

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

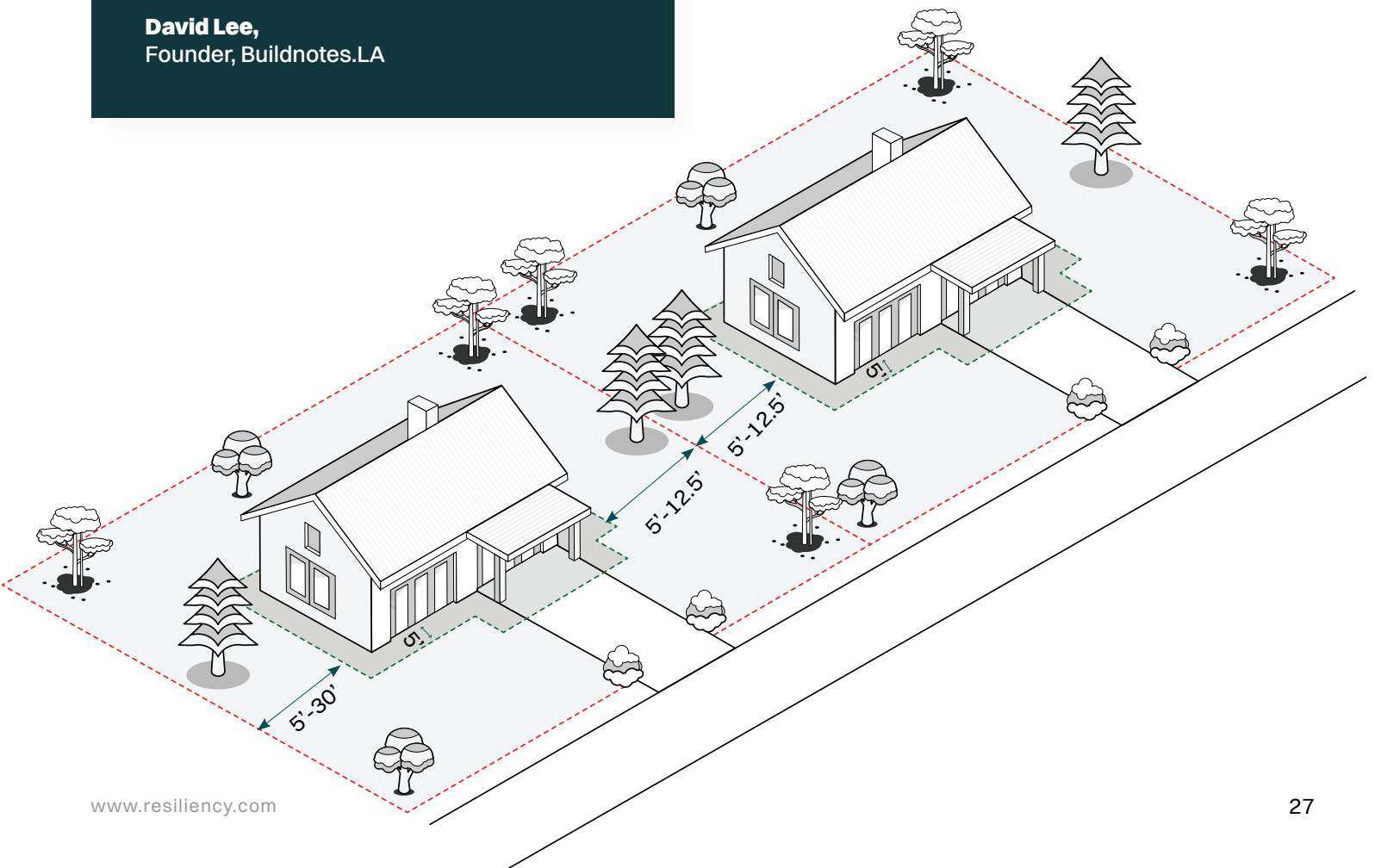
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A manual like this one, which highlights resilient building practices, helps us achieve our goals by helping homeowners improve their insurability and the likelihood that they can rebuild in the first place.”

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 graduated 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 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 tanks

✗ 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

Radiant heat transfer

02

Ember accumulation
in narrow side yards

03

Direct flame
impingement

04

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

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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.**

✓ Recommended

- ✓ Minimum separation from main structure
- ✓ Independent 0-5 ft noncombustible zone
- ✓ Noncombustible roof and walls
- ✓ Clear space between structures

✗ Avoid

- ✗ Sheds within ember zone of house
- ✗ Shared fencing or decks
- ✗ Combustible cladding or roofs
- ✗ Stored fuels near structures

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.

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 impractical

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

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Disasters and costs have risen dramatically. The status quo is unsustainable, therefore we must push resiliency to both homeowners and building professionals. Housing affordability 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.

4.7 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

4.8 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