Christchurch City Council

Ouruhia Reserve Cricket Shelter

PRK 0391 BLDG 002 EQ2

Detailed Engineering Evaluation

Quantitative Assessment Report

Christchurch City Council

Ouruhia Reserve Cricket Shelter

Quantitative Assessment Report

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Summary

Ouruhia Reserve Cricket Shelter
PRK 0391 BLDG 002 EQ2

Detailed Engineering Evaluation
Quantitative Report - Summary
Final

Background
This is a summary of the quantitative report for the Ouruhia Reserve Cricket Shelter building, and is based on the Detailed Engineering Evaluation Procedure document (draft) issued by the Structural Advisory Group on 19 July 2011, visual inspections on 10 June and 5 September 2012, measured-up sketch drawings and calculations.

Key Damage Observed
Splitting was observed in several roof members including rafters and sarking. The most critical splitting observed has occurred in a roof rafter – refer to photo 12. This splitting is deemed to not have been caused by recent earthquake activity.

The verandah slab also had visible voids and some minor non-structural cracking. Likewise, these are not related to the recent earthquakes.

Critical Structural Weaknesses
No critical structural weaknesses have been identified.

Indicative Building Strength
Whilst the seismic capacity of the building has been calculated to be 86% NBS, the design of this timber building will be governed by wind loading and therefore the %NBS of this building to wind loads will be less than 86% NBS.

Recommendations
The following remedial works should be undertaken:

(a) Investigate the existing timber floor bearers and install fixings to the subfloor concrete piles.

(b) The splits in the rafters should be measured, recorded and monitored to determine if they are worsening, and if so, repair and/or replacement may be required.

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1 Introduction

Opus International Consultants Limited has been engaged by Christchurch City Council to undertake a detailed seismic assessment of the Ouruhia Reserve Cricket Shelter, located at Chenery Ave, access off Marshland Rd, Ouruhia, Christchurch, following the Canterbury Earthquake Sequence since September 2010.

The purpose of the assessment is to determine if the building is classed as being earthquake prone in accordance with the Building Act 2004.

The seismic assessment and reporting have been undertaken based on the qualitative and quantitative procedures detailed in the Detailed Engineering Evaluation Procedure (DEEP) document (draft) issued by the Structural Engineering Society (SESOC) [3] [4].

2 Compliance

This section contains a brief summary of the requirements of the various statutes and authorities that control activities in relation to buildings in Christchurch at present.

2.1 Canterbury Earthquake Recovery Authority (CERA)

CERA was established on 28 March 2011 to take control of the recovery of Christchurch using powers established by the Canterbury Earthquake Recovery Act enacted on 18 April 2011. This act gives the Chief Executive Officer of CERA wide powers in relation to building safety, demolition and repair. Two relevant sections are:

Section 38 – Works

This section outlines a process in which the chief executive can give notice that a building is to be demolished and if the owner does not carry out the demolition, the chief executive can commission the demolition and recover the costs from the owner or by placing a charge on the owners' land.

Section 51 – Requiring Structural Survey

This section enables the chief executive to require a building owner, insurer or mortgagee to carry out a full structural survey before the building is re-occupied.

We understand that CERA require a detailed engineering evaluation to be carried out for all buildings (other than those exempt from the Earthquake Prone Building definition in the Building Act). CERA have adopted the Detailed Engineering Evaluation Procedure (DEEP) document (draft) issued by the Structural Engineering Society (SESOC) on 19 July 2011. This document sets out a methodology for both initial qualitative and detailed quantitative assessments.

It is anticipated that a number of factors, including the following, will determine the extent of evaluation and strengthening level required:

1. The importance level and occupancy of the building.

2. The placard status and amount of damage.
3. The age and structural type of the building.
4. Consideration of any critical structural weaknesses.

Christchurch City Council requires any building with a capacity of less than 34% of New Building Standard (including consideration of critical structural weaknesses) to be strengthened to a target of 67% as required under the CCC Earthquake Prone Building Policy.

2.2 Building Act

Several sections of the Building Act are relevant when considering structural requirements:

Section 112 - Alterations

This section requires that an existing building complies with the relevant sections of the Building Code to at least the extent that it did prior to the alteration. This effectively means that a building cannot be weakened as a result of an alteration (including partial demolition).

The Earthquake Prone Building policy for the territorial authority shall apply as outlined in Section 2.3 of this report.

Section 115 – Change of Use

This section requires that the territorial authority is satisfied that the building with a new use complies with the relevant sections of the Building Code 'as near as is reasonably practicable'.

This is typically interpreted by territorial authorities as being 67% of the strength of an equivalent new building or as near as practicable. This is also the minimum level recommended by the New Zealand Society for Earthquake Engineering (NZSEE).

Section 121 – Dangerous Buildings

This section was extended by the Canterbury Earthquake (Building Act) Order 2010, and defines a building as dangerous if:

1. In the ordinary course of events (excluding the occurrence of an earthquake), the building is likely to cause injury or death or damage to other property; or
2. In the event of fire, injury or death to any persons in the building or on other property is likely because of fire hazard or the occupancy of the building; or
3. There is a risk that the building could collapse or otherwise cause injury or death as a result of earthquake shaking that is less than a 'moderate earthquake' (refer to Section 122 below); or
4. There is a risk that other property could collapse or otherwise cause injury or death; or

5. A territorial authority has not been able to undertake an inspection to determine whether the building is dangerous.

Section 122 – Earthquake Prone Buildings

This section defines a building as earthquake prone (EPB) if its ultimate capacity would be exceeded in a 'moderate earthquake' and it would be likely to collapse causing injury or death, or damage to other property.

