

2011 Winner of the \$100,000 Lemelson-MIT Award for Sustainability
Dr. Elizabeth Hausler

Build Change Success – *Earthquake-Resistant Housing*

In 2004 Dr. Elizabeth Hausler founded Build Change, a nonprofit with the mission of greatly reducing deaths, injuries and economic losses caused by housing collapses due to earthquakes in developing countries. To date, the organization has:

Contributed to earthquake-resistant homes in disaster stricken areas of:



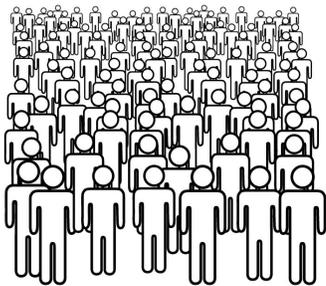
Port-au-Prince, Haiti



Aceh and West Sumatra, Indonesia



Sichuan, China



Trained **2,000** global citizens (homeowners, builders) in safer building practices

Improved **17,878** houses representing **71,000** people in safer homes



Produced culturally-accepted houses using local materials, labor that cost **\$4K - \$17K** less than donated homes

Donor Driven Homes
\$12K – 20K



Build Change Homes
\$3K – 8K

Worked in partnership with some of the world's largest relief agencies:



Build Change Reconstruction Technology (The Three C's) – Earthquake-Resistant Housing

While building techniques and materials used vary by location, to ensure successful implementation and sustainability, Build Change has identified three critical factors, or “The Three C’s,” for durable, culturally acceptable and affordable reconstruction, outlined below.



Confined masonry is the most commonly preferred structural system by homeowners in Aceh, Indonesia, shown here. In partnership with a team of pro bono structural engineers, Build Change performed engineering analysis and developed confined masonry structural design drawings for this typical single family house.

1. Configuration

Applying careful thought to a home’s design plan and layout can improve its resistance to earthquakes at little or no extra cost. For example, ensuring that structural walls are symmetrical and that there are approximately the same number of load-bearing walls in each direction per home will help improve its durability during natural disaster.

2. Connections

Unreinforced or unconfined masonry walls fail in earthquakes. Making strong “connections” between all components of the home (e.g., all walls, the foundation and the confining elements) is necessary for structural integrity.

3. Construction Quality

Using quality materials and workmanship is the first line of defense for an earthquake-resistant home. Simple, inexpensive techniques, like soaking bricks in water prior to building a masonry wall, make all the difference in the resilience of a house. Using locally available resources and labor also help make this the most affordable and culturally acceptable reconstruction process.