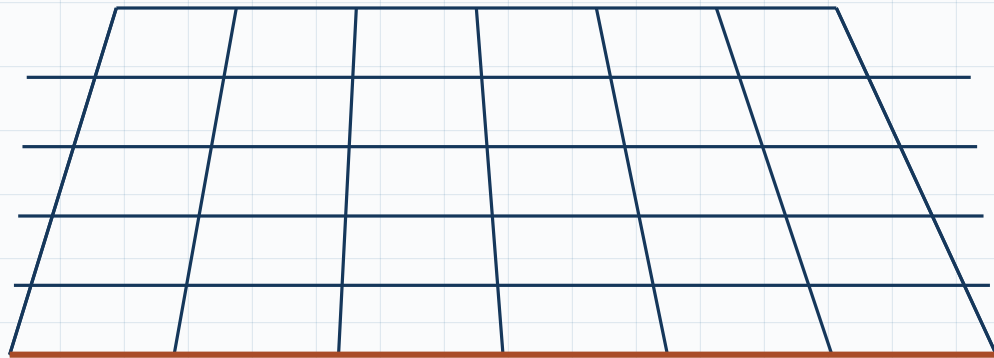


BOOK FOUR

THE RESILIENCE CASE

The institutional case for hazard-resistant, non-combustible construction



For municipalities, insurers, lenders, emergency managers, and policymakers

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A NOTE BEFORE YOU BEGIN

This is the volume of the Steel Building USA Standard written for the people who answer for communities: municipal officials and planners, insurers and lenders, emergency managers, housing agencies, and the developers and institutions that build where hazards live. It is an argument, and we make it plainly: the way America rebuilds after disasters - with the same combustible, fragile construction that just failed - is a policy choice, and it is the wrong one. The argument rests on three pillars.

First, the crisis is measurable: insurance is retreating from hazard-exposed markets, and with it goes mortgageability, salability, and community stability. Second, the economics are settled: federal and independent research puts the return on hazard-resistant construction at many dollars saved for every dollar invested. Third, the standard exists: engineered, non-combustible light gauge steel construction is code-recognized, produced today, and ready to be the default in hazard-prone rebuilding.

Every figure in these pages is cited, every claim is bounded by what the evidence supports, and where insurance outcomes cannot be promised, we say so. A resilience case that overstates is no case at all.

PART ONE / The Crisis

CHAPTER 01 - The Uninsurable Future

A home that cannot be insured cannot, in practice, be mortgaged. A home that cannot be mortgaged collapses to a cash-only market. Communities where that chain takes hold do not merely face higher premiums - they face declining values, stalled sales, and an erosion of the property-tax base that funds their own fire response.

This is the mechanism policymakers must hold in view: insurance retreat is not an industry story; it is a community-stability story.

The policy takeaway: Insurance availability now functions as a real-time audit of construction quality. Jurisdictions that keep rebuilding combustible stock in fire country are rebuilding the crisis.

The retreat, measured

In California, roughly 400,000 home-insurance policies were canceled or non-renewed between 2021 and recent reporting, and enrollment in the FAIR Plan - the insurer of last resort - grew about 43 percent in fifteen months. Seven of the state's twelve largest insurers limited new policies or pulled back from renewals. The January 2025 Palisades and Eaton fires destroyed more than 16,000 structures and generated on the order of \$40 billion in insured losses - the costliest wildfire disaster in U.S. history.

The pattern is spreading: Colorado launched its own FAIR Plan in 2025 after premiums rose roughly 58 percent in five years.

What a last-resort market signals

FAIR plans exist to catch what the voluntary market refuses. When a state's last-resort pool becomes one of its fastest-growing insurers, the market is sending an unambiguous price signal about the building stock itself: the structures, as built, carry more fire risk than carriers will voluntarily hold. Rate reform and regulatory pressure can shift where the risk sits; only changing what gets built can shrink it.

PART ONE / The Crisis

CHAPTER 02 - The Loss Curve: Why Disasters Keep Costing More

Disaster losses in the United States are compounding - not only because hazards are intensifying, but because we keep placing fragile buildings in their path and replacing them in kind after each event. The loss curve is a construction choice as much as a climate outcome.

Fire

California's fire agency reported over 600,000 acres burned in 2023 alone, with thousands of homes destroyed and families displaced - and 2025 brought the costliest wildfire disaster in U.S. history. In the wildland-urban interface, the dominant failure mode is well documented: structures ignite - from embers, from radiant heat, from structure-to-structure spread - and combustible framing turns each ignited home into fuel for the next. Defensible-space rules address the vegetation around a building; they do not change what the building itself is made of.

