ATTACHMENT R

Stone Report 2 - Impact of the Glazed Link

By Jasper Swann

AUSTRALIAN WAR MEMORIAL

REDEVELOPMENT PROJECT
ANZAC HALL & GLAZED COURTYARD LINK

PRELIMINARY REPORT CONCERNING EFFECTS OF REDEVELOPMENT ON EXISTING SANDSTONE FACADES

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1.0 Purpose of Report

This report has been commissioned by Cox Architecture.

The purpose of this report is to provide:

i) An assessment of the likely effects of the proposed new glazed courtyard on the existing sandstone facades of the Australian War Memorial at the northern end of the building;
ii) An assessment of the likely effects of increased visitor contact with the existing sandstone facades.

2.0 Author Identification

Jasper Swann has 30 years experience in the construction, conservation and care of sandstone buildings and structures. He holds a BSc(Hons) Degree, a City & Guilds London Institute Craft Certificate in Stonemasonry, a Diploma in Lettercutting & Carving and a Masters Degree in Heritage Conservation. He is a former member of the NSW Heritage Council's Technical Advisory Group and former lecturer in the conservation of sandstone structures in the Masters of Heritage Conservation Program at the University of Sydney. He has been a regular article contributor to the Australian Stone Advisory Association's (ASAA) industry magazine, *Discovering Stone*. A full CV is available at http://www.jasperswann.com.au/cv

3.0 Limitations of the Report

No site inspection has been made of the elevations pertinent to the proposed development at the northern end of the building. The current condition of the stonework on these facades is thus unknown. Recent inspection has been made of the stonework at the southern entrance, in the context of the current proposal for redevelopment of the southern entrance and forecourt.

4.0 Documentation

The following documents have been perused:

- Cox Architecture Drawings AWM-0273-CD-P-213, AWM-0273-CD-P-216
- Cox Architecture Eastern and Western Rendered Views
- Department of Environment 2019-8574 Assessment, Further Information Letter, Attachment A
- Site photographs provided by Cox Architecture

5.0 Effects of the Proposal on the Stonework

The proposed enclosure of the currently external sandstone facades may affect the weathering of the stonework in a number of ways. On balance, the effects are more likely to be beneficial than deleterious, but further site

inspection may be required in order to confirm this. The potential effects are discussed below.

5.1 Alteration of the Ambient Air Temperature and Humidity

I understand that the enclosure of the glazed courtyard will be a conditioned space with ambient temperature of 22 degrees Celsius +/- 4 degrees. Whilst no specific humidity control is proposed, the enclosure of the stonework in the glazed courtyard will nonetheless reduce fluctuations in both temperature and humidity. The temperatures that the stonework will be exposed to in summer are likely to be cooler than at present, which would be reasonably anticipated to reduce the effects of diurnal thermal expansion of the sandstone. Diurnal thermal expansion can cause cracking of sandstone at perpendicular and bed joints, so the potential for this is likely to be reduced. In the winter, it is likely that the stonework will be exposed to consistently more moderate temperatures than is currently the case, and also protected from frost. Frost is a contributor to cracking of stonework and synthetic stonework repairs. It is not known whether any synthetic repairs to the stonework exist, since close inspection of the stonework has not been made, but in any event, the potential for this mode of decay is likely to be reduced if the stonework is enclosed.

The only instance in which the stonework may be exposed to an increased risk of deterioration is if interior temperature alteration causes condensation to occur with any significant frequency on the stonework. This has been known to occur when heating interior spaces on cold, damp days. Water in the interior air in such conditions can condense on the stonework at night as the building cools. It is likely that interior temperatures and humidity would be maintained at moderate levels at all times, so this eventuality is considered unlikely.

5.2 Removal of Effects of Wind and Rain

Wind and rain are significant contributors to the decay of sandstone. Enclosure of some of the facades in the glazed courtyard is likely to provide a benefit to the longevity of the sandstone on these facades, through removal of these weathering influences.

Exceptions to this would be if any efflorescence currently exists in the walls. Efflorescence is characterised by the deposition of harmful soluble salts close to or on the surface of the stonework. Salts (as atmospheric pollutants) may have been deposited in the stonework through rain. If any efflorescence exists, then the drying-out of the air in the glazed courtyard has the potential to temporarily exacerbate the crystallization of salts, with potential for a sudden increase of rates of surface deterioration associated with this decay mechanism. Since inspection of the stonework has not been made, it is not known whether any significant efflorescence exists in the external stonework, but if so, then the issue could be readily ameliorated by desalination of the stonework through either the application of a poultice or by captive-head washing, both of which methodologies would significantly reduce the volumes

of soluble salts in the stonework. The glazed and fully-enclosed environment proposed would be likely to eliminate any future ingress of soluble salts into the stonework.

