HERITAGE IMPACT STATEMENT

UNIVERSITY OF SYDNEY ENGINEERING BUILDING

5 APRIL 2018
SH1210
FINAL
PREPARED FOR LAING O'ROURKE AUSTRALIA

URBIS

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1. INTRODUCTION

1.1. BACKGROUND

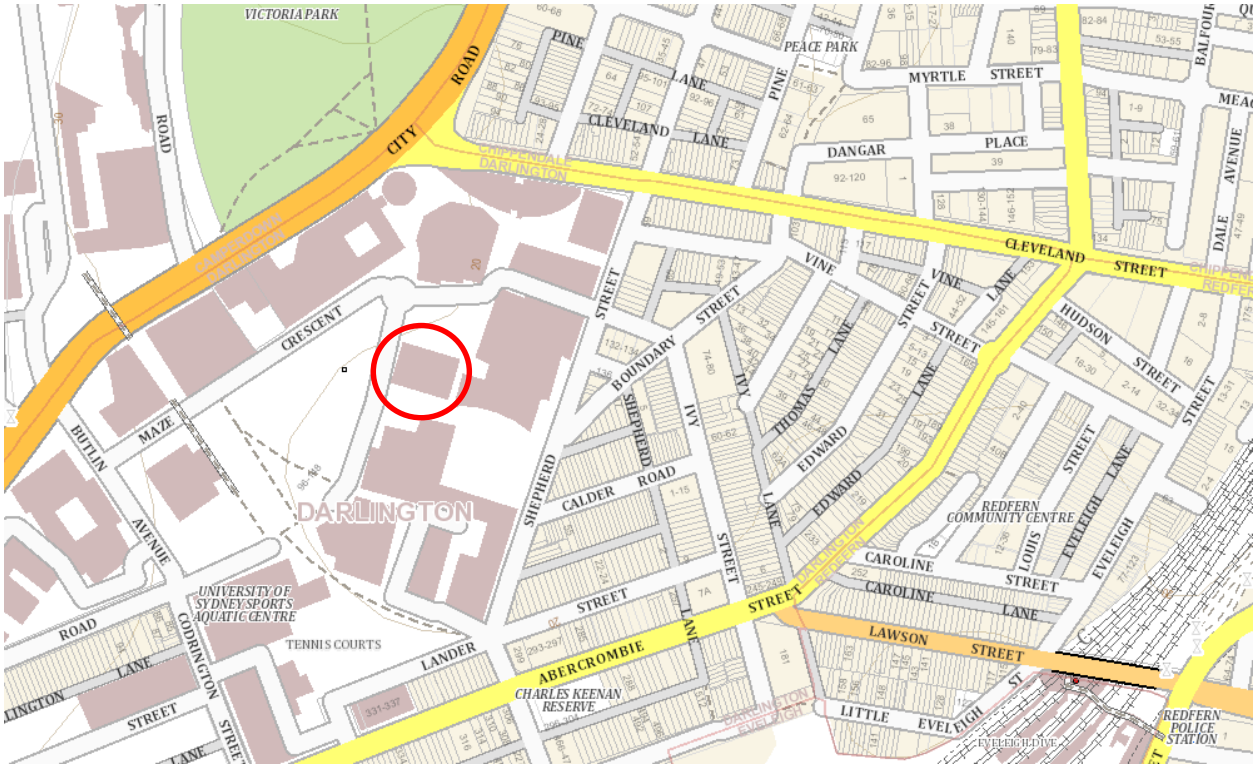
Urbis has been engaged by Laing O'Rourke Australia to prepare the following Heritage Impact Statement and Archaeological Assessment for the Electrical Engineering Building (J03), located within the Engineering and Technology Precinct of the Darlington Campus of The University of Sydney.

The University of Sydney is preparing a development application for Stage 1 refurbishment of the western wing to the Electrical Engineering Building (Building J03) and construction of a new, 14-storey eastern wing. This requires demolishing the eastern wing of the Electrical Engineering Building. This Heritage Impact Statement (HIS) is a response to the Secretaries Environmental Assessment Requirements (SEAR).

1.2. SITE LOCATION

The site is located at Maze Crescent, The University of Sydney, within the Darlington Campus. The site is located within the eastern portion of the university campus comprising the Engineering Precinct. The Engineering Precinct is bounded by Cleveland Street to the north, City Road to the northwest, Butlin Avenue and Codrington Street to the west, Abercrombie Street to the south and Shepherd Street to the east. The precinct has internal streets. The Engineering Building is located south of the corner of Maze Crescent and Blackwattle Creek Lane (see Figure 1).

Figure 1 – Locality map indicating the subject site circled in red



Source – *Sixmaps 2017*

1.3. METHODOLOGY

This Heritage Impact Statement (HIS) has been prepared in accordance with the NSW Heritage Branch guideline 'Statements of Heritage Impact' (HIS) (2002). The philosophy and process adopted is that guided by the *Australia ICOMOS Burra Charter* 1999 (revised 2013).

Site constraints and opportunities have been considered with reference to relevant controls and provisions contained within the *Sydney Local Environmental Plan 2012* and the *Sydney Development Control Plan 2012*.

1.4. HERITAGE SIGNIFICANCE

The University of Sydney Engineering Precinct is not listed as a heritage item in Schedule 5 of the *Sydney Local Environment Plan 2012* (Sydney LEP). It is not located within a heritage conservation area. It is located in the vicinity of a heritage item:

- 96–148 City Road, Darlington (Former Darlington Primary School including interior) – Item No: I524.

Sydney University campus, listed as "University of Sydney Heritage Conservation Area" (Map Reference No: CA 5) is only relevant to the principal campus dating to 1858-1940. The Engineering Precinct does not form part of this conservation area.

Two heritage conservation areas of local significance adjoin the Engineering Precinct with the border along Shepherd Street:

- Chippendale/Darlington - Darling Nursery Estate (Map reference: C10); and
- Darlington/Newtown - Golden Grove (Map reference: C18).

