process with greater confidence. My hope is that it serves as a practical resource, helping you ask better questions, make informed choices, and create a home that is not only beautiful and functional, but better prepared for the future.

Who We Are

Archicraft is an architecture and development studio with offices in Los Angeles and Prague. Our work spans custom homes, multifamily housing, adaptive reuse, feasibility studies, and post-disaster rebuilding. Following the 2025 Los Angeles wildfires, we became deeply involved in helping homeowners navigate the complex path from loss to rebuilding, while also researching and implementing wildfire-resilient design strategies.

We believe resilient homes should not feel like fortresses. They should be beautiful, comfortable, durable, and designed around the people who live in them.

Marija Volkman
Founder & Principal Architect
Archicraft
www.archicraft.co

TABLE OF

CONTENTS

CHAPTER 1: About This Manual	05
CHAPTER 2: How Homes Burn	15
CHAPTER 3: Layered Defense-Overall Strategies	23
CHAPTER 4: Layer 1-Site +Landscape	26
CHAPTER 5: Layer 2-Building Envelope	35
CHAPTER 6: Integration And Maintenance	53
CHAPTER 7: Case Studies	56
CHAPTER 8: Wildfire Prepared Home Designation Process	64
CHAPTER 9: Appendices + Resources	67
Project Team + Acknowledgments	72

A note from the Resiliency Company

In the wake of the Los Angeles fires in January 2025, people said, “We will rebuild.” This statement, often made after disasters, speaks to our extraordinary resilience. But as we reckon with the fact that our weather patterns have fundamentally changed, the conversation must shift from whether we rebuild to how we rebuild. We can restore exactly what was there before, or we can proactively adapt to the increased risk of wildfires.

The good news is we already know how to protect our homes and communities. The Insurance Institute for Business & Home Safety (IBHS) has established evidence-based wildfire resilience standards – the challenge is in applying these standards to rebuilds. This guide seeks to help the home building system we have today build the homes we need for tomorrow.

Since the fires, we’ve been in Los Angeles. Our focus has been on the technical systems that build and maintain homes, but we are well aware of the broader emotional and financial challenges homeowners are facing in rebuilding. We are inspired and amazed by the many ways communities have come together to support each other and are honored to be helping where we can, creating the Resilient Delta Fund, providing a source of capital for lenders and grantmakers to support homeowners in making their houses more resilient and more insurable.

While this guide was created to support the rebuilding efforts in Los Angeles its principles apply to homeowners, architects and builders across the country. It is designed for anyone working to build a more resilient future because while the next fire may be inevitable, its destruction is not.

Abby Ross, CEO, The Resiliency Company

THE RESILIENCY COMPANY

CHAPTER 1

About This Manual

About This Manual

This manual is a practical, design-forward guide for wildfire-resilient new residential construction, grounded in research by the Insurance Institute for Business & Home Safety (IBHS) and validated by on-the-ground post-fire investigations of major wildfires such as Los Angeles and other high-risk regions.

Expert Insight

> *Rebuilding with resilience is an investment that should give homeowners confidence that their new home is not only more insurable but more durable and resilient in the face of any future wildfires."*
>
> **Jasmin Shupper,**
> Founder & CEO, Greenline Housing Foundation

It was written to bridge a persistent gap:

The gap between wildfire science, building codes, and what gets built.

Rather than listing isolated requirements, this manual organizes wildfire mitigation as a coordinated system: from site planning and exterior assemblies to details that are often overlooked until it's too late. The goal is not just compliance, but also transparency: helping teams and homeowners understand why certain decisions matter, when they matter, and how they impact long-term risk, insurability, and performance.

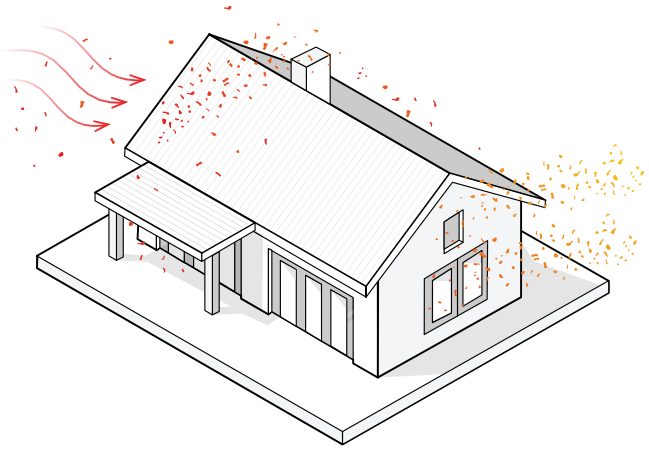
This document is intentionally prescriptive where necessary, and explanatory where understanding leads to better outcomes.



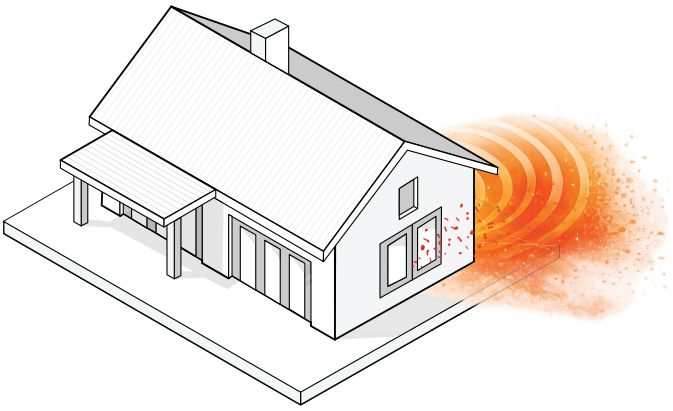
Why Wildfire-Resilient Design Matters

Wildfires no longer behave like the events for which many building standards were written.

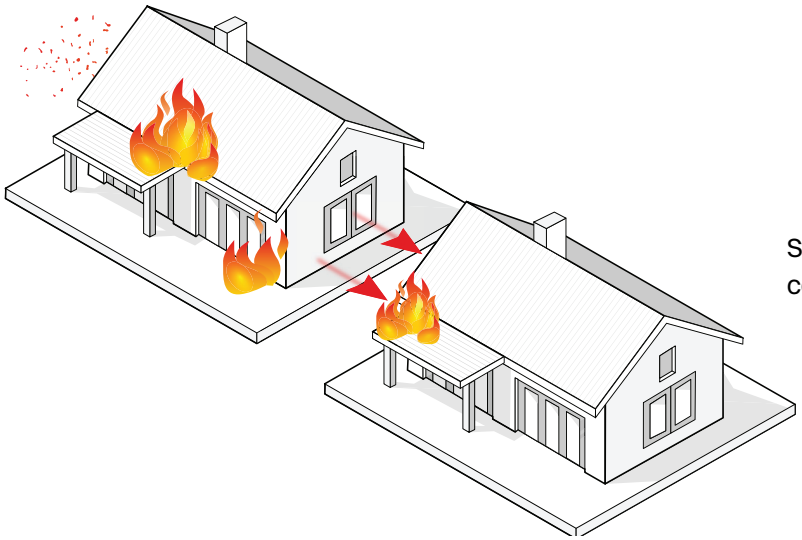
Today's losses are driven by:



Wind-borne embers traveling miles ahead of the fire front.



Direct flame impingement, and radiant heat that overwhelms vulnerable materials.



Structure-to-structure ignition in compact neighborhoods.

Post-fire investigations consistently show that homes rarely ignite because a wall of flame reaches them. They ignite because embers exploit weaknesses: open vents, combustible decks, debris-filled gutters, and fencing that carries fire directly to siding.

In this context, wildfire resilience is not a landscaping issue or a materials challenge.

It is a design problem.

Homes that survive do so because ignition pathways were interrupted. Homes that fail do so because they typically fail at predictable locations. The difference is rarely luck; it is design and preparation.

Who Is This Document For

This manual is written for new construction, including post-fire rebuilds that qualify as new builds.

It is intended for:

Homeowners rebuilding after wildfire.

Architects and designers working in fire-prone regions.

Builders and developers planning new residential projects.

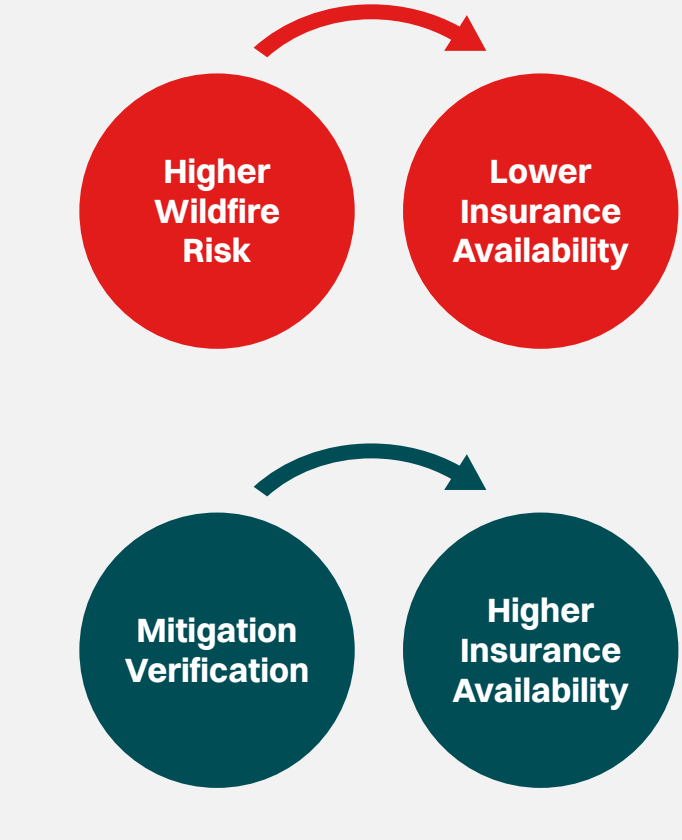
Project teams seeking alignment with IBHS Wildfire Prepared Home™ standards

It is not intended for retrofits.

Wildfire-resilient design relies on:

1. Early coordination across disciplines
2. Assembly-level decisions
3. Strategic choices about form, spacing, and materials

New construction is the best opportunity to build in resilience. Adding it after the fact is costly, complicated, and limited by the original design.





Rendering provided by archicraft

Why People Build This Way Now (Insurability, as well as Survivability)

For many homeowners, the urgency around wildfire-resilient design is no longer theoretical. It is financial and immediate.

Across California and other wildfire-exposed regions:

- Insurance carriers are reducing coverage or exiting markets.
- Insurance premiums are increasing dramatically.
- Insurance eligibility is tied to documented mitigation, not assumptions.

Meeting **minimum code requirements does not guarantee coverage.** Increasingly, insurers want evidence that a home is less likely to ignite, less likely to spread fire, and more likely to survive extreme conditions.

Design approaches that align with IBHS research:

01	Address the dominant ignition mechanisms.
02	Demonstrate risk reduction beyond code minimums.
03	Support underwriting decisions and long-term insurability.

Wildfire-resilient design is now not just a safety upgrade but a basic financial necessity for building.

Timeline: When Decisions Matter

The best time to think about wildfire resilience is at the beginning of the design process, during concept development and site planning.

Early decisions about building placement, orientation, spacing, and slope relationships shape exposure long before materials are selected. **When resilience is integrated from the start, it is more efficient,** more cost-effective, and more holistic.

That said, homes can still achieve high levels of wildfire resilience even when early choices are constrained. Where site or massing flexibility is limited, later design and material decisions play a critical role in meeting or exceeding wildfire-resilience standards.

Concept & Site Planning

- Building placement and orientation
- Distance to neighbors and accessory structures
- Slope relationships and defensible space feasibility

Schematic Design

- Roof geometry and materials
- Eave enclosure
- Decks, projections, and overhangs
- Exterior wall system strategies

Design Development

- Vent types and locations
- Window and door specifications
- Interface conditions between assemblies

Construction Documents

- Assembly coordination
- Transition details
- Alignment with IBHS requirements and verification pathways

Integrating wildfire resilience early is typically more efficient and cost-effective. Selecting the right materials and assemblies at the outset avoids costly replacements later and ensures systems work together as intended.

Wildfire resilience is strongest when planned early, but meaningful improvements can be made at every stage.

How to Use This Manual

This guide is organized to follow the logic of wildfire exposure rather than the order of a building code.

Early chapters explain how wildfire threatens homes: through embers, radiant heat, and flame contact. Later chapters translate that understanding into coordinated design and construction strategies.

Wildfire resilience begins by understanding how fire behaves around structures. Only then can we design homes that resist ignition rather than simply comply with minimum code requirements.

Requirements throughout this manual are framed in relation to **IBHS Wildfire Prepared Home™** standards, with an emphasis on clarity, coordination, and system performance.

You do not need to memorize standards to use this manual. You need to understand how fire works, and how buildings respond.



Rendering provided by archicraft

IBHS Wildfire Prepared Home™ Designations — Context for This Manual

The Insurance Institute for Business & Home Safety (IBHS) administers the Wildfire Prepared Home™ program, a research-based framework that evaluates how well a structure is designed, built, and maintained to reduce wildfire risk.

IBHS designations are performance-based, focusing on how structures ignite and fail during wildfire events, particularly through embers, radiant heat, and structure-to-structure fire spread.

This manual aligns with IBHS research and terminology but is not a certification guide.

Two Relevant Designation Levels

IBHS currently recognizes two residential designation levels relevant to new construction and rebuilds:

Wildfire Prepared Home™ (“Base”)

Establishes a baseline level of wildfire resilience

Appropriate for retrofits

Focuses on defensible space and ember-resistant building features

Wildfire Prepared Home Plus™ (“Plus”)

Establishes a higher level of resilience, including flames and radiant heat as well as embers

Preferred standard in new construction

Increases focus on defensible space and reduced connective fuels

Imposes stricter control of ignition pathways

How This Manual Uses These Terms

Throughout this manual:

"Base" means Wildfire Prepared Home

"Plus" means Wildfire Prepared Home Plus

Every structure can achieve Plus-level performance. Lot size, however, can be a challenge to meeting Plus-level designation due to separation requirements between structures on the same lot. Similarly, grandfathered setbacks can create a challenge to meeting Plus-level distances between neighboring structures.

Understanding the distinction between Base and Plus performance and the role of structure separation early in the design process allows teams to make informed decisions about layout, massing, accessory structures, and material strategies before constraints become irreversible.

Early clarity improves both performance and cost efficiency.

Important Note

Design intent alone does not guarantee IBHS certification.

Certification is granted only after construction is complete, and compliance has been verified through documentation and inspection. Performance must be demonstrated.

IBHS designation also requires ongoing property and building maintenance. A home that is properly constructed but poorly maintained may lose its eligibility over time.

IBHS Wildfire Prepared Home™ standards are performance-based and continue to evolve as wildfire research advances. Successful projects require coordination between designers, builders, and property owners to ensure that both construction and maintenance align with the standard.

Certification reflects verified performance; design intention alone is not enough.



Rendering
provided by archicraft



What Comes Next

The next chapter explains how wildfires actually ignite homes, breaking down ember exposure, radiant heat, direct flame contact, wind effects, and fuel exposure.

