



## **Fire Resilience**

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# Fire Resilient Design for Building & Community

**HUUM Architects** believes we are responsible to design buildings that safeguard lives, protect property and equally harmonize with our environment.

Wildfires due to development encroachment into wild lands and climate change are an ever-growing threat. California's dry climate, dense vegetation, and strong seasonal winds can produce ideal conditions for fast-moving and intense wildfires. As these fire events become more frequent and devastating, our communities in these areas must embrace fire resilient design and building strategies that balance the needs of individuals, communities and the natural environment. If we employ proactive strategies, inherent risks in these areas can be mitigated for us to live safely in these areas.

**HUUM** designs fire-resiliency based on the WUI code, Building Code, and best design and construction practices. Our following playbook of detail and guidance shows how a house can be designed to be resilient to natural fire disasters, but also how can they be more energy efficient to operate on a more global scale of trying to reduce carbon emissions that fuel climate change and its incumbent disasters.

Sustainability and Resilience can and should go hand in hand.

## THE DEFINITION OF RESILIENCE



### SUSTAINABILITY

Building's impact on the environment.



### RESILIENCE

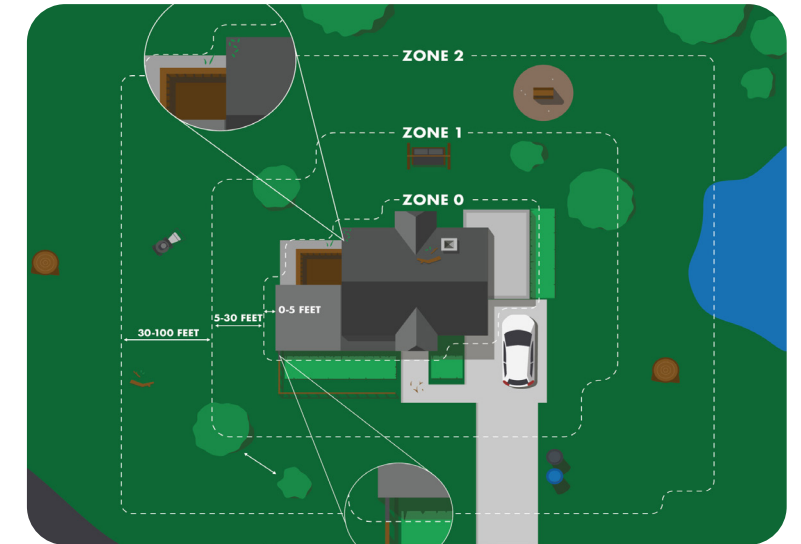
The environment's impact on a project, occupants, or community.

(Definition source: AIA Resilience and Adaptation on-line certificate program)

# Fire Resilient Design & Building Toolkit

## PERIMETER DEFENSE:      Active and Passive Systems

- concrete site walls
- reduce landscaping fuel within 5 feet of structure, “lean, clean and green”
- fire-wise native landscaping within 10 feet of structure
- clutterless site furnishings
- exterior fire sprinkler system rooftop irrigation, and strategically placed fire hydrants.  
for rural areas, consider water tanks with sufficient capacity for emergency use.
- defensible noncombustible or ignition resistant border around structure
- eliminate fire fuel
- ignition resistant decking material



## STRUCTURE/ GEOMETRY:      Reduce exposure

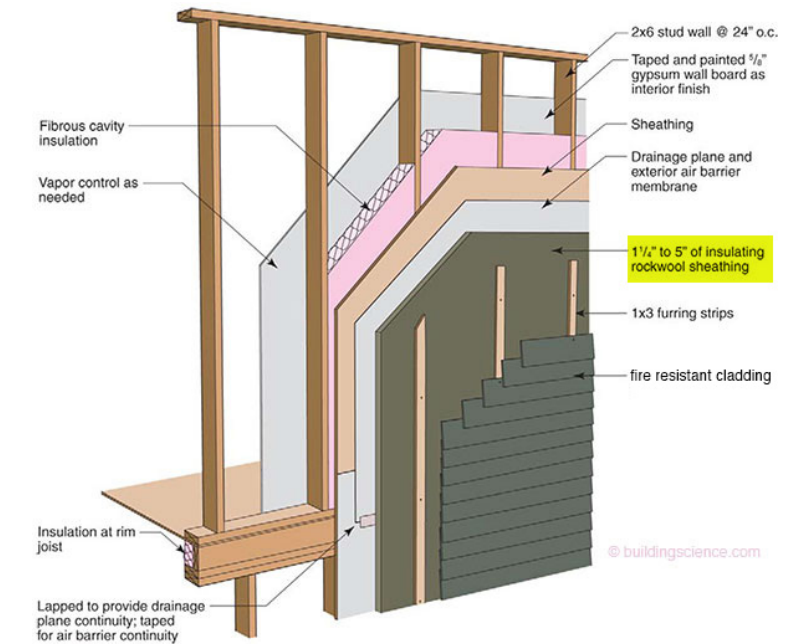
- compact forms
- pitched roof
- reduce overhangs and eaves
- air-tight envelope
- noncombustible structure
- protect/shield openings
- limit penetrations/vents/openings



