

Report

Project title	UNSW G25 Education Building
Job number	304141
File reference	H25-TN-STR-01 Rev 03
cc	
Prepared by	Matthew Walden
Date	21 February 2025
Subject	UNSW H25 Carpark New Lift - Structural Concept Design

Level 5 151 Clarence Street Sydney NSW, 2000 Australia

t +612 9320 9320 d +61 2 9320 9565

arup.com

1. Introduction

This report has been prepared by Arup on behalf of the University of New South Wales (UNSW) for construction and operation of a teaching and learning facility (the **Proposal**) to be known as the UNSW G25 Education Building, on land at 8 High Street, Kensington (the **Site**).

This report has been prepared to summarise concept structural design and how it meets the project brief, along with any addressing any potential planning considerations.

This report accompanies a State Significant Development Application (SSD) that seeks approval for the construction and operation of a teaching and learning facility at the G25 site, within the Upper Campus of UNSW.

Specifically, the SSDA seeks consent for the following:

- Site preparation works including demolition of the existing at-grade car park, tree removal, and excavation works.
- Construction of an eleven (11) storey (plus roof plant) teaching and learning building with approximately 20,200m² of gross floor area. The building will comprise the following:
 - Basement including plant/services, Bike Storage, End of Trip facilities and staff amenities, ancillary service areas such as Mail and Print rooms.
 - Ground level Food and Beverage space and informal education spaces
 - Teaching and Learning spaces and workspaces for UNSW Faculties for other levels
 - (The internal fit-out will be subject to separate approval)
 - Rooftop level including landscaped outdoor terrace, multifunction space, mechanical plant and services
- Associated landscaping, replacement trees and public domain embellishment works in and around the proposed building

Job number 304141
Date 21 February 2025

- Extension and augmentation of infrastructure and services as required
- New lift core in the adjacent building, H25 Botany Street Carpark and associated access improvements.

The Proposal will seek to deliver improvements including:

- Providing new, purpose-built learning and teaching spaces to support the University activities and strategic goals such as the development of the Randwick Health and Education Precinct
- Delivering an enhanced ground plane connection
- Providing flexible and adaptable teaching and learning spaces
- Creating a healthy, green, and welcoming place for students, staff and visitors
- Creating an experience that is an open, permeable, and connected public realm
- Creating pedestrian priority and inclusive shared public space

For a detailed project description refer to the Environmental Impact Statement prepared by Ethos Urban.

2. Site Analysis

2.1 Site Context

The site is situated within the UNSW Kensington upper campus, within the Randwick Local Government Area (LGA). The site address is 8 High Street, Kensington, which applies to the whole of the UNSW Kensington campus.

The UNSW campus forms part of the wider Randwick Health and Education Precinct, which has been strategically identified to provide a world-class coalition of education, research, innovation and healthcare organisations and to attract growth, investment and employment opportunities. This Precinct has been identified in the *Greater Sydney Region Plan – A Metropolis of Three Cities* and the *Eastern City District Plan*, for its strategic importance as a specialised centre providing for health and education research, innovation, teaching and learning.

The UNSW campus is located approximately 6km southeast of the Sydney CBD, immediately adjacent to the east is the Randwick Hospitals Complex which also forms part of the Randwick Health and Education Precinct. The UNSW site is within 600m of the Randwick Shopping Centre

Job number

304141

Date

21 February 2025

to the east and adjacent to Royal Randwick Racecourse to the north (refer



Figure 1: Site Context below).

