

Structural Engineering Peer Review - Structural Response to Applicant's Response to Submissions Report

North Sydney Olympic Pool Redevelopment DA 347/19

North Sydney Council / 3 June 2020

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1.0 Executive Summary

At the request of North Sydney Council, Taylor Thomson Whitting (NSW) Pty Ltd was commissioned to review documents submitted with Development Application DA347/19, to refurbish North Sydney Olympic Pool (NSOP). The purpose of our structural engineering review was to consider whether existing fabric could be conserved, as opposed to demolished, given to the heritage significance of the site. Our original review was provided to Council in February 2020.

This additional structural engineering review responds to amended plans and documents received by Council since our previous review in February 2020. The structural engineering advice of this review relates specifically to the following items, where the Applicant has provided further information. Our advice given in this review should be read in conjunction with and supplementary to the advice provided in the relevant sections of our February 2020 review.

- Further information required on how the Applicant proposes to open-up the space beneath the western staircase as indoor gymnasium space while successfully waterproof beneath the staircase and north-western wall, without changing the appearance of the polychrome brickwork wall (comments of Section 7.5 of our February 2020 review)
- Clarification on the extent of demolition proposed to the sun deck structure (comments of Section 7.7 of our February 2020 review)
- Further information required regarding the structural condition of the western corner building (comments of Section 7.9 of our February 2020 review).

Section 4.0 of this report assesses the additional information provided by the Applicant's project team.

2.0 Introduction

At the request of North Sydney Council, Taylor Thomson Whitting (NSW) Pty Ltd was commissioned to review documents submitted with Development Application DA347/19, to refurbish North Sydney Olympic Pool (NSOP). The purpose of the structural engineering review was to consider whether existing fabric could be conserved, as opposed to demolished, given to the heritage significance of the site. Our original review was provided to Council in February 2020.

This additional structural engineering review responds to amended plans and documents received by Council since our previous review.

The structural engineering advice of this review relates specifically to:

- Waterproofing the western staircase and wall so that the space beneath is habitable for indoor gymnasium use.
- The extent of proposed demolition to the eastern sun deck.
- The structural stabilisation of the western building where subsidence has occurred.

The advice provided in this review should read in conjunction with and supplementary to our advice provided in the relevant sections of our February 2020 review, namely Sections 7.5, 7.7 and 7.9.

All descriptions, references to conditions and other details are for general guidance only and are given as our structural engineering opinion. Any interested parties should not rely on them as statements or representations of fact and must satisfy themselves as to the correctness, quantity, costs, etc. of each of them.

The particulars set out in this report are for the exclusive use of North Sydney Council and are copyright and the property of Taylor Thomson Whitting (NSW) Pty Ltd. No responsibility or liability will be accepted resulting from the use of this report by any other party, and its findings and opinions shall not be used for any other purpose.

3.0 Scope of Additional Review

To form our opinions for this additional review the following amended plans and documents have been reviewed:

- The Applicant's Response to Submissions Report, dated 31 March 2020, prepared by Urbis. Only the additional structural information on page 21 has been reviewed.
- The Applicant's amended Appendix A – Amended Architectural Drawings
- The Applicant's amended Appendix B – Amended Architectural Design Statement
- The Applicant's amended Appendix C – Amended Photomontages
- The Applicant's original Appendix G – Landscape Report and Plans (referenced by the Applicant's Response to Submissions Report in relation to the western staircase)
- The Applicant's new Appendix I – Addendum to Structural Heritage Report (titled 'Building Services Report' on the copy provided to us).

The items we have reviewed accord to the Applicant's project team's additional structural information responses at page 21 of their Response to Submissions Report. Paraphrasing, these are as follows:

- Clarification on the extent of demolition proposed to the sundeck structure.
- Further information required regarding the structural condition of the western corner building.
- Further information required on how the Applicant proposes to open-up the space beneath the western staircase as indoor gymnasium space and successfully waterproof beneath the staircase and north-western wall without changing the appearance of the polychrome brickwork wall.

4.0 Additional Review Findings

The following advice is to be read as supplementary advice to the findings of our February 2020 review. The relevant Section numbers from our February 2020 report are cross-referenced for ease of review.

4.1 Western Staircase

Section 7.5 of our February 2020 review refers.