# Fire Resilient Design & Building Playbook

## ENVELOPE DEFENSE: Material and Assemblies

- noncombustible or ignition resistant exterior cladding
- high fire-rated wall assemblies
- high tempered windows with dual glazing and aluminum or metal frames
- spark arrestor at chimney, remove old wood burning fireplaces/stoves
- shield crawl spaces
- ember proof door thresholds
- fire rated doors
- fire shutters at glazing and openings
- noncombustible insulation/membrane, such as densglas sheeting, rockwool insulation



## ROOF DEFENSE: Material and Assemblies

- fire resistant roof material
- unvented roof assemblies
- gutter guard
- closed eaves and overhangs
- regularly maintain debris

## FIRE PROTECTION: Systems and Access

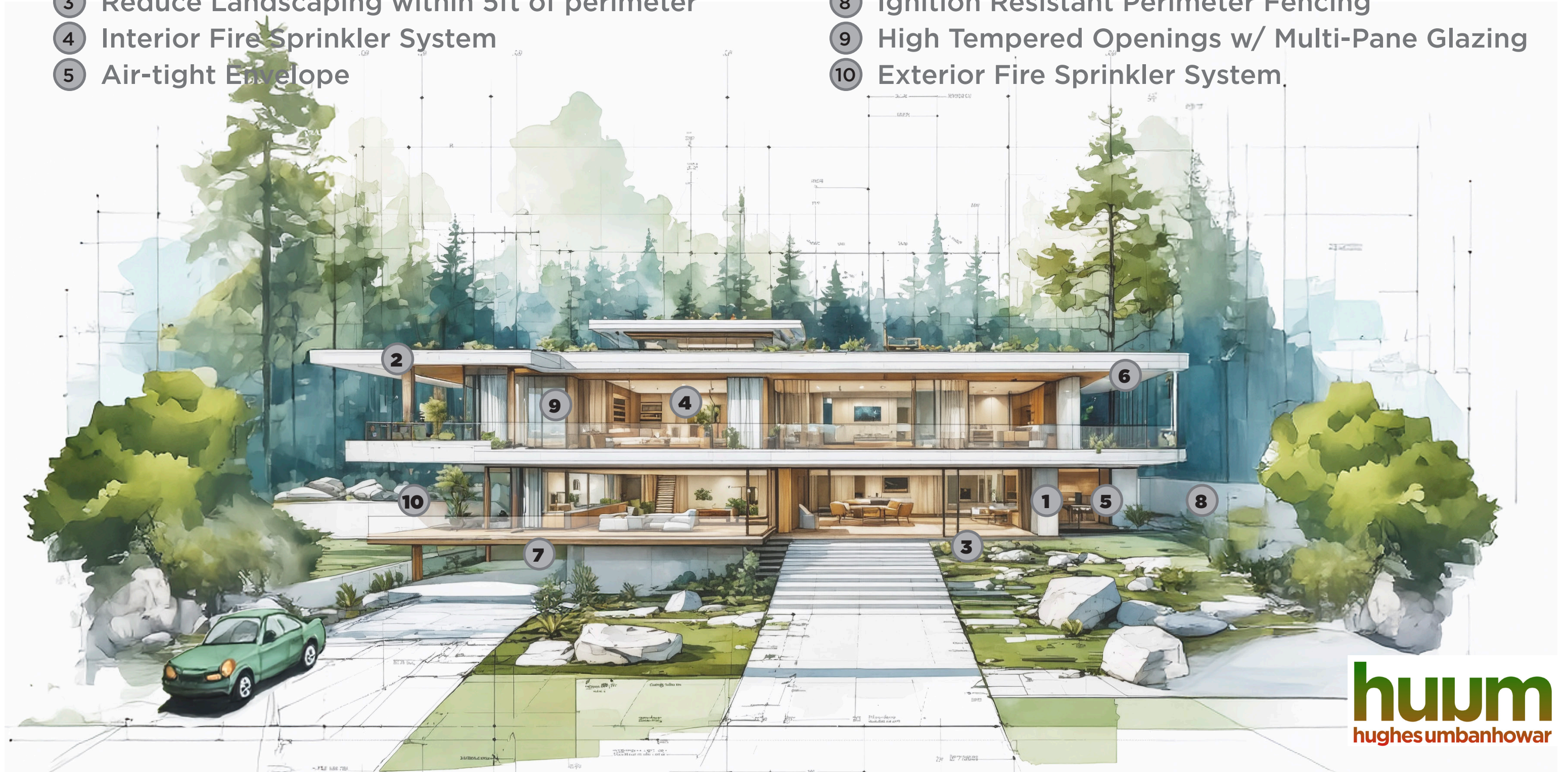
- fire sprinkler system
- fire alarm
- emergency response access: fire apparatus staging area and a clear firefighter footpath





