

CHRISTCHURCH CITY COUNCIL PRK_2389_BLDG_001 EQ2 Scarborough Farm Park Woolshed 190 Summit Road, Sumner



QUALITATIVE ASSESSMENT REPORT FINAL

- Rev B
- 23 May 2013



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1. Executive Summary

1.1. Background

A qualitative assessment was carried out on the buildings located in Scarborough Farm Park at 190 Summit Road, Sumner. The buildings are single storey and are currently utilised as a woolshed. There are two structures, an enclosed timber-frame building to the east and a steel-framed lean-to structure to the west. An aerial photograph illustrating this area is shown below in Figure 1. Detailed descriptions outlining the buildings' age and construction type is given in Section 5 of this report.



• Figure 1 Aerial Photograph of the woolshed in Scarborough Farm Park

The qualitative assessment includes a summary of the buildings' damage as well as an initial assessment of the current seismic capacity compared with current seismic code loads using the Initial Evaluation Procedure (IEP).

This qualitative report for the building structures is based on the Detailed Engineering Evaluation Procedure document (draft) issued by the Structural Advisory Group on 19 July 2011 and a visual inspection on 19 September 2012.



1.2. Key Damage Observed

No damage was observed during our site inspection.

1.3. Critical Structural Weaknesses

As the separation between the enclosed and lean-to structures is less than 0.005 times the height of the building, there is potential for pounding to occur in the longitudinal direction. This can have a severe effect on structural performance. However, if pounding occurred, it would likely have a greater effect on the capacity of the lean-to structure as opposed to the enclosed structure, due to the difference in construction and mass.

1.4. Indicative Building Strength (from IEP and CSW assessment)

1.4.1. Enclosed Structure

Based on the information available, and using the NZSEE Initial Evaluation Procedure, the building's original capacity has been assessed to be in the order of 72% NBS. No damage was observed during the site investigation therefore the post earthquake capacity will not change as a result of earthquake damage.

The building has been assessed to have a seismic capacity greater than 67% NBS and is therefore not a potential earthquake risk.

1.4.2. Lean-to Structure

Based on the information available, and using the NZSEE Initial Evaluation Procedure, the building's original capacity has been assessed to be in the order of 29% NBS. No damage was observed during the site investigation therefore the post earthquake capacity will not change as a result of earthquake damage.

The building has been assessed to have a seismic capacity less than 33% NBS and is therefore potentially earthquake prone.

1.5. Recommendations

1.5.1. Enclosed Structure

It is recommended that:

- a) There is no damage to the building that would cause it to be unsafe to occupy.
- b) We consider that barriers around the building are not necessary.

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1.5.2. Lean-to Structure

It is recommended that:

- a) There is no damage to the building that would cause it to be unsafe to occupy.
- b) A quantitative assessment of the building, supported by intrusive investigations if required, be undertaken to determine the seismic capacity and to develop potential strengthening concepts.
- c) We consider that barriers around the building are not necessary.



2. Introduction

Sinclair Knight Merz was engaged by Christchurch City Council to prepare a qualitative assessment report for the buildings located in Scarborough Farm Park at 190 Summit Road following the magnitude 6.3 earthquake which occurred in the afternoon of the 22nd of February 2011 and the subsequent aftershocks.

The qualitative assessment uses the methodology recommended in the Engineering Advisory Group draft document "Guidance on Detailed Engineering Evaluation of Earthquake affected Non-residential Buildings in Canterbury", issued 19 July 2011. The qualitative assessment includes a summary of the building damage as well as an initial assessment of the likely current Seismic Capacity compared with current seismic code requirements.

A qualitative assessment involves inspections of the building and a desktop review of existing structural and geotechnical information, including existing drawings and calculations, if available.

The purpose of the assessment is to determine the likely building performance and damage patterns, to identify any potential critical structural weaknesses or collapse hazards, and to make an initial assessment of the likely building strength in terms of percentage of new building standard (%NBS).

This report describes the structural damage observed during our inspection and indicates suggested remediation measures. The inspection was undertaken from floor levels and was a visual inspection only. Our report reflects the situation at the time of the inspection and does not take account of changes caused by any events following our inspection. A full description of the basis on which we have undertaken our visual inspection is set out in Section 7.

The NZ Society for Earthquake Engineering (NZSEE) Initial Evaluation Procedure (IEP) was used to assess the likely performance of the building in a seismic event relative to the New Building Standard (NBS). 100% NBS is equivalent to the strength of a building that fully complies with current codes. This includes a recent increase of the Christchurch seismic hazard factor from 0.22 to 0.3^{1} .

At the time of this report, no intrusive site investigation, detailed analysis, or modelling of the building structure had been carried out. The building description below is based on our visual inspections.

¹ <u>http://www.dbh.govt.nz/seismicity-info</u>

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3. 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.

3.1. 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 carry out a full structural survey before the building is re-occupied.

We understand that CERA will 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). It is anticipated that CERA will adopt the Detailed Engineering Evaluation Procedure document (draft) issued by the Structural Advisory Group on 19 July 2011. This document sets out a methodology for both qualitative and quantitative assessments.

The qualitative assessment is a desk-top and site inspection assessment. It is based on a thorough visual inspection of the building coupled with a review of available documentation such as drawings and specifications. The quantitative assessment involves analytical calculation of the buildings strength and may require non-destructive or destructive material testing, geotechnical testing and intrusive investigation.

It is anticipated that factors determining the extent of evaluation and strengthening level required will include:

- The importance level and occupancy of the building
- The placard status and amount of damage
- The age and structural type of the building
- Consideration of any critical structural weaknesses



• The extent of any earthquake damage

3.2. Building Act

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

3.2.1. 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 any alteration. This effectively means that a building cannot be weakened as a result of an alteration (including partial demolition).

3.2.2. Section 115 – Change of Use

This section requires that the territorial authority (in this case Christchurch City Council (CCC)) be satisfied that the building with a new use complies with the relevant sections of the Building Code 'as near as is reasonably practicable'. Regarding seismic capacity 'as near as reasonably practicable' has previously been interpreted by CCC as achieving a minimum of 67%NBS however where practical achieving 100%NBS is desirable. The New Zealand Society for Earthquake Engineering (NZSEE) recommend a minimum of 67%NBS.

3.2.3. Section 121 – Dangerous Buildings

The definition of dangerous building in the Act was extended by the Canterbury Earthquake (Building Act) Order 2010, and it now defines a building as dangerous if:

- 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
- 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
- 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
- there is a risk that that other property could collapse or otherwise cause injury or death; or
- a territorial authority has not been able to undertake an inspection to determine whether the building is dangerous.

3.2.4. Section 122 – Earthquake Prone Buildings

This section defines a building as earthquake prone 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 ground shaking 33% of the shaking used to design an equivalent new building.



3.2.5. 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.

3.2.6. Section 131 – Earthquake Prone Building Policy

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

3.3. 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 of the 4th September 2010.

The 2010 amendment includes the following:

- A process for identifying, categorising and prioritising Earthquake Prone Buildings, commencing on 1 July 2012;
- A strengthening target level of 67% of a new building for buildings that are Earthquake Prone. Council recognises that it may not be practicable for some repairs to meet that target. The council will work closely with building owners to achieve sensible, safe outcomes;
- A timeframe of 15-30 years for Earthquake Prone Buildings to be strengthened; and,
- 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.

We anticipate that any building with a capacity of less than 33%NBS (including consideration of critical structural weaknesses) will need to be strengthened to a target of 67%NBS of new building standard as recommended by the Policy.

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.

3.4. Building Code

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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.

After the February Earthquake, on 19 May 2011, Compliance Document B1: Structure was amended to include increased seismic design requirements for Canterbury as follows:

- a) Hazard Factor increased from 0.22 to 0.3 (36% increase in the basic seismic design load)
- b) Serviceability Return Period Factor increased from 0.25 to 0.33 (80% increase in the serviceability design loads when combined with the Hazard Factor increase)

The increase in the above factors has resulted in a reduction in the level of compliance of an existing building relative to a new building despite the capacity of the existing building not changing.



4. 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 new building standard load requirements have been determined in accordance with the current earthquake loading standard (NZS 1170.5:2004 Structural design actions - Earthquake actions - New Zealand).

The likely capacity of this building has been derived in accordance with the New Zealand Society for Earthquake Engineering (NZSEE) guidelines 'Assessment and Improvement of the Structural Performance of Buildings in Earthquakes' (AISPBE), 2006. These guidelines provide an Initial Evaluation Procedure that assesses a buildings capacity based on a comparison of loading codes from when the building was designed and currently. It is a quick high-level procedure that can be used when undertaking a Qualitative analysis of a building. The guidelines also provide guidance on calculating a modified Ultimate Limit State capacity of the building which is much more accurate and can be used when undertaking a Quantitative analysis.

The New Zealand Society for Earthquake Engineering has proposed a way for classifying earthquake risk for existing buildings in terms of %NBS and this is shown in Figure 2 below.

Description	Grade	Risk	%NBS	Existing Building Structural Performance		Improvement of Structural Performance	
					_►	Legal Requirement	NZSEE Recommendation
Low Risk Building	A or B	Low	Above 67	Acceptable (improvement may be desirable)		The Building Act sets no required level of structural improvement (unless change in use)	100%NBS desirable. Improvement should achieve at least 67%NBS
Moderate Risk Building	B or C	Moderate	34 to 66	Acceptable legally. Improvement recommended		This is for each TA to decide. Improvement is not limited to 34%NBS.	Not recommended. Acceptable only in exceptional circumstances
High Risk Building	D or E	High	33 or lower	Unacceptable (Improvement		Unacceptable	Unacceptable

Figure 2: NZSEE Risk Classifications Extracted from table 2.2 of the NZSEE 2006 AISPBE Guidelines

Table 1 below provides an indication of the risk of failure for an existing building with a given percentage NBS, relative to the risk of failure for a new building that has been designed to meet current Building Code criteria (the annual probability of exceedance specified by current earthquake design standards for a building of 'normal' importance is 1/500, or 0.2% in the next year, which is equivalent to 10% probability of exceedance in the next 50 years).



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



5. Building Details

The buildings are located in Scarborough Farm Park at 190 Summit Road. There are several buildings on this site, but only the woolshed is within the scope of this assessment. The buildings are one storey and are currently utilised together as a woolshed. There are two structures, the enclosed timber-framed building to the east and the steel-framed lean-to structure to the west. The sloping ground results in the lean-to structure being 800mm lower than the enclosed structure. It is assumed the building was designed and constructed in the 1970's due to its architecture.

Our evaluation was based on the visual inspection carried out on 19 September 2012. Drawings were not available to verify the date of construction. Only partial internal access was gained during the site inspection as some areas were inaccessible. However, these areas were able to be viewed through windows.

5.1. Enclosed Structure

5.1.1. Building Description

The building is constructed from lightweight timber-framing with lightweight corrugated steel cladding for the roof. The roof is supported on timber rafters are 150mm by 50mm and are at 800mm centres. The structure is supported by a concrete ground slab on the north side and timber piles on the south side. The majority of the external wall cladding is corrugated metal sheeting, with the rest being timber. The north part of the structure has plasterboard internal wall and ceiling cladding, while the rest of the structure is exposed.

5.1.2. Gravity Load Resisting System

It appears that the gravity loads from the roof are taken by the trusses and transferred into the timber framing in the walls. Then the loads are taken by the timber piles and concrete foundation.

