

**Resilient Organisations**

**Report 5**

**Asia Pacific Economic Cooperation**

**The Canterbury Earthquake:  
Challenges and Opportunities for  
Construction Organisations**

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## **Key Points:**

- The construction sector plays a large role in driving New Zealand's economic growth; however, it is subject to boom-bust cycles far more than other sectors. The imminent surge in construction activity following the earthquakes offers the sector the chance to develop skills and capital base for improving its economic prospects.
- Construction organisations, largely being labour-intensive, are more influenced by human resource effects. As the rebuild picks up, skilled labour could be a key constraint to recovery and economic growth in Canterbury.
- Many construction organisations are facing difficulties with immigration issues and housing incoming workforces. At the same time, there has been an inflationary impact which flows through to higher property rents, and makes attracting tradespeople from other parts of New Zealand harder.
- The earthquakes have led to a shift of organisational focus from running business operations to building resilience through innovation and partnership. Small construction organisations tend to form partnering and alliance-like clusters for mutual promotion and to attract skilled expertise.

## **1. The New Zealand Construction Sector**

At the time of the Magnitude 7.1 Darfield Earthquake on September 4<sup>th</sup>, 2010 (the first event in the Canterbury earthquake sequence) the New Zealand construction industry was going through a recessionary period of low activity. The rebuilding programme in Christchurch and seismic strengthening nationwide, in particular have presented the sector with an opportunity to revive from recession.

The construction sector plays a large role in driving New Zealand's economic growth; however, it is subject to boom-bust cycles far more than other sectors. Between 2006 and 2009, the construction sector contributed to 1.2% fall in productivity nationwide (Williamson, 2012). While the construction sector provides one in twelve jobs in New Zealand, it is characterised by small businesses and low labour productivity (PWC, 2011).

The Canterbury earthquake sequence caused widespread damage to built infrastructure. This included more than 60% of CBD buildings being severely damaged, 124 kilometres of water mains and 300 kilometres of sewer pipes damaged, 600 kilometres of roads seriously damaged with 50,000 road surface defects, and 438,000 EQC residential claims (CERA, 2012). Increasing rebuild requirements in the region raise concerns about the capability of the local, regional and national construction industry to deliver a timely rebuild.

This report presents the latest lessons learned from construction organisations<sup>1</sup> in Christchurch in response to and recovery from the Canterbury earthquakes. The information is based on the results of an ongoing study conducted by Resilient Organisations ([www.resorgs.org.nz](http://www.resorgs.org.nz)). The data was collected through two questionnaire surveys of construction organisations in Christchurch (launched December 2010 and October 2011), by interviews with key informants, and in-depth case studies of selected organisations. A range of businesses of different sizes were sampled, ranging from architectural and engineering consultancies to contractors. Opinions from government agencies and insurers' Project Management Offices (PMOs) were also utilised.

## 2. Sectoral Vulnerabilities

### 2.1 Socio-economic and demographic attributes

The construction sector in New Zealand has long suffered from volatility and the lingering effects of low productivity. Workers are the fourth lowest paid in New Zealand and the industry employs a relatively young workforce with higher levels of Maori and Pasifika demographic cohorts (PWC, 2011). These two ethnic groups are characterised by a higher unemployment rate and a lower education rate. The majority of businesses in the sector are small, with little capital and human resource development. These attributes (specified in Table 1) tend to increase the sector's vulnerabilities to disturbances in social and economic climates. In an estimate by BERL (2003) a 10% increase in labour productivity in building and construction would boost national GDP by \$2 billion. The imminent surge in construction activity following the earthquakes in Christchurch offers the sector the chance to develop skills and capital base for improving its economic prospects.

**Table 1: Socio-economic and demographic characteristics of the construction sector<sup>2</sup>**

<i>Characteristics</i>	<i>Description</i>
Wage	4 <sup>th</sup> lowest hourly incomes of all sectors in New Zealand, at \$23.60 an hour
Age	Prime working age: 4th highest proportion of 15 to 24 year olds; 5th highest proportion of 15 to 44 year olds
Ethnicities	High share of Maori (5 <sup>th</sup> highest) and Pasifika (8 <sup>th</sup> highest) employment
Qualification	Lowest share of people with Bachelors or above qualifications, sits at mid-field with school qualifications and below

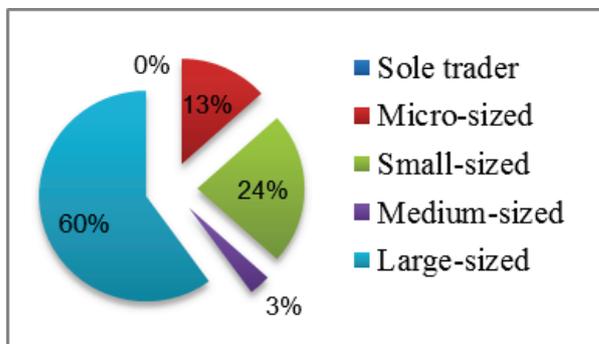
<sup>1</sup> Results in this report describing 'construction organisations' refer to organisations in a core industry as Division E – Construction in the Australia New Zealand Standardised Industrial Classification (ANZSIC06) codes and organisations with construction-related services such as architectural, engineering and technical services.

