

# RECONSTRUCTION PROCUREMENT SYSTEMS: THE 2005 MATATA FLOOD RECONSTRUCTION EXPERIENCE

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## Abstract

One of the key issues to consider in post-disaster reconstruction is the development of a fast and efficient contractual system for rebuilding. The types of contractual systems available post-disaster will vary according to differing factors; such as industry familiarity, previous use of system, and the existence of standardised contractual methods. This paper examines the 2005 Matata floods and the reconstruction and recovery processes following this natural disaster. This event caused major damage to infrastructure, and as a result required reconstruction strategies to be implemented. The study determines the current reconstruction system being used, with particular focus on its contractual arrangements and procurement plans. Detailed analysis of the advantage and disadvantages of the systems used in this case will be made. The paper concludes with recommendations for future development of post-disaster reconstruction contractual systems.

*Keywords: reconstruction; procurement systems; floods; New Zealand*

## INTRODUCTION

Various well-established and widely-applied contractual relationships to procure construction projects are available in New Zealand industry. For reconstruction after a natural disaster, such as in the aftermath of a flood and an earthquake, it is likely that without a comprehensive reconstruction procurement framework specifically designed for this purpose, rapid reconstruction will be significantly hampered. Among various natural disasters that New Zealand is vulnerable to, flood is the disaster with the highest occurrence rate. This paper will first review the procurement systems and some specific government guidelines and regulations about contractual arrangements that are currently being used in New Zealand. A recent flood case, the 2005 Matata floods, will then be analysed with respect to the use of New Zealand procurement systems. Some recommendations will be made for future development of post-disaster reconstruction contractual systems.

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## Procurement Systems used in New Zealand Construction

New Zealand procurement systems have been well established and developed following the examples from generally recognised western models, such as traditional, design and build and project management. Like many other countries, a variety of contractual relationships to procure construction projects are widely applied within New Zealand construction industry. As defined in Best Practice Procurement (NZCIC,2004), a discussion document recently issued by New Zealand Construction Industry Council, procurement is the phrase given to the process by which clients and users achieve their construction aims but is more than just construction procurement, covering the process from initial concept planning and design, to development, construction, maintenance and ongoing monitoring of performance (NZCIC,2004). Procurement is critical as it determines the overall framework for construction, embracing the structure of responsibilities, risks, and authorities for construction practitioners. The structure of responsibilities, risks, and authorities for construction practitioners are especially important for smooth delivery of post-disaster reconstruction because, if due consideration is given to them, they assist with rapid recovery of damaged communities. A wide range of procurement systems exist in the construction industry ranging from single stage traditional method at one end of the spectrum to Design and Build, together with new forms of contractual systems which are continually being devised to match client and community requirements, such as partnering and alliancing.

Procurement systems can be represented by Broome's model of procurement continuum, according to different contractual relationships among involved parties, especially between the Principal and the Contractor.

Incentives <span style="float: right;">→</span>						
Traditional contracting	Informal partnering	First generation	Target cost contracts	Project alliance	Strategic alliances	Joint ventures
<ul style="list-style-type: none"> <li>• selection by lowest price</li> <li>• confrontational</li> <li>• claims oriented</li> </ul>	<ul style="list-style-type: none"> <li>• little structure</li> <li>• little process</li> </ul>	<ul style="list-style-type: none"> <li>• selection on value and price</li> <li>• workshop with some cultural change</li> <li>• disputes ladder</li> </ul>	<ul style="list-style-type: none"> <li>• negotiated target</li> <li>• open book accounting and reimbursement</li> <li>• sharing of rewards</li> </ul>	<ul style="list-style-type: none"> <li>• supplier involvement prior to sanction</li> <li>• rewards tied to success of project</li> <li>• integrated teams</li> </ul>	<ul style="list-style-type: none"> <li>• integrated processes</li> <li>• benchmarking</li> <li>• partners may market 'product' together</li> </ul>	
Transactional	<b>Partnering</b> <span style="float: right;">→</span>					Relationship

