

Sincape, Peru

peru 2.1

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Designing Seismically Sound Housing Solutions for Peru

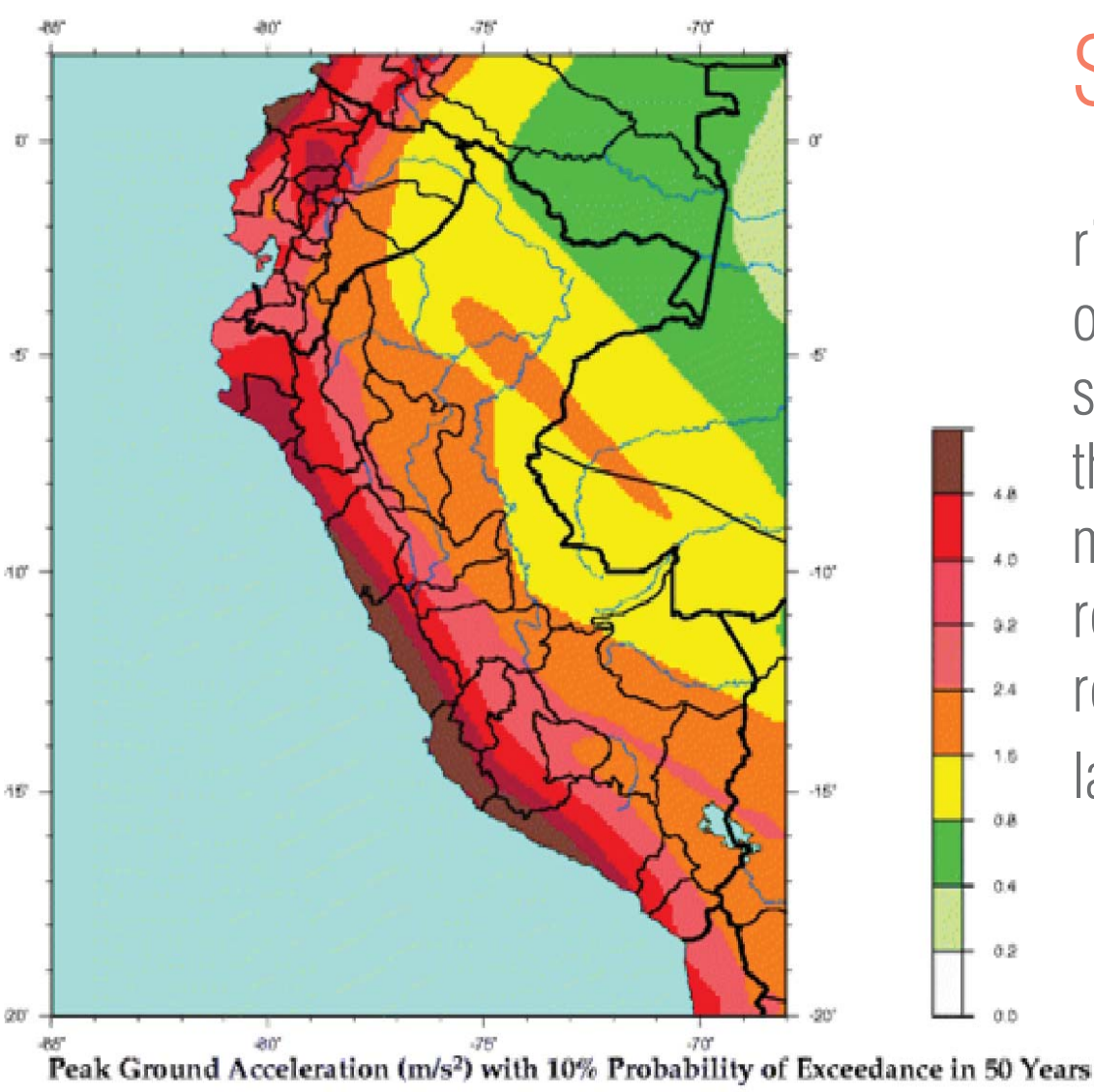
Background

In August of 2007, an earthquake with an estimated magnitude of 7.7-7.9 on the Richter scale left 519 dead, 1,366 wounded, and over 60,000 homes damaged or destroyed throughout Peru. This incident marks one of the more severe cases, but with four earthquakes in Peru with magnitudes of around 6 on the Richter scale just in 2009, the depth of this threat becomes much clearer. However, making some modifications to the current building design and the materials used could decrease the amount of destruction and harm.



