

**Submission
No 1**

**INQUIRY INTO GOVERNMENT'S MANAGEMENT OF THE
POWERHOUSE MUSEUM AND OTHER MUSEUMS AND
CULTURAL PROJECTS IN NEW SOUTH WALES**

Name: Mr Gordon Chirgwin

Date Received: 2 March 2020

Email : Mon 2/03/2020 8:00 PM

Subject: Building performance design parameters for the Proposed Parramatta Museum of Applied Arts and Sciences

Museums Committee,

I write regarding your upcoming inquiry.

The proposed construction of the new Museum of Applied Arts and Sciences at Parramatta raises several concerns, ranging from the destruction of heritage in Parramatta to the risk of flooding for the chosen site.

Given that the museum will hold items of irreplaceable heritage value, it is imperative that the design, construction and operation of the museum provide proper protection for these assets in the event of earthquake, fire and flood.

In this regard, the normal building design parameters do not apply. Normally, the design life of a building would be 50 years – that is, the structure should not fail structurally within 50 years, with a reliability index of 3.5. In crude terms, this equates to a likelihood of failure of about 1/6,000 over the building's life of 50 years.

A more appropriate structure life would be 200 years, with a reliability of 4.5 (i.e. a likelihood of failure of more like 1/60,000 in 200 years). This should include a very high level of storm and earthquake immunity. An appropriate design storm would be not less than the 1/10,000 AEP wind accounting for the effects of Climate Change, and the earthquake be not less than the 1/10,000 AEP earthquake.

This brings me to the next key factor. We do not want the collection to be damaged directly or indirectly due to flood. The collection should be out of flood reach for all reasonably foreseeable floods, and the failure of building services or the flooding of structure, fittings, furnishings and services should not cause damage to the collection. In this regard, one might look for the collections floor to be above the 1/10,000 year ARI. In assessing the flood immunity, the failure of the dam or failures in operation of the dam holding Lake Parramatta must be included in the assessment. The collection cannot be put at jeopardy by some future failure to maintain or properly operate the dam.

Likewise, the building itself cannot fail under such a flood – hence appropriate additional factors above the normal code provisions, will be required.

I suggest that A/Professor Stuart Reid, University of Sydney, would be a suitable person consult on reliability factors and other risk parameters, as structural reliability is his research field.

I trust that my submission will give the Committee some much needed, independent advice on these critical aspects.

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