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9th November 2011

Building Consents and Licensing Services
Wellington City Council
PO Box 2199,
WELLINGTON 6140

Attention: Ryan Fraser

Dear Ryan

RE: SIESMIC ASSESSMENT REPORT, BUILDING A, 41 BUCKLE STREET (SR224676)

We enclose for your reference a copy of the recently completed Seismic Assessment of the Carillon Tower completed by Dunning Thornton Consultants. This assessment has been completed as a result of the Potentially Earthquake Prone Building Notice (SR224676) issued to the Ministry for Culture and Heritage relating to the Carillon Tower at the National War Memorial, 41 Buckle Street, Wellington (PT SEC 1266 TOWN OF WELLINGTON).

We wish to advise Wellington City Council that design works towards the seismic strengthening of this building are currently being undertaken by Dunning Thornton Consultants, with a building consent lodgement for these works expected prior to the 2011 Christmas break.

We further wish to advise Wellington City Council that works on a seismic assessment of building B (the adjacent Hall of Memories, SR224677) is scheduled to be completed early in 2012 and as agreed in discussions between Paul Brimer of Dunning Thornton and yourselves, this report will then also be provided to the council.

We trust the attached is satisfactory. We look forward to lodging our consent for approval and request any enquiries relating to these works be directed towards either Phill Stanley (04 495 5281) in the first instance or the writer.

Yours sincerely,
THE BUILDING INTELLIGENCE GROUP

Nick Axten
ASSISTANT PROJECT MANAGER

Enclosed:
1. Seismic Assessment of Carillon Tower for the Ministry of Culture and Heritage, Dunning Thornton Consultants

Seismic Assessment of Carillon Tower for the Ministry of Culture and Heritage

Contents

1 Introduction

This report has been prepared for the Ministry of Culture and Heritage to provide information and recommendations regarding the seismic performance of the carillon tower at the National War Memorial.

1.1 Background

The carillon tower was built circa 1931 on Buckle Street, Wellington. The 45 metre tower was originally designed by Gummer & Ford Ltd and took into consideration seismic actions. Additional reinforcing steel was added on this account, and the original drawings detail an "earthquake and settlement joint" separating the carillon tower from the adjacent Hall of Memories.

Some seismic upgrading has been undertaken previously. This involved the installation of structural steel chevron braces in the upper section of the tower.

1.2 Scope

The scope of this report is understood to be simplified assessments of the tower to ascertain its ultimate limit state seismic performance relative to an equivalent new building. Our review has been largely limited to considering the primary structure.

We have not included any allowance for reduced strength due to corroded reinforcing steel as sufficient information to quantify this is not yet available. Similarly, we have had to make the assumption that the bell frame assembly is rigid relative to the tower, negating any influence that oscillation of the bell frames may have.

1.3 Structural Fabric

The tower is a monolithic reinforced concrete shell with large openings in the upper section. Floor-to-floor heights vary up the tower and the floors themselves are reinforced concrete slabs with a large access opening in the centre. These openings are well trimmed by reinforced concrete beams.

Plain round reinforcing bars have been used throughout, limiting the structure's capability to withstand repeated cyclic deformations (i.e. earthquake actions). However, the reinforcing is exceptionally well detailed and this adds an inherent robustness to the lower section of the tower.

The original drawings show the tower to be separated from its foundations. This means that the foundations offer no resistance to the tower's natural tendency to "uplift" under lateral loading. This limits the stress on the tower itself and this 'rocking' behaviour is beneficial in this respect.

2 Seismic Performance

The National War Memorial is of high value to the community and accordingly we consider the tower to be an importance level 3 building (R=1.3) as defined by NZS 1170.1. Therefore our assessment is based on a seismic event with a 1/1000 probability of exceedence. This importance level was also adopted in the initial evaluation procedure (IEP) used by Wellington City Council to determine its potential status.

We have assessed the tower using a displacement-based approach instead of a traditional force-based approach because it is more suitable for rocking structures. The tower is relatively bare (i.e. no ceilings, partitions or furnishings) and we have reduced the typical damping (energy dissipation) assumed to take this into account.

2.1 Summary

Our assessment of the tower leads us to believe that it can sustain rocking behaviour but its performance is limited by two primary failure mechanisms. The first mechanism identified is a partial collapse of the upper section of the tower (Figure 1a). This mechanism was previously addressed by the installation of the structural steel braces, however these braces buckle at a low load level relative to new building standard. This mechanism limits the performance of the tower to 30-35% of new building standard (NBS).

The second mechanism is failure of the wall sections above and below the window/door openings in the lower section of the tower (Figure 1b). These sections of wall have very little horizontal reinforcing steel, leading to 'unzipping' (separation) of the tower into two halves and significant, rapid degradation of strength. Should the first failure mechanism be addressed, this mechanism would limit the performance of the tower to 50-60% NBS.

