TTW Structural Civil Traffic Façade

Structural Engineering Peer Review

North Sydney Olympic Pool Redevelopment

DA 347/19

North Sydney Council / 28 February 2020

R0

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AUTHOR	REVIEWED	APPROVED	ISSUE	STATUS	DATE
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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 this structural engineering review is to consider whether existing fabric could be conserved, as opposed to demolished, given to the heritage significance of the site. Originally constructed in the mid 1930's for the 1938 Empire Games, the pool complex has local heritage significant, as listed in North Sydney Council's Local Environment Plan (LEP).

The scope of the review and documents reviewed are set-out in Sections 3.0 and 4.0.

Our assessment considers each element of the exiting complex that the Development Application proposes demolished and advises the current condition of that element and any options for its retention. Where relevant the impact the retention would have on the development proposals is also discussed.

In Section 7.0, our assessment of each element and the development proposed concludes with an advice note. The advice note for each element summarises our findings and reasons for them.

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2.0 Introduction

At the request of North Sydney Council, Taylor Thomson Whitting (NSW) Pty Ltd has been commissioned to review documents submitted with Development Application DA347/19, to refurbish North Sydney Olympic Pool (NSOP). The purpose of the structural engineering review is to consider whether existing fabric could be conserved, as opposed to demolished, given to the heritage significance of the site. Originally constructed in the mid 1930's for the 1938 Empire Games, the pool complex has local heritage significant, as listed in North Sydney Council's Local Environment Plan (LEP).

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.

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3.0 Scope of Review

To form our opinions the following level of structural engineering review has been undertaken:

- Development Application documentation review, and review of other relevant documentation. Refer to 4.0 for the list of relevant documents reviewed.
- We visually inspected the site, accompanied by the facilities manager Norman Boyle
- Because the pool was in use only the male changing rooms could be inspected
- Material testing or invasive inspections were not carried out
- Structural drawings for the proposed development have not been provided or reviewed (structural engineering concept options report has been reviewed)
- Structural documentation for the existing buildings was not available for review
- No structural analysis or design has been undertaken
- Stormwater drainage was not inspected
- Building services have not been considered
- NCC compliance has not been considered (other than for the Grandstand)
- The hazardous building materials assessment included within the DA documents has not been reviewed
- The site environmental assessment included within the DA documents has not been reviewed
- Environmentally sustainable design (ESD) has not been considered.

The level of review undertaken is limited to what is recorded in the following pages of this report and is not sufficient to certify that the building was constructed in accordance with the original design documents or is structurally adequate in accordance with design codes at the time of construction nor present codes.

Only visual assessment of accessible areas was made, and this report does not cover detailed measurement and recording of defects.

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4.0 Documents Reviewed

A full set of Development Application documents were provided to us by North Sydney Council. From these the architectural proposal and the following documents relevant to structural condition and proposed demolition have been reviewed. Additionally, an investigation and concrete tests to assess the condition of the grandstand concrete, undertaken in 2018, have been reviewed. Our structural review relates only to built elements.

The Development Application documents we have referred to are as follows:

- NSOP Revised Notification Plan prepared by Brewster Hjorth Architects, which gives an overview of the extent of proposed building and landscape works as well as the extent of heritage buildings and landscape works to be retained
- Architectural Drawings prepared by Brewster Hjorth Architects, which include demolition plans
- Heritage Impact Statement prepared by Urbis, which assesses the heritage significance of elements of the complex
- Geotechnical Report prepared by Douglas Partners
- Structural Engineering Concept Report prepared by Mott MacDonald Australia.

The Grandstand concrete investigation and test reports we have referred to are as follows:

- Grandstand Concrete Investigation report prepared by Mahaffey Associates, dated 19 October 2018
- Review of Findings Concrete Testing letter prepared by Mott MacDonald Australia, dated 15 October 2018.

5.0 Description of Building Structure

The existing North Sydney Olympic Pool complex consists of an outdoor 50m pool, children's and wading pool, grandstand, sun deck, a modern 25m indoor pool and pool hall, admin buildings and surrounding art deco arched brick masonry facades. The 50m pool, grandstand and sun deck structures were originally commissioned for the 1938 Empire Games, constructed primarily from reinforced concrete and polychrome brick masonry. These structures for the large part remain. The boundary walls of the original pool area are constructed with art deco masonry which mostly remains. Original features such as timber-framed windows to the original main entrance buildings remain.

The complex is heritage listed at a level of local significance by North Sydney Local Environmental Plan 2013 (Item No: I0537). The Luna Park site to the North West is listed on the State Heritage Register under the Luna Park Precinct, which shares a common staircase with North Sydney Olympic Pool. It is proposed to demolish and reconstruct this staircase as part of the works.

The complex is within the Sydney Opera House Buffer Zone and looks out over Sydney Harbour. The site is built over the old Dorman Long steel fabrication warehouse site, used to fabricate steelwork for Sydney Harbour Bridge.