1.5. AUTHOR IDENTIFICATION

The following report has been prepared by Lynette Gurr (Associate Director) and Chrisia Ang (Heritage Consultant). Stephen Davies (Director) has reviewed and endorsed its content.

Unless otherwise stated, all drawings, illustrations and photographs are the work of Urbis.

1.6. THE PROPOSAL

1.6.1. Description of the Proposed Works

The proposed works to the Electrical Engineering Building to create the Micro Engineering Building will include the following:

- 4,000m^2 new Research laboratories;
- 2 x Teaching laboratories;
- Associated workspace and support; and
- Precinct wide loading docks; and Informal and outdoor learning.
- Retention and refurbishment of the existing (southern wing of the Electrical Engineering Building;
- Demolition of the existing northern wing of the Electrical Engineering Building;
- Remove portion of existing Engineering Walk and replace with new walkway;
- Remove existing Garden Courtyard east of the Electrical Engineering Building to become new roof-top Garden;
- Construction of a new 10-level wing and refurbish existing wing of the Electrical Engineering Building with central atrium comprising the following:
    - Level 01 – Offices, Gardeners and Maintenance Store, Waste Store, Bulk Store, Research Lab, Autoclave, Plant;
    - Level 02 – Substation, Plant, Teaching and Learning spaces (closed and open);
    - Level 03 – Void to new wing and void for plant to portions of existing wing incorporating Library, Lounge, amenities, 4 x passenger lifts and 1 x goods lift and Display;

- Level 04 – Refurbish existing Laboratories and new Teaching and Learning (enclosed) and Prep areas;
- Level 05 - Refurbish Existing Laboratories and new Research Laboratories;
- Level 06 - Refurbish Existing Laboratories and new Research Laboratories;
- Level 07 – Refurbish existing for Post Graduates Offices and Boardroom and new Post-Doctoral research areas and Meeting Rooms;
- Level 08 – Refurbish existing Offices and new Research Laboratories;
- Level 09 – Existing Tower and New Research Laboratories;
- Level 10 – Existing Tower and New Plant;
- Level 11 – Existing and New Roof.

- Extend landscape to area north of Mechanical Engineering Building (adjoining Blackwattle Creek Lane).
- Remove existing carpark to area south of Mechanical Engineering Building to construct retention basin with new landscaping over.

1.6.2. Plans and Documentation

This HIS has been prepared with reference to the following architectural drawing set prepared by COX Architects for proposed works to the Electrical Engineering Building (J03), for The University of Sydney Engineer and Technology Precinct Stage 1. Any later versions of this documentation set have not been considered in preparation of this report.

Drawing Title	Dwg No	Revision	Date
Cover Sheet / Drawing Index	A-DA-0101	A	08/11/2017
Site Survey Plan	A-DA-0101	A	08/11/2017
Site Analysis Plan	A-DA-1111	A	08/11/2017
Site Plan – Existing & Demolition	A-DA-1121	A	08/11/2017
Site Plan - Proposed	A-DA-1122	A	08/11/2017
Floor Plan – Level 01 (Sheet 01 of 02)	A-DA-2101A	A	08/11/2017
Floor Plan – Level 01 (Sheet 02 of 02)	A-DA-2101B	A	08/11/2017
Floor Plan – Level 02	A-DA-2102	A	08/11/2017
Floor Plan – Level 03	A-DA-2103	A	08/11/2017
Floor Plan – Level 04	A-DA-2104	A	08/11/2017
Floor Plan – Level 05	A-DA-2105	A	08/11/2017
Floor Plan – Level 06	A-DA-2106	A	08/11/2017
Floor Plan – Level 07	A-DA-2107	A	08/11/2017
Floor Plan – Level 08	A-DA-2108	A	08/11/2017
Floor Plan – Level 09	A-DA-2109	A	08/11/2017
Floor Plan – Level 10	A-DA-2110	A	08/11/2017
Floor Plan – Level 11	A-DA-2111	A	08/11/2017
North Elevation	A-DA-3001	A	08/11/2017
South Elevation	A-DA-3002	A	08/11/2017
East Elevation	A-DA-3003	A	08/11/2017
West Elevation	A-DA-3004	A	08/11/2017
Sections – East to West	A-DA-4001	A	08/11/2017
Sections – North to South	A-DA-4002	A	08/11/2017

Shadow Diagrams	A-DA-8003	A	08/11/2017

The height of the parapet of the existing tower of the Electrical Engineering Building is approximately RL60.2. Figure 3 describes the “Proposed New Building” associated with the eastern wing is higher than the tower parapet.

Figure 2 – Photomontage showing an artist’s impression of the proposed new Micro Engineering Building, incorporating part of the existing Electrical Engineering Building (J03)

Source: COX Architecture, November 2017

1.6.3. Design Intent Statement

The following Design Intent Statement has been prepared by project architects, COX Architecture, to describe the proposed works to the Micro Engineering Information Building:

The Micro Engineering Building is the critical first stage in reimagining how the Faculty of Engineering and information Technologies (FEIT) will be teach, research and innovate at the University of Sydney…People are the university’s greatest assets and their building and infrastructure must create magnetic environments that will attract and retain the world’s best and support the way they work and interact between cohorts.

FEIT currently consists of 16 faculties across 5 schools. The engineering precinct masterplan seeks to organise space into sub precincts of Macro, Micro and Meso engineering. This is the critical first stage in this masterplan and will be a catalyst project for the rejuvenation of the precinct. The proposed building will provide greater research intensity in the precinct whilst improving the student experience essential to the continued success.

The Micro Engineering Building will attract award-winning researchers, staff, students and industry partners to the University of Sydney’s Engineering and Technology Precinct.

Underpinning the design approach are the Wingara Mura Design Principles.

A liberated ground plane allows for a constellation of spaces to form in the landscape and connect the internal and external teaching, social and reflective spaces.

