

# FACING A SEISMIC STRENGTHENING PROJECT

## – Case studies

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25 July 2016

CQ Hotel  
Wellington





## Programme outline

- Case study 1: completed case study: Sue Glyde
- Case study 2: non-heritage building in a heritage area: Jon de Groen
- Case study 3: non-heritage, standalone building: Chrissy Hill
- Questions & other experiences
- Update on legislation: Stephen Cody, WCC Resilience Manager
- Outline of future seminars

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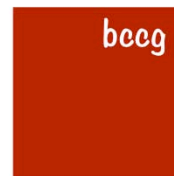


# Seismic Strengthening

## A Case Study: Sue Glyde

25 July 2016

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## The Building

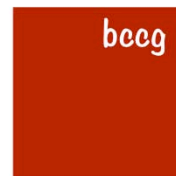
- Built in 1962 as a clothing factory – not heritage
- Converted to apartments in 1995
- 4 storeys, concrete construction with some brick infill
- 6 residential units, 1 mixed commercial/residential unit
- 85% owner occupied, long term residents, older age group
- 12% of NBS – too rigid (east/west walls)
- Solution: exoskeleton (K frame), cuts filled with silicon
- Final % of NBS: 45% (70% east/west, 45% north/south)



### Just a bit about the building:

- it was built in 1962 as a clothing factory and was converted into apartments in 1995.
- It has 4 storeys, of concrete construction with a small amount of brick infill.
- There are 7 units, 6 residential and one mixed residential and commercial.
- Most of the owners are occupiers, and most are long-term residents having lived in the building for 10 years or more. We are all of an older age group, which creates a few challenges when raising funds.
- The building was rated at 12% NBS, due to being too rigid in one direction (the other direction is 45% NBS).
- The solution was to install an exoskeleton front and rear (with a shear wall at the front to hide it) and to make a number of cuts to the concrete walls and filling them with silicon. This strengthened the front and rear to 70%, leaving the sides at 45%, giving the building an overall score of 45%.

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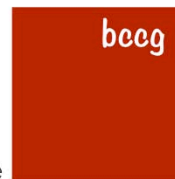
## The Journey

- Sep 2007 – notified as EQ Prone, 14% NBS
- Nov 2007 – engineer engaged for detailed assessment
- Aug 2009 – assessed at 12% NBS, option to go to 67% for \$300,000
- June 2011 – post-Christchurch revised schemes, 2 options: 45%, 67%
- Dec 2011 – initial QS cost estimate for 67% nearly \$800,000
- May 2012 – final QS estimate for partial implementation, \$600,000
- July 2012 – S124 certificate received
- June 2013 – architect approached for assistance
- Oct 2013 – architect engaged



- There was a slow start as the BC came to grips with the situation, and because there was so little information available in 2007/8 as to the best approach.
- The BC decided not to “shop around” but accept the assessment – the issue with huge variations between engineers wasn’t apparent then.
- The delays from 2009 through to 2013 caused by a sluggish engineer, the Christchurch earthquake, and a bit of denial on behalf of the BC.
- In 2013, we decided to employ an architect because of aesthetic concerns and to assist with driving the engineer.
- We didn’t employ a project manager, but we used the architect as PM through the consent and tender processes – very successful and made real progress.

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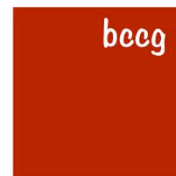
## The Journey continued

- Nov 2013 – design received and agreed in principle
- Nov 2013 – pre-application meeting with WCC
- Dec 2013 – revised costs for revised design
- Dec 2013 - Apr 2014 – working through owner objections
- Apr 2014 – resource consent application lodged
- May 2014 – application put on hold to resolve further objections
- July 2014 – resource consent received
- Sep 2014 – building consent application lodged
- Dec 2014 - tender



- The Architect encouraged an “added value” approach – do more than just the basic strengthening: new balconies and new windows which required further design, agreement and costing.
- WCC requirements (insisted on a smaller encroachment) led to design changes and therefore more costs and more decisions.
- Once the detailed design was evident, we embarked on a new round of concerns and debates within the BC causes delays in the consent process. This slowed progress and made timing issues difficult (trying to get the tender out before Christmas).