5.1.3. Seismic Load Resisting System

Lateral loads acting across and along the building will be transferred through the timber framing in the roof and walls and into the timber piles and concrete foundation below.

Note that for this building the 'along direction' has been taken as east-west and the 'across direction' has been taken as north-south.



5.2. Lean-to Structure

5.2.1. Building Description

The building is steel-framed with corrugated steel cladding on the roof supported on timber purlins which are in turn supported by the steel frames spaced at 3.1m centres. The walls of the structure are partially clad in lightweight corrugated metal sheeting supported by a timber sub-frame. The timber purlins are 150 x 50mm at 800mm centres. These are supported by 150mm deep x 100mm wide steel beams which are in turn supported by 50 x 50mm hollow section columns. The columns are spaced at 3.8m centres along the length of the building. Steel bar cross bracing is provided in the transverse direction in the western most bays of the roof and walls roof and in the western most bay in the transverse direction. The steel columns have 600mm square concrete block footings of unknown depth and the timber floor is supported by a combination of 200mm diameter timber piles and concrete footings.

5.3. Gravity Load Resisting system

It appears that the gravity loads are taken by the steel frames, with direct transfer into the concrete block footings below.

5.4. Seismic Load Resisting system

Lateral loads acting across the building will be transferred through the steel roof beams and into the steel cross bracing at the western end of the structure and into the ground through the concrete footings. It is assumed that load on the eastern end will be taken by the enclosed structure, however further investigation will be required to check if a connection is present between the two structures. Lateral loads acting along the building will be taken by the steel roof beams and posts acting as moment resisting sway frames, and into the ground through the concrete footings.

Note that for this building the 'along direction' has been taken as east-west and the 'across direction' has been taken as north-south.



6. Damage Summary

SKM undertook an inspection on 19 September 2012. The following areas of damage were observed during the time of inspection:

General

1) No visual evidence of settlement was noted at this site, therefore a level survey is not required at this stage of assessment.

Building Damage

- 1) No earthquake-related damage was observed during our site inspection.
- 2) Splitting of timber elements along the grain throughout the building. This is not believed to be earthquake-related damage.
- 3) Rusting of non-structural steel elements throughout the building. This is not earthquakerelated damage.

Photos of the above damage can be found in Appendix 1 – Photos.



7. Initial Seismic Evaluation

7.1. The Initial Evaluation Procedure Process

This section covers the initial seismic evaluation of the building as detailed in the NZSEE 'Assessment and Improvement of the Structural Performance of Buildings in Earthquakes'. The IEP grades buildings according to their likely performance in a seismic event. The procedure is not yet recognised by the NZ Building Code but is widely used and recognised by the Christchurch City Council as the preferred method for preliminary seismic investigations of buildings².

The IEP is a coarse screening process designed to identify buildings that are likely to be earthquake prone. The IEP process ranks buildings according to how well they are likely to perform relative to a new building designed to current earthquake standards, as shown in Table 2. The building rank is indicated by the percent of the required New Building Standard (% NBS) strength that the building is considered to have. Earthquake prone buildings are defined as having less than 33% NBS strength which correlates to an increased risk of approximately 20 times that of 100% NBS³. Buildings that are identified to be earthquake prone are required by law to be followed up with a detailed assessment and strengthening work within 30 years of the owner being notified that the building is potentially earthquake prone⁴.

Description	Grade	Risk	%NBS	Structural performance
Low risk	A+	Low	> 100	Acceptable. Improvement may be desirable.
building	А		100 to 80	
	В		80 to 67	
Moderate	С	Moderate	67 to 33	Acceptable legally. Improvement
risk building				recommended.
High risk	D	High	33 to 20	Unacceptable. Improvement required.
building	E		< 20	

Table 2: IEP Risk classifications

The IEP is a simple desktop study that is useful for risk management. No detailed calculations are done and so it relies on an inspection of the building and its plans to identify the structural members and describe the likely performance of the building in a seismic event. A review of the

² http://resources.ccc.govt.nz/files/EarthquakeProneDangerousAndInsanitaryBuildingsPolicy2010.pdf

³ NZSEE 2006, Assessment and Improvement of the Structural Performance of Buildings in Earthquakes, p 2-2

⁴ <u>http://resources.ccc.govt.nz/files/EarthquakeProneDangerousAndInsanitaryBuildingsPolicy2010.pdf</u>



plans is also likely to identify any critical structural weaknesses. The IEP assumes that the building was properly designed and built according to the relevant codes at the time of construction. The IEP method rates buildings based on the code used at the time of construction and some more subjective parameters associated with how the building is detailed and so it is possible that %NBS derived from different engineers may differ.

This assessment describes only the likely seismic Ultimate Limit State (ULS) performance of the building. The ULS is the level of earthquake that can be resisted by the building without catastrophic failure. The IEP does not attempt to estimate Serviceability Limit State (SLS) performance of the building, or the level of earthquake that would start to cause damage to the building⁵. This assessment concentrates on matters relating to life safety as damage to the building is a secondary consideration. SLS performance of the building can be estimated by scaling the current code levels if required.

The NZ Building Code describes that the relevant codes for NBS are primarily:

- AS/NZS 1170 Structural Design Actions
- NZS 3101:2006 Concrete Structures Standard
- NZS 3404:1997 Steel Structures Standard

7.2. Available Information, Assumptions and Limitations

Following our inspection on 19 September, SKM carried out a preliminary structural review. The structural review was undertaken using the available information which was as follows:

- SKM site measurements and inspection findings of the building. Please note no intrusive investigations were undertaken.
- There were no drawings available to carry out our review.

The following assumptions and design criteria were used in this assessment:

- Standard design assumptions for typical office and factory buildings as described in AS/NZS1170.0:2002
 - 50 year design life, which is the default NZ Building Code design life.
 - Structure Importance Level 1. This level of importance is described as 'low' with small or moderate consequence of failure.
 - Ductility level of 1.25 in both directions, based on our assessment and code requirements at the time of design.

⁵ NZSEE 2006, Assessment and Improvement of the Structural Performance of Buildings in Earthquakes, p2-9 SINCLAIR KNIGHT MERZ

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- Site hazard factor, Z = 0.3, NZBC, Clause B1 Structure, Amendment 11 effective from 1 August 2011
- Seismic subsoil Class D (deep or soft soil) ground performance and properties, in accordance with NZS1170.5

This IEP was based on our visual inspection of the building. Since it is not a full design and construction review, it has the following limitations:

- It is not likely to pick up on any original design or construction errors (if they exist)
- Other possible issues that could affect the performance of the building such as corrosion and modifications to the building will not be identified
- The IEP deals only with the structural aspects of the building. Other aspects such as building services are not covered.

7.3. Critical Structural Weaknesses

There is potential for pounding to occur in the longitudinal direction. This has a severe effect on structural performance as the separation between the enclosed and lean-to structures is less than 0.005 times the height of the building. However, if pounding occurred, it would likely have a greater effect on the capacity of the lean-to structure as opposed to the enclosed structure, due to the difference in construction and mass.

7.4. Qualitative Assessment Results

The building has had its capacity assessed using the Initial Evaluation Procedure based on the information available. The buildings capacity is expressed as a percentage of new building standard (%NBS) and are in the order of that shown below in Table 3. This capacity is subject to confirmation by a quantitative analysis.



Table 3: Qualitative Assessment Summary

Item	<u>%NBS</u>
Likely Seismic Capacity of Enclosed Structure including CSW (pounding)	72
Likely Seismic Capacity of Enclosed Structure excluding CSW's	82
Likely Seismic Capacity of Lean-to Structure including CSW (pounding)	29
Likely Seismic Capacity of Lean-to Structure excluding CSW's	42

7.4.1. Enclosed Structure

Our qualitative assessment found that the building is not likely to be classed as a potential earthquake risk and is probably a 'Low Risk Building' (capacity greater than 67% of NBS). The full IEP assessment form is detailed in Appendix 2 – IEP Reports.

7.4.2. Lean-to Structure

Our qualitative assessment found that the building is likely to be classed as potentially earthquake prone and is probably a 'High Risk Building' (capacity less than 34% NBS). The full IEP assessment form is detailed in Appendix 2 – IEP Reports.

Further investigation is required to confirm our initial findings and establish possible strengthening concepts.

The Council regulations state that if the %NBS of the building is less than 34%, this building is considered earthquake prone and is required to be strengthened.

The Engineering Advisory Group notes:

"For buildings with insignificant damage, but that have %NBS<33%, and buildings with significant damage, a quantitative assessment is required. Note that according to the extent of damage, it may be possible to complete a quantitative assessment for part only of the structure, with a qualitative analysis for the structure as a whole. This could be sufficient when there is highly localised severe damage but the building has otherwise suffered little or no damage."



8. Further Investigation

8.1. Enclosed Structure

No further investigation is required at this stage as the likely seismic capacity of the building is greater than 67% NBS and no structural damage was observed.

8.2. Lean-to Structure

Due to the lack of structural drawings and the likely seismic capacity of the building being less than 34% NBS we recommend that a quantitative assessment is carried out due to the potential margin of errors that may be inherent in our initial assessment. This will allow us to confirm our findings and establish possible strengthening concepts.

If a quantitative assessment is carried out then intrusive investigations will be required to confirm the following structural details:

Connection between the Enclosed and Lean-to structures



9. Conclusion

A qualitative assessment was carried out on the building located in Scarborough Farm Park at 190 Summit Road, Sumner. The building has sustained no earthquake-related damage.

9.1. Enclosed Structure

The building has been assessed to have a seismic capacity in the order of 72% NBS and is therefore not a potential earthquake risk and is likely to be classified as a 'Low Risk Building' (capacity greater than 67% NBS).

No further investigation is recommended at this stage.

It is recommended that:

- a) There is no damage to the building that would cause it to be unsafe to occupy.
- b) We consider that barriers around the building are not necessary.

9.2. Lean-to Structure

The building has been assessed to have a seismic capacity in the order of 29% NBS and is therefore potentially earthquake prone and is likely to be classified as a 'High Risk Building' (capacity less than 34% NBS).

Further investigation is required to confirm our initial findings and to establish possible strengthening concepts. This investigation will require carrying out a quantitative assessment on the building to determine if there is enough capacity in the structural elements to resist the required earthquake demand.

It is recommended that:

- a) There is no damage to the building that would cause it to be unsafe to occupy.
- b) A quantitative assessment of the building, supported by intrusive investigations if required, be undertaken to determine the seismic capacity and to develop potential strengthening concepts.
- c) We consider that barriers around the building are not necessary.



10. Limitation Statement

This report has been prepared on behalf of, and for the exclusive use of, SKM's client, and is subject to, and issued in accordance with, the provisions of the contract between SKM and the Client. It is not possible to make a proper assessment of this report without a clear understanding of the terms of engagement under which it has been prepared, including the scope of the instructions and directions given to, and the assumptions made by, SKM. The report may not address issues which would need to be considered for another party if that party's particular circumstances, requirements and experience were known and, further, may make assumptions about matters of which a third party is not aware. No responsibility or liability to any third party is accepted for any loss or damage whatsoever arising out of the use of or reliance on this report by any third party.

Without limiting any of the above, in the event of any liability, SKM's liability, whether under the law of contract, tort, statute, equity or otherwise, is limited in as set out in the terms of the engagement with the Client.