This constellation meanders up through the atrium that is surgically carved and expressed between new and old structures.

A refined flexible and functional building envelope is composed of rationalised elements that clearly express their purpose and encourage "Engineering on Display".

There are 7 core project objectives:

*(01) **Engineering on Display** – foster a culture of innovation to ensure engineering is always on display…conceived and designed as a place where special things happen in the public realm…The design of the building will optimise opportunities to showcase activity and invite public gaze and interest into its various portals, levels and facilities – bridging the traditional internal-external divide of a university campus. It will be designed and operated as a place of participation.*

*(02) **A Connected Community** – the team's approach to urban design and architecture is to create porosity vertically and horizontally whilst providing a range of meeting places to facilitate these connections.*

*(03) **Driven by Innovation** – the Micro Engineering Building will be founded upon world-class technology and systems to attract and retain world-class innovators… A technological backbone will facilitate innovation not currently conceived and provide new ways to visualise engineering processes and reactions.*

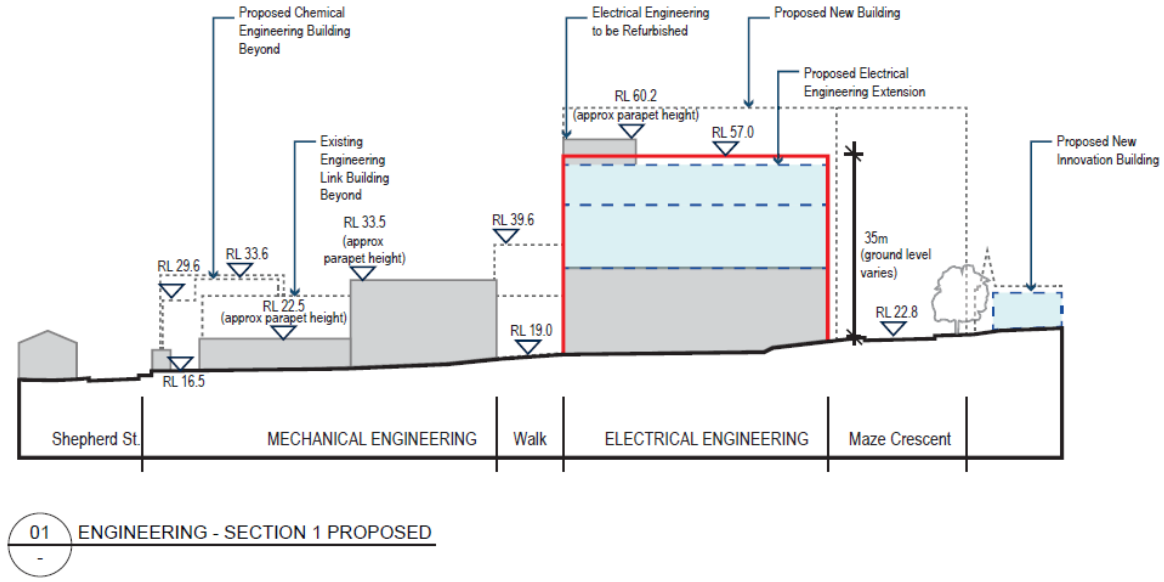
*(04) **Flexible and Functional** – the design is centred on an ideal research floor plate providing the optimum combination of efficiencies, flexibility, day light penetration and service reticulation. All components of the project have been designed with long-term flexibility in mind.*

*(05) **24/7 Precinct** – The ETP and the life it generates within its precinct will also link to, and enhance, the existing University campus and the adjacent neighbourhood. It will be a place intended to both excite and enable tenants and visitors alike, but which never loses sight of its identity as a place of research and higher learning.*

*(06) **Sustainability** – All aspects of the Micro Engineering Building have been designed with an aim for ESD optimisation. Passive building design principles and retention of the existing structure contribute to excellent and innovative sustainability outcomes. Integrated technologies enable the building to act as a living lab and data resource for ongoing research and innovation initiatives.*

*(07) **Wingara Mura Strategy** – the approach to the Wingara Mura Strategy underpins the design. The building design responds to the Wingara Mura Storylines document…*

Figure 3 – Electrical Engineering building showing the heights of existing and proposed buildings



Source: Campus Improvement Program, Engineering Section 1 - Proposed, Dwg: SSD-D-14