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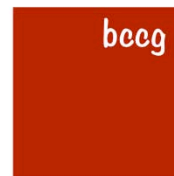
## The Journey continued

- Dec 2014 – Jan 2015 – tender process
- Feb – engaged QS to validate tenders due to unexpected overage
- Mar – May 2015 – 2<sup>nd</sup> tender process
- Late May 2015 – construction started
- Nov 2015 – “practical completion”
- Dec 2015 – May 2016 – defect resolution
- March 2016 – S124 certificate removed
- June 2016 – final bill paid



- Prices came in very much higher than the estimates, again causing another round of BC debates, with the decision to go back to market.
- Also re-engaged the QS to review the tenders to try and understand why some elements were so expensive.
- This whole process added another 4 months.
- The construction process took 6 months – 3 months longer than the tender estimate - with a further 5 months of defect resolution.
- We received a letter from the WCC in late February to allow us to remove the S124 certificate, but the published list of EQ prone buildings wasn't updated until May

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## The Money

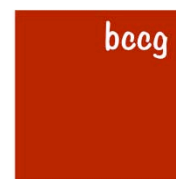
- Raised through special levies
- Billed owners based on estimates for added value elements
- Owners funded through additional mortgages and/or raiding retirement savings - very stressful
- Final total cost approx \$1 million
  - Build cost – 82% of total, approx 25% of this was added value work
  - Architect – 5%, Engineer – 7%, Others (legal, QS etc) – 1%
  - WCC Consent and other fees – 1%
  - Other costs e.g. compensation – 4%
- 11% overrun (based on tender)
  - Tender 28% greater than QS estimate
  - \$43,000 of variations



- Funds were raised via special levies, on a “just in time” basis. Owners preferred this approach as it reduced interest costs for those raising loans, and minimised disruptions to investments for others. As we had been told our apartments were “unsaleable”, concern of the impact of future special levies on sales was not a factor. Note that it is necessary to have the funds on hand (at least equal to the tender price) before signing the contract.
- We included non-strengthening work elements with the intention of adding further value to the building (double glazed windows and replacement balconies). These additional elements were to be paid by the owners benefiting – not all had balconies and numbers of windows varied (plus owners could choose not to replace their windows), so sharing costs by ownership interest was seen as unfair. We possibly should have raised the overall levy in advance based on ownership interest, then equalised things later once the exact costs were known, but instead we billed in advance based on estimates. This was to avoid some owners paying too much in the short term and to avoid the later hassle of having to bill some and refund others. This meant we had to ask the tenderers to split out these costs in the tender and in any subsequent variations, which they weren’t very happy about. I insisted on a unanimous resolution before adopting this approach.
- Some owners managed to raise additional credit but most funded by raiding retirement savings, which will not be able to be recouped before retirement. This is obviously a stressful process.
- The final total cost was just over \$1 million, mainly the build cost, but also a fairly significant cost for professional fees.
- The added value costs ended up being about 25% of the build costs (plus they added to architect and professional fees).
- We ended up 11% over budget, based on the tender and original professional fee estimates – but we were way over our original expectations, especially as all of the tenders were significantly higher than the Quantity Surveyor estimate.



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## Working with the owners

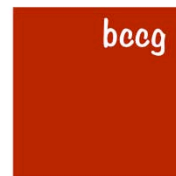
- Had to give everyone time to get used to the idea
  - Much like the grieving process - denial, anger, bargaining, depression and acceptance
- Plenty of meetings needed for consultation process: to get agreement and set expectations
  - formal and informal
  - For larger BCs, work with committee first
- Resolutions to document agreed process, major decisions
- Regular email updates to keep informed of progress and issues
  - Included communicating to tenants when relevant



The next few slides outline what we did, rather than a recommendation to others. It worked for us, as a small BC with the culture that we have (due to so many long term owner/occupiers). The process covered in the previous seminar would be preferable for larger BCs.

- It takes time. The slow progress from 2007 to 2013 was in part due to just working through the pain. One of our owners pointed out how it was just like the grieving process! And it wasn't just about the money – it was also the fact that our homes would be forever altered, especially for those affected by the K-frame.
- We had plenty of meetings to give people the opportunity to talk through their concerns. One of the advantages of a small BC is that you can include everyone without too much difficulty. As all owners are on the committee, we treated some of these meetings as committee meetings, and if we then needed a resolution, we did these by email later (under the provisions of s104 of UTA), rather than trying to call an EGM. We also held more informal meetings which were really just an opportunity to talk things through. It is very important to set the appropriate expectations well in advance – this gets back to the grieving process, and also to avoid complaints about noise/disruption once work gets underway.
- Initially, we didn't make many specific resolutions, keeping things generalised, but once we started facing objections, it was obviously advisable to document decisions through formal resolutions, with more detail. We voted on a set of 12 resolutions covering such things as the remaining steps we would go through to undertake the strengthening and an agreed dispute resolution process. Our lawyer in fact even suggested we considered a formal deed in addition to the resolutions but we resolved not to do this due to the cost.
- As Chair, I was the sole point of contact with the architect, engineer and eventually the contractor but I provided regular updates by email to all owners to keep them informed of progress. Once the construction work was underway, this was more frequent and I included tenants as I found the property manager failed to provide timely communication.

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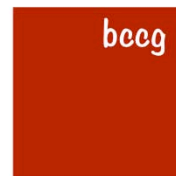
## Working with WCC

- Generally helpful and timely
- Treated like property developers rather than home owners
- Some individuals with strong personal views
- Pre-application meetings worthwhile (additional cost)
- Surprised by what they did and did not agree to!