Wind and water

Hurricane and severe-wind losses follow the same logic: under-engineered structures fail at the connections and the envelope, and every failure seeds debris that damages neighbors. Flood losses compound where structures cannot tolerate wetting - organic materials that mold and rot turn a wet building into a demolished one.

Earthquake

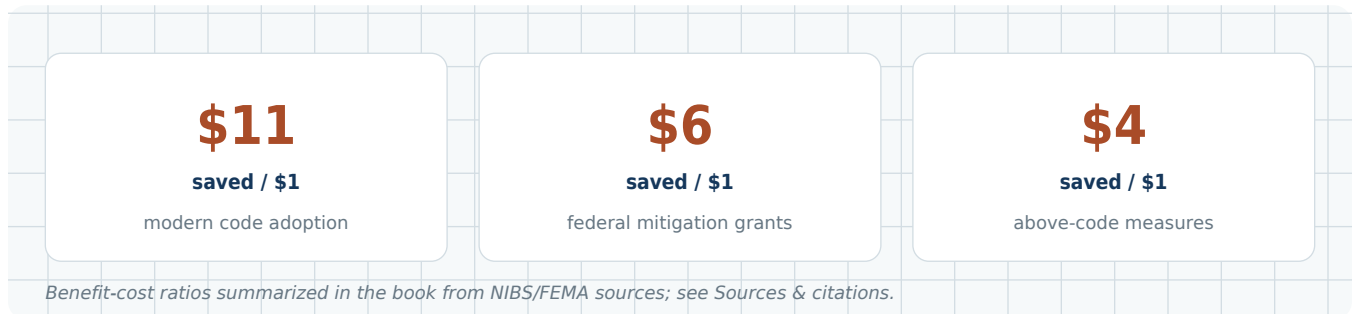
Seismic risk concentrates where older, brittle construction meets major faults. Structures that cannot flex crack; structures that cannot hold their connections collapse. California's building standards set seismic minimums, but minimums permit construction that survives the code case and little more.

The rebuild-repeat cycle

After each event, disaster funding flows - and most of it rebuilds what stood before, to the minimum standard, in the same footprint. The result is a loss curve that resets rather than bends: the same communities, the same construction, waiting for the same event. Part Two shows what it costs to keep choosing this - and what it returns to stop.

PART TWO / The Economics of Resilience

CHAPTER 03 - Eleven to One: The Federal Case for Better Codes



The strongest argument for hazard-resistant construction is not made by builders. It is made by the federal government's own research - and it is blunt. FEMA's Building Codes Save analysis and the National Institute of Building Sciences' landmark Natural Hazard Mitigation Saves study - the most exhaustive benefit-cost analysis of natural hazard mitigation ever conducted, funded by three federal agencies - converge on the same finding: adopting up-to-date model building codes saves about \$11 for every \$1 invested, at a construction-cost increase of roughly 1 percent.

FEMA's work documents billions of dollars in avoided losses in jurisdictions that adopted modern codes - and notes that roughly two-thirds of U.S. jurisdictions still have not.

Read that gap as an opportunity

Two-thirds of jurisdictions without modern hazard codes is not only a vulnerability statistic - it is the single largest, cheapest resilience opportunity in the country. Code adoption requires no new technology, no federal appropriation, and no construction moratorium. It requires a vote.

For a local official, few decisions on any agenda carry an evidence-backed eleven-to-one return. For decision-makers: The question FEMA's brochure poses to community leaders - what will be our legacy? - has a measurable answer: the codes in effect the day before the next disaster.

PART TWO / The Economics of Resilience

CHAPTER 04 - Mitigation Saves, By the Numbers

The Mitigation Saves research goes beyond the headline. Its national benefit-cost ratios, by strategy, give leaders a portfolio view of where resilience dollars return most - and its topline finding is that mitigation can save up to \$13 for every \$1 invested. National average benefit-cost ratios by mitigation strategy (NIBS, Natural Hazard Mitigation Saves, 2019)

- Adopting up-to-date model codes: \$11 saved per \$1 - the highest-leverage move available to most jurisdictions.
- Federal mitigation grants: \$6 saved per \$1 - public-sector investment in hardening pays for itself many times over.
- Above-code design: \$4 saved per \$1 - building beyond minimums returns value on day one for hazard-exposed assets.
- Private-sector building retrofits: \$4 saved per \$1 - including flood retrofits at up to \$6 per \$1 in specific applications.
- Lifeline retrofits: \$4 saved per \$1 - the telecommunications, roads, power, and water society depends on after an event. The ratios vary by geography and hazard - they can run much higher where exposure is severe - but the direction is uniform: every studied category of hazard mitigation returns multiples of its cost. There is no evidence-based case for building to yesterday's minimums in tomorrow's hazard zones.