2. SITE DESCRIPTION

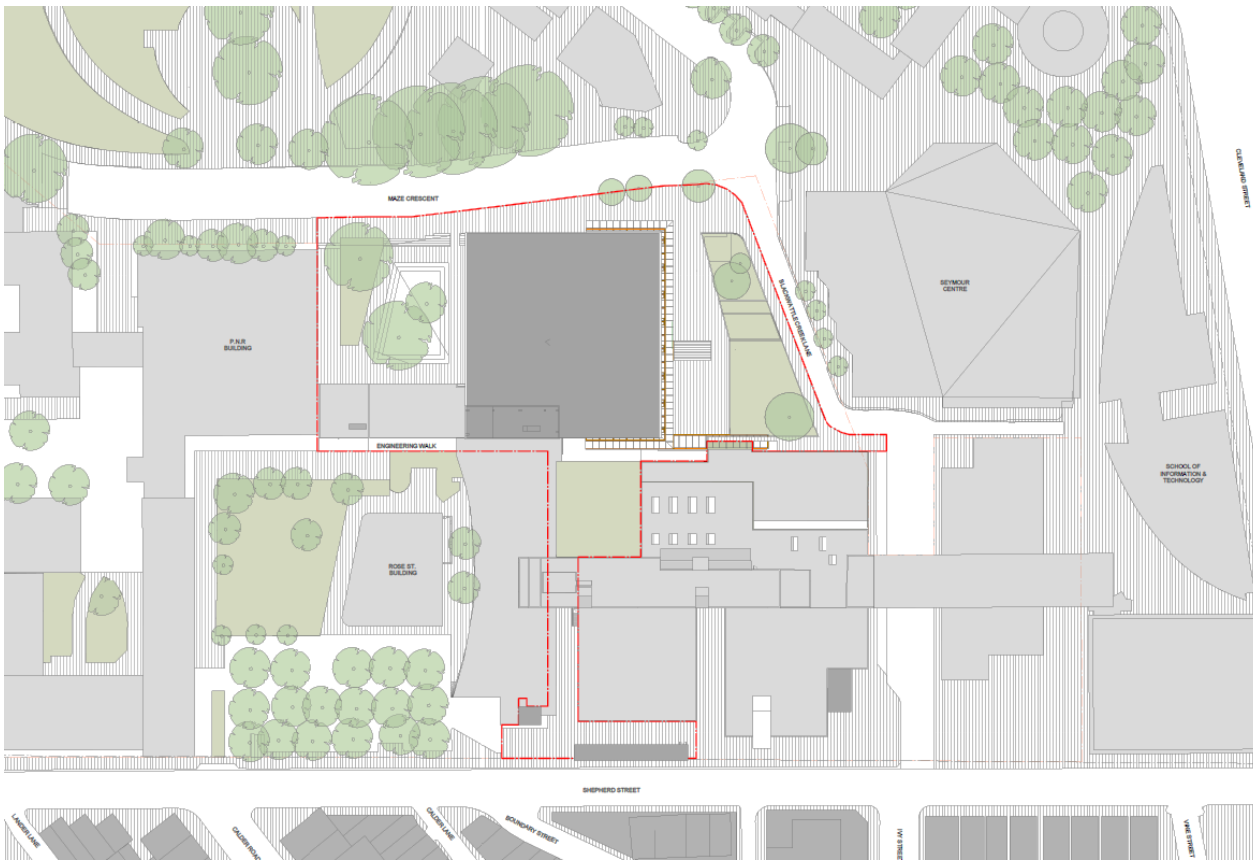
2.1. SETTING

The Electrical Engineering Building (J03) is located within the Engineering Precinct of the University's Darlington Campus. The Engineering Precinct, located on the eastern side of the University of Sydney Darlington Campus, comprises the following buildings:

- Information Technology Building (J12);
- Shepherd Street Carpark (J10);
- Aeronautical Engineering Building (J11);
- Mechanical Engineering Building (J07);
- Electrical Engineering Building (J03);
- Engineering Link Building (J13);
- Rose Street Building (J04);
- PNR Building (J02);
- Civil and Mining Engineering Building (J05);
- Materials and Structures Building (J05);
- Chemical Engineering Building (J01);
- Gordon Yu Choi Building (J14); and
- Various Sheds and ancillary structures (J10A, J10B, J11A, J11B).

The Electrical Engineering building addresses Maze Crescent, an internal roadway (see Figure 4). There are four phases of construction within the precinct: pre-1960, the 1960s, the 1970s and the 1980s onwards.

Figure 4 – Site Plan showing the subject site for the Electrical Engineering building (J03) outlined in red (not oriented in a northerly direction)



Source: Architect Cox, Site Survey Plan, Dwg No: A-DA-1001

Located immediately north of the Engineering Precinct is the Old Darlington School Building, a Victorian Gothic style building constructed in sandstone with slate roof, and a landscaped area, known as Cadigal Green. This area separates buildings constructed along City Road.

The following images and captions provide a description of the setting of the Electrical Engineering Building within the Engineering Precinct at The University of Sydney Campus.

Figure 5 – At left: Darlington Precinct includes Old School Building (former Darlington Primary School), a heritage item. At right: to the west is the Molecular Bioscience Building (G08). Buildings are located around the perimeter of the Cadigal Green.

Source: Urbis, November 2017

Source: Urbis, November 2017

Figure 6 – Old School Building (former Darlington Primary School) (left) is located southwest of the subject site on the western side of Maze Crescent. The glasshouse is located to the northwest of the subject site

Source: Urbis, November 2017

Source: Urbis, November 2017

Figure 7 – View to buildings north and west of the subject site including St Michael's College, Wilkinson Building (architectural and planning)

Source: Urbis, November 2017

Source: Urbis, November 2017

Figure 8 – View southeast from Maze Crescent showing the 2-storey PNR Building (at left) located south of the subject site, constructed in 1970, and separated by on-grade car parking. The Mechanical Engineering building (at right) is located east of the subject site. Engineering Walk, is a pedestrian link on a north-south axis across the precinct.

Source: Urbis, November 2017

Source: Urbis, November 2017

Figure 9 – At left: located north of the Electrical Engineering building, on the eastern side of Blackwattle Creek Lane, is the Seymour Centre, a four-storey face brick building. At right: in the distance is the reinforced concrete Shepherd Street carpark, designed by Allan Jack & Cottier architects in the Brutalist style, and built in 1975-76, in the foreground is the Aeronautical Engineering building.

Source: Urbis, November 2017

Source: Urbis, November 2017

Figure 10 – At left: vehicular roadway, runs parallel with Shepherd Street and provides vehicular access for loading bays. At right: Civil Engineering building is located along the Shepherd Street boundary and adjoins the vehicular entry off Shepherd Street to the Engineering Precinct.

Source: Urbis, November 2017

Source: Urbis, November 2017

Figure 11 – At left: landscaped area south of the Mechanical Engineering building is to be developed as a loading dock servicing the Electrical Engineering building. The Engineering Link building is located to the east. At right: view west from an internal access route to an existing access lane leading to a loading bay for the Mechanical Engineering Building.

Source: Urbis, November 2017

Source: Urbis, November 2017

Figure 12 – At right: view northwest from the vehicular access road running parallel to Shepherd Street, showing the two-storey polychrome facebrick Rose Street Building (former Boxton & Carr printery and carton manufactory) in the foreground and the Electrical Engineering building in the distance. The Electrical Engineering tower is a dominant feature within the Engineer Precinct. At right: vehicular entry to the Engineering Precinct off Shepherd Street and adjoining the Civil Engineering building on the south.

