06th February 2026

Proper Job Properties Ltd
8 The Rise, Mt Pleasant,
Christchurch 8081

Attention: Sarah Marwick (Client)

RE: 33 Nancy Avenue, Mairehau – Differential Floor Levels

SA Build has been engaged by Sarah Marwick to provide a qualitative damage assessment for their residential property at 33 Nancy Avenue. A builders' report by Inspected Residential, dated 31st October 2023, identified floor level variation across the building footprint close to 250mm, which is well in excess of limits within MBIE guideline 'Repairing and rebuilding houses affected by the Canterbury Earthquakes'. Our qualitative report discusses the likely cause of this settlement and its' impact on the building structural stability.

Figure 1: Property location (Dudley creek to North West) / View of Property from Nancy Ave. (East end)

We have gathered data on the building and associated damage by conducting a visual site inspection on 05th February 2026, and reviewing documentation provided by the client. Documentation provided includes raw floor level survey, builders report (2023), and EQC scope of works. There were no structural drawings or geotechnical reports available for review.

The building is a single storey heavy unreinforced masonry structure, built circa 1950's. The exterior walls are plastered over double layer concrete block with cavity, and the internal partitions are rendered single layer concrete block. The concrete blocks used are 400x200x100 thick, as shown in the photo below. They are understood to be not reinforced or grout filled. However, we believe that there is a reinforced concrete bond beam on top of all walls. The building has a flat roof of butanol glued over timber substrate, supported by timber joists. The ground floor is concrete slab on grade. It is understood to have a perimeter ring beam and possible internal thickenings to support the heavy masonry walls.

Figure 2: Concrete block used in walls (left), Eastern internal bathroom wall during recent refurbishment (right)

The ground floor of the property is observed to have a differential level, close to 250mm between the north eastern and south western corner of the building. Refurbishment of the property has been undertaken recently (between 2024-2025), which included localized floor re-levelling within the bathroom and kitchen areas. This has reduced the overall differential below 200mm; however, it still remains well outside the 50mm limit of MBIE guidance. The slopes within the floor are in the order of 1:30-1:60, which also exceeds the 1:200 limit of MBIE guidance. Despite these differential floor levels and slopes, the super-structure is observed to have minimal damage from the Canterbury Earthquake Sequence (CES). The EQC scope of work records '*There are minor cracks in all the areas, but nothing serious. A few cracks need racking out and epoxy filling*'. The records also make a comment that '*The fall is built into the whole house from the foundations, and floors*.' While no floor level survey is found within the EQC records, this one comment confirms that the current floor level variation was noticed during December 2011 inspection as well.