A moderate earthquake is defined by the building regulations as one that would generate loads 33% of those used to design an equivalent new building.

Section 124 – Powers of Territorial Authorities

This section gives the territorial authority the power to require strengthening work within specified timeframes or to close and prevent occupancy to any building defined as dangerous or earthquake prone.

Section 131 – Earthquake Prone Building Policy

This section requires the territorial authority to adopt a specific policy for earthquake prone, dangerous and insanitary buildings.

2.3 Christchurch City Council Policy

Christchurch City Council adopted their Earthquake Prone, Dangerous and Insanitary Building Policy in 2006. This policy was amended immediately following the Darfield Earthquake on 4 September 2010.

The 2010 amendment includes the following:

1. A process for identifying, categorising and prioritising Earthquake Prone Buildings, commencing on 1 July 2012;
2. A strengthening target level of 67% of a new building for buildings that are Earthquake Prone;
3. A timeframe of 15-30 years for Earthquake Prone Buildings to be strengthened; and,
4. Repair works for buildings damaged by earthquakes will be required to comply with the above.

The council has stated their willingness to consider retrofit proposals on a case by case basis, considering the economic impact of such a retrofit.

If strengthening works are undertaken, a building consent will be required. A requirement of the consent will require upgrade of the building to comply 'as near as is reasonably practicable' with:

- The accessibility requirements of the Building Code.

- The fire requirements of the Building Code. This is likely to require a fire report to be submitted with the building consent application.

Where an application for a change of use of a building is made to Council, the building will be required to be strengthened to 67% of New Building Standard or as near as is reasonably practicable.

2.4 Building Code

The Building Code outlines performance standards for buildings and the Building Act requires that all new buildings comply with this code. Compliance Documents published by The Department of Building and Housing can be used to demonstrate compliance with the Building Code.

On 19 May 2011, Compliance Document B1: Structure was amended to include increased seismic design requirements for Canterbury as follows:

- increase in the basic seismic design load for the Canterbury earthquake region (Z factor increased to 0.3 equating to an increase of 36 – 47% depending on location within the region);

- Increased serviceability requirements.

2.5 Institution of Professional Engineers New Zealand (IPENZ) Code of Ethics

One of the core ethical values of professional engineers in New Zealand is the protection of life and safeguarding of people. The IPENZ Code of Ethics requires that:

Members shall recognise the need to protect life and to safeguard people, and in their engineering activities shall act to address this need.

1.1 Giving Priority to the safety and well-being of the community and having regard to this principle in assessing obligations to clients, employers and colleagues.

1.2 Ensuring that responsible steps are taken to minimise the risk of loss of life, injury or suffering which may result from your engineering activities, either directly or indirectly.

All recommendations on building occupancy and access must be made with these fundamental obligations in mind.

3 Earthquake Resistance Standards

For this assessment, the building's earthquake resistance is compared with the current New Zealand Building Code requirements for a new building constructed on the site. This is expressed as a percentage of new building standard (%NBS). The loadings are in accordance with the current earthquake loading standard NZS1170.5 [1].

A generally accepted classification of earthquake risk for existing buildings in terms of %NBS that has been proposed by the NZSEE 2006 [2] is presented in Figure 1 below.

Description	Grade	Risk	%NBS	Existing Building Structural Performance
Low Risk Building	A or B	Low	Above 67	Acceptable (improvement may be desirable)
Moderate Risk Building	B or C	Moderate	34 to 66	Acceptable legally. Improvement recommended
High Risk Building	D or E	High	33 or lower	Unacceptable (Improvement required under Act)

Improvement of Structural Performance	
Legal Requirement	NZSEE Recommendation
The Building Act sets no required level of structural improvement (unless change in use) This is for each TA to decide. Improvement is not limited to 34%NBS.	100%NBS desirable. Improvement should achieve at least 67%NBS
	Not recommended. Acceptable only in exceptional circumstances
Unacceptable	Unacceptable

Figure 1: NZSEE Risk Classifications Extracted from table 2.2 of the NZSEE 2006 AISPBE Guidelines

Table 1 below compares the percentage NBS to the relative risk of the building failing in a seismic event with a 10% risk of exceedance in 50 years (i.e. 0.2% in the next year).

Table 1: %NBS compared to relative risk of failure

Percentage of New Building Standard (%NBS)	Relative Risk (Approximate)
>100	<1 time
80-100	1-2 times
67-80	2-5 times
33-67	5-10 times
20-33	10-25 times
<20	>25 times

3.1 Minimum and Recommended Standards

Based on governing policy and recent observations, Opus makes the following general recommendations:

3.1.1 Occupancy

The Canterbury Earthquake Order[1] in Council 16 September 2010, modified the meaning of "dangerous building" to include buildings that were identified as being EPB's. As a result of this, we would expect such a building would be issued with a Section 124 notice, by the Territorial Authority, or CERA acting on their behalf, once they are made aware of our assessment. Based on information received from CERA to date and from the DBH guidance document dated 12 June 2012 [6], this notice is likely to prohibit occupancy of the building (or parts thereof), until its seismic capacity is improved to the point that it is no longer considered an EPB.

