FYTFIELD PLACE – EOC, PARAPARAUMU

EQ No: 0883

5-C3144.00

INTRODUCTION:

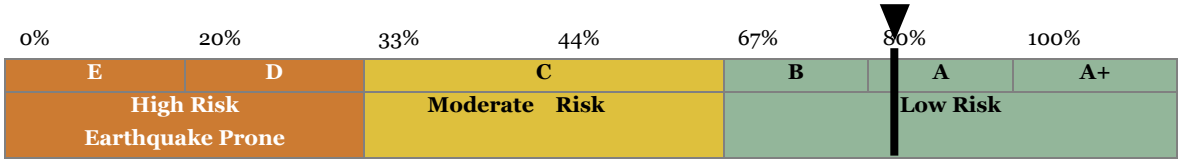
Opus International Consultants Ltd has undertaken an 'Initial Evaluation Procedure' (IEP) of Fytfield Place, Paraparaumu. The evaluation was carried out in accordance with NZ Society of Earthquake Engineering (NZSEE) guidelines. The process includes internal and external non-invasive visual inspections, and an estimation of %NBS using the IEP process.

BUILDING DESCRIPTION:

Building Name:	Kapiti Emergency Operations Centre	**Building Use:**	Emergency Operations Centre
Design/Constructed:	2007	**Importance Level**	4
General Shape:	Rectangular	**No. of Storeys:**	1
Longitudinal Lateral Load Resisting System:	Braced timber framed walls. Multi brace roof and Gib diaphragm bracing	**Transverse Lateral Load Resisting System:**	Braced timber framed walls. Multi brace roof and Gib diaphragm bracing
Foundation System:	Timber, driven timber anchor piles	**Other Level Floor Systems:**	None
Roof System:	Timber frames supporting lightweight cladding	**Primary Cladding Type:**	Hardboard cladding.
Other Comments:	None		

INITIAL EVALUATION PROCEDURE:

Fytfield Place, Kapiti Emergency Operations Centre, is assessed as **85% NBS** when considered as an IL4 building. The building is a low risk and does not require strengthening under the Building Act 2004.



	Longitudinal	Transverse
Baseline %NBS	56%	56%
Factors Influencing Baseline	Age of structure and design	Age of structure and design
Critical Structural Weaknesses	None	None
Modification Factors	1.5	1.5
Influence on Modification Factor	Braced timber framed walls.	Braced timber framed walls.
%NBS	**85% NBS**	**85% NBS**

Prepared by:	Gregory Fitzgerald	**Date:**	21 June 2016
Reviewed by:	Carl Ashby	**CPEng No:**	178762
Released by:	Carl Ashby	**Report Issue:**	Issued

Opus International Consultants Ltd
Wellington Civil
Version: 1 18/01/16

Level 8 Majestic Centre, 100 Willis St
PO Box 12 003, Wellington 6144
New Zealand

Telephone: +64 4 471 7000
Facsimile: +64 4 471 1397
Website: www.opus.co.nz

Initial Evaluation Procedure (IEP) Assessment - Completed for Kapiti Coast District Coun Page 1

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Street Number & Name:	**Fytfield Place**	**Job No.:**	**5C3144.00**
AKA:	**Kapiti Emergency Operations Centre**	**By:**	**GF**
Name of building:		**Date:**	**8/06/2016**
City:	**Paraparaumu**	**Revision No.:**	**0**

Table IEP-1 Initial Evaluation Procedure Step 1

Step 1 - General Information

1.1 Photos (attach sufficient to describe building)

1.2 Sketches (plans etc, show items of interest)

1.3 List relevant features (Note: only 10 lines of text will print in this box. If further text required use Page 1a)

Frame - Timber frames braced with Ply and gib lined walls
Foundations - Timber piles, driven piles
Roof Structure - Timber frame with multi brace and lightweight cladding

Subsoil - Assumed subsoil D based on local conditions

Construction - 2008

1.4 Note information sources Tick as appropriate

Visual Inspection of Exterior	☑	**Specifications**	☐
Visual Inspection of Interior	☐	**Geotechnical Reports**	☐
Drawings (note type)	☑	**Other (list)**	☐

2007 drawings

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Table IEP-2 Initial Evaluation Procedure Step 2

Step 2 - Determination of *(%NBS)*$_b$

(Baseline *(%NBS)* for particular building - refer Section B5)