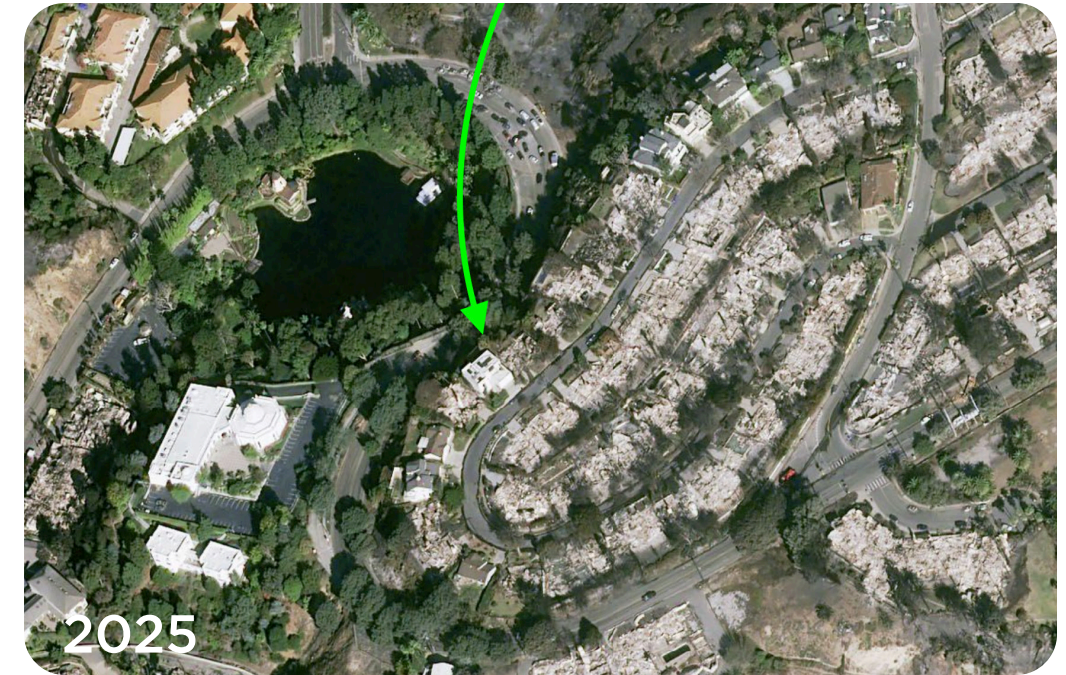
# Fire Resilient Details in place

- 1 Ignition Resistant Envelope
- 2 Unvented Roof Assembly
- 3 Reduce Landscaping within 5ft of perimeter
- 4 Interior Fire Sprinkler System
- 5 Air-tight Envelope
- 6 Closed Eaves & Overhangs
- 7 Protected Crawl Space
- 8 Ignition Resistant Perimeter Fencing
- 9 High Tempered Openings w/ Multi-Pane Glazing
- 10 Exterior Fire Sprinkler System





# Palisades Residence Resilience Designed survives January 2025 fire



## Primary Components

- Ignition Resistant Envelope
- Unvented Roof Assembly
- Reduced Landscaping within 5ft of perimeter
- Interior Fire Sprinkler System
- Air-tight Envelope
- High Tempered Openings w/ Multi-Pane Glazing
- Compact Forms



# Post January 2025 fires in Los Angeles

The reckoning of lives, structures, livelihoods, communities damaged and erased will be a long one, years if not decades. The challenges to rebound and thrive in these neighborhoods nevertheless demand a thoughtful, comprehensive response going forward. By designing fire-resilient homes, advocating for smarter land management, and prioritizing sustainable practices, we can rebuild stronger, safer, and more connected communities. Our above playbook of resilient strategies offers a roadmap for integrating resilience, efficiency, and ecological respect into every project. There is a chance the relationship between human habitation and nature can be reconsidered, ensuring a legacy of safety and sustainability for generations to come.

## Community-Level Approaches

In tandem with specific building technique and strategies, the ongoing devastation of wildfires in the West underscores the need for a collective, strategic response that encompasses both individual structures and their interfaces with wildlands. Management of WUI zones and adjacent wild areas must become a priority if we want to continue residing in these areas, encompassing the following measures:

### 1. Fuel Management

- Redirect funds typically allocated to disaster recovery toward proactive measures like controlled burns, managed grazing, and forest thinning programs. Treat nature like nature treats itself.
- Advocate for partnerships between government agencies, local communities, and private landowners to implement regional fuel reduction programs.