5.3 Removal of Effects of Heat Associated with the Western Sun

The heat associated with the afternoon western sun is a major contributor to the decay of sandstone, owing largely to increased intensity and frequency of evaporation cycles and increased diurnal thermal expansion of the stonework. The result of this mode of decay is increased cracking and exfoliation of the stonework. This can be seen on some west-facing facades at the Australian War Memorial.

The enclosure of some of the stone facades in the new glazed courtyard, and the associated modification of temperature and moisture ingress, is likely to be of a benefit in this regard, removing this mode of decay.

5.4 Potential Increased Physical Human Contact with Stonework

The proposal to enclose the stone facades at the northern end of the building and the associated increase in visitor traffic in this area has implications for potential increased soiling of the stonework at lower levels. The two most likely ways in which the stone may be soiled by people is i) placing of soles of feet against the walls, and ii) resting of heads against the walls, transferring oils into the sandstone. Over long periods of time, both have the potential to soil the stonework in concentrated zones. It would be preferable to avoid the soiling rather than focus on ways to clean it.

It would be preferable not to locate any benches or seating against the sandstone walls, as this does encourage resting of the head on the stonework.

Keeping the soles of feet off the walls is less easily dealt with, but in my view, it is not likely to present a significant issue. Options to protect the stonework from soiling include application of a wax coating to the lower courses. Such coatings have been used on other buildings to assist in the ready removal of graffiti. The coating is visually perceptible, but not overt. Dirt can be readily cleaned from this coating. Over time, periodic re-application of the coating might be necessary if cleaning of its surface has occurred. In my view, it may be best simply to monitor the situation in the first instance to see if any need to protect the stonework arises.

5.4.1 Asbestos-Containing Pointing (ACP)

Between the 1920s and 1970s it was not uncommon for masons to add asbestos fibres to pointing mortars. The most common additive was Chrysotile, a white asbestos. It is not known whether any asbestos is present in the pointing at the Australian War Memorial. Although the material, if

present, would be bonded and would not present a public risk if undisturbed, owners and authorities responsible for certain other significant public buildings that have undergone redevelopment, and in particular have undergone enclosure of previously external sandstone facades, have considered that the potential for increased public contact with the material was a risk that needed to be mitigated. Removal of the asbestos-containing pointing ensued. It is recommended that the pointing at the Australian War Memorial be inspected, sampled and tested for the presence of asbestos.

6.0 Previous Examples of Enclosure of External Sandstone Facades

There are many precedents for the enclosure of external sandstone facades in glazed interior spaces. These include:

- Capitol Theatre, Sydney, 1997
- GPO (Westin Hotel) Martin Place, Sydney, 1999
- Henry Jones Art Hotel Hobart, 2004
- Museum of Contemporary Art, Sydney, 2012
- Australian Museum 'Crystal Hall' entry building, 2015

I am not aware of any deleterious effects on the formally external stone facades in the above buildings arising from their enclosure.

7.0 Differential Weathering Rates and Visual Properties

The Australian War Memorial has specifically requested advice as to whether there would, over time, be a noticeable difference in the appearance of the stone on the inside of the glazed link to that on the external facades.

The rates of weathering of the external sandstone under normal weathering conditions are likely to be relatively slow. Whilst the internal facades will be protected from the effects of general weathering, and as such may benefit from increased longevity, in my view it is unlikely that any perceptible difference in the stone would arise in anything other than the very long term.

8.0 Conclusion

It is my view that the enclosure of the currently external sandstone facades at the northern end of the building in the proposed glazed courtyard is unlikely to have any deleterious effect on the weathering and longevity of the sandstone. It is more likely that it will significantly slow the rates of deterioration of the sandstone. From a conservation viewpoint, this would be considered to be a benefit. However, further investigation is, in my view, required to assess whether any remedial actions – such as desalination and removal of asbestos-containing pointing, should salts or ACPs be present – might need to be undertaken as a component part of the development.

Whilst visitor numbers around the formally external sandstone facades are projected to significantly increase, internal design measures, such as careful placement of any benches or seats, can be employed to prevent concentration of potential physical contact zones. It is likely that no treatment of the existing stone facades would be required to mitigate against soiling, at least in the first instance. Monitoring visitor movements, behaviours and any soiling of the sandstone early on would usefully guide any necessary decision-making in relation to possible protection of the lower courses of the sandstone.

Jasper Swann Pty Ltd **09/09/20**