3.1.2 Cordoning

Where there is an overhead falling hazard, or potential collapse hazard of the building, the areas of concern should be cordoned off in accordance with current CERA/territorial authority guidelines.

3.1.3 Strengthening

Industry guidelines (NZSEE 2006 [2]) strongly recommend that every effort be made to achieve improvement to at least 67%NBS. A strengthening solution to anything less than 67%NBS would not provide an adequate reduction to the level of risk.

It should be noted that full compliance with the current building code requires building strength of 100%NBS.

3.1.4 Our Ethical Obligation

In accordance with the IPENZ code of ethics, we have a duty of care to the public. This obligation requires us to identify and inform CERA of potentially dangerous buildings; this would include earthquake prone buildings.

[1] This Order only applies to buildings within the Christchurch City, Selwyn District and Waimakariri District Councils authority

4 Background Information

4.1 Building Description

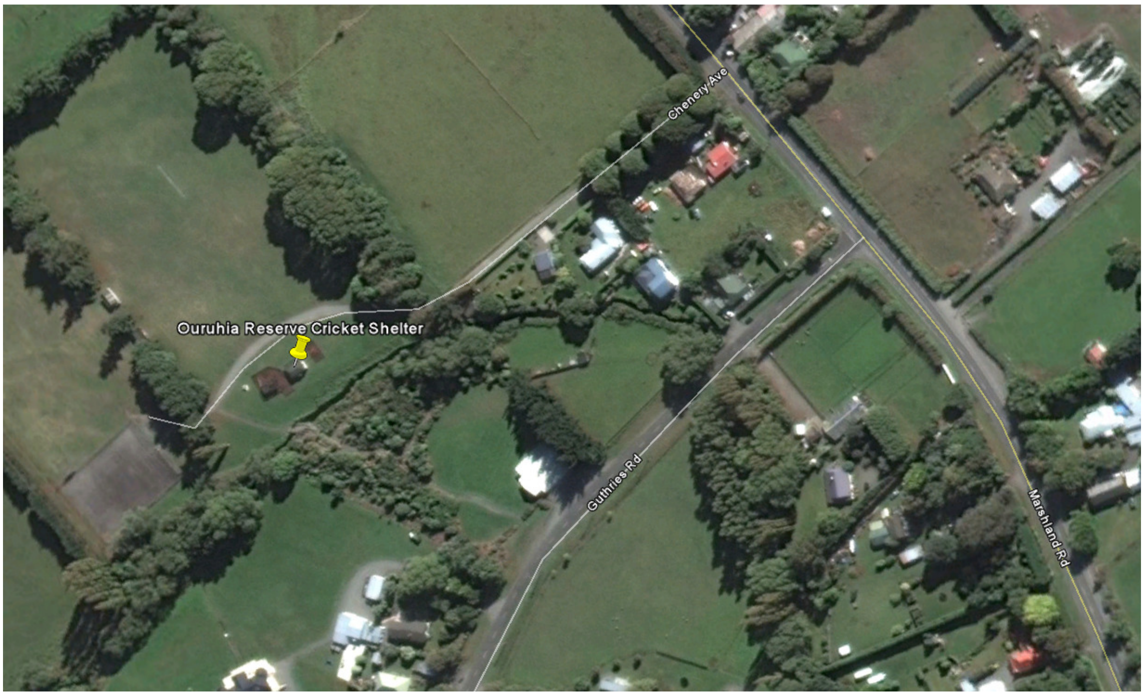


Figure 2 - Location of Ouruhia Reserve Cricket Shelter

The Ouruhia Reserve Cricket Shelter is a single-storey, timber framed, building approximately 7.4m long by 6.25m wide with a front verandah across the entire width. The building's age is unknown, but it is estimated to have been built before the 1960s.

The cricket shelter has a corrugated iron roof with a pitch of approximately 20 degrees. The roof is timber framed with sarking on the underside of the roof sheeting. There is no ceiling. The walls are timber framed and clad with ply internally and weatherboards externally. The floor is timber framed with chipboard flooring, timber joists, and timber bearers suspended by short concrete piles.

The verandah has a slab on ground with the timber roof supported between the main building and a four-post timber frame along the outside edge. The posts are supported at the base by 'Bowmac' brackets into the concrete slab.

4.2 Survey

Visual inspections were carried out on 10 June 2012 and 5 September 2012.

4.3 Original Documentation

No construction drawings or design calculations for the structure were located for this building.

5 Structural Damage

The building structure does not appear to have suffered damage as a result of the recent earthquake events.

Splitting was observed in several timber roof members including rafters and sarking. The most critical splitting observed occurred in a roof rafter – refer to photo 12. It is deemed that this is a result of age and usage, and not from recent earthquake damage.

The verandah slab also had visible voids and some minor non-structural cracking, likewise not from the recent earthquakes.

6 General Observations

Overall the building has performed very well under seismic conditions which would be expected for a single-storey timber framed structure.

The subfloor consists of timber flooring on timber joists and timber bearers supported by short concrete piles. There is no apparent connection between the bearers and the piles, which is not in accordance with the current building code.

7 Detailed Seismic Assessment

The detailed seismic assessment has been based on the NZSEE 2006 [2] guidelines for the "Assessment and Improvement of the Structural Performance of Buildings in Earthquakes" together with the "Guidance on Detailed Engineering Evaluation of Earthquake Affected Non-residential Buildings in Canterbury, Part 2 Evaluation Procedure" [3] draft document prepared by the Engineering Advisory Group on 19 July 2011, and the SESOC guidelines "Practice Note – Design of Conventional Structural Systems Following Canterbury Earthquakes" [5] issued on 21 December 2011.

