

Detailed Seismic Assessment Commercial Building

Location: 11b Allandale Road, Hawarden 7385 Client: Hurunui District Council

Job No: FC19037 Issue Date: 15 August 2019 Revision: 00

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Document Transmittal

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1 INTRODUCTION

This report covers the investigation into the Multi-Use Community Building at 11b Allandale Road, Hawarden

The report covers three aspects of the building:

- 1. Condition Assessment and Earthquake damage assessment
- 2. Engineering seismic risk assessment
- 3. Recommendations for repair and maintenance

1.1 Site Details

Address	11b Allandale Road, Hawarden 7385
Owner	Hurunui District Council
Architect	N/A
Engineer	Frontier Consultants NZ Ltd
Geotechnical Report	N/A
Site Area	N/A
Council	Hurunui District Council



1.2 Building Description

The building structure is a single level community building built using various construction methods including timber frame, reinforced concrete masonry block, and precast concrete panel.

The building includes a bar/function (social) area, change rooms and showers, kitchen, two squash courts, and associated change room facilities. The main rugby change rooms open onto a concrete viewing deck which opens onto the playing field.

Building Element	Description
Foundation	Slab on grade.
Walls/External Cladding	Main area – Reinforced concrete masonry timber frame Squash court – Precast concrete panels, and reinforced concrete masonry Fibre Cement Sheet above concrete panel Fibre Cement board – change rooms (part)
Walls/Internal Lining	Main building – wall sheeting various types
Roof - Structure	Column and Truss (main function area) Portal frame with infill timber frame (Changerooms) Beam and column (Squash court and facilities)

The Building has been divided into three main areas and throughout the report some different room titles have been used.

The Original building is of unknown age and is described as the original building or the "rugby" rooms. For the purposes of analysis, the change rooms constructed with the squash court/social area have also been included in this area. The original building is concrete masonry walled structure with internal steel portals supporting the gable roof and braced with timber frame and masonry walls. Horizontal bracing loads are resisted by longitudinal and transverse bracing walls. We have assumed that the building is circa 1965, based on the size of the steel in the portal frames in the change room which indicates that it is before 1975.

The "social area" is also described as the main area and includes the open plan area, kitchen, storerooms and bar area. The toilets and showers jointly used by the squash players were constructed with this area; as indicated above these rooms are analysed with the original building because the form of construction is like the original building. The social area is open plan and is constructed from timber trusses on reinforced concrete masonry columns. Horizontal bracing loads are achieved by the connection to the original building, and transverse horizontal loads are reacted by the columns. The building permit information indicates that the building was constructed in 1982/1983.

The two squash courts and viewing area were constructed last. We have not been provided with information on the squash courts. The front wall is precast concrete panel. The middle wall may be precast panel. The external side walls are reinforced concrete masonry block forming the rebound surface and timber frame above supporting the roof. The drawings of the social room reference the proposed squash court, so we have assumed construction circa 1985.



1.3 Executive summary

We have reviewed the building for overall condition as well as conducting a seismic risk assessment on the building.

In a repaired state, the overall seismic risk assessment is 72%NBS. The summary and the detail in the report provide the reasoning for this assessment.

The key findings are:

- The building is in "fair to good" condition
- There is earthquake damage which should be repaired.

1.3.1 Condition Assessment and Earthquake related damage

There are three aspects to the condition assessment. These are discussed as Earthquake related defects, Historical (normal age and condition-related defects) and Design related defects.

Based on our visual inspection and non-invasive testing we suggest that, structurally, the building is on balance in "fair to good" condition. There is some earthquake related damage to the structure indicated in the table below.

There is also evidence age and wear related defects and damage caused by using the building. It is "lived in". Age and wear defects are noted but are not significant.

The third aspect – design related defects – is related to how the building is used now compared to how it was envisaged to be used when constructed. There are no indications of design related defects.

There are 5 elements which are clearly damage caused by an earthquake. The most likely event is the Kaikoura earthquake of October 2016. Reasons for indicating that there is earthquake damage and discussion are given in the body of the report.



The Earthquake damage noted includes:

Damaged Item	Reason	Repair
Cracks in FC sheet above precast panel	Excessive racking in structure	Replace FC sheet
Crack in lower corner of precast	Earthquake shaking	Epoxy repair crack
Damaged connection in bock wall	Earthquake Shaking	Further investigation and strengthen connection
Damaged roof sheet – rugby change room above showers	Possible earthquake related damage	Replace roof sheet in short term – consider re-roof in long term
Cracks in concrete floor slab – exacerbated by shaking	Cracks in front deck (front of rugby rooms) are wider than expected from normal shrinkage	Repair step, replace deck slab

1.3.2 Seismic Assessment Risk Assessment

Seismic Risk assessment is used in commercial and public buildings to provide a <u>guide</u> to the risk of failure of a building which could cause harm. The seismic assessment is discussed in detail below and uses two related factors to assess seismic risk to the building under severe earthquake condition. The initial measure to describe structural capacity as a percentage of "New Building Standard" or % NBS and this related to a seismic grade measure marked from A to E

Our initial Seismic Risk Assessment is that the building lies between **50%NBS and 67%NBS** or Grade C. This would be increased to approximately **72% (Grade B)** when the key earthquake damage is repaired at the Squash Court back wall where the steel beam is fixed to the masonry block. Some additional strengthening may increase seismic grade to Grade A but it is doubtful whether it would extend beyond that grading.

Our analysis of the building structure indicates that it was designed to the building standards prior to 1985. After the Canterbury Earthquake Sequence (September 2010 to December 2011) the seismic loads used in design increased by approximately 30%. Effectively this means that in Canterbury most commercial buildings should return a seismic risk number of around 67%NBS.

1.3.3 Immediate Maintenance and Repair Recommendations

We have made immediate maintenance/repair recommendations for repair of the earthquake related damage.



These repairs are below in order of considered importance:

- 1. Repair and strengthen the damaged connection in the block wall between the squash court and the main function area
- 2. Repair the cracks between the block centre wall of the squash court and the pre-cast panels
- 3. Repair the external crack in the pre-cast panel with epoxy
- 4. Repair the cracks and settlement in the front deck (in front of the rugby change rooms)
- 5. Replace the external cladding above the concrete walls in the squash court A painted plywood shadow clad may be considered where this is screwed in a bracing pattern to provide additional resistance to racking
- 6. Seal the wall joints between squash court and function area with a flexible sealant

1.3.4 Secondary Repairs and maintenance

There are further repairs and maintenance noted. These include items of minor earthquake/exacerbation and items of maintenance (not earthquake damage):

- Replace roof sheeting on the rugby change rooms with "long run" to repair the crushed sheet and ensure water proofing of the building
- Treat rust in box gutter check on water proofing. Box Gutter is between the squash court roof and the main function area roof

There is also a small number of minor cracks in the foundation concrete – We recommend monitoring only because the cracks are minor and have no structural significance.

2 CONDITION ASSESSMENT

We have assessed the building as being in **"fair to good"** condition. Structurally, most of the critical elements are <u>not</u> showing signs of distress.

The following are a "plain English" range of descriptor definitions for condition grading:

- New condition expected of a newly constructed building no defects.
- Good "lived in" but no obvious defects or damage (could require paint)
- Fair "lived in" some defects or damage readily repaired defects or damage most of the building is good condition
- Poor has some defects that are more difficult to repair, or a lot of defects.
- Unsafe The building has significant defects which cause it to be unsafe.



The Assessment for this building is as follows:

I. There is one item of earthquake damage which could be noted as a critical structural weakness – this is the connection of the roof beam in the squash court to the masonry blockwork column in the main area. The damage occurred because there is a point load on the blockwork – this is unlikely to have been considered in the original design.

The repair of this item is more complex than the other repairs, but the proposed repair and strengthening of the area will decrease the seismic risk of the building and improve the overall grade.

The solution is to ensure that the squash court walls resist the whole of the earthquake load. The complexity is how can that be done as a retrofit solution.

- II. The deck area (in front of the rugby rooms) is damaged, cracked and out of level this should be repaired, or partially replaced.
- III. The other issues are minor damage which should be repaired.

I have included one maintenance issue in the report – specifically the treatment of rust in the box gutter. Other issues are relatively minor and can be readily included in the normal maintenance programme.

The Change rooms and toilets show signs of "wear and tear". This is expected in a building that is used well (appropriately).



3 EXPLANATION OF EARTHQUAKE DAMAGE – MBIE GUIDANCE

Assessment of earthquake damaged buildings is carried out in accordance with MBIE Guidance on "Repairing and rebuilding houses affected by the Canterbury earthquakes" issued December 2012.

The document provides guidance on repair of earthquake damage to buildings and guidance on when to repair or replace damaged items. The document is mostly applicable to residential buildings. More complex commercial buildings can be assessed using the same guidance, but more complex analysis and engineering judgement may be required.

Public and commercial buildings are assessed for seismic risk. This assessment involves review of damage to the building and an assessment of the risk of future damage to a building from a seismic event. How the building has performed or was damaged in previous seismic events provides a guide to future performance.