- WCC were on the whole cooperative and helpful, and timely with processing applications, although there was the occasional frustration. Our architect definitely assisted here - he knew who to deal with, how best to manage the process and what objections to anticipate.
- Some staff had a tendency to treat us as if we were property developers/investors operating on a commercial basis, rather than a group of home owners who found themselves in an unfortunate situation. Most of our owners are long term residents, and it's our home, not an investment opportunity, so it's about emotions not commercial considerations.
- We did encounter some opposition and strong views, particularly at first, and a few comments were made that I found rather unnecessary and slightly objectionable.
- The pre-application meeting was an excellent forum for getting these and other issues out in the open and working through them. Highly recommend it, in spite of the cost (ours was about \$1000).
- We were surprised by what was and wasn't agreed to by the WCC. As part of the negotiation to resolve issues with our owners, the BC had agreed to opt for larger balconies, and were surprised that this was supported by WCC. On the other hand, we were disappointed that we were unable to get the 300mm encroachment we needed for our shear wall as the 200mm restriction added significantly to our costs.

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## Working with the neighbours

- Needed access via 3 neighbouring properties
- Communicated regularly
- Paid compensation
  - enabled landlord to compensate tenants for loss of quiet enjoyment and use of garden
  - alternative parking
  - Use of driveway
- Provided morning teas / thank you gifts



- Our building is right on the boundary on two sides, with a small strip on one side that can only be accessed over private land. We are therefore very dependant on our neighbours to provide access.
- The secret to good relations is good communication, and I kept them as informed as possible throughout the construction process.
- We did end up paying compensation, in one case to allow a landlord of a neighbouring property to in turn compensate their tenants, and in another to provide alternative parking. We also came to an agreement to use the neighbouring driveway for our crane, as the cost to temporarily move the trolley bus cable was excessive!
- We also provided the occasional thank you gift and morning tea. These small gestures go a long way to keeping good relationships with your neighbours at relatively little cost.

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## Lessons Learned

- Communication is key, at all stages
- Give owners time, help take them on the journey
- Must follow BC governance processes meticulously and more
- Ideally, BC representative closely involved – don't rely 100% on PM
- Using an architect is worthwhile
- Engineers/Architects view often differs to contractor – independent PM may help



- Good and frequent communication is essential for setting expectations and ensuring cooperation, not to mention keeping the peace. BUT consider holding back until you have all the facts to hand to prevent unnecessary concern/debate. It's a juggling act between being timely and being accurate.
- Give owners time to "grieve" and make sure you have a consultation process to give them the opportunity to voice their concerns. Expect some owners to be unhappy – either about the money or possible negative impacts to their home, or the disruption of the construction process. Have a dispute resolution process documented in advance. In larger BCs, go through the process with the committee first.
- Make sure you understand the BC governance processes and follow them, dotting the Is and crossing the Ts. We were a long way down the track before someone decided they were going to object, so no matter how much you set expectations and get agreement, things can change later. If you have followed due process, then you can minimise the impact of such objections.
- It made a huge difference having me so closely involved. I wasn't the project manager (the main contractor provided the PM for construction), just a point of contact and someone with a vested interest to make sure all was going as smoothly from the owners' perspective. I'm not sure that any project manager or a BC Service Provider would have done as much to keep residents, owners and neighbours informed and cooperative, certainly not without significant additional cost. BUT having said that, it is very important to have professionals involved, especially when dealing with the WCC. I also received feedback from our architect and contractor that they found having such an engaged BC representative very helpful.
- Using an architect is definitely worthwhile. They consider more than just the engineering elements – aesthetics and the impacts on people and how they use the building – and are therefore a huge help in assessing and tweaking technical engineering solutions. They also helped us envisage the solution with great graphics, not just technical plans, and helped work through owner's issues.
- It's amazing how much debate there is between the various professionals – apparently completely normal on every project. At times this left me confused and concerned as to who to believe. I learned to let them fight it out between themselves. An independent PM may have helped here.

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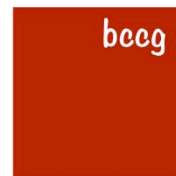
## Lessons Learned

- QS estimates may vary significantly from the market
- WCC pre-application meetings worthwhile, but not strengthening incentives
- It's worth keeping the neighbours happy
- "Added value" approach adds budget risk
- Tender evaluation is tricky
  - provisional sums and variations