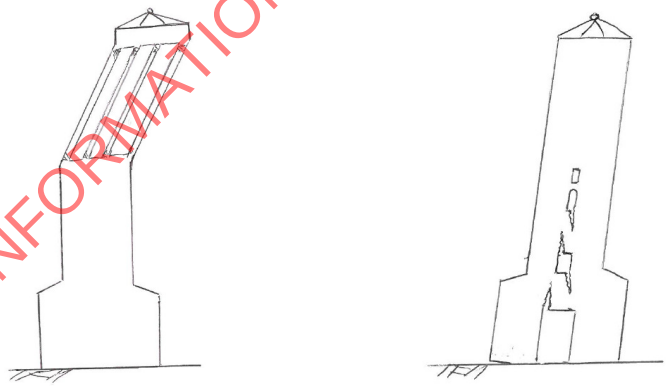

Figure 1: Identified failure mechanisms – (a) instability of upper section of tower; (b) unzipping of lower section of tower.

2.2 Primary Structure

As well as the damage to primary structural elements already described, we expect other primary elements to sustain damage at varying intensities of seismic demand. Damage to these items does not limit the tower's overall seismic capacity, however we believe this information should be provided to help develop the full picture.

The level five and level six balconies are supported off reinforced concrete perimeter beams. We anticipate that these beams would display significant structural damage at 30-40% and 70-80% NBS, respectively. However, the damage to these elements does not limit the performance of the tower as a whole,

and we anticipate that the balconies would remain tied into the tower.

We have reviewed the reinforced concrete floor beams and believe that they can maintain their load-bearing capacity to 100% NBS. Some cracking would most likely occur but the reinforcing and detailing is such that the beams can flex with the tower.

2.3 Secondary Elements

There are several secondary elements that should be considered in an assessment of the tower. At this stage, only the unreinforced masonry (URM) partitions have been reviewed. The other items described below are either outside the scope of this report or there is insufficient information to review.

a. Carillon Bells and Support Frame

The large mass of the bells means that they pose a risk to life within the structure should they come loose from their support frame, or the support frame fail. Furthermore, as the bells make up a significant proportion of the tower's mass they have the potential to shift the tower's centre of mass should they come loose. We recommend that an assessment of the bells' support/restraint is undertaken to quantify this risk.

b. Unreinforced Masonry (Brick) Partitions

There are a few URM partitions on the fifth level of the tower. These pose a risk to life within the structure and therefore limit the structure's performance to 11% NBS.

c. Stonework

Limited information has been available regarding the restraint of the stonework around the base of the tower. It is likely that veneer ties were added/replaced when the tower was re-clad in the early 1980's. We believe that this should be investigated further as falling stone potentially poses a risk to individual life outside the structure.

d. Precast Concrete Screens

A review of the original drawings shows that the precast screens (Figure 2) are built into rebates in the surrounding concrete work. This provides good restraint under face loads while the screens and surrounding concrete remain un-cracked. The screens are a stiff element within the relatively-flexible upper tower; this leads to significant cracking under a design level earthquake and degradation of the screens, possibly affecting their restraint under face loads. It is difficult to quantify the risk of falling concrete with the information currently available.

Figure 2: Precast concrete screens in the upper belfry.

3 Matters for Consideration

Our assessment of the carillon tower has demonstrated that it should be defined as an earthquake prone building, requiring seismic improvement work to be undertaken. However, we believe that decisions regarding seismic improvement work on the tower should take into account other key areas.

3.1 Heritage Value

The National War Memorial is of high value from both a heritage and community aspect. As such we consider that a building of this prominence should aim to achieve seismic performance that is as near as reasonably practical to new building standard (i.e. 100% NBS). The two key weaknesses identified in our assessment of the tower need to be addressed regardless of whether 67% or 100% NBS is being targeted, as a result a higher target strength is unlikely to mean a noticeably higher construction cost.

Further to this, our assessment has led us to believe that the tower has inherent characteristics that would allow seismic improvement works to be designed using damage-mitigation principles. This would greatly reduce the risk of the tower requiring deconstruction after a design level event, allowing its community and heritage values to be preserved.

3.2 Hall of Memories and Steps

Although outside scope, we are aware that Wellington City Council has advised that they consider the Hall of Memories to be potentially earthquake prone. The capacity of this building is heavily dependent on its cantilevered retaining walls, which are unlikely to have been designed for seismic loading. The completion of a detailed engineering assessment would allow any possible seismic improvement work to be taken into consideration.

Similarly, the retaining walls that are used to create the steps and landscaped area were unlikely to have been designed for seismic loading. Strictly speaking, these do not endanger the building, therefore we expect that any assessment or improvement would be at the discretion of the property owner.

3.3 Durability

The structural skeleton of the tower has a known history of corrosion to its structural steel and reinforced concrete elements. Repairs and the target level of seismic improvement work should consider the expected remaining life of the existing primary structural elements.

3.4 Access Stair Upgrade

Currently there is access stair upgrade work scheduled for early 2012. To avoid doubling up access and site establishment costs it may be prudent to complete a partial seismic upgrade as part of the access upgrade. We envisage this would involve strengthening the existing structural steel braces and addressing the URM partitions.

3.5 Accepted Risk

It should be understood that it is extremely difficult to restrain every individual brick and stone within the tower. This means that regardless of the level of seismic improvement undertaken, there is always an accepted risk to individual life from small, individual pieces of falling masonry.