Buildings can be damaged in one or both of two primary causes. The first cause is best described as shaking or racking damage. This is the observed movement of the superstructure. (The walls, floors and roof of the building above the ground).

The second cause is settlement of the foundations. This may have number of causes underlying the settlement, but the effect of the settlement is a change of foundation support which causes vertical stress load on the building walls and floors. When the stress in the building elements exceeds the capacity, failure occurs.

The Canterbury earthquakes in Christchurch caused a significant amount of settlement damage to buildings; particularly those on flat river silt areas. This resulted in emphasis on the settlement damage. It is also relatively easy to measure using simple techniques.

Floor levels are used to provide a guide to settlement which may have been directly caused by an earthquake event. Generally, buildings with differential floor level of less than 50mm and floor slopes of less than 0.5% or 1:200 are considered within suitable tolerances and do not require relevelling. Timber floors with differential floor levels between 50mm and 100mm would be recommended to be relevelled and floors that exceed 100mm in differential settlement may be recommended for foundation replacement.

These are broad guideline values and are subject to engineering advice and some discretion. It is noted that most buildings can be relevelled without the need to replace foundations.

The scope of work and repair methodologies are in accordance with the MBIE Guidance, and the NZ Building Code.

For this building we interpret the floor level data provided as indicating that the Floor levels are less than 20mm in total differential with no settlement indicated in the foundations.

The most significant damage to the building was racking of internal walls and evidence of damage between areas with differential stiffness.

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FC19037 DEE 11b Allandale Road R00



Understanding the Building

The building is a complex structure. It has been built in three stages. The original building includes the rugby club and change rooms, the open plan bar and club area is a second structure and the squash courts are a third structure.

The original area is normal construction with block walls providing bracing in both longitudinal and transverse directions. The roof is supported on portal frames which are braced by the walls and limits the deflection of the portal frame.

The function area is constructed using reinforced masonry columns and truss roof structure. The structure is braced by the original building walls in the longitudinal direction. As a stand-alone building this load in the transverse direction would have been carried by the columns as a cantilever.

The construction of the squash court attached to the wall of the club area provided additional bracing capacity in the transverse direction.

The roof structures provide transfer of load to bracing walls.

The seismic assessment of buildings uses a factor for assessment of ductility. (m) In lay terms this is a measure of stiffness and flexibility as it relates to earthquake performance of a structure.

In terms of this structure the original building is the least flexible, the open function area is the most flexible and the squash court varies from very stiff to very flexible. This explains the location of type of earthquake damage evident in the building and shows that it is the interaction of elements with different stiffnesses which causes the damage.

The floor level measurements taken show the building has not settled to any significant amount. Settlement damage is therefore excluded from the assessment.

The building is located approximately 40km from the Kaikoura earthquake epicentre. There is a clear line approximately south-south-west of the epicentre to the site. The earthquake would have been clearly felt at this site. We have not investigated the extent of shaking at the site, but we have investigated other buildings in the valley and the damage is consistent with the earthquake event.



Critical Structural Weakness

The building has one clear critical structural weakness. This is found at the connection of the squash court roof support to the main building column and masonry wall. There is earthquake damage at this point.

It is unknown at the time of writing whether the masonry blockwork in the original structure is reinforced. As there is no evidence of damage, and it is well supported by other walls, it is therefore reasonable to assume that the masonry is reinforced. There is no damage to the elements which indicate unreinforced masonry.

It appears that the addition of the squash court to the main building has changed the structural action of the building. The addition should have improved the structural performance of the building, and where the load transfer is through transverse walls, there is no evidence of damage. The main evidence of damage is where the transfer of horizontal earthquake force is through a <u>single point</u> at the roof rafter. The most likely repair is to strengthen the area of load transfer.

There are four different structural types of construction in the building. These are described on the attached plan as

- The rugby team rooms
- The rugby and squash court change and shower areas
- The main function area (Social Room and kitchen)
- The Squash Courts



4 SEISMIC RISK ASSESSMENT

The assessment has been carried out in 2 parts. A visual inspection of the building including photographs of the building elements, followed by an engineering assessment. The objective is to provide two figures; an assessment of strength based on the current or "New Building Standard" this is shown as a percentage of New Building Standard; and a related Seismic Grade.

The engineering assessment is also carried out in stages. The first stage is the "Initial Engineering Procedure" (IEP). This stage reviews the existing information and uses a spreadsheet to determine an initial assessment of the %NBS. If the result of this assessment is satisfactory then the assessment may stop at this point.

If the IEP result is unsatisfactory, further assessment of either the IEP factors or a more detailed analysis is required.

At the time of the inspection there was evidence of defects caused by an earthquake probably the Kaikoura event.

The initial engineering procedure (IEP) estimates that the design %NBS is currently 50%NBS based on the assessment of the original rugby rooms. The newer social room and squash court indicate %NBS greater than 100%. This assumes that the building is in good repaired condition. Based on the damage to the masonry blocks in the squash court we have derated the building in its present (unrepaired) condition to be in the order of **50%NBS to 67%NBS**.

The IEP result is often sensitive to the engineering factors selected, and a low result using the IEP in the first instance suggests that a better analysis should be carried out. We are confident, based on the type and extent of damage that the building in its current condition is greater than 50%NBS.

We have assessed that the building requires further analysis to confirm the seismic performance in the repaired state and to obtain information to assist with the design of the repair.

As indicated in the section of damage assessment the building has three distinct areas which react differently during earthquake shaking.

Our supporting reasoning is as follows:

- The rugby rooms and change rooms are constructed from concrete masonry block and provide bracing in both directions. The structure is normally ductile using a factor m of approximately 1.25.
- The Social room is a more flexible structure and is a column and truss construction. The columns act as cantilever moment supporting beams. A seismic ductility factor of 1.75 and 2.0 has been assumed.
- The Squash court for the most part is a stiff structure in the lower walls with a flexible structure in the upper part supporting the roof. This difference in ductility between floors is the reason for the damage noted in the structure. For the purpose



of analysis, a ductility factor of 1 is assumed for the lower portion of the walls and 2 for the upper flexible portion.

The results of the detailed analysis (explained below) including assumptions indicate that the building should have %NBS of approximately **72%** when repaired.

Further Explanation of the procedure:

The assessment of the % NBS based on the IEP (Initial Engineering Procedure) spreadsheet calculated to 50%NBS for the original building.

The additional analysis procedure proposed is as follows:

- Analyse the original building for earthquake loads and bracing determine %NBS
- Analyse the Social area for earthquake loads and bracing connected to original building
- Analyse the squash court as a stand-alone structure and determine the point load placed on the function area

The summary of results is tabulated below:

Building Section	%NBS – pre-repair	%NBS – Post Repair - estimated
Original Building – Rugby club rooms and change area	70%	90% improved bracing in roof and repair of roof sheet
Social Area	97%	Not calculated
Squash court Stand alone	100%	Not Calculated
Combined Building – worst case assessment	Worst Case 47% (calculated) 57%-60% (based on design)	72% Post repair without improvement

The %NBS result indicates that the assessed building is <u>not</u> earthquake prone. The single figure %NBS quoted is the lowest estimated figure – in this case 72%NBS.

4.1 Definitions of Seismic Risk Assessments

4.1.1 Earthquake Prone Assessment

The legal requirements for building structures assessed under this methodology are based on structures required to meet the minimum standard of 34% NBS. A building rating less than the 34% is considered to be "Earthquake prone"



A building assessed as being below the 34% figure requires further investigation and may require further action to strengthen the building.

If the above is greater than 33% then the Building does not require further action in terms of the Building Act but may still be strengthened to meet requirements of insurance.

If the result above result is less than or equal to 33% then the building is potentially earthquake prone in terms of the Building Act. Further action will be required, and this should include a detailed assessment of the building in the first instance.

4.1.2 Earthquake Risk Assessment

The second level is called Earthquake Risk. Buildings that are calculated to be less than 67%NBS but greater than 33%NBS

If the result above is greater than or equal to 67%NBS then the building does not present an earthquake risk. Generally, no further assessment is required.

If the result is above 33% and less than 67% then the building is potentially an earthquake risk and further action such as a detailed assessment of the building may be recommended.

We have not recommended a detailed analysis for this building as there is very little accurate information available and extensive intrusive investigations would be required.

4.1.3 Detailed Assessment

For this building a detailed assessment will add some value. In particular, it will allow the calculation of loads on the area of failure which is considered the critical structural weakness. Without a detailed analysis we are guessing.

4.1.4 Seismic Grade

The following excerpt from the NZSEE guidelines

"The grading scheme shown in Table 2.1 (Section 2.8) is being promoted by the New Zealand Society for Earthquake Engineering to improve public awareness of earthquake risk and the relative risk between buildings.

It is not a requirement of the Building Act to provide a seismic grade, but it is strongly recommended that this be recorded so as to promote the concept of seismic grading.

Seismic grading determined from the results of the IEP should be considered provisional and subject to confirmation by detailed assessment."

