Many houses in Canterbury have been damaged by earthquakes. Recovering from this damage presents a unique opportunity to make homes better for you, better for the environment and cheaper to run.

Repairing earthquake damage is the ideal time to consider improving your home and the benefits it can bring:

» A warmer, drier, more comfortable home
» Reduced energy bills and less water use
» Improved health with fewer visits to the doctor
» A more resilient and valuable home

The purpose of this guide is to help you when talking with builders and in making decisions about repairing your home. It provides tips for repairing your home and gives indicative costs and savings that could be made for an average sized, three to four bedroom home.

Before you do anything...

Make sure that you have made a claim with the Earthquake Commission and that your house has been assessed (www.eqc.govt.nz, 0800 326 243). Once you have a better idea of the type of repairs needed, do some further research and make a checklist of the improvements specific to your home so that you can discuss them with the relevant insurer, builder, and tradespeople.

In most cases you, as the homeowner, will have to fund the additional cost of the improvements set out in this guide. The good news is that government grants are available for insulation, clean heating, solar and heat pump hot water, and chimney replacement. Plus, best of all, you can enjoy the benefits of these improvements.

Where to start

Use the list below to decide where to start and in what order to undertake home improvements

1. Thermal envelope. First, stop draughts around windows and doors, insulate the ceiling and under the floor, and install thermal curtains; then insulate south walls, double glaze south windows, and finally, the rest of the walls and windows.

2. Dampness control. First, check and maintain rainwater drainage and wastewater pipes; then install a ground vapour barrier, bathroom ventilation, and kitchen ventilation; and finally install a vapour barrier in the walls along with wall insulation.

3. Efficient sustainable heat source. Make the most of warmth from the sun; then choose efficient heating systems for living spaces (heat to a minimum of 18°C when occupied); then bedrooms (heat to a minimum of 16°C when occupied).

4. Water efficiency. Choose the easy and simple measures first, such as water saving devices placed in existing toilet cisterns, low flow showerheads, and the purchase of water efficient appliances; then install aerated taps and dual flush toilets.

5. Efficient sustainable water heating. First, insulate pipes with lagging and wrap hot water cylinders; or if thinking about replacement, consider solar or heat pump hot water systems.

6. Supplementary water supply. Rainwater tanks for watering gardens and flushing toilets; consider greywater systems in areas with well-draining soils.
**Build Back Smarter**

### Heating and Chimneys

- **Challenge:** Damaged heating systems and chimneys

- **Opportunity:** Rebuilding your heating system

- **Impact:** Improved comfort and better health

- **Measures:**
  - **Investigate using Environmental Choice products in your rebuild.**
  - **Specify products labelled with an Environmental Choice tick which are durable, repairable and easily maintainable.**

- **Cost savings:**
  - **Improved Homestar™ rating**

**Next steps:**

1. **Investigate using Environmental Choice products in your rebuild.**
2. **Specify products labelled with an Environmental Choice tick which are durable, repairable and easily maintainable.**

### Materials and Finishes

- **Challenge:** Damaged materials and finishes

- **Opportunity:** Rebuilding your building materials and finishes

- **Impact:** Improved comfort and better health

- **Measures:**
  - **Specify products labelled with an Environmental Choice tick which are durable, repairable and easily maintainable.**

- **Cost savings:**
  - **Improved Homestar™ rating**

**Next steps:**

1. **Specify products labelled with an Environmental Choice tick which are durable, repairable and easily maintainable.**

### Hot Water Systems

- **Challenge:** Broken or damaged hot water system

- **Opportunity:** Install efficient heating system

- **Impact:** Household running cost savings

- **Measures:**
  - **Check out EECA’s solar and heat pump hot water grant information to see how you can qualify.**
  - **Discuss options with your builder or hot water specialist – assessing the practicality of installing a solar water heating system.**

- **Cost savings:**
  - **Increased capital value of the home**

**Next steps:**

1. **Check out EECA’s solar and heat pump hot water grant information to see how you can qualify.**
2. **Discuss options with your builder or hot water specialist – assessing the practicality of installing a solar water heating system.**

### Foundations and Floors

- **Challenge:** Damaged foundations and floors, cracked concrete slab and level floors

- **Opportunity:** Upgrading foundations and floors

- **Impact:** Household running cost savings

- **Measures:**
  - **Investigate using Environmental Choice products in your rebuild.**
  - **Specify products labelled with an Environmental Choice tick which are durable, repairable and easily maintainable.**

- **Cost savings:**
  - **Improved Homestar™ rating**

**Next steps:**

1. **Investigate using Environmental Choice products in your rebuild.**
2. **Specify products labelled with an Environmental Choice tick which are durable, repairable and easily maintainable.**
Build Back Smarter...