Figure 1: Procurement relationship arrangements adapted from procurement continuum produced by Broome (Broome 2002)

According to Broome's model, contractual systems can be generally divided into transactional contracts and relationship contracts. "A purely transactional contract is one where the client specifies all the requirements of a project, this will define not only the practicalities of the project such as what is required but also the individual requirements of each project participant will be outlined" (Henderson 2004). This form of contract is commonly termed as "Traditional" or "Multi-point" contract, using,

in New Zealand the common standard contract conditions of NZS3910:2003. Compared to this, at the other end of the procurement spectrum are relationship-focused contracts, such as “Project Alliance” and “Joint Ventures” with an emphasis on the way the contributing parties working together to procure the project, and not the contract form (Broome 2002). According to NZCIC’s report (2004), many problems facing the construction sector in New Zealand, such as a focus on costs over value, constrained innovation, inappropriate risk allocation, unsustainable market, can be addressed with a procurement shift from the left side to the right side of Broome’s model.

A recent survey (Henderson 2004) established the proportions of the major forms of contractual relationships being used in New Zealand construction as illustrated below:

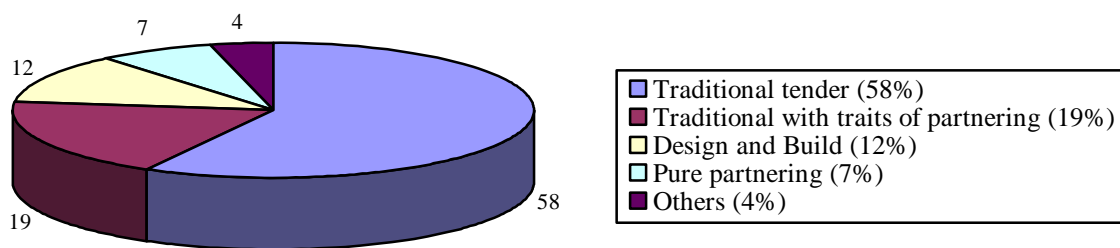


Figure 2: Proportions of the most commonly used contractual relationships in NZ construction industry (adapted from Henderson's survey in 2004)

It can be seen that the ‘traditional’ contractual relationship is still dominating the New Zealand construction industry. However, the use of pure partnering method and the combination ones with traditional tender are occupying 7% and 19% respectively, which suggest an increasing understanding and use of new procurement forms. Selection of appropriate procurement methods can influence the success or failure of a project and is especially crucial during a post-disaster situation where communities require a rapid response to recovery and reconstruction.

Procurement is important in the reconstruction process after a natural disaster, but generally considered, it can be seen as “a strategy designed to satisfy the client’s development needs” (Moore 2002). As for a disaster recovery situation, the ‘client’ here is most likely to be the government bodies coordinating the reconstruction process. A well-developed protocol or stipulated procedure should be available and clearly understood by the involved government agencies and appointed coordinators in such an event (Moore 2002; Wilkinson et al. 2004).

There are several guidelines that currently exist in New Zealand for Government (central or local) for procurement in normal situations. These are listed out in the following table:

<b>Government Bodies</b>	<b>Guidelines for procurement</b>
The Ministry of Economic Development's Regulatory and Competition Policy branch	Government Procurement in New Zealand – Policy Guide for Purchaser (July 2002)
Association of Consulting Engineers of New Zealand and the Institution of Professional Engineers of New Zealand (ACENZ & IPENZ)	Guideline on the Briefing and Engagement for Consulting Engineering Services (January 2004)
The Office of Controller and Auditor-General	Procurement – A Statement of Good Practice (June 2001)
Transfund New Zealand	Transfund New Zealand's Competitive Pricing Procedures (CPPs)

Figure 3: Guidelines on procurement in New Zealand

The Ministry of Economic Development (MED)'s guide to procurement is the major guideline available in New Zealand for government procurement activities, it is intended "to help government departments and other taxpayer funded agencies to support the government's procurement policy (Ministry of Economic Development's Regulatory and Competition Policy branch 2002) but it "does not provide significant guidance on processes for securing suppliers of large construction and/or building contract.

