

NATURAL DISASTER MITIGATION WITH PRECAST CONCRETE

Mitigation can be defined as the sustained action that reduces or eliminates long-term risk to people and property from natural multi-hazard disasters and their effects. Over the last several years, the United States has seen a shift in emergency management from relief and response to reducing hazard risk. Top priorities in this effort are building resilient structures and creating community-based disaster management plans. According to the National Oceanic and Atmospheric Administration (2020), our nation has averaged fourteen floods, wildfires, and other natural disasters every year for the last five years. These disasters annually cost the United States \$106 billion.

Precast concrete structures are inherently resilient and provide excellent protection against high winds from tornadoes and hurricanes, storm water surge and floods, wildfires, earthquakes, and blasts. Precast concrete is often used in FEMA storm shelters, residential single and multifamily housing, institutional, public, government, commercial, industrial, and other structures providing multi-hazard protection, durability, and resiliency. Impact testing of precast concrete insulated sandwich wall panels show they provide excellent resistance against flying debris, which can often become projectiles or missiles during a tornado or hurricane.

Today's U.S. building codes are based solely on establishing minimum requirements that intend to save lives, but no provisions to keep buildings usable after multi-hazard disasters. Consequently, organizations like the U.S. Resiliency Council (USRC) and the National Institute of Building Sciences (NIBS) have been formed to educate the design and construction com-

munities on the importance of building resilient structures. Resiliency can be defined as the ability of a structure to survive a multi-hazard event without severe long-term damage, recover with minimal repairs and be safely put back into service as soon as possible. The USRC has estimated that the additional cost to build resilient, high-performance structures is typically only 1% to 3% more than structures that just meet minimum building code standards. Similarly, NIBS has published a 2019 Report, "Natural Hazard Mitigation Saves," that describes the life-cycle cost benefits and return on investment for resilient design.

Precast concrete is a high-performance building material that integrates easily with other systems. It inherently provides the versatility, efficiency, resiliency, durability, and sustainability needed to meet the multi-hazard requirements and long-term demands of high-performance structures. It can be economically repaired and safely returned to service quickly after any natural disaster.

