Appendix D: Seismic – Initial Evaluation Procedure

Initial Evaluation Procedure (IEP) Assessment - Completed for WDC

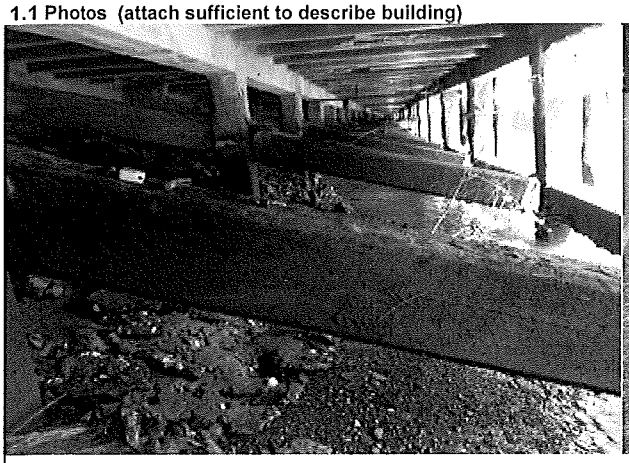
WARNING!! *This initial evaluation has been carried out solely as an initial seismic assessment of the building following the procedure set out in the New Zealand Society for Earthquake Engineering document "Assessment and Improvement of the Structural Performance of Buildings in Earthquakes, June 2006". This spreadsheet must be read in conjunction with the limitations 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.*

Street Number & Name:		Job No.:	851847
AKA:		By:	DRV
Name of building:	Whakatane Commercial Wharf - 1919 section	Date:	12/12/2014
City:	Whakatane	Revision No.:	1

Table IEP-1 Initial Evaluation Procedure Step 1

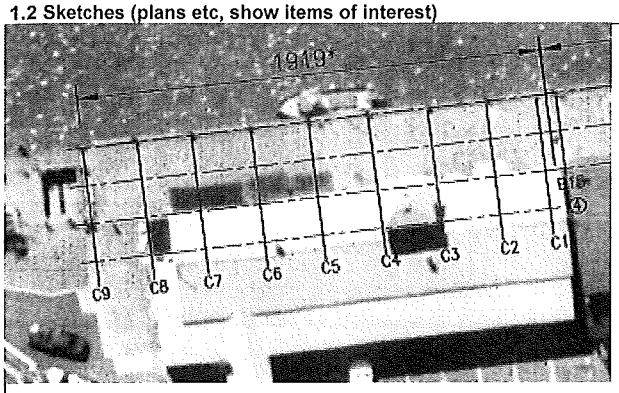
Step 1 - General Information

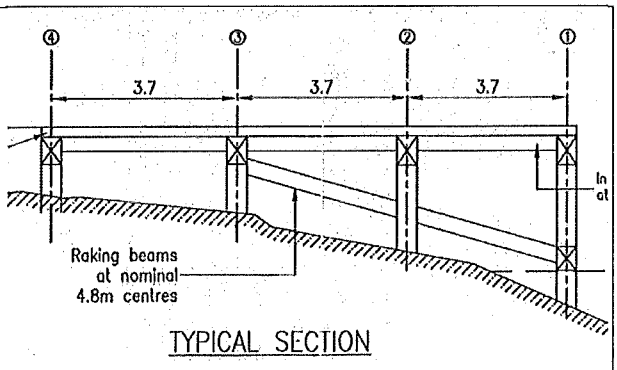
1.1 Photos (attach sufficient to describe building)



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)

Reinforced concrete wharf constructed in 1919. The wharf deck between gridlines 3 and 4 is currently supporting a 1-2 storey building.
NOTE: This assessment assumes that the wharf has been repaired to reinstate spalled / cracked concrete and replace corroded reinforcing bars.

1.4 Note information sources Tick as appropriate

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

Non-invasive condition survey on 5 November 2014 by Tonkin & Taylor. 2009 condition survey report by Opus.