7.1 Critical Structural Weaknesses

The term Critical Structural Weakness (CSW) refers to a component of a building that could contribute to increased levels of damage or cause premature collapse of a building. No potential CSW's were identified in this building.

7.2 Seismic design parameters

The seismic design parameters based on current design requirements from

NZS1170.5:2004 and the NZBC clause B1 for this building are:

- Site soil class D, clause 3.1.3 NZS 1170.5:2004;
- Site hazard factor, Z=0.3, B1/VM1 clause 2.2.14B;
- Return period factor, Ru = 1.0 from Table 3.5, NZS 1170.5:2004, for an Importance

Level 2 structure with a 50 year design life;

- Structural Ductility Factor, μ_{max} = 2

7.3 Quantitative Assessment Methodology

The assessment analysis has been based on assumed material properties for timber constructed before 1960. It has been assumed that the roof sarking acts as an adequate flexible diaphragm to distribute eaves-level seismic forces to sheet lined bracing walls.

7.4 Limitations and Assumptions in Results

The observed level of damage suffered by the building was deemed low enough to not affect the capacity. Therefore the analysis and assessment of the building was based on it being in an undamaged state. There may have been damage to the building that was unable to be observed during assessments that could cause the capacity of the buildings to be reduced; therefore the current capacity of the buildings may be lower than that stated.

The results have been reported as a %NBS and the stated value is that obtained from our analysis and assessment. Despite the use of best national and international practice in this analysis and assessment, this value contains uncertainty due to the many assumptions and simplifications which are made during the assessment. These include:

a. Simplifications made in the analysis, including boundary conditions such as foundation fixity.
b. Assessments of material strengths based on visual inspections only,
c. The normal variation in material properties which change from batch to batch.
d. Approximations made in the assessment of the capacity of each element.

7.5 Assessment

A summary of the structural performance of the building is shown in the table below. Note that the values given represent the worst performing elements in the building, as these effectively define the building's capacity. Other elements within the building may have significantly greater capacity when compared with the governing.

It is noted that there is a lack of connection between the bearers and the foundations to provide effective seismic load transfer. Although failure at this connection is unlikely, a failure could result in the building falling off the piles, which is likely to cause extensive damage to the building, but is unlikely to result in building collapse. This deficiency is not compliant with the Building Act and should be remedied as soon as possible.

Table 2: Summary of Seismic Performance

Structural Element/System	Failure Mode, or description of limiting criteria based on displacement capacity of critical element.	% NBS based on calculated capacity
Front wall along the building	Bracing capacity of timber framed walls	96%
Back wall along the building	Bracing capacity of timber framed walls	>100%
Walls across the building	Bracing capacity of timber framed walls	96%
Verandah frame - along	Bracing capacity of timber frame	100%
Subfloor Posts – along and across	Bracing capacity of subfloor piles	86%

It is unlikely that the split rafters would have any effect on the seismic performance of the building as they are not primary seismic resisting members. The splits should be measured, recorded and monitored to determine if they are worsening, and if so, repair and/or replacement may be required.

Whilst the seismic capacity of the building has been calculated to be 86% NBS, the design of this timber building will be governed by wind loading and therefore the %NBS of this building to wind loads will be less than 86% NBS.

8 Summary of Geotechnical Appraisal

Due to a lack of observed ground damage, no specific geotechnical assessment has been undertaken for this site. The site parameters used for the structural analysis have been taken as site subsoil class D, based on geotechnical advice.

9 Remedial Options

The floor bearer to pile connection should be investigated and fixings installed to the existing subfloor concrete pile foundations.

10 Conclusions

a) Whilst the seismic capacity of the building has been calculated to be 86% NBS, the design of this timber building will be governed by wind loading and therefore the %NBS of this building to wind loads will be less than 86% NBS.

b) Strengthening work is not required to increase the overall building capacity, but remedial work is required to investigate and install bearer to pile fixings,

c) The site and existing foundations have performed satisfactorily, and no geotechnical testing is required.

11 Recommendations

The following remedial works should be undertaken:

a) Investigate the existing timber floor bearers and install fixings to the subfloor concrete piles.

b) The splits in the rafters should be measured, recorded and monitored to determine if they are worsening, and if so, repair and/or replacement may be required.

12 Limitations

a) This report is based on an inspection of the structure with a focus on the damage sustained from the Canterbury Earthquake Sequence since September 2010, and aftershocks only.

b) Some non-structural damage is mentioned but this is not intended to be a comprehensive list of non-structural items.

c) Our professional services are performed using a degree of care and skill normally exercised, under similar circumstances, by reputable consultants practicing in this field at the time.

d) This report is prepared for the CCC to assist with assessing remedial works required for council buildings and facilities. It is not intended for any other party or purpose.

13 References

[1] NZS 1170.5: 2004, Structural design actions, Part 5 Earthquake actions, Standards New Zealand.

[2] NZSEE (2006), Assessment and improvement of the structural performance of buildings in earthquakes, New Zealand Society for Earthquake Engineering.