Source: Urbis, November 2017

Source: Urbis, November 2017

Figure 13 – Located on the eastern side of Shepherd Street is a pair of Victorian terraces. Adjoining the terraces is the Civil Engineering Workshop, at 225 Shepherd Street, a former warehouse dating to the 1920s, on the corner of Calder Lane.

Source: Urbis, November 2017

The Information Technology Building (J12), constructed in 2006, addresses Cleveland Street. This is a multi-storey engineering building with glazed façade treatment. The building departs for other buildings within the Precinct that are of the "Brutalist" style.

2.2. DESCRIPTION OF THE BUILDING

The Electrical Engineering Building comprises a three level podium with a central courtyard / pedestrian circulation concourse on the north-west axis. The axial circulation route is typical planning feature of the Engineering Precinct. Teaching wings are located on the eastern and western side of the central concourse.

The Electrical Engineering Building is designed in the Late Twentieth Century Brutalist style. During the 1960s, the Brutalist style was popular for education buildings. The Electrical Engineering building employs many of the features of the Brutalist style, including sun control panels (*brises soleil*), "light scoops", cantilevered terraces and balconies, ground level courtyard and internal concourses.

The Electrical Engineering Building is constructed using off-form concrete, exposed internal and external concrete work was formed and poured on site with the exception of the "sun louvres" or light scoops which were precast. The white paint finish applied to the off-form concrete is not original. The publication, *Constructional Review,* cites the architects' specification as follows: "not a perfect finish, not an imitation of cement render but good concrete without pronounced surface blemishes".

The internal finishes include glass mosaic tile in the main entrance, concrete flooring with timber floors used in some of the electrical engineering laboratories with vinyl tiles. Quarry tiles are used in areas of high traffic. Generally, window frames are steel. Some windows have timber detailing.

The following images and captions provide a description of the Electrical Engineering Building and its setting.

Figure 14 – Views showing the central pedestrian spine of the Electrical Engineering Building. It is proposed to retain the southern wing of the building complex with alterations to the balustrading and atrium

Source: Urbis, November 2017

Source: Urbis, November 2017

Figure 15 – At left: view looking west from the pedestrian spine showing the north elevation of the southern wing. At right: View looking east showing the southern wing, plant and tower.

Source: Urbis, November 2017

Source: Urbis, November 2017

Figure 16 – View looking east along the internal balconies to Electrical Engineering building. Materials include off-form concrete structural system (columns, beams and slabs) with infill brickwork walls and metal framed window and door openings. Paint to the concrete is a later addition. Floor has quarry tile and concrete finish.

Source: Urbis, November 2017

Source: Urbis, November 2017

Figure 17 – North Elevation of Electrical Engineering building showing the off-form concrete structure (with later addition paintwork) and infill face brickwork. The podium to the northern wing (in foreground) comprises two levels. The southern wing is a seven level tower. Sun louvres and awnings are located over window openings.

Source: Urbis, November 2017

Source: Urbis, November 2017

Figure 18 – West Elevation of the Electrical Engineering building presents as a solid wall. The northern wing is two storeys. The southern wing is six-storeys with an additional two levels (including plant) on the eastern tower. Each level is expressed as a shadow-line in the off-form concrete wall. The western entry to the building (at right) comprises a two-level bridge element with metal balustrading and metal grille door at ground floor entry.

Source: Urbis, November 2017

Source: Urbis, November 2017

Figure 19 – South Elevation of the Electrical Engineering building showing 6-storey wing in expressed structural vertical and horizontal beam in off-form concrete (at left). Wall infill panels are constructed in brickwork with metal framed windows in horizontal bands. Window shading devices (*brises soleil)* on the West Elevation are in off-form concrete (right). All concrete is painted and occurred some years later.

Source: Urbis, November 2017

Source: Urbis, November 2017

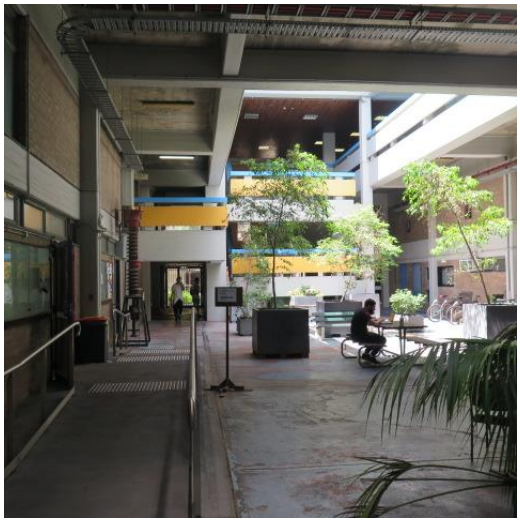
Figure 20 – View east from the Electrical Engineering building showing the sculptural courtyard garden bounded by the Mechanical Engineering Building (northern and eastern boundary) and Engineering Link building (southern boundary). It is proposed this garden courtyard be removed and replanted at a higher level, to allow for the construction of a proposed loading dock at the eastern extent of the existing garden.

Source: Urbis, November 2017

Source: Urbis, November 2017

Figure 21 – View looking east down concrete stairway to the courtyard and pedestrian east-west axis through Electrical Engineering building.

Source: Urbis, November 2017



Source: Urbis, November 2017

Figure 22 – At left: view looking west from the ground floor courtyard towards concrete and face brickwork stairway, Electrical Engineering building entry and pedestrian east-west axis link. At right: view looking east to tower of southern wing and upper level of northern wing.