It is not within SKM's scope or responsibility to identify the presence of asbestos, nor the responsibility of SKM to identify possible sources of asbestos. Therefore for any property predating 1989, the presence of asbestos materials should be considered when costing remedial measures or possible demolition.

There is a risk of further movement and increased cracking due to subsequent aftershocks or settlement.

Should there be any further significant earthquake event, of a magnitude 5 or greater, it will be necessary to conduct a follow-up investigation, as the observations, conclusions and recommendations of this report may no longer apply Earthquake of a lower magnitude may also cause damage, and SKM should be advised immediately if further damage is visible or suspected.



11. Appendix 1 – Photos

















12. Appendix 2 – IEP Reports



Page 1

Table IEP-1 Initial Evaluation Procedure – Step 1 (Refer Table IEP - 2 for Step 2; Table IEP - 3 for Step 3, Table IEP - 4 for Steps 4, 5 and 6)

Building Name:	Scarborough Farm Park Woolshed - Lean-to Structure	Ref.	ZB01276.129
Location:	190 Summit Road, Sumner	By	WPK
		Date	19/09/2012

Step 1 - General Information

1.1 Photos (attach sufficient to describe building)



1.2 Sketch of building plan

1.3 List relevant features

The building in Scarborough Park Farm at 190 Summit Road is one storey and is currently used as a woolshed. It is divided into two structures, the enclosed, timber-framed building to the east and the steel-framed lean-to structure to the west.

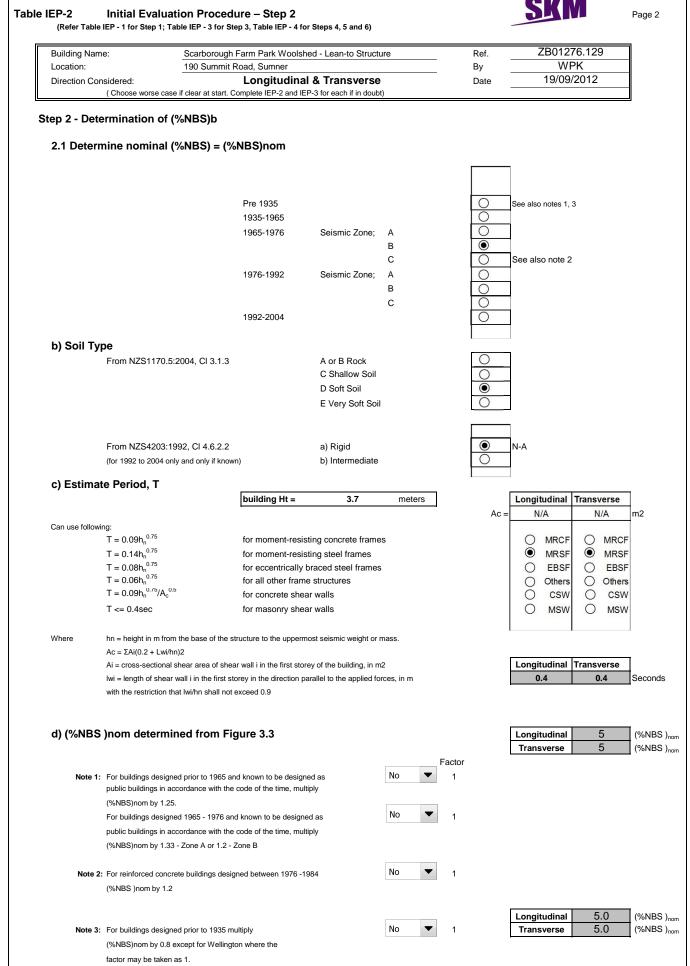
The building is constructed from timber-framed walls and roof with metal sheeting as external wall cladding. The main lateral load-resisting system appears to be the the steel portal frames in the east-west direction and steel rod cross-bracing in the walls and roof in the western-most bay in the north-south direction. The building appears to be supported on timber piles with concrete footings. The building is assumed to have been constructed in the 1970's, due to the architecture of the adjacent building.

1.4 Note information sources

Visual Inspection of Exteri Visual Inspection of Interio	
Drawings (note type)	
Specifications	
Geotechical Reports	
Other (list)	

Tick as appropriate	
	-
	-

Partial inspection of interior



Continued over page

le IEF	P-2 Initial Ev	aluation Procedure –	- Step 2 continue	d		27	Page
Bu	uilding Name:	Scarborough Farm Park \	Noolshed - Lean-to Str	ucture		Ref.	ZB01276.129
Lo	ocation:	190 Summit Road, Sumn	er			Ву	WPK
Di	irection Considered:	•	dinal & Transver			Date	19/09/2012
<u> </u>	(Choose wor	se case if clear at start. Complet	e IEP-2 and IEP-3 for each	n if in doubt)			
2.2 M	Near Fault Scaling If T < 1.5	Factor, Factor A sec, Factor A = 1					
-	ear Fault Factor, N(T,D) rom NZS1170.5:2004, C			1			
b) Ne	ear Fault Scaling Facto	or =	1/N(T,D)		Factor A	1.00	
2.3 H	Hazard Scaling Fac	ctor, Factor B					
a) Ц	arand Factor 7 for site		Select Location	Christchurch		•	
-	azard Factor, Z, for site rom NZS1170.5:2004, Ta			Z =	0.3		
		abic 3.3/		Z = Z 1992 =	0.8	Auckland 0.6	Palm Nth 1.2
b) Ha	azard Scaling Factor	Far and 1000 1/7				Wellington 1.2	Dunedin 0.6
		For pre 1992 = 1/Z	00/7			Christchurch 0.8	Hamilton 0.67
4	(Where 7 1992	For 1992 onwards = Z 19 is the NZS4203:1992 Zone Factor fro		b))			
	(WHOLE 2 1002		sin accompanying rigure c.o.	5/)	Factor B	3.33	
2.4 F	Return Period Sca	ling Factor, Factor C					
-	uilding Importance Lev rom NZS1170.0:2004, Ta			1	•		
b) Re	eturn Period Scaling Fa	actor from accompanying	Table 3.1		Factor C	2.00	
2.5 C	Ductility Scaling Fa	actor, D					
a) As	ssessed Ductility of Ex	isting Structure, µ		Longitudinal	1.25	µ Maximum =	2
-	-	um given in accompanying T	able 3.2)	Transverse	1.25	µ Maximum =	
b) Di	uctility Scaling Factor						
	For pre 197	6 =	k_{μ}				
	For 1976 or		1		-		
	(where k_{μ} is N	VZS1170.5:2005 Ductility Factor,	from	Longitudinal		1.14	
	accompanyin	g Table 3.3)		Transverse	Factor D	1.14	
2.6 \$	Structural Perform	ance Scaling Factor,	Factor E				
Se	elect Material of Latera	I Load Resisting System		a			
		Longitudinal		Steel			
		Transverse		Steel	•		
a) St	tructural Performance						
	from accor	npanying Figure 3.4	0	0.00			
		Longitudinal Transverse	Sp Sp	0.90 0.90			
b) St	tructural Performance	Scaling Factor					
		Longitudinal	1/S _p		Factor E	1.11	
		Transverse	1/S _p		Factor E	1.11	
		r Building, (%NBS) _b					
(e	equals (%NSB) _{nom}	x A x B x C x D x E)				Longitudinal	42.3 (%NB 42.3 (%NB
•						Transverse	42.3 (%NB

	Farm Park Woolshed - L	Lean-to Structure	_	Ref.	-	76.129 PK
irection Considered: (Choose worse case if clear at s	Road, Sumner a) Longitudinal start. Complete IEP-2 and IE	EP-3 for each if in doubt)	_	By Date		/2012
i tep 3 - Assessment o (Refer Appendix B - S		hievement Ratio (F	PAR)			
Critical Structural Wo	eakness		etural Performan			Building Score
3.1 Plan Irregularity		Severe	Significant	Insignificant		
Effect on Structural Per	rformance Comment	0	0	۲	Factor A	1
3.2 Vertical Irregularity		Severe	Significant	Insignificant]	
Effect on Structural Per	rformance Comment	0	0	٢	Factor B	1
3.3 Short Columns		Severe	Significant	Insignificant	_	
Effect on Structural Per	rformance Comment	0	0	۲	Factor C	1
3.4 Pounding Potential (Estimate D1	and D2 and set D = the	lower of the two, or =1.0	if no potential for	r pounding)		
a) Factor D1: - Pounding Eff Select appropriate value from						
		ni to the light of the value	e applicable to fra	-		
Table for Selection of Factor	Alignm	nent of Floors within 20%	Separation of Storey Height	Factor D1 Severe 0 <sep<.005h< th=""><th>0.7 Significant .005<sep<.01h 0.8</sep<.01h </th><th>Insignificant Sep>.01H</th></sep<.005h<>	0.7 Significant .005 <sep<.01h 0.8</sep<.01h 	Insignificant Sep>.01H
	Alignm Alignment		Separation of Storey Height	Factor D1 Severe 0 <sep<.005h< td=""><td>Significant .005<sep<.01h< td=""><td>Sep>.01H</td></sep<.01h<></td></sep<.005h<>	Significant .005 <sep<.01h< td=""><td>Sep>.01H</td></sep<.01h<>	Sep>.01H
b) Factor D2: - Height Differ	Alignm Alignment	nent of Floors within 20%	Separation of Storey Height	Factor D1 Severe 0 <sep<.005h< td=""><td>Significant .005<sep<.01h< td=""><td>Sep>.01H</td></sep<.01h<></td></sep<.005h<>	Significant .005 <sep<.01h< td=""><td>Sep>.01H</td></sep<.01h<>	Sep>.01H
	Alignm Alignment	nent of Floors within 20%	Separation of Storey Height	Factor D1 Severe 0 <sep<.005h< td=""><td>Significant .005<sep<.01h< td=""><td>Sep>.01H</td></sep<.01h<></td></sep<.005h<>	Significant .005 <sep<.01h< td=""><td>Sep>.01H</td></sep<.01h<>	Sep>.01H
b) Factor D2: - Height Differ	Alignm Alignment rence Effect m Table	nent of Floors within 20% t of Floors not within 20%	Separation of Storey Height of Storey Height Separation	Factor D1 Severe 0 <sep<0.05h< td=""> ● 0.7 ● 0.4 Factor D2 Severe 0<sep<.005h< td=""></sep<.005h<></sep<0.05h<>	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h< td=""><td>Sep>.01H</td></sep<.01h<></sep<.01h 	Sep>.01H
b) Factor D2: - Height Differ Select appropriate value fro	Alignm Alignment rence Effect m Table	nent of Floors within 20% t of Floors not within 20% Height Differ Height Differer	Separation of Storey Height of Storey Height	Factor D1 Severe 0 <sep<0.05h< td=""> ● 0.7 ● 0.4 Factor D2 Severe 0<sep<.005h< td=""> ● 0.4 ● 0.7</sep<.005h<></sep<0.05h<>	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h< td=""><td>Sep>.01H 0 1 0.8 Insignificant Sep>.01H</td></sep<.01h<></sep<.01h 	Sep>.01H 0 1 0.8 Insignificant Sep>.01H
b) Factor D2: - Height Differ Select appropriate value fro	Alignm Alignment rence Effect m Table	nent of Floors within 20% t of Floors not within 20% Height Differ Height Differer	Separation of Storey Height of Storey Height Separation rence > 4 Storeys ice 2 to 4 Storeys	Factor D1 Severe 0 <sep<005h< td=""> ● 0.7 ● 0.4 Factor D2 Severe 0<sep<.005h< td=""> ● 0.4 ● 0.7 ● 0.4 ● 0.7 ● 1 (Set D = lesser of 1)</sep<.005h<></sep<005h<>	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h 0.7 0.9 1 1 Factor D</sep<.01h </sep<.01h 	Sep>.01H 0 1 0.8 Insignificant Sep>.01H 0 1 0 1 0 1 0 1 0.7
b) Factor D2: - Height Differ Select appropriate value fro	Alignm Alignment ence Effect m Table r D2 ics - (Stability, land	nent of Floors within 20% of Floors not within 20% Height Differ Height Differ Height Differ	Separation of Storey Height of Storey Height Separation rence > 4 Storeys rence < 2 Storeys rence < 2 Storeys	Factor D1 Severe 0 <sep<0.05h< td=""> ● 0.4 Factor D2 Severe 0<sep<.005h< td=""> ● 0.4 ○ 0.4 ○</sep<.005h<></sep<0.05h<>	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h 0.7 0.9 1 Factor D of D1 and D2 or</sep<.01h </sep<.01h 	Sep>.01H 0 1 0.8 Insignificant Sep>.01H 0 1 0 1 0 1 0 1 0.7
b) Factor D2: - Height Differ Select appropriate value fro Table for Selection of Factor 3.5 Site Characteristi	Alignm Alignment ence Effect m Table r D2 ics - (Stability, land	Height Differ Height Differ Height Differ Height Differ Height Differ Severe	Separation of Storey Height of Storey Height Separation rence > 4 Storeys rence < 2 Storeys cence < 2 Storeys	Factor D1 Severe $0 < Sep < 0.05H$ \bullet 0.4 Factor D2 Severe $0 < Sep < 0.05H$ \circ \circ 0.4 \circ <	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h 0.7 0.9 1 Factor D of D1 and D2 or prospect of pound</sep<.01h </sep<.01h 	Sep>.01H 0 1 0.8 Insignificant Sep>.01H 0 1 0 1 0 1 0.7 ling)
b) Factor D2: - Height Differ Select appropriate value fron Table for Selection of Factor 3.5 Site Characteristi Effect on Structural Per	Alignm Alignment rence Effect m Table r D2 ics - (Stability, land rformance	hent of Floors within 20% of Floors not within 20% Height Differ Height Differ Height Differ Severe	Separation of Storey Height of Storey Height Separation rence > 4 Storeys rence < 2 Storeys cction etc) Significant	Factor D1 Severe 0 < Sep < 0.05H 0.4 Factor D2 Severe 0 < Sep < .005H 0.4 0.4 0.7 0.1	Significant .005 <sep<.01h 0.8 0.7 .005 Sep<.01H 0.7 0.9 1 Factor D of D1 and D2 or prospect of pound</sep<.01h 	Sep>.01H 0 1 0.8 Insignificant Sep>.01H 0 1 0 1 0 1 0.7 ling)

