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Structural Engineering Report

Date 05.08.2024

To Adriano Pupilli Architecture

Address Level 1, 68 The Corso, MANLY NSW 2095

Attention Adriano Pupilli

Dear Adriano,

Structural Supplementary Feasibility Report on Proposed Alterations and Additions to Newport SLSC

1.0 Introduction

- 1.1 Further to your request, I, Eamonn Madden, Director of Partridge Structural Pty Ltd (Partridge) have prepared the following supplementary report to previous reports prepared by Partridge regarding the above. I attach a copy of my Curriculum Vitae which details my experience in Appendix A
- 1.2 Partridge previously prepared a Structural Feasibility Report on Proposed Alterations and Additions to Newport SLSC, dated 20 August 2021 (Previous Report).
- 1.3 Partridge have been asked to consider the proposed amended drawings for the development application (listed below) and in addition to comments provided in the Previous Report, provide further comments relating to Structural Feasibility based on our review of the Reference Documents in Section 2.0 below including a proposed amended architectural design and amended plan of the coastal protection works and discussions with coastal engineer, Royal HaskoningDHV.

2.0 Reference documents

- 2.1 Amended architectural drawings, NSC 010-D, 011-D, 012-D, 0.13-D, 0.14-D, 0.19-D, prepared by Adriano Pupilli Architects. We note that some of the drawing revisions have been updated for version control and they are now all revision D.
- 2.2 Drawings prepared by Royal HaskoningDHV -all Revision P01, dated 30th July 2024.
PA2407-RHD-00-105-DR-MA-0001 Title Sheet.
PA2407-RHD-00-105-DR-MA-0011 General arrangement plan.
PA2407-RHD-00-105-DR-MA-0011 General arrangement details.
- 2.3 Report prepared by Royal HaskoningDHV- *Supplementary Coastal Eng Report PA2407-102-105-RP-0001-Newport SLSC - Alterations and Additions v.1* Dated 6th August 2024
- 2.4 Report prepared by Water Research Laboratory at the University of New South Wales (WRL) *Newport SLSC stepped seawall physical modelling*, dated 06-08-2024.
- 2.5 Report prepared by NDRS NBRS – *Heritage Impact Statement – Newport Surf Life Saving Club* dated 07-08-2024.

3.0 Updated Structural Opinion

- 3.1 In the Previous Report, we stated:

“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."

- 3.2 Partridge has reviewed the amended drawings and reports listed at section 2 above and the wave loading pressures referred to me in the report prepared by Royal HaskoningDHV (item 2.3 above) and WRL report (item 2.4 above).
- 3.3 In particular we note the following statement at Section 3.2.3 Royal HaskoningDHV report.
- To inform decision making on risk to the SLSC building asset, the physical model testing carried out by WRL considered both a 100-year ARI event and a 1,000-year event in the assessment of wave overtopping and wave forces on the seaward face of the building. The 1,000-year ARI event was selected to 'book-end' the design event for the new section of the building. The structural engineer for the building will select the ARI event for design. The 100-year ARI event may be applicable to the design of the section of the existing building to be retained, having regard to approaches in AGS (2007).
- 3.4 We have been asked by NBRS, the Heritage Consultant, to note that the existing eastern facing masonry wall has heritage value, and we have been asked to consider structural solutions which will allow retention of the existing eastern masonry wall and improve the buildings resistance to the predicted wave pressures.
- 3.5 In my opinion, based on my experience as a heritage and structural engineer with experience upgrading and strengthening heritage buildings, in a manner that is sympathetic to the heritage value of the building, I reconfirm the advice in our Previous Report that we consider that it is feasible to design the coastal protection measures and alterations to the building to resist the 1:100 wave loading for the existing building and 1:1000 loading for the new building and that it is feasible to structurally strengthen the existing structure for Ultimate State Design conditions to resist overtopping forces.

Limit State(s), ultimate is defined in Section 1.4.10 of the Australian/New Zealand Standard AS/NZS 1170 Structural Design Actions Part 0: General Principles as:

"State(s) associated with collapse, or with some other similar forms of structural failure. NOTE: This generally corresponds to the maximum load-carrying resistance of a structure or structural element

- 3.6 In addition to the recommendations made in our Previous Report, and while we have not carried out detailed structural analysis at this stage, we also consider that:
- The ground floor eastern masonry façade wall of the original heritage building can be strengthened on the internal face to support the Ultimate State Design loads without affecting the external heritage significant face of the wall. This strengthening can be in the form of a reinforced concrete facing (bracing) wall with returns and/or vertical steel bracing frames, supported by and connected to a new internal stiffened reinforced concrete floor slab. The concrete bracing wall will be attached to the internal face of the masonry wall with stainless steel pins, in a manner acceptable to the Heritage Consultant. This strengthening will not impact visually the external face of the eastern wall. The purpose of the proposed strengthening is to prevent structural collapse of the building under impact from wave loading.
- 3.7 The Eastern façade of the new extension can be designed in reinforced concrete to support the wave loading.

