

MAKE IT STRONG

Concrete can play a vital role in providing stronger homes, businesses, and communities.

Build with concrete and enjoy peace of mind knowing you are providing unsurpassed safety for the building's occupants.

Concrete structural systems have an inherent staying power unmatched by lighter weight, less robust, conventional systems.

Hardened concrete finishes give the outside better damage resistance as well.

Major Storms Surge

The widespread devastation caused by Hurricane Sandy is another reminder of the major destruction natural disasters can leave in their wake. In the United States alone, the storm affected 24 states with particularly severe damage to New Jersey and New York. Total damage estimates are in excess of \$60 billion dollars. After this storm, the public, more than ever, recognizes the long-term safety, durability, and value concrete building systems can provide.

Overall, the building envelope is the first line of defense against the intrusion of wind, water, wildfire, and debris. Many failures start when a component, or piece of light-weight cladding, is blown off, allowing wind and rain to enter. Uncontrolled entry of wind creates internal pressure, combined with external pressures, that can literally blow a structure apart.

There are a variety of ways to incorporate concrete to make projects more durable and disaster resistant. Concrete wall, floor, and roof systems offer an unsurpassed combination of structural strength, fire, and wind resistance. Add hardened exterior finishes for walls and roofs, and your home or business will have the best combination of strength and security available.

Five Solid Floor and Wall Systems:

Steel reinforced concrete walls and slabs have always had their place as foundation systems. They are now considered to be suitable above grade alternatives to conventional construction, where their strength and durability are even more effective.

- Conventionally formed concrete floors and walls are built with site-assembled forms that are removed once the concrete has hardened. The formwork assembly can incorporate clips or pins for holding insulation within the assembly to provide for a well-insulated structure.
- Autoclaved aerated concrete is a lightweight cellular concrete system. Preformed blocks are stacked with thin set mortars, and reinforced where required. It is lightweight and can be easily cut in the field.
- Concrete masonry, or concrete blocks have long been used for wall construction. They can be insulated, can be prefinished with a variety of textures and colors, or can accommodate a variety of site applied finishes.
- Precast systems are becoming more popular for panelized construction. Larger panels can be fabricated off site and trucked to the job, or cast on site and tilted into position. Insulation can be incorporated within a "sandwich" of concrete.
- Insulating concrete forms is formwork that is intended to be assembled on site, filled with rebar and concrete. Unlike conventional systems, the forms stay after the concrete hardens to provide high levels of insulation as well as a built-in means of attaching finishes. There are a variety of insulated form configurations for construction of durable and efficient wall and floor assemblies.



Portland Cement Association
500 New Jersey Avenue NW, 7th Floor
Washington, DC 20001-2066
202.408.9494 Fax 202.408.0877

5420 Old Orchard Road
Skokie, Illinois 60077-1083
847.966.6200 Fax 847.966.9781
www.cement.org

THE ADVANTAGE OF WEIGHT AND MASS

Concrete is heavier than other construction systems. This makes it much better at resisting uplift and overturning forces of wind, and the lateral and uplifting forces of water. Solid concrete walls resist racking stresses, helping to more easily stiffen a building.

All of these above-grade systems provide a strong, easily assembled disaster resistant alternative to wood and steel frame construction with the added bonus of money saving energy efficiency.

Rock Hard Finishes

On the outside, there are a variety of cement based systems that provide durable, long-lasting, attractive finishes that better resist fire, hail, and wind driven debris.

- Fiber-cement sidings offer the look of conventional siding, but with far greater strength, stability, and water and insect resistance. Aesthetically, they offer sharp, clean lines and are available as traditional planks or as panels for more contemporary designs.
- Portland cement stucco is a fine concrete that can be spread in thin coats over a wall surface. It has the advantage of allowing a wall to breathe to enable the wall assemblies to remain dry.
- Concrete roof tiles are an attractive choice in more and more locations. They offer better impact and wind resistance and can lower cooling costs by providing air circulation, thermal mass, and reflectivity to the top of the building.
- Manufactured stone and concrete masonry veneers both offer attractive long lasting brick or stone like finishes.

All of these systems offer durable finishes that require little maintenance, even when exposed to the elements for decades.

Build Better

Concrete systems help reduce property damage losses in the event of a disaster. Its common sense; harden the container and the contents will be far less susceptible to damage. With less complexity, there are fewer connections, fewer chances the envelope will fail to perform as required. It all adds up to better safety and security for the long term.

The Resilience of Concrete

	Hurricanes	Tornadoes	Fire	Flood	Tsunami	Earthquakes	Hail	Extreme Temperature	Applicable Systems
Wall Systems	•	•	•	•	•	•		•	Cast-in-Place, Precast, Tilt Up, AAC, Conc. Masonry, ICF
Floor Systems	•	•	•	•	•	•		•	Cast-in-Place, Precast, Tilt Up, AAC, ICF
Finishes	•	•	•				•		Stucco, Fiber-Cement Siding, Manufactured Stone, Concrete Masonry Veneer
Roof Tiles	•	•	•				•	•	Variety of colors & textures
Storm Shelters	•	•							Concrete, Concrete Masonry
Retaining Walls				•	•				Concrete sea walls, flood walls
Pavements								•	Traditional, Permeable Pavers, Pervious Paving