

OXFORD STREET HOTEL

1-11 Oxford St, Paddington —

Concept Report



FOR / Structural Engineering Services CLIENT / Boston Global and Central Element DOCUMENT NO / S18117-BGE-RPT-001 REV / C DATE / 31/05/2019 bgeeng.com—

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Document Control

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1 INTRODUCTION

The subject site at 1-11 Oxford Street, Paddington consists of an existing building with 3 storeys above Ground level and a part basement level. The building was constructed in the early 1911's with extensive renovation works taken place over the years. The current building contains a mix of uses including retail, offices, commercial and food & beverage. The original building housed two cinemas.

The proposed development is to convert the existing building into a hotel and ancillary use. The proposal involves demolition of part of the existing building whilst maintaining the existing brick façade/stairwell and constructing a 6 storey hotel with 2 levels of basement.

1.1 Reference Documents

This report has drawn on the information provided in the following documents:

- Planning Proposal Architectural Drawings Tonkin Zulaitina Greer dated 22 May 2019
- Report on Desktop Geotechnical Assessment Douglas Partners Project 86362.00 dated 9 November 2018
- City of Sydney Guidelines for Temporary Protective Structures- Hoardings, Scaffolding, Shoring & Façade Retention -6 April 2001

1.2 Site Description

The development site is bounded by Oxford St to the North and South Dowling Street to the West. A multistorey residential building is located east of the site and residential terrace houses are situated on the southern boundary. The site area is approximately 1574m2.



Site Plan



1.3 Existing Building

The existing building was constructed in approximately 1911. There are no original drawings available. The existing building consist of a predominately concrete framed structure with a brick façade. A high level visual inspection of accessible areas showed that the external and internal walls did not show signs of any significant cracking or structural distress or evidence of any major structural repairs.

Footing types and footing depths are unknown however given the age of the building it is likely that the footings consist of shallow depth footings into shale.

The roof structure appears to consist of steel trusses and framing with timber purlins and a steel sheet roof.

1.4 Geotechnical Conditions

A desktop Geotechnical assessment has been carried out by Douglas Partners - Report on Desktop Geotechnical Assessment – Douglas Partners Project 86362.00 dated April 2018

Based on Sydney 1: 100 000 Geological Series Sheet, the site is underlaid by Ashfield Shale, which typically consists of black to dark grey shale and laminate. The site is close to the geological boundary with Hawkesbury Sandstone, which typically comprises of medium to coarse grained quartz sandstone with minor shale and laminate layers.

Given the above the regional groundwater table is likely to be well below the site's surface and proposed excavation levels. A perched water table should be expected.

Advice suggests that the subsurface profile for the site is likely to comprise of some possible sandy filling overlying residual clay and then sandstone bedrock. The depth of bedrock is likely to be 4.5m to 5.5m deep. The bedrock is likely to be extremely low to low strength and grade to medium to high strength in the upper 2m to 4m of rock.

1.4.1 Retaining / Shoring

The proposed basement excavation will extend as close as possible to the site boundaries. Vertical excavations within the soils and shale will require retaining structures both during construction and as part of the final structure.

The shoring systems will require lateral restraint to be provided by either temporary ground anchors or internal props until the permanent structure is constructed.



2 PROPOSED WORKS

The proposed development consists of converting the existing building into a hotel and ancillary uses. The proposal involves demolition of part of the existing building whilst maintaining the existing brick façade/stairwell and constructing a 6 storey hotel with 2 levels of basement.

Following is a summary of the proposed structural framework for the proposed building. Also refer to Appendix A for Structural Mark-ups.

2.1 Retention Walls

The retention walls will consist of either a contiguous piled wall or a soldier piled wall with shotcrete infill panels. Piling along the Eastern and Southern boundary walls will more than likely consist of a contiguous piled wall given that the retention wall is in close proximity to the existing brick facade wall. To mitigate chance of undermining at these locations introducing closely spaced piles will assist to avoid material from under or adjacent footings moving. It is anticipated that one row of temporary anchors will be required to restrain the retention walls. Permission to install temporary anchors into neighbouring properties or council property must be obtained. Permission to install temporary anchors into neighbouring properties, Council or RMS property would be obtained as per the guidelines.

2.2 Foundations

Foundations typically will consist of pad footings supporting columns and raft slabs supporting lifts, stair and shear walls.

2.3 Columns

Columns will consist typically reinforced concrete columns. Columns on hotel levels will be designed to be longer blades that sit within hotel party walls.

2.4 Walls

Stair and lift walls will consist of reinforced concrete walls. Utilisation of preformed system like Dincel or Rediwall can be adopted.

2.5 Slabs

Suspended floor slabs will generally consist of post tensioned two way flat plates. Slab thicknesses will typically be 200mm however heavier loaded slabs on the lower levels and basements will need to be thicker.

Approximately 50mm setdowns will be provided in the wet areas to ensure that floor finishes are level.



2.6 Basement Slab

Basement 2 slab will consist of a concrete slab on grade.

2.7 Roof

Roof will consist of a predominately steel framed structure with timber rafters.

2.8 Existing Façade

The existing brick façade will be maintained on this project. The existing walls around the perimeter of the building are approximately 12.5m with the buildings parapet extending up to 17m in height above street level. Wall thickness appear to be approximately 4 course thick. The existing walls will be restrained temporarily until permanent structure is built and utilised to restrain the walls in the permanent condition. Existing walls will not be utilised to support any building load from the new structure.

Refer to Section 3.0 of this report for Façade Retention Methodology.