uilding Name:	Scarborough Farm Park Woolshed - I	_ean-to Structure	Ref.	ZB0127	
ocation: irection Considered:	,		By Date	WF 19/09/	
	case if clear at start. Complete IEP-2 and IEP-3				
	ment of Performance Achieven endix B - Section B3.2)	nent Ratio (PAR)			
Critical Str	uctural Weakness	Effect on Structural Performan	ce		Building
		(Choose a value - Do not interpol	ate)		Score
3.1 Plan Irregu	ularity	Severe Significant	Insignificant	r I	
Effe	ect on Structural Performance Comment		۲	Factor A	1
3.2 Vertical Irr		Severe Significant	Insignificant]	
Effe	ect on Structural Performance Comment	0 0		Factor B	1
3.3 Short Colu	umns	Severe Significant	Insignificant		
Effe	ect on Structural Performance Comment	0 0	۲	Factor C	1
				ŀ	
3.4 Pounding		lower of the two, or =1.0 if no potential for p	oundina)		
	(····· ··· ···· ···· ··· ··· ··· ··· ··			
	Pounding Effect iate value from Table				
Select appropr					
-	-	For stiff buildings (eg with shear walls), the the right of the value applicable to frame bu			
Values given a of pounding ma	ay be reduced by taking the co-efficient to		ildings. Factor D1		
Values given a of pounding ma	-	the right of the value applicable to frame bu	ildings. Factor D1 Severe	Significant	Insignificant Sep>.01H
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Values given a of pounding ma	ay be reduced by taking the co-efficient to ction of Factor D1	the right of the value applicable to frame bu Separation	ildings. Factor D1 Severe 0 <sep<.005h 0.7</sep<.005h 	Significant .005 <sep<.01h< td=""><td>Sep>.01H</td></sep<.01h<>	Sep>.01H
Values given a of pounding ma Table for Selec b) Factor D2: -	ay be reduced by taking the co-efficient to stion of Factor D1 Align Alignme Height Difference Effect	the right of the value applicable to frame bu Separation mment of Floors within 20% of Storey Height	ildings. Factor D1 Severe 0 <sep<.005h 0.7</sep<.005h 	Significant .005 <sep<.01h< td=""><td>Sep>.01H</td></sep<.01h<>	Sep>.01H
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Values given a of pounding ma Table for Selec b) Factor D2: - Select appropr	ay be reduced by taking the co-efficient to stion of Factor D1 Align Alignme Height Difference Effect	the right of the value applicable to frame bu Separation mment of Floors within 20% of Storey Height	ildings. Factor D1 Severe 0 <sep<.005h 0.7</sep<.005h 	Significant 005 <sep< 01h<br="">0.8 0.7</sep<>	Sep>.01H ① 1 ① 0.8 Insignificant
Values given a of pounding ma Table for Selec b) Factor D2: - Select appropr	ay be reduced by taking the co-efficient to stion of Factor D1 Align Alignme Height Difference Effect iate value from Table	the right of the value applicable to frame bu Separation ment of Floors within 20% of Storey Height and of Floors not within 20% of Storey Height Separation	Factor D1 Severe 0 <sep<.005h 0.7 0.4 Factor D2 Severe 0<sep<.005h< td=""><td>Significant 005<sep<.01h 0.8 0.7 1 Significant 005<sep<.01h< td=""><td>Sep>01H 1 0.8 Insignificant Sep>01H</td></sep<.01h<></sep<.01h </td></sep<.005h<></sep<.005h 	Significant 005 <sep<.01h 0.8 0.7 1 Significant 005<sep<.01h< td=""><td>Sep>01H 1 0.8 Insignificant Sep>01H</td></sep<.01h<></sep<.01h 	Sep>01H 1 0.8 Insignificant Sep>01H
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Values given a of pounding ma Table for Selec b) Factor D2: - Select appropr	ay be reduced by taking the co-efficient to stion of Factor D1 Align Alignme Height Difference Effect iate value from Table	the right of the value applicable to frame bu Separation ment of Floors within 20% of Storey Height and of Floors not within 20% of Storey Height Separation Height Difference > 4 Storeys Height Difference 2 to 4 Storeys	Factor D1 Severe 0 <sep<.005h< td=""> 0.7 0.4 Factor D2 Severe 0<sep<.005h< td=""> 0<sep<.005h< td=""> 0 0 0 0 0 0</sep<.005h<></sep<.005h<></sep<.005h<>	Significant 005 <sep<.01h 0.8 0.7 1 Significant 005<sep<.01h 0.7 0.7 0.9</sep<.01h </sep<.01h 	Sep>01H ● 1 ○ 0.8 Insignificant Sep>01H ○ 1 ○ 1
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Values given a of pounding ma Table for Selec b) Factor D2: - Select appropr	ay be reduced by taking the co-efficient to stion of Factor D1 Align Alignme Height Difference Effect iate value from Table	the right of the value applicable to frame bu Separation ment of Floors within 20% of Storey Height and of Floors not within 20% of Storey Height Separation Height Difference > 4 Storeys Height Difference 2 to 4 Storeys	Factor D1 Severe 0 <sep<.005h< td=""> 0.4 Factor D2 Severe 0<sep<.005h< td=""> 0 0.4 0 0.4 0 0.4 0 0.4 0 0.4 0 0.4 0 0.4 0 0.4 0 0.4 0 0.4 0 0.4 0 0.4 0 0.7 0 1 (Set D = lesser</sep<.005h<></sep<.005h<>	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h 0.7 0.9 1 Factor D</sep<.01h </sep<.01h 	Sep>.01H ● 1 ○ 0.8 Insignificant Sep>.01H ○ 1 ○ 1 ● 1 1
Values given a of pounding ma Table for Select b) Factor D2: - Select appropr Table for Select 3.5 Site Ch	ay be reduced by taking the co-efficient to tion of Factor D1 Align Height Difference Effect iate value from Table tion of Factor D2 aracteristics - (Stability, landslid	the right of the value applicable to frame bu Separation ment of Floors within 20% of Storey Height of Floors not within 20% of Storey Height Separation Height Difference > 4 Storeys Height Difference < 2 Storeys Height Difference < 2 Storeys	Factor D1 Severe 0 <sep<.005h< td=""> 0.4 Factor D2 Severe 0<sep<.005h< td=""> 0.4 0<0.7</sep<.005h<></sep<.005h<>	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h 0.05 0.9 1 Factor D of D1 and D2 or</sep<.01h </sep<.01h 	Sep>.01H ● 1 ○ 0.8 Insignificant Sep>.01H ○ 1 ○ 1 ● 1 1
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Values given a of pounding ma Table for Select b) Factor D2: - Select appropr Table for Select 3.5 Site Ch	ay be reduced by taking the co-efficient to tion of Factor D1 Align Alignme Height Difference Effect iate value from Table tion of Factor D2 aracteristics - (Stability, landslid ect on Structural Performance	the right of the value applicable to frame bu Separation ment of Floors within 20% of Storey Height of Floors not within 20% of Storey Height Beight Difference > 4 Storeys Height Difference > 4 Storeys Height Difference < 2 Storeys Height Difference < 2 Storeys	Factor D1 Severe 0 <sep<.005h< td=""> 0 0.7 0.4 0.4 Factor D2 Severe 0<sep<.005h< td=""> 0 0.4 0 0.4 0 0.4 0 0.4 0 0.4 0 0.4 0 0.4 0 0.4 0 0.1 (Set D = lesser set D = 1.0 if no Insignificant 1</sep<.005h<></sep<.005h<>	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h 0.05 0.9 0.1 Factor D of D1 and D2 or prospect of pour</sep<.01h </sep<.01h 	Sep>.01H ● 1 ○ 0.8 Insignificant Sep>.01H ○ 1 ○ 1 ● 1 • 1 • 1 • 1 • 1 • 1 • 1 • • • • • • • • • • • • • • • • • • •
Values given a of pounding ma Table for Select b) Factor D2: - Select appropr Table for Select 3.5 Site Ch Effe 3.6 Other F Record ratio	ay be reduced by taking the co-efficient to stion of Factor D1 Align Alignme Height Difference Effect iate value from Table stion of Factor D2 aracteristics - (Stability, landslid ect on Structural Performance Factors ionale for choice of Factor F:	Separation Imment of Floors within 20% of Storey Height Separation Separation Height Difference > 4 Storeys Height Difference > 4 Storeys Height Difference < 2 Storeys	Factor D1 Severe 0<5ep<.005H	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h 0.7 0.9 0.7 0.9 0.1 Factor D of D1 and D2 or prospect of pour Factor F Factor F</sep<.01h </sep<.01h 	Sep>.01H ● 1 ○ 0.8 Insignificant Sep>.01H ○ 1 ○ 1 ● 1 • 1 • 1 • 1 • 1 • 1 • 1 • • • • • • • • • • • • • • • • • • •
Values given a of pounding ma Table for Select b) Factor D2: - Select appropr Table for Select 3.5 Site Ch Effe 3.6 Other F Record rati Lightweight, sin	ay be reduced by taking the co-efficient to tion of Factor D1 Align Alignme Height Difference Effect iate value from Table tion of Factor D2 aracteristics - (Stability, landslid ect on Structural Performance Factors ionale for choice of Factor F: ngle storey structure. Likely that wind wou	Separation Internet of Floors within 20% of Storey Height Int of Floors not within 20% of Storey Height Separation Height Difference > 4 Storeys Height Difference > 4 Storeys Height Difference < 2 Storeys	Factor D1 Severe 0 <sep<.005h< td=""> 0.1 0<0.7</sep<.005h<>	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h 0.7 0.9 0.7 0.9 0.1 Factor D of D1 and D2 or prospect of pour Factor F Factor F</sep<.01h </sep<.01h 	Sep>.01H ● 1 ○ 0.8 Insignificant Sep>.01H ○ 1 ○ 1 ○ 1 1 1 1 1 1

