

## Evolving Climate Patterns and Extreme Weather Demand New Building Methods

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Compared to the rest of the world, most buildings in the United States are relatively young. But most residential and commercial properties could use a makeover. Buildings constructed over 20, 50, and 100 years ago are, unsurprisingly, not as energy-efficient or as safe as new builds following modern methods – especially when considering the effects of climate change and more frequent extreme weather events on the integrity of that infrastructure.

According to the National Association of Home Builders, over 90% of new homes built in the United States today are wood-framed. These homes are incapable of withstanding a tornado or hurricane, yet they are still being built directly in the path of storms. Even buildings constructed in some of the most earthquake-prone areas of the U.S. may contain design flaws that make them susceptible to damage because they are built using a non-ductile concrete method, which experts say has an inadequate configuration of steel reinforcing bars – making the building vulnerable when shaken. While this building method was banned for new construction, it is not yet required to retrofit older construction to improve safety and structural integrity.

Instead of building with timber or concrete forms, especially in regions most prone to weather and climate disasters, there is a superior option that can withstand damage under extreme conditions: 3D expanded polystyrene (EPS) wire mesh panels. These panels can be custom manufactured in a variety of shapes and sizes and can be used to build roofs, interior and



exterior walls, floors, staircases, and more. The EPS panels are clipped together using specialty metal fasteners and then coated on both sides with concrete.


The advantages of building with EPS wire mesh panels are extensive and start with manufacturing. Unlike wood or steel that are either not recyclable at all or only partially recycled, every scrap of polystyrene cut when shaping panels during manufacturing can be recycled and harvested to reuse in the making of another panel or other products. Additionally, compared to other building materials, CO2 emissions are reduced during the manufacturing of EPS wire mesh panels as well as over the lifespan of the building. Constructing a building using EPS wire mesh panels is faster and less expensive when compared to other building materials and methods.

The true strength and power of EPS wire mesh panels is experienced under the greatest duress. Buildings constructed using these panels are more durable and disaster-resistant than other types of buildings. Homes and businesses built using EPS panels can withstand projectile objects blown into them during severe thunderstorms, tornados and hurricanes, without damage. This type of building is also earthquake-proof, sometimes up to a 10 on the Richter scale, due to the flex allowed by the polystyrene and the strength from the wire mesh and the concrete. Because the EPS wire mesh panels are coated on all sides with concrete, there is nothing to burn in a wildfire or house fire. While finishing surfaces like roofing materials, siding, drywall or windows might still be damaged in a fire, the structure of the building will remain intact. If timber structures are damaged in a storm or wildfire, once debris is cleared, if the building slab retains its structural integrity, EPS wire mesh panels can be used to rebuild faster and stronger.

For commercial buildings, EPS wire mesh panels offer additional security. The panels are both bulletproof and blast resistant. This makes them an ideal building option for schools, hospitals, banks, and other commercial buildings where safety is a top priority and threats of gun or other forms of violence are higher risk.

In 2022 alone, the U.S. was impacted by 18 natural disasters that caused losses exceeding \$1 billion each, including flooding, severe storms, hurricanes, and wildfire. Between 2016 and 2022 there have been 122 separate billion-dollar natural disasters totaling more than \$1 trillion in damages. These major weather events were devastating, and the magnitude of the damage is even greater when smaller events are factored into the equation.

The impact of weather and climate events cannot be measured in losses alone. According to data from the Census Bureau, in 2022 3.4 million people were forced out of their homes by hurricanes, wildfires, and other weather-related events – 16% of those displaced have not returned home and may never, 12% were displaced for six months or more, and only 40% were able to return home within a week. The Census Bureau data also revealed that people who were unable to return to their homes experienced further hardships such as lack of housing, food, water, sanitation, and childcare; people with incomes below the poverty line, particularly minorities and LGBTQIA+, were disproportionately impacted.

People living in areas prone to disasters should be able to expect their buildings will withstand strong storms, fires, and other destructive forces. A better building solution exists, but it must be implemented, especially in areas at the highest risk for damage and loss, to be effective. 



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## About the Article

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