Ceilings and Roofs

Challenge: Damaged ceiling or roof – external or internal

Opportunity:
Upgrade ceiling insulation and remove recessed downlights (see lighting section). Change to lightweight and durable roofing material. Upgrade or install bathroom and kitchen ventilation.

Solution:
Standard ceilings / roofs (houses with an accessible ceiling space): Remove damaged linings and any damaged ceiling joints and replace. Remove and replace recessed downlights (see Lighting section). Fix thick bulk ceiling insulation between and over the ceiling joists (ideally as a blanket). Aim for R4.0 insulation or more if you want to be warmer (this may be installed as a couple of layers and could be 175 mm or thicker, depending on the type of insulation). Where roof material is damaged, replace with suitable new material – consider more earthquake-proof options such as long run steel, rather than heavy tiles, for your roof covering. Ensure existing extractor fans in bathrooms and kitchens are vented to the outside of the house (through the roof or under the eaves), or fit extractor fans if you don’t already have them.

Skillion roofs (houses without ceiling space): If only the internal roof or under the eaves), or fit extractor fans if you don’t already have them.

Solution:
1. Remove damaged linings and external wall cladding. Add insulation to the walls beyond R2.8. This can cover a third or more of these costs.
2. Work out a budget for the work including the additional costs in the region of $70.

Benefits:
Increased capital value of the home
Improved comfort and better health
Improved Homestar™ rating

Walls

Challenge: Internal or external wall damage

Opportunity:
If you have to replace the wall linings or external wall cladding this is the best time to add or upgrade the insulation in the walls.

Solution:
In timber and steel frame walls, remove damaged linings or external wall cladding as well as any damaged framing. Increase the bracing where required. Add insulation and building wrap (building paper). Replace with new linings or cladding. Add insulation that is at least R2.5, the higher the better. Note that higher levels of wall insulation beyond R2.8 may only be possible if you increase the width of the walls or rebuild completely.

Benefits:
Better insulation and ventilation, and improved comfort and health.

Lighting

Challenge: Damaged light fittings and existing inefficient recessed downlights

Opportunity:
Replace downlights and install energy efficient light bulbs while ceilings and/or lights are being repaired or replaced.

Solution:
1. Familiarise yourself with the ‘downside’ to downlights (see the Consumer NZ report on downlights www.consumer.org.nz/reports/recessed-downlights).
2. Find out about efficient lighting options at www.rightlight.govt.nz

Benefits:
Improved comfort and better health
Increased capital value of the home
Improved Homestar™ rating

Talk to your builder about...
» The best insulation options for your home – and whether it is worth doing the whole home at the same time.
» Taking advantage of opening your walls for insulation to also check your wiring and plumbing. In older houses, it may be cost effective to re-wire at the same time.
» Prioritising living areas, bedrooms and the south facing colder sides of the house first as these will be the ones losing the most heat.
» Ensuring that insulation is installed in accordance with the appropriate NZ standards (especially NZS 4406:2006 – see www. energywise.govt.nz/node/3009 ).

Talk to your builder/electrician about...
» The damage to your roof and the best options available to get more installation installed.
» Fixing other issues at the same time such as putting in ventilation to bathrooms and kitchens - and in the order in which these should be done to minimise damage to the new insulation.
» Replacing downlights at the same time so there are no gaps in your insulation.
» Roof colour - lighter roofs reflect heat, keeping the house cooler in summer.

Next steps:
1. Find out about grants or loans assistance for insulation from EECA.
2. Work out a budget, including what your insurance will cover and any financial support for additional costs.

Household running cost savings
Improved comfort and better health
Increased capital value of the home
Improved Homestar™ rating

Natural and artificial light.
Switch to efficient light bulbs, such as compact fluorescent bulbs - these are easy to install, last longer and can save $100 each, over the life of the bulb.