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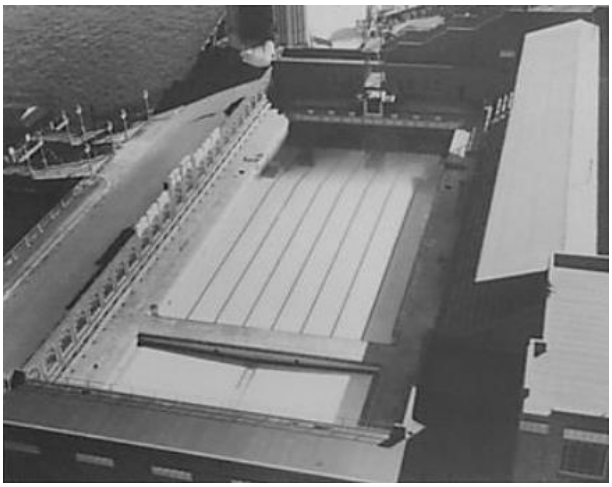

Figure 1 – North Sydney Olympic Pool c.1936[1]

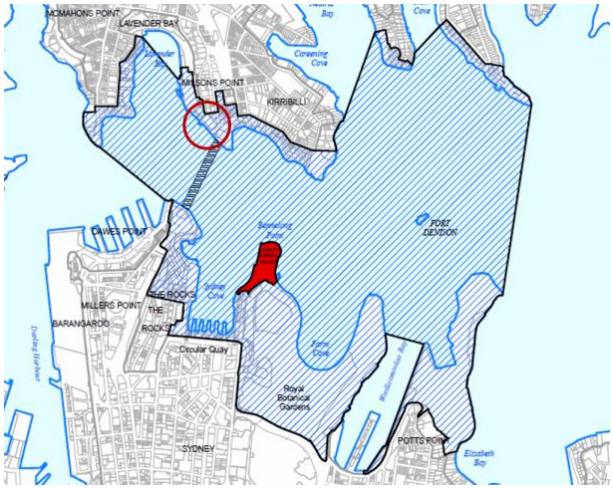

Figure 2 – Sydney Opera House Buffer Zone Map[2]

Additions and alterations have been carried out over of the life of the complex including the 25m indoor pool and gymnasium, constructed in 2001. The 2001 structures to the north east are steel-framed and externally glazed. There is a clear distinction between what was original and what was added in 2001.

6.0 Building Inspection

Paul Connett and Angus Busuttil from the Sydney office of Taylor Thomson Whitting carried out our site inspection of the North Sydney Olympic Pool on 15 January 2020. The inspection was in the company of the facilities manager Norman Boyle, who provided access and described the works proposed to be undertaken.

Internal and external elements were inspected with a focus of attention to the structural integrity of the existing construction, giving practical consideration to conserving existing fabric as opposed to demolition. The existing structure has been reviewed against the demolition drawings prepared by Brewster Hjorth Architects, and for coordination this report uses the building names used on these drawings to identify items.

Most sections of the complex were accessible for our visual inspection, however confined spaces underneath the original 50m swimming pool were not accessible. Because the pool was in use, only the male changing rooms could be inspected.

[1] *Stanton Library, North Sydney Heritage Centre, LH REF PF559*
[2] *NSW Planning & Environment, Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005*

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7.0 Building Condition and Proposed Work Assessments

7.1 50 Metre Pool

The 50m pool was constructed using reinforced concrete in 1936. The original design included a deeper end for diving, which TTW has been advised was shallowed in the 1980's. We understand significant re-waterproofing works have been completed over the life of the pool, however water loss issues – and water penetrating the structure – have persisted.

Condition Assessment

The 50m pool was inspected from publicly accessible locations around the pool deck with the following observations:

- Pool deck tiles are drummy, indicating delamination from the substrate below.
- TTW was advised by the facilities manager that the pool deck along the harbour side has previously had load restrictions placed on it, following a structural review.
- TTW was advised that access below the pool deck was not possible due to the area being a confined space. It is understood from Mott MacDonald's structural report that water penetrates between the pool walls and bottom slab.

Figure 3 – Existing 50m Pool Overview

Figure 4 – Existing 50m Pool Overview

Development Proposal

The development proposal documents demolishing the existing 50m pool and pool deck, leaving in place the existing pool slab where possible[3], and re-constructing the 50m pool. The proposal aims to address the reported significant leaks, which have not been rectified despite numerous attempts. The Structural Engineering Concept Options Report advises that investigations undertaken by Ninnes Fong in 2005 and by Mahaffey in 2018 found that the pool structure is severely degraded and requires replacement.

Advice

In our opinion, options for conserving the existing concrete structure of the 50m pool are limited because of the reported poor condition of reinforced concrete and continuing water leaks. It is unlikely that the pool slab will be able to be kept as any moisture in the ground will continue to corrode reinforcement and the expansion

[3] Mott MacDonald, Structural Engineering Concept Options Report, Section 4.1.1

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of reinforcement and heave beneath the new works will disturb the new works. In addition, the architectural drawings indicate that it is proposed that the slab be demolished. It may be possible that a proportion of the former diving pool slab (already infilled) could be left in place, isolated from the new pool structure and infilled with mass concrete, as an archaeological reminder of the former pool.

7.2 Indoor 25 Metre Pool and Hall Structure

The existing indoor 25m pool and pool hall were constructed in 2001, consisting of a 220mm thick reinforced concrete slabs founded on 1MPa sandstone with piers down to 3.5MPa bedrock[4]. The Pool hall was built at the same time and consists of long spanning steel frames with large glass facades and roof sheeting.

Condition Assessment

The 25m pool and poll hall were inspected from around its below-floor maintenance perimeter, beneath the public access area and from the external perimeter with the following observations:

- The steel framed roof canopy is in a deteriorated condition, with corroded structural steel and cladding sections noted, and significant paint peeling.
- Several steel connections to concrete hobs are in a severely corroded condition.
- Concrete vertical sections below ground, forming the pool structure show efflorescent staining but the concrete appears sound. There was no evidence of reinforcement corrosion observed.

Figure 5 – existing indoor pool structure overview

Figure 6 – existing indoor pool structure

Development Proposal

The development proposes retaining the existing 25m indoor pool (while extending it for a ramp into the pool), demolishing the surrounding steel-framed pool hall and glazing and building a new additional pool and surrounding pool hall. The proposed new pool hall structure, described in Section 3.1.2 of the Structural Engineering Concept Options Report, will incorporate deep steel beams spanning 30m across the new and existing pools, with skylights between.