Source: Urbis, November 2017

Source: Urbis, November 2017

Figure 23 – At left: view to learning laboratory (left) and lecture theatre (right) within the Electrical Engineering building

Source: Urbis, November 2017

Source: Urbis, November 2017

2.3. LATE TWENTIETH-CENTURY BRUTALISM

The University of Sydney's Engineering Precinct is located between Maze Crescent and Shepherd Street, Darlington. The Master Plan, and much of the architecture, was developed by Ancher Mortlock & Murray (Ancher Mortlock Murray & Woolley after 1964).[1]

Much of the Late Twentieth-Century engineering precinct designed by Ancher Mortlock and Murray is constructed in concrete and/or steel-framed masonry buildings with brick infill, roofed in metal (copper, Zincalume, steel), concrete with applied membrane or ceramic tiles. The precinct contains a range of concrete structures and finishes, most notably "off form" concrete in a "béton brut" style. No finishes were originally applied to the concrete. Generally, light hues of the concrete contrast with dark brickwork with oxide-darkened mortar to heighten the colour and materials contrast. On the northwest corner of the precinct, at the intersection of Shepherd and Cleveland Streets, the Allen, Jack + Cottier (AJC) Shepherd Street Carpark is designed in the "Brutalist-style", comprising concrete structure with reeded finish applied to the concrete on the prominent elevations.

[1] This assessment relies on the work of Trevor Howells, *University of Sydney Architecture,* Watermark Press, 2007 for attributions unless otherwise noted.

Three buildings of the precinct buildings rely on traditional brick treatments, the Rose Street Building (c1937), the Civil Engineering Workshop (225 Shepherd St) and the Gazzard Sheldon designed Engineering Link Building (completed in 1993).

The Gordon Yu-Hoi Chiu building (1998), associated with the Chemical Engineering Department, contrasts with the remainder of the precinct by the use of glass, steel and aluminium.

The engineering precinct has a strong axial plan defined by the "Engineers' Walk", a covered way extending from the Peter Nichol Russell (PNR) Building to the Mechanical Engineering Building. With the exception of the Aeronautical Engineering building, all engineering faculties have physical and visual connections with this pedestrian-spine. This linear planning, along with the use of off-form concrete, has led commentators to describe the precinct as an exercise in the design philosophy of "Brutalism".2

In 1955, Reyner Banham outlined the principal features of "Brutalism" in the *Architectural Review* as follows:

1. Formal, axial plans (a formal legibility of plan);

2. An emphasis on basic structure (a clear exhibition of structure);

3. Candidly expressed materials and finishes (materials "as found" or "off-form");

4. Predominantly concrete, but integrating glass, brick and timber,[3]

Banham's description of "Brutalism" paired with the Smithsons' description: "functionally compatible buildings, like the components of a tea set" with "the space between them becoming the collective of the spaces" is a summary of the methodology of the Ancher Mortlock and Murray master planning of the engineering precinct.

Ancher Mortlock and Murray's designs for the Civil Engineering (1961-1963), Chemical Engineering (1962-1964) and Electrical Engineering (1963-1965) buildings established a precinct-wide methodology and materials palette of timber, brick and off-form concrete. The Shepherd Street carpark in 1975 was a break from this tradition.[4]

The architectural style of "Brutalism" at The University of Sydney's engineering precinct forms part of a group of NSW educational commissions by the firm. Following their success with the Sydney University engineering precinct, in 1965, the practice commenced design development of the Macquarie University Student Union.[5] Other architects embraced the style. In 1966, the NSW Government Architect, under EH Farmer, designed concrete construction technique of expressed structure, precast elements and off-form finishes with commissions for Randwick Girls High School (1966), Macquarie University Library (1966), the University of Technology Sydney (NSWIT) Tower (1966), Goldstein Hall (UNSW) (1964), Ku-ring-gai William Balmain Teachers College (1967) (Now UTS) and the Hornsby Technical College, Hornsby (1968).[6]

The Chemical Engineering building (1963-1965) is considered one of the pivotal buildings in the complex establishing the Engineers Walk axis, the elongated rectilinear window treatments (repeated in an elevation of the PNR building), the ratio of concrete to face brick and one of the Smithson-inspired "Brutalism" tenets where "the space between [buildings becomes] the collective of the spaces that each of the buildings carries with it".[7] Off-form concrete is an integral part of the design language.

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2 Trevor Howells, *University of Sydney Architecture*, Watermark Press, 2007, p.106, p.114, p.117.

3 Reyner Banham. op. cit., p.357.

4 Smithson, Alison, and Peter Smithson. Without Rhetoric. An Architectural Aesthetic 1955-1972, Latimer New Dimensions, 1973, p.6. "Respect for materials" became a popular phrase for the "As Found" textural qualities of off-form concrete work.

5 During this same period, the practice won the 1967 Blacket Award for the modestly scaled Union building at the University of Newcastle with Ken Woolley as design architect and Glen Murcutt as his assistant. *Architecture in Australia*, November 1968.

6 In 1968, a spokesperson for the NSW Government Architect said that the "as found" off-form finish of Hornsby Technical College was selected not because of any fashion for "brut" concrete, but because years of school and college maintenance has shown the Government Architect the value of upkeep-free materials." "Technical College." Constructional Review, March 1968, pps.14-17.

7 Irenee Scalbert, "The Smithsons and the Economist Building Plaza" in *Architecture* is not made with the Brain. The Labour of Alison and Peter Smithson. Architectural Association, 2005, p,24.

The PNR building (1965-1966) completed the enclosure of the Engineers' Lawn and established a series of elevated concourses, wings and pedestrian walkways. This structure integrated the Chemical Engineering, Civil Engineering and Electrical Engineering structures into a unified whole.

The Electrical Engineering building (1964-1966) is amongst the first Australian educational buildings to commit to a full expression of "Brutalism".[8] A survey article in *Constructional Review* cites the architects' specification as calling for "not a perfect finish, not an imitation of cement render, but good concrete without pronounced surface blemishes"[9]. It should be seen in the context of the small-scale Wollongong Teachers College library (1968) and Macquarie University's Union building (1965-1968) designed by Ancher Mortlock, Murray and Woolley and also employing the engineering firm Taylor, Thomson and Whitting who collaborated on the Sydney University engineering buildings. Here, the practice turns to an industrial-scale "Brutalism" where reinforced concrete allows cavernous interior architecture on a scale rarely seen outside of sacred architecture. The building's concrete elevations have now been painted which diminishes the visual impact of the building.