Job number 304141
 Date 21 February 2025

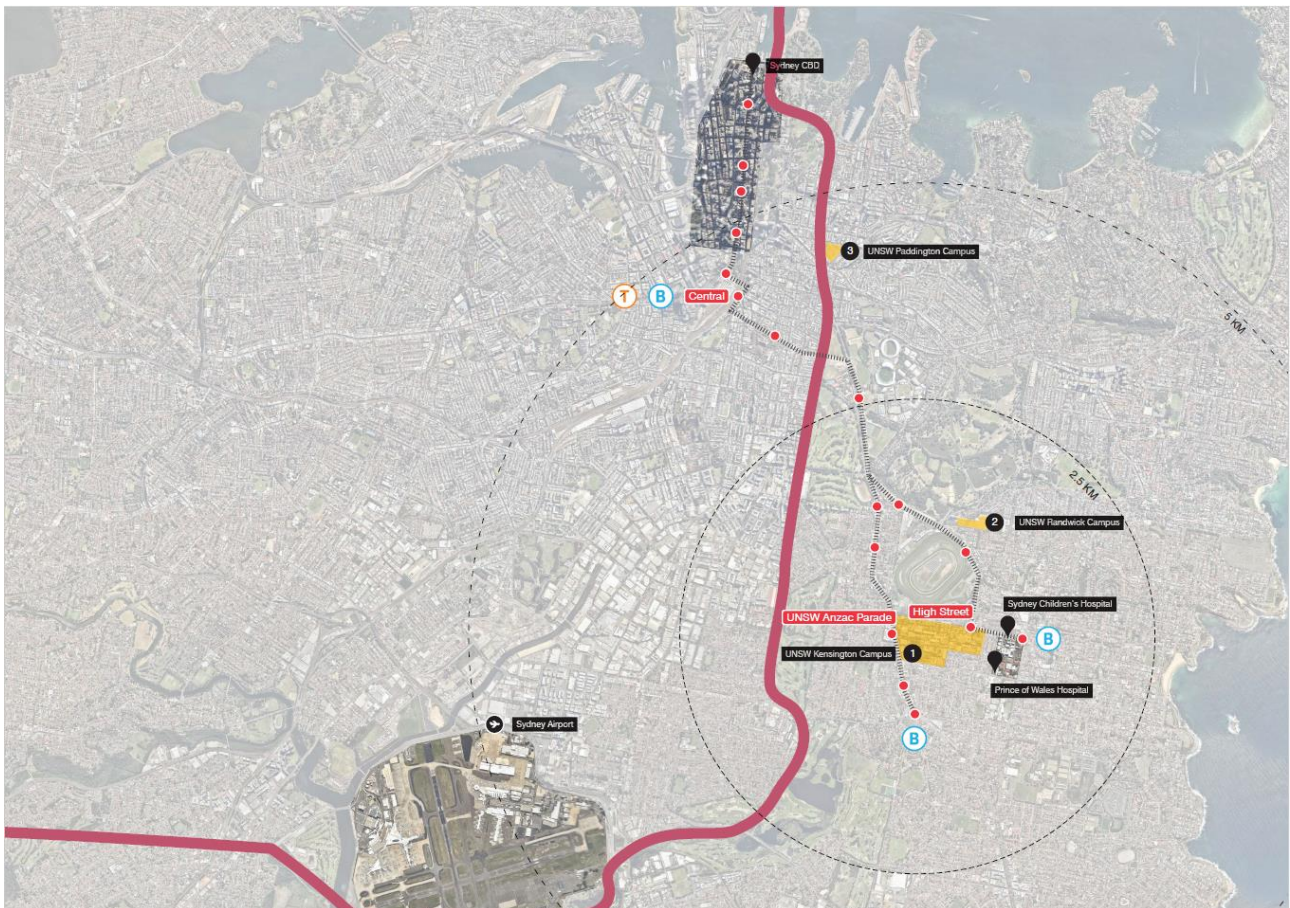


Figure 1: Site Context (Source: Ethos Urban, Google Maps)

2.2 Site Description

The subject site known as the G25 site, is an existing on-grade carpark comprising of hardstand pavement with line-marked spaces, trees and landscaped areas. The site also includes the eastern portion of Library Walk and the loading dock area of the AGSM (Australian Graduate School of Management) Building (G27), with no other existing development on the site.

It is bounded to the north by the Samuels Building (F25) and Mathews Building (F23), to the west by the Solar Industrial Research Facility (SIRF) Building (G23), to the south by the multi-storey Botany Street Carpark Station (H25), and to the east by the Australian Graduate School of Management (AGSM) Building (G27) and the Gate 11 entrance to UNSW from Botany Street.

The broader UNSW Kensington Campus consists of five separate allotments. This site is situated within a single allotment legally described as Lot 5 DP 1264171. The UNSW Kensington campus is bounded by Anzac Parade (to the west), High Street (to the north), Botany Street (to the east), and Barker Street (to the south). It also includes developments to the west of Anzac Parade and north of Day Avenue, such as NIDA, the University Regiment, and the New College Post-Graduate Village. The campus currently has approximately 60,000 student enrolments.