[4] Mott MacDonald, Structural Engineering Concept Options Report

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Discussion

The proposal is to retain the existing 25m pool, extending it along the south-west side to provide improved stair and ramp access, and to construct a second accessible pool to the north. Retaining the existing pool hall building, which won architectural and engineering awards when it opened in 2001[5], would prevent this.

The existing pool hall building is in a relatively unmaintained state in terms of general building maintenance and is showing its age. The swimming pool environment and proximity to the harbour both generate microclimates that are aggressive to painted steel and aluminium. This would have been considered when the building was designed, however the long period since the building was last painted to protect it is evident. There is corrosion to structural steel and cladding sections – such as steel eave fascia – and there is significant peeling of paint more generally. Tiling around the bottom of the glazed walls have spalled, revealing heavily corrode structural steel baseplates.

Advice

It is proposed to retain the existing 25m pool, extending it along the south-west side to provide improved access to the water, and to construct a second accessible pool to the north. Retaining the existing pool hall would prevent this. It is our opinion that maintenance and repair of the 25m pool hall is overdue and that to undertake a full repair programme that would extend the life of the pool hall for a further 20 years would be expensive. Scaffolding to access the south-west roof cantilever would need to be constructed from the open corridor behind the male changing rooms and this too would be expensive to construct. It would also complicate access to undertake works to the grandstand area of the site, for example.

In conclusion, retaining the exiting pool hall would significantly change the development proposal for a fully accessible program pool and would therefore reduce the amenity of the future complex. In addition, undertaking a full program of repairs to the pool hall, to achieve a further 20 years of service, will be expensive. Therefore, the cost of retaining and repairing the pool hall against the benefit of significantly improved future facilities needs to be considered. It is our opinion that retaining and repairing the existing pool hall will not give value to the community.

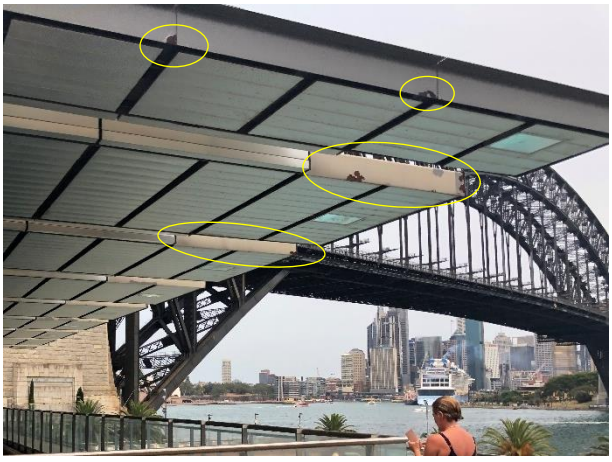

Figure 7 – Areas where corrosion is occurring – typical of all fascia

Figure 8 – External view. Spalled tiles at base of glazing revealing severely corrode structural steel baseplate. Painted steel frame to left of photo (inside building) also significantly corroded.

[5] Urbis Heritage Impact Statement, Page F-37

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7.3 Children's and Wading Pools, Including Shade Structures

The children's and wading pools have been considerably altered; however, the pool was part of the original configuration within the complex for the 1938 British Empire Games. The steel shade structures with fabric canopies are more recent additions.

Condition Assessment

The pools and shade structures were inspected from the pool deck with the following observations:

- The shade cloth is in an aged condition and requires cleaning. Shade cloth of this type has a short life, of say a maximum 10 years, before it needs replacing.
- The steel structure supporting the shade cloth is in a deteriorated condition with corrosion visible and paint peeling.
- Floor tiles surrounding the pool are drummy indicating delamination from the concrete substrate below and likely water ingress.

Figure 9 – Existing Wading Pool and Shade Structure, looking across towards the children's pool

Figure 10 – Existing Wading Pool and Shade Structure, looking across at the children's pool

Development Proposal

The development proposes demolishing the existing children's and wading pools and shade structures, to rebuild a new leisure pool with a larger footprint extending further north-east. A new ETFE foil canopy structure is proposed to replace the existing shade structures.

Discussion

The underlying reinforced concrete structure of these two pools is of similar age to that of the 50m pool, it is therefore likely to be in similar condition. At 84 years of age it is highly likely that the reinforcement is corroding, and the concrete is spalling. As with the 50m pool, it is likely that these pools also leak water.

Advice

In our opinion, options for conserving the children's and wading pool structures as they stand are limited because of the age of the structure. The condition of reinforced concrete to these pools will be similar to that of the 50m pool, which concrete testing and investigations have shown to be poor. The modern, basic shade cloth structures above both these pools are also close to the end of their service life.

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7.4 Grandstand

The steeply terraced grandstand was constructed in 1936 and consists of reinforced concrete stepped slabs, with concrete beams and columns below supporting it. The grandstand stepped form acts as the roof structure over the pool changerooms below, which continue to be used. Water services for the changeroom showers are cast into the grandstand concrete.

