

Macquarie University
**Macquarie University Central
Courtyard Precinct (MUCCP)
Redevelopment – State Significant
Development Application**

Structural Report

This report takes into account the particular instructions and requirements of our client.
It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 251278-00

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1 1 Central Courtyard Structural Services

This section of the report describes the structural concepts proposed for the new learning and teaching centre – Building 1 Central Courtyard structure on the north side of the development. The building is proposed to be primarily conventional in-situ reinforced and post tensioned concrete frames, walls and floors.

This section is based on the following: -

- Architectural 50% Draft Design Development Drawing package; &
- Demolition of the existing building C9A and C10A described in the architectural drawing package.

1.1.1 Design Life and Durability

The structures will be designed for a 50-year design life and thus specifically comply with the requirements of AS3600:2009 Concrete Structures, AS4100:1998 and AS2159: 2009 Piling-Design and Installation as part of the design suite described below in the design standards section.

1.2 Structural Configuration

1.2.1 General Description

Reference is made to the 50% DD structural drawings for more detail on the configuration of the 1 Central Courtyard building.

In principle the development comprises 2 levels below ground in the basement and a superstructure above courtyard level consisting of 3 levels plus the roof.

The basement is approximately 7m deep and the average height of the building above the courtyard surface level is approximately 16m (19m to lift overrun).

The basement excavation and substructure will consists of conventional cantilever retaining walls and soldier piled retaining walls with shotcrete infill and suspended concrete slabs to link to the cores. The retention piles may be drilled from the existing surface.

The superstructure consists of a system of post-tensioned banded slabs spanning between reinforced concrete columns and walls. Level 1 is a transfer level which transfers the Levels 2 and 3 floors above and hangs the courtyard level slab below above the graduation halls space.

1.2.2 General Building Data:

Building height above ground:	16m (19m to lift overrun)
Number of stories above ground:	3
Typical floor to floor height:	7m / 5m (main building) – 3.5m (basements)
Number of basement levels:	2
Primary Grid (approx.):	15m x 10m

2 R1 & R2 Structural Services

This section of the report describes the structural concepts proposed for the student accommodation buildings – R1 & R2 structures on the north-west side of the development. The buildings are to be primarily conventional in-situ reinforced and post tensioned concrete frames, walls and floors.

This section is based on the Architectural 50% Draft Design Development Drawing package.

2.1.1 Design Life and Durability

The structures will be designed for a 50 year design life and thus specifically comply with the requirements of AS3600:2009 Concrete Structures, AS4100:1998 and AS2159: 2009 Piling-Design and Installation as part of the design suite described below in the design standards section.

2.2 Structural Configuration

2.2.1 General Description

Reference is made to the 50% DD structural drawings for more detail on the configuration of the R1 & R2 buildings.

The two towers are typically rectangular in nature and consist of the following:

- Single level shared basement basement;
- Podium slab level;
- 4 & 6 suspended floors above ground; &
- Roof structure.

The current architectural drawings describe a typically rectangular floor plate configuration approximately 18m wide with apartment unit widths approximately 4.6m wide above the ground level podium structure. The podium level slab will need to act as a transfer level for the parking grid within the basement.

The basement is approximately 6m deep and the average height of the building above the courtyard surface level is approximately 16m and 22m.

The basement excavation and substructure will consists of conventional cantilever retaining walls and soldier piled retaining wall with shotcrete infill and suspended concrete slabs to link to the cores. The retention piles will be drilled from the existing surface.

The superstructure consists of a system of post-tensioned flat slabs spanning between reinforced concrete columns and walls. Ground Level is a transfer level which transfers the column grid above ground.

The north end of R1 and north-west end of R2 will cantilever over the Basement 1 level.

2.2.2 General Building Data:

Building height above ground:	16/22m
Number of stories above ground:	5/7
Typical floor to floor height:	3.1m – 6m (basements)
Number of basement levels:	1