Job number 304141
Date 21 February 2025

Figure 2 provides an aerial image of the site and its location relative to the UNSW upper campus boundaries.



Figure 2: Site Aerial (approximate site area outlined in red) (Source: Nearmap, Ethos Urban)

2.3 Surrounding Development

The following development surrounds the site:

- North: To the north and directly adjacent to the site across from the Library Walk are the Samuels (F25) Building and Mathews (F23) Building, which comprise up to 16-storeys. Further north within the campus are additional education, administration and library buildings. The wider context includes the UNSW High Street Light Rail stop, as well as low to medium density residential development north of High Street.
- South: South of the site is the UNSW Botany Street Carpark Station (H25) (5 storeys), which is accessed internally within the UNSW campus. This location includes a pedestrian link from Oval Lane. The wider context includes low-medium density residential development south of Oval Lane.
- East: The site directly abuts the ASGM Building (G27) to the east (5 storeys), which fronts Botany Street. To the east and also fronting Botany Street is the Randwick Hospitals Complex including the Prince of Wales Hospital, the Sydney Children’s Hospital, and the Royal Hospital for Women, as well as low-medium density residential development to the south-east.

Job number 304141
Date 21 February 2025

- West: The site directly adjoins the Solar Industrial Research Facility (SIRF) (G23) to the west, which also sits within the confines of Library Walk and Valentine Close. The western context of the subject site is primarily characterised by the wider UNSW campus (lower campus) as well as the Anzac Parade Light Rail stop.

3. H25 Existing Structure

The existing H25 Botany Street Carpark consists of a reinforced concrete moment frame structure, with concrete stair cores which are separated from the main structure with isolation joints, thus not forming part of the lateral stability system. The typical floor structure consists of band beams running north-south, with reinforced concrete slab spanning east-west. By exception, the floors at the western end of the building and the uppermost floor on the northern side are post-tensioned.

It is proposed to provide a new lift within the envelope of the H25 building, to replace an external lift that is to be demolished to permit construction of the G25 building.

Openings will be cut in the slabs between the band beams for the new lift shaft to be constructed through them.

4. Concept Lift Shaft Design

In its most basic form, the new lift shaft is proposed to be a standalone reinforced concrete shaft, comprised of a footing, lift pit, and walls. A piled foundation is both sufficient and consistent with the design of the other cores in the building.

The lift pit is expected to be approximately 1 metre deep, retaining the surrounding sandy material. This will then continue in the same form up to the top of the building, forming one consistently sized lift shaft. It is expected that 200mm thick walls will be appropriate for the shaft.

At the slab interfaces with the new core, support corbels will be added to provide a vertical load path to ground. Isolation joints will be provided all the way around the core to prevent it from influencing the lateral stability system.

By making local changes to the vertical load path, and not influencing the lateral load path or stability system, no NCC compliance and seismic upgrading requirements are triggered.

5. Structural Design Concept

The following sketches graphically illustrate the key structural design concept.