Condition Assessment

Our assessment of the condition of the grandstand structure relies on Mahaffey Associates' grandstand concrete investigation and concrete test results of October 2018 and our visual observations. Our assessment of condition is as follows:

- Mahaffey Associates' investigations and tests found that the concrete cover to the reinforcement in the steps is inadequate, at 15mm. The depth of concrete carbonation exceeds the depth of reinforcement, making the reinforcement vulnerable to corrosion.
- Mahaffey Associates' concrete tests found that the chloride ion content exceeds recommended limits in several locations, giving rise to the risk of chloride-induced corrosion of reinforcement.
- Commencement of corrosion of reinforcement was evident where Mahaffey exposed reinforcement in four locations.
- From our observations, in some locations spalling of concrete is occurring, indicating the corrosion of reinforcement.
- Concrete patch repairs have been previously made to the exposed upper faces of the grandstand terrace at numerous locations, with render repairs in several locations.
- Below the terrace, there is significant cracking of brickwork that encases concrete columns. We strongly suspect that this indicates corrosion and expansion of the column reinforcement and spalling of the columns. If this is the case this is of significant structural concern.
- The existing grandstand steps do not comply with current NCC requirements for access and egress. Stair treads were measured to be approximately 230mm in height with the NCC requiring a maximum height of 190mm (NCC D2.13). The steep incline of the steps is excessive, and the circulation widths at exits are too narrow. In our opinion, there would be safety issues to crowds using the grandstand.
- Balustrades to the pool side of the grandstand and steps are in a very heavily corroded condition.
- Brick infill walls below the grandstand along the pedestrian area adjacent to the pool were in generally reasonable condition but with vertical cracking at door entrances and return corners. This was not investigated but may indicate corrosion of embedded steel elements.
- The grandstand reinforced concrete landings and steps down to the pool perimeter have been re-supported on steel posts (from historical photographs the posts are not original).

Mott MacDonald's review of Mahaffey's findings of October 2018 – where they were asked to advise on the current load capacity of the grandstand[6] – concludes that the existing load capacity is currently unknown. They further advised that until such time as further investigations and analysis are carried out they would recommend that the grandstand structure not be subjected to crowd loading, such as for major events and swimming carnivals. Mott MacDonald advised however that the structure could remain in use for general day-to-day use by swimmers and staff.

We concur with Mott MacDonald's general view on the strength and load capacity of the grandstand. We would also advise that in our opinion it does not meet NCC requirements for access and egress. In addition, there are vertical supports – reinforced concrete columns – beneath the back of the grandstand that we believe to be corroded and spalled; where encasing brickwork is cracked vertically. These would need to be repaired and strengthen to allow the grandstand to be reused.

[6] Mott MacDonald, Structural Engineering Concept Options Report, Section 5

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Figure 11 – Grandstand overview

Figure 12 – Grandstand terrace

Figure 13 – Vertically cracked brickwork encasing a column to the back of the grandstand, which suggests that the column reinforcement is likely corroding and the concrete spalled

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Development Proposal

The development proposes a new concrete framed grandstand with two tiers. New columns are proposed to support the new reinforced concrete structure. The overall seating capacity is reduced.

Advice

We concur with Mahaffey's testing assessment that the grandstand reinforced concrete is at the end of its serviceable life and that concrete and supporting elements would require significant repair to make the grandstand serviceable once more. The current load capacity of the grandstand is unknown and in addition it does not comply with present-day access and egress requirements. Although the grandstand has a historical significance it is difficult to know how it could be integrated into any redevelopment scheme for reuse as a grandstand. Even if it could be there would be considerable maintenance challenges to it ongoing upkeep.

7.5 Western Staircase

The existing western staircase extends between the intersection of Northcliff Street and Paul Street to the north and downwards towards the harbour and the entrance to Luna Park. The staircase consists of suspended reinforced concrete flights and landings supported by structural steel and masonry walls below.

Condition Assessment

The existing stair structure is in generally poor condition with the following observed:

- From below, the concrete landings and treads appear to have undergone significant patch and sprayed concrete repairs over time.
- Supporting structural steelwork is in a corroded condition. Close access to inspect the extent and severity of corrosion and measure sections was not possible at our inspection, however from photographs taken severe corrosion pitting can be seen to some sections, indicating loss of steel section and strength.
- The Brickwork wall along the north-west side of the staircase, facing Luna Park has steel post and rail stiffeners behind it, strengthening the brickwork[7]. The strength and integrity of this wall is unknown.

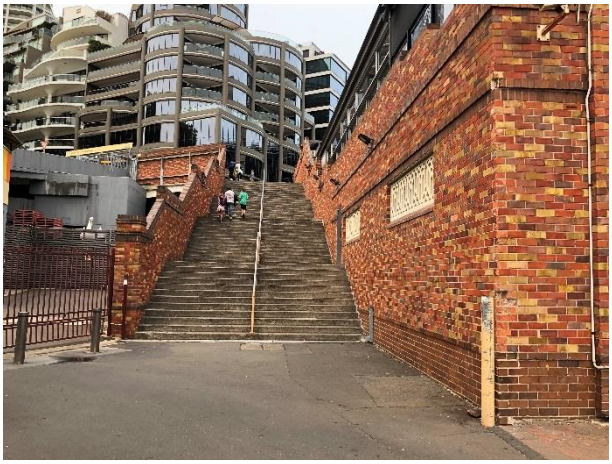

Figure 14 – Existing Western Staircase Overview

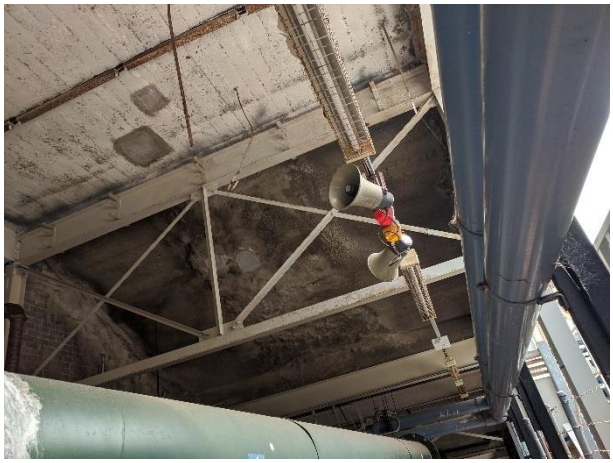

Figure 15 – Existing Western Staircase Underside

[7] Mott MacDonald, Structural Engineering Concept Options Report, Section 10.3

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Development Proposal

The development proposes to demolish and reconstruct the staircase, and to extend the gym and pool plantrooms beneath the stair. It is understood form Urbis' Heritage Impact Statement that it is intended that the brickwork along the north-east side of the stair will be carefully taken down, the bricks cleaned and reused to construct a new, matching wall.