“In August of 2007, an earthquake with an estimated magnitude of 7.7-7.9 on the Richter scale left 519 dead, 1,366 wounded, and over 60,000 homes damaged or destroyed throughout Peru”

* Showing the migration of the housing units that were affected by earthquakes in Peru



Site

The village of Sincape is located near the coast in a high-risk seismic activity area. Unfortunately, due to the rural nature of many of the affected areas, there is not much money to spend on better reinforced and non local materials, limiting the ways in which better construction may occur. Currently, most houses are made of adobe bricks with corrugated steel roofs either tied to the walls or simply weighed down using rocks. In the event of an earthquake, the walls typically collapse and the roof then falls in on the house.

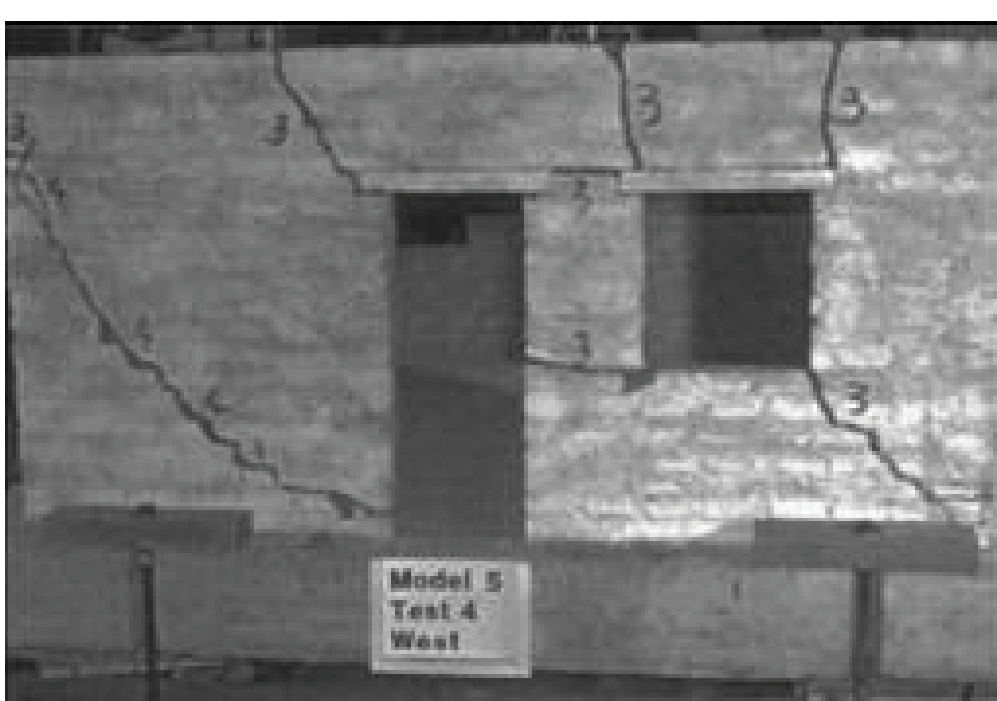


Sincape, Peru: -7.466667, -79.533333

Problem & Solution

In the area peru2.1 has selected, Sincape, Peru, the main concern with housing is the high risk of seismic activity. The area has earthquakes every year of a magnitude of 7 or more on the Rickter Scale. With the typical house in the area now is made of adobe bricks with a thin metal sheet for a roof. During earthquakes, these constructions do not hold up well and cause thousands of deaths due to walls caving in or roofs collapsing. To solve this dangerous situation, we have come up with a typical house construction made primarily of local materials and methods that is structurally sound against seismic activity.

We have chosen rammed earth as the main material for the structure, made into interlocking bricks that have vertical reinforcements of locally found bamboo. The roof will be made in the typical fashion, but it will be completely separate from the walls, allowing for more flexibility. This construction, along with a ring beam to tie the four walls together, has been proven to work successfully in Peru against the 7 magnitude earthquakes.



Temperature

Unlike most equatorial countries, Peru has a variety of climates instead of solely a tropical one. This ranges from cold mountainous regions to warm coastal areas. Sincape, the site chosen for this project, is a small village approximately 350 miles from Lima. Being near the coast, it has a warmer climate, averaging around 75°C-80°C annually with little to no rainfall. However, it does lie on a fault line, resulting in dangerous levels of seismic activity.