Building Name:	Scarborou	gh Farm Park W	oolshed - Lean-	to Structure	_	Ref.	ZB01	276.129
Location:		it Road, Sumner		Norco	-	By		VPK
Direction Consi (Choose worse case if clear	-	inal & Trans IEP-2 and IEP-3 for		t)	Date	19/0	09/2012
Step 4 - Pei	rcentage of New B	uilding Stan	dard (%NB	5)				
						Longitudina	al	Transverse
4	4.1 Assessed Base	eline (%NBS)	ь			42		42
	(from Ta	ible IEP - 1)					_	
4	4.2 Performance A (from Ta	chievement ble IEP - 2)	Ratio (PAR))		0.70]	1.00
4	4.3 PAR x Baseline	e (%NBS) _b				29]	42
4	4.4 Percentage Net (Use lov	w Building S wer of two va						29
:	Step 5 - Potentially		e Prone? appropriate)					
		(mark ao	appropriato)			%NBS ≤ 3	3	YES
\$	Step 6 - Potentially	v Earthquake	e Risk?			%NBS < 6	7	YES
\$	Step 7 - Provisiona	al Grading fo	or Seismic R	lisk based	on IEP	Seismic G	Grade	D
I	Evaluation Confirn	ned by	MMCa	avet			Signature	
			Nick Calvert				Name	
			242062				CPEng. No	
I	Relationship betwe	een Seismic		% NBS :			_OF Eng. No	
Γ	Grade:	A+	Α	В	С	D	E	
	%NBS:	> 100	100 to 80	80 to 67	67 to 33	3 33 to 20	< 20	



Page 1

Table IEP-1 Initial Evaluation Procedure – Step 1 (Refer Table IEP - 2 for Step 2; Table IEP - 3 for Step 3, Table IEP - 4 for Steps 4, 5 and 6)

Building Name:	Scarborough Farm Park Woolshed - Enclosed Structure	Ref.	ZB01276.129
Location:	190 Summit Road, Sumner	Ву	WPK
		Date	19/09/2012

Step 1 - General Information

1.1 Photos (attach sufficient to describe building)



1.2 Sketch of building plan

1.3 List relevant features

The building in Scarborough Park Farm at 190 Summit Road is one storey and is currently used as a woolshed. It is divided into two structures, the enclosed, timber-framed building to the east and the steel-framed lean-to structure to the west.

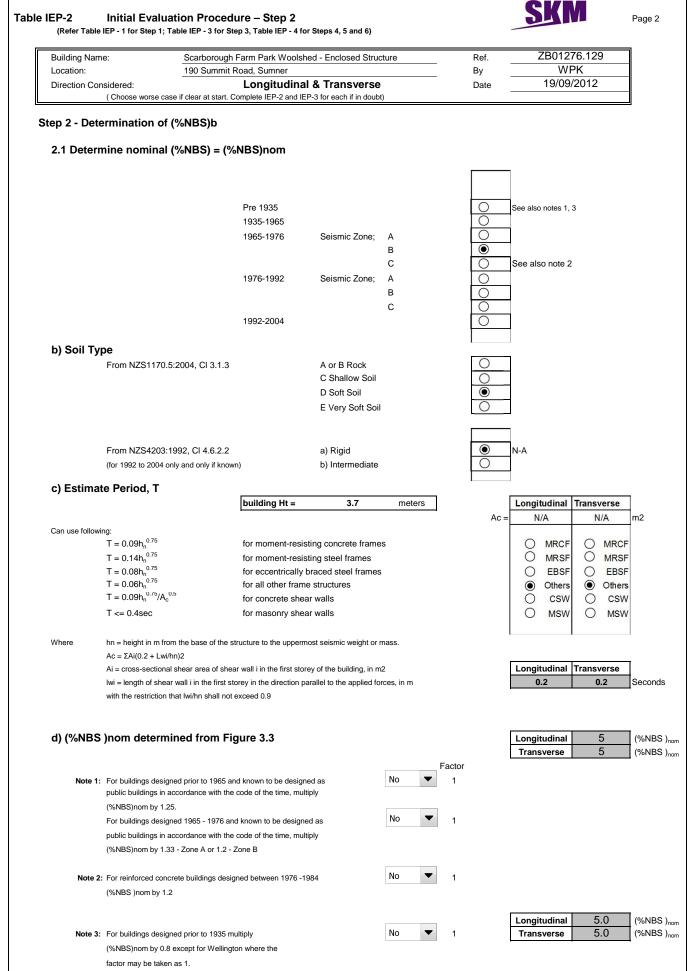
The building is constructed from timber-framed walls and roof with timber elements as external wall cladding. The main lateral load-resisting system appears to be the timber framing and rod cross-bracing in the walls and roof. The building appears to be supported on a combination of concrete footings and timber piles. The building is assumed to have been constructed in the 1970's due to its architecture.

1.4 Note information sources

Visual Inspection of Exterio
Visual Inspection of Interio
Drawings (note type)
Specifications
Geotechical Reports
Other (list)

Tick as appropriate	
	Γ

Partial inspection of interior



Continued over page

Sinclair Knight Merz

ble IEP-2 Initial Evaluation Procedure – Step 2	2 continued	d		SK	Page
Building Name: Scarborough Farm Park Woolshed	d - Enclosed S	tructure		Ref.	ZB01276.129
Location: 190 Summit Road, Sumner				Ву	WPK
Direction Considered: Longitudinal &				Date	19/09/2012
(Choose worse case if clear at start. Complete IEP-2 and	nd IEP-3 for each	if in doubt)			
2.2 Near Fault Scaling Factor, Factor A If T < 1.5sec, Factor A = 1					
a) Near Fault Factor, N(T,D) (from NZS1170.5:2004, CI 3.1.6)		1			
b) Near Fault Scaling Factor = 1/N	N(T,D)		Factor A	1.00	
2.3 Hazard Scaling Factor, Factor B					
	elect Location	Christchurch			
a) Hazard Factor, Z, for site		-	0.2		
(from NZS1170.5:2004, Table 3.3)		Z = Z 1992 =	0.3 0.8	Auckland 0.6	Palm Nth 1.2
b) Hazard Scaling Factor				Wellington 1.2	Dunedin 0.6
For pre $1992 = 1/Z$				Christchurch 0.8	Hamilton 0.67
# For 1992 onwards = Z 1992/Z	opuing Figure 2 F/b				
(Where Z 1992 is the NZS4203:1992 Zone Factor from accompa	anying Figure 3.5(b)))	Factor B	3.33	
2.4 Return Period Scaling Factor, Factor C					
a) Building Importance Level (from NZS1170.0:2004, Table 3.1 and 3.2)		1	•		
b) Return Period Scaling Factor from accompanying Table 3.1	I		Factor C	2.00	
2.5 Ductility Scaling Factor, D					
a) Assessed Ductility of Existing Structure, µ		Longitudinal	1.25	µ Maximum =	2
(shall be less than maximum given in accompanying Table 3.2)		Transverse	1.25	µ Maximum =	
b) Ductility Scaling Factor					
For pre 1976 =	kμ				
For 1976 onwards =	1				
(where k_{μ} is NZS1170.5:2005 Ductility Factor, from		Longitudinal	Factor D	1.14	
accompanying Table 3.3)		Transverse	Factor D	1.14	
2.6 Structural Performance Scaling Factor, Factor	r E				
Select Material of Lateral Load Resisting System					
Longitudinal		Timber	•		
Transverse		Timber	-		
a) Structural Performance Factor, Sp					
from accompanying Figure 3.4					
Longitudinal	Sp	0.93			
Transverse	Sp	0.93			
b) Structural Performance Scaling Factor					
Longitudinal	1/S _p		Factor E	1.08	
Transverse	1/S _p		Factor E	1.08	
2.7 Baseline %NBS for Building, (%NBS) _b					
(equals (%NSB) _{nom} $x A x B x C x D x E$)				Longitudinal	41.2 (%NB
				Transverse	41.2 (%NB
					(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

