Clendon Burns & Park Ltd
CONSULTING CIVIL & STRUCTURAL ENGINEERS

9 August 2016

Reference: 207113

Chairperson Body Corporate 152 The Terrace
C/o Your Property Matters Ltd
P O Box 12123
WELLINGTON 6144
Attention M/s Carol Freeman

Dear Carol

Re: Stair seismic strengthening – 152 The Terrace, Wellington

Following on from the developed design documentation Clendon Burns & Park Ltd (CBP) undertook a Detailed Structural Assessment (DSA) that highlighted deficiencies with the stair, and also with the two surrounding insitu concrete walls. These walls were highlighted as having only an ultimate capacity of 10%NBS.

Detailed design for the stair seismic strengthening for the purpose of lodging for Building Consent was undertaken following the DSA. While undertaking this detailed design CBP came up with a solution to install FRP (Fibre Reinforced Polymer) strips to the inside face of the side insitu walls to ensure that they would not fall into the stairwell posing a hazard to people. The build-up of FRP to the walls would be in the order of 1-2mm, and can be plastered and painted as necessary for finishing. However the FRP requires a specialised contractor to undertake the installation.

The documentation was reviewed by the Wellington City Council (WCC), as part of the Building Consent process. They acknowledged that the FRP would prevent overall wall collapse, but questioned whether spalling of the concrete between the FRP strips would pose a hazard to the stairwell, as well. As such the FRP was then extended to cover the full area of the stair walls to help prevent spalling hazard to the stairwell.

This type of hazard has been highlighted as a concern due to the recent amendment to the Building Act. The Building (Earthquake-prone Buildings) Amendment Act 2016 received royal assent on 13 May 2016 and is likely to come into force mid-2017, and no later than 12 May 2018. This amendment will repeal section 122, “Meaning of earthquake-prone building”, replacing it with section 133AB within the new subpart 6A. The new subpart 6A, “Special provisions for earthquake-prone buildings”, narrows the definition of an earthquake prone building (EPB), whilst broadening the scope to include parts of buildings. The parts of the building that will be deemed to be critical in the rating of a building is designated to the Territorial Authorities (TA). The amendment also provides further definition of earthquake ratings, seismic risk and identifies priority buildings. Timeframes allowed to strengthen buildings will be altered to between 7.5 years and 35 years from receipt of the first EPB notice, with reduced time frames allocated to priority buildings.

Alternatives to the FRP could be installing framing with ply linings to prevent the spalling concrete from falling into the stairwell. This would encroach into the stairwell, with increased cuts to the stairs so that the framing can pass from floor to floor. The decrease in stair width could compromise fire egress requirements that would need to be confirmed. This framing could be reduced in depth if steel sections were used, but the benefit would only be in the order of 25-40%.

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Another alternative arrangement could be to cut the existing insitu walls to provide movement joints at the ends. Therefore reduce the load attracted by the floor movements. The top would be required to be restrained in the out of plane direction, this could be done using steel angles with slotted holes. The movement gaps and slots to the walls will require fire rating treatment.

One further alternative is to remove the insitu walls altogether and replaced with light-weight timber walls, with appropriate fire rating. These alternatives are likely to be more invasive than the proposed FRP method, but could possibly be more cost effective. This would need to be advised by the contractor undertaken the works.

I hope the information above makes sense. Don't hesitate to call if you require any clarification.

Yours faithfully
Clendon Burns & Park Ltd

Anthony Taylor
ASSOCIATE DIRECTOR