It is essential to understand the threat before discussing materials or design decisions, because once you understand how homes ignite, building the IBHS standard in wildfire-prone areas is no longer optional – it is necessary.

THE RESILIENCY COMPANY

CHAPTER 2

Understanding Wildfire Exposure

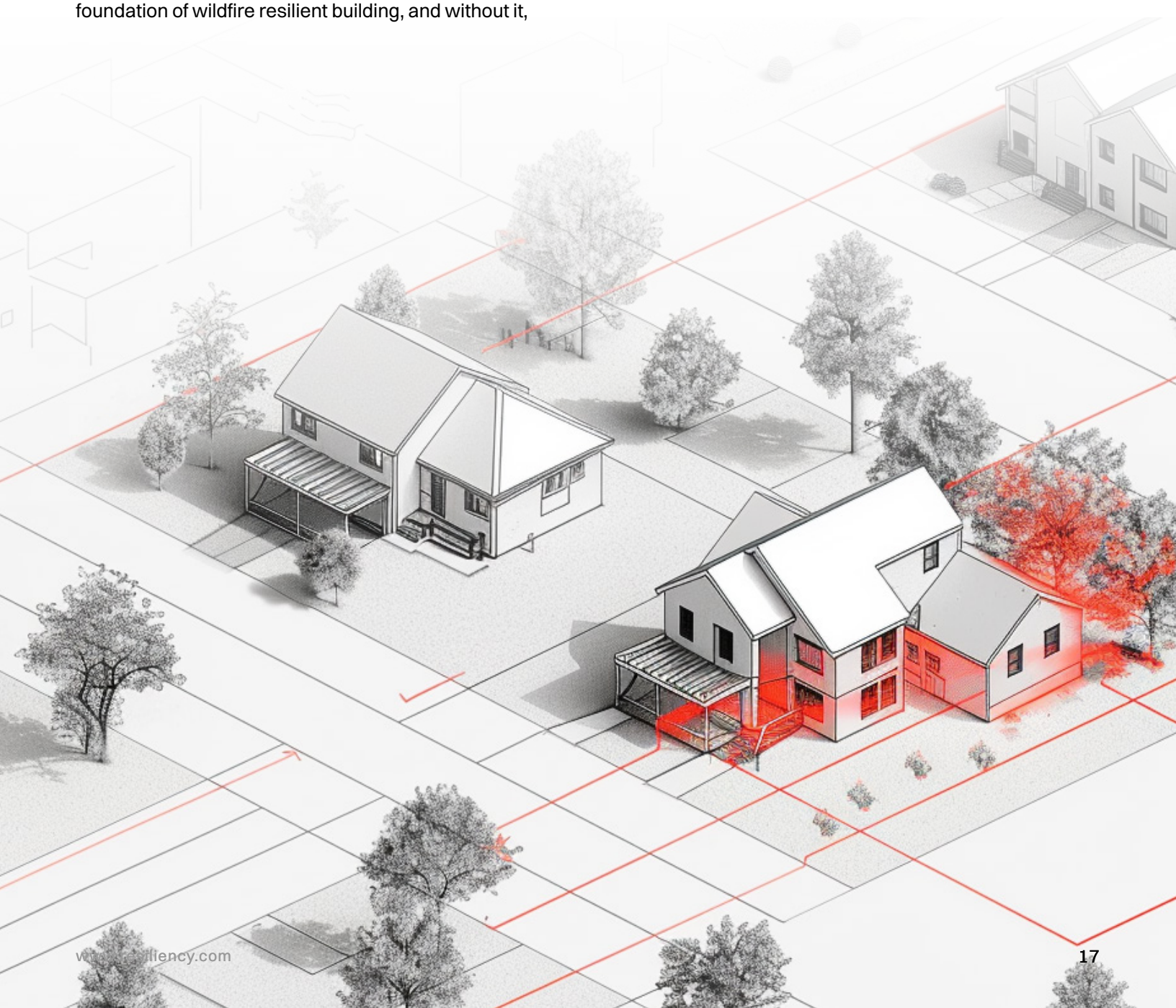
How Homes Burn:
Understanding Wildfire Exposure

Wildfires that destroy homes today are not primarily driven by towering flames rolling through forests.

Wind, embers, and structure-to-structure ignition drive them.

Understanding how homes ignite is critical. It is the foundation of wildfire resilient building, and without it, wildfire resilience becomes a checklist exercise, often expensive, incomplete, and ineffective.

This chapter explains the **three primary exposure mechanisms** that cause a home to ignite and explains the dynamics of modern urban fires and why current code requirements are no longer enough.



2.1 The Three Ways Homes Ignite

Wildfire exposure unfolds in sequence.

Wind carries embers far ahead of the flame front. Those embers land on structures and surrounding materials, searching for vulnerabilities. When ignition occurs, vegetation around homes, combustible structures in yards, fences, and buildings themselves become fuel, increasing heat and accelerating spread from one structure to the next.

By the time flames reach a neighborhood, home ignition may already be underway.

The following sections break down the three primary exposure mechanisms that drive this process.

2.1.A Wind-Driven Embers - Primary Cause of Home Loss

Embers lead the charge.

Carried by the wind, they travel miles ahead of the visible fire. They do not move like a wall of flame; they move as a storm of ignition sources, scattering across rooftops, decks, vents, vegetation and fences.

They look for weaknesses. They exploit small gaps, joints, and combustible surfaces.

Expert Insight

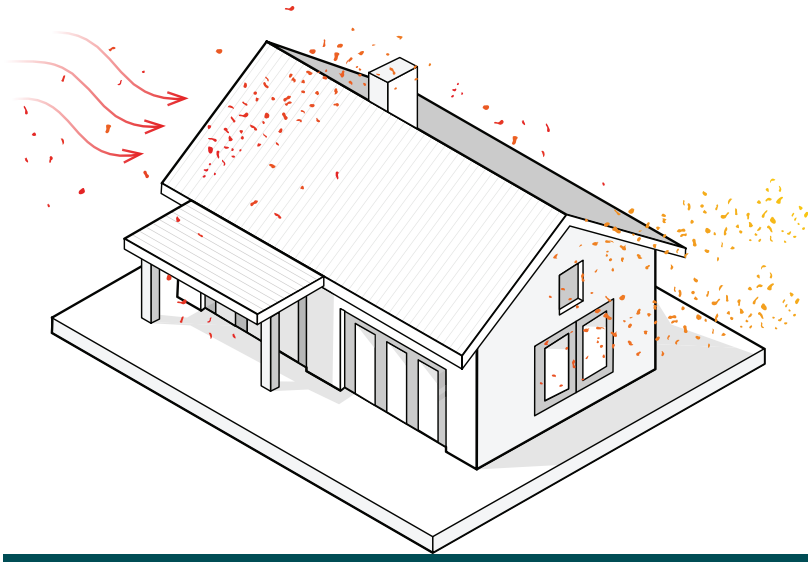
> *We believe that these types of [resilience] investments will support the affordability and availability of insurance over time."*

Victor Joseph,
President and COO, Mercury Insurance

Common ember entry points include:

1. Roof edges and debris-filled gutters
2. Vents and open eaves
3. Deck surfaces and under-deck areas
4. Base of exterior walls
5. Fences, pergolas, and attached structures

Most homes do not ignite because a flame front touches them. They ignite because embers accumulated in a vulnerable location and found something that could burn. If embers land and can remain in place long enough, they can heat a material to ignition. This process begins quietly, often unseen.



Key takeaway:
If embers land and can accumulate, ignition is possible.

2.1.B Direct Flame Contact – Escalation

If an ember ignites a fence, a hedge, a deck surface, or stored material, exposure to flames follows. These flames burn slowly, close to the house and are rarely a towering inferno. Fire does not need to be intense to be dangerous. It needs proximity and time.

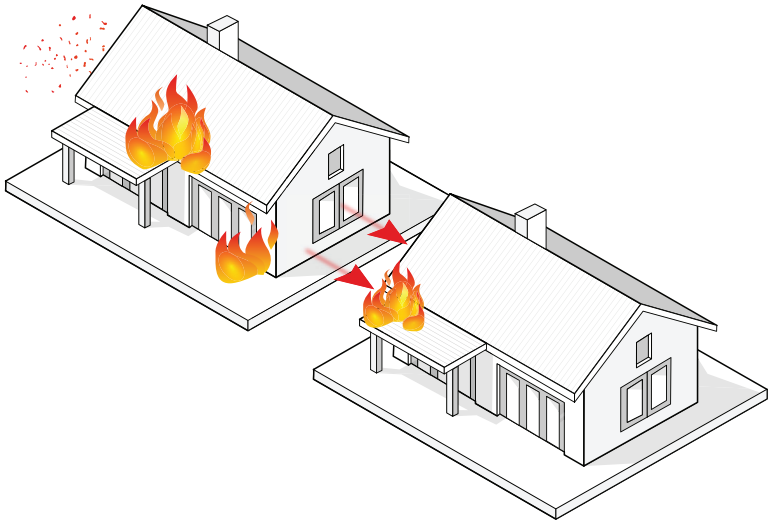
Direct flame contact typically occurs when:

- Vegetation, fences, or accessory structures ignite
- Fire spreads via connective fuels to the home
- Structures are placed too close together and one ignites as winds stretch flames

In dense neighborhoods, where homes are closely spaced, or fencing runs uninterrupted between properties, flame spread becomes structure-to-structure ignition. **At this stage, what began as scattered ember ignitions becomes continuous fire.**

This is especially dangerous in:

1. Dense residential neighborhoods
2. Hillside developments, where wind accelerates uphill, and flames preheat structures above the fire
3. Areas with parallel fencing or attached decks



Key takeaway:
Flame exposure risk is determined less by peak fire intensity and more by how long combustible materials burn in direct contact with the structure.

2.1.C Radiant Heat – The Multiplier

Radiant heat is energy transferred through space. It does not require flames to touch the structure.

When a nearby building, deck, or vegetation burns, it emits intense thermal radiation. That energy travels outward and is absorbed by surrounding surfaces. As surfaces absorb heat, their temperature rises.

At elevated temperatures:

1. Glass can crack or shatter
2. Vinyl components can soften and deform
3. Sealants and weather barriers can fail
4. Combustible materials can dry, preheat, and eventually ignite

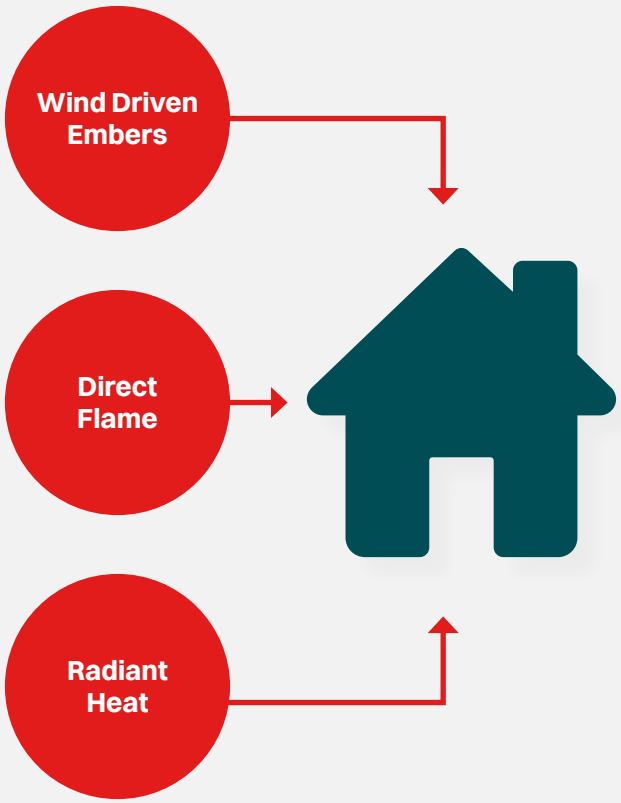
Exterior glass can fail at temperatures well below direct flame contact. Vinyl framing can begin to deform at temperatures far lower than ignition. Once materials soften or crack, new gaps and vulnerabilities are created — allowing embers or flame to enter.

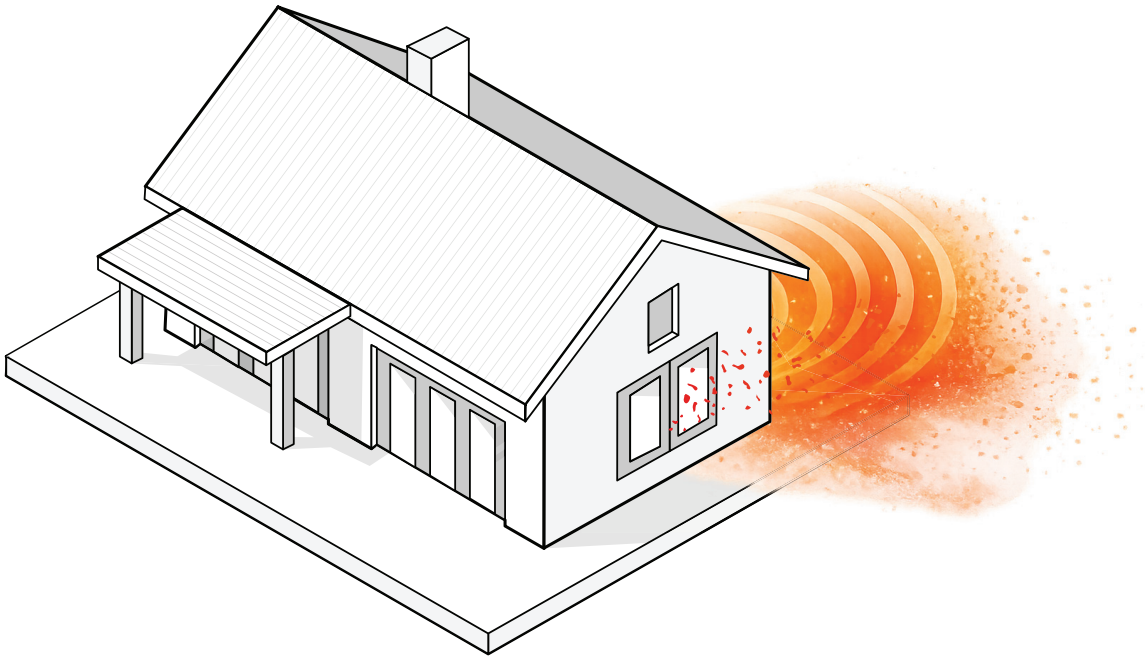
Radiant heat exposure increases significantly when:

1. Homes are closely spaced
2. Large combustible surfaces face each other
3. Combustible vegetation and materials are closely spaced around homes

Radiant heat does not need to ignite a structure on its own to be dangerous. It can weaken defenses, lower ignition thresholds, and prepare materials for failure. In dense residential areas, **one burning structure becomes a heat source for adjacent buildings.** Radiant heat turns a single ignition into multiple simultaneous exposure events.

The Three Ways Homes Ignite





Key takeaway:
Radiant heat is a multiplier; it turns nearby fires into structure-level threats.