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

Prepared by

Eamonn Madden
BE MSc(Struct) FIEAust CPEng
NER(Structural) APEC Engineer IntPE(Aus)
Director, Partridge Structural
For and on behalf of Partridge Structural Pty Ltd



CV-Eamonn Madden

Title Director

Qualifications

Bachelor of Engineering, Galway University, 1980
Master of Science, Surrey University, 1985

Professional Affiliations/ Registrations

Fellow, Institution of Engineers, Australia

APEC Engineer

IntPE (Aus)

NER-3 National Professional Engineers Register Section 3 in the category Structural

CPEng Chartered Professional Engineer

Accredited Building Practitioner Tasmania CC4545 0 (Engineer)

Registered Professional Engineer of Queensland (15513 - Structural)

Board Member (2011 – 2016) and President (2013 – 2014) of the Association of Consulting Structural Engineers (ACSE), NSW.

Member of Engineers Australia National Heritage Committee. (Current)

Member of Engineers Ireland, CEng MIEI

Experience

1989 – Present

Director, Partridge

Prior to migrating to Australia, Eamonn had 9 years experience as a structural engineer in Ireland and the UK, including bridge design and upgrading historical buildings. After joining Partridge in 1989 he was appointed Director in 1999 and Managing Director in 2009, a position he held for 10 years. His areas of expertise include bespoke architectural structures, temporary event structures, public artwork, heritage and expert witness work and a range of structural materials including glass and cable design. He has provided expert advice on various structural engineering, facade engineering and building disputes and litigation.

He has lectured in Structural Engineering in Ireland, and at the University of Technology Sydney and he delivers an annual lecture on creative thinking at the University of Sydney and National University of Ireland, Galway.

Sample of Heritage Engineering experience

Ireland and UK

Refurbishment of Leinster House, Dublin, built in 1748, home to the Irish parliament, for Office of Public Works, Ireland

Refurbishment of roof of Castle Rushen, a medieval castle, Isle of Man, UK. For Manx Government.

Australia

Refurbishment and upgrade of Science House and The Sailor's Home, Rocks Sydney for Rocks Authority.

Rebuilding the Beulah bridge, the oldest privately owned bridge in Australia, Sydney Living Museums

Upgrade of Stables and Turrets, Vaucluse House, Sydney, Sydney Living Museums (SLM).

Strengthening works to external balconies, Mint Building, Macquarie Street, Sydney, SLM

Replacement of metal wall cladding to Heritage Listed Town Hall House, City of Sydney municipal building, City of Sydney.

Successful expert witness litigation for the retention of St Columbans Church, Mayfield, NSW, an example of early adoption of reinforced concrete in church construction. Newcastle City Council.

Retention of examples of heritage significance in Industrial construction, Corrimal Coke Works, Corrimal, NSW. Private Client



Seismic Strengthening of brick and sandstone buildings, The Rocks, Sydney-Placemaking NSW.
Refurbishment of timber framed Wool shed, built in Rouse Hill House, Sydney Living Museums
Refurbishment of 1918, industrial building, formerly Wrigley's factory, Sydney. Private Client.
Refurbishment and strengthening of Culwarra Chambers, Sydney's first 'skyscraper' which wraps around the older heritage listed Surry Hotel. Private Client.
Conservation and restoration works to re-establish the perimeter sandstone fence of the historic Wentworth Mausoleum, including rebuilding on screw pile foundations using a substantial amount of original materials.

Sample of Structural Projects

Huntley Street Recreation Centre,(20M) conversion of industrial building to architect designed sports complex for City of Sydney.
Coolong Road, waterfront residence, designed by SAOTA architects,(\$40M), (Reinforced concrete).
Wingadal Place, waterfront residence, designed by MHNDU architects,(\$30M), (Reinforced Concrete and Steel).
Ravine House, Oceanfront Residence, designed by Rolf Ockert architect (\$20M), (Reinforced Concrete and Steel).
299 Elizabeth Street Sydney, curtain wall façade rectification.
Central Park, Building 9, Soffit Nest suspended artwork
Tulsa Boat Stacker, Oklahoma, USA
Galston Aquatic and Leisure Centre, Sydney
Long Reef Surf Life Saving Club- design review
Events and Entertainment (certifying engineer for Sydney Olympics opening and closing ceremonies, Vancouver Olympics opening ceremony, Doha Asian Games opening and closing ceremonies, Elton John concert staging, Big Day Out concert staging Australia and New Zealand, Sydney Theatre stage sets, movie sets for 'Australia', 'Superman Returns' Mad Max 'Fury Road'. etc.)

Awards

'Halo', Kinetic Artwork, Central Park, Sydney (winner of Engineers Australia President's Prize NSW).
'Glebe House', Sydney (winner of Concrete Institute of Australia National Excellence in Concrete Award)
'Skymate', A cable supported steel framed *High Ropes Access climbing park*. Adelaide, SA (winner of Association of Consulting Engineers NSW, Special/Unusual Project Award)

Papers

Interaction between Façades and Building Structures

Paper presented to Association of Consulting, Structural Engineers (ACSE) seminar 1995.

The Future Engineer: Skilled at Math's, Art and Creativity

Presented to World Engineers Convention, Melbourne Australia, 2019.

Art in Engineering: Evoking a Creative Response from Engineering Students and More

with Dr Jamie Goggins; Marta Fuente Lastra and Eamonn Madden-presented to Civil Engineering Research Ireland (CERI) 2020 conference.

Lecturing and Public Speaking

Art in Engineering and Creative Design

Annual lecture and studio at the School of Civil Engineering, Sydney University; and annual lecture and studio at the School of Civil Engineering at National University of Ireland Galway, (NUIG), Ireland.