Relationship of Seismic grade to %NBS

Grade:	A+	А	В	С	D	E
%NBS:	> 100	100 to 80	80 to 67	67 to 33	33 to 20	< 20



5 MAINTENANCE/REPAIR RECOMMENDATIONS

The following table represents my recommendations for maintenance and repair methodology.

Issue	Repair Method	Recommended Product/s	Cost/Value
Critical Connection	Repair masonry block wall and strengthen with steel plate	Further investigation of the repair method is required	
Critical Connection	Provide additional strengthening to steel rafter at roof ridge – review and improve bracing	Further investigation of the repair method is required	
Repair to front wall of squash court	Grind temporary repair flat and seal		
Repair hairline cracks in wall	Inspect and repair with liquid epoxy as required or rake out crack and fill with an epoxy putty grind flat		
External squash court wall joint between panels	Need further investigation		
External squash court wall – crack in bottom right corner of panel	Epoxy repair/ seal external concrete panel with waterproof seal	Possible to repair with AQURON	
Original rugby building roof sheet damage	Replace roof sheet with "long run" sheeting – inspect and improve bracing in roof		
Cracks in veranda stair	Epoxy fill stair and grind flat		
Cracks in concrete floors in change rooms	Ensure floors are safe Grind and paint with epoxy nonslip floor coating		
Box gutter rust	Treat rust with rust converter and paint		

APPENDIX 1 – Seismic Evaluation

Detailed Evaluation

Peter D Dur	ncan CP	Eng RPEQ	Job No	190801		
Address		Hawarden Multi use	190801			
Loads AS11	70					
Dead Load	item	Roof load From Sheet	0.12	0.12	kn/m2	
		Roof Purlins	0.05 kn/m /purlin	0.15	kn/m2	
		Roof Beams		0.064	kn/m	
Live Load	item	Load on beam from DL roof	0.25 x w	1.29	Kn/m	
		roof point load		1.4	kN	
Wind Load		location	Hawarden			
		wind region	Region	A7	Fig 3.1	
		Determine Structural Importance		1	BCA B1.2	
					AS1170	
		Wind speed		45		
		Wind Speed servicability LS		37		
		Wind directional multiplier	Wind actions major ele.	0.9		
		Wind directional multiplier	Cladding	1		
		Structure Height		7		
		terrain category		2		
		terrain height multiplier	M (z,cat)	0.91		
		sheilding multiplier	Ms	1	Table 4.3	
		topoographic multiplier	Mh	1	4.4.2	
		Lee multiplier (NZ	Mlee	1.1		
		site wind speed servicability		33.67		
		Site Wind Speed Vu		36.855		
		design wind pressure, sls		0.680201	kPa	2.4.1
		design wind pressure, uls		0.814975	kPa	2.4.1
		Wind Zone	Medium		<37m/s	

The following table has been used to calculate the seismic loads on the structures.



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Earthquake	Design Lo	ads NZS	<u>1170.5</u>						
Site Data						Building	Data		
Sile Data						Dunung	Data		
Location=	Hawarden				Period T1=	0.4	s	Clause 4.3	
Soil Type=	d				Ductility µ=	2			
learest Fault=	kakapo	Figure 3.5		Return	Perion ULS=	100	yrs	Table 3.3 NZS 11	70.0
D (km)=	100	Table 3.3		Return	Perion SLS=	25	yrs		
Nmax(s)=	1	Table 3.7			Sp=	0.7	0.7	Clause 4.4	
					kμ=	1.57	1.6	Clause 5.2.1.1	
Elastic site spec	tra								
Ch(T) =	3	1.9						Table 3.1	
Z =	0.3							B1 modification	
Ru =	1	Rs =	0.25					Table 3.5 with B	1 ame
N(T,D) =	1								
C(T)=	0.9		0.23					Eq. 3.1(1)	
		C(T)=Ch(T)	T) Z R N (T,	D)					
Horizontal desig	gn action coe	fficient							
Cd(T1) ULS	<u>0.40</u>	SLS	0.10					Eq. 5.2(1)	
		Cd(T1)=C9	(T1)Sp/k µ						
Note: $Cd(T1) \ge$	(Z/20+0.02)	Ru & 0.03Rı	ı					Eq. 5.2(2)	
(Z/20+0.02)R	0.035	TRUE	0.00875	TRUE					
0.03Ru	0.03	TRUE	0.0075	TRUE					

We then made the following assumptions:

1. The original building has enough bracing to satisfy the earthquake loads but is unlikely to achieve 100%NBS. There is minimal evidence of earthquake damage in the original building and the building is a standard (straight-forward) structure. There is significant structural redundancy in the building (eg: bracing walls). We did not carry out a detailed analysis of the original building but focussed on the critical structural weakness evident in the squash court.

2. The social building extension can be tested as a "stand alone" structure. Wall and roof loads are applied at the top of the concrete masonry columns.

2a. The social building columns are assumed to be reinforced with 4- D16 bars (one in each "pot") in the 400 square column

3. The critical load point from the squash court beam can then be determined and applied to the masonry column. The load is assumed to be placed at the top of the column in the first case and at approximately 1m away from the column as second design case.

Taking the critical grid line where the middle wall of the squash court will apply the load, the load on the column from seismic shaking can be applied m=2 for the social room. CdT (ULS) = 0.4

Part wall and part roof load 3x2.6x4.5 = 35.1kN 35.1 x 0.4 = 14.04kN Roof = 3x6.7x0.9= 18.09 18.09x0.4 = 7.2

14.04+7.2= 21.27kN

Moment at base of column = 55.31kNm (estimated New Building Standard) Design Capacity of column = 53.69kNm <u>97% NBS</u>

Add Point load from Squash court middle wall and column and recalculate.

Mid Wall of squash court -

10x2.4x4.5=108kN 108x0.4= 43.2kN

Assume 1/3 of load is applied. Most of the load will be taken in the wall and less than 1/3 will be transferred through the steel frame

43.2/3= 14.4kN

14.4 +21.27=35.67kN

Moment = 92.74kNm

Capacity is therefore 53.69/92.67= 57%

It is possible that the original design did not allow for any horizontal force to be transferred from seismic loading to the block wall.

Making this assumption, the load applied to the masonry wall would be 7.2kN and the moment at the base would be 21.27+7.4=28.67Moment = $28.67 \times 2.6=74.54$ kNm

53.69/74.54= 72%NBS



NZSEE IEP Spreadsheet Version 0.5

Initial Evaluation Proced	ure (IEP) Assessment - C	ompleted for {Client/TA	}	Page 1
WARNING!! This initial evaluation ha Society for Earthquake Engineering doc must be read in conjunction with the lin and engineering calculations, or engine	is been carried out solely as an initial sei ument "Assessment and Improvement of nitations set out in the accompanying re jerina iudaements based on them, have r	smic assessment of the building followi f the Structural Performance of Building port, and should not be relied on by an jot been undertaken, and these may lea	ng the procedure set ou is in Earthquakes, June i party for any other pur id to a different result o	t in the New Zealand 2006". This spreadsheet pose. Detailed inspections r seismic grade.
Street Number & Name: AKA: Name of building:	Hawarden Rugby Rooms Multi Use Building		Job No.: By: Date:	190801 P Duncan 14/08/2019
City:	Hawarden		Revision No.:	0
Table IEP-1 Initial Eva	luation Procedure Step 1			
Step 1 - General Information				
1.1 Photos (attach sufficient to	describe building)			
	NOTE: THERE ARE MORE	PHOTOS ON PAGE 1a ATTACHE	D	
.2 Sketches (plans etc, show it	tems of interest)			
	NOTE: THERE ARE MORE	SKETCHES ON PAGE 1a ATTACH	ED	
1.3 List relevant features (Note: Aulti use building with Function Area, Change	NOTE: THERE ARE MORE	SKETCHES ON PAGE 1a ATTACH n this box. If further text requi	ED red use Page 1a)	
1.3 List relevant features (Note: Auti use building with Function Area, Change	NOTE: THERE ARE MORE only 10 lines of text will print i rooms and Squash courts - three different stru	SKETCHES ON PAGE 1a ATTACH n this box. If further text requi	ED red use Page 1a)	
1.3 List relevant features (Note: Nutl use building with Function Area, Change	NOTE: THERE ARE MORE only 10 lines of text will print i rooms and Squash courts - three different stru	SKETCHES ON PAGE 1a ATTACH n this box. If further text requi	ED red use Page 1a)	
1.3 List relevant features (Note: Auti use building with Function Area, Change	NOTE: THERE ARE MORE only 10 lines of text will print i rooms and Squash courts - three different stru	SKETCHES ON PAGE 1a ATTACH n this box. If further text requi	ED red use Page 1a)	
1.3 List relevant features (Note: Null use building with Function Area, Change	NOTE: THERE ARE MORE only 10 lines of text will print i rooms and Squash courts - three different stru	SKETCHES ON PAGE 1a ATTACH n this box. If further text requi	ED red use Page 1a)	
1.3 List relevant features (Note: Auti use building with Function Area, Change	NOTE: THERE ARE MORE : only 10 lines of text will print i rooms and Squash courts - three different stru Tick as appropriate	SKETCHES ON PAGE 1a ATTACH n this box. If further text requi	ED red use Page 1a)	
1.3 List relevant features (Note: Nutl use building with Function Area, Change 1.4 Note information sources Visual Inspection of Exterior Visual Inspection of Interior Drawings (note type)	NOTE: THERE ARE MORE conly 10 lines of text will print i rooms and Squash courts - three different stru Tick as appropriate	SKETCHES ON PAGE 1a ATTACH n this box. If further text requi cture types. Specifications Geotechnical Reports Other (list)	IED red use Page 1a)	