### 2. Urban and Suburban Planning

- Zone new developments to incorporate firebreaks, widen access roads for emergency vehicles, and situate critical infrastructure away from high-risk areas.
- Foster fire-adaptive communities by requiring collective maintenance of defensible spaces and community-wide evacuation plans.

### 3. Policy Advocacy

- Push for code updates that incentivize fire-resistant construction, including grants, tax credits, and insurance premium reductions for homes built or retrofitted to meet WUI standards.
- Support funding for community education programs to raise awareness about fire prevention and preparedness.

## Harmonizing Human and Natural Values

Living at the wildland-urban interface offers a unique and cherished connection to nature. However, this proximity requires a reciprocal relationship—one grounded in mutual respect for human safety and ecological health. As architects, our designs should honor this relationship by embracing solutions that:

- Respond to local climate and ecology.
- Minimize resource consumption through energy efficiency & carbon neutrality.
- Enhance the resilience and sustainability of both homes and communities near and on the opposite sides of the globe.

## Integrating Fire Resilience with Energy Efficiency

While fire resilience addresses immediate safety, energy-efficient design tackles the broader challenge of mitigating climate change—one of the root causes of increasingly severe wildfires. Homes designed with resilience and sustainability in mind should include:

- High-Performance Envelopes: Use insulation, air barriers, and high-performance windows to reduce energy demand and maintain interior comfort during extreme conditions.
- Renewable Energy Systems: Incorporate solar panels, battery storage, and grid-independent power sources to ensure functionality during outages.
- Low-Carbon Materials: Specify materials with low embodied carbon, such as reclaimed wood, bamboo, and low-impact concrete alternatives.
- Water Efficiency: Collect and store rainwater for irrigation and fire suppression, reducing dependence on strained water supplies.

## Advocacy for Larger Measures

To rebuild effectively and sustainably, our firm urges:

1. Adherence to Fire-Resilient Guidelines: Implementing these principles is critical to ensuring individual and community safety.
2. Advancing WUI Management: Proactive policies and funding are essential for making wildland interfaces manageable.
3. Aligning Codes with Climate Goals: Continue to encourage regulations that prioritize carbon reduction and resilience, creating communities that thrive in harmony with their environment.

# Let's be Pyrophytic

Pyrophytes are plant species that have evolved to thrive in environments that are frequently subjected to fire. These plants have various adaptations that allow them to survive and even benefit from wildfires, playing a critical role in the ecosystems where they are found. Understanding pyrophytes is essential as they contribute to the recovery of ecosystems post-fire and influence fire behavior through their growth patterns and life cycles.



## Resources

<https://www.nfpa.org/en/education-and-research/wildfire/preparing-homes-for-wildfire>

<https://naes.agnt.unr.edu/PMS/Pubs/2020-3810.pdf>

[https://cms5.revize.com/revize/wascocounty/WUI%20Visuals%20Community%20Guide\\_2018.pdf](https://cms5.revize.com/revize/wascocounty/WUI%20Visuals%20Community%20Guide_2018.pdf)

<https://mayor.lacity.gov/sites/g/files/wph2066/files/2025-01/EO%201%20-%20Emergency%20Executive%20Order%20-%20Expedited%20Community%20Rebuilding%20and%20Recovery.pdf>

<https://www.frontlinewildfire.com/>

<https://readyforwildfire.org/prepare-for-wildfire/defensible-space/>

[https://ucanr.edu/sites/safelandscapes/fire\\_resistant\\_buildings/](https://ucanr.edu/sites/safelandscapes/fire_resistant_buildings/)

<https://disastersafety.org/wildfire/>



# Design Process and Fire Resiliency

Rebuilding or designing a home in a fire-prone area is an opportunity to create a legacy of resilience, sustainability, and beauty. Our detailed fire-resilient design playbook will guide you through the process, ensuring that every decision aligns with your safety, aesthetic preferences, and values.

Together, we'll design a home that not only withstands natural disasters but also minimizes its environmental impact--creating a sanctuary that protects and inspires, harmonizes between human habitation and the natural world.

Through collaborative discovery we explore the unique opportunities of your site, to seamlessly integrate fire-resilient features into your home. Design iterations ensure a balance between safety, aesthetics, and sustainability—resulting in a home that embodies fire resistant features, but is specific to each client and family.

Our office has navigated the regulatory agencies of Los Angeles for over 25 years and knows how to simplify the entitlement process. The amount building applications to follow the January fires may prove a daunting task for nominally staffed building departments, though it appears agencies are putting in place accelerated measures for fire rebuilds. We leverage our experience and long standing relations with expediting firms to guide projects effectively through code and administrative tasks to proceed steadfastly to get to building, whether a 110% rebuild or new project.

We are here when you are ready to restart and renew.

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