In determining the target level for seismic performance it is perhaps important to understand the consequence associated with 'failure' of the tower. The consequences of a complete and total overturning failure would be significant. We believe that it would be appropriate for any improvement works to make the lower tower stronger than the upper tower, thereby allowing a partial collapse of the tower which acts as a 'fuse' to prevent complete overturning – that is to say, if the upper tower is improved to 67% NBS, the lower tower should ideally be improved to at least 80% NBS.

With regard to the bell frames, a detailed assessment may find that retrofit work is required to improve their seismic performance. Consideration would need to be given to the effects this may have on the tune of the bells. An increased level of risk may have to be accepted to ensure the continuing functionality of the instrument.

4 Recommendations

4.1 Further Investigation

We would recommend that further investigation is undertaken with regard to secondary elements. Specifically, the presence of veneer ties in the stonework around the base of the tower should be confirmed.

A detailed review of the bell support frames should also be completed. This would require copies of the original drawings or a thorough site measure. We recommend that the scope of our engagement is extended to include this review.

An estimate of the remaining useful life of the structure should be obtained from a specialist materials engineer. The remaining life of the primary structure should be taken into account when determining the level of seismic improvement.

4.2 Detailed Analysis

Our current review leads us to believe that further detailed analysis would not remove the tower from its earthquake-prone status. Resources would best be directed towards an interim seismic upgrade that could be undertaken in conjunction with the access upgrade works, allowing the tower's earthquake-prone status to be withdrawn.

4.3 Seismic Improvement

a. Full Seismic Upgrade

It is not difficult to improve the tower's seismic performance to 67% of new building standard by optimising the current seismic behaviour of the tower. Using the same approach, increasing the target performance from 67% to 100% NBS could be achieved without a significant cost premium – requiring only a modest increase in construction effort. Included in this report is a sketch (Figure 3) indicating the type of work we expect would be required to achieve either 67% or 100% NBS.

We have also included a second sketch (Figure 4) indicating the type of work we expect would be required for a damage-mitigation design to achieve either 67% or 100% NBS. A damage-mitigation design would reduce the costs of repairs to primary structural elements following a major seismic event. The major cost in most seismic improvement work is the removal and making good of finishes. The making good work required for this alternative is similar to that required for the conventional strengthening; meaning the benefits of damage-mitigation design can be attained without a significant cost premium. Moreover, the energy dissipation this could include would reduce the stress on secondary elements and corrosion-damaged primary elements.

The level and type of seismic improvement works should take into account the remaining life of the structure. Although slightly arbitrary, we suggest that 25 years is a useful "line in the sand" because this is where NZS 1170 marks the boundary between risk associated with a 1/500 event (R=1.0) and risk associated with a 1/1000 event (R=1.3). Assuming three possible outcomes from the assessment of the corrosion, we recommend the seismic improvement described in Table 1.

Table 1: Recommendations for seismic improvement work

Remaining life of primary structure with maintenance	Recommended seismic improvement work
5 years	Short-term securing to 40% NBS
25 years	Conventional strengthening to 67% NBS
50 years	Damage-mitigation strengthening to 100% NBS

b. Short Term Securing

To avoid having the carillon tower categorised as earthquake prone by WCC we recommend that interim strengthening work is undertaken in conjunction with the access improvement work. This would involve adding steel plating to the structural steel braces in the upper tower and addressing the URM partitions. The quantity and arrangement of the steel plating should be designed to achieve the target strength of the eventual full upgrade. The URM partitions could either be strengthened with steel mullions or removed and replaced with lightweight partitions. The proposed work could be detailed and implemented relatively quickly to match the programme of the access work.