Street Number AKA: Name of buildi Sity:	r & Name: ing:	Hawarden Rugby Rooms Multi Use Build Hawarden	ing			Job No.: By: Date: Revisior	1 1 1 1 1 1 1 1 1	90801 9 Duncan 4/08/2019	
able IEP-2	Initial Ev	aluation Proced	ure Step 2						
tep 2 - Deter	mination of (NBS)							
Baseline (%NBS	6) for particular bu	ilding - refer Section B5))						
.1 Determine	nominal (%NB	5) = (%NBS) _{nom}			Longitudinal	L	1	Transverse	
a) Building St	rengthening Data	1							
Tick if bui	ilding is known to l	have been strengthened	in this direction						
If strengt	hened, enter pero	entage of code the buildi	ng has been strengthened	to	N/A			N/A	
b) Year of Des	ian/Strenathenin	a. Building Type and S	eismic Zone						
,		a,a -)			Pre 1935	0		Pre 1935 ()	
					1935-1965	0		1935-1965 🔾	
					1965-1976	•		1965-1976 💿	
					1976-1984	0		1976-1984 〇	
					1984-1992	0		1984-1992 ()	
					2004-2011	0		2004-2011	
					Post Aug 2011	0	Pos	at Aug 2011 ()	
					ootring Lorr				
			Building Type:	Others		-	Oth	ars	
			Seismic Zone:	Zone B		•	Zon	98	
c) Soil Type Fro	om NZS1170.5:20	04, CI 3.1.3 :		D Soft	Soil	*	DS	oft Soil	
Fre	om NZS4203:1993	2, CI 4.6.2.2 : d only if known)				-			
d) Estimate P	eriod T	,							
Comment				h, =	3			3 m	
				A _c =	3.45]		2.76 m ²	
			47			-			
Moment R	esisting Concrete	Frames:	7 = max{0.09h_0.05, 0.4}		0			0	
Eccentrica	Ilv Braced Steel F	rames:	$T = \max\{0.08h_{*}^{0.75}, 0.4\}$		õ			8	
All Other F	Frame Structures:		7 = max(0.06h_0.75, 0.4)		õ			ŏ	
Concrete S	Shear Walls		7 = max(0.09h_n^{0.75}/ A_c^{0.5}, 0.4	}	•			ŏ	
Masonry S	Shear Walls:		T ≤0.4sec		0			⊙ O	
User Denn	ieu (input Periou).	- height in matter from the he	es of the simplice in the		0			0	
	uppermosi	seismic weight or mass.	se or me structure to the	1	r: 0.40	1	Ι Г	0.40	
						-			
e) Factor A:	Strengthening factor If not strengthened	or determined using result from	(a) above (set to 1.0	Factor A	1.00]		1.00	
f) Factor B:	Determined from N (a) to (e) above	ZSEE Guidelines Figure 3A.1 (using results	Factor E	8: 0.05]	C	0.05	
g) Factor C:	For reinforced cond C = 1.2, otherwise	rete buildings designed betwee take as 1.0.	en 1976-84 Factor	Factor 0	: 1.00]	C	1.00	
h) Factor D:	For buildings desig where Factor D ma	ned prior to 1935 Factor D = 0. y be taken as 1, otherwise take	8 except for Weilington e as 1.0.	Factor D): 1.00]		1.00	
(%NBS) _{nom} =	AxBxCxD			(%NBS) _{no}	m 5%]		5%	
WARNING!! 7 Engineering docun	his initial evaluation h nent "Assessment and in the accompanying	as been carried out solely as a Improvement of the Structure report, and should not be relie	n initial seismic assessment of 1 al Performance of Buildings in E of on by any party for any other	the building foi arthquakes, Ju purpose. Deta	lowing the proced ne 2006". This spi illed inspections of	ure set out in readsheet mu nd engineerin	the New Zeala st be read in co g calculations,	nd Society for Earthque injunction with the or engineering	uake



Initial Evaluation Proced	ure (IEP) Assessment - Complet	ed for {Client/TA}	Page 3
Street Number & Name: AKA: Name of building: City:	Hawarden Rugby Rooms Multi Use Building Hawarden	Job No.: By: Date: Revision	190801 P Duncan 14/08/2019 No.: 0
Table IEP-2 Initial Eva	luation Procedure Step 2 contin	ued	
2.2 Near Fault Scaling Factor, F If T < 1.5sec, Factor E = 1	actor E	Longitudinal	Transverse
a) Near Fault Factor, <i>N</i> (<i>T</i> , <i>D</i>) (from NZ61170.5:2004, C(3.1.5) b) Factor E	= 1/N(T,D)	N(T,D): 1 Factor E: 1.00	1
2.3 Hazard Scaling Factor, Fact a) Hazard Factor, Z, for site	or F		
Location Z 21992 Z ₂₀₀₄	Onternal Image: Control of the second s	e 3.3) from accompanying Figure 3.5(b)) e 3.3)	
For post 2011 For post 2011	$= 1/Z = Z_{1002}/Z = Z_{2004}/Z$	Factor F: 2.50	2.50
2.4 Return Period Scaling Facto a) Design Importance Level, I (Set to 1 if not known. For buildings design building set to 1.25. For buildings design building set to 1.33 for Zone A or 1.2 for 2 b) Design Risk Factor, R ₀ (set to 1.0 if other than 1976-2004, or not	or, Factor G ned prior to 1965 and known to be designed as a public d 1965-1976 and known to be designed as a public one B. For 1976-1984 set I value.) t known)		
c) Return Period Factor, R (from NZS1170.0:2004 Building Importar	ce Level) <u>Choose Importance Le</u>	R₀ = we/ O1 ⊛2 O3 O4 R =	1 ○1 ◎2 ○3 ○4 1.0
d) Factor G	= IR ₀ /R	Factor G: 1.00	1.00
 a) Available Displacement Ductili Comment: 	tor H ty Within Existing Structure	μ =1.25	1.25
b) Factor H	For pre 1976 (maximum of 2) For 1976 onwards	$= \frac{k_{\mu}}{1.14} = \frac{1}{1.14}$ Factor H: 1.14	k _µ 1.14 1.14
2.6 Structural Performance Sca a) Structural Performance Factor (from accompanying Figure 3.4) Tick if light timber-framed const	ling Factor, Factor I , S _p		
b) Structural Performance Scalin Note Factor 8 values for 1992 to 2004 h	g Factor = $1/S_p$ ave been multiplied by 0.67 to account for Sp in this period	S _p = 0.93 Factor I: 1.08	0.93
2.7 Baseline %NBS for Building (equals (%NBS) _{nom} x E x F x (l,(%ANBS)₀ GxHxI)	15%	15%
WARNING!! This initial evaluation has b Engineering document "Assessment and Imp limitations set out in the accompanying repo judgements based on them, have not been a	een carried out solely as an initial seismic assessment of t provement of the Structural Performance of Buildings in E rt, and should not be relied on by any party for any other indertaken, and these may lead to a different result or sei	the building following the procedure set out in t arthquakes, June 2006". This spreadsheet must purpose. Detailed inspections and engineering smic grade.	he New Zealand Society for Earthquake t be read in conjunction with the colculations, or engineering