The further advice requested from the Applicant was as follows:

- The key to successfully opening-up the space beneath the western staircase as gymnasium space will be successfully waterproofing between the staircase and north-western wall of the complex without changing the appearance of the polychrome brickwork wall. How this is done will require careful consideration and may require more height of brickwork than envisioned on the development drawings to be demolished and reconstructed above the level of the stair treads. Early consideration of this detail is important, to minimise that amount of demolition required.*

The Applicant's project team's response is:

- The waterproofing detail will be a standard junction detail of continuous hob and drained and sealed joint. The detail will be developed for the Construction Certificate but will rely on a pressure seal rather than demolition of additional polychrome brickwork.*

TTW's Supplementary Advice based on the Applicant's Response

Our interpretation of the of waterproofing description provided by the Applicant's project team is that it describes continuous upstand hobs – presumably to the staircase edges – and drained and sealed joints. Additionally, it will rely on a pressure seal to the polychrome brickwork, rather than additional demolition and reconstruction of brickwork, to achieve a waterproof roof above the proposed gymnasium space. We provide additional comment as follows:

- Upstand hobs along the sides of the staircase will alter the appearance of the staircase and its relationship to the polychrome brickwork. Presently, the stair treads abut walls either side of the staircase without hobs. Introducing hobs will result in details different to the two photographs on page G-24 of Appendix G, the Landscape Report and Plans, referenced by the Applicant's Response to Submissions Report.
- A new door from the western building to the staircase is proposed (item 19 on architectural drawing No. A19 and noted on architectural elevation No. A22). A continuous hob or step across the door threshold may not be acceptable.
- Describing a joint as being both 'drained and sealed' is not understood by us. A sketch of this detail by the Applicant's project team would be of assistance to understand how waterproofing will be achieved.
- From the brickwork bond and period of construction, it is our assessment that the polychrome brickwork wall is a cavity wall. The means by which a cavity wall prevents water penetrating and entering a building is via the cavity. Typically, the cavity channels any rainwater that penetrates the outside skin (and cappings) to cavity flashings that then drain the water externally. Presently the cavity wall passed the staircase and the staircase abuts the wall – there are no cavity flashings above the staircase level to drain water via. Therefore, removing the wall beneath staircase level – to open the sub-stair space as an indoor gymnasium space – will cause the cavity to drain into the building unless cavity flashings are constructed above the staircase level, i.e. above new roof level. NCC Performance Requirement FP1.4 requires that, 'A roof and external wall (including openings around windows and doors) must prevent the penetration of water that could cause (a) unhealthy or dangerous conditions, or loss of amenity for occupants; and (b) undue dampness or deterioration of building elements'. In our opinion a hob and pressure seal to the wall face, as described by the Applicant's project team's response, will not prevent the penetration of water and will therefore not meet NCC Performance Requirement FP1.4.



Figure 1 - Western wall and staircase – Presently the concrete staircase appears to be constructed against the wall, and the cavity wall runs past the staircase to the ground. Removing the wall – to open the space beneath the staircase as habitable space – and reconstructing the staircase as a roof will require a waterproofing detail that meets NCC Performance Requirement FP1.4.

4.2 Extent of Proposed Demolition of Sun Deck

Section 7.7 of our February 2020 review refers.

The further advice requested from the Applicant was as follows:

- *The extent of demolition of the sundeck structure needs to be clarified as the plans show less areas of demolition than is shown on the elevations.*

The Applicant's project team's response is:

- *The architectural documentation has been revised to indicate changes to the extent of demolition. For further details, refer to the amended Architectural Plans.*

TTW's Supplementary Advice based on the Applicant's Response

The architectural proposals for the sun deck have been amended. In our opinion the amended architectural plans now show / note similar extent of demolition to the architectural elevations.

When taking down the sun deck we note that it is intended to salvage bricks and other materials for reconstruction works and repair works elsewhere in the complex. We note also that it is proposed to take moulds concrete motifs for duplication in reconstructed elements.

We have no further structural comments.

4.3 Western Building (Presently Used as a Gym)

Section 7.9 of our February 2020 review refers.

The further advice requested from the Applicant was as follows:

- *Further details are required regarding the structural state of the western corner building, adjacent to Luna Park. The cause(s) of the apparent movement or settlement of the harbour-facing wall needs to be investigated. The cause of movement should be repaired, and the wall underpinned if necessary.*

The Applicant's project team's response is:

- *Additional advice has been provided by the structural engineer in relation to this matter, referring to Appendix I.*

TTW's Supplementary Advice based on the Applicant's Response

Appendix I records the cracking to the south-western wall and the Applicant's intent to underpin this wall.

We agree that this will be the likely structural requirement, in response to settlement, and have no further structural comments.