- We put too much faith in the QS estimates – we had assumed there might be some variation and had allowed for 15% so the 28% was unexpected. This triggered another round of grieving! We never managed to identify why there was such a variation between QS and tenderers as all parties stood by their figures.
- The WCC was better to deal with that I thought. I highly recommend having a professional (architect, engineer, PM) to drive this process and also to have pre-application meetings. BUT don't get excited about the strengthening incentives. I calculated that the rates remission was going to save me about \$69 per year for 3 years, and our fees rebate will be \$680, so less than \$100 per owner.
- It's worth the effort to maintain good relations with your neighbours. Keep them informed, apologise if things get more inconvenient than you expected and compensate when appropriate.
- The architect's proposal to add some value to the building as part of the project seemed a great idea, but it was these items that created the most issues with the highest cost overrun. So think carefully before doing anything more than the minimum needed for strengthening. We don't regret it, but maybe we would have hesitated had we known the issues in advance!
- Tender evaluation isn't as easy as you might think, and I was grateful for our architect's professional advice. You have to know how to make pears look like apples. The costing is also not straight forward, largely due to provisional sums which are those which do not have a fixed price in the tender, usually due to a high level of uncertainty. Our lawyer commented that it was good to avoid provisional sums, however, I suspect that fixed price items may sometimes be on the high side to compensate for unknowns. Also, just because something is a fixed price doesn't mean that it won't cost you more. Variations are the mechanism for handling unforeseen problems. We had 47 variations that we accepted (and a few that were rejected) costing a total of \$43,000.

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## Lessons Learned

- Ensure the contracted time frame is realistic
  - Extension of time penalties vs. liquidated damages
- Contract Administration is more than you might think
- Trolley bus/City Link cables are very expensive to move
- Contingency is essential



- It's important that the contracted completion date is realistic, as it impacts the Extension of Time penalty amount – the industry standard is to use a daily rate calculated by dividing the contract price by the contracted number of days. A contractor has to have good reason to apply an EoT penalty and bad estimation isn't one of them, but bad estimation means a higher daily rate when genuine EoT circumstances arise. You also need to ensure you have a realistic but healthy liquidated damages amount. This is a figure that represents the cost to the client of delays (such as extensions to contract works insurance, rent for alternative premises, increased contract administration costs etc). In our case, this helped with EoT penalty negotiations.
- Contract Administration is more involved than I thought – it includes managing all of the variations and there were a lot more of these than I had ever imagined! It cost us considerably more than I had originally budgeted. The Architect had this role and their original proposal only included an hourly rate, so I made a guesstimate. I would advise getting an estimate of a likely number of hours, and a revised estimate once the contract has been signed (when more is known). Note that construction delays and the number of variations can't be predicted and will add to the cost of contract administration.
- Be warned if you have trolley bus cables outside your building! The quote for temporarily moving the cable was about \$20,000, and we would have needed to do this twice. This was due to the City Link fibre optic cable that piggy backs on it, so a City Link rather than a Wellington Cable Car issue.
- Finally, everything takes longer and costs more! Budget for contingency: you WILL need it.

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## Seismic Strengthening: non-heritage in a heritage area

A Case Study: Jon de Groen

25 July 2016



## About the building

- Built 1927, Ground floor retail, 5 levels reinforced concrete 20Apts, 2 Penthouse floors 4Apts added during refit 1996.
- Not a heritage building; compliance with heritage area status
- Strengthened during conversion in 1995-6 WCC
- IEP rating of 37% (2007 DT Ltd)
- 24 apartment owners; 50% owner-occupied
- 2 Ground Floor retail units owner-occupier



## Timeline so far ...

- 2008– 2010: Debate between B/C Reps, Engineers and WCC over IEP (37% vs 8%) re-assessed by DT @ 20% NBS . EQ Prone !
- 2010 : Engineers designed K frame strengthening concept, Option 1
- 2011: S124 notice posted , EOI sent to six Arch's/Engs for Ideas.
- 2011: Option 1 rejected at AGM, Architect engaged to find solution
- 2012: Option 2 Moment Resisting Frame proposed and design accepted by AGM
- 2013: Option 2 given resource consent but did not achieve 67%NBS and Failed in detailed design stage.
- 2014-15: Option 3 Sylvester Clarke propose BRB design, plans and design accepted at AGM 2016, resource consent alteration suggested but not accepted by WCC new application proceeding , design achieves 70% NBS.
- 2016 Detailed Seismic Analysis and push over test commissioned.

This project has been underway since 2007. A detailed seismic assessment was not completed (2010) initially as the engineers said it would not get above 34% NBS.

On realisation that we had a major issue we asked for expressions of interest in fixing our issues with an Inovative solution not K frame ,

Athfields were chosen and provided an external Moment Resisting Frame solution that essentially followed the framework of the existing buildig resulting in better than 67% NBS. Acceptable to Heritage guide lines.

Engineers replaced due to many delays.Sylvester Clarke take over eng work designdeveloped and Council issued resource consent 2013 but Design failed when engineers reached detailed design stage,  
beams and joints became too large and unweildy if 67% required

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## Deciding on a solution – Option 1

- Internal K-frame
- Engineer (Dunning Thornton) who had previous experience in building, advised as best option.
- Was affordable and acceptable by WCC all internal would achieve 50-70% NBS
- Cost \$0.9m, but this excluded 'make good' costs
- AGM rejected option:
  - Impact on 20 affected apartments (views/values/usable space)
  - 'Make good' costs likely to double costs
  - Had to vacate building (estimate 6- 9 months)

At AGM 2010 K Frame suggested as solution by DT Ltd. The engineers did not recommend a detailed seismic assessment at that point as they considered brittle elements in building limited NBS to < 20% and it would be a waste of funds to document this.