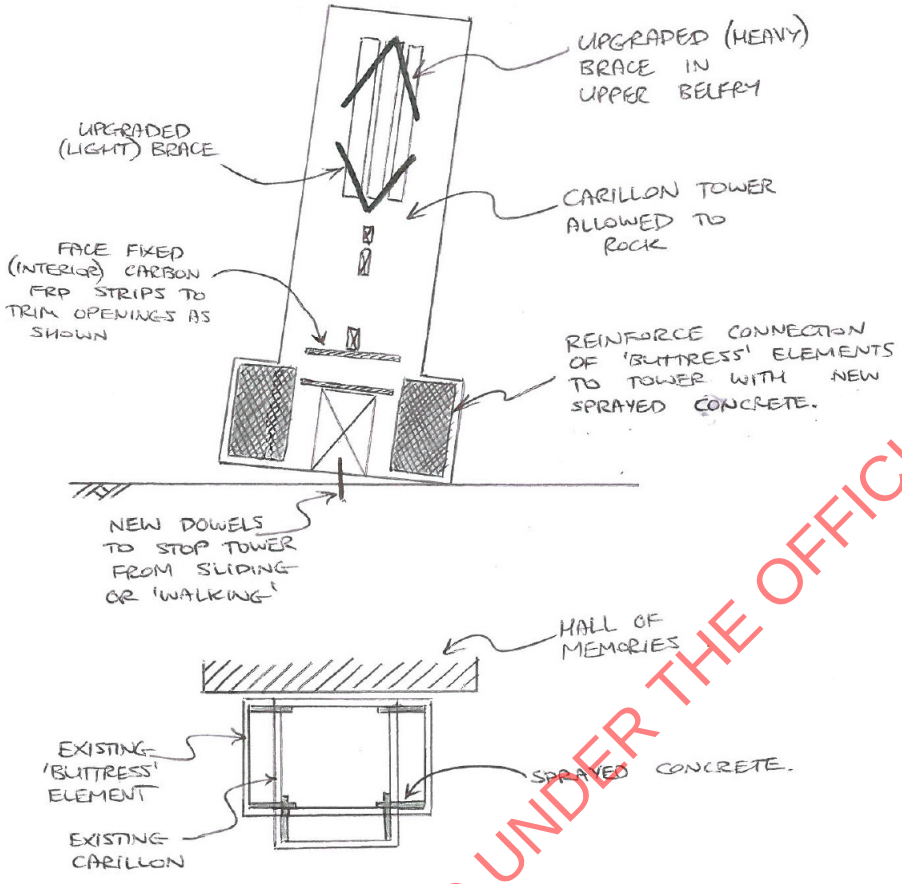

Figure 3: Conventional structural strengthening.

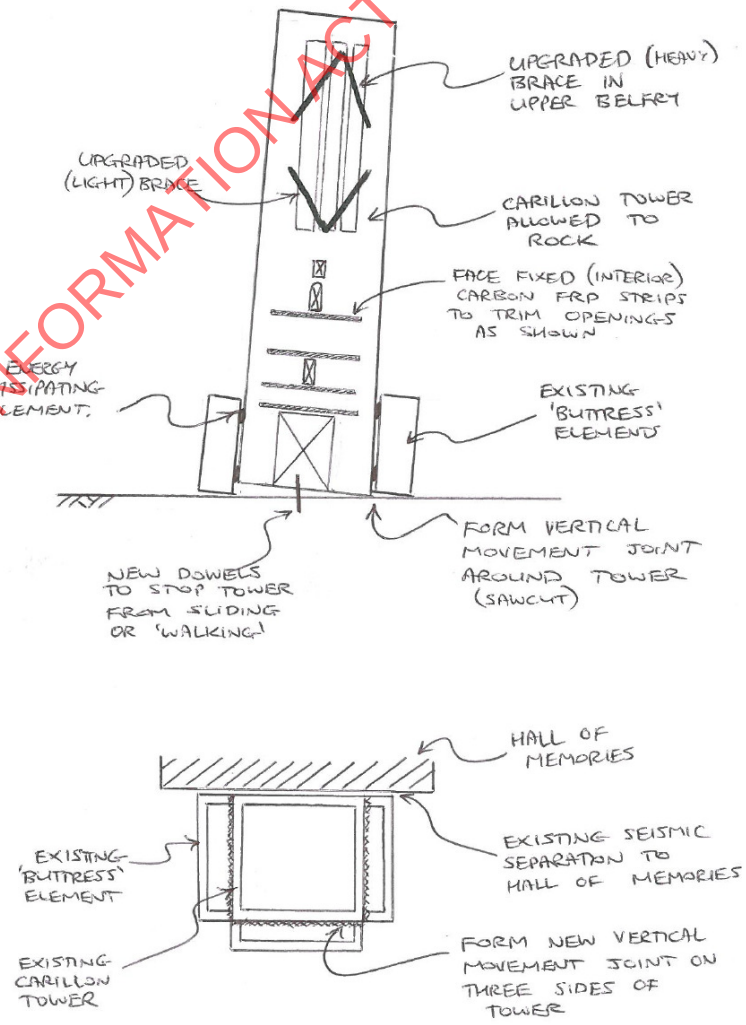

Figure 4: Alternative structural strengthening – damage mitigation

Dunning Thornton consultants

Ref: 6825 L14

24 February 2017

Ministry of Culture & Heritage
PO Box 5364
WELLINGTON
Attention: Brodie Stubbs

Dear Brodie,

Carillon Bell Frames – Detailed Seismic Assessment

We are pleased to submit a proposal to complete a Detailed Seismic Assessment (DSA) of the bell frames within the carillon tower at the National War Memorial.

The bell frames are 'structures within a structure' and there are two possible approaches that can be taken for completing a DSA. The first (option one) is a linear static analysis, and the second (option two) is a non-linear dynamic analysis.

Option one follows the simplified method contained within the Building Code, and is generally considered to be a conservative approach. The loads prescribed by the Code for 'structures within a structure' are high – in the order of three times the bell frames' mass acting sideways on the frames – and we expect that the analysis would conclude the frames have a capacity that is less than 34% of New Building Standards (NBS).

Option two would be considered an Alternative Solution to the Building Code, and would require the tower structure to be modelled in its entirety. This analysis method is generally considered to be more accurate, and would probably conclude a greater '%NBS', however it might still conclude that the capacity is less than 34% NBS. This analysis method requires specialist skills and experience from the engineer, and uses a more complex software package. Accordingly, this type of analysis takes more time and requires additional fees.

It is worth noting that the analysis completed for option two would be re-used and form part of the design process for possible future retrofit of the bell frame and/or lower carillon tower. This analysis would require peer review if it were required to form part of a building consent application.

We strongly recommend option two. This is because we believe it will reduce the scope (and cost) of construction work associated with any future seismic retrofit. The more-detailed analysis work is essentially an investment in the building that we expect would pay for itself in the long term.

