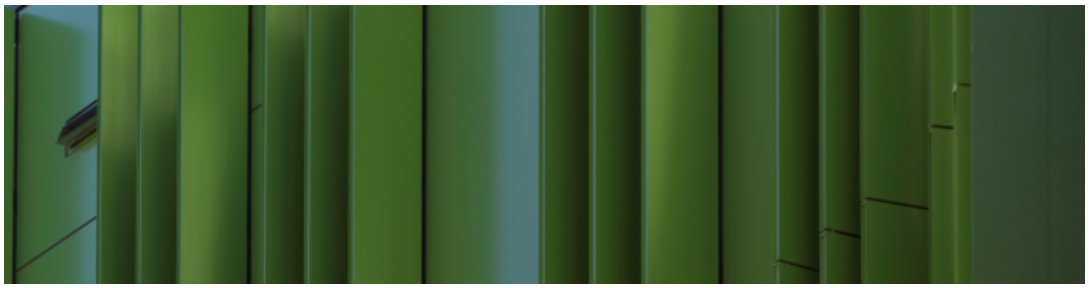
Structural

TaylorThomsonWhitting



Structural Report for DA

Iglu Student Accommodation

60-78 Regent Street, Redfern

for Iglu Pty Ltd

19 November 2014

141515

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1.0 INTRODUCTION

Taylor Thomson Whitting have been engaged by Iglu Pty Ltd as the Structural Engineers for the proposed development at 60-78 Regent Street, Redfern.

The proposed development will have 18 storeys above ground and a small area of basement towards the Southern end of the site which will be used for sprinkler and hydrant tanks.

Ground floor will be used for retail space, plant space, loading dock and storage.

Level 1 houses student common areas and accommodation and Levels 2 to 17 house student accommodation. There will be plant space on Level 18.

2.0 SUPERSTRUCTURE

The superstructure will be designed as a reinforced and post-tensioned concrete frame supported on reinforced concrete blade columns and walls. The footings will be bored piles socketed into shale bedrock.

The Ground floor is proposed to be a concrete slab on ground with a small area of suspended slab above the basement.

Level 1 will be a post-tensioned concrete banded slab.

Level 2 will typically be designed as a post-tensioned flat plate with one transfer beam required above the entry laneway. Other than this one column, all columns are continuous from footing level to Level 18 without the need for transfers.

Levels 3 to18 will be post-tensioned concrete flat plates.

Structural steel will be used to frame around the plant enclosure on Level 18.

3.0 HERITAGE FACADE RETENTION

The existing brick facade along the Regent Street elevation will be retained and used as part of the final facade. The remainder of the brick buildings on the site will be demolished.

A temporary braced steel frame built inside the site boundary will provide lateral stability to the existing facade walls during construction. In the final condition the existing brick wall will be tied into the new Level 1 slab and a new steel frame at Level 2 to provide lateral stability to the wall.

4.0 GEOTECHNICAL INVESTIGATION

As there are existing buildings currently occupying the site, it is proposed that a Geotechnical Investigation of the site is carried out at a later date once the existing building have been demolished.

SMEC Testing Services Geotechnical Engineers have prepared a Geotechnical Report for

the development based on the borehole data from two adjoining sites (157 Redfern Street and 7-9 Gibbons Street).

A summary of the anticipated Geotechnical parameters is as follows.

4.1 Sub surface conditions

The SMEC Geotechnical Report indicates that the subsurface conditions consist of Fill up to 1.2m deep overlying Silty Clays from 2.7m to 5.6m deep below ground level.

Shale is found below the Silty Clays. The shale extends to depths from 20.48m to 28.8m below ground level. The shale is extremely low strength at the top of the layer and becomes medium to high strength below a depth of approximately 12m.

High strength sandstone is found below the shale.

4.2 Groundwater

The SMEC Geotechnical Report indicates that during construction of the adjoining sites very minor pockets of seepage were encountered and no dewatering was required.

The basement is currently proposed to be designed as a drained basement which will be confirmed in the site testing.

5.0 EXCAVATION AND RETAINING/SHORING WALL DESIGN

For the basement we currently propose to excavate temporary batters where possible and construct reinforced concrete or reinforced blockwork retaining walls. These will be backfilled using appropriate free-draining material. Where the excavation is too close to the boundaries we propose to design a soldier piled wall with shotcrete infill panels and vertical strip drains to relieve any groundwater seepage. temporary ground anchors will be installed to provide lateral restraint until the ground floor slab is constructed. In the final condition the temporary ground anchors will be destressed.

6.0 FOOTING DESIGN

We propose to support the structure on bored reinforced concrete piles which will be socketed into the Shale bedrock.

7.0 LOADING

The structural will be designed in accordance with the loading requirements of the Australian Standards AS 1170.0 - Structural Design Actions General Principles and AS 1170.1 – Dead and live loads and load combinations.

The structure will also be designed to carry the superimposed dead loads from the specific finishes, partitions, services and facade.

8.0 LATERAL STABILITY

Lateral stability will be provided by the reinforced concrete lift cores, stair cores and shear walls.

The structure will be designed to carry the wind and earthquake loads in accordance with AS 1170.2 Wind Actions and AS 1170.4 Earthquake Actions in Australia.

We have carried out preliminary finite element modelling using Strand7 software to check the stability.

9.0 AUSTRALIAN STANDARDS

AS 3600 – Concrete Structures

AS 4100 – Steel Structures

AS 3700 – Masonry Structures

AS 2159 – Piling Design and Installation

AS1170.0 – Structural Design Actions

AS1170.1 - Dead and live loads and load combinations

AS 1170.2 - Wind Actions

AS 1170.4 - Earthquake Actions in Australia

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