

## Resilience

When we design buildings we specify a program - what the spaces and their functions are - and a budget. At South Mountain we also specify performance - how will the building function in terms of its health and safety, comfort, acoustics, and resource usage. Another characteristic of a high performance home is "resilience".

Resilience is the capacity of a system - ecosystem, organization, organism, or building - to retain or rapidly regain functionality in the face of stress, disturbance or change. Resilient buildings support us in the face of stresses that may come from natural events (hurricanes, floods, earthquakes, wildfires, ice storms) or man-made events (explosions, spills, infrastructure destruction, riots, toxic contamination of water, air, or soil). During and after such events we try to satisfy our basic physical needs - clean water, food, shelter and heat, and sanitation - and supplementary needs like medical treatment, security, communications, and access to information.

Ordinarily, our buildings house most of our basic needs, so we need our buildings to support resilience rather than undermine it. Consider loss of power to a house after a significant event.

We may lose the use of the following:

- Water Supply and Toilets
- Refrigerator and Freezer
- Range (if electric)
- Heating and Cooling Systems
- Communications

In severe weather we worry about the house freezing and the extensive damage that may come from frozen plumbing. In the summer, the cooling system won't operate, which is not usually an emergency, but in severe hot weather elderly and ill people may suffer without it. In short term interruptions, a generator may suffice to keep the house operating. As the event stretches out, fuel to operate the generator may not continue to be available.

How can we make a house support our resilience? Important strategies include:

- Superinsulation - the house needs little heat, loses temperature slowly when heat is unavailable, and never freezes
- Wood stove heaters
- Roof water collection and storage system - providing an emergency water supply
- Passive solar water heaters
- Waterless composting toilets
- Edible landscape
- Non-electric food storage

If the house is equipped with a solar electric generation system, that system can be expanded into a bimodal system that includes a battery back-up and off-grid inverter to serve key electrical loads when the grid is down.

South Mountain has implemented these approaches for years, and we can help you incorporate them into your project - building resilience into your home and your life.