Consulting Structural Engineers
94 Dixon Street, PO Box 27-153, Wellington 6141
Telephone (644) 385-0019, E-Mail: dtcwgtn@dunningthornton.co.nz

Our proposal has allowed for assessing the bell frames as far as their connection to the carillon tower's concrete structure, and both options also include a limited re-evaluation of the tower to determine what effect the bell frames have on its overall seismic performance. It is worth noting that the analysis completed for Option two could be re-used and form part of the design process for possible retrofit of the lower section of the carillon tower.

We have supplied proposed fees and time frames for both analysis options. For us to complete the analysis we require the following information:

- Detailed as-built structural drawings of the bell frames. We understand that Steel Iconz Ltd have previously completed this work. If new steel elements have been added during the recent maintenance work then these drawings might need to be updated.
- A schedule of the bells, including each bell's location, mass/weight, height and diameter at the base of the bell.
- Geotechnical parameters regarding soil stiffness below the tower's foundations (Option two only). Tonkin and Taylor provided geotechnical advice for the Hall of Memories strengthening and the Arras Tunnel, so would be best placed to provide this information. We would be happy to liaise with them direct to obtain a proposal for this work. If you wished us to seek a second proposal, then we would suggest ENGEO.

1.0 Scope of Engineering Services

1.1 Analysis Phase

- Adaption of Steel Iconz's as-built drawings into a structural analysis model.
- Assuming the structure is in as-new condition (i.e. no corrosion), complete calculations/analysis to establish the performance of the bell frames relative to New Building Standard with respect to seismic and gravity loads.

1.2 Review Phase

- Determine which elements of the bell frame are the most critical to its strength, and review the current insitu condition of these elements with respect to corrosion.
- Establish (approximately) the current '%NBS' taking into consideration the condition of critical elements. This would be an approximation, not a full schedule of the condition of each element.

1.3 Reporting Phase

- Provide a written report on the above with sufficient detail to allow a high-level peer review if required.
- Update our previous seismic assessment report for the carillon structure such that all the building information is in one report.
- Provide guidance on which elements should be prioritised for corrosion repairs.
- If required, prepare two or three options for retrofit of the bell frames to an agreed %NBS. These options would be to a feasibility 'sketch' design level and allow a Quantity Surveyor to establish a Rough Order of Cost. This does not include new options for the tower itself.
- Discussion of report and retrofit options with MCH or their representative.

2.0 Conditions of Engagement

We would treat this as an extension to our current engagement for the Carillon (our reference 6825 L04).

Our fees do not include an allowance for any other consultants (e.g. geotechnical engineer) that may be required to completed the work. We have allowed to manage/liaise with other consultants, but their engagement would be direct to MCH.

3.0 Professional Liability

The liability of the consultant to the client in respect of our services shall be limited in accordance with our existing engagement (ACENZ short form). We have professional indemnity insurance in place to cover this amount. We advise that we exclude any liability on any matters relating to Asbestos or contaminated ground.

4.0 Payment and Timing

4.1 Analysis Phase

Option one (Linear static analysis) – Lump sum fee of $9(2)(b)(ii) plus GST payable on a monthly pro rata basis during the analysis phase. Due to our current heavy workload, we would be unable to commence this work until mid-April. Once underway, we expect this to take approximately four weeks to complete.

Or

9(2)(b)(ii)

Option two (Non-linear dynamic analysis) – Lump sum fee of $[redacted] plus GST payable on a monthly pro rata basis during the analysis phase. Due to our current heavy workload we would be unable to commence this work until mid-April. Once underway, we expect this to take approximately eight weeks to complete.

4.2 Review Phase

9(2)(b)(ii)

Lump sum fee of $[redacted] plus GST payable at completion of the reporting phase. We expect this to take one to two weeks following the analysis.

4.3 Reporting Phase

9(2)(b)(ii)

Lump sum fee of $[redacted] plus GST payable at completion of the reporting phase. We expect this to be complete within two to three weeks following the analysis.

4.4 Work Beyond Scope of Work (with prior agreement of client)

On a time basis;

Director	[redacted] /hour plus GST
Senior Design Engineer	/hour plus GST
Design Engineer	/hour plus GST
Senior CAD Operator	/hour plus GST
CAD Operator	/hour plus GST
Disbursements at cost	9(2)(b)(ii)

Please note that the timing above is valid until 10 March 2017, after which it shall be subject to review. We will also require prompt input from a geotechnical engineer if we are to maintain the timing described above. Additionally, the fees outlined above are valid for six months from the date of this letter, after which they shall be subject to review.

We trust that this provides the information that you require. We would be happy to discuss any aspect of our submission.

Yours faithfully

Matt Davies
SENIOR ENGINEER
170214 PDB

Consulting Structural Engineers
94 Dixon Street, PO Box 27-153, Wellington 6141
Telephone (644) 385-0019, E-Mail: dtcwgtn@dunningthornton.co.nz

14 August, 2017

Absolutely Positively
Wellington City Council
Me Heke Ki Pōneke

Ministry for Culture and Heritage
PO Box 5364
Wellington 6140

Service request No. 224676

New national earthquake-prone building legislation

Site address: 41 BUCKLE STREET (Bldg - A - National War Memorial - Bell Tower)

Dear Sir/Madam

The Government introduced the Building (Earthquake-prone Buildings) Amendment Act on 1 July this year. The aim of this Act is to introduce a nationally consistent approach to how earthquake-prone (EQP) buildings are assessed and managed.