Majority of owners wanted to proceed with Option 1 and to get the work done ASAP .

BC started a EQ strengthening fund Levies @ \$150K/ PA. ( Levy doubled existing BC fees and has run 6 years, tot \$750K )

At the 2011 AGM, the BC agreed that the K frame was intrusive and unfair on minority other better external constructions should be persued to achieve 67% NBS. This decision was driven by desire to get out of the EQ Risk category (34 > 67% NBS). This categories are not set in any legislation but are used by insurers, banks and WCC.as desirable.

An EQ Sub-Committee was formed of Chair, 3 owners (architects and engineer), and BC property manager, and sought Expressions of Interest from reputable Wellington companies for solution to exceed 70% NBS. Got responses from 6 companies. Athfield Archs / DT Ltd .

## Deciding on a solution – Option 2

- 2011 External Moment resisting frame (no diagonals)
  - \$1.3m; NBS expected to exceed 67%, External steel frame
  - No impact on internal living, no loss of views and residents could remain in building
- Stayed with Dunning Thornton and Athfield Architects
- Resource consent granted on basic MRF design
- At detailed design stage couldn't reach 67% NBS (rejected)
  - Heritage constraints meant that frame had to follow beams and pillars; doubled cost to \$3.5m and would achieve <67% NBS (only around 50%)
- New ideas needed Engineer contract terminated, Sept 2013

DT knew the building; had done earlier strengthening and conversion work. Approach was for architects to look at the building/space and propose options to suit the building and work with engineers to evaluate feasibility. The engineers did not give BC options to choose from, but recommended a moment-resisting frame as being the best solution.

The heritage area status meant that if external frames followed the beams and columns without Diagonal bracing WCC consent could be expected.

2012-2013 MRF design developed to Resource consent stage peer reviewed by SC

The 2013 earthquakes struck soon after the decision was made to not proceed with Option 2. and resulted in a large number of cracked windows (about 20% in old steel frames), but no obvious structural damage. Many owners esp. landlord owners required the BC to undertake an assessment of the building as their tenants were raising concerns about the building safety.

The BC Chair requested DT to check the building to provide an integrity assurance it appeared undamaged and was safe. DT's response was that they were too busy with Christchurch and other Wellington urgent requisites and could not respond. The BC were not happy with the response

The BC Chair rang other engineers to check availability and Silvester Clark agreed to

## Moment resisting frame



## Deciding on a solution – Option 3

- 2014 External Buckling Restraint Brace suggested by SC Ltd as best solution to achieve >67% NBS
  - Estimated cost: \$4.3m; includes LTMP items (roof, replace windows & double-glaze, painting ).
- Solution used extensively in Christchurch for new and old buildings; diagonal bracing would go across some windows but acceptable to owners.
- WCC asked to amend Resource Consent to BRB design  
Challenge of getting WCC heritage approval becomes apparent - new RC req. including detailed analysis of why K frame and Moment Resisting Frame rejected.

The heritage area constraints had a major impact with this option. WCC Heritage Planner required that the BC provide a report with detailed designs for the two previous options and the reasoning for not progressing with these solutions.

The BC Chair's view is that the Heritage Officers do not want to engage with the owners rep and prefer to speak to professionals. Initially the Chair left the discussions to the professionals but this presents a risk that the professionals will be too willing to compromise as professionals have an interest to maintain their professional relationship with the WCC for future projects. The BC Chair considered that the other WCC officers saw the potential of the proposed solution compared to the moment resisting frame.

Following the submission of the report, WCC agreed it would accept that buckling restraint frame over the K-Frame and the Moment Resisting Frame but Heritage didn't like the diagonals they don't fit Cuba Precinct

Eventually "March 2016" BRB scheme given the green light for consent ,pressure coming from Planning, Urban Design and Seismic Resilience managed to convert Heritage.

## Buckling restraint brace



## Deciding on a solution – ‘push over test’

- BC owner requested that a DSA and push over test be completed.
- BC meeting agreed, though concerns given expenditure and decision to go over 70% NBS still in force.
- Benefit of a push over test was that it could get the building off EQP list and allow owners to borrow against building
- Two quotes obtained
- Work continues on developing Option 3

The request for a push over test followed the discussion on detailed seismic assessments at the first EQ Strengthening seminar in March. The owner questioned that a DSA had not been completed previously, but that it should now be done given the advances in knowledge of buildings and analysis methodology since the Christchurch earthquakes.

The BC meeting voted in favour of the decision; there was concern about going backwards after having spent money on detailed plans and having made a decision to strengthen to over 70%NBS.

If the result was over 34% NBS, this would have to be peer reviewed and accepted by WCC.