Advice

The steelwork supporting the western staircase is corroded and the suspended concrete landings and flights have been extensively repaired previously. In our opinion, options for conserving and reusing the staircase are limited because of its poor condition. Also, it would not be effective and waterproof as a roof to enclose the proposed gym and plantroom extensions.

The development proposes to salvage and construct the polychrome brickwork of the north-west wall, so that the reconstructed appearance of the staircase is similar. Wen salvaging bricks, we would recommend that a dismantlement and cleaning trial be undertaken in advance of full removal, to work out the best methods of careful removal and cleaning the bricks. It is inevitable that some bricks will be lost. With polychrome brickwork that has a random pattern it will be necessary to have more bricks than are needed to reconstruct the wall in a similar way. This will mean that matching bricks from elsewhere across the site will also need to be carefully salvaged and cleaned.

We would also note that there are two types of polychrome face brickwork across the site, one with a vertically raked brick face and the other with a smooth brick face. Each has a different textural appearance.

7.6 Plantrooms

The existing plantrooms consist of concrete framed rooms with masonry infill walls, which contain mechanical pumps for the complex's pool plant equipment.

Condition Assessment

The existing plantrooms are in a reasonable to poor condition with the following observed:

- Efflorescent staining is prevalent to concrete sections
- Paint is delaminating from masonry wall sections
- Cracking through rendered brickwork is extensive below the western staircase exit at Level 1.

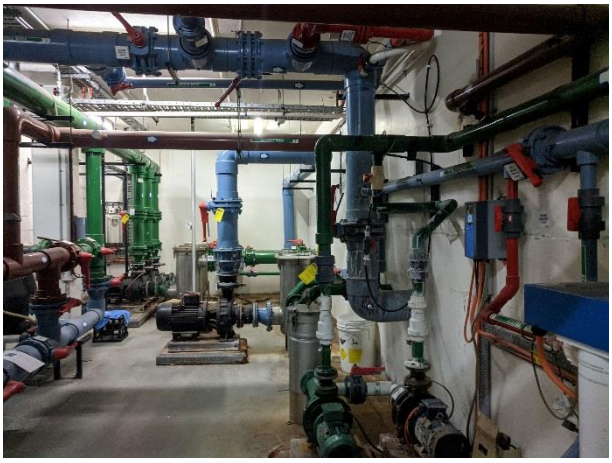

Figure 16 – Existing Plantroom Overview

Figure 17 – Cracking Around Plantroom Door Entrance

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Development Proposal

The development proposes demolishing the Level 1 plantroom western wall, to extend the plantroom zone to the property boundary beneath the western staircase. The proposal forms part of demolishing and rebuilding the western staircase, discussed above. The plantroom zone at Level 2 appears largely unchanged – walls bounding the rockface are not marked for demolition.

Advice

It is reasonable that redevelopment of the pool complex to the extent proposed will require new and extended plantrooms. The walls marked for demolition are back-of-house and in poor condition. The north-western wall is badly cracked around the door leading to the external area beneath the western staircase. This wall requires reconstruction, to support the reconstructed stair. In our opinion, there is limited scope to conserve these elements of the building.

7.7 Sun Deck

The existing sun deck appears to be concrete framed with brick (or brick encased concrete) columns, and brick masonry walls to Ripples Café and at the northern end. The west-facing columns have decorative concrete capitals (painted cream) and the sun deck concrete edge is fluted and painted a terracotta colour. Above the fluted edge there is a more modern glazed balustrade. The sun deck roof consists of timber joists spanning north – south (to concrete beams), with a layer of timber boards, plywood, waterproofing membrane and synthetic turf surface.[8]

The east-facing side of the sun deck colonnade at ground level is concrete, painted cream, and the colonnade openings are infilled with aluminium-framed glazing. The southern end has been infilled for Ripples Café, with aluminium-framed glass louvres and fibre cement sheet panels facing the wading pool.

Condition Assessment

The sun deck building is in a tired-looking condition generally and the following was observed:

- Brick faces to several columns were deteriorating due to hard cementitious mortar having been used for repointing.
- Cracks were noted to concrete edge beams, suggesting the onset of reinforcement corrosion.
- Several cracks were noted to the sun deck masonry parapets, to the east and north.
- Plant growth was evident within bed joints around header courses in the masonry parapets.
- The existing brick parapets may require strengthening for earthquake actions.
- The aluminium door, window and louvre frames are tired-looking and unattractive.
- The Ripples Café enclosure uses fibre cement which is dilapidated and unattractive.
- The colonnade beneath the sun deck (intended for children's pool and family use) has a concrete path around it at a higher level than the pool surround and not in keeping with the pool surround. The single step is a potential trip hazard for pool users.

[8] The roof structure makeup was not inspected by TTW. Mott MacDonald's Structural Engineering Concept Options Report, which as photographs of the construction from beneath, has been relied upon.

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Figure 18 – Sun deck and west elevation, facing the 50m pool

Figure 19 – Sun deck east elevation. Painted concrete, aluminium-framed glazed doors and original brick parapet above

Figure 20 – Back wall to Ripples Café, facing the wading pool. Aluminium-framed glazed louvres and fibre cement board in poor condition

Figure 21 – Concrete path surrounding sun deck at different level to pool

Development Proposal

The development proposes to demolishing most of the sun deck, retaining only the norther portion, adjacent to the grandstand, and the south-east corner walls, facing the harbour and wrapping around northwards to enclose a reconfigured café footprint. The centre portion would be partly rebuilt in a more modern style, as a shaded sun deck and with an exit route from the pool area to Alfred Street.