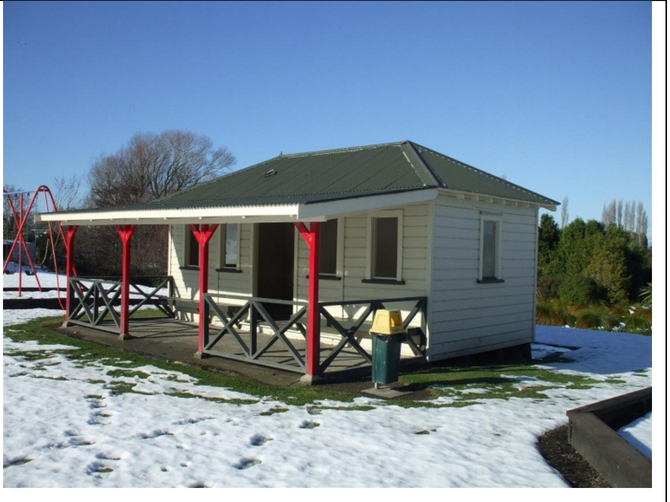
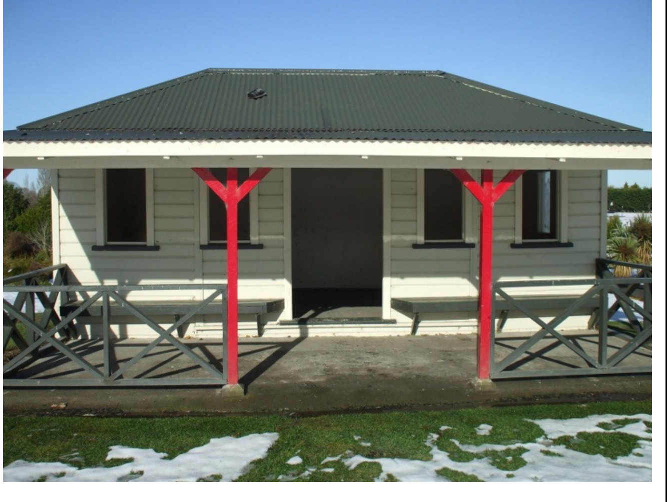
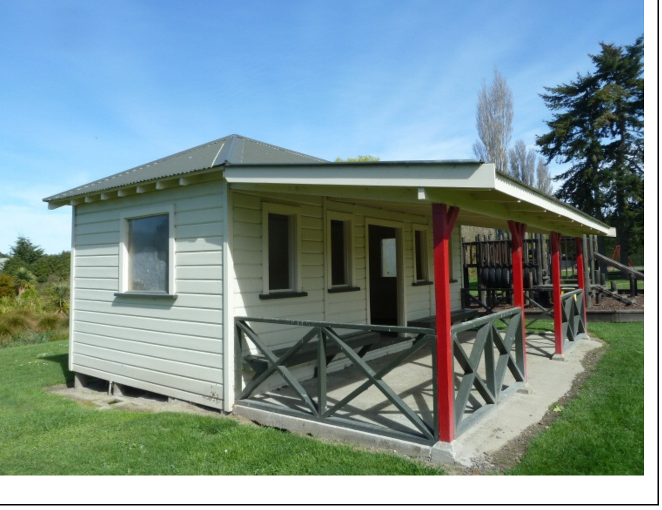
[3] Engineering Advisory Group, Guidance on Detailed Engineering Evaluation of Earthquake Affected Non-residential Buildings in Canterbury, Part 2 Evaluation Procedure, Draft Prepared by the Engineering Advisory Group, Revision 5, 19 July 2011.

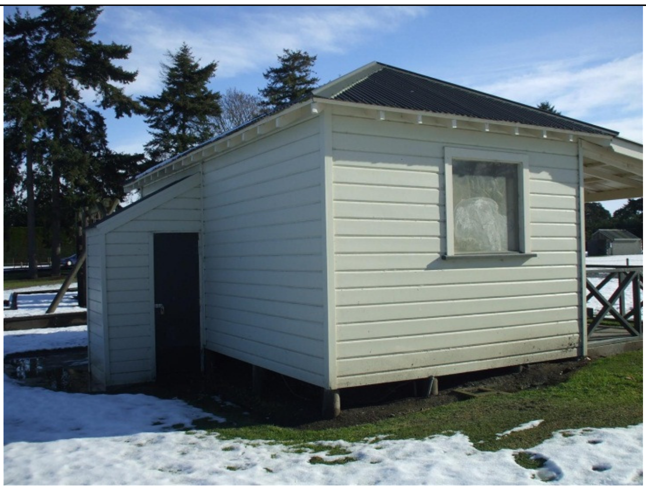
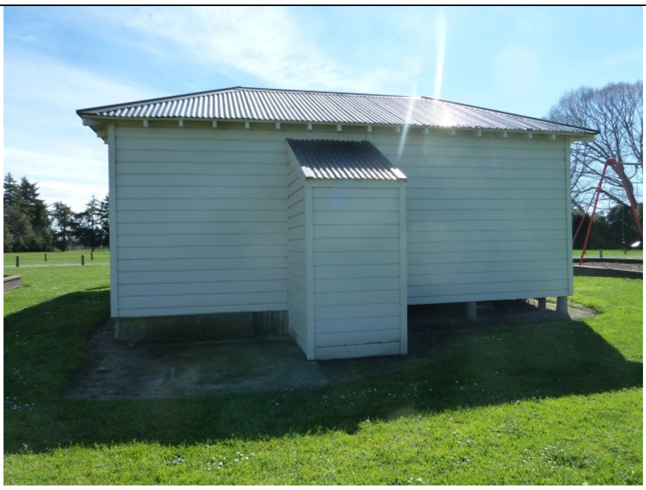
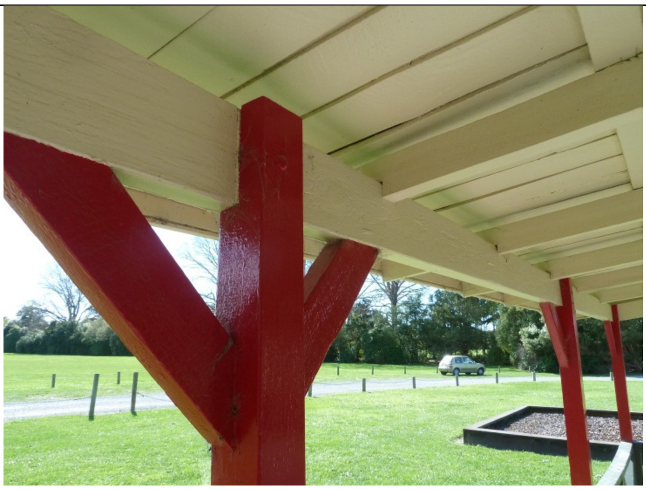
[4] Engineering Advisory Group, *Guidance on Detailed Engineering Evaluation of Non-residential buildings, Part 3 Technical Guidance*, Draft Prepared by the Engineering Advisory Group, 13 December 2011.

