



Ductile design ‘works and has saved lives’

DESIGNING buildings to be flexible or “ductile” did work and saved lives in February’s Christchurch quake, says Opus chief executive David Prentice.

It was a tragedy that anyone was killed in the quake and it was right and proper that questions had to be asked about why certain buildings and infrastructure failed.

But from an engineering perspective, the size of the quake was unexpected.

“Christchurch was struck by a quake almost two times [as large] as any quake expected,” Dr Prentice says.

In the 1970s, the engineering approach changed from a brittle design to a “ductile” design and

New Zealand was leading the charge internationally in the new thinking.

Although some buildings did collapse, with the loss of many lives, many buildings failed but did not collapse.

“It is not a success story, but it proves ductile design works,” he says.

Ductile design helps absorb the energy of a shake, rather a rigid design which may see a building shaken to bits in a big quake.

The prime example of ductile design was the Hotel Grand Chancellor in Christchurch. A car park building next to the hotel swayed in the quake, struck the main building and caused irreparable damage to the hotel,

causing a “complete failure”.

“But the simple fact is that it was a ductile design and it did not fall down,” Dr Prentice says, and so it saved lives, despite a quake twice as large as it was designed for.

The big surprise was the extent of the ground liquefaction. From an engineering perspective there would be tough decisions to make about what could be built, “if we build at all on top of those areas”, he says.

But there is a real need to act quickly and get some momentum going on the master plan and rebuilding work to restore business confidence in the city, he says.

The flip side was not making hasty decisions that turned out to be wrong.



Still standing:

The Hotel Grand Chancellor suffered irreparable damage in the deadly February 22 Christchurch earthquake – but its design prevented the building from collapsing, according to David Prentice. Photo: ROSS GIBLIN