2.2 From Exposure to Spread: The Role of Fuels

Fuel in wildfire events is not limited to vegetation. Once fire reaches residential areas, homes and their immediate surroundings become the primary fuel source.

Elements such as decks, fences, exterior wall finishes, attached structures, stored items, and nearby accessory buildings create **continuous pathways that allow fire to spread from the landscape to the structure,** and from one structure to the next.

These pathways, commonly referred to as **connective fuels,** enable wind-driven embers and flames to move efficiently through residential areas. Even small combustible elements can link larger fuel sources, turning isolated ignitions into structure-to-structure fire spread.

Most large residential **losses result from a chain of connected ignitions** rather than a single point of failure.

2.3 Wildfire vs. Urban Structure-To-Structure Fire Spread

Modern wildfire losses are increasingly **structure-to-structure fire spread, not isolated wildland events.** When fire reaches a neighborhood, the fuel source changes. The wildland is no longer the primary threat; the home next door is.

Once a single structure ignites, it becomes a concentrated fuel source producing embers, flames, and radiant heat. That exposure spreads laterally, upward, and across property lines. **Wind-driven fire behaves like a chain reaction.**

When fire enters a neighborhood:

1. Wildland fuels are replaced by urban fuels
2. Burning homes generate new ember storms
3. Fences, decks, accessory structures and vegetation transmit fire between properties
4. Radiant heat from one structure ignites siding, eaves, and breaks windows in another

IBHS field investigations show that:

1. Homes that survive interrupt structure-to-structure spread
2. Space between buildings matters as much as materials
3. Individual building performance directly influences neighborhood fire spread
4. Strengthening your home reduces both individual and community risk

This changes how we think about design: Homes must be designed not only to survive wildfire, but to avoid igniting neighboring structures.



2.4 Why Traditional Code Is Not Enough

Building codes play an important role in reducing wildfire risk and have evolved over time to incorporate lessons from past events. However, many current provisions were developed incrementally and do not yet fully reflect the latest scientific understanding of how structures ignite and how fire spreads in the built environment. As a result, most provisions focus on individual components:

- Roofing classification
- Exterior wall materials
- Vent screening
- Basic defensible space

These measures are important. But they do not address **resilience as a system,** home components and surroundings.

When fire enters a neighborhood:

1. Structures become primary fuel sources
2. Burning buildings generate sustained radiant heat
3. Ember production increases dramatically
4. Fire can burn longer and hotter due to concentrated urban fuel loads

Urban fuels: decking, fencing, siding, vehicles, stored materials, often burn faster and at higher heat release rates than surrounding vegetation. Codes do not always account for prolonged exposure from adjacent burning structures or cumulative radiant heat from multiple ignition sources.

IBHS research demonstrates that code-compliant homes still fail when:

- Connective fuels remain
- Assemblies are not coordinated
- Maintenance is not integrated into design decisions

In dense developments, it is not only whether your home can survive the approaching wildfire. It is also whether it can resist ignition from embers and flames/radiant heat from adjacent structure's fires.

This is why IBHS approaches wildfire mitigation as a system, combining:

- Site planning
- Building materials
- Assemblies and junctions
- Ongoing maintenance

Expert Insight

> *"As an architect, it is essential that resiliency becomes recognized no longer as a design decision, but rather is delivered as a standard for every project. Every family deserves safety, and our ability as design professionals to deliver that safety efficiently and affordability is crucial for both building and rebuilding in the 21st century."*

Alex Athenson, AIA
Executive Director, The Foothill Catalog Foundation

2.5 The Role of Design in Risk Reduction

Wildfire resilience is not a stylistic constraint. It is an opportunity to design buildings that interrupt fire pathways.

Fire spreads through small weaknesses: gaps, combustible connections, accumulated debris, and materials that fail under heat. Resilient design identifies and removes these vulnerabilities early, before they become embedded in the building.

Poor design, by contrast, often hides vulnerability behind attractive finishes. Decorative trim becomes an ember trap. Privacy fencing becomes a flame bridge. Dense planting becomes a connective fuel.

Good wildfire-resilient design:

- Eliminates ignition pathways early
- Uses materials intentionally
- Aligns architecture, landscape, and detailing
- Reduces long-term insurance and maintenance risk

The chapters that follow translate wildfire science into design logic. They focus on material selection, assembly behavior, critical dimensions, and the details that repeatedly fail in post-fire investigations.



Rendering provided by archicraft

THE RESILIENCY COMPANY

CHAPTER 3

Overall Strategies

Overall Strategies

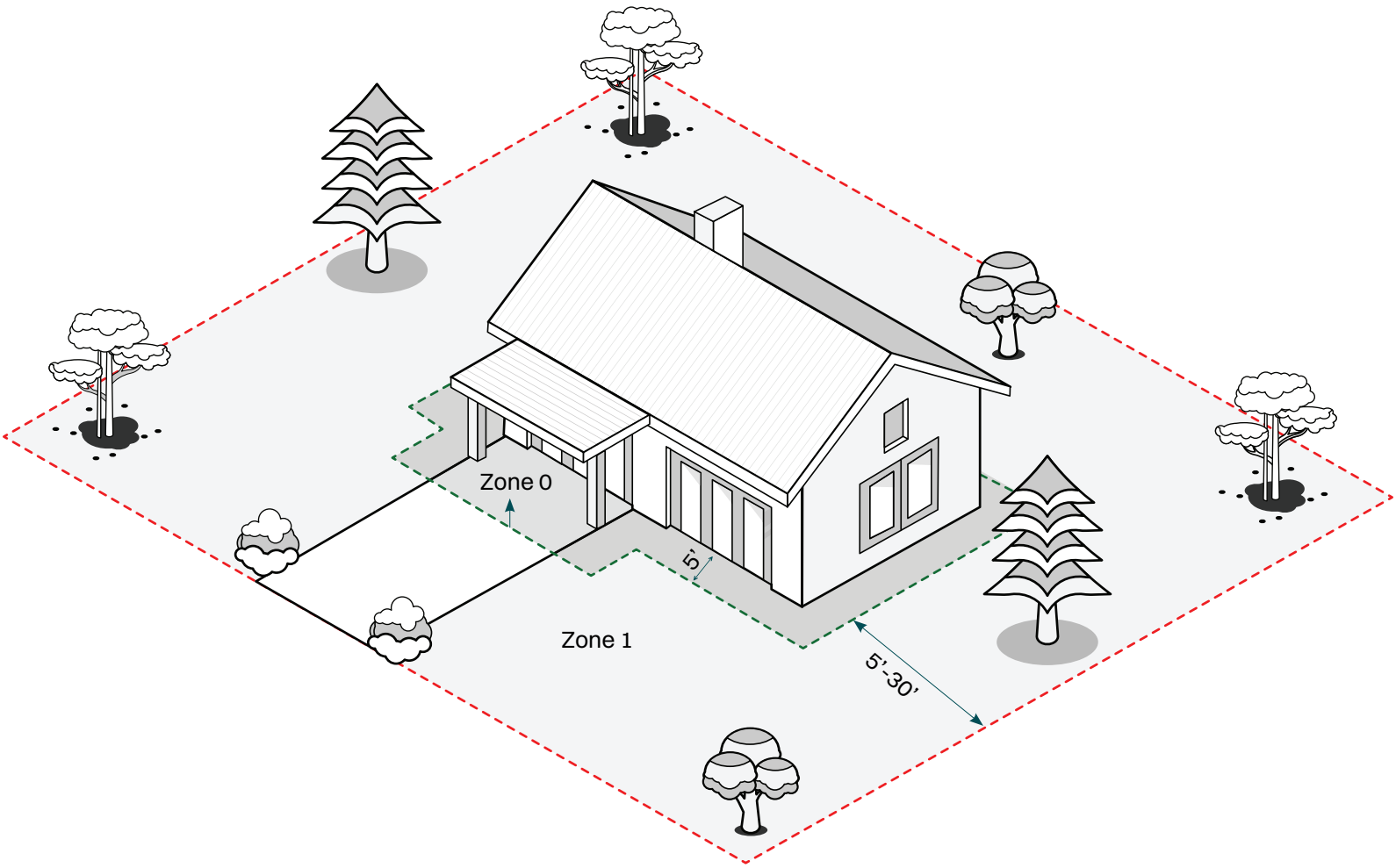
Wildfire-resilient design is not achieved through individual products, isolated upgrades, or late-stage changes. It results from coordinated decisions across site planning, building form, material selection, and detailing.

This chapter establishes the framework used throughout this manual. Rather than treating wildfire mitigation as a checklist, the chapters ahead organize decisions into a layered system, where each layer either interrupts or enables fire to spread.

Layered Defense Strategy ("Outside In")

Wildfire resiliencie is addressed from the site inward, beginning where exposure can be reduced before fire reaches the building.

This layered approach recognizes that no single upgrade determines performance. Risk is shaped by how site planning, spacing, landscape, materials, and detailing interact. A weakness in one layer increases the burden on the next.



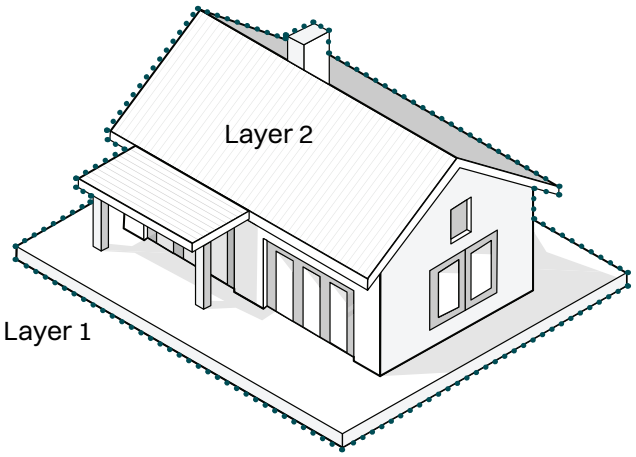
Layer 1 – Site + Landscape

Site and landscape conditions strongly influence how fire behaves near structures.

This layer addresses:

- Defensible space and fuel management
- Elimination of connective fuels
- Structure spacing and site layout
- Conditions directly adjacent to exterior walls and appendages

Effective site strategies reduce exposure to the building edge and support the performance of exterior assemblies.



Layer 2 – Building Envelope

The exterior envelope determines whether ignition occurs.

This layer addresses:

- Roof assemblies
- Vents, eaves, and soffits
- Exterior walls and cladding
- Windows, doors, decks, and other exterior elements
- Transitions, penetrations, and interfaces

Decisions at this layer directly affect ember entry, surface ignition, and fire spread.

Architect & Contractor Perspective: Prioritization Over Perfection

Wildfire-resilient construction operates within real constraints:

Budget limitations	Existing site conditions
Zoning, setbacks, and code requirements	Availability of materials and labor

Resilience does not require perfection. Instead, it emphasizes prioritization.

Because wildfire performance depends on how layers work together, not every decision carries equal weight. **Some design choices materially reduce ignition risk.** Others offer marginal benefits. When compromises are unavoidable, the critical task is understanding which decisions most affect system performance.

Throughout the chapters that follow:

- High-impact measures are clearly identified
- Common failure points are highlighted
- Trade-offs are discussed
- Both site and building decisions are evaluated as part of a connected system

The objective is not to eliminate all risks, but to materially reduce the likelihood of ignition and loss.

THE RESILIENCY COMPANY

CHAPTER 4

Layer 1 Site + Landscape

Layer 1
Site + Landscape

Wildfire resilience begins before materials, assemblies, or details. It begins before decisions about style.

Long before the home is defined as modern, craftsman, or traditional, the **organization of the site already shapes how fire will behave.**

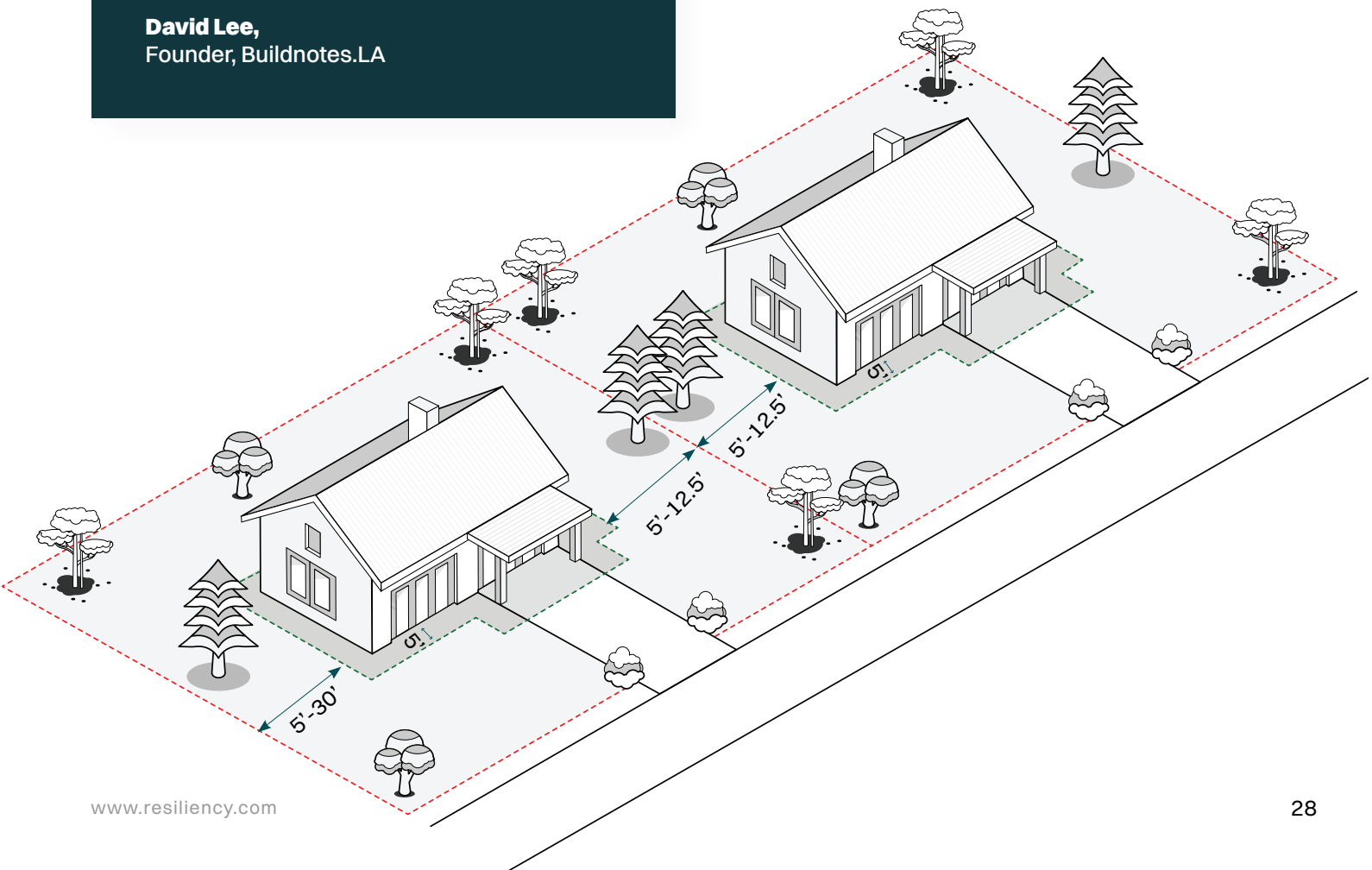
Expert Insight

> *A manual like this one, which highlights resilient building practices, helps us achieve our goals by helping homeowners improve their insurability and the likelihood that they can rebuild in the first place."*

David Lee,
Founder, Buildnotes.LA

Research consistently shows that homes are lost because embers and radiant heat exploit poor spacing, combustible ground cover, and connected structures; not because the flames reach them. Site planning is therefore not aesthetic or secondary; it is the first line of defense.