2.1 Determine nominal *(%NBS)* = *(%NBS)*$_{nom}$

	Longitudinal	Transverse
a) Building Strengthening Data		
Tick if building is known to have been strengthened in this direction	☐	☐
If strengthened, enter percentage of code the building has been strengthened to	N/A	N/A
b) Year of Design/Strengthening, Building Type and Seismic Zone		
Pre 1935	○	○
1935-1965	○	○
1965-1976	○	○
1976-1984	○	○
1984-1992	○	○
1992-2004	○	○
2004-2011	◉	◉
Post Aug 2011	○	○
Building Type:		
Seismic Zone:		
c) Soil Type		
From NZS1170.5:2004, Cl 3.1.3 :	D Soft Soil	D Soft Soil
From NZS4203:1992, Cl 4.6.2.2 : (for 1992 to 2004 and only if known)	Flexible	Flexible
d) Estimate Period, *T*		
Comment:		
h_n =	5	5 m
A_c =	1.00	1.00 m^2
Moment Resisting Concrete Frames: $T = \max\{0.09h_n^{0.75}, 0.4\}$	○	○
Moment Resisting Steel Frames: $T = \max\{0.14h_n^{0.75}, 0.4\}$	○	○
Eccentrically Braced Steel Frames: $T = \max\{0.08h_n^{0.75}, 0.4\}$	○	○
All Other Frame Structures: $T = \max\{0.06h_n^{0.75}, 0.4\}$	◉	◉
Concrete Shear Walls $T = \max\{0.09h_n^{0.75}/A_c^{0.5}, 0.4\}$	○	○
Masonry Shear Walls: $T \leq 0.4$sec	○	○
User Defined (input Period):	○	○
Where h_n = height in metres from the base of the structure to the uppermost seismic weight or mass.	**T:** 0.40	0.40
e) Factor A: Strengthening factor determined using result from (a) above (set to 1.0 if not strengthened)	**Factor A:** 1.00	1.00
f) Factor B: Determined from NZSEE Guidelines Figure 3A.1 using results (a) to (e) above	**Factor B:** 1.00	1.00
g) Factor C: For reinforced concrete buildings designed between 1976-84 Factor C = 1.2, otherwise take as 1.0.	**Factor C:** 1.00	1.00
h) Factor D: For buildings designed prior to 1935 Factor D = 0.8 except for Wellington where Factor D may be taken as 1, otherwise take as 1.0.	**Factor D:** 1.00	1.00
***(%NBS)*$_{nom}$ = AxBxCxD**	***(%NBS)*$_{nom}$** 100%	100%

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Initial Evaluation Procedure (IEP) Assessment - Completed for Kapiti Coast District Council Page 3

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Table IEP-2 Initial Evaluation Procedure Step 2 continued

2.2 Near Fault Scaling Factor, Factor E

If $T \leq 1.5$sec, Factor E = 1

		Longitudinal	Transverse
a) Near Fault Factor, *N(T,D)* (from NZS1170.5:2004, Cl 3.1.6)	**N(T,D):**	1	1
b) Factor E = 1/N(T,D)	**Factor E:**	1.00	1.00

2.3 Hazard Scaling Factor, Factor F

a) Hazard Factor, *Z*, for site

Location: Paraparaumu **Refer right for user-defined locations**

Z =	0.4	(from NZS1170.5:2004, Table 3.3)
Z_{1992} =	1.2	(NZS4203:1992 Zone Factor from accompanying Figure 3.5(b))
Z_{2004} =	0.4	(from NZS1170.5:2004, Table 3.3)

b) Factor F

For pre 1992	=	$1/Z$
For 1992-2011	=	Z_{1992}/Z
For post 2011	=	Z_{2004}/Z

Factor F: 1.00 | 1.00

2.4 Return Period Scaling Factor, Factor G

a) Design Importance Level, I

(Set to 1 if not known. For buildings designed prior to 1965 and known to be designed as a public building set to 1.25. For buildings designed 1965-1976 and known to be designed as a public building set to 1.33 for Zone A or 1.2 for Zone B. For 1976-1984 set I value.)

