



## EERI Policy Statement

Earthquake Engineering Research Institute  
499 14th Street, Suite 220  
Oakland, CA 94612-1934  
510-451-0905

Contact | **Zoe Yin**  
Program Coordinator  
zoe@eeri.org

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### Promoting the Use of Confined Masonry Construction

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International building code writing bodies, academic institutions, and international aid agencies should promote the use of confined masonry as an affordable, earthquake-resistant construction choice for emerging economies in seismically active regions around the world.

#### Background

Confined masonry is a technology that, if built correctly, performs well in earthquakes. Well-constructed confined masonry buildings have been observed to incur little or no damage when exposed to strong earthquake shaking.

Confined masonry uses the same basic materials of concrete and bricks/blocks that are used in more common construction techniques in areas of high seismic risk around the world, such as unreinforced masonry and reinforced concrete frame construction with masonry infill walls. Because confined masonry uses these commonly available materials, it can be an affordable and feasible construction choice for low-rise buildings (4 stories or less). The key difference is the construction sequence and system. In confined masonry construction, the walls are built first. These masonry walls carry the seismic loads while the reinforced concrete confining elements are used to confine individual walls. The confining elements are effective in enhancing the stability and strength of masonry walls for in-plane and out-of-plane earthquake loads. In contrast, unreinforced masonry and inadequately engineered reinforced concrete frame systems have proven to perform poorly in earthquakes as typically constructed.

While confined masonry as a building technology is addressed in some countries' building codes (Mexico, Chile, Peru, Argentina, China as well as Eurocodes which are used in the European Union countries), it is more widely treated as an informal technology. This makes it difficult for engineers and architects in countries where its use could be beneficial to use the technology. It is also difficult for international organizations to recommend its use if it is not addressed in codes.

#### Needed Actions

Multiple groups should promote the use of confined masonry in the following ways:

- Code bodies in various emerging economies should develop building code provisions that specifically address confined masonry based on the experiences and codes in countries where confined masonry is practiced.
- Training programs and materials are needed for different stakeholders in the construction industry. Information also needs to be included in the curriculum in architectural and engineering colleges and universities.
- Aid agencies and international NGOs involved in post-disaster reconstruction work should include training sessions for local masons in the design and construction of confined masonry as integral components to their programs in seismically active areas. Further, by modeling confined masonry construction standards in their own facilities, international agencies would better ensure the safety of their employees and guests during earthquakes and improve their ability to use their own facilities, whether owned or rented, thereafter.
- EERI's Learning from Earthquakes Program should track and showcase the performance of confined masonry buildings affected by earthquakes.