Mechanical and Aeronautical Engineering was designed by Ancher, Mortlock, Murray and Woolley and built in two stages, Mechanical Engineering (1970-1971) and the Aeronautical Engineering structure (1973-1975). The design architect was Stuart Murray.

The buildings are committed to the "Brutalist" methodology including *brises soleil*, "light scoops", cantilevered terraces and/or balconies and internal concourses and explore new methods of interior architecture bringing light and space deep into the interiors.

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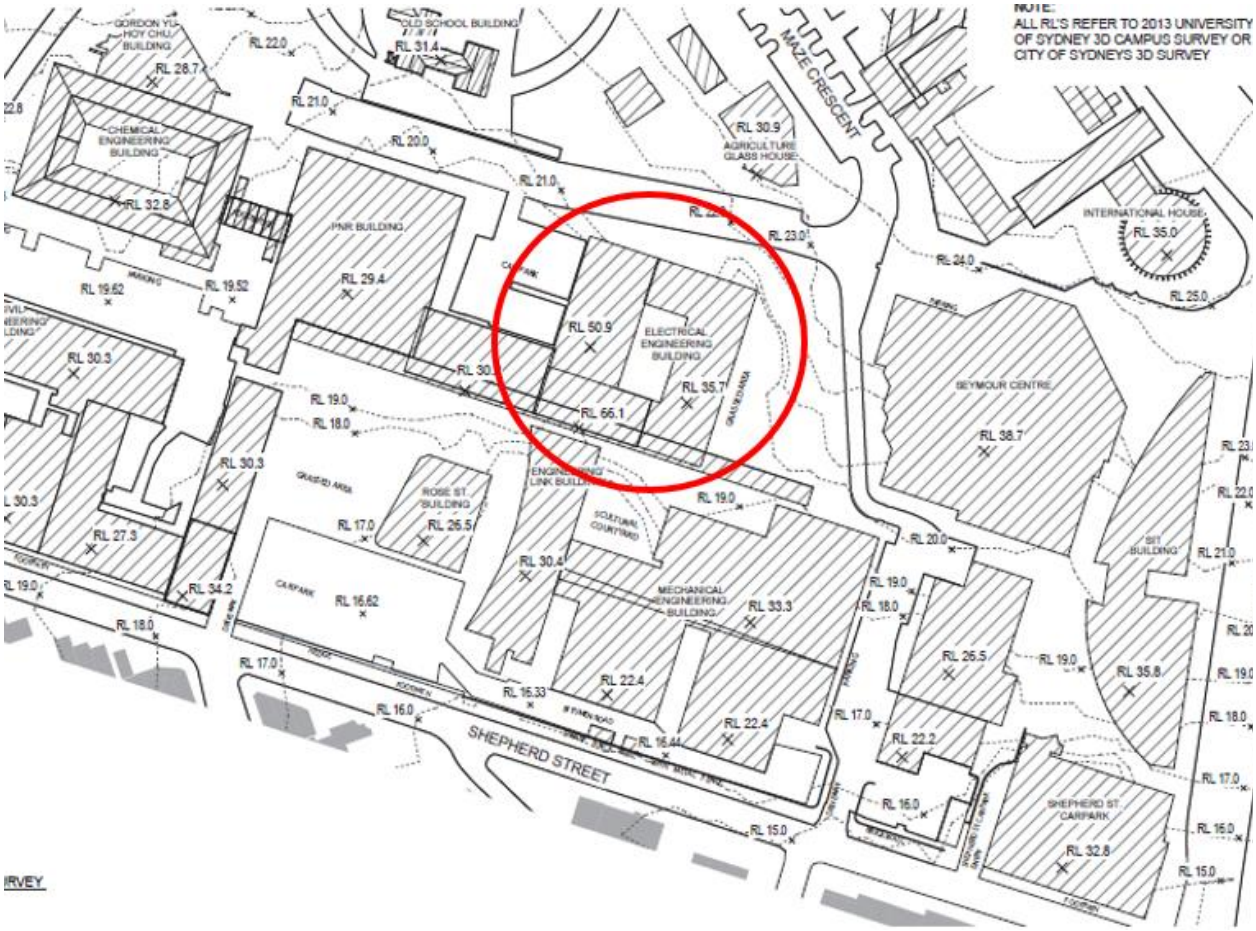
[8] Geoffrey London's entry on Brutalism in the Encyclopaedia of Australian Architecture claims the Hale School Memorial Hall, Wembley Downs (1961) as amongst the earliest educational buildings in this aesthetic. *Encyclopaedia of Australian Architecture*, Philip Goad, et al. Cambridge University Press, 2012, p.110.

[9] "Electrical Engineering Building." *Constructional Review*, October, 1967, p.13.

Figure 24 – Site Survey showing the heights (RL) of each of the buildings within the Engineering Precinct (north point located to right)



Source: Campus Improvement Program, Dwg Title: "Engineering - Site Survey", Dwg No SSD-D-01

3. HISTORICAL OVERVIEW

3.1. THE UNIVERSITY OF SYDNEY – PRE-EUROPEAN

The following history is summarised from the “Grounds Conservation Management Plan” (2014) prepared by University of Sydney Planning Team Campus Infrastructure Service based on information provided by Clive Lucas, Stapleton and Partners Pty Ltd and Circle Square Design Landscape Architects.

The grounds of the University of Sydney originally formed part of the land occupied by the Aboriginal people of the Cadigal and/or Wannigal clans. The occasional Aboriginal occupation may have been attracted by the freshwater sources and swamps within close proximity to the University grounds. However, there are no sandstone outcrops or source of stone for tool manufacture found. No Aboriginal sites have been identified within the grounds.