I = 1 | 1

b) Design Risk Factor, R_o

(set to 1.0 if other than 1976-2004, or not known)

R_o = 1 | 1

c) Return Period Factor, R

(from NZS1170.0:2004 Building Importance Level)

Choose Importance Level ○ 1 ○ 2 ○ 3 ◉ 4 | ○ 1 ○ 2 ○ 3 ◉ 4

R = 1.8 | 1.8

d) Factor G = IR_o/R

Factor G: 0.56 | 0.56

2.5 Ductility Scaling Factor, Factor H

a) Available Displacement Ductility Within Existing Structure

Comment:

Lined timber framed walls both directions

μ = 2.00 | 2.00

b) Factor H

		k_μ	k_μ
For pre 1976 (maximum of 2)	=	1.57	1.57
For 1976 onwards	=	1	1

Factor H: 1.00 | 1.00

(where k_μ is NZS1170.5:2004 Inelastic Spectrum Scaling Factor, from accompanying Table 3.3)

2.6 Structural Performance Scaling Factor, Factor I

a) Structural Performance Factor, S_p

(from accompanying Figure 3.4)

Tick if light timber-framed construction in this direction ☑ | ☑

S_p = 0.50 | 0.50

b) Structural Performance Scaling Factor = $1/S_p$ **Factor I:** 1.00 | 1.00

Note Factor B values for 1992 to 2004 have been multiplied by 0.67 to account for Sp in this period

2.7 Baseline *%NBS* for Building, *(%NBS)*$_b$
(equals ***(%NBS)*$_{nom}$ x E x F x G x H x I**)

56% | **56%**

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Initial Evaluation Procedure (IEP) Assessment - Completed for Kapiti Coast District Council Page 4

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Table IEP-3 Initial Evaluation Procedure Step 3

Step 3 - Assessment of Performance Achievement Ratio (PAR)
(Refer Appendix B - Section B3.2)

a) Longitudinal Direction

potential CSWs — **Effect on Structural Performance** (Choose a value - Do not interpolate) — **Factors**

3.1 Plan Irregularity
Effect on Structural Performance ○ Severe ○ Significant ◉ Insignificant — **Factor A** 1.0
NA

3.2 Vertical Irregularity
Effect on Structural Performance ○ Severe ○ Significant ◉ Insignificant — **Factor B** 1.0
NA

3.3 Short Columns
Effect on Structural Performance ○ Severe ○ Significant ◉ Insignificant — **Factor C** 1.0
NA

3.4 Pounding Potential
(Estimate D1 and D2 and set D = the lower of the two, or 1.0 if no potential for pounding, or consequences are considered to be minimal)

a) Factor D1: - Pounding Effect

Note:
Values given assume the building has a frame structure. For stiff buildings (eg shear walls), the effect of pounding may be reduced by taking the coefficient to the right of the value applicable to frame buildings.

Factor D1 For Longitudinal Direction: 1.0

Table for Selection of Factor D1	Severe	Significant	Insignificant
	Separation 0<Sep<.005H	.005<Sep<.01H	Sep>.01H
Alignment of Floors within 20% of Storey Height	○ 1	○ 1	◉ 1
Alignment of Floors not within 20% of Storey Height	○ 0.4	○ 0.7	○ 0.8

NA

b) Factor D2: - Height Difference Effect

Factor D2 For Longitudinal Direction: 1.0

Table for Selection of Factor D2	Severe	Significant	Insignificant
	0<Sep<.005H	.005<Sep<.01H	Sep>.01H
Height Difference > 4 Storeys	○ 0.4	○ 0.7	○ 1
Height Difference 2 to 4 Storeys	○ 0.7	○ 0.9	○ 1
Height Difference < 2 Storeys	○ 1	○ 1	◉ 1

NA

Factor D 1.0

3.5 Site Characteristics - *Stability, landslide threat, liquefaction etc as it affects the structural performance from a life-safety perspective*

Effect on Structural Performance ○ Severe ○ Significant ◉ Insignificant — **Factor E** 1.0
None

3.6 Other Factors - *for allowance of all other relevant characterstics of the building* — **Factor F** 1.5
For ≤ 3 storeys - Maximum value 2.5
otherwise - Maximum value 1.5.
No minimum.