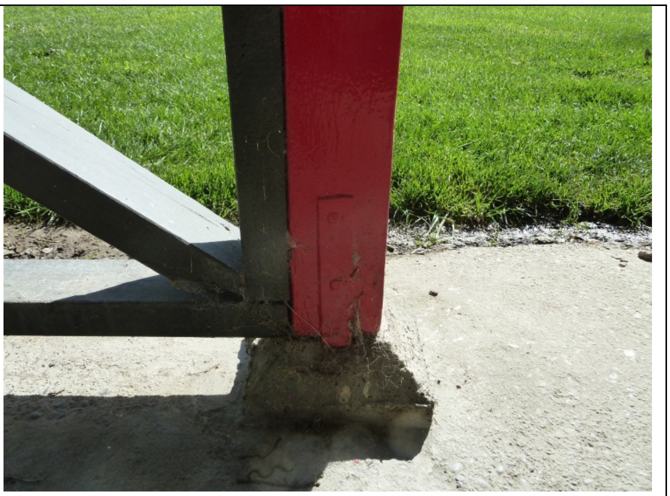
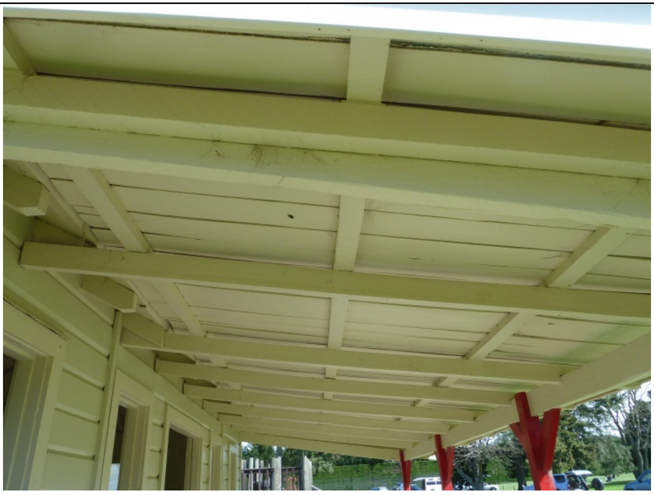
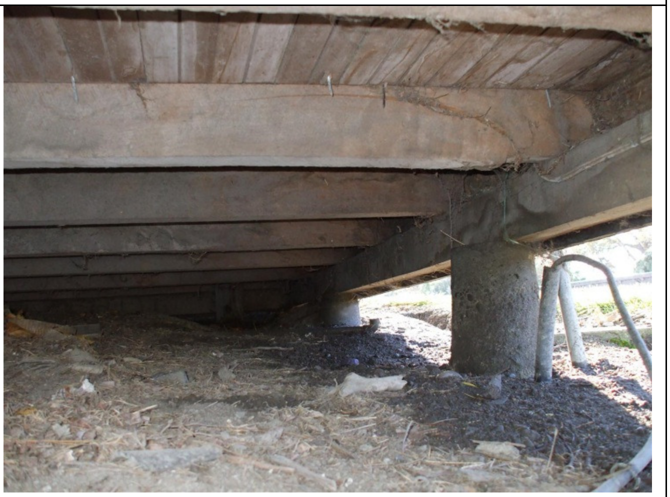
[5] SESOC (2011), Practice Note – Design of Conventional Structural Systems Following Canterbury Earthquakes, Structural Engineering Society of New Zealand, 21 December 2011.