ocation: 190	-	d - Enclosed Structure	_	Ref.		76.129 PK
irection Considered: (Choose worse case	Summit Road, Sumner a) Longitudina if clear at start. Complete IEP-2 ar		_	By Date		/2012
	ment of Performance ix B - Section B3.2)	Achievement Ratio (I	PAR)			
Critical Struct	ural Weakness		ctural Performance e - Do not interpola			Building Score
3.1 Plan Irregulari	ity	Severe	Significant	Insignificant		
-	ctural Performance Comment	0	0	۲	Factor A	1
3.2 Vertical Irregu Effect on Stru	ctural Performance	Severe	Significant	Insignificant	Factor B	1
	Comment					
3.3 Short Column Effect on Stru	s ctural Performance Comment	Severe	Significant	Insignificant	Factor C	1
3.4 Pounding Pote (Esti	ential imate D1 and D2 and set D =	the lower of the two, or =1.0) if no potential for	pounding)		
a) Factor D1: - Pou Select appropriate	-					
or pounding may be	e reduced by taking the co-en	icient to the right of the valu	e applicable to fra	ls), the effect me buildings.		
Table for Selection	of Factor D1	gnment of Floors within 20%	Separation 6 of Storey Height	Factor D1 Severe 0 <sep<.005h 0.7</sep<.005h 	0.7 Significant .005 <sep<.01h 0.8</sep<.01h 	Insignificant Sep>.01H
Table for Selection	of Factor D1 Ali Alignn		Separation 6 of Storey Height	Factor D1 Severe 0 <sep<.005h 0.7</sep<.005h 	Significant .005 <sep<.01h< td=""><td>Sep>.01H</td></sep<.01h<>	Sep>.01H
Table for Selection	of Factor D1 Ali Alignn ght Difference Effect	gnment of Floors within 20%	Separation 6 of Storey Height	Factor D1 Severe 0 <sep<.005h 0.7</sep<.005h 	Significant .005 <sep<.01h< td=""><td>Sep>.01H</td></sep<.01h<>	Sep>.01H
Table for Selection	of Factor D1 Ali Alignn ght Difference Effect value from Table	ignment of Floors within 20% nent of Floors not within 20% Height Diffe Height Differer	Separation 6 of Storey Height	Factor D1 Severe 0 <sep<.005h< td=""> 0.7 0.4 Factor D2 Severe 0<sep<.005h 0<="" 0<sep<.005h="" td=""> 0 0 0 0</sep<.005h></sep<.005h<>	Significant .005 <sep< 01h<br="">0 0.8 0 0.7</sep<>	Sep>.01H
Table for Selection b) Factor D2: - Hei Select appropriate	of Factor D1 Ali Alignn ght Difference Effect value from Table	ignment of Floors within 20% nent of Floors not within 20% Height Diffe Height Differer	Separation 6 of Storey Height 6 of Storey Height Separation rence > 4 Storeys nce 2 to 4 Storeys	Factor D1 Severe 0 <sep<0.05h< td=""> 0.7 0.4 Factor D2 Severe 0<sep<0.05h< td=""> 0.4 0.4 0 0.4 Severe 0<sep<0.05h< td=""> 0.4 0.7 0.4 0.7 0.4</sep<0.05h<></sep<0.05h<></sep<0.05h<>	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h 0.7 0.9 1 Factor D</sep<.01h </sep<.01h 	Sep>.01H 0 1 0.8 Insignificant Sep>.01H 0 1 0 1 0 1 0 1 0 1 0 .7
Table for Selection b) Factor D2: - Hei Select appropriate Table for Selection 3.5 Site Chara	of Factor D1 Ali Alignn ght Difference Effect value from Table	ignment of Floors within 20% nent of Floors not within 20% Height Diffe Height Diffe Height Diffe	Separation 6 of Storey Height 6 of Storey Height Separation rence > 4 Storeys rence < 2 Storeys ction etc) Significant	Factor D1 Severe 0 <sep<.005h< td=""> 0.7 0.4 Factor D2 Severe 0<sep<.005h (set="" 0.4="" 0.7="" 1="" coset="" d="1.0" if="" insignificant<="" no="" td=""><td>Significant .005<sep<.01h 0.8 0.7 1 Significant .005<sep<.01h 0.7 0.9 1 Factor D f D1 and D2 or</sep<.01h </sep<.01h </td><td>Sep>.01H 0 1 0.8 Insignificant Sep>.01H 0 1 0 1 0 1 0 1 0 1 0 .7</td></sep<.005h></sep<.005h<>	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h 0.7 0.9 1 Factor D f D1 and D2 or</sep<.01h </sep<.01h 	Sep>.01H 0 1 0.8 Insignificant Sep>.01H 0 1 0 1 0 1 0 1 0 1 0 .7
Table for Selection b) Factor D2: - Hei Select appropriate Table for Selection 3.5 Site Chara	of Factor D1 Ali Alignm ght Difference Effect value from Table of Factor D2 of Factor D2	gnment of Floors within 209 nent of Floors not within 209 Height Diffe Height Diffe Height Diffe andslide threat, liquefa Severe	Separation 6 of Storey Height 6 of Storey Height Separation rence > 4 Storeys rence < 2 Storeys <u>ction etc)</u> Significant 5 0.7	The buildings. Factor D1 Severe 0 < Sep < 0.05H $\bigcirc 0.7$ $\bigcirc 0.4$ Factor D2 Severe 0 < Sep < .005H $\bigcirc 0.4$ $\bigcirc 0.7$ $\bigcirc 0.4$ $\bigcirc 0.4$ $\bigcirc 0.7$ $\bigcirc 0.4$ $\bigcirc 0.5ep < .005H$ $\bigcirc 0.4$ $\bigcirc 0.7$ $\bigcirc 1$ $\bigcirc 2.5ep < .005H$ $\bigcirc 0.7$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 2.5ep < .005H$ $\bigcirc 0.7$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 2.5ep < .005H$ $\bigcirc 0.7$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 2.5ep < .005H$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 2.5ep < .005H$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 2.5ep < .005H$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 2.5ep < .005H$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 2.5ep < .005H$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 2.5ep < .005H$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 2.5ep < .005H$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 2.5ep < .005H$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 1$ $\bigcirc 2.5ep < .005H$ $\bigcirc 1$ $\bigcirc 1$ \bigcirc	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h 0.7 0.9 1 Factor D f D1 and D2 or prospect of pound Factor E</sep<.01h </sep<.01h 	Sep>.01H 0 1 0.8 Insignificant Sep>.01H 0 1 0 1 0 1 0.7 ling)
Table for Selection b) Factor D2: - Hei Select appropriate Table for Selection Table for Selection 3.5 Site Chara Effect on Stru 3.6 Other Factor	of Factor D1 Ali Alignm ght Difference Effect value from Table of Factor D2 of Factor D2	gnment of Floors within 209 nent of Floors not within 209 Height Diffe Height Diffe Height Diffe andslide threat, liquefa Severe	Separation 6 of Storey Height 6 of Storey Height Separation rence > 4 Storeys rence > 4 Storeys rence < 2 Storeys ction etc) Significant 0 0.7	Factor D1 Severe 0 <sep<005h< td=""> 0 0.4 Factor D2 Severe 0<sep<005h< td=""> 0.4 Severe 0<sep<005h< td=""> 0.4 Severe 0<sep<005h< td=""> 0.4 (Set D = lesser c set D = 1.0 if no Insignificant ① 1</sep<005h<></sep<005h<></sep<005h<></sep<005h<>	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h 0.7 0.9 1 Factor D f D1 and D2 or prospect of pound</sep<.01h </sep<.01h 	Sep>.01H 0 1 0.8 Insignificant Sep>.01H 0 1 0 1 0 1 0.7 Insignificant