The ACENZ & IPENZ guideline on briefing and engagement is used for selecting consulting engineers' processes and has a focus on quality-based selection. According to the CIC (2004), the Audit Office's Guideline assists with "...understanding the importance of a well-structured procurement process, and importance of the 'basics' – careful definition of the specification, cost estimating, robustness and transparency of process, attention to detail in planning and project management etc" (2004). However, compared to ACENZ & IPENZ's guideline, it does not provide guidance on how to embody the quality and value consideration in the actual selection step. The last one, Transfund NZ's Competitive Pricing Procedures, provides guidance in the transport sector, with a range from Lowest-Price Conforming procedures to Brooks Law procedures with an emphasis shifting from price to quality.

### **Major Standard Contracts used in NZ Construction**

The current basic contract document used in New Zealand construction industry is NZS3910:2003, *Conditions of Contract for Building and Civil Engineering Construction*. NZS3910. The main aim of NZS3910:2003 has been to produce a straightforward flexible document which includes all essential commercial provisions and which may be used for all types of engineering and building work with a variety of administrative arrangements.

The NZS3910 conditions of contract are well established, tested and widely used for most building and civil engineering construction works in New Zealand, typically using traditional procurement. However, there are various other standard forms

available in the new Zealand construction market, some of them are variations developed based on NZS3910 for special purpose, some are issued by different industry institutions for use by their own members. One example of variation of the standard forms is NZS3915:2000. This is a standard document for building and civil engineering construction “where an experienced engineer, architect, surveyor or other suitable person (either a direct employee or another person) is not readily available to the Principal to act as Engineer to the contract” (2000). The prompt for establishing such a variation of standard contract was originally raised by the Registered Master Builders’ Federation (MBF) of New Zealand to address the contractual situation on “comparatively straightforward” projects where the role of the Engineer is absent (2000). Besides NZS3910 and NZS3915, other commonly used standard forms for civil construction are those issued by MBF and the New Zealand Institute of Architects (NZIA). The MBF standard contract conditions was designed to cater to the needs of small building projects of any nature (Wilkinson 2003). Familiarity with these forms of contract in the construction industry is high, and the use of these with the traditional forms of procurement is common.

### **New Zealand Reconstruction Efforts - Government Guidelines**

“There have been changes in the forms of contract and other types of project relationships used in some sectors of construction in recent years, and some of these maybe more suitable for post-disaster reconstruction projects than traditional systems (Wilkinson et al. 2004)”. Such procurement planning should form part of any reconstruction planning for major disasters. However, this appears to be lacking in New Zealand. A series of Recovery Plans prepared by New Zealand Ministry of Civil Defence & Emergency Management (MCDEM) in order to “achieve greater standardisation and equity in central government policies for dealing with the aftermath of disasters” (MCDEM 2005) provide some assistance in the reconstruction procurement process expected to be followed after a disaster event.

The Civil Defence and Emergency Management (CDEM) Act 2002, established a framework for MCDEM to build resilient communities (2005a). As a part of this framework, a national CDEM strategy (2004) was also established, focusing on reducing the impact of emergencies through a sustainable approach to hazard risk management and pre-event recovery planning to cope with the long-term impact of disasters. Four goals have been identified in this strategy and the main interest of this research is to focus on the reconstruction procurement aspect within Goal 4 – to enhance New Zealand’s capability to recovery from disasters (Recovery within the ‘4Rs’).