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PO Box 79183 Avonhead Christchurch 8446 P 0508 FRONTIER (0508 376 684)



eet Number & Name:	Hawarden		J.	ob No :	190801
A:	Rugby Rooms		B	y:	P Duncan
me of building:	Multi Use Building		Di	ate:	14/08/2019
y:	nawargen		R	evision No.:	0
ble IEP-3 Initial Ev	aluation Procedure Step 3				
p 3 - Assessment of Per	formance Achievement Ratio (P	AR)			
fer Appendix B - Section B3.2)		-			
Longitudinal Direction					
tical Structural Weakness	Effect on Structural Performan	nce			Fact
	(Choose a value - Do not interpol	atej			
Plan Irregularity Effect on Structural Performa	ICE O Severe	O Significant		Insignificant	Eactor A 10
Comment		O Olgrinoux		0	
Vertical Irregularity					
Effect on Structural Performa	nce O Severe	O Significant			Factor B 1.0
Comment					
Short Columns					
Effect on Structural Performal Comment	nce O Severe	O Significant		Insignificant	Factor C 1.0
Pounding Potential					
Note: Values given assume the may be reduced by taking	building has a frame structure. For st the coefficient to the right of the valu	iff buildings (eg shea Je applicable to fram	ar walls), the effe e buildings.	ct of pounding	
Note: Values given assume the may be reduced by taking	building has a frame structure. For st the coefficient to the right of the valu	iff buildings (eg shea Je applicable to fram	ar walls), the effe e buildings.	ct of pounding]
Note: Values given assume the may be reduced by taking Table for Selection of	building has a frame structure. For st the coefficient to the right of the valu Factor D1	iff buildings (eg shea le applicable to fram Factor D1 For Lo Severe	ar walls), the effe e buildings. ongitudinal Dire Significant	ct of pounding ection: 1.0 Insignificant]
Note: Values given assume the may be reduced by taking Table for Selection of	building has a frame structure. For st the coefficient to the right of the valu Factor D1 Sep Vignment of Floors within 20% of Storey	iff buildings (eg shea e applicable to fram Factor D1 For Lo Severe aration 0-Sep<.005H Height 0 07	er walls), the effe e buildings. ongitudinal Dire Significant .005 <sep<.01h O 08</sep<.01h 	ct of pounding cction: 1.0 Insignificant Sep=.01H © 1]
Note: Values given assume the may be reduced by taking Table for Selection of	building has a frame structure. For st the coefficient to the right of the valu Factor D1 Sep Nignment of Floors within 20% of Storey	iff buildings (eg shea e applicable to fram Factor D1 For Lo Severe aration 0-Sep<.005H Height 0 07	ar walls), the effe e buildings. ongitudinal Dire Significant .005 <sep<.01h O 08</sep<.01h 	ection: 1.0 Insignificant Sep>.01H © 1	
Note: Values given assume the may be reduced by taking Table for Selection of Align Comment	building has a frame structure. For st the coefficient to the right of the valu Factor D1 Sep Nignment of Floors within 20% of Storey ment of Floors not within 20% of Storey	iff buildings (eg shea le applicable to fram Factor D1 For Lo Severe aration 0 <sep<.005h Height 0 07 Height 0 04</sep<.005h 	ar walls), the effe e buildings. ongitudinal Dire Significant .005 <sep<.01h O 08</sep<.01h 	ct of pounding ection: 1.0 Insignificant Sep>.01H © 1 © 1	
Note: Values given assume the may be reduced by taking Table for Selection of Align Comment b) Factor D2: - Height D	building has a frame structure. For st the coefficient to the right of the valu Factor D1 Sep Nignment of Floors within 20% of Storey ment of Floors not within 20% of Storey	iff buildings (eg shea le applicable to fram Factor D1 For Lo Severe aration 0-Sep<.005H Height 0 0.7 Height 0.4	ar walls), the effe e buildings. ongitudinal Dire Significant .005 <sep<.01h 0 08</sep<.01h 	ct of pounding cction: 1.0 Insignificant Seps.01H © 1 0 08	
Note: Values given assume the may be reduced by taking Table for Selection of Align Comment b) Factor D2: - Height D	building has a frame structure. For st the coefficient to the right of the valu Factor D1 Sep Nignment of Floors within 20% of Storey ment of Floors not within 20% of Storey	iff buildings (eg shea e applicable to fram Factor D1 For Lo Severe aration 0-Sep<.005H Height 0 07 Height 0 04	ar walls), the effe e buildings. ongitudinal Dire Significant .005 <sep<.01h 0 08 0 07</sep<.01h 	ct of pounding ction: 1.0 Insignificant Sep>.01H © 1 © 0.8 ction: 1.0	
Note: Values given assume the may be reduced by taking Table for Selection of Align Comment b) Factor D2: - Height D	building has a frame structure. For st the coefficient to the right of the valu Factor D1 Sep Nignment of Floors within 20% of Storey ment of Floors not within 20% of Storey ifference Effect Factor D2	iff buildings (eg shea le applicable to fram Factor D1 For Lo Severe aration 0-Sep<.005H Height 0 07 Height 0 04 Factor D2 For Lo Severe	ar walls), the effe e buildings. Significant .005 <sep<.01h 0 05 0 07 0 07</sep<.01h 	ection: 1.0 Insignificant Sep>.01H © 1 0 0.5 ection: 1.0 Insignificant	
Note: Values given assume the may be reduced by taking Table for Selection of Align Comment b) Factor D2: - Height D Table for Selection of	building has a frame structure. For st the coefficient to the right of the valu Factor D1 Sep Nignment of Floors within 20% of Storey ment of Floors not within 20% of Storey ifference Effect Factor D2	iff buildings (eg shea le applicable to fram Factor D1 For Lo Severe aration 0-Sep<.005H Height 0 07 Height 0 04 Factor D2 For Lo Severe 0-Sep<.005H	ar walls), the effe e buildings. pogitudinal Direct Significant .005 <sep<.01h O 07 O 07 ongitudinal Direct Significant .005<sep<.01h O 07</sep<.01h </sep<.01h 	ct of pounding ection: 1.0 Insignificant Seps.01H © 1 © 0.5 ection: 1.0 Insignificant Seps.01H O 1	
Note: Values given assume the may be reduced by taking Table for Selection of Align Comment b) Factor D2: - Height D Table for Selection of	building has a frame structure. For st the coefficient to the right of the valu Factor D1 Sep Wignment of Floors within 20% of Storey ment of Floors not within 20% of Storey ifference Effect Factor D2 Height Difference > 4 S Height Difference > 1 4 S	iff buildings (eg shea le applicable to fram Factor D1 For Lo Severe aration 0-Sep<.005H Height 007 Height 004 Factor D2 For Lo Severe 0-Sep<.005H Storeys 004 Storeys 007	ar walls), the effe e buildings. ongitudinal Direct Significant .005 <sep<.01h 0 08 0 07 ongitudinal Direct Significant .005<sep<.01h 0 07 0 09</sep<.01h </sep<.01h 	ection: 1.0 Insignificant Seps.01H © 1 © 0.8 ection: 1.0 Insignificant Seps.01H O 1	
Note: Values given assume the may be reduced by taking Table for Selection of Align Comment b) Factor D2: - Height D Table for Selection of	building has a frame structure. For st the coefficient to the right of the valu Factor D1 Sep Nignment of Floors within 20% of Storey ment of Floors not within 20% of Storey ifference Effect Factor D2 Height Difference > 4.5 Height Difference 2 to 4.5 Height Difference 2 to 4.5	iff buildings (eg shea le applicable to fram Factor D1 For Lo Severe aration 0-Sep<.005H Height 0 07 Height 0 04 Factor D2 For Lo Severe 0-Sep<.005H Storeys 0 07 Storeys 0 1	ar walls), the effe e buildings.	ection: 1.0 Insignificant Sep01H © 1 0.5 ection: 1.0 Insignificant Sep01H O 1 0 1 0 1 0 1	
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Note: Values given assume the may be reduced by taking Table for Selection of Align Comment b) Factor D2: - Height D Table for Selection of .Comment	building has a frame structure. For st the coefficient to the right of the valu Factor D1 Sep Nignment of Floors within 20% of Storey ment of Floors not within 20% of Storey ifference Effect Factor D2 Height Difference > 4.3 Height Difference < 2.3	iff buildings (eg shea le applicable to fram Factor D1 For Lo Severe aration 0-Sep<.005H Height 0 07 Height 0 04 Factor D2 For Lo Severe 0-Sever.005H Storeys 0 07 Storeys 0 07	ar walls), the effe e buildings.	ct of pounding ection: 1.0 Insignificant Seps.01H © 1 © 0.5 ection: 1.0 Insignificant Seps.01H © 1 © 1 © 1 © 1 © 1	Factor D 1.0
Note: Values given assume the may be reduced by taking Table for Selection of Align Comment b) Factor D2: - Height D Table for Selection of Comment Comment Site Characteristics - Stab	building has a frame structure. For st the coefficient to the right of the valu Factor D1 Sep Wignment of Floors within 20% of Storey ment of Floors not within 20% of Storey ifference Effect Factor D2 Height Difference > 4 S Height Difference < 2 S Height Difference < 2 S	iff buildings (eg shea le applicable to fram Factor D1 For Lo Severe aration 0-Sep<.005H Height 0 0.7 Height 0 0.4 Factor D2 For Lo Severe 0-Sep<.005H Storeys 0 0.4 Storeys 0 0.7 Storeys 0 1	ar walls), the effe e buildings.	ct of pounding ction: 1.0 Insignificant Sep=.01H 0 1 cos ction: 1.0 Insignificant Sep=.01H 0 1 cos a life-safety persp	Factor D 1.0
Note: Values given assume the may be reduced by taking Table for Selection of Align Comment b) Factor D2: - Height D Table for Selection of Comment Site Characteristics - Stab Effect on Structural Performa	building has a frame structure. For st the coefficient to the right of the value Factor D1 Sep Nignment of Floors within 20% of Storey ment of Floors not within 20% of Storey ifference Effect Factor D2 Height Difference > 4.5 Height Difference < 2.5 Height Difference < 2.5 Height Difference < 2.5 Height Difference < 2.5	iff buildings (eg shea le applicable to fram Factor D1 For Lo Severe aration 0-Sep<.0D5H Height 0 07 Height 0 04 Factor D2 For Lo Severe 0-Sep<.0D5H Storeys 0 04 Storeys 0 1 it affects the structural (0 Significant	ar walls), the effe e buildings.	ct of pounding ction: 1.0 Insignificant Sep=.01H 0 Insignificant Sep=.01H 0 Insignificant Sep=.01H 0 I sep=.01H I sep=.01	Factor D 1.0
Note: Values given assume the may be reduced by taking Table for Selection of Align Comment b) Factor D2: - Height D Table for Selection of Comment Site Characteristics - Stab Effect on Structural Performa Comment	building has a frame structure. For st the coefficient to the right of the value Factor D1 Sep Nignment of Floors within 20% of Storey ment of Floors not within 20% of Storey ifference Effect Factor D2 Height Difference > 4.3 Height Difference < 2.3 Height Difference < 2.5 Height Difference < 2.5 Height Difference < 2.5	iff buildings (eg shea le applicable to fram Factor D1 For Lo Severe aration 0-Sep<.005H Height 0 07 Height 0 04 Factor D2 For Lo Severe 0-Sep<.005H Storeys 0 04 Storeys 0 07 Storeys 0 1 t affects the structural (0 Significant	ar walls), the effe e buildings.	ct of pounding ection: 1.0 Insignificant Sep=.01H © 1 Cos ection: 1.0 Insignificant Sep=.01H Con Insignificant Sep=.01H Con Insignificant Sep=.01H Con Insignificant Con Insig	Factor D 1.0 Pective Factor E 1.0
Note: Values given assume the may be reduced by taking Table for Selection of Align Comment b) Factor D2: - Height D Table for Selection of Comment Comment Site Characteristics - Stab Effect on Structural Performa Comment	building has a frame structure. For st the coefficient to the right of the valu Factor D1 Sep Wignment of Floors within 20% of Storey ment of Floors not within 20% of Storey ifference Effect Factor D2 Height Difference < 2 S Height Difference < 2 S Height Difference < 2 S Height Difference < 2 S Height Difference < 3 i Height Difference < 4 i Height Difference < 3 i Height Difference < 3 i Height Difference < 4 i Height Difference < 3 i Height Difference < 4 i Height Difference < 4 i Height Difference < 4 i Height Difference < 3 i Height Difference < 4 i Height Differ	iff buildings (eg shea le applicable to fram Factor D1 For Lo Severe aration 0-Sep<.005H Height 0 07 Height 0 04 Factor D2 For Lo Severe 0-Sep<.005H Storeys 0 07 Storeys 0 07 Storeys 0 1 t affects the structural (0 Significant	ar walls), the effe e buildings.	ct of pounding ection: 1.0 Insignificant Seps.01H © 1 Co.5 ection: 1.0 Insignificant Seps.01H O 1 O 1 O 1 O 1 O 1 O 1 O 1 O 1 O 1 O 1	Factor D 1.0 Pective Factor E 1.0
Note: Values given assume the may be reduced by taking Table for Selection of Align Comment b) Factor D2: - Height D Table for Selection of Comment Comment Site Characteristics - Stab Effect on Structural Performa Comment Other Factors - for allowanc Peoper ration of for a box	building has a frame structure. For st the coefficient to the right of the value Factor D1 Sep Wignment of Floors within 20% of Storey ment of Floors not within 20% of Storey interence Effect Factor D2 Height Difference > 4 S Height Difference > 4 S Height Difference < 2 S Height Difference < 2 S Height Difference < 2 S Height Difference < 3 S Height Diffe	iff buildings (eg shea le applicable to fram Factor D1 For Lo Severe aration 0-Sep<.005H Height 0 0.7 Height 0 0.4 Factor D2 For Lo Severe 0-Sep<.005H Storeys 0 0.4 Storeys 0 0.7 Storeys 0 1 t affects the structural j 0 Significant he building Fo	ar walls), the effe e buildings.	ct of pounding ct of pounding ction: 1.0 Insignificant Sep=.01H 0 Insignificant Sep=.01H 0 Insignificant 0 Ins	Factor D 1.0 Pective Factor E 1.0 Factor F 2.5
Note: Values given assume the may be reduced by taking Table for Selection of Align Comment b) Factor D2: - Height D Table for Selection of Comment Site Characteristics - Stab Effect on Structural Performa Comment Comment	building has a frame structure. For st the coefficient to the right of the value Factor D1 Sep Wignment of Floors within 20% of Storey ment of Floors not within 20% of Storey interence Effect Factor D2 Height Difference > 4.5 Height Difference < 2.5 Height Difference < 2.5 Height Difference < 2.5 Height Difference < 2.5 Height Difference < 3.5 Height Difference < 4.5 Height Difference < 3.5 Height Difference < 4.5 Height Difference < 3.5 Height Diffe	iff buildings (eg shea le applicable to fram Factor D1 For Lo Severe aration 0-Sep<.005H Height 0 07 Height 0 04 Factor D2 For Lo Severe 0-Sep<.005H Storeys 0 04 Storeys 0 04 Storeys 0 1 it affects the structural 0 Significant he building Fo	r walls), the effe e buildings.	ct of pounding ct of pounding ction: 1.0 Insignificant Sep.01H 0 Insignificant Sep.01H 0 Insignificant Sep.01H 0 I Insignificant Sep.01H 0 I Insignificant Sep.01H 0 I Insignificant IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Factor D 1.0 pective Factor E 1.0 Factor F 2.5
Note: Values given assume the may be reduced by taking Table for Selection of Align Comment b) Factor D2: - Height D Table for Selection of Comment Site Characteristics - Stab Effect on Structural Performa Comment Other Factors - for allowanc Record rationale for cho Comment	building has a frame structure. For st the coefficient to the right of the value Factor D1 Sep Wignment of Floors within 20% of Storey ment of Floors not within 20% of Storey ifference Effect Factor D2 Height Difference > 4 S Height Difference < 2 S Height Difference < 2 S Height Difference < 2 S Height Difference < 3 S Height Difference < 3 S Height Difference < 3 S Height Difference < 4 S Height Difference < 4 S Height Difference < 3 S Height Diffe	iff buildings (eg shea le applicable to fram. Factor D1 For Lo Severe aration 0-Sep<.005H Height 0 07 Height 0 04 Factor D2 For Lo Severe 0-Sep<.005H Storeys 0 07 Storeys 0 1 t affects the structural (0 Significant he building Fo	er walls), the effe e buildings.	ct of pounding	Factor D 1.0 Peetive Factor E 1.0 Factor F 2.5
Note: Values given assume the may be reduced by taking Table for Selection of Align Comment b) Factor D2: - Height D Table for Selection of Comment Site Characteristics - Stab Effect on Structural Performa Comment Other Factors - for allowanc Record rationale for cho Comment	building has a frame structure. For st the coefficient to the right of the value Factor D1 Sep Wignment of Floors within 20% of Storey ment of Floors not within 20% of Storey ifference Effect Factor D2 Height Difference > 4.5 Height Difference > 4.5 Height Difference < 2.5 Height Difference < 2.5 Height Difference < 2.5 Height Difference < 3.5 Height Difference < 4.5 Height Difference < 4.5 Height Difference < 4.5 Height Difference < 3.5 Height Difference < 4.5 Height Difference < 5 Height D	iff buildings (eg shea le applicable to fram Factor D1 For Lo Severe aration 0-Sep<.005H Height 0 07 Height 0 04 Factor D2 For Lo Severe 0-Sep<.005H Storeys 0 07 Storeys 0 07 Storeys 0 1 t affects the structural (O Significant he building Fo	r valls), the effe e buildings.	ct of pounding ct of pounding ction: 1.0 Insignificant Seps.01H © 1 Co.5 ction: 1.0 Insignificant Seps.01H O 1 O 1 O 1 O 1 O 1 O 1 O 1 O 1 O 1 O 1	Factor D 1.0 Pective Factor E 1.0 Factor F 2.5
Note: Values given assume the may be reduced by taking Table for Selection of Align Comment b) Factor D2: - Height D Table for Selection of Comment Site Characteristics - Stab Effect on Structural Performa Comment Other Factors - for allowand Record rationale for cho Comment Performance Achievemen (equals A x B x C x D x E	building has a frame structure. For st the coefficient to the right of the value Factor D1 Sep Wignment of Floors within 20% of Storey ment of Floors not within 20% of Storey ifference Effect Factor D2 Height Difference > 4 S Height Difference > 4 S Height Difference < 2 S Height Difference < 2 S Height Difference < 2 S Height Difference < 3 S Height Diffe	iff buildings (eg shea le applicable to fram Factor D1 For Lo Severe aration 0-Sep<.005H Height 0 0.7 Height 0 0.4 Factor D2 For Lo Severe 0-Sep<.005H Storeys 0 0.4 Storeys 0 0.7 Storeys 0 1 t affects the structural j 0 Significant he building Fo	r walls), the effe e buildings.	ct of pounding ction: 1.0 Insignificant Sep=.01H 0 1 cos ction: 1.0 Insignificant Sep=.01H 0 1 cos	Factor D 1.0 Pective Factor E 1.0 Factor F 2.5 PAI ongitudinal 2.50