Previously Wellington City Council had been issuing earthquake-prone building notices (under section 124 of the Building Act 2004) via its own system. The new national system replaces the Council's existing earthquake system. Most things are similar but there are new clauses which may affect you as a building owner. Below is a brief outline of some of these changes.

1) **Changes to timeframes:**

There are different time frames for buildings to be assessed and upgraded, in different parts of the country depending on the earthquake risk. In high-risk areas, like the east coast of the North Island and west coast of the South Island, strengthening or demolition must be completed within 15 years. In medium-risk areas, such as Nelson, work must be done within 25 years, and in low-risk areas, such as Auckland, within 35 years.

<u>What this means for Wellington EQP owners</u>
The Council policy required earthquake-prone buildings to be fixed within 10 to 20 years. The new legislation specifies a maximum time frame of 15 years. This time frame will start from the date of issue of the old S124 notice. New notices will be issued with the new timeframe.

In those cases where the old S124 notice had 20 years, the timeframe will be reduced to 15 years from the date of the original S124 notice.

Wellington City Council
101 Wakefield Street
PO Box 2199, Wellington 6140,
New Zealand
Phone +64 4 499 4444
Fax +64 4 801 3138
Wellington.govt.nz

In those cases where the old S124 notice had less than 15 years, there will be no change to the current time frame, except for priority buildings (explained below).

As the owner you may also apply to the Council to have the relevant notice period specified in section 133AM(2) applied retrospectively to the date of the old S124 notice. The Council will consider the particular circumstances and any guidance issued by the Ministry of Innovation and Employment before granting the time extension application. Subject to the Council decision, the deadline for completing seismic work would be extended to be in line with the period under the new legislation.

2) **Priority buildings**:

The new law introduces a new 'priority' classification which include hospitals, emergency and education buildings. Priority buildings have to be strengthened in half the standard time which in Wellington means a maximum of 7.5 years for strengthening work or demolition.

There is also a category of priority buildings for buildings with unreinforced masonry (URM) elements that face on to busy pedestrian/vehicle traffic routes and also buildings that could collapse and block strategic routes.

Before a URM priority building or a strategic route priority building is confirmed the Council will consult with the community on routes that are considered to be busy pedestrian/vehicle or strategic routes.

What this means for Wellington EQP owners
For EQP buildings that meet the criteria for hospital, emergency or education buildings, the new notice will have the reduced timeframe (maximum 7.5 years).

Council officers will need to develop a list of proposed routes that could meet the criteria of a busy pedestrian/vehicle and strategic routes. Once the proposed routes are agreed by Council, they will go out to public consultation.

This process is not expected to start until late 2017 with public consultation planned for early 2018.

3) **New earthquake prone building notices will be issued to EQP buildings.**

What this means for Wellington EQP owners
New earthquake-prone building notices will be issued to replace the existing yellow S124 notices. The new notices will look similar in layout to the S124 notices but will be white and will include references to the new legislation and where applicable, revised timeframes.

The process of replacing all existing notices is likely to take several months. The current S124 notices still remain in force until they are replaced by a new notice. The building will be included in the national Register of Earthquake-Prone Buildings.

After consultation and priority buildings are decided, new notices with the shorter timeframe will replace existing notices for those buildings.

If a priority building is strengthened and the unreinforced masonry features facing busy pedestrian/traffic routes no longer poses a risk to the public, then owners will be able to apply for a new EQP notice that covers any remaining EQP elements of the building. The timeframe on this new notice will reflect the timeframe that was in place before the building was identified as a priority building.

4) **Requirement to strengthen if substantial upgrade of building is undertaken**.

Another new requirement is for EQP building owners who are doing a substantial building upgrade is to strengthen it to the minimum standard (34%NBS) at the same time.

The definition of a substantial upgrade is defined by regulations and is available to view:
http://www.legislation.govt.nz/regulation/public/2005/0032/latest/DLM313966.html

What this means for Wellington EQP owners

If you are thinking of doing a substantial upgrade to your EQP building before strengthening it is recommended you check this work will not trigger the need to strengthen the building.

Next steps

Over the next few months officers will begin the process of issuing new EQP notices as well as writing to owners of potentially EQP buildings. They will also start collecting information to help form the consultation process for priority buildings.

The introduction of the new EQP legislation does not affect your ability to apply for incentives currently available to owners of EQP buildings. This includes the rates rebate scheme as well as the Built Heritage Incentive Fund. Enclosed is a copy of our incentives brochure for your reference.

Thank you for your patience while we transition to the new legislation. In the interim if you have any questions please contact the Seismic Assessment Team on 04 499 4444 or email: buildingresilience@wcc.govt.nz

Yours sincerely,

Steve Cody
Manager Building Resilience
City Resilience & Sustainability

9(2)(a)

From: Brodie Stubbs
Sent: Friday, 9 August 2019 4:50 PM
To: Bede Robertson
Subject: RE: National War Memorial

Hi Bede

Thanks for giving this consideration.

I understand that you can only work off the information you have. It seems that it is the presence of some URM partitions that limit the structure to 11%. These have been either removed or strengthened and I will dig out the evidence for this (a little surprised that this has not made its way to the Council but never mind).