This chapter addresses site planning as a system, organizing the landscape into functional fire-performance zones, and establishing clear rules for spacing, vegetation, and accessory structures.



4.1 Defensible Space as a System

Defensible space is not a ring of clearance. It is a graduate system that reduces ignition risk as fire approaches a structure.

Each zone serves a different function. Together, they control how fire intensity builds, how heat transfers, and whether ignition pathways are created or interrupted.

This manual adopts the following zone framework:

Zone 0 — Immediate Zone (0–5 ft)

This is the most critical layer.

Most ember ignitions occur at the building perimeter: at the base of walls, beneath decks, in accumulated debris, and in combustible groundcover.

Objective: Eliminate ignition opportunities at the building perimeter.

1. No combustible materials
2. No vegetation
3. No wood fencing, mulch, or stored items
4. Hardscape only (concrete, stone, gravel, pavers)

Zone 0 -one must remain clean, hard, and continuous around all structures.

Recommended

- ✓ Bare mineral soil or noncombustible hardscape
- ✓ Noncombustible wall base (min. 6 in. clearance)
- ✓ No vegetation within 5 ft
- ✓ No combustible groundcover (no mulch, no artificial turf)
- ✓ No wood fencing, posts, or gates within 5 ft

Avoid

- ✗ Grass, shrubs, flowers, succulents
- ✗ Wood or rubber mulch
- ✗ Wood or vinyl fencing
- ✗ Stored combustibles or decorative items

Zone 1 — Managed Zone (5–30 ft)

Beyond the immediate perimeter, the goal shifts.

Zone 1 is not an empty space. It is controlled by fuel management.

Objective: Reduce flame contact and radiant heat exposure.

Vegetation must be spaced, pruned, and maintained so that fire cannot move continuously from one fuel source to another. Dense hedges, shrubs beneath tree canopies, and continuous planting beds create unified fuel masses. When these ignite, they produce sustained flame contact and radiant heat.

1. Managed low-fuel vegetation
2. Spaced shrubs and trees
3. No continuous fuel paths
4. Irrigated and maintained landscape

Recommended

- Prune tree branches to 6 ft above ground (or 1/3 tree height if under 18 ft)
- Keep tree branches 10 ft from chimneys and roofs
- Space shrubs 2x their height apart (max required spacing 10 ft)
- Create “islands” of vegetation (less than 10 ft diameter clusters)
- Cut annual grasses to under 4 in.
- Remove dead leaves, pine needles, and fallen branches regularly
- Store firewood 30 ft away (or inside compliant structure)
- Maintain horizontal and vertical separation between plants
- Use gravel or noncombustible hardscape near propane tnks

Avoid

- Continuous dense vegetation
- Privacy hedges touching or within 10 ft of house
- Tree branches overhanging roof
- Dead plants, brush piles, stacked debris
- Wood piles within 30 ft
- Unmaintained tall grass
- Parallel combustible fencing (Plus level restriction)
- Propane tanks surrounded by vegetation
- Large accessory structures within 10 ft of home (Base)

4.2 Structure Spacing & Site Organization

Increased distance lowers exposure. However, many neighborhoods are built with limited separation, and rebuilding often occurs within existing lot constraints.

Because spacing cannot always be increased, resilience must be achieved through coordinated site planning and construction performance.

Spacing as Risk Reduction

Increased separation between buildings reduces:

01	02	03	04
Radiant heat transfer	Ember accumulation in narrow side yards	Direct flame impingement	The likelihood of multi-structure ignition events

IBHS Approach to Structure Separation

The IBHS Wildfire Prepared Home™ standard pairs minimum property line clearances with upgraded construction requirements when large setbacks between structures are not possible.

Spacing must be addressed early, embedded into site design, layout, and wall assemblies. Subsequent material choices are not a substitute for resilient design.

When buildings are close together:

01 Exterior wall assemblies must resist ignition and radiant heat exposure	**02** Openings must be protected or limited	**03** Eaves and vents must be enclosed and ember-resistant
04 Roof assemblies must meet Class A requirements	**05** Combustible attachments between structures must be eliminated	**06** The 0–5 ft noncombustible zone becomes critical

When Neighboring Structures Are Not Yet Rebuilt

In post-fire areas where adjacent parcels remain undeveloped or uncertain, design decisions should assume proximity. Exterior wall assemblies and openings at property lines should be designed to perform even if neighboring structures are later rebuilt further from the property line.

Maintain a minimum 5-foot noncombustible zone along property lines whenever possible, particularly in areas where fencing, planting, storage, or future accessory structures may otherwise create combustible conditions between homes. Avoid combustible fencing attachments, vegetation, or stored materials within this zone.

Expert Insight

> *Defensible space is essential - and the best designs treat it as a layered system of healthy, thriving landscapes. Soil and vegetation that hold moisture slow fire's ability to spread, buying structures critical time. Breaking ladder fuels through careful plant spacing, limbed-up trees, and non-combustible breaks like gravel and stone paths works precisely because the ecosystem around it is intact. Large, mature canopy trees are a key part of that system - regulating temperature, reducing heat-island conditions, buffering wind, and keeping soil moist and stable. A well-tended, ecologically alive landscape isn't just beautiful — it's proof that defensible space works. Protecting habitat and protecting homes are the same investment."*

Elisa Read,
Landscape Architect, Principal, studio pappaterra

4.3 Detached Structures & ADUs

Detached structures: ADUs, garages, studios, sheds, and pool houses must be treated as independent ignition sources.

They do not inherit the protection of the main house.

ADU / Detached Structure Separation

The ADU or detached garage should be constructed in the same manner as the main structure. Structure separation should **always be maximized with 30 feet** as the gold standard for wildfire resilience. A minimum of 15 feet, measured exterior wall to exterior wall, is recommended **with different distances required for Base and Plus certification.**

Defensible Space for ADUs

Each detached structure must maintain:

- Its own Zone 0 (0–5 ft) non-combustible perimeter
- Its own Zone 1 (5–30 ft) managed landscape

Small Structures

- Very small sheds (≈15 sf or less) may be reduced to 10 ft separation
- All other accessory structures should follow the 30 ft rule. Where that is not possible, a minimum of 15 feet.

Recommended	Avoid
✓ Minimum separation from main structure	✗ Sheds within ember zone of house
✓ Independent 0-5 ft noncombustible zone	✗ Shared fencing or decks
✓ Noncombustible roof and walls	✗ Combustible cladding or roofs
✓ Clear space between structures	✗ Stored fuels near structures

4.4 Slopes

Topography accelerates fire behavior.
Fire spreads more rapidly uphill because heat rises and preheats vegetation and structures above the flame front. On steep slopes, flames can lean toward the terrain, allowing fire to attach directly to vegetation and structures. Ridges, saddles, and canyons can also accelerate wind, increasing ember transport and flame intensity.

Sites located:

- On slopes
- At ridgelines
- In saddles or canyons

...are subject to increased flame length, wind acceleration, and radiant heat.

01	Increase defensible space beyond minimums where possible
02	Terrace landscapes to interrupt fire flow
03	Avoid placing structures downslope of heavy vegetation
04	Use non-combustible retaining systems where vegetation management is impractica

4.5 Driveways & Access

Driveways and access routes are often overlooked in wildfire planning, **yet they play a critical role in both evacuation and emergency response.**

Landscaped driveways lined with dense vegetation can unintentionally create continuous fuel pathways that carry fire toward the home. At the same time, narrow or obstructed access can delay emergency vehicles during a fire event.

Clear, defensible access routes improve both life safety and firefighting response.

Design considerations:

- Clear vegetation along driveways
- Avoid combustible edging
- Maintain access width and clearance for emergency vehicles

Fire resilience depends not only on defense, but also on access and evacuation.

Expert Insight

> *Disasters and costs have risen dramatically. The status quo is unsustainable, therefore we must push resiliency to both homeowners and building professionals. Housing affordabilty is arguably already out of reach for most. Building to old standards for old conditions won't work anymore."*

Frank Renfro,
Founder, Pali Builds

4.6 Strategy for Vegetation

Wildfire resilience is about reducing risk. Most vegetation itself is not inherently hazardous, but when it is **dense, continuous, poorly placed, or poorly maintained, it can increase fire risk.** What matters is not simply the presence of vegetation, but what it is, where it is located, and how it is managed.

In wildfire events, vegetation becomes dangerous when it forms continuous fuel beds, creates ladder fuels that carry fire from the ground into tree canopies, or is positioned directly against structures. **Poorly arranged or unmanaged landscaping can increase flame height,** sustain heat exposure, and accelerate fire spread toward the building envelope.

The objective of a **strategy for vegetation is not removal;** it is interruption and occasional replacement.

Landscape design should shape how fire behaves before it reaches the structure, reducing intensity, breaking continuity, and limiting heat transfer.

Key Principles

1. Choose low resin, low oil, non-woody shrubs
2. Break fuel continuity
3. Avoid ladder fuels
4. Favor spacing over clearing
5. Maintain hydration and health

Species Selection

Species characteristics matter, but placement and maintenance matter more.

The goal is to avoid plantings that produce excessive dead material, accumulate dry leaf litter, contain high levels of volatile oils, or form dense, unbroken masses. **These characteristics increase fuel continuity, promote sustained flame contact, and elevate radiant heat exposure near structures.**

Examples of recommended vegetation:

- Deciduous trees with high moisture content
- Widely spaced native shrubs that do not form dense hedges
- Low-growing succulents and groundcovers
- Well-maintained ornamental grasses that are cut back regularly

No plant is fireproof. Even lower-flammability species can ignite under extreme conditions. Species selection must therefore be evaluated together with spacing, irrigation, pruning, and ongoing maintenance.

4.6 Approved Hardscape & Paving Palette

Hardscape is a fire-resilience tool, not just a finish.

Noncombustible surfaces such as paving, patios, and walkways help interrupt fuel continuity around structures. When used strategically, hardscapes reduce vegetation density near buildings, limit ember accumulation, and create defensible areas that slow the spread of fire.

Hardscape elements are particularly important within the immediate zone surrounding the home, where reducing combustible materials is critical.

Preferred materials include:

- Concrete
- Stone
- Gravel
- Permeable pavers

These materials:

- Block ember ignition
- Reduce radiant heat exposure
- Support drainage and erosion control

4.7 Design Takeaways: A Comprehensive Approach

Wildfire-resilient sites are not over-cleared or barren. They can be lush, expressive landscapes that reflect the **character of the home and its surroundings,** designed thoughtfully to reduce wildfire risk.

Well-designed landscapes balance beauty and resilience through spacing, thoughtful plant selection, and careful placement.

Key takeaways:

1. Spacing matters more than materials alone
2. Detached structures are a major risk multiplier
3. Zone 0 is non-negotiable
4. Site planning decisions cannot be corrected later

A well-planned site reduces pressure on every layer that follows.

Expert Insight

"The best way to improve wildfire insurability is to reduce the risk, including through wildfire-resilient construction."

Carolyn Kousky,
Founder and Executive Director, Insurance for Good

Common Site Planning Failures

DON'T - Site

- Place mulch or organic ground cover within 0-5 ft zone
- Use decorative gravel concealing combustible debris
- Use planters added near walls after inspection
- Allow storage creeping into perimeter zones over time
- Grade sloping toward the structure

DO - Site

- Maintain a clean 0-5 ft noncombustible zone around the structure
- Use mineral soil, gravel, pavers, or stone as groundcover near the house or extend noncombustible patios out 5'
- Keep the perimeter clear of storage and movable items
- Inspect regularly and remove accumulated debris
- Ensure site grading slopes away from the structure

DON'T - Wall Base / Zone 0

- Terminate wood siding or trim at grade
- Wrap decorative elements to soil
- Attach combustible fence or gates directly into the wall base
- Place planters, edging, or hardscape against the foundation
- Place post-permit aesthetic additions at the wall base

DO - Wall Base / Zone 0

- Maintain a minimum 6-inch noncombustible wall base at grade
- Use stucco, masonry, fiber cement, or metal flashing at the base of walls
- Keep the wall base fully visible and accessible for inspection
- Terminate siding above grade with proper flashing
- Keep combustible fencing, planters, and landscape elements separated from the wall base

DON'T - Landscape (5–30 ft)

- Plant privacy hedges within 10 ft close to structures
- Place shrubs directly under tree canopies
- Create continuous groundcover that forms fuel pathways
- Over-irrigate to the point of dense, unmanaged growth
- Assume long-term maintenance not enforced

DO - Landscape (5–30 ft)

- Maintain vertical clearance under tree canopies
- Provide horizontal spacing between shrubs and trees
- Use low, well-spaced plant groupings
- Maintain vegetation through regular trimming and debris removal
- Break up vegetation with paths, hardscape, or open space

DON'T - Outbuilding & ADU Failures

- Place sheds or accessory structures within the ember exposure zone
- Share combustible decks or fencing between structures
- Use combustible cladding on secondary buildings
- Reduce structure spacing during construction
- Store fuels adjacent to outbuildings

DO - Outbuilding & ADU Failures

- Maintain minimum separation between structures
- Provide each structure with its own defensible space zone
- Use noncombustible roofs and exterior materials
- Inspect regularly and remove accumulated debris
- Maintain 5ft clear space between buildings and fencing
- Store fuels and combustible materials away from structures