Job number

304141

Date

21 February 2025

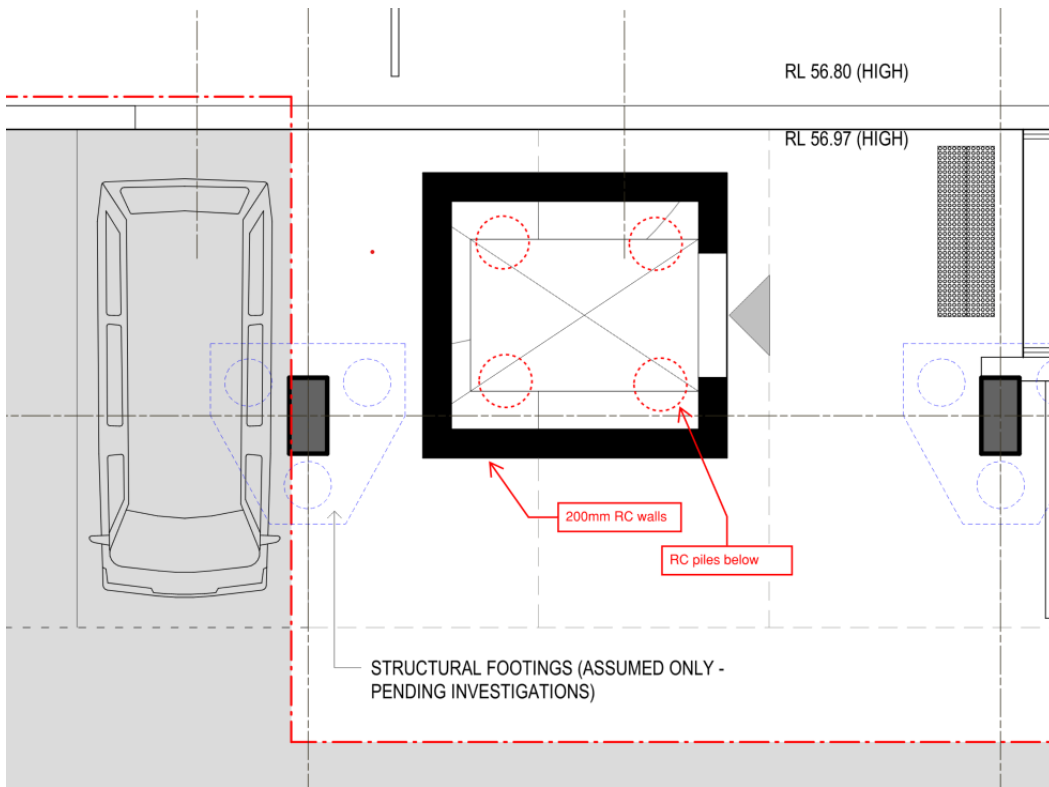


Figure 3: Plan view of new lift at ground level showing indicative pile locations (from Architectus drawing). NTS.

Job number
Date

304141
21 February 2025

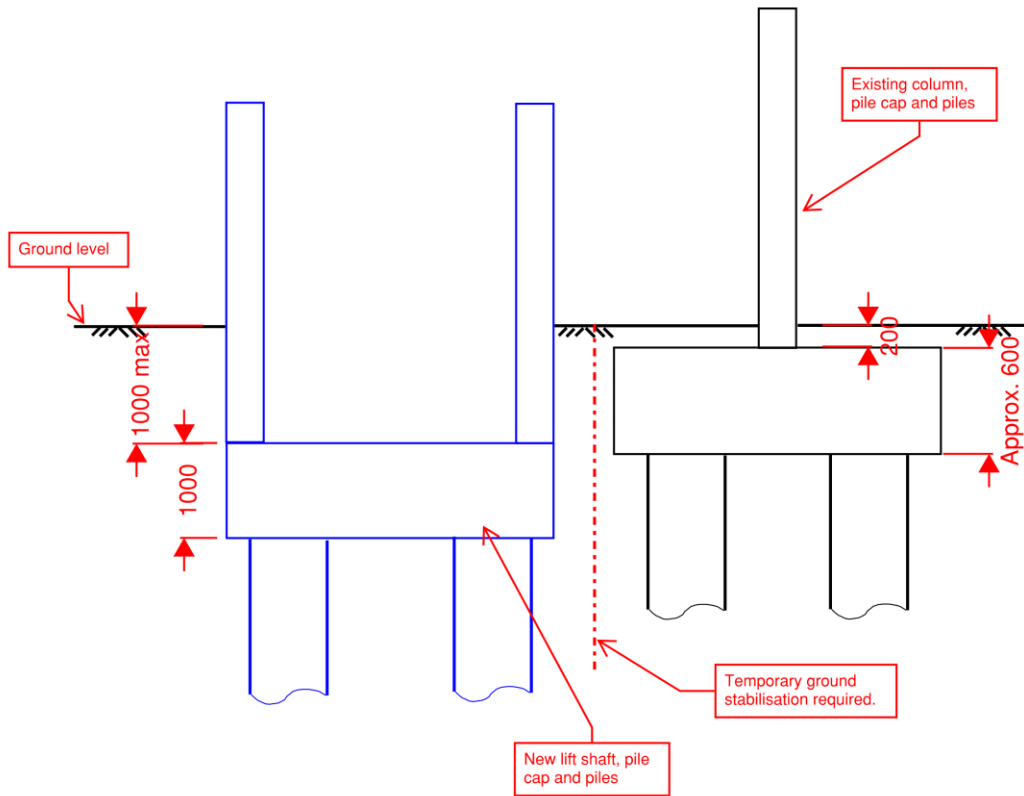


Figure 4: Section view of lift pit and existing column foundations, looking South. NTS.