IMPORTANT Benefit-cost ratios are national averages from the cited NIBS research and vary by location, hazard, and measure. They describe societal returns, not a guarantee of savings on any single project.

PART TWO / The Economics of Resilience

CHAPTER 05 - The Insurance Math

Insurers price what they observe, and what they observe is construction. For institutions and owners, the resilience decision shows up on three insurance lines.

During construction

Builder's risk premiums reflect the fuel on site. Non-combustible framing has been reported to reduce builder's-risk costs dramatically - savings of up to roughly 77 percent over the course of construction - because a half-built steel structure is not a fire load.

At stabilization

Completed non-combustible construction earns better risk classifications, and carriers increasingly offer mitigation credits for hardened features. In wildfire-exposed markets, the more consequential effect is binary: whether a property can be voluntarily insured at all - which in turn governs financing, valuation, and exit.

At the portfolio and community level

For a lender, a municipality, or a housing agency, the aggregate matters most: a building stock that carriers will insure is a tax base that holds, collateral that lends, and a community that can absorb an event and recover. Resilient construction is, functionally, insurance-market policy executed one building at a time.

IMPORTANT Insurance outcomes depend on carrier, market, location, and many property-specific factors. Non-combustible construction strengthens a property's risk profile; it does not guarantee coverage, premiums, or credits. Figures cited are reported ranges from public sources.

PART THREE / Steel as the Resilient Standard

CHAPTER 06 - The Non-Combustible Answer

Every hazard argument in this book sharpens to a single material fact in fire country: light gauge steel framing is non-combustible. It does not ignite, does not add fuel, and does not carry fire from one part of a structure to another. In the wildland-urban interface - where homes ignite homes - a non-combustible frame interrupts the chain reaction that turns an ember storm into a neighborhood loss.

Fire-rated steel assemblies are tested and listed to hold for hours, and the industry's fire research - including the cold-formed steel sector's own published briefs - documents the performance gap between combustible and non-combustible framing under real fire exposure. None of this makes a building fireproof; roofing, vents, glazing, and defensible space still matter. It makes the structure itself stop being part of the fuel.

FIELD NOTE - The structural difference In a conflagration, wood framing is inventory for the fire. Steel framing is not. Everything else about wildfire hardening builds on which of those two facts describes your building stock. For rebuilding policy, the implication is direct: the moment of reconstruction - when insurance proceeds and disaster funds are already being spent - is the cheapest moment a community will ever have to change what burns.

PART THREE / Steel as the Resilient Standard

CHAPTER 07 - Engineered for Wind and Quake

Fire is steel's headline; wind and seismic are its quiet strengths.

Wind

Wind failures concentrate at connections and the envelope. Engineered cold-formed steel construction addresses both by design: every connection is specified and screwed rather than improvised and nailed, load paths are continuous from roof to foundation, and high-wind-rated trusses are standard production items - engineered well beyond 100 mph exposure and manufactured to the stamped drawings, not to a framer's judgment on a windy afternoon.

Seismic

Earthquakes punish brittleness and reward ductility - the capacity to flex and return. Steel's strength-to-weight ratio and ductile behavior are precisely why engineers favor it in seismic design: a lighter structure attracts less seismic force, and a ductile one absorbs what arrives. PE-stamped lateral systems with engineered bracing are the norm in cold-formed steel design, not an upgrade.

And water

After wind and flood events, the second disaster is often biological: soaked organic framing that molds, rots, and must be torn out. Inorganic steel framing tolerates wetting - dry it, inspect it, close it back up. For flood-exposed communities, that difference is the line between remediation and demolition.

