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STRUCTURAL AND CIVIL ENGINEERS

5 June 2015

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MICHAEL FOWLER CENTRE - SEISMIC REVIEW - SUMMARY

Dear Geoffrey

The following correspondence is intended to provide a summary of the seismic performance of the Michael Fowler Centre (MFC). Findings outlined in this summary, together with the seismic assessment scope and limitations should be read in conjunction with our Detailed Seismic Assessment (DSA) report rev 1 (dated 14 November 2014). In addition to this structural advice, Geotechnical Engineering input was also provided by Tonkin and Taylor (T&T).

The MFC was designed in the late 1970s and early 1980s and was opened in 1983. The structure comprises three distinct zones (made up of four seismically separate building structures). These include;

- Main Auditorium Building
- Renouf Foyer Building
- Stair Towers (identical pairs) between the Renouf Foyer and Auditorium

The buildings are primarily of reinforced concrete construction with both walled (Auditorium) and frame (Renouf Foyer) structural forms. The Stair Towers are a hybrid wall/frame configuration. Extensive use of precast concrete construction is a feature of this building and is a noteworthy change from the earlier Christchurch Town Hall, which otherwise shares some similarities in form.

Our DSA of the structure, together with advice received from T&T shows that the overall building system sits above the Earthquake Prone Building 34%NBS threshold. However, there are isolated building components that do not meet this level of performance and strengthening is recommended. These following components are considered to be Earthquake Prone (EQP);

- Stairs 7 and 8

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- Stairs 15 and 16

We are currently documenting remedial strengthening measures for these stair structures.

In addition, further assessment and/or remedial strengthening of three additional components is recommended and documentation for these additional components will progress following the EQP items noted above. These components include, stairs 9 and 10, auditorium structure adjacent stair blocks (bays 6/7, 6a/7a) and auditorium roof support on steel trusses.

Once the items outlined above have been addressed, foundation movements (lateral spread) will then likely govern overall building performance. Building foundations have capacity to tolerate up to 200mm lateral movement. Reference should be made to the T&T advice regarding assessments of the levels of earthquake shaking that may lead to such movement.

Once the above outlined considerations are addressed, we have assessed that the overall building structures seismic rating (across all three zones) sits in the range 50-60%NBS. This rating is based on the entire building being considered Importance Level 3 (IL3) due to its ability to house large crowds. A site "D" subsoil class has also been used to derive seismic loads to NZS11270.5:2004 in accordance with advice received from T&T.

Yours sincerely

Hamish McKenzie

PROJECT DIRECTOR

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