Initial Evaluation Procedure (IEP) Assessment - Completed for WDC

Street Number & Name:		Job No.:	851847
AKA:		By:	DRV
Name of building:	Whakatane Commercial Wharf - 1919 section	Date:	12/12/2014
City:	Whakatane	Revision No.:	1

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:	Public Buildings	Public Buildings
Seismic Zone:		
c) Soil Type		
From NZS1170.5:2004, Cl 3.1.3 :	C Shallow Soil	C Shallow Soil
From NZS4203:1992, Cl 4.6.2.2 : (for 1992 to 2004 and only if known)		
d) Estimate Period, *T*		
Comment: Primary lateral load resisting system in the longitudinal direction is moment resisting concrete frames. Frames are braced transversely.		
h_n =	2.5	2.5 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	0.10
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: 0.04	0.04
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: 0.80	0.80
(%NBS)$_{nom}$ = AxBxCxD	*(%NBS)*$_{nom}$ 3%	3%

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Initial Evaluation Procedure (IEP) Assessment - Completed for WDC

Street Number & Name:		Job No.:	851847
AKA:		By:	DRV
Name of building:	Whakatane Commercial Wharf - 1919 section	Date:	12/12/2014
City:	Whakatane	Revision No.:	1

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: Whakatane

Z =	0.3	(from NZS1170.5:2004, Table 3.3)
Z_{1992} =	1.175	(NZS4203:1992 Zone Factor from accompanying Figure 3.5(b))
Z_{2004} =	0.3	(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

	Longitudinal	Transverse
Factor F:	3.33	3.33

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.)

	Longitudinal	Transverse
I =	1.25	1.25

b) Design Risk Factor, R_o (set to 1.0 if other than 1976-2004, or not known)

	Longitudinal	Transverse
R_o =	1	1

c) Return Period Factor, R (from NZS1170.0:2004 Building Importance Level)

Choose Importance Level: ○1 ○2 ◉3 ○4 (Longitudinal) ○1 ○2 ◉3 ○4 (Transverse)

	Longitudinal	Transverse
R =	1.3	1.3

d) Factor G = IR_o/R

	Longitudinal	Transverse
Factor G:	0.96	0.96

2.5 Ductility Scaling Factor, Factor H

a) Available Displacement Ductility Within Existing Structure

Comment:

	Longitudinal	Transverse
μ =	1.25	1.25

b) Factor H

	k_μ Longitudinal	k_μ Transverse
For pre 1976 (maximum of 2) =	1.14	1.04
For 1976 onwards =	1	1
Factor H:	1.14	1.04

(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

	Longitudinal	Transverse
S_p =	0.93	0.93

b) Structural Performance Scaling Factor = $1/S_p$

	Longitudinal	Transverse
Factor I:	1.08	1.08

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)

Longitudinal	Transverse
11%	10%

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Initial Evaluation Procedure (IEP) Assessment - Completed for WDC

Street Number & Name:		Job No.:	851847
AKA:		By:	DRV
Name of building:	Whakatane Commercial Wharf - 1919 section	Date:	12/12/2014
City:	Whakatane	Revision No.:	1

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

Critical Structural Weakness	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
3.2 Vertical Irregularity				
Effect on Structural Performance	○ *Severe*	○ *Significant*	◉ *Insignificant*	Factor B 1.0
No evidence of vertical irregularity.				
3.3 Short Columns				
Effect on Structural Performance	○ *Severe*	○ *Significant*	◉ *Insignificant*	Factor C 1.0
No evidence of short columns.				

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	○ 0.7	○ 0.8	◉ 1
Alignment of Floors not within 20% of Storey Height	○ 0.4	○ 0.7	○ 0.8

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

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

This assessment assumes no risk of liquefaction at the site. This would need to be confirmed during detailed assessment.

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

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

Factor F 1.0

Record rationale for choice of Factor F:

No other CSWs noted. No evidence to justify any enhancement of the PAR.

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

	PAR
Longitudinal	1.00

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Initial Evaluation Procedure (IEP) Assessment - Completed for WDC

Street Number & Name:		Job No.:	851847
AKA:		By:	DRV
Name of building:	Whakatane Commercial Wharf - 1919 section	Date:	12/12/2014
City:	Whakatane	Revision No.:	1

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

Critical Structural Weakness	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
Unequal pile lengths will induce some torsional response, but not considered to be a significant plan irregularity.				
3.2 Vertical Irregularity				
Effect on Structural Performance	○ *Severe*	○ *Significant*	◉ *Insignificant*	Factor B 1.0
No evidence of vertical irregularity.				
3.3 Short Columns				
Effect on Structural Performance	○ *Severe*	○ *Significant*	◉ *Insignificant*	Factor C 1.0
No evidence of short columns.				

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

No buildings nearby.

b) Factor D2: - Height Difference Effect

Factor D2 For Transverse 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

No buildings nearby.