One reason given for the proposed demolition of the central area of the sun deck is that reducing the ground level around it will expose column bases, requiring the columns to be underpinned[9]. We agree that this would be difficult and impractical to do.

[9] Mott MacDonald, Structural Engineering Concept Options Report, Section 10.2

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Discussion

The architectural plans are unclear in that they show less areas of demolition on plan than they do in elevation. The demolition elevation drawings show more brickwork demolished at the north and south ends of the sun deck than the demolition plans show. We recommend that this be clarified for DA and before the design proceeds. The design intent – described in notes on the drawings – seems to be to modify the walls for new openings but not to demolish the walls.

Advice

The sun deck is part of the original pool complex, dating from 1936. The Sun deck has been modified over the years, with the installation of aluminium-framed doors and louvres and fibre cement panels. The Heritage Impact Statement for the pool development assesses the sun deck as having moderate heritage significance.

Constructed in 1936, cracks exist to concrete edge beams which suggest the onset of reinforcement corrosion. Given the sun deck's age, exposure to rain and to the harbour environment, it is likely that the concrete elements (perimeter beam and columns) are in a similar condition to the grandstand concrete. Tests undertaken to the grandstand concrete in 2018 by Mahaffey Associates concluded that the reinforced concrete is at the end of its serviceable life and that the concrete would require significant repair to make it serviceable once more. We assess that this will apply equally to the sun deck concrete.

A reason given in the Development Application for requiring the central colonnade area of the sun deck to be demolition is that the proposed regrading of surfaces around the new leisure pool will undermine the columns. We observed that the bottoms of brick columns are presently slightly elevated above ground level and therefore any reduction in the ground level would expose more of the footing. We agree that it would be difficult and impractical to support and underpin the columns, introducing more brick course at their foot. The only practical option would be to take down and reconstruct the columns, if they were to be kept.

The redevelopment proposals show the leisure pool (presently the children's pool) extended north-east, past the sun deck, to a 'beach entry' close to Alfred Street. If this proposal is to be realised, we would agree that it would be impractical to retain the sun deck in its present form.

When taking down the sun deck we would advise that every effort be made to salvage bricks and other materials for repair works elsewhere in the complex.

7.8 Hall of Fame (Level 1)

The existing Hall of Fame extends along the northern rock cut beneath the grandstand and connects the lower N-E entrance lobby to the central entrance onto the 50m pool. The eastern portion of the Hall of Fame is original construction and rolls of honour and displays showcase the history of North Sydney Olympic Pool.

The existing Hall of Fame has two halved. It is our understanding that the eastern half – behind the female changing room – is original construction, dating from 1936. This half is dry and in reasonable repair. The walls are painted brick masonry, with brick piers at regular centres. We believe that the piers on the south side (female changing room side) conceal concrete columns supporting the grandstand. However, this area appears to have always been undercover and there were no brick cracks suggesting corrosion of reinforcement (refer to Section 7.4, Grandstand).

The western half – behind the male changing room – we understand is not original and the floor above is open to the elements albeit beneath the cantilevering roof of the 50m pool. The grandstand columns above this section are believed to be corroded and spalling.

Condition Assessment

The eastern portion of the Hall of Fame, dating from 1936, appears to be in reasonable condition structurally and does not necessitate demolition. It presently provided connection from the lower entrance lobby to the central entrance onto the 50m pool. It provides a display area showcasing the history of the pool and World Records set.

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Figure 22 – c1936 eastern portion of Hall of Fame, looking west from the N-E entrance lobby

Figure 23 – Non-original western portion of Hall of Fame, looking west

Development Proposal

The development proposes demolishing the Hall of Fame and exposing the rock face presently behind the northern wall. The reason appears to be a need to compress the space for both male and female changing rooms towards the eastern end of the site, to free up additional gym space where the male changerooms stand presently.

Advice

In our opinion there is no structural reason to demolish the original eastern portion of the Hall of Fame, if it can be worked into the new layout of the facilities. Demolishing the grandstand and present changerooms will remove a great deal of the internal feel of the building and sense of history that it engenders. Keeping a small portion of this, the eastern portion of the Hall of Fame, leading to the new changerooms, may help users understand the past history of the place. The Heritage Impact Statement assesses the Hall and Fame (and grandstand) as having High heritage significance. We would recommend that consideration be given to its retention if possible.

7.9 Western Building (Presently Used as a Gym)

The existing western corner building of the complex (to the western end of the 50m pool) has an original art deco brick masonry façade and is currently used as a gymnasium. A privately-run restaurant has been built above the gymnasium, using structural steel framing.

Condition Assessment

The existing gymnasium portion is in reasonable condition for its age with the following exceptions:

- To the south-west wall, facing the harbour, several cracks exist in the brickwork and concrete/rendered window surround section. The masonry below this area appears to be bowing outwards and may have subsided. It is possible that the base of the wall retains fill material and the lateral force is push the wall outwards. It is also possible that stormwater from the site is drained to the harbour via a pipe at this corner and if the pipe is broken it is causing washout of the foundation. Equally, the 50m pool may leak at this corner. This is the only point on the site where we observed apparent settlement of a masonry wall. The cause(s) of this movement should be investigated and repaired, and the wall underpinned if necessary

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- Bricks are deteriorated along the façade in several locations. Pointing mortar between bricks may be too hard, resulting in deterioration of the bricks. Repointing has been carried out and new non-matching bricks have been used at several locations.
- There is mechanical damage to the S-W corner brickwork (by vehicles) that needs repair
- The timber large window facing the harbour appears to be original and requires repainting to prevent further deterioration of the timber. This window is marked to be changed to a door, to match the existing window.
- The access ramp to the westernmost arch of the pool wall is in a poor condition. It is proposed to demolish and rebuild this ramp, lengthening the ramp.