THE RESILIENCY COMPANY

CHAPTER 5

Layer 2 Building Envelope

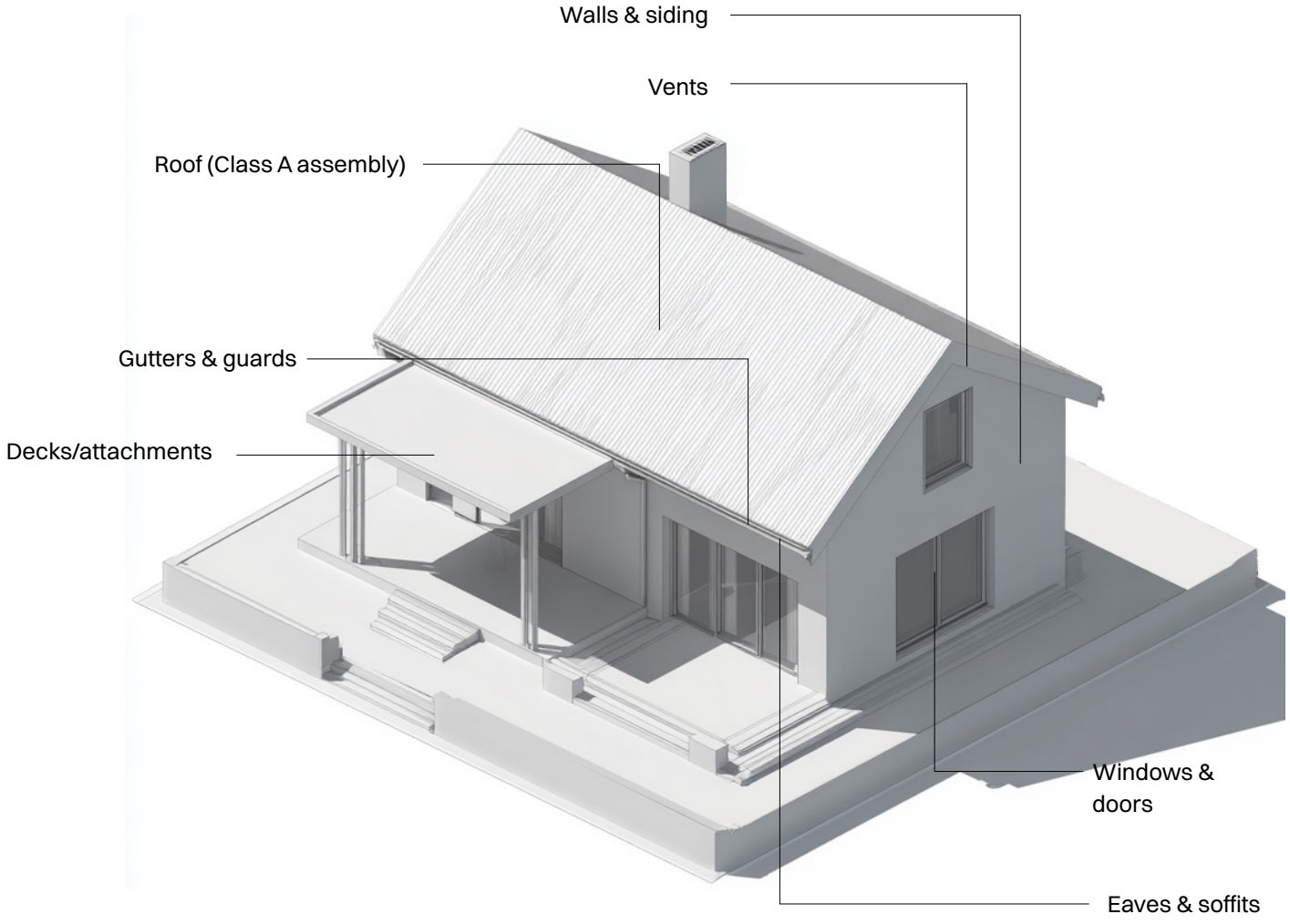
Layer 2
Building Envelope

Once fire moves past the vegetation and through the site, the **first constructed line of defense against embers, radiant heat and direct flame contact is the building's skin.** The performance of exterior assemblies will determine whether a structure resists ignition or catches fire.

Wildfire does not attack materials in isolation. Embers exploit gaps and edges. Radiant heat weakens glazing and deforms components. And sustained flame contact tests the continuity of wall, roof, and vent assemblies. To resist fire penetration, these **systems must perform together.** Isolated upgrades are not sufficient.

This chapter focuses on exterior assemblies that directly influence wildfire performance and IBHS Wildfire Prepared Home™ eligibility, including:

- WUI code minimum requirements
- Base-level wildfire resilience strategies
- Plus-level enhanced resilience measures



5.1 Roof Systems

The roof is the most vulnerable surface during ember storms: periods when wind-driven burning debris from a wildfire is carried ahead of the fire front and accumulates on structures. Embers can travel hundreds of feet or even miles, settling in roof valleys, edges, penetrations, and gutters where they can ignite combustible materials.

Because embers concentrate at roof edges, valleys, and penetrations, **wildfire performance depends on more than the visible roof covering.**

Class A Roof Assembly Required

The roof covering must be part of a Class A-rated assembly, tested in accordance with ASTM E108 or UL 790.

A Class A rating applies to the tested system, which includes:

- Roof covering
- Insulation, if applicable
- Underlayment
- Sheathing
- Attachment method

Examples of roof coverings commonly used in Class A assemblies include:

- Fiberglass composite asphalt shingles
- Concrete or clay tiles
- Metal shingles or panels
- Slate
- Listed single-ply membrane systems (flat or low-slope roofs)

Prohibited Materials

Wood shakes, wood shingles, and any wood roof covering are not permitted, regardless of ignition-resistant treatment or applied coatings. Roof edges shall be constructed of noncombustible materials, and exposed fascia shall either be noncombustible or fully protected by metal gutters with guards.

Service life fire retardants do not override the prohibition on combustible wood roof coverings.

Documenting Roof Assembly

It is important to document the roof assembly during construction. Ask for the following:

Verification may be demonstrated through:

- Approved construction documents identifying the specific Class A assembly and final inspection confirmation or
- Contractor installation records, product labels, approved testing documentation, and photographic correlation confirming the installed assembly matches the tested system

Maintenance is part of performance.

Even a Class A roof can fail if not properly maintained for wildfire resilience.

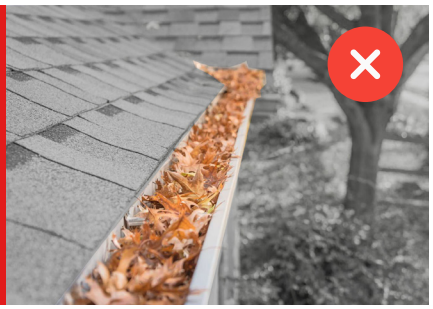
The roof must be:

- Kept clear of vegetative debris (including leaves, pine needles, and other organic material)
- Protected at eave ends with noncombustible bird stops (for barrel tile or corrugated profiles) to prevent ember intrusion

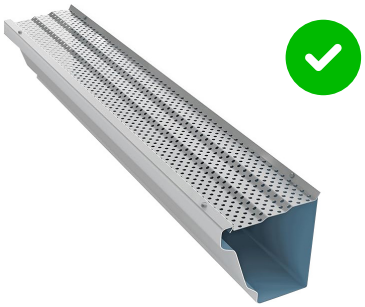
5.2 Gutters & Downspouts

During wildfire events, gutters become ignition points. Wind-driven embers accumulate in gutters and roof edge conditions and ignite leaves, pine needles, and other organic debris. Once ignited, their flames extend to the roof's edge, fascia, soffit, or adjacent wall assemblies.

Open gutters that allow debris and ember accumulation



Noncombustible metal gutters with integrated gutter guards



Standard and Components

Gutters and downspouts **must be noncombustible. They should be designed and maintained to prevent the accumulation of debris** that could ignite during ember exposure. For Plus level homes, a gutter guard must be used.

Acceptable noncombustible material includes **aluminum, galvanized steel, copper, or other approved metal systems.**

Ongoing maintenance is critical. Gutters shall be maintained clear of vegetative debris, including leaves, pine needles, and organic buildup. Roof edges, valleys, and roof-to-wall intersections shall also be inspected regularly to prevent debris accumulation.

Key Difference Summary

The following chart compares minimum California WUI code requirements with the enhanced standards required for Base and Plus designations. Each level introduces additional wildfire resilience measures beyond code minimums.

System	Requirement Level	Key Difference
CA WUI Code (Chapter 5)	Minimum code requirement	Noncombustible gutters required; gutter covers not specified
Base	Above-code program	Requires noncombustible gutters and downspouts and maintenance to prevent debris accumulation
Plus	Highest resilience level	Requires noncombustible gutter covers in addition to noncombustible gutters

5.3 Eaves & Soffits

During wildfire events, eaves and soffits create areas where embers can accumulate, generate heat, and ignite combustible materials. Wind-driven embers collect beneath roof overhangs and can ignite soffit materials or enter attic cavities.

Once embers enter the attic or roof cavity, fire can spread rapidly through concealed spaces within the structure. Open eaves, exposed rafter tails, and combustible soffit materials increase the likelihood of ember intrusion and ignition.

Standards and Components

Eave and soffit assemblies **shall be constructed to prevent ember intrusion** and reduce ignition potential.

All eaves shall be enclosed or constructed to prevent ember intrusion. Enclosed eaves may include an exposed beam appearance, provided all surfaces are protected with noncombustible materials.

Enclosing eaves:

1. Prevents direct ember intrusion
2. Eliminates exposed rafter tails
3. Avoids open gaps at roof-to-wall intersections
4. Maintains continuous protection between the roof edge, fascia, soffit, and wall assembly

Soffits shall be constructed of noncombustible materials suitable for wildfire-prone areas.

Acceptable soffit materials include:

- Fiber-cement panels
- Metal soffit systems
- Stucco or other noncombustible assemblies

Joints, seams, and penetrations within the soffit assembly shall be sealed and detailed to prevent ember intrusion. Where soffits include ventilation openings, vent assemblies shall comply with the vent requirements outlined in **Section 5.4.**

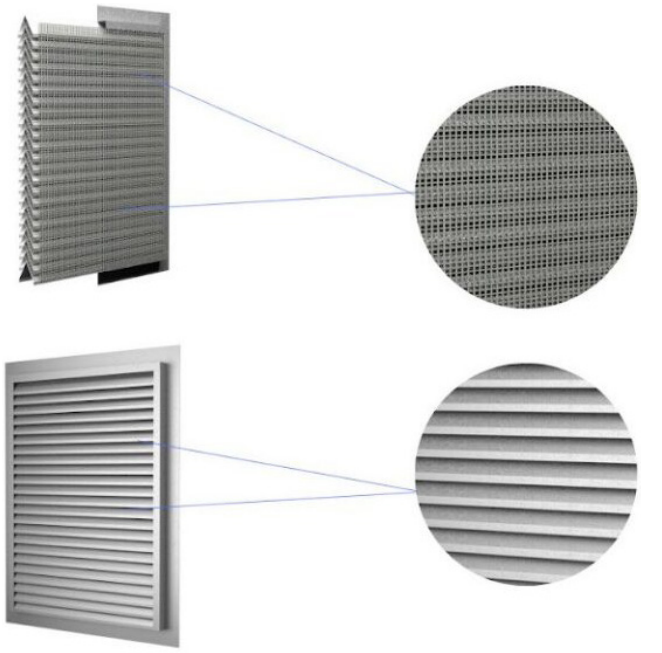
Key Difference Summary

System	Requirement	Standard
CA WUI Code (Chapter 5)	Ignition-resistant materials, 2-inch nominal dimension lumber, or noncombustible materials	ASTM E84 or UL 723 (extended test); ASTM E2768; ASTM E136
Base	Ignition-resistant materials, 2-inch nominal dimension lumber, or noncombustible materials	ASTM E84 or UL 723 (extended test); ASTM E2768; ASTM E136
Plus	Noncombustible materials only	ASTM E136; ASTM E119 or UL 263;

5.4 Vents

Vents are among the most common pathways for wildfire ignition. During ember storms, wind-driven embers enter attic, crawlspace, and underfloor cavities through vent openings. Once inside the structure, embers ignite combustible materials such as insulation, framing, or stored debris.

Even small openings can allow ember intrusion. Standard building vents may not provide adequate protection against blowing embers.



Use ember- and flame-resistant vents tested to resist ember intrusion and reduce flame penetration during wildfire exposure

Turbine vents (whirlybird vents) are not permitted.

Vent frames and trims within 6 inches of grade or decking shall be constructed of noncombustible materials. Joints and seams around vent assemblies shall be sealed according to manufacturer installation instructions to prevent ember intrusion.

Some vent types require functional operation and therefore use different protection methods.

Plumbing vents are exempt from ember screening requirements. Dryer vents, kitchen exhaust vents, and central vacuum exhausts require a noncombustible functional louver or flap rather than mesh screening.

Standards and Components

Vents shall be **designed to resist ember intrusion and flame exposure.** Compliance may be achieved through one of the following approaches:

Performance-Based

Vents shall be corrosion-resistant and tested in accordance with ASTM E2886 for flame and ember resistance.

Prescriptive Option

Vents shall be covered with noncombustible, corrosion-resistant mesh. Mesh openings shall not exceed 1/8 inch

The performance pathway provides the highest level of protection against ember and flame intrusion. The prescriptive option is available where performance tested vents are not used.

All ventilation openings shall comply with either the performance or prescriptive options. This includes attic vents, gable vents, ridge vents, soffit vents, crawlspace vents, underfloor vents, foundation vents, and any other permanent ventilation opening in the structure.

Key Difference Summary

System	Requirement	Standard
CA WUI Code (Chapter 5)	WUI vents installed on horizontal or vertical planes, or vents protected with screens	ASTM E2886 or vents covered with noncombustible, corrosion-resistant mesh with openings 1/16”–1/8” (ASTM E136)
Base	WUI vents or screened vents	ASTM E2886 or vents covered with noncombustible, corrosion-resistant mesh with openings 1/16”–1/8”
Plus	WUI vents or screened vents	ASTM E2886 or vents covered with noncombustible, corrosion-resistant mesh with openings 1/16”–1/8”



Rendering
provided by
Altadena Collective

5.5 Exterior Walls & Siding

Exterior wall assemblies form a critical part of the building envelope during wildfire exposure. Embers can accumulate on horizontal surfaces, lodge in joints and trim, or ignite combustible siding materials. Radiant heat from nearby flames can also deform or ignite wall components, while sustained flame contact from adjacent vegetation, fences, or attached structures can spread fire directly to the building.

If exterior wall materials are combustible or poorly detailed, fire can penetrate the wall assembly and ignite structural components inside the building.



Minimum 6-inch vertical clearance between siding and finished grade or hardscape

Because walls connect to multiple other assemblies; including decks, fences, windows, and roof edges, failures often occur at these transition points rather than within the siding material itself.

Standard and Components

Exterior wall coverings shall be constructed of noncombustible materials.

All decorative or attached elements installed on exterior walls shall also be constructed of noncombustible materials, including shutters, decorative trim, and architectural accents.

- Metal siding



- Fiber-cement siding or panels



- Stucco



- Brick



- Concrete or masonry veneer



Exterior wall assemblies shall maintain continuous noncombustible protection without exposed combustible components.

Under Wildfire Prepared Home Plus™, exterior wall coverings must be noncombustible.

Anything attached to the exterior walls or siding that can ignite can compromise the noncombustible integrity of the wall assembly. Attachments connecting to exterior walls must not create concealed spaces or fuel traps.

Examples include pergolas, carports, patio covers, and shade structures.

All penetrations through the wall assembly must be sealed and detailed to prevent ember intrusion.

Materials labeled as ignition-resistant or fire-treated can still burn. These treatments may slow ignition, but they do not stop fire under intense heat or ember exposure.