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

This assessment assumes no risk of liquefaction at the site. This would need to be confirmed during detailed assessment.

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

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

Factor F 1.00

Record rationale for choice of Factor F:

No other CSWs noted. No evidence to justify any enhancement of the PAR.

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

PAR
Transverse 1.00

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 Earthquakes, June 2006". This spreadsheet must be read in conjunction with the limitations 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.*

Initial Evaluation Procedure (IEP) Assessment - Completed for WDC

Street Number & Name:		Job No.:	851847
AKA:		By:	DRV
Name of building:	Whakatane Commercial Wharf - 1919 section	Date:	12/12/2014
City:	Whakatane	Revision No.:	1

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 $(\%NBS)_b$ (from Table IEP - 1)	11%	10%
4.2	Performance Achievement Ratio (PAR) (from Table IEP - 2)	1.00	1.00
4.3	PAR x Baseline $(\%NBS)_b$	10%	10%
4.4	Percentage New Building Standard *(%NBS)* (Use lower of two values from Step 4.3)		10%

Step 5 - Potentially Earthquake Prone? (Mark as appropriate) *%NBS* ≤ 34 — YES

Step 6 - Potentially Earthquake Risk? (Mark as appropriate) *%NBS* < 67 — YES

Step 7 - Provisional Grading for Seismic Risk based on IEP

Seismic Grade: E

Additional Comments (items of note affecting IEP score)

1.The wharf is currently in a poor state of repair. This assessment assumes that the wharf has been repaired to reinstate spalled / cracked concrete and replace corroded reinforcing bars.
2. it has been assumed that the wharf was designed as a 'public building'. This increases the IEP score by a factor of 1.25 (factor 'G') as public buildings were designed to higher loadings than other buildings.
3. Soil site class C has been assumed, based on T&T's experience of sites in the vicinity of the wharf. However, no site investigation at the wharf site has been undertaken. This may be required if a detailed assessment is undertaken.

Evaluation Confirmed by ..... Signature

Geoff Radley Name

171865 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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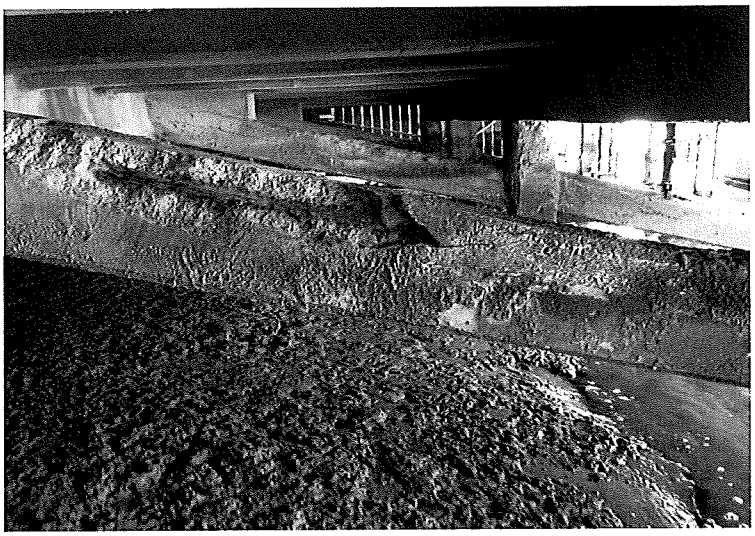
Initial Evaluation Procedure (IEP) Assessment - Completed for WDC

Street Number & Name:		Job No.:	851847
AKA:		By:	DRV
Name of building:	Whakatane Commercial Wharf - 1919 section	Date:	12/12/2014
City:	Whakatane	Revision No.:	1

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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Initial Evaluation Procedure (IEP) Assessment - Completed for WDC

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Street Number & Name:		Job No.:	851847
AKA:		By:	DRV
Name of building:	Whakatane Commercial Wharf - 1936 & 1940 sections	Date:	12/12/2014
City:	Whakatane	Revision No.:	1