There are various published related documents about the post-disaster recovery issued by MCDEM available, such as “Focus on Recovery”, “Preparing a Recovery Plan (2002)”, or the above mentioned “National CDEM Strategy”. The CDEM Act is the foundation for the CDEM environment upon which the National CDEM Strategy has been developed. “The Director’s Guideline and Information Series” in combination with the “National CDEM Strategy” and “CDEM Act” assist in driving the planning processes involved in the development of “CDEM Group Plans” and the “National CDEM Plan” (2005a). Aiming at detailing “the framework and responsibilities for disaster and emergency recovery operations and the principles

and existing policies for post-disaster activity (2005b)", the Nation Recovery Plan, does not directly concern itself with the reconstruction procurement process or related contractual arrangements. The plan focuses more on the general aspects of recovery activities and the resilience of the whole community. But there are some points, such as financial matters and insurance arrangements, addressed within the plan relevant to the cost aspect of reconstruction procurement. However, there is a lack of understanding of how construction works will be procured, how the industry will facilitate reconstruction, and who, in the construction industry, will be involved in procuring, and constructing such reconstructed facilities. This is confirmed by the involvement of central government in assistance of recovery which seems hands-off in both financial and physical aspects with the intension of encouraging the local authorities, businesses and individuals to initiate the reconstruction process. Central government would become involved only when recovery is beyond the ability of the community to manage.

### **A New Zealand flood case study – a focus on reconstruction contracts**

New Zealand is vulnerable to various natural disasters, including floods. Disastrous floods have struck most parts of New Zealand and they are the most common cause of a civil defence emergency. Several so-called "100-year" floods can happen in quick succession. Two recent floods that happened in New Zealand are the 2004 Manawatu floods and the 2005 Matata floods (also known as Bay of Plenty Floods). Both these events caused major damage to infrastructure, and as a result required general recovery procedure and reconstruction strategies to be implemented.

On 18 May 2005 a band of very intense rain fell in the catchments behind Matata triggered many landslips, and several large debris flows. The destruction in the community of Matata was caused by debris flows. Although debris flows were the primary hazard at Matata on 18 May 2005, it was accompanied by flooding. This intensive rainfall appears to be approximately a 500-year recurrence event. The rainfall caused floods in the area and also triggered debris avalanche landslips, these landslips initiated debris flows causing widespread damage to highways and roads, bridges and housing and railway infrastructure. In response to the Matata disaster, a Civil Defence Emergency was declared 18 May 2005 and remained in place until the end of May. The Recovery structure (used during the Recovery phase after the Matata flood) lists the different parties involved. Five work streams reporting to the recovery manager were:

(1) Media

(2) Reporting

(3) Hazards consisting of: Tonkin and Tailor (leader), Specialist engineering, Environment Bay of Plenty, Whakatane District Council, Department of Conservation, Iwi, Planning staff, EQC (Earthquake Commission)

(4) Infrastructure consisting of Whakatane District Council (leader), Opus, Transit New Zealand, Fulton Hogan, Ontrack

(5) Welfare

Other parties involved were: Government, Insurance companies (AMI), Land Transport New Zealand (subsidy), Hazard Task Force, Infrastructure Task Force, Rural Task Team, Task Force Green, Smithbridge Limited

The role of some of the key construction parties involved in the recovery process are listed below.

### *Tonkin and Tailor*

Whakatane District Council (WDC) appointed Tonkin and Taylor Ltd (T&T) to assist with disaster recovery activities and coordinate hazard and risk management investigations following the debris flows, flooding and widespread damage.

### *Whakatane District Council*

Programmes were managed by the Whakatane District Council. The district councils was responsible for developing plans and recovering the lifelines such as roading, electrical services, telecommunications etc.

### *EQC*

The Earthquake commission is the only organisation that provides cover for land after the disaster of May 2005.

### *Opus*

Four engineering companies were contacted to put forward pricing and proposals for recovery of the Northern end of Herepuru Road, which was closed. The companies investigated all options and the costs of each option.

Opus Consultants were awarded the tender to investigate long-term roading options for Herepuru Road. They were engaged by Whakatane District Council to progress the options for Herepuru Road.

### *Transit New Zealand*

From the moment that the floods occurred in May, Transit worked with Whakatane District Council on roading infrastructure.

### *Ontrack*

Ontrack is the owner and manager of New Zealand's railway infrastructure.

This team was concentrating on removing debris from Matata and after that—they considered longer-term rail infrastructure.