In the meantime, the existing notice remains in place.

Cheers

Brodie

From: Bede Robertson <9(2)(a)>
Sent: Thursday, 8 August 2019 11:05 AM
To: Brodie Stubbs <Brodie.Stubbs@mch.govt.nz>
Subject: RE: National War Memorial

Morning Brodie,

I've talked through the report that we have from Dunning Thornton on file that gives the 11% NBS rating for the bell tower with my colleagues.

Given that this is the most recent information we have on file and that it does clearly state the building's 11% NBS we do need to record that on the EPB notice. If we were to state that the building's earthquake rating had not been determined on the EPB notice this would not line up with what we have on file.

As we discussed on the phone, we are happy to update or uplift the EPB notice once we receive Dunning Thornton's new assessment of the building. Please note that this assessment will need to meet the requirements of the EPB Methodology in order for us to accept it.

Cheers,

Bede Robertson
Technical Advisor, Resilience And Sustainability
Wellington City Council

Phone 9(2)(a)
Email 9(2)(a)
Website wellington.govt.nz

From: Brodie Stubbs [mailto:Brodie.Stubbs@mch.govt.nz]
Sent: Wednesday, 7 August 2019 5:04 PM
To: Bede Robertson
Subject: National War Memorial

Kia ora Bede

I am responsible for the management of Pukeahu National War Memorial including the National War Memorial. I recently received the notice concerning the bell tower being an earthquake-prone building rated at 11% NBS. To be clear, I do not want to avoid the need to display a notice that the tower is an EPB but I would like to understand how the rating came about and whether there is an opportunity to work with you to ensure that we are working off the most up-to-date information.

I understand that the above rating was based on information from 2011. However, there has been work done since then and recent communication from our engineers, Dunning Thornton, estimates the tower to be in the range of 40-50%. This forms part of our recently updated conservation plan for the NWM.

To give a more accurate assessment we have already contracted Dunning Thornton to carry out a detailed seismic assessment which is due to start shortly. We will have a preliminary assessment in September and the full report towards the end of the year which will then guide further strengthening work.

I would be grateful if we could discuss the above and the best way forward.

Ngā mihi

Brodie Stubbs | **Manager, Te Pae Mahara**
Manatū Taonga - Ministry for Culture and Heritage
He ngākau titikaha, he hononga tangata
Promoting a confident and connected culture
Public Trust Building, Level 1, 133-135 Lambton Quay
P O Box 5364, Wellington 6140
Ph +64 4 499 4229 Extn: [redacted]9(2)(a)
Mbl [redacted]9(2)(a)
Website: www.mch.govt.nz

9(2)(a)

From: Brodie Stubbs
Sent: Monday, 12 August 2019 5:16 PM
To: Bede Robertson
Subject: NWM Carillon
Attachments: 6825 150107 L13 (Letter only) (003).pdf

Hi Bede

Picking things up from last week, attached is a 2015 letter from Dunning Thornton, which updates their calculations on the seismic rating for the tower. The element in their 2011 report which dragged the rating down to 11%, the URM partitions, were dealt with as part of a major upgrade to the building – see page 2 of the letter. The primary structure is estimated at 40-50% NBS but there are some unknowns for the secondary structures such as the bellframe.

I am out of town tomorrow but perhaps we can touch base on Wednesday to discuss.

Cheers

Brodie

Dunning Thornton consultants

Ref: 6825 L13

7 January 2015

Ministry of Culture & Heritage
c/- The Building Intelligence Group
PO Box 830
WELLINGTON

Attention: Andrew McCalman

Dear Andrew

National War Memorial Carillon Tower: New Access Stairs, New Mesh Floors and Seismic Strengthening of Existing Braces.

We are pleased to enclose our Producer Statement for Construction Monitoring (PS4) regarding the above project. Also enclosed is a recommended schedule of maintenance for the structural aspects of the work. These documents, our site reports and this letter are required to form part of an application for the Code Compliance Certificate for the works. A separate Producer Statement for the safety nets will also be required. These nets are not part of our scope and were designed and inspected by the Contractor.

With the seismic strengthening of the braces now complete, the seismic performance of the primary structure is estimated to be 40-50% NBS. However, the building still remains potentially earthquake prone. This status will only be removed when the secondary elements have been addressed. We include a table on the following page which summarises the current status of these elements.

We trust that this provides the information that you require.

Yours faithfully

Paul Brimer
DIRECTOR
150107 PDB

Consulting Structural Engineers
94 Dixon Street, PO Box 27-153, Wellington 6141
Telephone (644) 385-0019, E-Mail: dtcwgtn@dunningthornton.co.nz

Dunning Thornton consultants

Summary of Primary and Secondary Structural Elements

Building	Element	Current %NBS[1]	Comments
Carillon Tower – Primary Structure	Concrete shell/frame	40-50% [2]	Upper section of Tower (existing steel braces) were retrofitted as part of access upgrade works.
Carillon Tower – Secondary Structure	URM wall in clavier chamber	85%	Retrofit completed as part of Tower access upgrade works.
Carillon Tower – Secondary Structure	Bell frame	Unknown	Outside our current scope. An issue with respect to building's EQP status.
Carillon Tower – Secondary Structure	Precast screens	Not determinable	Detailed design of retrofit works is currently being completed.
Carillon Tower – Secondary Structure	Exterior veneer (stone)	Not determinable	Can be demonstrated to not be earthquake prone if cracked/damaged stones are replaced or repaired to full strength. Repairs currently being planned.