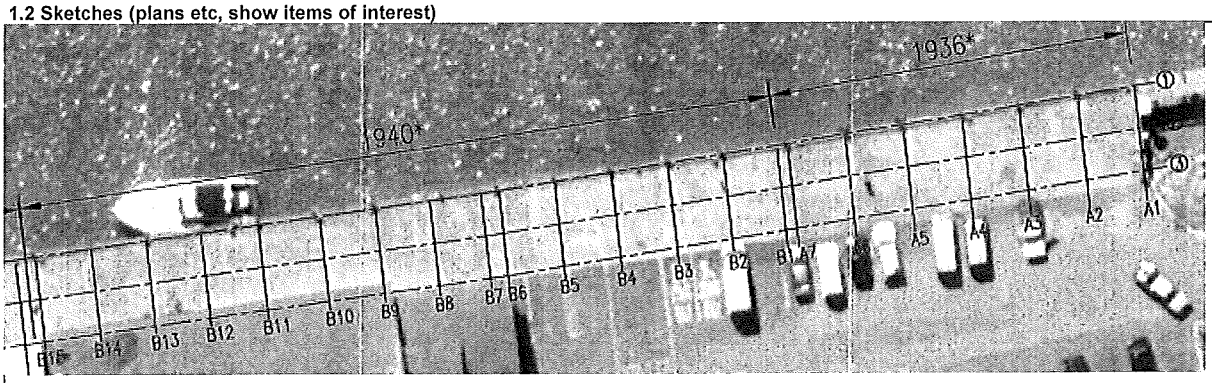
Table IEP-1 Initial Evaluation Procedure Step 1

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)

Reinforced concrete wharf constructed in 1936 (section A) and 1940 (section B). 1-2 storey buildings are located on grade, immediately behind the 1940 section of the wharf.
NOTE: This assessment assumes that the wharf has been repaired to reinstate spalled / cracked concrete and replace corroded reinforcing bars

1.4 Note Information sources Tick as appropriate

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

Non-invasive condition survey on 5 November 2014 by Tonkin & Taylor. 2009 condition survey report by Opus.

Initial Evaluation Procedure (IEP) Assessment - Completed for WDC

Street Number & Name:		Job No.:	851847
AKA:		By:	DRV
Name of building:	Whakatane Commercial Wharf - 1936 & 1940 sections	Date:	12/12/2014
City:	Whakatane	Revision No.:	1

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:	Public Buildings	Public Buildings
Seismic Zone:		
c) Soil Type		
From NZS1170.5:2004, Cl 3.1.3 :	C Shallow Soil	C Shallow Soil
From NZS4203:1992, Cl 4.6.2.2 : (for 1992 to 2004 and only if known)		
d) Estimate Period, *T*		
Comment: Primary lateral load resisting system in the longitudinal direction is moment resisting concrete frames. Frames are braced transversely.	h_n = 2.5	2.5 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	0.10
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: 0.04	0.04
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)*$_{nom}$ 4%**	4%

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Initial Evaluation Procedure (IEP) Assessment - Completed for WDC

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AKA:		By:	DRV
Name of building:	Whakatane Commercial Wharf - 1936 & 1940 sections	Date:	12/12/2014
City:	Whakatane	Revision No.:	1

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: Whakatane

Z =	0.3	(from NZS1170.5:2004, Table 3.3)
Z_{1992} =	1.175	(NZS4203:1992 Zone Factor from accompanying Figure 3.5(b))
Z_{2004} =	0.3	(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

	Longitudinal	Transverse
Factor F:	3.33	3.33

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.)

	Longitudinal	Transverse
I =	1.25	1.25

b) Design Risk Factor, R_o (set to 1.0 if other than 1976-2004, or not known)

	Longitudinal	Transverse
R_o =	1	1

c) Return Period Factor, R (from NZS1170.0:2004 Building Importance Level)

	Longitudinal	Transverse
Choose Importance Level	○1 ○2 ◉3 ○4	○1 ○2 ◉3 ○4
R =	1.3	1.3

d) Factor G = IR_o/R

	Longitudinal	Transverse
Factor G:	0.96	0.96

2.5 Ductility Scaling Factor, Factor H

a) Available Displacement Ductility Within Existing Structure

Comment:

	Longitudinal	Transverse
μ =	1.25	1.25

b) Factor H

		k_μ Longitudinal	k_μ Transverse
For pre 1976 (maximum of 2)	=	1.14	1.04
For 1976 onwards	=	1	1
Factor H:		1.14	1.04

(where $k\mu$ 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

	Longitudinal	Transverse
	☐	☐
S_p =	0.93	0.93

b) Structural Performance Scaling Factor = $1/S_p$

	Longitudinal	Transverse
Factor I:	1.08	1.08

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)