Key Difference Summary

System	Requirement	Standard
CA WUI Code (Chapter 5)	Exterior wall coverings may be noncombustible, ignition-resistant, or fire-retardant-treated wood (cover or assembly)	ASTM E136; ASTM E84 or UL 723 extended test; ASTM E2768
Base	Existing combustible wall coverings may remain in retrofit conditions; however, a minimum 6-inch vertical noncombustible base is required at the base of the wall	ASTM E136
Plus	Exterior wall coverings and attached elements shall be noncombustible	ASTM E136



Rendering provided by Altadena Collective

5.6 Exterior Window and Door Assemblies

Exterior openings are among the most vulnerable components of the building envelope during wildfire exposure.

Windows and doors are vulnerable to ember intrusion at frame edges, glazing seals, and hardware interfaces. Wind-driven embers can accumulate at these openings, and gaps at frame-to-wall connections allow embers to enter the building's envelope and ignite the structure from within.

Radiant heat from nearby flames can fracture glazing — even before direct flame contact occurs. Breaking glass or deforming frames allows embers and flames to enter the structure and ignite interior materials.

Because exterior openings interrupt the continuity of exterior walls, the performance of window and door assemblies depends not only on the product itself, **but also on the quality of installation, perimeter sealing,** and the fire-resistance of adjacent wall components.

Standard and Components

An assembly consists of the complete installed unit, including the glazing, frame, spacers and seals, and all associated hardware. Exterior glazing in windows or doors, including garage doors, shall meet one of the following requirements:

- **Two panes of tempered glass,** or
- Fire-protection-rated glazing with a minimum 20-minute rating tested in accordance with NFPA 257 or UL 9, or
- Glass block (windows only)

Exterior window and door assemblies shall be designed to resist fracture from radiant heat exposure and limit ember intrusion.



Dual-pane glazing with both panes tempered or with 20-minute fire-rated glazing for enhanced wildfire resistance

Skylights, as discussed below, are subject to other standards.

Dual tempered paned glass is required because tempered glass is stronger and more resistant to heat than standard glass. During a wildfire, radiant heat can cause ordinary glass to crack or shatter, creating openings where embers and flames can enter the home.

Two panes of tempered glass provide an additional layer of protection. In extreme heat, the outer pane may break or fall away, but the inner pane can remain in place longer, helping keep embers out and protecting the interior of the home.

All operable windows and doors shall:

1. Close tightly and remain in functional condition
2. Maintain weather seals and flashing integrity
3. Prevent ember intrusion at frame-to-wall connections

Window Assemblies

All window assemblies shall:

- Maintain tight seals between glazing and frame components
- Resist ember intrusion at glazing-to-frame interfaces

All exterior glazing, again, must include dual-pane glazing with both panes tempered, or comply with the glazing performance requirements noted above.

Window assemblies shall be **evaluated as a complete system,** including glazing, frame, seals, and hardware.

Frame materials are not required to be noncombustible; however, they shall be compatible with the glazing requirements and maintain assembly integrity under heat exposure. Noncombustible frames (such as aluminum) are preferred.

Note: Changes to window frame materials may affect compliance with California Title 24 energy requirements. Coordination with energy consultants or code specialists may be required when modifying window assemblies.

Skylights

Skylights are permitted with the following specifications:

- One outer tempered pane
- One inner laminated pane

Operable skylights shall be protected with a noncombustible mesh screen with openings not exceeding 1/8 inch.

Exterior Doors

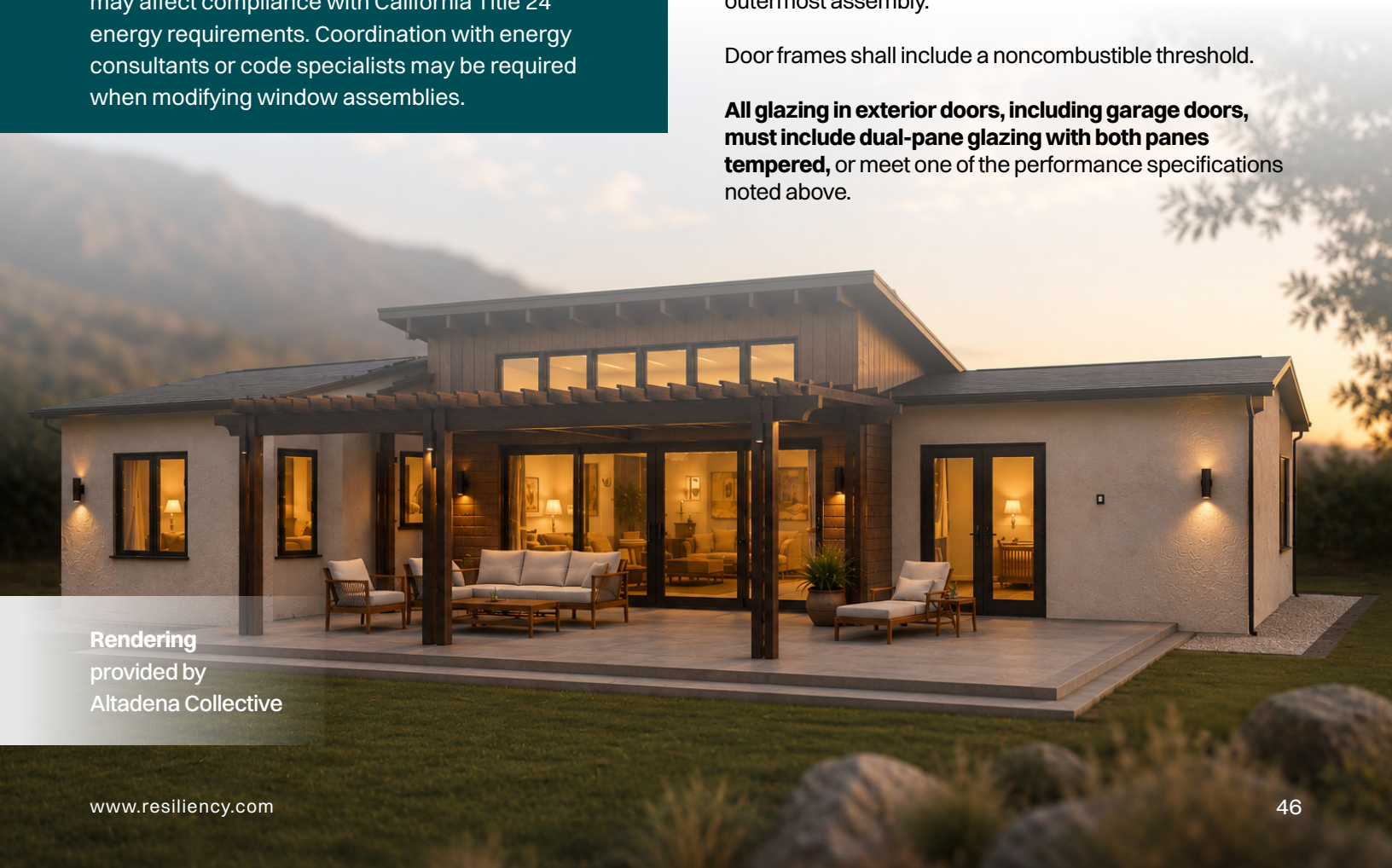
Exterior door assemblies shall comply with one of the following:

- Noncombustible construction, or
- Solid-core wood doors not less than 1¾ inches (44 mm) thick, or
- Fire-resistance rating of at least 20 minutes tested in accordance with NFPA 252, UL 10B, or UL 10C

Combustible doors are permitted only when protected by a noncombustible exterior storm door installed as the outermost assembly.

Door frames shall include a noncombustible threshold.

All glazing in exterior doors, including garage doors, must include dual-pane glazing with both panes tempered, or meet one of the performance specifications noted above.



Rendering provided by Altadena Collective

Difference Summary

Exterior Windows

System	Requirement	Standard
CA WUI Code (Chapter 5)	Dual-pane glazing with at least one tempered pane or 20-minute fire-rated glazing	ANSI Z97.1 or CPSC 16 CFR 1201; NFPA 257 or UL 9
Base	Same as CA WUI Code	Same as CA WUI Code
Plus	Dual-pane glazing with two tempered panes or 20-minute fire-rated glazing	ANSI Z97.1 or CPSC 16 CFR 1201; NFPA 257

Exterior Doors

System	Requirement	Standard
CA WUI Code (Chapter 5)	Ignition-resistant covering, 20-minute fire-rated door, or solid wood core door ≥ 1¾”	ASTM E2768; ASTM E84 or UL 723 (extended test); NFPA 252; UL 10B or UL 10C
Base	Same as CA WUI Code	Same as CA WUI Code
Plus	Noncombustible door, 20-minute fire-rated door, solid core door, or combustible door protected by noncombustible exterior storm door	ASTM E136; NFPA 252

Skylight

System	Requirement	Standard
CA WUI Code (Chapter 5)	Skylights must comply with exterior glazing requirements	ANSI Z97.1 or CPSC 16 CFR 1201
Base	Same as CA WUI Code	Same as CA WUI Code
Plus	Skylights permitted with outer tempered pane and inner laminated pane; operable skylights protected with noncombustible mesh (≤1/8”)	ANSI Z97.1; NFPA 257

5.7 Decks & Stairs

Decks are a common ignition point during wildfires. Wind-driven embers accumulate between deck boards, beneath walking surfaces, and around structural connections where debris collects. If combustible materials are present, these embers ignite and produce sustained flame contact against exterior walls and doors.

Because decks are attached directly to the building envelope, ignition at the deck can quickly spread to the structure. Decks located within Zone 0 must minimize combustible materials and eliminate locations where embers and debris can accumulate.

Standard and Components

Deck assemblies shall be designed to reduce ember accumulation and prevent ignition adjacent to exterior walls.

All deck components, including framing, walking surfaces, railings, posts, stairs, and structural supports, **shall be constructed of noncombustible materials.**

Acceptable noncombustible materials include:

- Metal
- Fiber-cement
- Concrete
- Tile
- Other materials that meet noncombustible requirements (glass)

Deck assemblies shall meet the following:

1. Walking surfaces shall be solid and constructed of noncombustible materials
2. Deck systems that allow debris to accumulate beneath the deck shall be avoided
3. Railings, posts, stairs and structural supports shall be noncombustible
4. Areas beneath decks shall be kept clear of combustible debris, vegetation, and stored materials
5. Low-elevation decks shall be enclosed with noncombustible, corrosion-resistant mesh with openings not exceeding 1/8 inch unless completely noncombustible

Note: Decking materials marketed as “low-maintenance,” including vinyl and composite products, are generally considered combustible unless specifically tested and approved as noncombustible materials in accordance with applicable standards.

Deck Stairs

Deck stairs can trap embers and debris and shall be designed to minimize combustible cavities. Open stair systems that allow debris to accumulate shall be avoided.

Stairs less than 4 feet wide:
Treads shall be solid and constructed of noncombustible materials.

Stairs 4 feet wide or greater:
The area beneath the stairs shall be enclosed with noncombustible, corrosion-resistant mesh (≤ 1/8-inch openings) • Stairs shall include closed risers and solid treads constructed of noncombustible materials.

Where a fully noncombustible deck is not feasible, the following upgrades are recommended to reduce ignition potential:

01
Walking surfaces shall be solid and constructed of noncombustible materials

02
Open decking systems that allow debris accumulation should be avoided

03
Railings within 5 feet of the building shall be noncombustible

04
Deck posts shall include a minimum of 6 inches of vertically applied noncombustible material at the base

05
Areas beneath decks shall be kept clear of combustible debris, vegetation, and stored materials

06
Low-elevation decks should be enclosed with noncombustible mesh (≤ 1/8 inch openings)

Key Difference Summary

System	Requirement	Standard
CA WUI Code (Chapter 5)	Deck surfaces and stair treads shall be noncombustible, ignition-resistant materials, or fire-retardant-treated wood	ASTM E136; ASTM E84 or UL 723 extended test; ASTM E2632; ASTM E2768; SFM Standard 12-7A-4A
Base	Deck surfaces and stair treads shall be noncombustible materials	ASTM E136
Plus	Deck assemblies shall be fully noncombustible, including framing, walking surfaces, stairs, posts, and railings	ASTM E136; ASTM E119 or UL 263

5.8 Fences and Gates

Fences and gates can act as fire pathways, allowing flames to travel from vegetation or adjacent properties directly to the building. When combustible fencing connects to the structure, it can bypass defensible space and expose exterior walls to sustained flame contact.

To reduce this risk, fence and gate design must interrupt fire pathways and prevent ignition at the building perimeter.

Standard and Components

Fences and gates **within 5 feet of the building shall be constructed entirely of noncombustible materials,** including posts, panels, rails, and hardware.

Combustible fencing shall not be attached directly to the building.

Combustible fencing may be used beyond 5 feet from the building, but where it approaches the structure, it shall transition to a noncombustible section extending at least 5 feet from the building.



Replace all wood or vinyl fencing within 5 feet of the home with noncombustible materials such as aluminum, steel, iron, or chain link

Expert Insight

To give homeowners with standing homes, the opportunity to feel safe again. Returning home after a fire isn't just a logistical milestone, it's an emotional one, and people need to trust that their home can be their safe space again. In addition, recovery should not return people to the same level of vulnerability they had previously; incorporating resilience into our practice allows homeowners to return home stronger than they were pre-fire. Finally, resilience measures can reduce insurance premiums, which is a huge concern throughout Altadena."

Calley Bilgram,
Program Lead, GER3

Examples of non-combustible fence materials include:

- Metal (steel, aluminum)
- Fiber-cement
- Concrete or masonry

Note: Wood, vinyl, and composite materials are combustible.

Neighboring Fencing

Parallel combustible fencing between adjacent properties can increase the risk of structure-to-structure fire spread and should be avoided, particularly in higher-density neighborhoods.

Where property line setbacks are less than 5 feet, a structure may still comply provided that the area within 5 feet of the building is maintained as a noncombustible zone, including:

1. Fencing within this zone shall be noncombustible
2. The area between the fence and structure shall be free of combustible materials and vegetation

Fence systems should be treated as part of the overall wildfire defense strategy, not as isolated site elements.

Key Difference Summary

System	Requirement	Standard
CA WUI Code (Chapter 5)	No specific fence material requirement related to structure attachment	n/a
Base	Fences located within 5 feet of the building must be noncombustible	ASTM E136
Plus	Fences within 5 feet of the building must be noncombustible and parallel combustible fences within 5 feet of each other (5–30 ft from the home) are not permitted	ASTM E136

5.9 Outdoor Kitchens, Bars & Built-In Features

Outdoor kitchens, bars, and built-in features located within 30 ft of the building can create direct ignition pathways. Combustible materials, concealed cavities, and attached elements can trap embers and allow fire to spread directly to the building envelope.

Once ignited, these assemblies can sustain flame contact at the wall and bypass defensible space protections.

Standard and Component

Permanent outdoor cooking areas, bars, and built-in features located attached to or located within 5 feet of the building shall be constructed entirely of noncombustible materials.

Requirements

1. Structural framing shall be noncombustible
2. Counters, cabinets, and cladding shall be noncombustible
3. Installations shall not create concealed combustible cavities against the structure

Combustible cabinetry, framing, or decorative finishes are not permitted where these elements connect to the building envelope.