	Scarborough Farm Park Woolshed - I	Enclosed Structure	Ref.	ZB0127 WF	
ocation: Direction Considere (Choose worse	190 Summit Road, Sumner b) Transverse e case if clear at start. Complete IEP-2 and IEP-3 I		By Date	19/09/	
Step 3 - Asses	sment of Performance Achieven bendix B - Section B3.2)				
	ructural Weakness	Effect on Structural Performa	1000		Building
		(Choose a value - Do not interp			Score
3.1 Plan Irreg	gularity	Severe Significant	Insignificant]	
E	ffect on Structural Performance Comment			Factor A	1
3.2 Vertical I	rregularity	Severe Significant	Insignificant]	
E	ffect on Structural Performance Comment	0 0		Factor B	1
3.3 Short Co	lumns	Severe Significant	Insignificant		
E	ffect on Structural Performance Comment	0 0	۲	Factor C	1
3.4 Pounding	a Potential			2	
3.4 Poundinț	-	lower of the two, or =1.0 if no potential for	pounding)		
	- Pounding Effect priate value from Table				
Note:					
-	assume the building has a frame structure. nay be reduced by taking the co-efficient to				
		•	Julianigo.		•
Table for Sele	ection of Factor D1		Factor D1 Severe		Insignificant
Table for Sele		Separation	Factor D1 Severe 0 <sep<.005h< td=""><td>Significant .005<sep<.01h< td=""><td>Sep>.01H</td></sep<.01h<></td></sep<.005h<>	Significant .005 <sep<.01h< td=""><td>Sep>.01H</td></sep<.01h<>	Sep>.01H
Table for Sele	Aligr		Factor D1 Severe 0 <sep<.005h ht 0.7</sep<.005h 	Significant	and a state of the
	Aligr	Separation nment of Floors within 20% of Storey Heig	Factor D1 Severe 0 <sep<.005h ht 0.7</sep<.005h 	Significant .005 <sep<.01h< td=""><td>Sep>.01H</td></sep<.01h<>	Sep>.01H
b) Factor D2:	Align Alignme	Separation nment of Floors within 20% of Storey Heig	Factor D1 Severe 0 <sep<.005h< td=""> 0 0 0 0 0 0 0 0 0 0 0</sep<.005h<>	Significant 005 <sep<.01h 0.8 0.7</sep<.01h 	Sep>.01H
b) Factor D2: Select approp	Align Alignme - Height Difference Effect	Separation nment of Floors within 20% of Storey Heig	Factor D1 Severe 0 <sep<.005h ht 0.7</sep<.005h 	Significant 005 <sep<.01h 0.8 0.7</sep<.01h 	Sep>.01H 1 0.8
b) Factor D2: Select approp	Align Alignme - Height Difference Effect priate value from Table	Separation nment of Floors within 20% of Storey Heig	Factor D1 Severe 0 <sep<.005h ht 0.7 ht 0.4 Factor D2</sep<.005h 	Significant 005 <sep<.01h 0.8 0.7</sep<.01h 	Sep>.01H 1 0.8 Insignificant Sep>.01H
b) Factor D2: Select approp	Align Alignme - Height Difference Effect priate value from Table	Separation nment of Floors within 20% of Storey Heig ent of Floors not within 20% of Storey Heig Separation Height Difference > 4 Store	Factor D1 Severe 0 <sep<005h< td=""> ht 0.7 ht 0.4 Factor D2 Severe 0<sep<005h< td=""> 0<sep<005h< td=""> ys</sep<005h<></sep<005h<></sep<005h<>	Significant 005 <sep<.01h 0.8 0.7 1 Significant 005<sep<.01h 0.7 0.7</sep<.01h </sep<.01h 	Sep>.01H 1 0.8 Insignificant Sep>.01H 1 1
b) Factor D2: Select approp	Align Alignme - Height Difference Effect priate value from Table	Separation nment of Floors within 20% of Storey Heig ent of Floors not within 20% of Storey Heig Separation Height Difference > 4 Store Height Difference 2 to 4 Store	Factor D1 Severe 0 <sep<005h< td=""> ht 0.7 ht 0.4 Factor D2 Severe 0<sep<005h< td=""> ys 0.4</sep<005h<></sep<005h<>	Significant 005 <sep<.01h 0.8 0.7 1 Significant 005<sep<.01h 0.7 0.7 0.9</sep<.01h </sep<.01h 	Sep>.01H 1 0.8 Insignificant Sep>.01H 1 1 1 1 1
b) Factor D2: Select approp	Align Alignme - Height Difference Effect priate value from Table	Separation nment of Floors within 20% of Storey Heig ent of Floors not within 20% of Storey Heig Separation Height Difference > 4 Store	Factor D1 Severe 0 <sep<005h< td=""> ht 0.7 ht 0.4 Factor D2 Severe 0<sep<005h< td=""> ys 0.4</sep<005h<></sep<005h<>	Significant 005 <sep<.01h 0.8 0.7 1 Significant 005<sep<.01h 0.7 0.7</sep<.01h </sep<.01h 	Sep>.01H 1 0.8 Insignificant Sep>.01H 1 1
b) Factor D2: Select approp	Align Alignme - Height Difference Effect priate value from Table	Separation nment of Floors within 20% of Storey Heig ent of Floors not within 20% of Storey Heig Separation Height Difference > 4 Store Height Difference 2 to 4 Store	Factor D1 Severe 0 <sep<005h< td=""> 0.7 ht 0.7 ht 0.4 Factor D2 Severe 0<sep<.005h< td=""> 0<sep<.005h< td=""> 0.4 ys 0.4 ys 0.7 ys 1</sep<.005h<></sep<.005h<></sep<005h<>	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h 0.7 0.9 1 Factor D</sep<.01h </sep<.01h 	Sep>.01H 1 0.8 Insignificant Sep>.01H 1 1 1
b) Factor D2: Select approp	Align Alignme - Height Difference Effect priate value from Table	Separation nment of Floors within 20% of Storey Heig ent of Floors not within 20% of Storey Heig Separation Height Difference > 4 Store Height Difference 2 to 4 Store	Factor D1 Severe 0 <sep<0.05h< td=""> 0.7 ht 0.7 ht 0.4 Factor D2 Severe 0<sep<.005h< td=""> 0<sep<.005h< td=""> ys 0.4 ys 0.7 ys 1 (Set D = lesser</sep<.005h<></sep<.005h<></sep<0.05h<>	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h 0.7 0.9 0.9 1</sep<.01h </sep<.01h 	Sep>.01H ● 1 ● 0.8 Insignificant Sep>.01H ● 1 ● 1 ● 1 ● 1 ● 1 ● 1 ● 1 ● 1
b) Factor D2: Select approp Table for Sele	Align Alignme - Height Difference Effect priate value from Table ection of Factor D2	Separation ment of Floors within 20% of Storey Heig ent of Floors not within 20% of Storey Heig Separation Height Difference > 4 Store Height Difference 2 to 4 Store Height Difference < 2 Store	Factor D1 Severe 0 <sep<0.05h< td=""> 0.7 ht 0.7 ht 0.4 Factor D2 Severe 0<sep<.005h< td=""> 0<sep<.005h< td=""> ys 0.4 ys 0.7 ys 1 (Set D = lesser</sep<.005h<></sep<.005h<></sep<0.05h<>	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h 0.7 0.9 1 Factor D of D1 and D2 or.</sep<.01h </sep<.01h 	Sep>.01H ● 1 ● 0.8 Insignificant Sep>.01H ● 1 ● 1 ● 1 ● 1 ● 1 ● 1 ● 1 ● 1
b) Factor D2: Select approp Table for Sele	Align Alignme - Height Difference Effect priate value from Table	Separation ment of Floors within 20% of Storey Heig ent of Floors not within 20% of Storey Heig Separation Height Difference > 4 Store Height Difference 2 to 4 Store Height Difference < 2 Store	Factor D1 Severe 0 <sep<005h< td=""> 0.7 ht 0.7 ht 0.4 Factor D2 Severe 0<sep<.005h< td=""> 0<sep<.005h< td=""> 0</sep<.005h<></sep<.005h<></sep<005h<>	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h 0.7 0.9 1 Factor D of D1 and D2 or.</sep<.01h </sep<.01h 	Sep>.01H ● 1 ● 0.8 Insignificant Sep>.01H ● 1 ● 1 ● 1 ● 1 ● 1 ● 1 ● 1 ● 1
b) Factor D2: Select approp Table for Sele	Align - Height Difference Effect priate value from Table ection of Factor D2 haracteristics - (Stability, landslid	Separation nment of Floors within 20% of Storey Heig ent of Floors not within 20% of Storey Heig Separation Height Difference > 4 Storey Height Difference > 2 to 4 Storey Height Difference < 2 Storey Height Difference < 2 Storey	Factor D1 Severe 0 <sep<0.005h< td=""> 0 0 0 0 0 0 0 0 Severe 0<sep<.005h< td=""> 0</sep<.005h<></sep<0.005h<>	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h 0.7 0.9 1 Factor D of D1 and D2 or.</sep<.01h </sep<.01h 	Sep>.01H ● 1 ● 0.8 Insignificant Sep>.01H ● 1 ● 1 ● 1 ● 1 ● 1 ● 1 ● 1 ● 1
b) Factor D2: Select approp Table for Sele	Align Alignme	Separation nment of Floors within 20% of Storey Heig ent of Floors not within 20% of Storey Heig Separation Height Difference > 4 Storey Height Difference > 2 to 4 Storey Height Difference < 2 Storey Height Difference < 2 Storey	Factor D1 Severe $0 < Sep < .005H$ ht 0.7 ht 0.4 Factor D2 Severe $0 < Sep < .005H$ ys 0.4 ys 0.4 ys 0.7 ys 0.7 ys 1 (Set D = lesser set D = 1.0 if no Insignificant .7 1	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h 0.7 0.9 1 Factor D of D1 and D2 or. o prospect of pour</sep<.01h </sep<.01h 	Sep>.01H ● 1 ● 0.8 Insignificant Sep>.01H ● 1 ● 1 ● 1 ● 1 ● 1 ● 1 ● 1 ● 1
b) Factor D2: Select approp Table for Sele 3.5 Site Cl E 3.6 Other	Align Alignme	Separation Inment of Floors within 20% of Storey Heig Int of Floors not within 20% of Storey Heig Separation Height Difference > 4 Stores Height Difference 2 to 4 Stores Height Difference < 2 Stores Height Difference < 2 Stores Height Difference < 0 Stores Height Dif	Factor D1 Severe 0 < Sep < .005H ht 0.7 ht 0.4 Factor D2 Severe 0 < Sep < .005H ys 0.4 ys 0.7 ys 1 (Set D = lesser set D = 1.0 if no lnsignificant .7 • 1 He 2.5,	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h 0.7 0.9 1 Factor D of D1 and D2 or. o prospect of pour</sep<.01h </sep<.01h 	Sep>.01H ● 1 ● 0.8 Insignificant Sep>.01H ● 1 ● 1 ● 1 ● 1 ● 1 ● 1 ● 1 ● 1
b) Factor D2: Select approp Table for Sele 3.5 Site Cl E 3.6 Other Record ra	Align Alignme	Separation Inment of Floors within 20% of Storey Heig Int of Floors not within 20% of Storey Heig Separation Height Difference > 4 Storey Height Difference 2 to 4 Storey Height Difference < 2 Storey Height Difference < 2 Storey Height Difference < 3 Storey Height Difference < 1 Storey Height Difference < 2 Storey Height Difference < 2 Storey Height Difference < 3 Storey For < 3 storeys - Maximum value 1.5	Factor D1 Severe $0 < Sep < 0.05H$ ht 0.4 Factor D2 Severe $0 < Sep < 0.05H$ ys 0.4 $0 < Sep < 0.05H$ ys 0.4 ys 0.7 $0 < Sep < 0.05H$ ys 0.1 (Set D = lesser set D = 1.0 if no Insignificant .7 \bullet 1 ue 2.5, . No minimum.	Significant .005 <sep<.01h 0.8 0.7 1 Significant .005<sep<.01h 0.7 0.9 0.7 0.9 1 Factor D rof D1 and D2 or. prospect of pour Factor E Factor F</sep<.01h </sep<.01h 	Sep>.01H ● 1 ● 0.8 Insignificant Sep>.01H ● 1 ● 1 ● 1 ● 1 ● 1 ● 1 ● 1 ● 1

				DCEDURE – S 0 1; Table IEP - 2			ep 3)		
Building Name		90 Summit R	oad, Sumner			_	Ref. By	١	1276.129 NPK
Direction Cons	sidered: (Choose worse ca			inal & Trans EP-2 and IEP-3 for		t)	Date	19/0	09/2012
Step 4 - Pe	ercentage of	New Buil	ding Stan	dard (%NB	5)				
							Longitudin	al	Transverse
	4.1 Assesse	ed Baselin from Table		Ь			41]	41
	4.2 Perform	ance Ach i from Table		Ratio (PAR)	I		1.75]	2.00
	4.3 PAR x Baseline (%NBS) _b						72]	82
	4.4 Percenta			tandard (% ues from Ste					72
	Step 5 - Pot			e Prone? appropriate)			%NBS ≤ 3	33	NO
	Step 6 - Pot	entially E	arthquake	Risk?			%NBS < 6	37	NO
							,		
	Step 7 - Pro	visional G	Frading fo	r Seismic R	isk based	on IEP	Seismic (Grade	В
	Evaluation (Confirmed	i by	MMCa	auert			Signature	
				Nick Calvert				Name	
				242062				_CPEng. No	
	Relationshi	p betweer	N Seismic	Grade and	% NBS :				
	Grad		A+	A	B	C	D	E]
	%NB	3.	> 100	100 to 80	80 to 67	67 to 33	33 to 20	< 20	