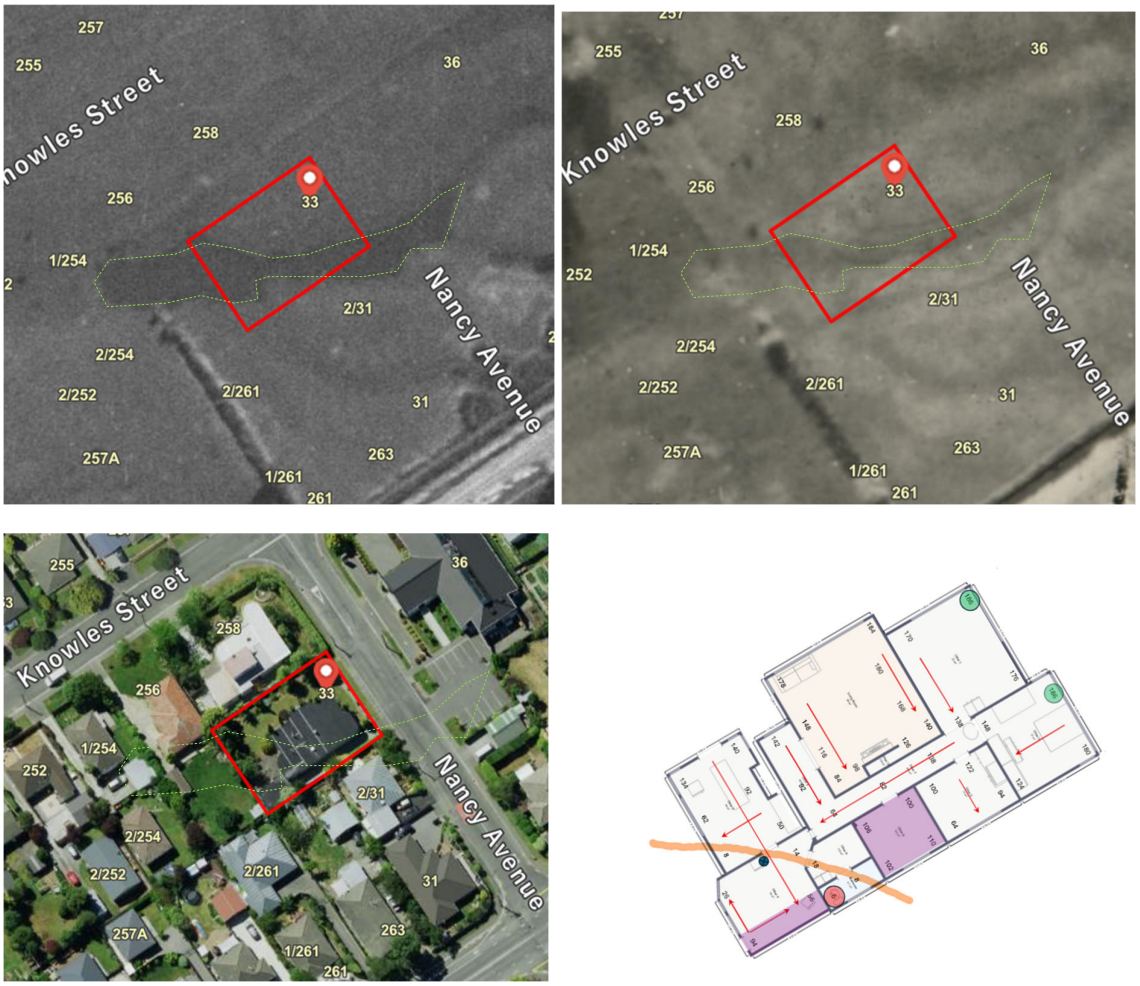

Figure 3: Locality Aerials: 1940-44 (top left), 1945-49 (top right), current (bottom left), house plan showing area of lowest floor levels (bottom right)

The combination of such large floor level differential with only cosmetic cracking post CES suggest that the floor was out of level pre-earthquakes. The second comment by EQC inspector identifies the floor slope as being an intentional design feature, however we disagree with this notion. The magnitude and dispersion of floor slopes is not even and certainly not something one would expect in an internal 'dry' area. We have reviewed historical photos of the location, where 33 Nancy Ave is built, see Figure 3. It is understood that there was small pond (depression) at the location of the house. It is

likely that the fill that was used to level this depression has experienced settlement. The location of the depression corelates closely with the location of lowest floor levels recorded. It is difficult to say, 'when' this settlement occurred. The owner reinstated all floor coverings between 2023-2024. She stated that no signs of cracks or repaired cracks were observed in the concrete slab. This indicates that most of the settlement likely occurred during or immediately after construction. Any damage that occurred was likely covered up by architectural rendering/plastering, while applying finishing touches to the building.

While majority of the settlement appears to be pre-earthquake, it is highly likely that the CES has added to these settlements to some extent. The property is located in a TC2 area, within 200m South-East of the Dudley Creek and is of heavy weight. These are characteristics that are known to lead to higher liquefaction related ground settlements. It is difficult to say to what extent without a detailed geotechnical investigation and analysis. During our site visit, we did not observe any damage to exterior or interior of the building, possibly due to refurbishment and repairs over time, however there was several cracks to hardscaping around the dwelling.

The building damage has been observed to be minimal from the Christchurch earthquakes. This suggests that the existing floor levels have not adversely affected the seismic behaviour/capacity of the building during CES, or for the 70+ years that the building has been standing. At the location of largest settlement (south-west corner), there are numerous closely spaced walls that restrain each other in out-of-plane. The flat timber roof also holds these walls together, likely working as a diaphragm. Based on these factors, it is our engineering opinion that the observed floor levels have not substantially diminished the structures' load carrying capacity or pose a structural hazard in itself. It is clarified that this opinion is relative to a similar structure, without differential floor levels. It is not to be interpreted as a seismic assessment of the building. The construction of this building utilizes unreinforced masonry, which is known to under-perform in earthquakes and create local collapse hazards. A detailed seismic assessment of the building is recommended to evaluate the building's actual seismic performance and associated seismic strengthening.

While not a stability issue, the recorded floor levels and slopes are well outside the serviceability limits of a residential space. This could potentially create a risk for the elderly and running children. Hence, it is our recommendation that consideration is given to re-levelling the floor to MBIE guidance. Possible repair strategies include jacking using engineered resin or low mobility grout, and formation of a new slab above the existing. Input from an experienced re-levelling contractor should be sort to develop and implement the most feasible repair solution.

This letter closes our brief structural review in respect to the identified damage. Please feel free to contact the undersigned for any clarifications.

Yours sincerely

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Structural Engineer
SA Build Ltd

Appendix A – Raw floor level survey (by client)

Disclaimer:
Conclusions in this letter are reliant on limited inspections, and information provided by the client. It does not address the defects that are not discoverable from the information available (specifically geotechnical related) and/or issues unrelated to scope of this letter. No testing of materials or quantitative analysis has been carried out. This report has been produced for the use of our client only, and solely for their purpose of obtaining a statement of professional opinion. It may not be used by others for any other purposes. SA Build accepts no liability to any third party who may act upon the contents of this report.

Appendix A – Floor level survey provided by client (Raw – uncorrected for floor coverings)