

01/06/2022

Project No. 220197

**Northern Beaches Council**  
**725 Pittwater Road,**  
**Dee Why NSW 2099**

To whom it may concern,

**Re: Structural Integrity Methodology Report of the subject premise****Subject Premise: Lot 1 in DP 115705 and Lot D in DP335027, 12 Boyle Street and 307 Sydney Road Balgowlah, NSW****Development Application No: DA2019/0081 – Condition 15**

Adams Consulting Engineers is engaged by Sun Property Northbridge Pty Ltd to undertake structural design of the new residential unit development at the subjected address. There are in total 5 new dwellings spread over two buildings above a common podium and single level basement carpark. The construction of the basement will require a vertical cut of maximum 4.5m. The existing home at 307 Sydney Road has significant heritage fabric and its building structure needs to be protected and retained during and after the construction of the new built. Refer to DA Cond. 15. This report has been prepared to address engineering design and construction methodologies to this DA condition.

## **1. Existing Heritage Building Structural and Geotechnical Condition**

Adams' structural engineer has conducted a visual site inspection on 4<sup>th</sup> April 2022 to inspect the structural condition of the existing heritage building. The existing building is single-storey height with internal and external loadbearing brick walls and timber framed floor structure. Our inspection through the undercroft area at the back of the building affirms that the building brick pier footings are founded on sandstone rocks. No significant structural defects had been observed.

Geotechnical engineering reports by JK Geotechnics (dated 21<sup>st</sup> December 2018 and 25<sup>th</sup> August 2021) also indicates that the site is covered by a shallow layer of silty sand over underlying sandstone.

## **2. Design Philosophy of Heritage Building Retention**

The critical structural design consideration taken by Adams to maintain the structural integrity of the existing heritage building is to keep the new built form especially its basement away from the heritage building. Current architectural drawings show that there is approximately 500mm distance between the edge of basement and the heritage building. Geotechnical report indicates that vertical cut of the sandstone is likely to be feasible during excavation subjected to further detailed geotechnical assessment after the existing building at No.12 Boyle Street is demolished. Given the fact that the existing building is most likely founded on sandstone, the vertical cutting of the sandstone should not undermine the existing building footings.

In the permanent condition, subjected to further geotechnical assessment and preferred architectural finish, a new permanent concrete or block retaining wall could be constructed against the vertical cut rock face. The retaining wall will then be tied to the new concrete slab at podium level which works as a rigid diaphragm to prevent any movement of the surrounding ground.

Another critical structural design philosophy in relation to the integrity of the existing building is to minimize the internal structural alteration work. As far as it is concerned, the only alteration of the existing structure is via an extension of the building to its northwest corner to create a new multipurpose room. The new extension structure will be designed to be self-supported so no additional loads will be surcharged to the existing building structure hence no negative impact.

### 3. Construction Sequence of the New Buildings

The following construction and demolition sequence is proposed by Adams Consulting Engineers to demonstrate how the structural integrity of the heritage building is retained during construction.

1. Safely demolish the existing building at No.12 Boyle Street to allow access for test pit work near the rear of the existing heritage building.
2. Conduct test pit and confirm the depth of existing footing and the condition of the sandstone foundation under the heritage building. Contact and report to Adams Engineer and Geotechnical engineer for inspection and confirm if vertical cut of the sandstone is permissible or retention piles are required.
3. Install retention piles and shotcrete if required, otherwise go to step 4.
4. Undertake vertical excavation following geotechnical engineer's recommendations and vibration monitoring scheme.
5. Construct new basement slab, footings and retaining walls if required.
6. Construct new podium slab and connect to the retaining walls.

In summary, this report has included a detailed structural design philosophy and proposed construction methodology of the DA approved building work in order to protect the structural integrity of the existing heritage building at site. The design has followed fundamental engineering practice and our past experience of retaining heritage building together with recommendations by the geotechnical engineer. We trust this work will ensure councils DA approval conditions 15 be satisfied.

Please contact us should you have any queries.

**Engineer:** Mark Wu

**Qualifications:** B.Eng(Hons), PhD, MIEAust, CPEng

**Signature:** 

For and on behalf of

**Adams Consulting Engineers Pty Ltd**

**Address of Engineers:**

Suite 1402, Level 14, 49 York Street, SYDNEY NSW 2000

**Business Telephone No:**

02 9222 9970

**Email:** admin@adamseng.com.au

**Name of Employer:**

Adams Consulting Engineers Pty Ltd

NOTE

1. Any advice expressed and/or implied in this document does not constitute a variation order and/or EOT. Any authority to proceed with any variation to the building work must be authorized by the superintendent.

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