ISSN number 1179-7118

CANTERBURY DISASTER SALVAGE TEAM

Number 42 and 43 **September 2010 and February 2011**

Earthquakes

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Compiled for Canterbury Disaster Salvage Team

Canterbury earthquake

In the early hours of Saturday 4 September, 2010, the Canterbury region was rather violently woken up by a 7.1 magnitude earthquake, one of the largest and most devastating earthquakes in New Zealand's recorded history. The epicentre was located 40 kilometres west of Christchurch near Darfield and had a focal depth of 10km[1]. It took approximately 40 seconds to cause billions of dollars worth of damage which affected an entire region with movement felt widely across the South Island and as far north as New Plymouth. No one had been killed during this earthquake, which was a miracle considering its size, but many homes and buildings throughout the region had been badly damaged, including many heritage buildings.

What causes earthquakes?

Earthquakes occur in New Zealand every day and are caused by tectonic plates bumping and scraping against each other or by a sudden slip on a fault line. A fault slip occurs when stress builds up over time, causing the rock to slip suddenly. During an earthquake these waves of energy spread out from the epicentre which cause ground movement which is greatest near the epicentre. Soft uncompacted soils such as sands tend to shake more violently than rock, which can cause structural damage to buildings, and liquefaction will occur where there is water present in the ground.

Each earthquake magnitude is unique and the affects vary for a variety of reasons, such as the ground conditions, distance and construction standards. How we experience an earthquake will depend on the depth of the earthquake, how close we are to the epicentre and the type of building we are in during an earthquake.

Photographs have been provided by Lynn Campbell, Conservator, Christchurch Art Gallery Te Puna O Waiwhetu

Disaster Recovery Plans - Being well prepared

A disaster is an event which is sudden, often not predicted and causes a lot of chaos. They are either naturally occurring events, such as earthquakes or floods, or man-made, such a vandalism. They can strike at any time and being prepared is key to getting through – we've all heard the radio commercials and television broadcast on what to do in an emergency situation but how many of us think "*Oh yes, now I must get that emergency kit ready, I'll do that next week*" and never do? So what does your organisational disaster recovery plan look like? And how long is it since you last looked at it?

The importance of developing a disaster recovery plan

Revamping an existing disaster recovery plan is not always the most effective method for ensuring senior management approval. You need to think about the issues that are unique to your organisation and come up a plan that incorporates fresh ways of managing any potential disaster[2]. Areas identified within the disaster recovery plan for your organisation need to be assessed for potential risk which can then either be isolated, minimised or eliminated and then managed with staff training. According to Forde (2008:129) "*The objective of the training is to ensure that staff are sufficiently confident of their roles to avoid panic….Each individual or team should practice so that members are clear about their own responsibilities*". Therefore, disaster planning meetings and mock drills ideally should take place several times a year to re-evaluate any potential risks.

An effective disaster recovery mock drill needs to have:

- Access to the disaster recovery plan for **all** staff
- A single leader to communicate what needs to be done
- Clear objectives for the drill
- A meeting to summarise and discuss issues raised and solutions found

Disasters come in all shapes and sizes. Therefore you need to plan for different scenarios, i.e. earthquake to a network power outage, and use a mock drill situation to work through any issues as *communication* is a key factor to any successful recovery plan[3].

General advice and safety precautions

The Archives New Zealand Te Rua Mahara o te Kāwanatanga (ANZ) website[4] gives a thorough step by step overview of the necessary steps to have in place if a disaster occurs and is geared towards public agencies and other collecting institutions and organisations. The most important factor is that no salvage of any collection material can take place until a building has been inspected and is safe to enter - this can take days, even weeks.

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[2] Forde, H. (2008). *Preserving archives.* Facet Publishing: London (p120)

[3] Hoffman, T. (2008) [Online] Computerworld the voice of the ICT community. *Drills vital for effective disaster recovery: practice makes perfect when it comes to Disaster Recovery* http://computerworld.co.nz/news.nsf/mgmt/C59212F151CC769DCC25742100056 4B1

[4] Archives New Zealand, http://www.archives.govt.nz/advice/current-projects-and-news/disaster-recovery-archives-and-records-canterbury-region

The other very important factor to remember is the emotional affect of seeing your collection compromised, tossed and scattered or damaged. Once your building has been given the *all clear* you will need to appoint someone as Coordinator/Controller of the salvage operation. The Coordinator/Controller is the person to liaise with the emergency services and structural engineers to advise them of the archives, records and any other significant items within the building.

The Coordinator/Controller is responsible for allocating tasks such as

- Health and safety precautions and supplies. It is important to have essential supplies such as stationery, food and water and protective gear. Every team member must have protective equipment such as gloves, dust masks, torch, fluorescent vests and hard hats and the Coordinator/Controller needs to make sure they are used
- Hazards. Identify any hazards in the recovery area such as water or anything that might have spilled that could be contaminated
- Recovery area. An area that has been declared safe where material recovered from the damaged or threatened areas can be assessed, prepared for blast-freezing or air-drying, listed according to their condition and destination and packed. The amount of time spent assessing, recording, and re-housing will determine the long term preservation of what items you have been able to salvage
- Recordkeeping. A record must be kept of the material as it is being moved during the recovery process. If this does not happen, material will be lost
- Photographs. Take photographs before work begins, during and after. This is recommended for a number of reasons such as:
    - Photographs provide evidence that can be used as a valuable tool for demonstrating the effects for those who have not been through an earthquake and seen first hand the damage caused

The recovery is the slowest part of any disaster plan and can take months or even years to complete[5]. Once the salvage process of physically saving the collection material is over there will be an expectation from the organisation and the general public to function as normal. More often than not, this will be the case but sometimes the recovery process will impact on getting things back to normal and this is something that you need to bear in mind.