Notes:

1 Importance level three, 50 year design life, subsoil class C.
2 Estimated, based on assumed founding parameters (soil bearing strength).

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9(2)(a) [redacted]

From: Brodie Stubbs
Sent: Saturday, 22 February 2020 1:39 PM
To: 9(2)(a) [redacted]
Subject: Temporary closure of the National War Memorial

Kia ora Richard

This is to advise you that the National War Memorial building is temporarily closed. The Ministry has received a detailed seismic assessment report on the carillon tower section of the National War Memorial building. While we work through this report and make sure we have a full understanding of any implications we have taken the decision to close the building. The safety of our staff and the public is of paramount importance to us.

The area immediately around the National War Memorial building and the wider Pukeahu National War Memorial Park is unaffected, as is the education centre. Our staff will continue to host groups and visitors to the park.

I would be grateful if you are able to pass this information on to anyone else at WCC who may need to know. Your contact centre may also receive calls or emails about this and they can be passed on to me

If you have any questions about how this temporary closure may affect you, please do not hesitate to contact me. We will keep you updated with any developments.

Ngā mihi

Brodie Stubbs | Manager, Te Pae Mahara
Manatū Taonga - Ministry for Culture and Heritage
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9(2)(a) [redacted]
Website: www.mch.govt.nz

9(2)(a) [redacted]

From: 9(2)(a) [redacted]
Sent: Thursday, 19 March 2020 2:31 PM
To: 9(2)(a) [redacted]
Subject: FW: National War Memorial

Follow Up Flag: Follow up
Flag Status: Flagged

From: Julia Luty <9(2)(a) [redacted]>
Sent: Monday, 24 February 2020 5:24 PM
To: Katie Scotcher <Katie.Scotcher@rnz.co.nz>; Media <Media@mch.govt.nz>
Subject: RE: National War Memorial

Kia ora Katie

To help you with your story, please see below the statements we provided to Stuff in response to their questions earlier today.

Please attribute our responses to Brodie Stubbs, Manager, Te Pae Mahara.

Statement 1

The National War Memorial is temporarily closed. The Ministry has received a detailed seismic assessment report on the Carillion tower portion of the building. While we work through this report and make sure we understand any implications, we have decided to temporarily close the building. The safety of our staff and the public is of paramount importance.

Pukeahu National War Memorial Park and the Pukeahu education centre remain open.

The Carillon was reopened in 2018 following refurbishment of the bell frame and some earthquake strengthening work.

The bell frame needed refurbishment as the steel bell frame had corroded. While we had engineers and steel workers on site we took the opportunity to add to the existing seismic bracing. The engineers suggested a detailed seismic assessment to include the whole tower and the bell frames.

The Ministry has now received a detailed seismic assessment report which has confirmed that the building is earthquake prone. We have decided to temporarily close the building while we work through any implications of this report.

Statement 2

The decision to temporarily close the memorial was made on Wednesday 19 February with effect from Thursday 20 February.

The National War Memorial comprises the Carillon and the Hall of Memories. The Hall of Memories is already strengthened to 100% of earthquake code. However, the Carillon tower is earthquake prone and it is not possible to enter the Hall of Memories without passing through the ground floor of the Carillon tower. The closure only affects the Carillon and the Hall of Memories. Pukeahu War Memorial Park and the Pukeahu education centre remain open.

The Carillon tower has closed as a result of a detailed seismic assessment report confirming that the tower is earthquake prone. We were already prepared to take any action we felt necessary as a result of the findings of the report. Ideally we would want to strengthen the tower to that of a new building. In this case we have decided to temporarily close the building, while we work through this report and make sure we understand any implications, in particular whether the building, or parts of the building, could be a hazard in the event of an earthquake.

We are working through the report as quickly as possible but there is no set timeframe for when the Carillon will reopen.

Ngā mihi

Julia Luty | **Senior Communications Adviser**
Manatū Taonga | **Ministry for Culture & Heritage**
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Please note I don't work on Wednesdays

From: Katie Scotcher <Katie.Scotcher@rnz.co.nz>
Sent: Monday, 24 February 2020 4:33 PM
To: Media <Media@mch.govt.nz>
Subject: National War Memorial

Kia ora,

I was hoping to speak to someone from the Ministry about the National War Memorial closure, as reported by Stuff: https://www.stuff.co.nz/national/119757799/national-war-memorial-found-to-be-earthquake-prone-silencing-carillion-bells

Would someone be available for a pre-recorded interview this evening?

I'd like to know what is in the report the Ministry received and who/what engineering firm was commissioned to do it?

How earthquake prone is the building? Are there particular parts of the building that are more at risk than others?

Why did the Ministry decide to commission engineers to carry out a seismic assessment in the first place?

How much work needs to be done to ensure the building is safe?

How long will it be closed for?

Please let me know if the interview is a possibility as soon as possible.

Thanks,

Katie Scotcher
Journalist
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