Initial Evaluation Proced	ure (IEP) Assessment - Comp	leted for {CI	ient/TA}		Page 5
Street Number & Name: AKA:	Hawarden Rugby Rooms		Job No. By:	: <u>1</u> 9 P	0801 Duncan
Name of building:	Multi Use Building		Date:	14	1/08/2019
City:	Hawarden		Revisio	n No.: Ö	
Table IEP-3 Initial Eva	luation Procedure Step 3				<u>_</u>
Step 3 - Assessment of Perfo (Refer Appendix B - Section B3.2) b) Transverse Direction	ormance Achievement Ratio (PAR)	1			
Critical Structural Weakness	Effect on Structural Performance (Choose a value - Do not interpolate)				Factors
2.4. Dian lass substitu					
Effect on Structural Performan Comment	ice 🔿 Severe	O Significant	⊙ In	significent	Factor A 1.0
3.2 Vertical Irregularity					
Effect on Structural Performan Comment	ce 🔿 Severe	O Significant	⊙ In:	significant	Factor B 1.0
3.3 Short Columns					
Effect on Structural Performan Comment	ce 🔿 Severe	🔿 Significant	⊛ Ins	significant	Factor C 1.0
 a) Factor D1: - Pounding Effect 	= the lower of the two, or 1.0 if no potent	ial for pounding,	or consequences are o	onsidered to	be minimal)
Note:					
Values given assume the b may be reduced by taking	uilding has a frame structure. For stiff b the coefficient to the right of the value ap	uildings (eg shear plicable to frame	walls), the effect of po buildings.	ounding	
		Factor D1 For T	ransverse Direction:	1.0	
Table for Selection of F	Factor D1	Severe	Significant Insig	nificant	
A	Separativ comment of Floors within 20% of Storey Heio	xn 0 <sep<.005h b⊁ Oo7</sep<.005h 	.005 <sep<.01h se<br="">O 0.0</sep<.01h>	ip⊳.01H ⊚ 1	
~	grinen of Floore mann 2070 of Glorey Freig		• • • •		
Alignr	nent of Floors not within 20% of Storey Heig	ht 004	Q 0.7	0.8	
Comment					
b) Factor D2: - Height Dit	ference Effect				
Table for Selection of L	actor D2	Factor D2 For II	Significant Insig	1.0	
Table for Selector of r		0 <sep<.005h< td=""><td>.005<sep<.01h se<="" td=""><td>p>.01H</td><td></td></sep<.01h></td></sep<.005h<>	.005 <sep<.01h se<="" td=""><td>p>.01H</td><td></td></sep<.01h>	p>.01H	
	Height Difference > 4 Store	/S Q 9.4	Q 9.7 Q	21	
	Height Difference 2 to 4 Store	/8 O 0.7	0.9 0	01	
Comment	Height Difference < 2 Store	ys O1	01 6	01	
Commen					Factor D 1.0
3.5 Site Characteristics - Stabil	ity, landslide threat, liquefaction etc as it aff≘	cts the structural p	erformance from a life-s	afety perspec	tive
Effect on Structural Performan Comment	ice O Severe	⊖ Significant	€ In	significant	Factor E 1.0
		1.r			
3.6 Other Factors - for allowance Record rationale for ch Comment: There is no evident	of all other relevant characterstics of the bu bice of Factor F: ee of damage, but detailed analysis will show	ulding For	3 storeys - Maximum v. otherwise - Maximum v. No minimur r directon	alue 2.5 alue 1.5. n.	Factor F 2.50
					DVD
3.7 Performance Achievement (equals A x B x C x D x E x	Ratio (PAR) F)			Tra	nsverse 2.50
WARNING!! This initial evaluation has I Engineering document "Assessment and Im limitations set out in the accompanying rep based on them, have not been undertained	been carried out solely as an initial seismic assessmer provement of the Structural Performance of Buildings ort, and should not be relied on by any party for any (and these may lead to a different result or seismic and and these may lead to a different result.	t of the building follow in Earthquakes, June other purpose. Detailed	ing the procedure set out in 1 2006". This spreadsheet mus d inspections and engineering	the New Zealand It be read in conj calculations, or	Society for Earthquake unction with the engineering judgements
	, "				