Getting back to normal for heritage organisations

It is important to pass on information about the things we've all learnt through experiencing this earthquake. These help to form a snap shot of areas which can be altered in order to prevent damage to heritage collections in the event of another large scale disaster. It is not easy returning to how things were prior to a disaster occurring and for many, this earthquake has entirely changed their lives. The Canterbury earthquake was within the category of *major earthquake capable of serious damage over large*. As at 6 December 2010 the Earthquake Commission (EQC) had received 160,641 claims. According to the EQC, there are "…*about 3300 properties…*in*…the areas most affected by land damage…*that*…will require wide-scale coordinated land repair…before any rebuilding can*

[5] Forde, H. (2008). *Preserving archives.* Facet Publishing: London (p136)

take place[6]. The recovery of Canterbury will take years and retaining the unique character of Christchurch will be important as we rebuild

What have we learnt from the Canterbury earthquake?

The following checklist has been put together by a variety of organisations from the Canterbury region.

- It is important to have up to date contact details for everyone that you need to communicate with
- Simple procedures put in place can save your collection from being damaged and assist with the safety of staff, i.e. close compactors each night, keep corridors clear, be mindful of the weight of material on shelves and their distribution across each storage unit and keep a torch handy
- Communication was central throughout this ordeal. When communication is poor, people are left second guessing or assuming how things need to be done which causes confusion
- Buildings need to be declared safe before anyone can enter by the emergency services and only then can collection material be assessed
- Seek professional help if material/objects have been broken or damaged
- Everyone reacts in a different way during a large scale disaster and everyone will be affected in different ways.
- You need to be aware that you will be tired and stressed for sometime and don't underestimate the emotional affect of seeing your collection compromised, tossed, scattered or damaged
- This earthquake highlighted, for a number of organisations, areas which need improvement, in particular where personal safety was concerned. It is important to always be thinking of ways in which to minimise risk those working with the collection
- Salvaging your collection is one thing but returning to normal afterward is another and the recovery process, as we have seen with Kaiapoi Museum, will take a long time
- And most importantly, do not leave it until a disaster occurs to think about the risks to staff and your collections. Having a disaster recovery plan in place that **all** staff have access to that has been approved by senior management is vital

Further information on recovery of archival material after an earthquake

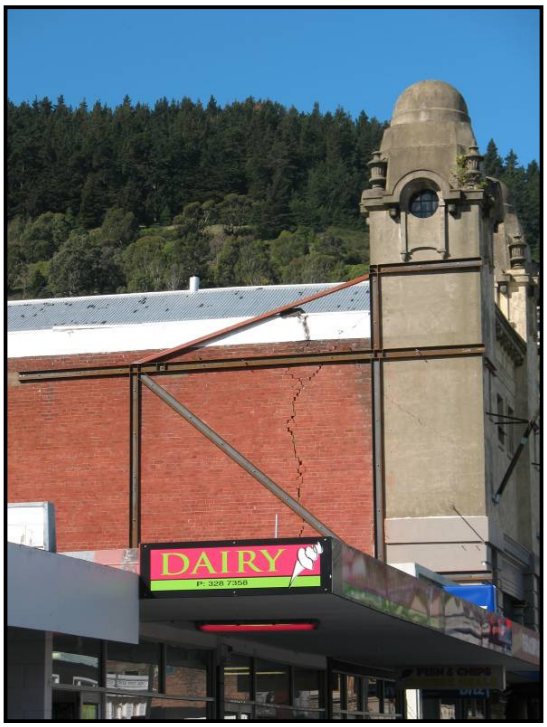
Archives New Zealand Te Rua Mahara o te Kāwanatanga, http://www.archives.govt.nz/advice/current-projects-and-news/disaster-recovery-archives-and-records-canterbury-region

Canterbury Disaster Salvage Team, http://www.disalteam.co.nz/

[6] The Earthquake Commission [Online] http://canterbury.eqc.govt.nz/news-releases/2010/12/last-day-lodge-claims-eqc

Interesting websites

Whilst there are a lot of interesting websites now regarding the Canterbury earthquake, the following provide useful information on the affects and also how to cope during and after such an event.



Cantage, http://cantage.wordpress.com/
Disaster Plan templates, http://cool.conservation-us.org/bytopic/disasters/plans/
New Zealand Conservators of Cultural Materials Pu Manaaki Kahurangi (NZCCM), http://www.conservators.org.nz/

Earthquake Commission Kōmihana Rūwhenua, http://canterbury.eqc.govt.nz/

Geonet, www.geonet.org.nz

New Zealand Civil Defence, www.civildefence.govt.nz/

New Zealand History Online. Disasters, www.nzhistory.net.nz/category/tid/1707

Stronger Canterbury Earthquake Recovery, http://www.canterburyearthquake.govt.nz/

Taylor, Judith (2010). *What happened to Kaiapoi Museum?* [Online] http://www.nzmuseums.co.nz/news/what-happened-to-kaiapoi-museum/
http://www.geonet.org.nz/

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Forde, H. (2008). *Preserving archives.* Facet Publishing: London

Gorman, G.E. & Shep, S.J 2006). *Preservation management for libraries, archives and museums*. Facet Publishing: London

Hoffman, T. (2008) [Online] Computerworld the voice of the ICT community. *Drills vital for effective disaster recovery: practice makes perfect when it comes to Disaster Recovery*
http://computerworld.co.nz/news.nsf/mgmt/C59212F151CC769DCC257421000564B1

The Library of Congress Preservation,
http://www.loc.gov/preserv/emergprep/earthquake.html