PART THREE / Steel as the Resilient Standard

CHAPTER 08 - Code-Ready by Design

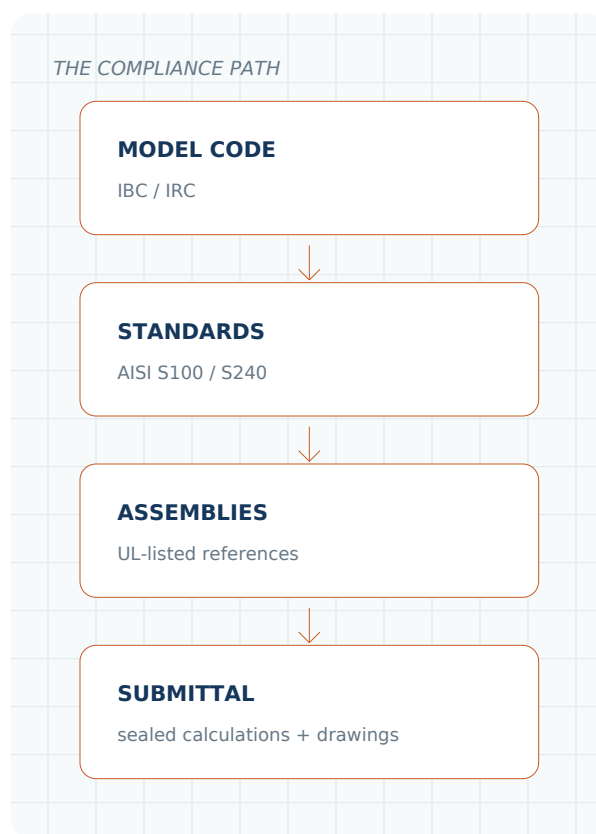
Institutions do not adopt materials; they adopt compliance paths. Steel's path is mature and fully marked.

Model-code recognition. Cold-formed steel framing is recognized in the IBC and IRC, with both prescriptive residential paths and engineered design.

Governing standards. AISI S100 governs member design; AISI S240 governs structural framing systems - the citations a building official expects to see.

Listed assemblies. UL-listed wall, floor, and roof assemblies carry tested fire, sound, and thermal ratings that drawings can reference directly.

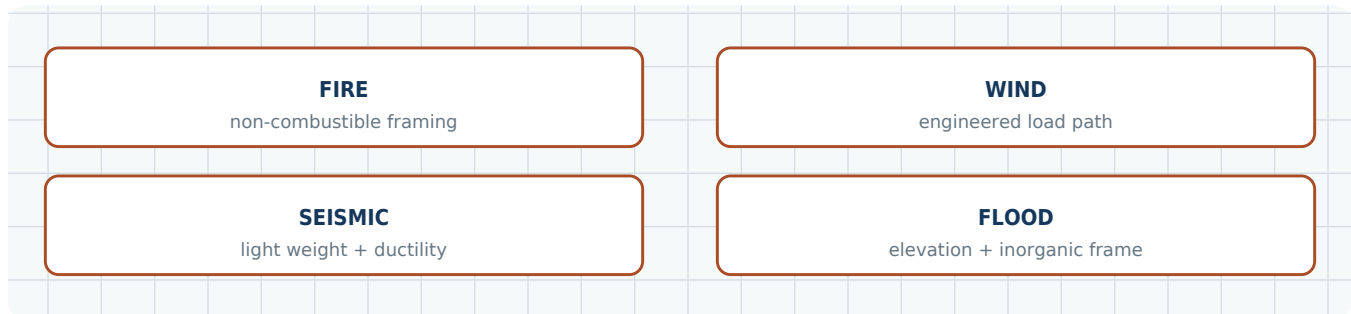
Stamped and submission-ready. Steel Building USA packages arrive with sealed structural calculations, framing layouts, and shop drawings mapped to the local code cycle - a clean plan-check, not a negotiation.



For a jurisdiction weighing hazard-resistant requirements, this matters: mandating or incentivizing non-combustible, engineered construction does not push builders into an unregulated frontier. It points them at one of the best-documented compliance paths in the code. An engineered light gauge steel framing set - every member designed, stamped, and code-referenced before fabrication (representative Steel Building USA sample).

PART THREE / Steel as the Resilient Standard

CHAPTER 09 - Region by Region: Building for the Hazard You Have



Resilience is local. The standard is the same - engineered, non-combustible steel - but the design emphasis follows the map.

The fire West

California and the interior West: the priority is ignition resistance - non-combustible framing paired with ember-resistant vents, Class A roofing, and defensible space. Here the insurance crisis is most acute, and here the case for rebuilding in steel is strongest: it is the region where a frame that cannot burn changes both survival odds and insurability.