2.9 Busby Bore

Busby Bore is a water supply channel built during 1827 to 1837. The bore is approximately 1-1.5m diameter and has been identified running diagonally through the site and is noted on the plan, see below indicative location. The bore is described in AMAC Archaeological report to be 11.1 metres below ground, and the 3m heritage curtilage adds 3 metres above that level. Therefore the bore is approximately 8.1m below ground which is outside our lowest basement level.



Plan indicating Busby Bore





Section indicating Busby Bore



3 FAÇADE RETENTION METHODOLOGY

The existing brick façade will need to be temporarily supported during demolition and construction works prior to connection of permanent structure for restraint. The proposed Methodology for restraint of the existing brick façade will be designed in accordance with City of Sydney Guidelines for Temporary Protective Structures - Hoardings, Scaffolding, Shoring & Façade Retention - 6 April 2001, and each elevation is noted below.



Northern Elevation- Existing Facade



Western Elevation - Existing Façade





Southern Elevation - Existing Façade

The proposed methodology for restraint of existing brick façade is noted below for each elevation.

- North Elevation Oxford St External bracing/hoarding
- West Elevation South Dowling St External bracing/hoarding
- South Elevation Internal bracing
- East Elevation Internal bracing

Demolition and Construction Sequence

- 1. Install external bracing along Oxford St and South Dowling St.
- 2. Install internal bracing along southern and eastern elevations.
- 3. Demolish existing building.
- 4. Install shoring wall within the existing façade walls.
- 5. Underpin southern wall.
- 6. Excavate down to bulk excavation level (incl. installation of any temporary anchors in retention wall).
- 7. Building structure B2- Level 4.
- 8. Remove temporary bracing on southern and eastern elevation.



9. Remove connection between façade and bracing on Northern and Western elevations.

Bracing/Hoarding to remain in place until façade can be supported by new building works.

North Elevation – Oxford St – External Bracing/Hoarding

An external bracing option is being proposed for existing façade along Oxford St. This option utilises external bracing that is located outside the boundary and over council footpath. The bracing will be designed to meet *City of Sydney Guidelines for Temporary Protective Structures- Hoardings, Scaffolding, and Shoring & Façade Retention -6 April 2001*. An externally braced option provides clear access internally to demolish the existing building without having internal bracing or support structure as an interference. This option provides least amount of risk to damage of the existing façade. We also highlight that the external bracing can also be integrated with site hoarding and site shed accommodation. See below concept design sections of the external bracing and some photos of similar external bracing.



Typical Oxford St & South Dowling St Section



2 HOARDINGS (Urban Design Requirements for Hoardings)



Mark up – 4

Typical construction hoarding as per City of Sydney guidelines



Example of external bracing utilising blocks for uplift resistance





Example of external bracing

West Elevation – South Dowling St – External Bracing/Hoarding

This elevation will also consist of an external bracing option similar to Oxford St. External bracing on this elevation will need to be modified slightly to allow for the existing trees on the footpath. The modifications to the bracing system due to the trees can easily be accommodated.

South Elevation – Internal Bracing

The southern wall along the boundary cannot be supported externally due to the neighbouring property. An internally braced solution must be utilised. The boundary wall is approximately 14m high at its highest point. An internal braced option has been conceptually designed which includes a horizontal truss at approximately Level 2 and diagonal strutting members that support the truss and a waler at the top of the wall. The truss has been designed the span horizontally across the site. Internal bracing will need to be installed through any existing floors and extreme care must be taken during demolition to ensure that bracing in not damaged. New structure will also need to be installed in and around bracing.

West Elevation – Internal Bracing

The existing façade wall on the western elevation is currently proposed to be supported by internal bracing similar to southern elevation. This wall will also require underpinning due to new basement excavation



extending underneath existing wall. Underpinning works will require specialist contractor input to determine a suitable technique and sequencing with demolition and excavation works.

We note that all temporary bracing must remain in place until the permanent structure is constructed and existing brick façade is support by new works.

Refer to Appendix B for Façade Retention sketches.



4 DESIGN CRITERIA

4.1 Australian Standards

All structural elements will be designed in accordance with the relevant structural standards referenced in the Building Code of Australia 2015.

The structural engineering design of the building is covered by Australian Standard provided below:

AS/NZS 1170.0 - 2002	-	Structural Design Actions - General Principles
AS/NZS 1170.1 - 2002	-	Structural Design Actions - Permanent, Imposed and Other Actions
AS/NZS 1170.2 - 2011	-	Structural Design Actions - Wind Actions
AS/NZS 1170.4 - 2007	-	Structural Design Actions - Earthquake Actions in Australia
AS 3600 - 2018	-	Concrete Structures
AS 3700 - 2018	-	Masonry Structures
AS 4100 - 1998	-	Steel Structures

- 4.2 Other
- City of Sydney Guidelines for Temporary Protective Structures- Hoardings, Scaffolding, Shoring & Façade Retention -6 April 2001



Structural Mark-ups



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PROJECT : OXFORD STREET HOTEL 1-11 Oxford Street Paddington NSW 2021

	ARCHITECT	DRAWING TITLE		DRAWN BY	
EL 21	TONKIN ZULAIKHA GREER ARCHITECTS 117 Reservoir Street	BASEMENT 02 PLAN		CHECKED	JH
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Façade Retention



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MEMBER SCHEDULE							
SIZE	REMARKS						
200 PFC							
150 UC 23							
200 UC 46							
200 UC 46							
75 x 6 EA							
90 x 8 EA	10mm FIN PLATE WITH 2M16 8.8/S BOLTS EACH END TYP.						
90 x 8 EA	FIX TO FLOORING TO PREVENT SAGGING						



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