Record rationale for choice of Factor F:
Lined timber framed walls, braced with ply and gib linings designed as EOC

3.7 Performance Achievement Ratio (PAR)
(equals **A x B x C x D x E x F**)

PAR
Longitudinal **1.50**

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Table IEP-3 Initial Evaluation Procedure Step 3

Step 3 - Assessment of Performance Achievement Ratio (PAR)
(Refer Appendix B - Section B3.2)

b) Transverse Direction

Factors

potential CSWs — **Effect on Structural Performance** (Choose a value - Do not interpolate)

3.1 Plan Irregularity
Effect on Structural Performance ○ Severe ○ Significant ◉ Insignificant — **Factor A** 1.0
NA

3.2 Vertical Irregularity
Effect on Structural Performance ○ Severe ○ Significant ◉ Insignificant — **Factor B** 1.0
NA

3.3 Short Columns
Effect on Structural Performance ○ Severe ○ Significant ◉ Insignificant — **Factor C** 1.0
NA

3.4 Pounding Potential
(Estimate D1 and D2 and set D = the lower of the two, or 1.0 if no potential for pounding, or consequences are considered to be minimal)

a) Factor D1: - Pounding Effect

Note:
Values given assume the building has a frame structure. For stiff buildings (eg shear walls), the effect of pounding may be reduced by taking the coefficient to the right of the value applicable to frame buildings.

Factor D1 For Transverse Direction: 1.0

Table for Selection of Factor D1	Severe 0<Sep<.005H	Significant .005<Sep<.01H	Insignificant Sep>.01H
Separation			
Alignment of Floors within 20% of Storey Height	○ 1	○ 1	◉ 1
Alignment of Floors not within 20% of Storey Height	○ 0.4	○ 0.7	○ 0.8

NA

b) Factor D2: - Height Difference Effect

Factor D2 For Transverse Direction: 1.0

Table for Selection of Factor D2	Severe 0<Sep<.005H	Significant .005<Sep<.01H	Insignificant Sep>.01H
Height Difference > 4 Storeys	○ 0.4	○ 0.7	○ 1
Height Difference 2 to 4 Storeys	○ 0.7	○ 0.9	○ 1
Height Difference < 2 Storeys	○ 1	○ 1	◉ 1

NA

Factor D 1.0

3.5 Site Characteristics - *Stability, landslide threat, liquefaction etc as it affects the structural performance from a life-safety perspective*

Effect on Structural Performance ○ Severe ○ Significant ◉ Insignificant — **Factor E** 1.0
None

3.6 Other Factors - *for allowance of all other relevant characterstics of the building* — **Factor F** 1.50

For ≤ 3 storeys - Maximum value 2.5
otherwise - Maximum value 1.5.
No minimum.

Record rationale for choice of Factor F:
Lined timber framed walls, braced with ply and gib linings designed as EOC

PAR

3.7 Performance Achievement Ratio (PAR) (equals **A x B x C x D x E x F**) — **Transverse** **1.50**

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Table IEP-4 Initial Evaluation Procedure Steps 4, 5, 6 and 7

Step 4 - Percentage of New Building Standard *(%NBS)*

		Longitudinal	Transverse
4.1	**Assessed Baseline *%NBS (%NBS)*$_b$** (from Table IEP - 1)	56%	56%
4.2	**Performance Achievement Ratio (PAR)** (from Table IEP - 2)	1.50	1.50
4.3	**PAR x Baseline *(%NBS)*$_b$**	85%	85%
4.4	**Percentage New Building Standard *(%NBS)*** (Use lower of two values from Step 4.3)		85%

Step 5 - Potentially Earthquake Prone? (Mark as appropriate) ***%NBS* ≤ 34** NO

Step 6 - Potentially Earthquake Risk? (Mark as appropriate) ***%NBS* < 67** NO

Step 7 - Provisional Grading for Seismic Risk based on IEP

Seismic Grade A

Additional Comments (items of note affecting IEP score)

Relationship between Grade and *%NBS*:

Grade:	A+	A	B	C	D	E
%NBS:	> 100	100 to 80	79 to 67	66 to 34	33 to 20	< 20

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Table IEP-5 Initial Evaluation Procedure Step 8

Step 8 - Identification of potential Severe Critical Structural Weaknesses that could result in significant risk to a significant number of occupants

8.1	Number of storeys above ground level	1
8.2	Presence of heavy concrete floors and/or concrete roof? (Y/N)	N

Occupancy not considered to be significant - no further consideration required

Risk not considered to be significant - no further consideration required

IEP Assessment Confirmed by  **Signature**

Carl Ashby **Name**

178762 **CPEng. No**

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Initial Evaluation Procedure (IEP) Assessment - Completed for Kapiti Coast District Council Page 1a

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Table IEP-1a Additional Photos and Sketches