Layer 2 — Building Envelope Failures

The previous chapter outlined the recommended wildfire-resilient strategies for individual exterior building components. On the next page we are calling out real-world failure points observed during wildfire events.

Post-fire investigations consistently show that homes rarely ignite because an entire system fails at once. More often, ignition begins at a vulnerable detail, transition, opening, or poorly maintained assembly that allows embers, radiant heat, or direct flame contact to compromise the building envelope. Common building skin failures include debris-filled gutters, ember intrusion through vents, combustible attachments, exposed edges, aging sealants, and weak connections between materials.

Understanding these recurring building skin failures helps explain why the previous recommendations matter and how seemingly minor vulnerabilities can significantly impact wildfire performance. The following examples illustrate the most common Layer 2 weaknesses identified in wildfire-exposed homes and the conditions that contribute to their failure.

Expert Insight

> *The most important wildfire resilience decisions happen early — before materials are ordered or construction begins. Noncombustible windows and doors, exterior cladding, foundation design, sealed attic assemblies, and careful consideration of neighboring structure proximity all play a critical role in reducing ignition risk and improving long-term wildfire performance."*
>
> **Alex Rahba ,**
>
> General Contrator, Rahban Development

Where Building Skin Fails - What to Watch Out For

Roof

- Class A rating assumed without verified, tested assembly documentation
- Single-ply or low-slope roof systems specified without confirmed Class A compliance
- Unguarded or debris-filled gutters in ember exposure zones
- Roof valleys and roof-to-wall intersections that trap combustible debris
- Field substitutions or detailing changes that void tested fire-rated assemblies

Eaves & Soffits

- Open or decorative eaves exposing rafter cavities
- Standard code-compliant vents used instead of ember-resistant vent assemblies
- Plastic, fiber, or oversized vent mesh exceeding permitted opening size
- Combustible soffit or fascia materials within ember exposure zones
- Unsealed joints, gaps, or penetrations allowing ember intrusion

Vents

- Standard code-compliant vents installed instead of ember-resistant vent assemblies
- Vent mesh exceeding permitted opening size (oversized screening)
- Plastic, fiber, or combustible vent components in ember exposure zones
- Vent frames or trims installed within 6 inches of grade using combustible materials
- Gaps at vent-to-wall interfaces left unsealed, allowing ember intrusion

Exterior Walls & Siding

- Discontinuous wall planes creating ledges or ember traps
- Horizontal trim or decorative bands that collect debris
- Penetrations and junctions not detailed for ember resistance
- Fence, deck, or attachment connections bypassing noncombustible wall assemblies
- Combustible or ignition-resistant siding treated as equivalent to noncombustible

Exterior Window and Door Assemblies

- Single-pane or non-tempered exterior glazing
- Vinyl frames without reinforcement or thermal protection
- Operable openings without ember-resistant detailing
- Gaps at frame-to-wall interfaces left unsealed
- Glazing specified without confirming full window assembly performance

Decks & Attachments

- Combustible deck assemblies adjacent to exterior walls
- Open under-deck cavities, allowing ember accumulation
- Combustible posts or rails within ember exposure zones
- Stairs or projections tying directly into the building envelope
- Overhead structures (pergolas, patio covers, carports) attached without maintaining noncombustible continuity

Fences & Gates

- Combustible fencing directly connected to the primary structure
- Wood fencing terminating against combustible siding
- Lack of noncombustible transition within 5 feet of the building
- Parallel combustible fencing between adjacent properties
- Vegetation and debris accumulation along fence lines

Integration & Maintenance

- Envelope components designed and evaluated in isolation
- Field substitutions made during construction that void tested assemblies
- Minor detailing changes that disrupt noncombustible continuity
- Post-permit modifications that compromise ember resistance
- Deferred maintenance of roof edges, gutters, vents, and wall bases

THE RESILIENCY COMPANY

CHAPTER 6

Integration And Maintenance

Integration And Maintenance

Wildfire performance shall be maintained through ongoing inspection and upkeep. Compliance is not achieved at construction completion alone. Even compliant assemblies can fail if debris accumulates, vegetation encroaches, or protective details deteriorate. Post-fire investigations repeatedly show that ignition often results from neglected upkeep rather than material selection alone.

The following requirements apply to all Wildfire Prepared Home™ designations.

Expert Insight

> *Many homeowners prioritize speed over resilience, rushing early design decisions without understanding how small choices can greatly impact long-term survivability."*
>
> **Chris Corbett,**
> Founder and Principal, Altadena Collective



Rendering
provided by
Altadena Collective

Inspection and Seasonal Review

At a minimum, the property shall be inspected annually and prior to peak fire season. Inspection shall verify that:

1. Roof surfaces, valleys, and roof-to-wall intersections are free of accumulated leaves and debris
2. Gutters are clear and functioning
3. Ember-resistant vents remain unobstructed and undamaged
4. Required noncombustible zones remain continuous and free of vegetation or stored materials
5. Decks, stairs, and areas beneath attached structures are free of combustible debris
6. Fence-to-building transition zones remain compliant
7. Annual check-in with IBHS is required and recertification in year 3

Debris and Vegetation Control

Accumulated combustible material shall be removed regularly and after significant wind events. This includes:

- Leaves and pine needles on roofs and at wall bases
- Debris beneath decks and stairs
- Vegetation encroaching into Zone 0
- Accumulations along fence lines or at structural attachments

Maintenance of defensible space zones is a performance requirement, not a landscaping preference.

Assembly Integrity

Exterior components shall remain in functional condition. Windows and doors shall close tightly. Seals and weatherstripping shall remain intact. Mesh screens shall not exceed the required opening dimensions. Flashing and noncombustible base protection shall remain continuous.

Fire resistance shall not rely solely on coatings or treatments that degrade over time.

Owner Responsibility During High Fire Conditions

During Red Flag or high-wind fire conditions, owners shall:

- Remove furniture cushions or decorative items within 5 feet of the structure.
- Move trash bins inside garage or away from structures
- Move cars inside garage or away from structures
- Relocate portable firewood and combustible materials at least 30ft away from the building.
- Ensure doors and windows remain closed.
- Confirm that decks and stair areas are clear of debris.

Wildfire resilience is sustained through shared responsibility. Design establishes the system. Maintenance preserves its performance.

THE RESILIENCY COMPANY

CHAPTER 7

Case Studies

Case Studies

Previous chapters defined how homes ignite and outlined strategies to reduce risk at the building and site levels. This chapter applies those strategies to real buildings.

The houses represent different architectural expressions, ranging from modern to traditional, while all were developed using the same wildfire resilience framework and designed to meet IBHS Home Plus standards. Each building component — including roofs, vents, exterior walls, windows, and the immediate 0–5 foot zone — was evaluated and upgraded in accordance with the performance criteria described in the previous sections.

The intent is to show how these standards translate into architecture.

Fire-resistant design is often associated with heavy construction, minimal openings, or bunker-like forms.

The IBHS framework does not prescribe a specific aesthetic. Instead, it defines how a building must perform under wildfire exposure.

When applied systematically, these requirements can be integrated into a range of architectural styles without fundamentally altering their design intent.

Together, the examples illustrate how both IBHS Home and Home Plus can be achieved in different types of homes, using the same underlying strategies.



by archicraft

Contemporary Modern House



by The Foothill Catalog Foundation

California Craftsman



by Brookfield Residential

Mediterranean Revival Residence

Case Study 1

Modern Single-Family Home

This case study examines a 1,975 sq ft single-family residence in Altadena, California, consisting of three bedrooms, two bathrooms, and an attached garage.

The project is a post-fire rebuild, designed within the original footprint with a modest increase in area (within the allowable +10%). While the footprint and general massing follow the previous structure, the home has been fully reimagined to meet current performance and resilience standards.

The design is intentionally simple, with a flat roof, clean geometry, and a defined 0–5 ft noncombustible perimeter. These decisions are not only architectural but also strategic, establishing a clear framework for reducing ignition risk and implementing the wildfire resilience strategies outlined in the previous chapters.

Architect:
Marija Volkman
archicraft

Site Zones + Defensible Space

The site is designed as a continuous defensible-space system, coordinated with the building envelope to reduce ignition risk and limit ember exposure at the structure perimeter.

Zone 0 (0–5 ft from the building)

A fully noncombustible perimeter is established using concrete pavers, gravel, and slab-on-grade surfaces with a noncombustible tile finish, eliminating potential ignition sources adjacent to the structure.

No vegetation, combustible materials, or storage are permitted within this zone.

Zone 1 (5–30 ft from the building)

A combination of noncombustible hardscape and fire-resistant planting. Vegetation is limited to low-flammability species and strategically spaced to prevent continuous fuel paths.

Decks + Exterior Surfaces

No elevated or combustible deck assemblies are permitted. All exterior program areas are constructed as slab-on-grade surfaces with a noncombustible tile finish.



Roof + Form

A flat roof with a continuous parapet is designed as a complete Class A-rated assembly. The roof is vented and protected with ember-resistant venting.

Roof edges, parapets, and drainage are detailed to prevent debris accumulation. All penetrations are minimized and sealed to reduce ember intrusion.

The rear overhang is constructed of noncombustible metal with no exposed cavities.

Gutters + Downspouts

Gutters are eliminated. Downspouts are constructed of noncombustible materials, and all drainage components are designed and maintained to prevent debris accumulation.

Eaves + Soffits

Eaves are eliminated at the primary roof perimeter.

Soffits are limited to entry conditions only and are constructed of stucco. All joints and transitions are sealed to prevent ember intrusion.



Vents

Vented roof assembly with ember-resistant vent protection. Vents comply with ASTM E2886 or are covered with noncombustible, corrosion-resistant mesh with openings between 1/16" and 1/8". Vent locations are coordinated to limit direct ember exposure. All vent frames, joints, and penetrations are sealed to prevent ember intrusion.

Exterior Walls & Siding

A cement-based three-coat stucco system is combined with a noncombustible aluminum panel batten cladding system to form a continuous, noncombustible exterior wall assembly. The cladding material complies with ASTM E136 and CAN/ULC-S114 for noncomputability and achieves a Class A surface burning rating in accordance with ASTM E84.

A minimum 8" noncombustible concrete base is provided above soil. All penetrations, joints, and transitions are sealed to maintain continuity of the assembly and prevent ember intrusion.

Windows

Window assemblies consist of dual-pane glazing with both panes tempered, or a 20-minute fire-rated glazing assembly. All windows are installed as complete systems. Glazing-to-frame and frame-to-wall interfaces are sealed to prevent ember intrusion. Operable units close tightly and maintain continuous weather seals.

Doors

Exterior doors include a glazed entry door and metal garage door assemblies. Entry door glazing consists of dual-pane tempered glass or 20-minute fire-rated glazing. Garage doors are constructed of noncombustible metal or meet a minimum 20-minute fire rating. All door assemblies are installed as complete systems with sealed frame-to-wall interfaces. Door frames include noncombustible thresholds and are designed to maintain tight closure

Attachments + Fences

All attachments are constructed of noncombustible materials and detailed to avoid concealed cavities and ember traps. Fences are constructed of noncombustible materials and detailed to maintain continuous protection at the building perimeter.

Designation: IBHS Wildfire Prepared Home Plus

Case Study 2

Traditional Single-Family Home

This case study is based on “The Lewis,” a 1,259 sq ft single-family residence from the Foothill Catalog, representing a traditional bungalow with a pitched roof, articulated eaves, and a covered front porch.

The architectural language reflects a familiar residential typology common throughout Southern California. While the form includes elements typically considered more vulnerable in wildfire conditions, including overhangs, exposed structure, and increased material transitions, the same wildfire resilience strategies outlined in the previous chapters are applied.

The design demonstrates how IBHS Wildfire Prepared Home requirements can be integrated into a traditional architectural form without fundamentally altering its character.

Architect:
The Foothill Catalog Foundation

Site Zones + Defensible Space

The site is designed as a continuous defensible-space system, coordinated with the building envelope to reduce ignition risk.

Zone 0 (0–5 ft from the building)

A fully noncombustible perimeter is established using concrete pavers, gravel, and hardscape surfaces. No vegetation, combustible materials, or storage are permitted within this zone.

Zone 1 (5–30 ft from the building)

A combination of noncombustible hardscape and fire-resistant planting. Vegetation is limited to low-flammability species and spaced to prevent continuous fuel paths.

Decks + Exterior Surfaces

No elevated deck assemblies are provided. All exterior program areas are constructed as slab-on-grade concrete surfaces, minimizing potential ignition risks associated with combustible or elevated structures.



Roof + Form

The roof is a pitched assembly finished with Class A asphalt shingles. The form includes multiple gable conditions with articulated edges and transitions typical of traditional residential construction. Roof edges, valleys, and transitions are detailed to prevent debris accumulation. All penetrations are minimized and sealed.

Gutters + Downspouts

Gutters and downspouts are constructed of noncombustible materials. Drainage components are designed and maintained to prevent debris accumulation by using a debris screen (mesh).

Eaves + Soffits

The design incorporates non-vented, fully enclosed eaves constructed with fiber cement materials, with approximately 30" overhangs and exposed roof brackets.

The enclosed, noncombustible condition reduces the risk of ember intrusion and ignition at the roof edge; however, the overhangs and horizontal surfaces may still allow for debris and ember accumulation.



www.resiliency.com

Vents

The roof assembly is not vented. No roof or floor vents are provided.

The absence of roof vents reduces direct ember entry points at the roof plane, while the reduced opening size at eaves helps limit ember intrusion.

Exterior Walls & Siding

The exterior facade consists of fiber cement siding in multiple configurations, including horizontal lap siding, shingle panels, and vertical board-and-batten elements at gable ends. The wall assembly includes an 8" concrete wall base at the lower portion of the structure.

Structural wood posts and beams are fully wrapped with fiber cement boards, providing a more durable and ignition-resistant exterior surface.

The wall base is defined by a raised stucco condition with a concrete cap. The assembly reflects a conventional residential wall system with a mix of cladding types and material transitions.

Windows

Window assemblies consist of vinyl-framed units with dual-pane tempered glazing. All windows are installed as complete systems, with glazing-to-frame and frame-to-wall interfaces sealed to limit air and ember intrusion. Operable units are designed to maintain tight closure and continuous weather seals.

Doors

Exterior doors consist of vinyl-framed assemblies with dual-pane tempered glass panels.

All door assemblies are installed as complete systems with sealed frame-to-wall interfaces and are designed to maintain tight closure and continuous weather seals.

Attachments + Fences

Connections to the building are detailed to limit ember accumulation. Fences within 5 ft of the structure constructed of noncombustible materials, with transitions where required.

Designation: IBHS Wildfire Prepared Home Plus

Case Study 3

Rebuilding with Resiliency in Mind

This case study examines a 2,744 sq ft single-family residence in the La Vina Community in Altadena, California. This rebuild includes four bedrooms, 3.5 bathrooms, and an attached 3-car garage.

This project is a post-fire rebuild. The owners are rebuilding the home they lost, originally built in 1999, and wanted to do so in a more resilient way. The home has been redesigned to replace the previous residence with a modest increase in area (within the allowable +10%). The footprint and massing are nearly identical to the prior structure. However, the new home is being built to comply with the IBHS Wildfire Prepared Plus performance and resilience standards.