## Body Corporate Issues

- Project managed by BC
- Project manager was considered but their strength was in getting agreed option implemented rather than in helping to decide solution  
Sub-committee of owners:
  - must have time to commit and carryout allotted tasks, technically knowledgeable preferable;
- Meetings of owners: may not give full views at meeting, but the views come out later; BC Chair has to listen to all views and try and bring parties together
- Number of owners will not be able to fund share as do not meet banks lending criteria; BC has approached main finance providers without success

The levy established in 2010 provided the funding source to pay for the Engineers, Architects and professionals (\$300K), but until funds are in place (\$5 Million) construction cannot start.

The benefit of having a consented plan and indicative costs means that owners may be able to sell their property at closer to market rate. However, dropping Capital Values since the s124 notice was applied (QV have reduced values by @ 40%) means this is unlikely. Potential purchasers will deduct the cost of the strengthening from already devalued prices, leaving the current owners in a difficult situation.

Levies established to fund investigation, design, plans, resource consent costs (300K) to date; estimate \$500k to construction stage.

EQ Levy doubled existing BC annual Fee





## Heritage area issues

- Not a heritage building but required to maintain 'heritage area' guidelines
- Is the heritage constraint reasonable when balanced against impact on usability of individual's property, costs and/or seismic rating?
- Who in WCC advocates for the owner when there is a heritage – cost/usability/rating impasse?
- Is it reasonable to impose additional costs to justify the heritage-area constraint?



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## Challenges – Technical & Process

- Investigating/developing multiple solutions = additional costs & time
- Poor advice from professionals leads to wasted funds & time; recovery of money costs in time & dollars
- Technical knowledge evolves over the time; can lead to extra costs & uncertainty, but potential benefits (eg, push over test)
- Imposed costs (and risk of imposed design) by WCC due to heritage area restrictions



## Challenges – BC & process

- Cannot begin until all owners can fund their share; start will be delayed if this cannot be achieved
- Huge time commitment for BC members and endless meetings to try and maintain owners informed and agree on progress.
- Background of negative feelings, unfairness, helplessness, insecurity and anxiety.
- Living with effects of s124, cost, sales, loss of values/equity, insurance 10x.
- Setting up a fund to cover costs associated with solutions – Engineer, Architect, Legal, WCC.

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# Seismic Strengthening: A Case Study: Chrissy Hill

25 July 2016

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A case study to Earthquake Strengthen  
**a non-heritage, standalone building**  
to Tender stage



Lessons learnt and what has been achieved to date  
without the benefit of seminars such as this.

By the Chair of the BC  
and the EQS committee Rep.

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## Basic building info.



- 'Pilschkesque,' modernist concrete structure built in 1963, unusual lift slab technique, designed by engineers for a printing company.
- One of the first commercial buildings in Te Aro to be repurposed for residential use back in the 1990's
- 7 levels with ground level car parks.
- 12 Owners / mixed use, 2 floors are commercial and the rest residential
- **Aim**
- **To strengthen up to 80%**
- Achieve the highest NBS and Fire Protection feasible and affordable.
- Ensure a safe structure for owners and tenants
- Re-establish and exceed market value.

1935 National design standards for buildings were introduced after the Napier earthquake.

Significant changes followed in 1965, 1976 & 2004.

In depth studies of Kobe (after 1995) & others lead to a clearer understanding of buildings in EQ's

We are fortunate as a 2.5 m set back allows all structure to be outside the building so no internal disruption is expected other than installing the sprinkler system and have a small BC.

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## The 10 year Story so far



- **2006** - received notice from WCC advising that the building was potentially earthquake prone.
- **2010 / 11** Christchurch earthquakes !!!
- **June 2011** – BC voted to established EQS fund, a special levy and a EQS committee was established.
- **2012** - WCC issued the dreaded 124 – i.e. we were 'yellowed stickered' – Demolish or strengthen by 2026 !!
- **2013** - BC voted to spend approx. \$45,000 on consultants. Architects and engineers engaged to explore design solutions and costs. This was beginning of 3 years of preliminary investigation.
- **2015** - BC voted to spend approx \$150,000 on consultants for design and to bring us to the Building & Resource consent and tender stage.
- **2016 July Documents went out for 3 x Tenderers**  
3 Tenders have just been received - being reviewed now

2006 WCC adopted its EQ- prone buildings policy as required by the Act - Buildings constructed after 1976 not included.

Way back in **2006** we were obliged to respond to WCC by 2011 show evidence that it wasn't EQ prone otherwise the WCC would deem the building earthquake prone (we didn't respond as professional advice received earlier had indicated that the building was below 34%NBS) And of course at that stage EQS was not really being considered an important issue - there were lots of heads in the sand.... And that year the Government announces a \$11.5 billion surplus, the largest in the country's history. Then things changed!

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## Agree a plan forward



Explore what options are available and suitable for your building and establish an agreed desired outcome with the BC.