Longitudinal	Transverse
14%	13%

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Initial Evaluation Procedure (IEP) Assessment - Completed for WDC

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AKA:		By:	DRV
Name of building:	Whakatane Commercial Wharf - 1936 & 1940 sections	Date:	12/12/2014
City:	Whakatane	Revision No.:	1

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

Critical Structural Weakness	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
3.2 Vertical Irregularity				
Effect on Structural Performance	○ *Severe*	○ *Significant*	◉ *Insignificant*	Factor B 1.0
3.3 Short Columns				
Effect on Structural Performance	○ *Severe*	○ *Significant*	◉ *Insignificant*	Factor C 1.0

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	○ 0.7	○ 0.8	◉ 1
Alignment of Floors not within 20% of Storey Height	○ 0.4	○ 0.7	○ 0.8

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

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

This assessment assumes no risk of liquefaction at the site. This would need to be confirmed during detailed assessment.

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

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

Factor F 1.0

Record rationale for choice of Factor F:
No other CSWs noted. No evidence to justify any enhancement of the PAR.

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

PAR
Longitudinal 1.00

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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

Critical Structural Weakness — **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

Unequal pile lengths will induce some torsional response, but not considered to be a significant plan irregularity.

3.2 Vertical Irregularity

Effect on Structural Performance ○ *Severe* ○ *Significant* ◉ *Insignificant* Factor B: 1.0

No evidence of vertical irregularity

3.3 Short Columns

Effect on Structural Performance ○ *Severe* ○ *Significant* ◉ *Insignificant* Factor C: 1.0

No evidence of short columns

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

No buildings nearby.

b) Factor D2: - Height Difference Effect

Factor D2 For Transverse 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

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

This assessment assumes no risk of liquefaction at the site. This would need to be confirmed during detailed assessment.

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

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

Factor F: 1.00

Record rationale for choice of Factor F:

No other CSWs noted. No evidence to justify any enhancement of the PAR.

3.7 Performance Achievement Ratio (PAR)

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

PAR

Transverse: 1.00

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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 $(\%NBS)_b$ (from Table IEP - 1)	14%	13%
4.2	Performance Achievement Ratio (PAR) (from Table IEP - 2)	1.00	1.00
4.3	PAR x Baseline $(\%NBS)_b$	15%	15%
4.4	Percentage New Building Standard *(%NBS)* (Use lower of two values from Step 4.3)		15%

Step 5 - Potentially Earthquake Prone? *%NBS* ≤ 34 — YES
(Mark as appropriate)

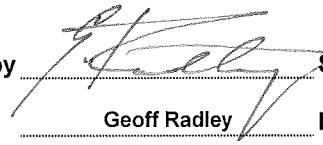
Step 6 - Potentially Earthquake Risk? *%NBS* < 67 — YES
(Mark as appropriate)

Step 7 - Provisional Grading for Seismic Risk based on IEP

Seismic Grade: E

Additional Comments (items of note affecting IEP score)

1.The wharf is currently in a poor state of repair. This assessment assumes that the wharf has been repaired to reinstate spalled / cracked concrete and replace corroded reinforcing bars.
2. it has been assumed that the wharf was designed as a 'public building'. This increases the IEP score by a factor of 1.25 (factor 'G') as public buildings were designed to higher loadings than other buildings.
3. Soil site class C has been assumed, based on T&T's experience of sites in the vicinity of the wharf. However, no site investigation at the

Evaluation Confirmed by  Signature

Geoff Radley Name

171865 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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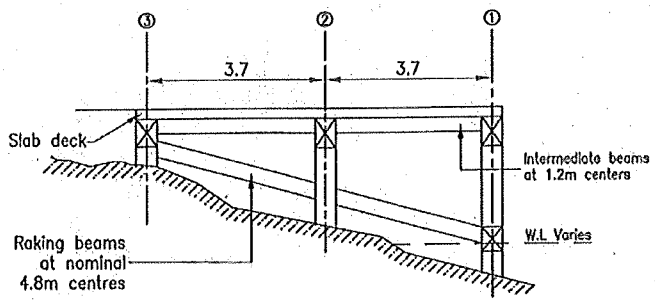
Table IEP-1a Additional Photos and Sketches

Add any additional photographs, notes or sketches required below:

Note: print this page separately



TYPICAL SECTION
1936 to 1940
Scale 1:100

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