### *Government*

The Government was looking for an integrated recovery plan for Matata with Whakatane District Council and other relevant agencies. To facilitate this process the Ministry of Civil Defence and Emergency Management appointed a recovery facilitator. This facilitator worked together with the Recovery manager to rehabilitate Matata and provide an interface between central Government and Whakatane District Council.

### *Insurance Companies*

The Earthquake Commission does not provide cover for damage to dwellings or contents caused by storm or flood. If the event is determined to be a storm or a flood then cover will be provided by people's own insurance companies.

### *Hazard Task Force*

The original scope of work for the Hazards Team prepared by WDC included the following:

- To identify what action plans and processes need to be put in place to address the short term and long term risks still facing Matata as a result of the event
- To identify what future land use provisions need to be put in place
- Ensuring further rainfall in the short-term can be managed without causing further property damage
- The Hazards Task Team final report

### *Infrastructure Task Force*

The scope of work for this team included the following:

- To clear debris
- To sort out roads
- To get water on and back to a standard for use

### *Task Force Green*

Employed twenty-seven workers and three supervisors for three months to clean up public domains and help reinstating sections. The Task Force Green made a significant contribution to the recovery process in Matata.

### *Smithbridge Limited*

The contract to construct a new two-way rail underpass for State Highway 2 traffic was awarded shortly before the floods struck in May, but construction was delayed by the flooding. The contractor, Smithbridge Limited, won the contract for the underpass including the construction of the new underpass and a new rail bridge, realignment of the highway on both sides of the underpass, demolition of the old underpass, removal of the traffic signals, and installation of a speed threshold.

The major recovery project owners are: Ontrack, Transit, Whakatane District Council and Environment Bay of Plenty. They are owners of major infrastructural assets and therefore key parties in the recovery effort.

The recovery phase started after one week and parties came into action to clear the roads and the land from rocks, stones and debris. There was no tendering of work during this period. Parties had their own contractors and it was not necessary to involve new parties. When the reconstruction after 4-6 weeks took place, new parties were required. The tendering was fast tracked, but the parties approached were only a few parties of an existing relationship. (Brady, 2005). The work is accomplished by existing contractors and parties and the same contracts can be used during the reconstruction process.

Both Ontrack and Transit own a significant part of the infrastructure in the area affected by the event. It was needed to ensure that both these organisations were working collaboratively with the Hazards and Risks Task Group to identify long-term solutions.



There was little difference between contractual arrangements of after-disaster reconstruction and normal time construction in New Zealand industry. Packages of work are tendered where needed. There may have been some expediency and short cutting, but in general terms all work is done within the existing contractual frameworks. The small differences between the normal building processes and the reconstruction process may partially be explained by the fact that the investigated disasters were of a small scale. The parties that are normally involved during the construction projects in the area are also involved during the reconstruction process, and this is certainly an advantage due to the industry familiarity and enhanced level of trust-based collaboration of existing relationships. This lends itself towards the partnering and alliancing arrangements discussed earlier.

Encourage the use of relationship-focused contracts or procurement methods (e.g. partnering or traditional ones with traits of partnering) in a post-disaster reconstruction to ensure a good collaboration among involved parties and a higher level of industry familiarity.

## **CONCLUSION**

In this paper, the analysis has focused on information about procurement systems for reconstruction within New Zealand circumstance. Firstly, the current procurement systems and various standard contracts that are being used in New Zealand construction industry have been reviewed. Several government guidelines on procurement and a national recovery plan issued by Ministry of Civil Defence and Emergency Management based on newly released CDEM Act 2002 have also been introduced to see if procurement strategies are incorporated into the recovery from disasters. The case study showed that due to existing contractual relationships in Matata, collaboration between the parties was quickly established, and contracts let. This shows some traits of traditional, and some traits of collaborative procurement strategies in use. Extending this research to include other, larger case studies, would assist with an understanding of whether one form is more prevalent. In the case of the Matata floods, relationship-focussed contracting certainly played a key part in the recovery and reconstruction.

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