

Earthquake

TESTED AND PROVEN IN EARTHQUAKES
A PERFORMANCE REPORT

enduring roof systems crafted in nature's image



AHI ROOFING – TESTED AND PROVEN IN REAL EARTHQUAKES

Earthquakes are tragic reminders of the power of nature. As well as the billions of dollars worth of property damage, earthquakes cause countless injuries and deaths.



THE DANGERS OF A HEAVY ROOF

The most common cause of damage, injuries and deaths in earthquakes are structural movements in buildings often made worse by heavyweight roofing materials moving and collapsing due to insufficient structural support.

EVIDENCE FROM KOBE...

On January 17, 1995, an earthquake measuring 7.2 on the Richter scale, and lasting barely twenty seconds, resulted in the death of more than five thousand people; 300,000 more were made homeless. Repair and rebuilding estimates – for the more than 55,000 houses and apartments wrecked in the quake – were US\$400 billion over more than ten years.

Most houses and commercial structures built after 1980 – when Japan's building code had its last major revision – remained standing. However, the most common form of damage was where roofs and upper stories collapsed

onto lower floors accounting for 90 per cent of earthquake deaths.

A moratorium on post-quake construction stopped hasty reconstruction projects and gave time for the introduction of building code changes. One proposed solution is to replace the prevalent use of heavy concrete and/or clay tiles with lightweight roofing materials such as AHI Roofing's systems which are more secure in earthquake movement and require less and lighter structural support. They also have good weather security and fire resistance.

...AND LOS ANGELES

On January 16, 1994, an earthquake measuring 6.8 on the Richter scale struck the Los Angeles basin. Violent shaking lasted about ten seconds while ground movement lasted more than forty seconds. More than three million people were left without power and more than 40,000 structures were left without water. Fifty-seven deaths were attributed to building collapse, fire and other direct effects of the quake. The damage costs exceeded \$US16 billion. More than 350,000 people were left homeless.

As in nearly all earthquakes, most deaths and injuries were due to collapsed and damaged roofs.

The roofs in the earthquake area represented a wide variety of style, pitch, configuration, age, materials, and application. A survey of roofs in the area revealed that roofs could be categorised under three headings:

1. Roofs that were damaged by shifting of

roofing materials that were inadequately fastened.

2. Roofs that were damaged as a result of structural failure.

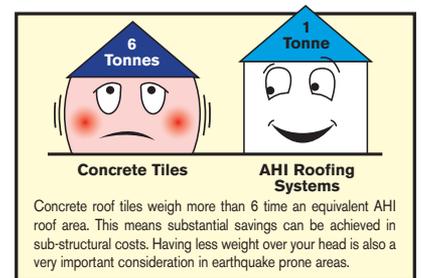
3. Roofs with no apparent or visible damage. The majority of roofs in the earthquake area were concrete or clay tiles and improper fastening had often allowed these roofing materials to shift. Where damage to roof rafters and supporting walls and other serious structural damage were observed the weight of the concrete or clay tiles could not be discarded as a significant contributing factor. The combination of heavy tiles on inadequate framing almost always resulted in serious structural damage to the roof or supporting structure and in some cases to total roof collapse. Indeed, in number of cases, roof weight was very likely to have been the significant factor in collapse of the entire structure.



Traditional clay tile roofs are inevitably heavy weight and cause structural damage in Earthquakes



These cement shakes slipped causing sub-structural damage



The least affected roofs were the stone-coated steel roofing materials as made by AHI Roofing. Scores of homes with these roofs had no structural or roof damage even though they were located in areas of significant destruction with neighbouring houses showing serious damage.

AHI ROOFING SYSTEMS. THE SIMPLE SOLUTION.

AHI Roofing is the world leader in the development, manufacture and marketing of stone-coated steel roofing materials which provide safety, security and peace of mind in the most extreme environments and weather conditions.

Enduring roof systems. Crafted in nature's image. Manufactured to the highest international standards. AHI Roofing is registered to ISO 9001 which

recognises the quality management systems standards now accepted in more than one hundred and fifty countries. This certification recognises the commitment of AHI Roofing to quality, productivity, cost competitiveness and customer satisfaction. Tested and proven.

AHI Roofing systems have been tested and proven under a wide range of extreme natural conditions.



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