20th August 2021

Mr Adriano Pupilli
Adriano Pupilli Architects
PO Box 770
MANLY NSW 2095

Dear Mr Pupilli,

RE: STRUCTURAL FEASIBILITY REPORT on
PROPOSED ALTERATIONS and ADDITIONS to NEWPORT SLSC

1.0 INTRODUCTION

Further to the request of Mr Adriano Pupilli, of Adriano Pupilli Architects, Mr Peter Standen, Managing Director of Partridge Structural Pty Ltd, consulting structural engineers, carried out an inspection on Thursday 23rd May 2018 of the existing structure at Newport Surf Life Saving Club (SLSC). Also present at the time of the inspection was Mr Adriano Pupilli.

At the time of the inspection the weather conditions were sunny and dry.

Access was provided to the internal spaces in the building as well as the external areas.

The purpose of the inspection and this report was limited to investigate and advise on the feasibility of the proposed alterations and additions and to visually assess the structural adequacy of the existing building to support the proposed ground floor and first floor alterations and additions.

Subsequent to the inspection, Partridge Structural has liaised with Adriano Pupilli Architects and Horton Coastal Engineering with regard to suitable foundations for the proposed clubhouse, and feasible measures to resist wave forces on the seaward face of the clubhouse.

This report lists our observations made during the inspection, and our comments based on our review of the proposed architectural design and discussions with the coastal engineer, Horton Coastal Engineering.

Reference documents:

- Horton Coastal Engineering report "Assessment of Options for Redevelopment of Newport SLSC, with Updated Consideration of Risk from Coastal Erosion/Recession" issue A dated 17 February 2020
- Heritage21 Conservation Management Plan, job number 8133, dated July 2020
- Architectural drawings, NSC 000 – 013 prepared by Adriano Pupilli Architects, revision D.
- UNSW WRL Report dated 8th July 2021
- Horton Coastal Engineering reports "Coastal Engineering and Flooding Advice for Newport SLSC Clubhouse Redevelopment" and "Coastal Engineering Report and

Statement of Environmental Effects for Buried Coastal Protection Works at Newport SLSC" dated August 2021.

- James Taylor and Associates report "Newport SLSC, Building Protection from Wave Forces" dated August 2021.

2.0 DESCRIPTION

The property is situated on the eastern side of Barrenjoey Road and for the purposes of this report the front of the building facing Barrenjoey Road is deemed to be facing west.

The site is relatively flat and located at the western edge of Newport Beach. The existing property comprises a two-storey building currently being used as a Surf Life Saving Club and was originally constructed of timber framed roof and floors supported on load bearing masonry walls and strip footings. The original construction was completed in 1933. Subsequent additions to the building have been constructed with suspended reinforced concrete floor slabs supported on load bearing masonry and founded on a concrete raft slab to the north and the original building strip footings to the south.

3.0 INSPECTION AND DISCUSSION

The inspection consisted of visual observations of the existing structure.

Our summary of observations is listed as follows with our recommendations provided below each summary.

3.1 Existing structure

The building presents in generally good condition considering its age and proximity to the ocean. There is evidence of previous and current concrete spalling, where corroding reinforcement is causing the concrete to crack, which is to be expected given the marine environment and age of the structure.

Based on our visual inspection the load bearing structural elements generally are performing as intended and it is our opinion that the existing walls and foundations will be capable of safely supporting the proposed alterations and additions, without allowing for any wave forces on the building (remedial measures to deal with the wave forces are outlined below). The original walls appear to be of solid 230mm thick masonry construction and the subsequent additions have been constructed with perimeter cavity walls.

We have also undertaken a cursory review of the proposed alterations and additions with Adriano Pupilli Architects and confirm that, in our opinion, the existing structure will be capable of safely supporting the proposed alterations and additions when designed by a suitably qualified and experienced structural engineer. As part of the building works the cavity ties, concrete spalling and steel beams should be checked for evidence of corrosion and repaired as deemed necessary.