The wind Gulf and Southeast

Hurricane country calls for engineered load paths, high-wind-rated trusses, and envelope detailing that keeps the structure closed when the pressure arrives. Steel's screwed, specified connections and stamped lateral design are built for exactly this exposure - and the Southeast is already served by Steel Building USA's production network.

The seismic West

Along the fault systems, light weight and ductility lead: less mass to shake, engineered bracing to absorb what shakes anyway. Steel's seismic behavior is a first-order reason engineers specify it where the ground moves.

Flood country, everywhere

Riverine and coastal flood zones span every region. Elevation and siting do the first work; an inorganic frame that tolerates wetting does the second - turning a flooded building into a remediation project instead of a teardown. One standard, tuned locally: The Steel Building USA Standard carries the same engineering discipline into every region - what changes is which hazard the design leads with.

PART FOUR / Tools, Programs & Policy

CHAPTER 10 - The Hazard-Resistant Building Program

Steel Building USA has organized the material case in this book into a working program: hazard-resistant home building, supported by tools that help owners, officials, and partners see their exposure and their options. The program starts from a simple definition: an ordinary home is built to code; a hazard-resistant home is built to survive the disaster its region actually faces - and to stay insurable for the long term. Around that definition sit the practical pieces: engineered, non-combustible designs matched to regional hazards; a hazard and insurance calculator that lets a user understand their risk profile and how construction choices move it; and a production network that can deliver the resulting buildings today.

For public officials and institutions, the program functions as a bridge between policy intent and buildable reality: when a jurisdiction decides that rebuilding should mean rebuilding better, the designs, the engineering, the compliance path, and the manufacturing capacity already exist. Explore the tools: The hazard-resistant building program and the hazard and insurance calculator are available at steelbuildingusa.com.

PART FOUR / Tools, Programs & Policy

CHAPTER 11 - The Policy Case: Rebuild Better, or Rebuild Again

Steel Building USA has put its position on the public record: a petition to the Governor of California urging that hazard-resistant materials be required in rebuilding across hazard-prone areas - and that combustible wood framing no longer be the default material with which fire country reconstructs itself.

The argument, in brief

The petition's logic tracks this book's. California is among the most disaster-exposed states in the nation, with wildfire, seismic, and extreme-weather risk intensifying; its own agencies document the toll, including more than 600,000 acres burned in 2023 alone. Existing law addresses the surroundings but not the structure: defensible-space requirements under Public Resources Code §4291 manage vegetation around buildings while leaving the combustibility of the buildings themselves untouched, and Title 24's seismic minimums still permit framing that is less resilient than modern engineered alternatives.

Meanwhile, rebuilding in wood perpetuates deforestation and a repeating cycle of loss and reconstruction.

The ask

The petition asks the state to close that gap: require hazard-resistant, non-combustible materials - such as engineered light gauge steel - when hazard-prone areas rebuild. Not as a preference, but as policy, applied at the one moment when policy is cheapest to apply: reconstruction, when the money is already being spent.

Why this is a reasonable policy, not a radical one

Every element of the ask is already established practice somewhere in the system. Codes already dictate materials and assemblies for safety - that is what codes are. The federal government's own research (Chapters 3 and 4) says hazard-resistant construction returns roughly eleven dollars per dollar.

And the compliance path (Chapter 8) is fully mapped. What the petition proposes is alignment: making the rebuilding rules match the evidence the government itself has published.

IMPORTANT Chapter 11 summarizes Steel Building USA's public policy position. Legal citations reference California statutes as characterized in that petition; officials should rely on current statutory text and counsel for regulatory decisions.

PART FOUR / Tools, Programs & Policy

CHAPTER 12 - Public Projects, Public Partners

Policy sets direction; procurement builds it. For agencies and municipalities ready to act, Steel Building USA is structured to be a public-sector partner, not only a vendor.

The certification portfolio

Steel Building USA qualifies for the set-aside pathways that route public contracts to certified firms: and (small business), SDVOSB (service-disabled veteran-owned), DVBE (disabled veteran business enterprise), and DIR Public Works registration for California public projects. For an agency carrying set-aside goals, resilient construction and procurement compliance can arrive in the same award. Certifications open the set-aside pathways - and route resilient public work to the regional network positioned to build it

What the network delivers

Behind the certifications sits the production system this series documents: engineered designs, sealed and code-mapped submissions, regional manufacturing in the Southeast and West, panelized delivery, and rapid-deployment structures for disaster response. Municipal buildings, housing-authority projects, stormwater-compliance retrofits under MS4 programs, and postdisaster rebuilding all fit the same workflow.

