Before an Independent Hearings Panel
Appointed by Christchurch City Council

under: the Resource Management Act 1991

in the matter of: proposed Plan Change 14 to the Christchurch District Plan

and: **Church Property Trustees**
(Submitter 825)

Summary statement of Peter Carney (Structural Engineering) on behalf of Church Property Trustees

Dated: 17 April 2024

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SUMMARY STATEMENT OF PETER CARNEY ON BEHALF OF CHURCH PROPERTY TRUSTEES

INTRODUCTION

1 My full name is Peter Edward Carney. I am the Structures Manager for the Christchurch office of Holmes NZ LP.

2 I prepared evidence in relation to the submission made by Church Property Trustees (*CPT*) on Plan Change 14 to the Christchurch District Plan (*PC14*) and the engineering issues discussed in that submission dated 20 September 2023 (*EiC*). My qualifications, experience and confirmation I will comply with the Code of Conduct for Expert Witnesses (Part 9, Environment Court Practice Note 2023) are set out in my EiC and I do not repeat those here.

3 This statement is intended to provide a brief summary of my evidence. This includes updates where relevant in light of the rebuttal evidence filed for Christchurch City Council (*Council*).

SUMMARY OF EVIDENCE

4 The statement of evidence I submitted on 20 September 2023 outlined my review of Clara Caponi's evidence for the Council as relating to the St. James Riccarton Church along with my high-level desktop review of Aurecon's Strength and Repair Assessment and Re-Strengthening Drawings.

5 In this statement of evidence I referenced additional mark-ups I had made on a copied version of Aurecon's drawings. These mark-ups show my recommended amendments/alterations to the Aurecon strengthening scheme for the St. James Riccarton Church to achieve a seismic capacity of 67% NBS IL2. These mark-ups are based on my experience with buildings similar to the St. James Church (i.e. unreinforced masonry/concrete buildings with timber roofs).

6 In my statement of evidence, I also noted two risk items that have the potential to affect any strengthening scheme for the St. James Riccarton Church.

7 The first of these risks relates to the lack of geotechnical information and assessment of future foundation performance under design earthquake loading. As part of any assessment and strengthening project for an existing building, foundation performance against a target seismic capacity is a key structural engineering consideration. I noted no commentary within Aurecon's Strength & Repair Assessment to suggest foundation performance had been assessed as part of the scheme. Therefore, my evidence noted this as a risk for future consideration should an assessment and strengthening scheme be pursued. Acknowledgement of this risk is prudent and what would normally be expected of a practicing consultant.

8 The second risk I noted relates to the potential change of use for the building, with Section 115 of the Building Act requiring that the building (my emphasis in **bold**):

> *(i) Will comply, as near as is reasonably practicable, **with every provision of the building code that relates to the following**:*
>
> *(A) means of escape from fire, protection of other property, sanitary facilities, **structural performance** and fire-rating performance.*

9 This raises a question of whether the Council would accept a seismic strength of 67% NBS IL2 for the building if it underwent a change of use. While this could amount to nothing, again, I noted it as a risk for consideration and attention should a strengthening scheme and change of use be pursued. Such risk identification is what would normally be expected of a practicing consultant.

10 Ms Caponi in her rebuttal evidence writes that neither unreinforced masonry (*URM*) material, local or global failure mechanisms occurred at the St. James Riccarton Church as a result of the Canterbury Earthquakes. Section 3 of Aurecon's Strength and Repair Assessment for Godfrey & Company[1] notes observed damage at the church including:

> *"Both the east and west main gables have cracked at eaves level and the walls rocked out-of-plane around the cracked joint causing degradation of masonry at the joints."*

11 Such damage is typically referred to as "gable hinging" and is visually described in Appendix C of Ms Caponi's rebuttal under the label of "local failure mechanism". The building has experienced multiple instances of a local unreinforced masonry failure mechanism. Noting I have not visited the building to observe its condition or any damage that remains, I am relying on Aurecon's damage report as being accurate.

12 Under the section titled *Building Seismic Performance*, Ms Caponi writes "*I consider that St James Church has performed extremely well during the Canterbury earthquake sequence. The building heritage structures are also characterised by a high level of inherent robustness as the damage did not worsen over the earthquake swarm and following events.*"

13 Satisfactory seismic performance during past seismic events is not a guarantee of satisfactory future seismic performance. In the

[1] Attached to Ms Caponi's primary statement of evidence.

context of assessing and strengthening an unreinforced masonry building such as St. James Riccarton Church, a practicing structural engineer is expected by the Christchurch City Council to rely on New Zealand Building Code standards and industry guidelines to assess and design an appropriate strengthening scheme.

14 Under the section titled *Strengthening Scheme Scope of Work*, Ms Caponi writes "*Numerical analysis might prove that high-level remedial strengthening solutions for the gable end walls and chancel arch might suffice to achieve an acceptable level of seismic resistant capacity when the inherent capacity of the existing structures is taken into consideration.*"

15 I will again stress my strengthening recommendations are based on my experience and familiarity with unreinforced masonry buildings of a similar age and construction typology to that of the St. James Riccarton Church. In my experience, structural intervention and strengthening such as that shown in my amendments/additions to Aurecon's scheme is required to achieve a capacity above earthquake prone, let alone a target of 67% NBS IL2 or higher. I therefore do not agree with this statement of Ms Caponi's.

Peter Edward Carney

17 April 2024