Figure 24 – Western Corner Building, adjacent to Luna Park

Figure 25 – Wall face (beneath window) were settlement appears to have occurred

Development Proposal

The development proposes very little change to the western corner of the building. It is proposed to demolish the existing steep ramp and reconstruct it to a 1:21 incline, and to replace the large corner window with a door, matching the existing window.

Further back along the north-western wall, it is proposed to demolish the wall behind the western staircase to use the space as gym and plantroom areas.

Advice

Before development works at this corner proceed, we would recommend that the cause(s) of the apparent movement or settlement of the harbour-facing wall be investigated. The cause of movement should be repaired, and the wall underpinned if necessary.

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.

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8.0 Additional Information

Generally, our findings conclude that the reinforced concrete elements dating from c1936 are close to the end of their service life – with the onset of reinforcement corrosion and spalling of concrete – and that there is little that can be done economically to conserve and reuse these elements. However, the polychrome brickwork from which the complex is built is not at the end of its service life, but it does require maintenance. With a major redevelopment project of this type it is often easy to concentrate on the new works but ignore, or cost-save, on remediation works to heritage fabric. In our opinion, to achieve best value from the project, and life to first maintenance, equal attention should be paid to conserving and remediating the heritage fabric which is to be retained.

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Appendix A

Photographs

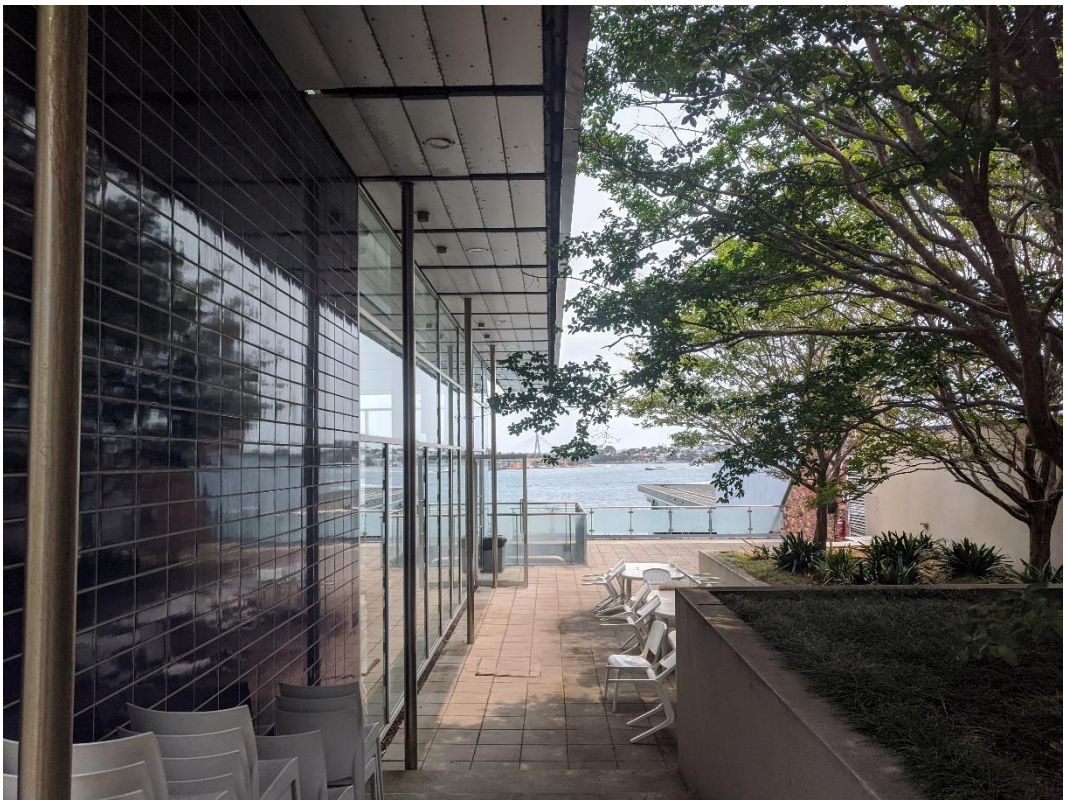

Figure 26 – Steel Framing and Glazing of 2001 25m Pool Hall Structure

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Figure 27 – Steel Framing and Glazing of 2001 25m Pool Hall Structure

Figure 28 – Balustrade Above Pool Grandstand

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Figure 29 – Overview of Pool and Grandstand

Figure 30 – Overview of 50m Pool and Grandstand

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Figure 31 – Overview of Grandstand Seating

Figure 32 – Render Delaminating from Concrete Grandstand

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Figure 33 – Corrosion to Balustrade Base Plates to Grandstand