The existing structure as originally constructed in 1933 is likely founded on shallow brick (or possibly concrete) strip footings. The existing and original foundations appear to be performing adequately since construction in 1933. According to the

Horton Coastal Engineering report, the existing structure does not comply with current coastal erosion requirements for foundation depths, and is expected to be undermined by coastal erosion and severely damaged in the design event.

The existing structure, in its current condition, will not resist the design wave loading as noted in the WRL or Horton reports.

It would be highly invasive and not cost effective to retrofit deep foundations to the existing structure to allow it to remain supported in the design erosion event. The proposed seawall is therefore necessary for the existing structure to not be undermined and damaged by coastal erosion in the design event, as discussed in the Horton Coastal Engineering reports. The seawall is designed to acceptably reduce the risk of scour occurring below the existing foundations of the clubhouse.

For the existing structure to resist the design wave runup loading, it will be necessary to install measures to reduce wave forces on the building and/or install strengthening elements on the seaward face of the clubhouse. Measures to reduce wave forces on the building are considered in the Horton Coastal Engineering reports, and include permanent seating barriers on the seaward and landward edges of the promenade, adjustments to the seawall stairs, and installation of temporary barriers on the promenade. Horton Coastal Engineering considered that as part of detailed design, a suitable mix of practical measures would be able to be formulated to reduce the wave forces on the existing structure to acceptable levels, in conjunction with strengthening measures on the seaward face of the building (if required) as discussed below.

Feasible remedial measures from a structural engineering perspective to increase the resistance of the seaward face of the existing building to wave forces would include introducing a secondary structure to the inside seaward face of the building to support the brickwork (either steel stiffening plates or a reinforced concrete wall) or introducing a reinforced concrete wall on the outside seaward face (which would need to be considered in conjunction with the heritage preservation objectives). In both cases (ie inside or outside), the secondary structure would not need to extend the full height of the ground floor, with forces acting below a design depth of 1.3m (which may be refined as part of detailed design).

3.2 Proposed structure and footings

We have not been engaged to undertake any calculations or detailed design at this stage of the project, however, following our cursory review of the Architect's design intent we consider that the proposed alterations and additions will be structurally feasible.

The proposed additions to the building should be founded on similar material to the original structure, or there should be consideration of the potential for differential settlement in design of the additions to the building.

Referring to the Horton Coastal Engineering report (2020), we note several options have been considered to address the coastal erosion risks to the structure. We have assessed each of these options together with Horton Coastal Engineering, and we recommend the proposed approach of maintaining the existing building's shallow

footings and strengthen as required, and to construct the new portion of the building on shallow foundations, in conjunction with a piled sea wall to protect both original and new portions of the structure (Option 6 in the Horton Coastal Engineering report 2020) as the preferred option.

The proposed new portion of the building structure can be designed to resist the wave loading from the WRL report without wave loading mitigation measures, if required. This can be achieved by having sufficiently thick reinforced concrete walls and/or columns, say 200mm thick (to be confirmed as part of detailed design). The storage room doors would be considered as sacrificial unless measures were installed to reduce wave forces on the new portion of the building.

Consideration could be given to pile foundations for the new portion of the building to reduce the extent of seawall required to the north of the building, if found to be cost effective.

4.0 CONCLUSION

We visually inspected the existing Newport Surf Life Saving Club structure and have undertaken a cursory review of the proposed alterations and additions prepared by Adriano Pupilli Architects, the Conservation Management Plan and the Coastal Engineering reports.

It is our opinion that the proposed ground floor and first floor alterations and additions are structurally feasible with the appropriate structural engineering strengthening and detailing. We recommend adopting a shallow foundation design to match the founding material of the existing portion of the building, combined with the coastal protection measures of a seawall to the east of the building as outlined by the Coastal Engineering Reports. With the construction of the proposed seawall we consider it feasible to design the new structure to resist the WRL wave loading, and feasible to strengthen the existing structure to resist the overtopping forces. We recommend initiatives be pursued to minimise the wave loading by analysing and installing seaward mitigation measures, as discussed in the Horton Coastal Engineering Reports.

Should you have any further queries please do not hesitate to contact the undersigned.

Yours faithfully,

Partridge Structural Pty Ltd

Peter Standen
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Managing Director