13. Appendix 3 – CERA Standardised Report Form

Control Control <t< th=""><th>Detailed Engineering Evaluation Summary Data</th><th></th><th></th><th>V1.11</th></t<>	Detailed Engineering Evaluation Summary Data			V1.11
	Location			
	Building Name	e: to Structure		
	Building Address			
			Company project num	Der: ZB01276.129
			Min Sec	
SN Source (Source (Sou			Revis	ion: B
And the start is a start of the st		.[PRK_2369_BEDG_001	is there a full report with this summa	ny/ yes
And the start is a start of the st				
And the submergenergy of the long of the lo				
Participant of a field of a fiel			If Ground improvement on site, desc	ibe'
Aming Solid Sing Solid Sing </td <td>Proximity to clifftop (m, if < 100m)</td> <td>):</td> <td></td> <td></td>	Proximity to clifftop (m, if < 100m)):		
Image: Section of the section of th	Proximity to cliff base (m,if <100m)	۹	Approx site elevation	m):
Image: Section of the section of th	Partition of			
Answer and a second in the second intervence i	No. of storeys above ground			
And Markel (1995)			Ground floor elevation above ground	m):
Are there will be into a legit be into	Foundation type	e: mat slab	if Foundation type is other, described of the second s	ibe:
	Age of Building (years		Date of des	ign: 1965-1976
Bus beginnt min Control display Control display Control display SSG.JUMMI Control display Control display Control display Control display SSG.JUMMI Control display Control display Control display Control display Control display SSG.JUMMI Control display Cont	Strengthening present	? <u>no</u>		
	Use (ground floor	: commercial		
Same in the second of				
Charles in the same in the same in the same in the same intervent of the same intervent	Importance level (to NZS1170.5	: IL1		
And Society Hole and				
Provide Provide <t< td=""><td>Gravity System</td><td>frame system f: timber framed</td><td>rafter type, purlin type and clad</td><td>ling 150x50 timber rafters</td></t<>	Gravity System	frame system f: timber framed	rafter type, purlin type and clad	ling 150x50 timber rafters
Column: trackarded Second Participation Second Part	Floors	timber	joist depth and spacing (r	nm) Unknown
Answer Assessed years Assessed years<				
Aussister of the second seco	Walls	non-load bearing		0
Detiny seamed i, mean us intellery without (US,) ref. Constrained expert intellery without (US,) ref. Constrained experimental intellery without (US,) ref. Constrained exper i				4 V
Productions 0.12 0.27 cm paramiters in their entropies of the second of	Lateral system along Ductility assumed, p	welded and bolted steel moment frame		(m) <u>3.8</u>
mainton intervo mission (15) (mi) mainton (15)	Period along	0.40	0.37 from parameters in sheet estimate or calculat	
Instant generation construction Instant generation Instant				
Lange Lange <thlange< th=""> Lange <thl< td=""><td></td><td></td><td>note twoical hav length</td><td>(m) 31</td></thl<></thlange<>			note twoical hav length	(m) 31
Autor Control designer		1.25		
medium intentions whether (iii (iii) (iiii) (iii) (iii) (iii) (iii) (iii) (iii) (iii) (iii) (iii)				
Aniskie drome in the initial initial information of the set of the s				
Anisolity of the second sec	Separations;			
Non-standard aligned is Series (min)	north (mm)		leave blank if not relevant	
Description Operating oper	south (mm):		
Available documentation Advinition framesing Centres (Centres	west (mm	۵		
Available documentation Correct in the contract of debates in the contra				
Arailable documentation Architectural proc Arailable documentation Architectural proc Biblic Correct Placet Biblic (proc Dimage Differential content proc apparent Discrete Biblic (proc Dimage Differential content proc apparent Discrete Biblic (proc Dimage Differential content proc apparent Discrete Biblic (proc Differential content proc apparent Discrete Biblic (proc Differential content proc apparent Discrete Biblic (proc Differential content proc apparent Differential content proc apparent Differ	Wall cladding	profiled metal	desc	ribe Lightweight corrugated sheeting
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Available documentation Architectus Income Describe Geotech report Elections Geotech report Income Architectus Income Describe Geotech report Income Original designer name/date original designer name/date Damage Statistic (refer DEE Table 4.2) Site performance Differential iteritionene Differential iteriti	Ceilings	s: none		
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Architectural rene original designer namebias Structural rene original designer namebias Damage original designer namebias Structural rene Describe damage Damage Describe damage (ref DEE Table 4.2) Ste performance Describe damage Describe damage Differential stellenteri from dostred Differential stell spread from dostred Differential stellenteri				
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Differential settlements one doserved notes (if applcable) notes (if applcable) Differential lettle settlements notes (if applcable) notes (if applcable) notes (if applcable) Differential lettlements notes apparent notes (if applcable) notes (if applcable) Building Current Placard Status green notes (if applcable) notes (if applcable) Along Damage taics 0% Describe (summary); No damage observed Across Damage ratio 0% Describe how damage ratio arrived at: Inspection Dispragman Damage ratio 0% Describe (summary); No damage observed Across Damage ratio 0% Describe how damage ratio arrived at: Inspection CSWs: Damage? Inc Describe (summary); No damage observed Describe [summary] Pounding: Damage? Inc Describe [summary] Describe [summary] No structural: Damage? Inc		t pope observed	notos (if applica	
Lateral Spread: Image random protection	Differential settlemen	t: none observed	notes (if applical	le):
Differential lateral spread: none apparent notes (if applicable): note				
Damage to area notes (if applicable): Building: Current Placard Status: green Along Damage ratic 0% Describe how damage ratio arrived at: No damage observed Across Damage ratic 0% Diaphragms Damage?: no Pounding: Damage?: Describe (summar): No atmage ?: no Describe (be/fore) - % NBS (defer)) % NBS (be/fore) % NBS (be/fore) Diaphragms Damage?: no Pounding: Damage?: Describe (manage?): No estructural: Damage?: Describe (manage?): Non-structural: Damage?: Describe: Non-structural: Damage?: Describe: Adong Assessed %NBS before: No Along Assessed %NBS before: 22% Across Assessed %NBS before: 22%	Differential lateral spread	h: none apparent	notes (if applical	le):
Current Placard Status: green Along Damage ratio: 0% Describe (summary): No damage observed Across Damage ratio: 0% Diaphragms Damage?: 0 CSWs: Damage?: 0 Pounding: Damage?: 0 Non-structural: Damage?: 0 Non-structural: Damage?: 0 Recommendations: fmo 0 Interim occupancy recommendations: full occupancy %/NBS from IEP below If IEP not used, please detail report. Across Assessed %/NBS before: 29%, 29%, 29%, 29%, 29%, 29%, 29%, 20%, 20%, 20%, 20%, 20%, 20%, 20%, 20				
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Along Damage ratic O% Describe (summary): No damage observed 0% Across Damage ratic 0% Damage ratic 0% Describe (summary): No damage observed Diaphragms Damage?! 0 CSWs: Damage?! Describe (summary): Pounding: Damage?! Describe (summary): Nor-structural: Damage?! Describe (summary): Nor-structural: Damage?! Describe (summary): Recommendations: Damage?! Describe (summary): Recommendations: Interim occupancy recommendations: Interim occupancy Along Assessed %NBS before: 29% %NBS from IEP below Across Assessed %NBS before: 29% %NBS from IEP below				No damage observed during our site
Across Damage ratio 0%<	Along Damage ratio	: 0%	Describe how damage ratio arrive	
Actoss Describe (summary): No damage observed 020 Damage Kull 0 =% NBS (before) Diaphragms Damage?: no Describe:			(% NBS (before) - % NBS (after))	
Diaphragms Damage?: no Describe:			Damage Rano =	
CSWs: Damage?: no Describe: Describe				-
Pounding: Damage?: no Describe: Describe: Non-structural: Damage?: no Describe: Describe: Recommendations: Level of repair/strengthening required: none Describe: Describe: Building Consent required: none Describe: Describe: Describe: Interim occupancy recommendations: Interim occupancy Describe: Describe: Along Assessed %NBS before: 29% %NBS from IEP below If IEP not used, please detail report). Across Assessed %NBS before: 29% %NBS from IEP below If IEP not used, please detail report). Across Assessed %NBS before: 29% %NBS from IEP below If IEP not used, please detail report).	Diapnragms Damage?	: <u>no</u>	Desc	
Non-structural: Damage?: no Recommendations Level of repair/strengthening required: none Building Consent required: none Describe: Interim occupancy recommendations: full occupancy Along Assessed %NBS before: 29% Mong Assessed %NBS before: Assessed %NBS before: 29% Mong Assessed %NBS before:	CSWs: Damage	: no	Desc	ibe:
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Recommendations Describe: Building Consent required: no Interim occupancy recommendations: full occupancy Along Assessed %NBS before: 29% Assessed %NBS after: 29% Across Assessed %NBS before: 42% %NBS from IEP below If IEP not used, please detail (point).	Non-structural: Damage	: no	Doco	ibe:
Level of repair/strengthening required: none Describe: Building Consent required: no Interim occupancy recommendations: full occupancy Along Assessed %NBS before: 29% Assessed %NBS after: 29% Across Assessed %NBS before: 29% Across Assessed %NBS before: 42% %NBS from IEP below If IEP not used, please detail report).	Cullage			
Level of repair/strengthening required: none Describe: Building Consent required: no Interim occupancy recommendations: full occupancy Along Assessed %NBS before: 29%	Recommendations			
Interim occupancy recommendations: Induces Describe: Along Assessed %NBS before: 29% %NBS from IEP below If IEP not used, please detail report). Across Assessed %NBS before: 29% Across Assessed %NBS before: 42%	Level of repair/strengthening required			
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Across Assessed %NBS before: 42% %NBS from IEP below				
			/01VDS TRUTH IE F DEROW	

Detailed Engineering Evaluation Summary Data			V1.11
Location	Scarborough Farm Park Woolshed -		
Building Name	Enclosed Structure	Reviewer: No: Street CPEng No:	Nick Calvert 242062
Building Address		190 Summit Road, Sumner Company:	SKM
Legal Description		Company project number: Company phone number:	
GPS south	n l	Min Sec Date of submission:	24-May
GPS eas		Inspection Date: Revision:	
Building Unique Identifier (CCC)	:[PRK_2389_BLDG_001	Is there a full report with this summary?	yes
Site Slope	flat	Max retaining height (m):	0.8
Soil type Site Class (to NZS1170.5)	2	Soil Profile (if available):	
Proximity to waterway (m, if <100m) Proximity to clifftop (m, if < 100m)	12	If Ground improvement on site, describe:	
Proximity to cliff base (m, if <100m)		Approx site elevation (m):	
Ded de a			
Building No. of storeys above ground		single storey = 1 Ground floor elevation (Absolute) (m):	
Ground floor split Storeys below groun	d0	Ground floor elevation above ground (m):	
Foundation type Building height (m)	3.70	if Foundation type is other, describe: height from ground to level of uppermost seismic mass (for IEP only) (m):	3.7
Floor footprint area (approx) Age of Building (years)		Date of design:	1965-1976
Strengthening present	?[no	If so, when (year)? And what load level (%g)?	
Use (ground floor, Use (upper floors)	recreational	Brief strengthening description:	
Use notes (if required) Importance level (to NZS1170.5	1		
Gravity Structure Gravity System	frame system		150v50 roftoro et 200e/e
Floors	timber framed	rafter type, purlin type and cladding joist depth and spacing (mm)	Unknown
Columns			Unknown Unknown
Walls	non-load bearing	0	
Lateral load resisting structure Lateral system along	: lightweight timber framed walls	Note: Define along and across in note typical wall length (m)	15.2
Ductility assumed, _µ Period along		detailed report! 0.00 estimate or calculation?	estimated
Total deflection (ULS) (mm) maximum interstorey deflection (ULS) (mm)	10	estimate or calculation? estimate or calculation?	estimated
	: lightweight timber framed walls	note typical wall length (m)	9.3
Ductility assumed, µ	.: 1.25		
Period across Total deflection (ULS) (mm)	10	0.00 estimate or calculation? estimate or calculation?	estimated
maximum interstorey deflection (ULS) (mm)	۶ <u>ــــــــــــــــــــــــــــــــــــ</u>	estimate or calculation?	estimated
Separations: north (mm)		leave blank if not relevant	
east (mm] south (mm]):		
west (mm)	d		
Non-structural elements Stairs	s:[]		
Wall cladding	: other light		Timber elements and lightweight corrugated sheeting
Roof Cladding			Lightweight corrugated sheeting
	: plaster, fixed		In some areas, others exposed
	•L		
Available documentation			
Architectura Structura	al none	original designer name/date original designer name/date	
Mechanica Electrica	al none	original designer name/date original designer name/date	
Geotech repo	t <u>none</u>	original designer name/date	
Damage			
Site: Site performance (refer DEE Table 4-2)	d	Describe damage:	No damage observed
Settlemen Differential settlemen	t none observed	notes (if applicable): notes (if applicable):	
Liquefaction	: none apparent : none apparent	notes (if applicable): notes (if applicable):	
Differential lateral spread	t: none apparent	notes (if applicable): notes (if applicable):	
	a: none apparent	notes (if applicable): notes (if applicable):	
Building:			
Current Placard Status	:[green		
Along Damage ratio		Describe how damage ratio arrived at:	No damage observed during our site inspection.
Describe (summary)	: No damage observed	Damage $Partia = (\% NBS (before) - \% NBS (after))$	
Across Damage ratio Describe (summary)): 0% I: No damage observed	$Damage _Ratio = \frac{(NTBS(before))^{-(NTBS(defore))}}{NBS(before)}$	
Diaphragms Damage?		Describe:	
CSWs: Damage		Describe:	
-			
Pounding: Damage?		Describe:	
Non-structural: Damage?	:[no	Describe:	
Recommendations			
Level of repair/strengthening required Building Consent required:	l: none no	Describe: Describe:	
Interim occupancy recommendations		Describe:	
			Qualitative Assessment carried out includes NZSEE IEP (refer to SKM
Along Assessed %NBS before:	72%	%NBS from IEP below If IEP not used, please detail	report).
Assessed %NBS after:	72%	assessment methodology:	
Across Assessed %NBS before: Assessed %NBS after:	<u>82%</u>	%NBS from IEP below	