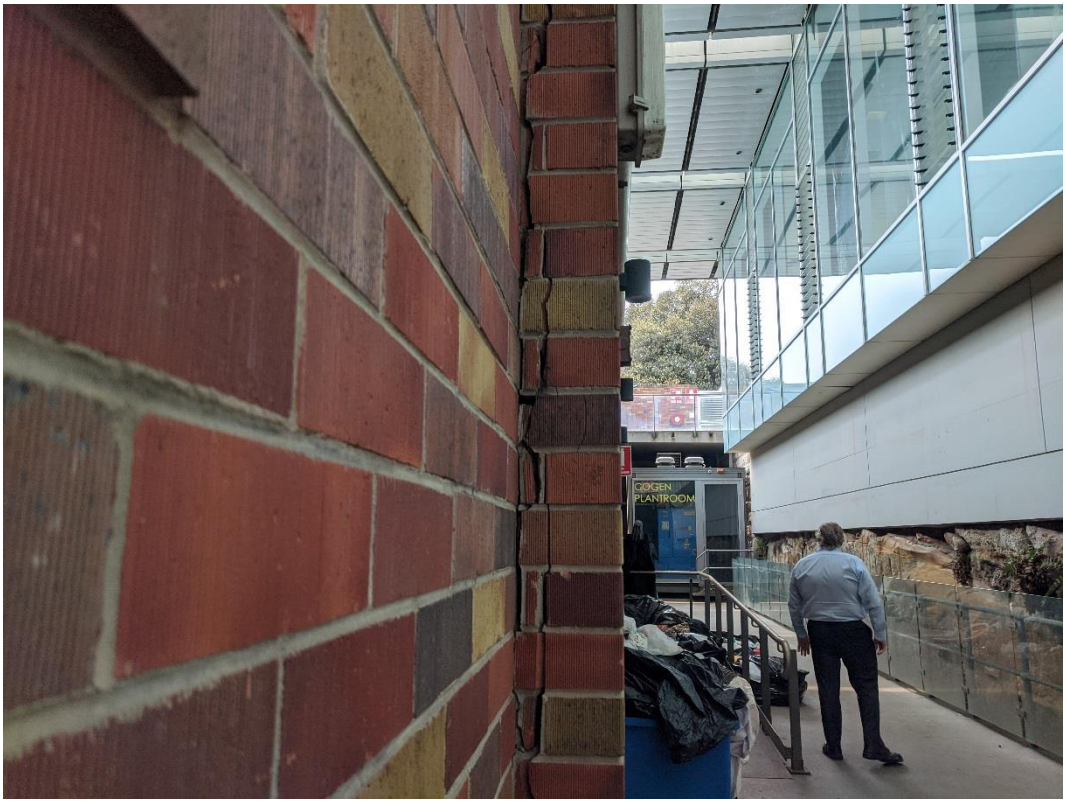

Figure 34 – Cracking to Masonry Skin to Grandstand Concrete Column (Likely Corrosion of Reinforcement)

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Figure 35 – Significant Efflorescent Staining to Underside Of 25m Pool

Figure 36 – Overview of Eastern Portion of Hall of Fame (Masonry Walls in Good Condition)

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Figure 37 – Overview of Grandstand Concrete Soffit (Areas of Previous Repair Observed)

Figure 38 – Overview of Western Staircase Soffit in Deteriorated Condition

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Figure 39 – Overview of Internal Condition of South Western Arched Wall

Figure 40 – Overview of External Condition of South Western Arched Wall

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Figure 41 – Overview of External Condition of The Original Entrance

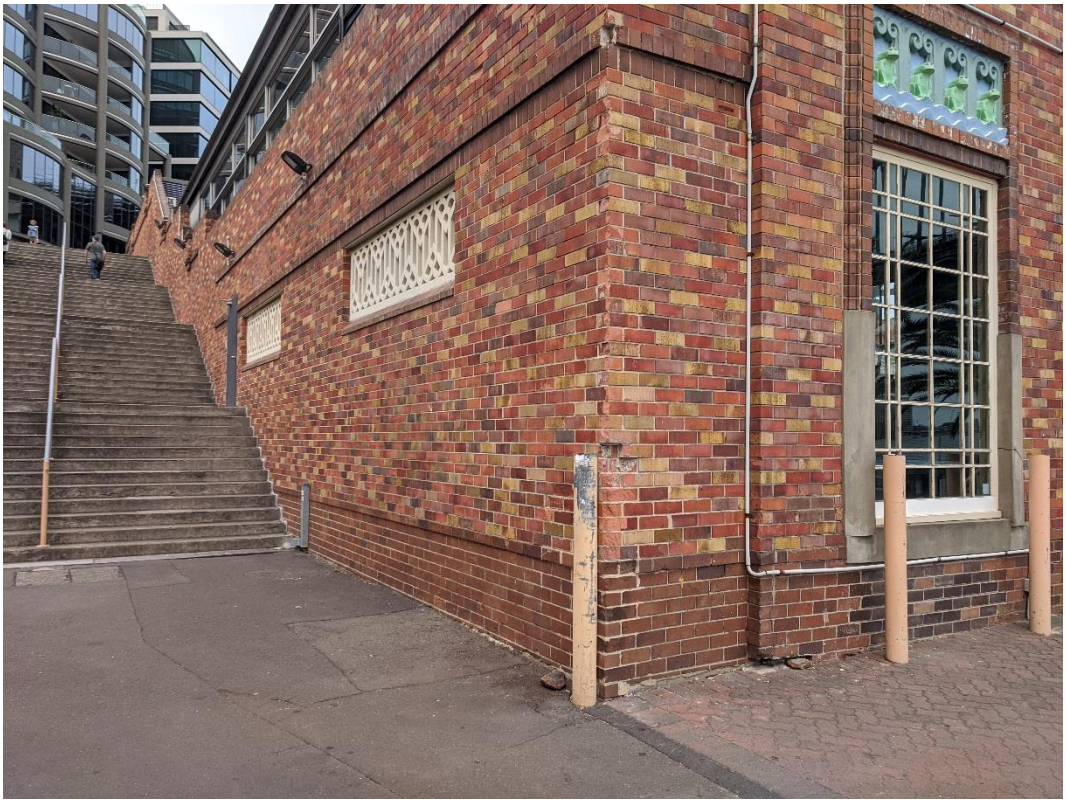

Figure 42 – Overview of Western Corner with Brickwork Requiring Remedial Repair and Possible Underpinning

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Figure 43 – Overview of Western Staircase.

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