Disaster response, specifically

Recovery programs increasingly specify resilient, rapidly deployable structures. Flat-pack steel shelters that erect in under an hour, engineered ADU-scale housing that can repopulate a burned block, and non-combustible replacement stock that will not feed the next event - the network produces all three today.

PART FOUR / Tools, Programs & Policy

CHAPTER 13 - What Leaders Can Do Now

Resilience does not require waiting for the state or the next appropriation. Each seat at the table has a move available this quarter.

If you set codes or policy

1. Adopt the current model codes - the documented eleven-to-one decision - and review local amendments that weaken hazard provisions. 2.

In high-hazard zones, require or incentivize non-combustible construction for rebuilds: expedited permits, fee reductions, or density considerations for hazard-resistant projects. 3. Pre-approve resilient plan sets - including steel ADU and infill designs - so the fastest path through your counter is the strongest building.

If you insure, lend, or appraise

4. Recognize non-combustible, engineered construction explicitly in underwriting, mitigation credits, and collateral assessment. 5.

Price the difference honestly - the data supports it, and the market signal accelerates adoption faster than any mandate.

If you build, develop, or manage public assets

6. Specify hazard-resistant construction for anything you intend to hold - the above-code return is documented at \$4 per \$1 and rises with exposure. 7.

Run one project through the resilient standard and measure it: schedule, builder's risk, and the insurance conversation at stabilization. And whichever seat you hold - talk to us. The designs, the engineering, the compliance path, and the production capacity described in this book exist now, and they are built to plug into public purpose.

Steel Building USA

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The series

This is Book Four of the Steel Building USA Standard. Book One, The Opportunity, recruits the regional producers who manufacture this standard. Book Two, the Homeowner's Guide, speaks to the families who live in it.

Book Three, the Developer & Builder Playbook, equips the professionals who deliver it. Together they describe one system - and this volume states why it matters: because the next disaster is already scheduled, and what stands afterward is being decided now, one frame at a time.

Regional risk quick reference

- Fire West (CA, interior West): lead with non-combustible framing, ember-resistant venting, Class A roofing, defensible space; insurability is the binding constraint.
- Wind Gulf / Southeast: lead with engineered load paths, high-wind-rated trusses, envelope integrity; production network active in-region.
- Seismic West: lead with light weight and ductility; PE-stamped lateral systems and engineered bracing standard.
- Flood (riverine and coastal): lead with elevation and siting; inorganic framing converts flooding from demolition to remediation.

REFERENCE

GLOSSARY & SOURCES

BuildSteel.org fire research. All figures are cited ranges and national averages, not guarantees; no third-party copyrighted text or drawings are reproduced.

Glossary

- Non-combustible. Will not ignite or contribute fuel to a fire - the defining property of steel framing in hazard policy.
- WUI. Wildland-urban interface - where structures meet fire-prone vegetation, and where structure-to-structure ignition drives losses.
- FAIR Plan. A state-created insurer of last resort for properties the voluntary market declines.
- BCR. Benefit-cost ratio - dollars of expected loss avoided per dollar invested in mitigation.
- Mitigation Saves. The National Institute of Building Sciences' landmark benefit-cost research on natural-hazard mitigation.
- AISI S100 / S240. The design specification for cold-formed steel members, and the standard for CFS structural framing systems.
- MS4. Municipal Separate Storm Sewer System - the stormwater-compliance framework behind enclosure-retrofit demand.

Sources & citations

Mitigation economics are from the National Institute of Building Sciences, Natural Hazard Mitigation Saves (2019) - including the \$11:\$1 code-adoption, \$6:\$1 federal-grant, and \$4:\$1 above-code and retrofit ratios and the up-to-\$13:\$1 topline - and from FEMA's Building Codes Save analysis and Protecting Communities and Saving Money (2020). Insurance-market figures (California non-renewals, FAIR Plan growth, carrier pullbacks, 2025 Los Angeles fire losses, Colorado FAIR Plan) are from public regulatory data and industry reporting current as of publication and are fast-moving; verify before relying on them.

Wildfire acreage is as reported by Cal Fire and cited in Steel Building USA's public petition, which Chapter 11 summarizes; statutory references therein (Public Resources Code §4291; Title 24) are as characterized in that petition. Steel performance and code references follow AISI S100/S240, the IBC/IRC, UL assembly listings, SFIA, and