- Consider engaging a Valuer to understand how the figures stack up for your options in the current market and what other approach could be considered.
- For example:
  - ‘strengthening’ only for safety / resale / rentals / compliance
  - Redevelopment / capitalization of asset / over capitalization of asset.

### Examples / Options we explored from 2011

1. A speculative development and construction company came knocking with a prelim concept of a basic K frame structural solution. Est. \$ 2,000,000
2. Exploration to add extra value, adding levels and extending the building out to the boundary increasing the floor plate from 350m<sup>2</sup> to 500 m<sup>2</sup> and including balconies. Est. \$13,000,000
3. A design exploring a ‘Value added’ arty architectural frame (and not just the generic K brace) Est. \$ 7,000,000
4. An Engineer-led design for generic K Bracing, with some architectural design component around the footings and to the steel bracing.  
Est. - yet to be finalized but closer to example 1

1. And this was just weeks after the Christchurch EQ’s We were taken aback as it felt like they were ambulance chasers – anyway by this stage we were already considering other options and gave them the wide birth.



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## Ducks in a row 1<sup>st</sup> Stage



Have all BC Operational Rules and Regulations up to date.

- **Establish and levy for an EQS fund NOW!** Voting to establish this fund is an acknowledgement that the process has started.
- Establish a EQS sub committee – vote and appoint an official Chair / Rep.
- Consider appointing an independent Project Manager to manager the process from this stage.
- Establish operating rules and guidelines around the EQS sub committee
  - maintain clear records with a dedicated minute taker
  - have the group commit when appointed to meeting dates (eg quarterly; on the first Monday in the month from 5.30 – 6.30pm closer to Tenders going out)
- Expect to have more General Meetings and resolutions by postal / email vote.
- Expect some conflict.

**Operational Rules etc.** we needed to change to Unit interests (UI) and pass a resolution re. FDU's levies / voting rights – all very important detail when striking levies.

**Stage 1** – establish the fund and intention to strengthen BC EQS committee (ours initially 6 Members now down to 4) Make sure the committee and officers are well supported as these roles are generally unpaid, difficult and time consuming appointments.

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## More ducks and 2nd stage



- **through to Tender**
- Set up an informal **'time line' / program guide** - BC members who have to sell or secure finance will require basic information.
- Interview, engage and brief consultants (Architects and Structural Engineers and Quantity Surveyors etc) to investigate design options.
- Getting cost estimates on initial designs will assist BC members who want / need to sell their units.
- Expect to spend 10% / 12% of the total cost of build on 'Consultants fees' *NB. have employed 14 consultants to date.*
- The BC Chair is ultimately responsible for budgets, authorising invoices, special resolutions / GM etc. and liaising with EQS committee and BC secretary through these processes and into construction.
- Lawyers to check contracts, insurance companies to be contacted and liquidated damages to consider.

Consider employing a PM (independent from Engineer and Architect) especially if there is no one the committee with project or construction industry experience.

In addition Geotech, Surveyor, Lawyers, Traffic Engineer, Fire Engineers.

Record all discussions around EQS in all BC minutes so new owners buying into the building are alerted to the intention to EQS.

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## \$\$\$ Funding the project



- **START NOW:**  
Include an EQS fund amount / account in the annual budget increasing the monthly BC fee accordingly.
- **QS ESTIMATES:**  
Act as guidelines in establishing costs per Utility Interest.
- **SPECIAL RESOLUTIONS** around levies can include a (10 %) late penalty interest clause.
- **EXPECTATIONS, assumptions & hope:**  
After this 10 year extensive process we can only assume & hope all BC members have funds available to cover their Utility Interest portion of the project and the final cost of the tender accepted by the BC – and we haven't heard otherwise!
- **LISTEN, ENGAGE AND COMMUNICATE REGULARY WITH THE BC**

**Expectations:** We looked into and discussed ESCROW and our BC secretary advised that all monies should be in prior to going out to tender - but BC members and their banks have indicated they will only draw down funds as the project progresses. We have had discussions with a leaky home BC of the same size and they didn't have problems with funds being made available when required.

We are also fortunate as an older BC that we are GST registered which means we have our GST refunded.

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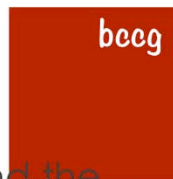
### **What is expected.....**

- Noise and vibration
- Businesses within the building having to relocate.
- Disruption to car parking (finding alternative car parking)
- Disgruntled occupiers / Tenant / rentals disruption.
- Variations / extras / unexpected costs over runs
- Time over runs.
- Extra work for the EQS rep and the BC Chair

### **An upgraded fire and seismic compliant building!!**



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## Future EQ seminars

- **Seminar 4** – Managing the project and the new detailed assessment methodology
- **Seminar 5?** – Update on regulations to prescribe assessment methodologies
  
- Feedback needed:
  - [national.president@bccg.org.nz](mailto:national.president@bccg.org.nz)
  - [innercityassociation@gmail.com](mailto:innercityassociation@gmail.com)
  - [info@wcc.govt.nz](mailto:info@wcc.govt.nz)



## **Earthquake strengthening seminar 3: Question and answer session**

### **1. Comment from Project Management Company representative (Tom Colman)**

The representative stressed the need for a geotechnical assessment.