The design intentionally mirrors what was lost to allow the family to move back "home."

This is a very compelling example of how a family home can be rebuilt with long-term resilience in mind.

Architect:
Brookfield Residential

Site Zones + Defensible Space

The site is designed as a continuous defensible-space system, coordinated with the building envelope to reduce ignition risk and limit ember exposure at the structure perimeter.

Zone 0 (0–5 ft from the building)

A fully noncombustible perimeter is established using concrete, gravel, and slab-on-grade surfaces with a noncombustible finish, eliminating potential ignition sources adjacent to the structure. No vegetation, combustible materials, or storage are permitted within this zone.

Zone 1 (5–30 ft from the building)

A combination of noncombustible hardscape and fire-resistant planting. Vegetation is limited to low-flammability species and strategically spaced to prevent continuous fuel paths.

Decks + Exterior Surfaces

The home overlooks the San Gabriel Valley, with beautiful open space and city views to the southeast. Therefore, the home includes a fully covered deck off the primary bedroom to allow enjoyment of the vista. The covered deck is constructed with all non-combustible surfaces to prevent ember-driven combustion.



Roof + Form

A pitched roof is designed as a complete Class A-rated terracotta clay tile roof assembly. The attic is NOT vented to eliminate the possibility of ember intrusion into the attic space.

Gutters + Downspouts

Non-combustible rain gutters and gutter guards are included in the design. Downspouts are constructed of noncombustible materials, and all drainage components are designed and maintained to prevent debris accumulation.

Eaves + Soffits

To meet the Wildfire Prepared Plus level, enclosed eaves are used with noncombustible soffit materials, in this case stucco. All exposed facias are non-combustible cementitious boards.



Vents

The main attic area is a high-performance attic type A which is a sealed attic with open-cell spray foam insulation and therefore is not required to be vented. This eliminates the possibility of ember intrusion into the main attic area. On the lower roof areas that require vented attic spaces, O'Hagin Fire and Ice vents approved for use in Wildland Urban Interface (WUI) zones are used for ember-resistance. All vent frames, joints, and penetrations are sealed to prevent ember intrusion.

Exterior Walls & Siding

The home is built in a Spanish style with no exposed combustible materials. Style appropriate stucco makes up the main body of the home. All exterior details are non-combustible.

A cement-based one-coat stucco system is used to form a continuous, noncombustible exterior wall assembly. All architectural details such as faux pipe vents and wrought iron detailing are completed with non-combustible materials.

Windows

Window assemblies consist of dual-pane glazing with both panes tempered, and a 20-minute fire-rated glazing assembly. All windows are installed as complete systems. Glazing-to-frame and frame-to-wall interfaces are sealed to prevent ember intrusion. Operable units close tightly and maintain continuous weather seals.

Doors

Exterior doors include a non-combustible entry door and metal garage door assemblies. Garage doors are constructed of noncombustible metal or meet a minimum 20-minute fire rating. All door assemblies are installed as complete systems with sealed frame-to-wall interfaces. Door frames include noncombustible thresholds and are designed to maintain tight closure

Attachments + Fences

Side yard walls are non-combustible block walls. The side yard return walls are non-combustible block and feature a non-combustible metal gate for access to the rear yard. The block walls and metal gate maintain continuous protection at the building perimeter.

Designation: IBHS Wildfire Prepared Home Plus

THE RESILIENCY COMPANY

CHAPTER 8

Path to Wildfire Prepared Designation

Path to Wildfire Prepared Designation

Phase 1: Design & Integration

Start Early (Before Plans Are Final)

Designation is easiest when integrated into the design and construction process from the beginning, rather than addressed later as a retrofit or checklist item. Early coordination between the homeowner, architect, builder, landscape designer, roofer, and exterior trades helps prevent costly late-stage changes that commonly delay or fail designation. The project team should align early on pursuing Wildfire Prepared Base or Wildfire Prepared Plus designation and assign one primary point of contact to coordinate the process. Common late-stage issues include non-compliant vents, combustible fencing near the home, combustible landscaping within Zone 0, and roof edge details that trap debris.

Design to the Standard (Plans & Specs Phase)

During the design phase, the architectural drawings, specifications, landscape plans, and exterior detailing should already comply with the Wildfire Prepared Home Technical Standard. Wildfire resilience should be integrated holistically into the project rather than treated as an add-on at the end of construction. Key design items include maintaining a noncombustible Zone 0 within the first five feet around the structure, specifying Class A roof assemblies, using ember-resistant vents, and designing decks, pergolas, and fences to avoid ember pathways. Landscaping plans should also avoid prohibited vegetation directly adjacent to structures.

Phase 2: Physical Standards Checklist

Build to the Standard (Construction Phase)

The builder is responsible for ensuring the home is physically constructed to match the approved wildfire-resilient design. During construction, Zone 0 should remain clear and free of combustible storage or temporary materials. Builders should verify correct installation of vents, flashing, siding terminations, roof edges, and all ember-resistant assemblies. Roofing and solar contractors must coordinate carefully so that solar installations do not compromise the integrity or Class A performance of the roof assembly. Thorough field quality control during this phase is critical to successful designation.

Phase 3: Establishing Compliance Documentation Strategy

Documentation Strategy

Wildfire Prepared designation is documentation-based, meaning photographs, product information, and installation records must be collected throughout construction, especially as many assemblies become concealed over time. Typical documentation includes roof and vent specifications, window and door labels, installation photographs, Zone 0 and defensible space photos, and exterior attachment and assembly documentation. Clear and organized records help streamline the evaluation process and reduce delays during final review.

Phase 4: The Path to Designation

Create the Homeowner Account & Apply

The homeowner is the official applicant for the Wildfire Prepared Home designation process. Once construction is underway or nearing completion, the homeowner creates an account through the Wildfire Prepared Home portal, registers the property address, and submits the application. The $125 application fee is paid during this step. While the homeowner submits the application directly, builders and architects often assist with supporting documentation and coordination.

Upload Documentation & Photos

Clear documentation is essential to verify that the project complies with the standard. The builder typically assists the homeowner by preparing and organizing photographic evidence of the completed work. Typical photo documentation includes all four sides of the home, roof and eave conditions, vents and penetrations, Zone 0 treatment, and all exterior attachments such as decks, fences, and patios. Builders are encouraged to create repeatable photo checklists for superintendents to ensure documentation is consistent and complete across projects. Supporting documentation may also include manufacturer specifications, product labels, and tested assembly information.

Coordinate the On-Site Evaluation

After documentation is submitted, the project moves to the field evaluation phase. The builder coordinates the evaluator visit, ensures site access, and may walk the evaluator through relevant systems and assemblies if needed. The evaluation verifies that the completed home physically meets the wildfire resilience requirements. If the project passes, it moves directly to designation. If corrections are required, the builder completes the identified punch-list items and submits documentation showing the corrections were addressed. Most corrections are relatively minor when wildfire requirements were integrated early in design and construction.

Receive Designation

Once all requirements are verified, the home receives its official Wildfire Prepared Base or Wildfire Prepared Plus designation. The designation documentation can then be used in insurance discussions, future resale marketing, and long-term property resilience planning. For architects and builders, designated projects also demonstrate expertise in wildfire-resilient construction and help distinguish their work in fire-prone regions. Designations are valid for three years and require annual review submissions to maintain active status.

THE RESILIENCY COMPANY

CHAPTER 9

Appendices + Resources

Appendices + Resources

This section provides reference material to support the design, construction, and maintenance of wildfire-resilient homes.

It summarizes key requirements, materials, and performance measures presented in previous chapters and organizes them into a format intended for quick use by homeowners, architects, and builders. The information is not exhaustive but focuses on the most relevant systems and decisions required to achieve IBHS Home and Home Plus standards.

Expert Insight

> *Finalizing the home design, scope, and material selections early in the process is one of the most important ways to prevent cost overruns. Early alignment around wildfire resilience requirements, IBHS standards, and permitting constraints helps avoid redesigns, change orders, and delays later in construction. Working with a turnkey builder also helps create greater coordination across design, permitting, and construction teams, reducing miscommunication, improving efficiency, and providing homeowners with more clarity throughout the process."*

Joshua Welty,
Director of Construction, Homebound

Materials + Measures Matrix

Building Component	CA WUI Code (Chapter 5)	Base	Plus
Roof	Class A roof	Verified Class A assembly	Full Class A system
Gutters + Downspouts	Noncombustible	Code compliant	Noncombustible + debris protection
Vents	Screened vents	Ember-resistant vents	ASTM E2886 rated vents
Exterior Walls	Ignition-resistant	Noncombustible or protected	Fully noncombustible system
Windows	Dual-pane glazing (≥1 tempered pane or fire-rated)	Code compliant (dual-pane, ≥1 tempered)	Dual tempered or fire-rated glazing
Doors	Solid-core or rated	Code compliant	20-min fire-rated or noncombustible
Eaves + Soffits	Protected / enclosed	Enclosed, ignition-resistant	Fully enclosed, noncombustible
Decks + Stairs	Ignition-resistant	Noncombustible near structure	Fully noncombustible
Fences	—	Noncombustible within 5 ft	Fully noncombustible
Site (0–5 ft Zone)	Basic clearance	Noncombustible zone	Fully controlled noncombustible system

Code vs Base vs Plus

Wildfire resilience is achieved through a series of layered decisions. This table summarizes how those decisions differ across three levels of protection, from minimum code requirements to enhanced, system-based strategies.

Level	What It Does	Where It Focuses	Typical Outcome	Why It Exists
CA WUI Code (Chapter 5)	Meets minimum legal requirements for building in wildfire-prone areas	Basic material compliance and fire-resistive components	Reduces risk, but vulnerabilities at vents, edges, and transitions may remain	Establishes a baseline level of safety required by law
Base	Reduces common ignition risks	Critical failure points such as vents, openings, and the immediate building perimeter	Lower likelihood of ignition from embers and surface fires	Addresses the most frequent causes of home loss in wildfires
Plus	Maximizes building survivability under wildfire exposure	Continuous noncombustible construction and coordinated system performance	Significantly improved resistance to ember intrusion and radiant heat	Provides a higher level of protection for extreme conditions and long-duration exposure

Most projects begin with code-compliant construction and selectively upgrade key elements such as vents, windows, and the 0–5 ft zone to achieve Base or Plus performance.

Expert Insight

As we rebuild after the Palisades Fire, we have a real opportunity to think beyond simply replacing what was lost. Wildfires are part of the reality of living in communities like ours, and resilience has to become part of how we build moving forward.

Going beyond the City's code requirements and building to the State's IBHS standards can help create homes that are better prepared to withstand the next inevitable fire. We have lost too much in this beautiful community not to learn from this moment.
Rebuilding with resilience is about protecting lives, preserving community continuity, and ensuring that the next wildfire does not produce the same level of devastation for the places and people we love."

Maryam Zar,
President, Palisades Recovery Coalition

The following notes summarize key technical requirements and material considerations for each building component.

They are intended to support design and construction decisions by highlighting critical conditions that affect wildfire performance. These notes do not replace manufacturer specifications or code requirements, but guide how systems should be selected and coordinated.

Roof

- **Class A-rated roof assembly required**
- **Roofing must be part of a tested assembly**
- Materials: asphalt shingles, clay/concrete tile, metal, slate
- Single-ply membranes are allowed only within tested assemblies
- Solar panels must maintain Class A rating
- Battery systems must be noncombustible and compatible

Doors + Garage Doors

- **Exterior doors must be noncombustible, solid-core, or 20-min rated**
- **Garage doors must be noncombustible**
- Glazing must be dual tempered or fire-rated
- Combustible doors only with noncombustible storm door
- Thresholds must be noncombustible
- Assemblies must be sealed

Gutters + Downspouts

- **Noncombustible materials required**
- **Systems must remain clear of debris**
- Metal systems recommended; no vinyl
- Gutter covers are noncombustible materials

Windows

- Dual-pane glazing with two tempered panes or a fire-rated assembly
- All window assemblies must be sealed
- Frames: vinyl, fiberglass, or aluminum
- Skylights must meet window requirements
- Operable units require mesh screens (≤ 1/8”)

Vents

- **All vents must be ember-resistant**
- **All openings must be protected**
- Applies to attic, soffit, ridge, and crawlspace vents
- Dryer and exhaust vents require louvers/flaps (not mesh)
- Plumbing vents exempt
- Whirlybird vents not permitted
- Assemblies must be sealed

Fences

- Noncombustible materials required within 5 ft of the structure
- Materials: metal, concrete
- No wood or vinyl within 5 ft
- No parallel combustible fences near the building
- Connections must maintain noncombustible continuity

Fences & Gates

- **Continuous noncombustible wall assembly required**
- **Noncombustible base at wall-to-ground interface**
- Materials: metal, fiber cement, stucco, brick, masonry veneer
- All trim and decorative elements must be noncombustible
- No exposed combustible components

Decks + Exterior Surfaces

- Noncombustible materials required
- Walking surfaces must be solid (no gaps)
- Materials: metal, fiber cement, concrete, tile, glass
- Structural components must be noncombustible
- No composite materials

System

Wildfire resilience is not achieved through a single material, detail, or decision. It is the result of coordinated choices across the building and site, applied consistently from design through construction and maintained over time.

The strategies outlined in this manual are based on known patterns of ignition and tested methods of reducing risk. When applied systematically, they can be integrated into a range of architectural approaches without defining a specific style.

This manual is intended as a working framework to support clear decisions and coordinated implementation.



Rendering
provided by Altadena Collective

Project Team+ Acknowledgments

This manual was developed through collaboration between architectural and resiliency teams, combining design expertise, field experience, and performance-based wildfire strategies.

Lead Architect + Author

Marija Volkman, Archicraft

Responsible for the overall structure, content, and integration of architectural design with wildfire resilience strategies.

Archicraft – Architectural studio

Project Initiation + Resiliency Strategy

The Resiliency Company Led the conception and direction of this work, establishing the framework for integrating wildfire resilience into broader infrastructure and community-focused initiatives.

The Resiliency Company

IBHS (Insurance Institute for Business & Home Safety)

Provided the research foundation and performance framework for the Wildfire Prepared Home and Home Plus standards referenced throughout this manual.

IBHS.org – Insurance Institute for Business & Home Safety

Graphic Design + Visual Development

Archicraft

Development of diagrams, visual systems, and layout to support clarity and accessibility of technical information.

Acknowledgments

This manual reflects a collaborative effort between architecture, wildfire resilience, and building science disciplines.

Special thanks to Laura Blaul at IBHS and Jonathan Dromgoole and Alexis Pelosi at the Resiliency Company for their work in making this manual a reality.

We would like to acknowledge The Foothill Catalog Foundation and Brookfield Residential for supporting the development of the featured case studies included in this manual.

We also recognize the architects, builders, consultants, researchers, and wildfire resilience professionals whose expertise informed the technical and design strategies presented throughout this guide.

THE RESILIENCY COMPANY

May 2026

www.resiliency.com