

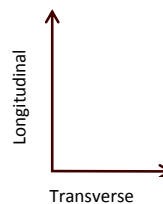
Initial Evaluation Procedure(IEP) Assessment - Colliers**Page 1**

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Street Number & Name:	4 Glover Street	Job No.:	21009
AKA:		By:	GMS
Name of building:	Glover Court	Date:	14/12/2016
City:	Wellington	Revision No.:	1

Table IEP-1 Initial Evaluation Procedure Step 1**Step 1 - General Information****1.1 Photos (attach sufficient to describe building)**

NOTE: THERE ARE MORE PHOTOS ON PAGE 1a ATTACHED

1.2 Sketches (plans etc, show items of interest)

NOTE: THERE ARE MORE SKETCHES ON PAGE 1a ATTACHED

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

Building is an industrial warehouse complex consisting of 9 units.
 The structure is a combination of portal frames for hipped roofs and braced bays for monoslope roofs. Internally, block walls are used as bracing elements.
 Some units contain timber framed mezzanine floors which are lightweight and self bracing, using either cross bracing or cantilever columns.

1.4 Note information sources

Tick as appropriate

Visual Inspection of Exterior
 Visual Inspection of Interior
 Drawings (note type)

☒
☒
☒

Specifications
 Geotechnical Reports
 Other (list)

☐
☐
☐

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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}

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

Longitudinal

Transverse

☐☐

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 ☐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 :

From NZS4203:1992, Cl 4.6.2.2 :

(for 1992 to 2004 and only if known)

d) Estimate Period, T

Comment:

h_n = 6.22A_c = 1.00

6.22 m

1.00 m²

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:

 $T \leq 0.4\text{sec}$ ☒

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: 0.32

0.32

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} 32%

32%

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Table IEP-2 Initial Evaluation Procedure Step 2 continued

2.2 Near Fault Scaling Factor, Factor E

If $T \leq 1.5\text{sec}$, Factor E = 1a) Near Fault Factor, $N(T,D)$

(from NZS1170.5:2004, Cl 3.1.6)

Longitudinal

N(T,D): 1

Transverse

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: Wellington

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: 2.50

2.50

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

R = 0.5

☒ 1 ☐ 2 ☐ 3 ☐ 4

0.5

d) Factor G

 $= IR_o/R$

Factor G: 2.00

2.00

2.5 Ductility Scaling Factor, Factor H

a) Available Displacement Ductility Within Existing Structure

Comment:

 $\mu = 2.00$

2.00

b) Factor H

For pre 1976 (maximum of 2)

For 1976 onwards

 $k_{\mu} = 1.57$
 $= 1$

Factor H: 1.00

 $k_{\mu} = 1.57$
 $= 1$

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

☐
 $S_p = 0.70$ ☐
0.70

b) Structural Performance Scaling Factor

 $= 1/S_p$

Factor I: 1.43

1.43

Note Factor B values for 1992 to 2004 have been multiplied by 0.67 to account for S_p in this period2.7 Baseline %NBS for Building, (%NBS)_b(equals (%NBS)_{nom} x E x F x G x H x I)

227%

227%

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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 0.4
Two or more wings. Note this approach considered possibly conservative as the wings are more like individual buildings.		
3.2 Vertical Irregularity		
Effect on Structural Performance ☐ Severe ☐ Significant ☒ Insignificant		Factor B 1.0
Comment		
3.3 Short Columns		
Effect on Structural Performance ☐ Severe ☐ Significant ☒ Insignificant		Factor C 1.0
Comment		
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 0<Sep<.005H	Significant .005<Sep<.01H	Insignificant 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
Comment			

b) Factor D2: - Height Difference Effect

Factor D2 For Longitudinal 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
Comment			

Factor D

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 0.7
Land slips known to have occurred at this site.	

3.6 Other Factors - for allowance of all other relevant characteristics of the building

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

Factor F

Record rationale for choice of Factor F:

Land slip effects considered to unfairly penalise this building.

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

PAR
Longitudinal

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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☐ InsignificantFactor A

Two or more wings. Note this approach considered possibly conservative as the wings are more like individual building.

3.2 Vertical Irregularity

Effect on Structural Performance ☐ Severe☐ Significant☒ InsignificantFactor B

Comment

3.3 Short Columns

Effect on Structural Performance ☐ Severe☐ Significant☒ InsignificantFactor C

Comment

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:

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

Comment

b) Factor D2: - Height Difference Effect

Factor D2 For Transverse Direction:

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

Comment

Factor D

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☐ InsignificantFactor E

Land slips known to have occurred at this site.

3.6 Other Factors - for allowance of all other relevant characteristics of the building

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

Record rationale for choice of Factor F:

Land slip effects considered to unfairly penalise this building.

3.7 Performance Achievement Ratio (PAR)

(equals A x B x C x D x E x F)

PAR

Transverse

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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)	227%	227%
4.2 Performance Achievement Ratio (PAR) (from Table IEP - 2)	0.34	0.34
4.3 PAR x Baseline (%NBS) _b	75%	75%
4.4 Percentage New Building Standard (%NBS) (Use lower of two values from Step 4.3)		75%

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

B

Additional Comments (items of note affecting IEP score)

The score seems reasonable based on previous experience assessing relatively light weight steel frame buildings.

Evaluation Confirmed by I. P. Black Signature

Ignatius Black

Name

259219

CPEng. No

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

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Initial Evaluation Procedure(IEP) Assessment - Colliers

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Table IEP-1a Additional Photos and Sketches

Add any additional photographs, notes or sketches required below:

Note: print this page separately



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