Cost estimate:
The cost of replacing downlights will vary depending on how many you have and whether you are repairing your ceiling anyway. As a stand-alone job, replacing a recessed light fitting with a simple pendant fitting would cost in the region of $70.

Talk to your builder/electrician about...
» The most effective lighting arrangement as part of your rebuild.
» Rewiring for better control of lighting systems.
» Adding more insulation to the ceiling once downlights have been removed.

Benefits:
More efficient lighting will reduce energy costs, while removing downlights will allow you to fill insulation gaps and keep heat inside the home, potentially saving you as much as $250 per year.

Household running cost savings
Improved comfort and better health
Increased capital value of the home
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Next steps:
1. Find out about efficient lighting options at www.rightlight.govt.nz
2. Draw up a budget to carry out the work.
Homestar™ measures or rates the performance of your home, in a similar way to the energy star rating for a washing machine or fridge. The advice given here closely aligns with the Homestar™ rating tool – so making the effort to build back smarter can increase the performance, value and comfort of your home. A trained Homestar Practitioner can provide you with professional advice about incorporating good environmental design and help you get the appropriate Homestar rating. Use the free online version of the rating tool to compare different options for your home www.homestar.org.nz.

A note on waste
To reduce construction waste going to landfill, and to gain further points in the Homestar™ rating tool, your builder and tradespeople should be encouraged to follow REBRI (Resource Efficiency in the Building and Related Industries) guidelines for waste management. These provide information and advice on:
» What materials can be recycled or salvaged.
» How to develop a waste management plan and system.
» How to separate and store waste.
For more information, visit: www.branz.co.nz/rebri
You may also be able to find ways of using waste material around your neighbourhood, e.g. your old bricks could be someone’s new paving.

Obtaining consent
In most cases you will require a building consent to undertake any major repair work. Talk to your builder or the Christchurch City Council about obtaining building consent before starting any repairs. For more information, visit: www.ccc.govt.nz/homeliving/buildingplanning/index.aspx

Finding tradespeople
Look for membership with reputable associations such as Registered Master Builders, Certified Builders, or Master Plumbers. Electricians should be registered with the Electrical Workers Registration Board, and plumbers and gasfitters with the Plumbers, Gasfitters and Drainlayers Board.
Solar water heater installers must be accredited by the Solar Industries Association, and wood or pellet burner installers must be accredited by the NZ Home Heating Association. Heat pumps use refrigerants and therefore installers should have both electrical and refrigerant certification (HVAC engineer).
The Department of Building and Housing has just started a Licensed Building Practitioner Scheme which has a list of all registered tradespeople. These provide information, advice and discussed over the phone or during site visits.

For general information on improving your home:
» Smarter Homes www.smarterhomes.org.nz
Download two key publications: Your Guide to $marter Living and Your Guide to $marter Insulation.
» Beacon Pathway www.beaconpathway.co.nz
Download an in-depth homeowner manual
» Consumerbuild, a guide to the process of building and renovating: www.consumerbuild.co.nz
» Level, more technical detail on home improvements: www.level.org.nz
» Department of Building and Housing website that provides guidance and information on building code requirements: www.dbh.govt.nz/canterbury-earthquake

Seek advice from:
» Community Energy Action Charitable Trust’s free advice service: for free advice on all home energy matters and associated renovations. Call 0800 388 588, email energyadvice@cea.co.nz or visit http://www.cea.co.nz/charitable-programmes/#heac.
» Community Energy Action Charitable Trust’s insulation and heating installation service: For free insulation checks and free insulation and heating quotes (with government subsidies). Call 374 7222, email info@cea.co.nz or visit www.cea.co.nz
» Your local Eco-Design Advisor, free and independent advice on home design. Home designs can be emailed to advisors and discussed over the phone or during site visits. www.ecodesignadvisor.org.nz

What is an R value?
The effectiveness of insulation is measured by its R value. The higher the R value on an insulation product, the more it slows down the transfer of heat. Generally, the R value of insulation gets higher as the product gets thicker. For example, an R3.0 product has greater thickness than a R1.0 product of the same type. Using R values helps you to compare the effectiveness of different types of insulation.