Initial Evaluation Proced	ure (IEP) Assessmen	t - Completed	for {Client/	TA}		Page 6
Street Number & Name: AKA: Name of building: City:	Hawarden Rugby Rooms Multi Use Building Hawarden			Job I By: Date: Revis	No.: sion No.:	190801 P Duncan 14/08/2019 0
Table IEP-4 Initial Eva	luation Procedure St	eps 4, 5 and 6				
Step 4 - Percentage of New B	uilding Standard (%NBS	9	Longi	itudinal		Transverse
4.1 Assessed Baseline (%NBS (from Table IEP - 1)	6) _b		1	5%		15%
4.2 Performance Achievemen (from Table IEP - 2)	t Ratio (PAR)		2	.50		2.50
4.3 PAR x Baseline (%NBS) b			4	0%		40%
4.4 Percentage New Building (Use lower of two values from	Standard (%NBS) om Step 4.3)					40%
Step 5 - Potentially Earthqua	ke Prone? (Mark as appropriate)			%	N BS <u>≤</u> 34	NO
Step 6 - Potentially Earthqual	ke Risk? (Mark as appropriate)			%	NBS < 67	YES
Step 7 - Provisional Grading	for Seismic Risk based o	on IEP		Seisr	nic Grade	с
Additional Comments (items	of note affecting IEP score)					
Evaluatio	n Confirmed by		Sig	nature		
		Peter Duncan	Nan	ne		
Relationship betwee	n Grade and %NBS :	144221	CPI	Eng. No		
Grade:	A+ A	В	С	D	E	1
% NBS:	> 100 100 to 8	30 79 to 67	66 to 34	33 to 20	< 20	1
WARNING!! This initial evaluation has Engineering document "Assessment and Im limitations set out in the accompanying rep judgements based on them, have not been	been carried out solely as an initial se provement of the Structural Performe ort, and should not be relied on by an undertaken, and these may lead to a l	ismic assessment of the t ince of Buildings in Earth γ party for any other pur different result or seismic	uilding following th quakes, June 2006" pose. Detailed inspi grade.	e procedure set a . This spreadshee ections and engin	ut in the New Ze It must be read i eering calculatio	aland Society for Earthquake n conjunction with the ns, or engineering



NZSEE IEP Spreadsheet Version 0.5

reet Number & Name:	Hawarden	loh No :	190801
(A·	Rugby Rooms	Bu:	P Duncan
ame of building:	Multi Use Building	Date:	14/08/2019
tv:	Hawarden	Revision No ·	0
y.	Hawarden	Nevision no	·
able IEP-1a Additio	nal Photos and Sketches		
Add any additional photo	graphs, notes or sketches required below:		
Note: print this page separately			
VARNING!! This initial evaluation I	has been carried out solely as an initial seismic assessment of the bu	ilding following the procedure set out in the New 2	Cealand Society for Earthquake
and the second	i Improvement of the Structural Performance of Buildings in Forths	uakes, June 2006". This spreadsheet must be read	in conjunction with the
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NZSEE IEP Spreadsheet Version 0.5

nitial Evaluation Proced	lure (IEP) Assessment - as been carried out solely as an initial	Completed for {Client/TA	\} ing the procedure set out	Page
society for cartinguake Engineering do must be read in conjunction with the li and engineering calculations, or engine	cument "Assessment and improvemen mitations set out in the accompanying sering judgements based on them, hav	it of the structural Performance of buildin report, and should not be relied on by an ve not been undertaken, and these may le	gs in Earthquakes, June. Iy party for any other pur ad to a different result o	2006 . This spreadsheet pose. Detailed inspections r seismic grade.
treet Number & Name: KA: lame of building: ity:	Hawarden Social Multi Use Building Hawarden		Job No.: By: Date: Revision No.:	190801 P Duncan 14/08/2019 0
able IEP-1 Initial Eva	aluation Procedure Step	01		
tep 1 - General Information	o describe building)			
	actionite banding)			
	NOTE: THERE ARE MO	RE PHOTOS ON PAGE 1a ATTACH	ED	
2 Sketches (plans etc, show i	items of interest)			
	NOTE: THERE ARE MOR	RE SKETCHES ON PAGE 1a ATTAC	HED	
3 List relevant features (Note at use building with Function Area, Change	: only 10 lines of text will prin rooms and Squash courts - three different	nt in this box. If further text requestructure types.	ired use Page 1a)	
4 Note information sources	Tick as appropriate			
Visual inspection of Exterior Visual inspection of interior		Specifications Geotechnical Reports		3
Drawings (note type)		Other (list)		