Sue Glyde responded that a geotechnical assessment had been budgeted. However, it had not proved necessary because there was sufficient information from the Wellington City Council (ie 11 m piles).

John de Groen noted that his body corporate had obtained a geotechnical report which said there was little chance of liquefaction in the area. Piles had been driven in 1926 but the building was too rigid and that the latter is what had to be addressed in the earthquake strengthening.

Geraldine Murphy noted that the next seminar in the series would deal with geotechnical assessments as part of the theme professional/expert reports.

### **2. Comment from Terry Jones.**

Terry noted that his body corporate, comprising 28 apartments, had dealt with both weathertightness and earthquake strengthening costing \$5.2m. The project had been managed by a team of three body corporate owners. As there was a high time commitment their time has been charged out as part of the project. Terry also noted the cost and distribution agreement that every owner had to sign.

### **3. Question asking how funding and earthquake strengthening options were managed.**

Jon de Groen said they had not been able to get a fixed price. It was therefore important to get owners involved and keep them up to date by way of a circular to owners. This was important as owners needed to source funds between the stage of getting information and before work commenced. People's circumstances can be very different across an apartment complex – some have large mortgages, some are retired with banks unwilling to lend. The body corporate was doing its best to accommodate all owners as best as possible. In the absence of earthquake strengthening, owners could lose up to 80 or 90 per cent of their investment. There were instances of bodies corporate hamstrung because owners could not afford the cost of strengthening while other bodies corporate were proceeding with strengthening regardless.

Geraldine Murphy commented that the Inner City Association and the Body Corporate Chairs' Group had had discussions with Grant Robertson, Paul Foster-Bell and Mayor Celia Wade-Brown about funding issues relating to earthquake strengthening by owners of residential apartments. Iona Pannett (City Councillor) had also been at those discussions but so far there has been no feedback. Geraldine Murphy and Neil Cooper encouraged apartment owners to contact the Lambton Ward or local city councillor, especially Iona Pannett who is Chair of the Built Environment Portfolio.

### **4. Public good**

A member of the audience advocated for some public responsibility as there is a public good in earthquake strengthening of inner city buildings. The Wellington City Council has the ability to go to the government seeking support because of the public good element.

Geraldine Murphy commented that Grant Robertson (MP, Wellington Central) had undertaken to get an analysis done of funding options but, so far, we have not heard anything more. The earthquake

strengthening issue affects Wellington mostly and regional towns with earthquake prone buildings on their main streets and the funding issue needs to be raised with political representatives of the relevant regions. Chrissie Hill suggested that an earthquake strengthening fund should be established.

## **5. Matters of unequal disadvantage**

David Levitt asked how matters of unequal disadvantage had been resolved, in cases where some owners had impeded outlook because of K frames in front of windows or taking up internal space.

Chrissie Hill said that in her building, it was mainly the bedrooms that had been affected. There had been options with fewer or no unequal impacts but those options were more expensive. Overall, the strengthening options ranged from \$2m to \$13m. Consideration had also been given demolition by offering the site to a developer. However, this last option was not progressed as owners wanted to continue to live there.

## **Update – Building Act legislation**

6. Stephen Cody (Manager Building Resilience, Wellington City Council) provided an update on implementation of the legislation. It is expected to take effect early next year when regulations are brought into force. Currently, the Ministry of Building, Innovation and Employment (MBIE) has six streams of work developing the regulations. Things that are being worked on include:

- defining earthquake buildings
- standard notices throughout the country
- a national register of earthquake prone buildings.

Councils are providing input. Lower seismic risk means that Auckland has longer to implement the requirements than Wellington. MBIE is developing general guidelines which are expected to be put out for public consultation in September 2016.

## **Update - Review of the Unit Titles Act**

Neil Cooper (National Chairperson, BCCG) advised that he had met with MBIE on the potential review of the Unit Titles Act and raised 20 issues in addition to those raised in the Unit Title Working Group's Report (<http://www.documentcloud.org/documents/2848147-Unit-Title-Working-Group-May-2016.html>). Public submissions will assist officials in reporting back to the Minister of Housing in August. Please email any input to [national.president@bccg.org.nz](mailto:national.president@bccg.org.nz).

## **Next Seminar**

Geraldine Murphy advised that:

- Seminar 4 in this series is scheduled for mid-October 2016 on managing earthquake strengthening from a technical perspective
- Seminar 5 will on methodologies and an update on the regulations to be confirmed.

Note: the meeting closed with a vote of thanks to the speakers, and acknowledgement of the generous subsidy for the meeting venue by CQ Hotel.