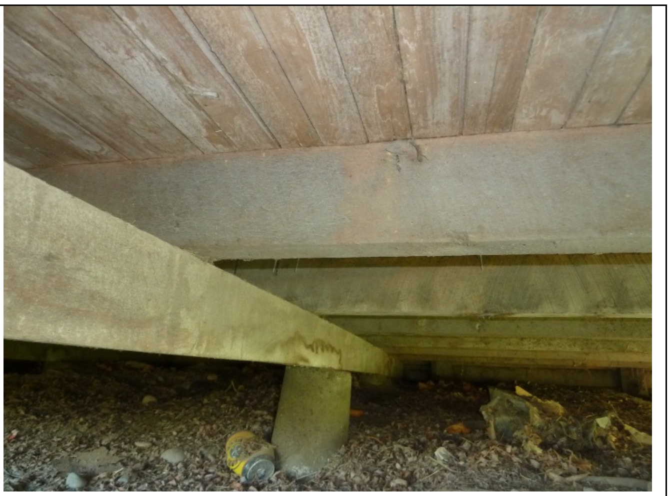
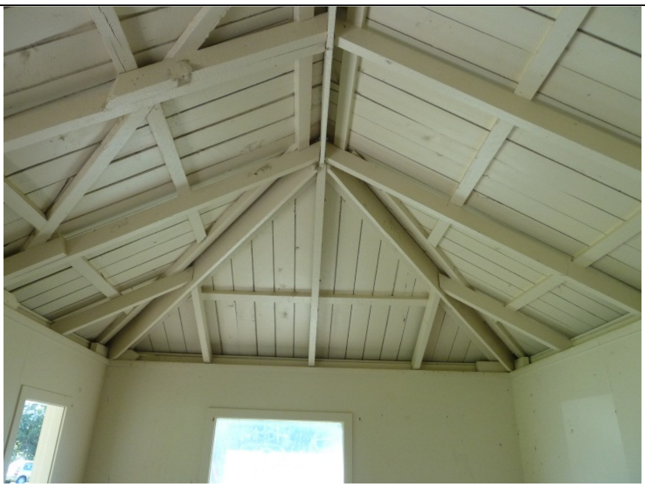
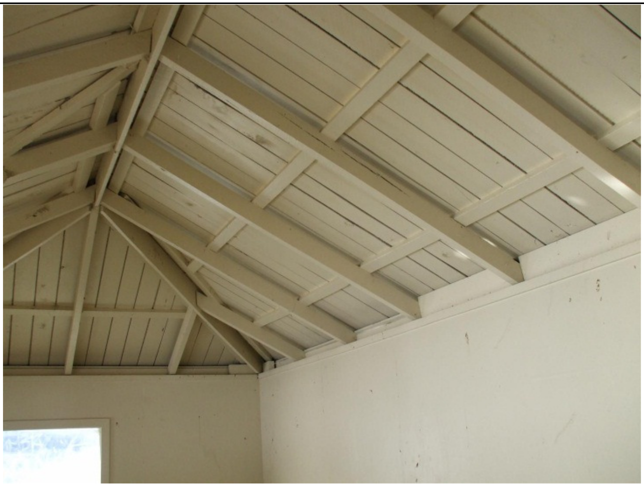
[6] DBH (2012), Guidance for engineers assessing the seismic performance of non-residential and multi-unit residential buildings in greater Christchurch, Department of Building and Housing, June 2012.

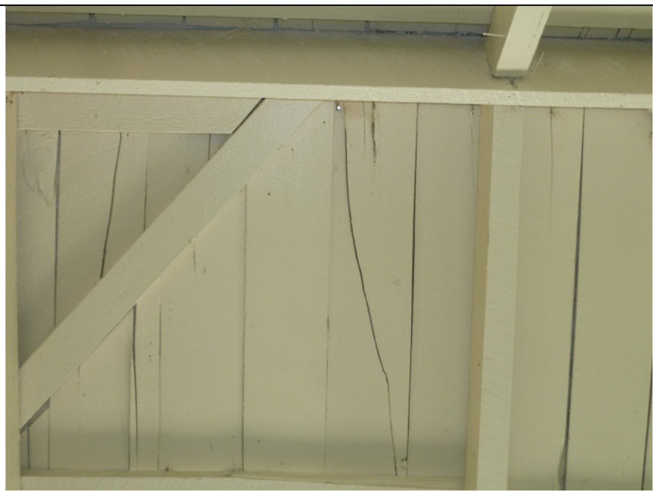
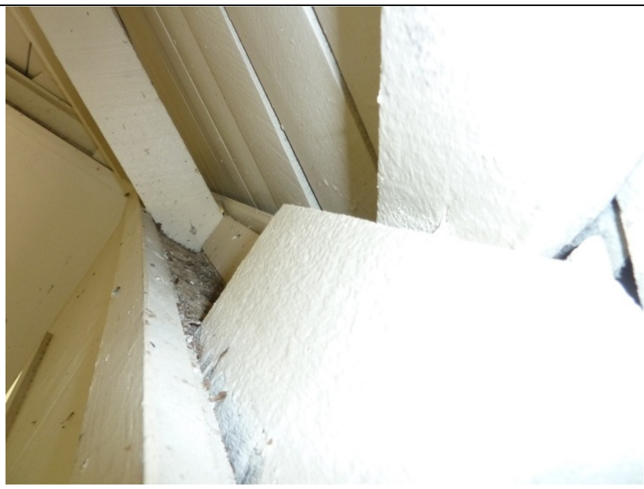
Appendix 1 - Photographs

Ouruhia Reserve Cricket Shelter		
No.	Item description	Photo
1.	North-west view of the cricket shelter	
2.	Front view of the cricket shelter	
3.	North-east view of the cricket shelter	

4.	South-east view of the cricket shelter	
5.	Rear view of the cricket shelter	
6.	Top of verandah posts	

7.	Bowmac bracket connection at base of verandah post	
8.	Timber framed verandah roof with sarking underside	
9.	Timber floor framing (chipboard floor over boards on timber joists & bearers)	