KA: Social Desc. Pyr. Pyr. Pyr. Pyr. PDure able IEP-2 Initial Evaluation Procedure Step 2 Revision No:: 0 able IEP-2 Initial Evaluation Procedure Step 2 Revision No:: 0 top 2 - Determination of <i>PSMBS</i>) Revision No:: 0 0 able IEP-2 Initial Evaluation Procedure Step 2 Initial Evaluation Procedure Step 3 Initial Evaluation Procedure Step 3 ablemic <i>PMBS</i> (Particle Malling Strengthenic Data Initial Evaluation Transmeter Initial Evaluation Transmeter Initial Evaluation Transmeter a) Building Strengthening. Building Type and Seismic Zone Pre 1935 O 1925-1935 O 1926-1962 O 1926-1962 O b) Year of Design/Strengthening. Building Type and Seismic Zone Pre 1935 O 1926-1962 O 1926-1962 O able Tipe 2 2004 Dime Issue 192 O 2004-001 O 2004-001 O able Tipe 2 2004 Dime Issue 192 O 2004-001 O 2004-001 O able Tipe 2 2004 Dime Issue 192 O 2004-001 O 2004-001 O able Tipe 2 2004 Dime Issue 192 O Issue 192 O 2004-001 O 2004-001 O 2004-001 O <th>0801</th>	0801
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able IEP-3 Initial Eval	uation Procedure Step 3			
tep 3 - Assessment of Perfor Refer Appendix B - Section B3.2)) Longitudinal Direction	rmance Achievement Ratio (P	AR)		
critical Structural Weakness	Effect on Structural Performar (Choose a value - Do not interpole	ice ite)		Factors
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	Alle (IEP) Assessment -	completed for (client		Page 5
Street Number & Name: AKA: Name of building: City:	Hawarden Social Multi Use Building Hawarden		Job No.: By: Date: Revision No.:	190801 P Duncan 14/08/2019 0
Table IEP-3 Initial Ev	aluation Procedure Step	3		
Step 3 - Assessment of Perf (Refer Appendix B - Section B3.2) b) Transverse Direction	ormance Achievement Ratio	(PAR)		
Critical Structural Weakness	Effect on Structural Perform (Choose a value - Do not inter	nance polate)		Factors
3.1 Plan Irregularity Effect on Structural Performa Comment	nce 🔿 Severe	O Significant	⊙ Insignificant	Factor A 1.0
3.2 Vertical Irregularity Effect on Structural Performa Comment	ince 🔘 Severe	O Significant	Insignificant	Factor B 1.0
3.3 Short Columns Effect on Structural Performa Comment	nnce O Severe	🔿 Significant	⊙ Insignificant	Factor C 1.0
A Pounding Potential (Estimate D1 and D2 and set D a) Factor D1: - Pounding Effect Note: Values niven assume the l) = the lower of the two, or 1.0 if no	potential for pounding, or con	sequences are considered	d to be minimal)
may be reduced by taking	the coefficient to the right of the v	Factor D1 For Transv	erse Direction: 1.0] T
Table for Selection of	Factor D1	Severe Sign Separation 0 <sep<.005h .005<<="" td=""><td>ificant Insignificant Sep<.01H Seps.01H</td><td>Ţ</td></sep<.005h>	ificant Insignificant Sep<.01H Seps.01H	Ţ
A	Vignment of Floors within 20% of Sto	rey Height 0 07	0 0.8 ⊗ 1	
Align Comment	ment of Floors not within 20% of Sto	rey Height 004	0.7 00.8	J
h) Easter D2: Unight D				
b) Pactor b2: - Height D	ifference Effect			
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Table for Selection of	ifference Effect Factor D2 Height Difference > Height Difference < Height Difference <	Factor D2 For Transv Severe Sigr 0 <sep<:005h .005<s<br="">4 Storeys 0.94 4 Storeys 0.97 00 2 Storeys 0.1 00</sep<:005h>	erse Direction: 1.0 ificant Insignificant ep<.01H Sep>.01H 0.7 Q 1 1.09 Q 1 1.1 Q 1	
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Table for Selection of Comment	ifference Effect Factor D2 Height Difference > Height Difference 2 to Height Difference <	Factor D2 For Transv Severe Sign 0 <sep<.005h .005<<br="">4 Storeys 0 P4 0 4 Storeys 0 P7 0 2 Storeys 0 1 0</sep<.005h>	erse Direction: 1.0 ifficant Insignificant ep<01H Sep>.01H 9.7 Q 1 109 Q 1 109 Q 1 109 Q 1	Factor D 1.0
Table for Selection of Comment	ifference Effect Factor D2 Height Difference > Height Difference 2 to Height Difference < ility, landslide threat, liquefaction etc. nce O Severe	Factor D2 For Transv Severe Sign 0 <sep<.005h .005<2<br="">4 Storeys 0 94 0 4 Storeys 0 97 0 2 Storeys 0 1 0 as it aflects the structural perform 0 Significant</sep<.005h>	erse Direction: 1.0 ificant Insignificant ep<.01H Sep>.01H 10.7 Q 1 10.9 Q 1 11 11 Q 1 11 11 Q 1 11 11 11 11 11 11 11 11 11	Factor D 1.0
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Initial Evaluation Procedure (IEP) Assessment - Completed for {Client/TA} Page 6 Street Number & Name: Hawarden Job No.: 190801 P Duncan AKA: Social By: _____ Multi Use Building 14/08/2019 Name of building: Date: City: Hawarden 0 Revision No. Table IEP-4 Initial Evaluation Procedure Steps 4, 5 and 6 Step 4 - Percentage of New Building Standard (%NBS) Longitudinal Transverse 4.1 Assessed Baseline (%NBS) b 63% 63% (from Table IEP - 1) 1.50 1.50 4.2 Performance Achievement Ratio (PAR) (from Table IEP - 2) 4.3 PAR x Baseline (%NBS) b 95% 95% 4.4 Percentage New Building Standard (%NBS) 95% (Use lower of two values from Step 4.3) %NBS ≤ 34 NO Step 5 - Potentially Earthquake Prone? (Mark as appropriate) Step 6 - Potentially Earthquake Risk? %NBS < 67 NO (Mark as appropriate) Step 7 - Provisional Grading for Seismic Risk based on IEP Seismic Grade A Additional Comments (items of note affecting IEP score) Social PArt of building considered on its own Evaluation Confirmed by ______Signature Peter Duncan Name 144221 CPEng. No ._____ Relationship between Grade and %NBS: Grade: в С A+ Α D Е % NBS: > 100 100 to 80 79 to 67 66 to 34 33 to 20 < 20 WARNING!! This initial evaluation has been carried out solely as an initial seismic assessment of the building following the procedure set out in the New Zealand Society for Earthquake Engineering document "Assessment and Improvement of the Structural Performance of Buildings in Earthquake, June 2006". This spreadsheet must be read in conjunction with the fimitations set out in the accompanying report, and should not be relied on by any party for any other purpose. Detailed inspections and engineering calculations, or engineering judgements based on them, have not been undertaken, and these may lead to a different result or seismic grade.



	dure (IEP) Assessment - Complete		Page 10
Street Number & Name:	Hawarden	Job No.:	190801
AKA:	Social	By:	P Duncan
Name of building:	Multi Use Building	Date:	14/08/2019
City:	Hawarden	Revision No.:	0
Table IEP-1a Additio	nal Photos and Sketches graphs, notes or sketches required below	v:	
Note: print this page separately			
WARNING!! This initial evaluation h Engineering document "Assessment and limitations set out in the accompanying	as been carried out solely as an initial seismic assessment of the Improvement of the Structural Performance of Buildings in Ear report, and should not be relied on by any party for any other au	building following the procedure set out in the New 2 thquakes, June 2006". This spreadsheet must be read roose. Detailed inspections and engineering calculati	eolond Society for Earthquake in conjunction with the ons, or engineering judgement.



APPENDIX 2 – Photographs



Social Room



Earthquake Damage Critical Structure weakness – squash court





Rust on roof at box gutter



Crack through pf sheet at squash court – timber frame above concrete wall

ATTACHMENT A – Drawings







	This drawing was produced for and remains the property of Frontier Consultants NZ Ltd. This drawing shall not be used in any manner without the prior agreement of Frontier Consultants NZ Ltd. Frontier Consultants NZ Ltd. exceeded and the second	Client	Project Description	Drawn by	RJK	Scale at A3 1:150	Project #	FC19037
cc cc pr Fi	Consularins NZ Lia does not accept any responsibility or liability to any find party as a result of the content contained on this drawing. The Contractor must verify all dimensions on site before – commencing any work or making any shop drawings. Figured dimensions must be taken in preference to scaled dimensions. All dimensions are in millimetres unless noted otherwise. © Frontier Consultants NZ Limited 2018	Project Address 11b Allandale Road, , Hawarden		Design by		Issue Date 26/08/2019	Sheet	A1.1
			Ground Floor Plan	QA by	####	Project Status: Issued for Report	Revision	А
R-11. FC Draughting Elles/Archized Templates/FC. Template V22. Inl Rev Date ##/######								