<sup>2</sup> Synthesis of PWC (2011) and Statistics New Zealand (2011) reports

## 2.2 Resource effects

Construction organisations, largely being labour-intensive, are more influenced by human resource effects. The sudden increased workloads after the September 2010 earthquake have generally affected their ‘business as usual’ projects. Following the February 2011 earthquake, construction organisations in Christchurch experienced major resource shortages for both post-quake damage emergency response and rebuild/reconstruction stages. Ongoing aftershocks caused structural and land inspection personnel to be constantly diverted from existing jobs to new damage.

In a Resilient Organisations questionnaire issued between October 2011 and January 2012, resource pressures were primarily from human resources associated with structural, architectural and land issues. The three most frequently reported



**Figure 1: Size of construction organisations experiencing human resource shortages**

‘problematic’ human resources were: structural engineers (17%), geotechnical engineers (15%), and draughtsperson (7%). Of those organisations that reported some impact from the shortages of human resources, 60% are large organisations, 24% are small-sized and 13% are micro-sized organisations (Figure1).

Construction businesses in Christchurch seemed to be less concerned about building material and plant availability (Table 2). A consensus emerged that resource endowment in South Island, particularly in the timber and quarry industry, would ensure sufficient supply of raw materials to meet rebuild demands. At the time of writing, a longitudinal study shows that there has been a gradual change in the possible level of resourcing since January 2012. In the second quarter of 2012, many organisations have reported their difficulty with finding suitable project management expertise such as site engineers, project managers and quantity surveyors.

**Table 2: Proportion of construction organisations experiencing resource shortages**

	Human resources	Building materials and products	Construction plant
Felt resource effects	60%	7%	12%
Not affected	40%	93%	88%

## 2.3 Organisational vulnerability

Prior to the earthquakes, many construction businesses had their offices or ‘yards’ outside the Christchurch CBD; this included sole trader businesses such as plumbers and electricians. A few architectural and engineering consultancies were located near to the CBD. In the months following the February earthquake, displaced companies

identified the most destructive impact of the event to be the disruption to IT infrastructure and supply chain relationships.

Some engineering consultancies have reported ongoing issues sourcing people with high skill levels. Since the September 2010 earthquake, young engineers and mature project management skills from Europe continue to be the largest inbound demographic group involved with the rebuild in Christchurch. Many construction organisations are facing difficulties with immigration issues and housing these incoming workforces. At the same time, there has been an inflationary impact which flows through to higher property rents, and makes attracting tradespeople from other parts of New Zealand harder.

### **3. Response to post-quake recovery**

#### *3.1 Capacity building*

Following the September 2010 earthquake, the New Zealand Government and Christchurch City Council have taken initiatives on many fronts to link the sector's development with immigration, education and training. For example, the Budget 2011 includes a \$42 million package for trades training in the Canterbury region. Many construction organisations have put solutions in place to build their capacity, including sharing, borrowing, recruiting, retaining and optimising existing skills (Chang et al., 2012). Others, by reflecting on lessons learned during the period following the earthquake, have continuously improved productivity enhancing management techniques to better position themselves for future.

#### *3.2 Innovation and partnership*

The earthquakes have led to a shift of organisational focus from running business operations to building resilience through innovation and partnership. Small construction organisations tend to form partnering and alliance-like clusters for mutual promotion and to attract skilled expertise. Large construction companies faced a more competitive market following the disaster. Several organisations of large size have formed joint ventures, and thus being better able to secure contracts. There are indications that many businesses, following the earthquakes, reinvented themselves in innovative technology and techniques, such as social media, new IT software, satellite phones, web-based seminars, video conference facilities and GPS.

### **4. Challenges for construction organisations**

Companies had thought that the major build-up of work would start in the mid of 2012, but now the start has become the big 'unknown'. The speed of the rebuild, coupled with uncertainties about the future of the CBD and commercial

reconstruction work in Christchurch City, has posed difficulties for construction organisations with forward planning.

The Canterbury earthquakes have had implications for other NZ cities and towns, with their earthquake-prone buildings coming into prominence. Construction organisations are aware that there will be ongoing resource shortages for the rebuild in Christchurch due to increased construction demand in other places such as Auckland and Queensland. As the rebuild picks up, skilled labour could be a key constraint to recovery and economic growth in Canterbury.

For construction organisations, opportunities and risks go hand in hand during the recovery period. The key challenge is to look at ways to overcome its inherent vulnerabilities. Despite the uncertainties, current and ahead, most construction businesses are still optimistic about the future of recovered Christchurch, themselves, and their employees. But the question still remains as to how to create a sustainable and vibrant construction sector – the answer lies in three key points: business, innovation and employment.

## 5. References

- BERL (2003). Economy-wide Impact of Building and Construction Industry. Prepared by Dr. Ganesh Nana. Wellington, BERL Economics.
- CERA (2012). Christchurch Economic Recovery Plan, presented by S. Wakefield. *The Logistics of Natural Disaster Recovery 2012 International Conference, 5-7 March 2012*. Wellington, CILT NZ.
- Chang, Y., S. Wilkinson and E. Seville (2012). Resourcing the Canterbury rebuild: Issues and outlook. *A supplementary report April 2012*. Auckland, Resilient Organisations. <http://www.recres.org.nz/publications>.
- PWC (2011). Valuing the role of construction in the New Zealand economy: A report to the Construction Strategy Group. Auckland, PricewaterhouseCoopers (PWC).
- Williamson, M. (2012). Minister's speech. *The Construction Clients' Group Annual Members' Event: Responding to a major disaster*. The University of Auckland, Tamaki Innovation Campus, Construction Clients' Group.