10.	No apparent connection between bearers and piles		
11.	Timber framed roof. Timber board sarking in roof plane.		
12.	Some timber rafters show splitting –not a result of earthquake actions		

13.	Split sarking–not a result of earthquake actions	
14.	Corner of side wall to roof rafters	

Appendix 2 – CERA DEE Spreadsheet

Detailed Engineering Evaluation Summary Data V1.11

Location

Building Name:	Ouruhia Reserve Cricket Shelter	Reviewer:	Jan Stanway
	Unit / No: 755 / Street: Marshland Rd	CPEng No:	222291
Building Address:	755 Marshland Rd	Company:	Opus International Consultants
Legal Description:		Company project number:	QUCC1.70
		Company phone number:	03 363 5400
	Degrees / Min / Sec		
GPS south:	43 / 26 / 26.63	Date of submission:	11-Apr-13
GPS east:	172 / 39 / 6.49	Inspection Date:	10/06/2012
		Revision:	Final
Building Unique Identifier (CCC):	PRK 0391 BLDG 002 EQ2	Is there a full report with this summary?	yes

Site

Site slope:		Max retaining height (m):	
Soil type:		Soil Profile (if available):	
Site Class (to NZS1170.5):	D		
Proximity to waterway (m, if <100m):		If Ground improvement on site, describe:	
Proximity to clifftop (m, if < 100m):			
Proximity to cliff base (m,if <100m):		Approx site elevation (m):	

Building

No. of storeys above ground:	1	single storey = 1	Ground floor elevation (Absolute) (m):
Ground floor split?	no	Ground floor elevation above ground (m):	
Storeys below ground	0		
Foundation type:	other (describe)	if Foundation type is other, describe:	short concrete piles
Building height (m):	2.50	height from ground to level of uppermost seismic mass (for IEP only) (m):	
Floor footprint area (approx):	46		
Age of Building (years):	60	Date of design:	1935-1965
Strengthening present?	no	If so, when (year)?	
		And what load level (%g)?	
Use (ground floor):	public	Brief strengthening description:	
Use (upper floors):			
Use notes (if required):			
Importance level (to NZS1170.5):	IL2		

Gravity Structure

Gravity System:	load bearing walls		
Roof:	timber framed	rafter type, purlin type and cladding	metal cladding on timber board sarking
Floors:	timber	joist depth and spacing (mm)	
Beams:	timber	type	
Columns:	timber	typical dimensions (mm x mm)	94x94
Walls:			

Lateral load resisting structure

Note: Define along and across in detailed report!

Lateral system along:	lightweight timber framed walls		note typical wall length (m)	varies
Ductility assumed, μ:	2.00			
Period along:	0.20	0.00	estimate or calculation?	estimated
Total deflection (ULS) (mm):	1		estimate or calculation?	estimated
maximum interstorey deflection (ULS) (mm):	1		estimate or calculation?	estimated
Lateral system across:	lightweight timber framed walls		note typical wall length (m)	varies
Ductility assumed, μ:	2.00			
Period across:	0.20	0.00	estimate or calculation?	estimated
Total deflection (ULS) (mm):	1		estimate or calculation?	estimated
maximum interstorey deflection (ULS) (mm):	1		estimate or calculation?	estimated

Separations: (leave blank if not relevant)

north (mm):	
east (mm):	
south (mm):	
west (mm):	

Non-structural elements

Stairs:			
Wall cladding:	other light	describe	timber weatherboard
Roof Cladding:	Metal	describe	corr iron
Glazing:	timber frames		
Ceilings:	none		
Services(list):			

Available documentation

Architectural	none	original designer name/date	
Structural	none	original designer name/date	
Mechanical	full	original designer name/date	
Electrical	none	original designer name/date	
Geotech report	none	original designer name/date	

Damage

Site: (refer DEE Table 4-2)

Site performance:	good	Describe damage:	
Settlement:	none observed	notes (if applicable):	
Differential settlement:	none observed	notes (if applicable):	
Liquefaction:	none apparent	notes (if applicable):	
Lateral Spread:	none apparent	notes (if applicable):	
Differential lateral spread:	none apparent	notes (if applicable):	
Ground cracks:	none apparent	notes (if applicable):	
Damage to area:	none apparent	notes (if applicable):	

Building:

	Current Placard Status:			
Along	Damage ratio:	0%	Describe how damage ratio arrived at:	
	Describe (summary):			
Across	Damage ratio:	0%		
	Describe (summary):			
Diaphragms	Damage?:		Describe:	
CSWs:	Damage?:		Describe:	
Pounding:	Damage?:		Describe:	
Non-structural:	Damage?:		Describe:	

$$Damage\_Ratio = \frac{(\% NBS\,(before) - \% NBS\,(after))}{\% NBS\,(before)}$$

Recommendations

	Level of repair/strengthening required:	minor structural	Describe:	check and install bearer to pile fixings
	Building Consent required:		Describe:	
	Interim occupancy recommendations:	full occupancy	Describe:	
Along	Assessed %NBS before e'quakes:	86%	##### %NBS from IEP below	If IEP not used, please detail assessment methodology: quantitative
	Assessed %NBS after e'quakes:	86%		
Across	Assessed %NBS before e'quakes:	86%	##### %NBS from IEP below	
	Assessed %NBS after e'quakes:	86%		

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