In 1788, Governor Phillip set aside reserves for Crown, church and school purposes. In 1792, Lieutenant Governor Grose was granted a lease of 30 acres out of the 400-acre Crown reserve to build a house. Grose later changed the purpose of the lease to farming. Leases were subsequently granted within and surrounding the reserve to other officers for cultivation. Grose sold his lease to another officer in 1794 but the land which forms the university grounds became known as Grose Farm and continued to do so until the 1850s. In 1801, land within the school and Crown reserves was granted to the Female Orphan Institution, who set up a farm on what became known as Orphan School Creek. The land was subdivided throughout the years.

3.1. THE UNIVERSITY OF SYDNEY – (1850-1950s)

Except where otherwise referenced, the following history is summarised from the “Grounds Conservation Management Plan” (2014) prepared by University of Sydney Planning Team Campus Infrastructure Service based on information provided by Clive Lucas, Stapleton and Partners Pty Ltd and Circle Square Design Landscape Architects.

The University of Sydney was founded in 1850, in a period characterised by increasing concern among the newly emerged middle classes for an education system which prepared the ‘higher grades’ of society for leadership and the professions. It began its teaching in 1852 utilising the premises of the former Sydney College, before obtaining a grant at Grose Farm, then used as grazing land for cattle destined for the Sydney meat market.

The first University buildings (the Main Buildings) formed the basis of what is now The Quadrangle, designed and built by Edmund Blacket between 1855 and 1862, and reflected the philosophy and aspirations of the newly established institution. It set a style which would inform the physical development of the University. This grand Gothic Revival architecture and their positioning on a ridge commanding a view over Sydney, with an impressive entrance drive, suggests the founders’ desire to emulate the great ancient universities of Oxford and Cambridge. These collegiate influences were present, but so were those of the Scottish universities, and of the University of London, all of which displayed the new colony’s commitment to the ideals of higher learning. This philosophy was echoed in a curriculum focussing on classical education, rather than tuition in the professions of Medicine or Law. The structure of the University as a non-denominational, non-residential institution with provision for residential colleges to be located on the ridges, viewed across the valley from the Main Buildings by the four religious denominations represented a uniquely Australian approach to the institution’s design.

The prominence offered by the topography of the Petersham Ridge was utilised to create the first of these, with the placement of Edmund Blacket’s Main Quadrangle Building on the crest of the ridge, with sweeping views up to it from the main artery leaving the city, Parramatta Road. The positioning of the building was a conscious statement of the importance of the University. The orientation of the Main Building, and the axis of the view up to it, established two of the most enduring aspects of the planning arrangement of the University, these being the prominence of the Petersham Ridge, which became Eastern Avenue, and of the east-west axis that extends along University Avenue and through Victoria Park, and west of the Main Quadrangle Building along Science Road.

Blacket established the architectural style of the early University in the Main Quadrangle Building facing Sydney town, and in the first college building, St Paul’s College. The distribution of the University colleges around the periphery separated the teaching buildings from the residential, while stressing the communal nature of the University as a whole. James Barnet’s design of the Anderson Stuart Building, together with the

earlier work by Blacket and the architects William Wardell (St John's College) and William Munro (St Andrew's College) consolidated the sandstone Gothic and Tudor revival architectural character and the dispersed planned form of the early University. These buildings comprise what is arguably the most important grouping of Gothic/Tudor Revival architecture in Australia, and the landscape and grounds features associated with them contribute to and support the existence and appreciation of their architectural aesthetic qualities.

Towards the end of the nineteenth century the University faced pressure to make its curriculum more relevant to the needs of an increasingly industrialised society. The development of the sciences led to the erection of functional, purpose-built facilities, hidden behind the Main Buildings, influenced by the Colonial Architect, James Barnet, so as not to impinge on the impressive view from the east. The buildings erected in this period were built as temporary structures, their alignment parallel to Parramatta Road formed the heart of the fine grain of the University and what became Science Road, a major scientific precinct.

The expansion of University buildings west from the Main Quadrangle Building emphasised the importance placed on the Petersham Ridge alignment and vistas by the University planners. The late nineteenth century developments either reinforced and extended the original Main Quadrangle Building alignment and architectural style (ie. the Anderson Stuart Building), or ensured that new development did not intrude on the primary axes east and south.

The early years of the twentieth century saw the continued growth of professional education, particularly in the fields of agriculture, veterinary science, engineering and commerce in response to the great pastoral and commercial expansion that had occurred in preceding decades. In turn, the experience of the 1890s depression brought on by drought highlighted the need for expertise in land management and pastoralism, on which the Australian economy very much depended. In this period, facilities were constructed for Veterinary Science, Agriculture, Engineering, Geology and Applied Science.

The somewhat ad hoc expansion of the university to the west, combined with more limited funding, resulted in a range of architectural styles being used, and building location and site planning was poorly controlled. The Government Architect, Vernon, made plans to impose some unifying planning and stylistic control over campus growth, such as the formalisation of the Science Road alignment to which subsequent buildings were oriented, but this was met with only limited success. It took another two decades for Vernon's aims to be realised in the work of Wilkinson.

In the period following World War I, further attempts were made to bring a sense of unity, order and beauty to the campus through the work of Professor of Architecture and University Architect, Leslie Wilkinson. Wilkinson was perhaps the most influential architect in shaping the physical development of the University from the 1920s onwards. His plans involved the creation of vistas by carefully placed axes, open and closed courtyards and the creation of a harmonious architectural style, with a predominantly Mediterranean influence, which Wilkinson believed to be more suitable to the Australian environment than the earlier Gothic styles. Wilkinson's work included the bringing together of previously disparate styles of architecture, particularly in The Quadrangle-eastern Science Road area; and the re-alignment of buildings in Science Road and their treatment in the Mediterranean style. Integral to his plans was the maintenance of vistas from various parts of the campus, such as from St Paul's College across the Hockey Square to the Union Refectory; St Paul's College and The Quadrangle; and views down Science Road.

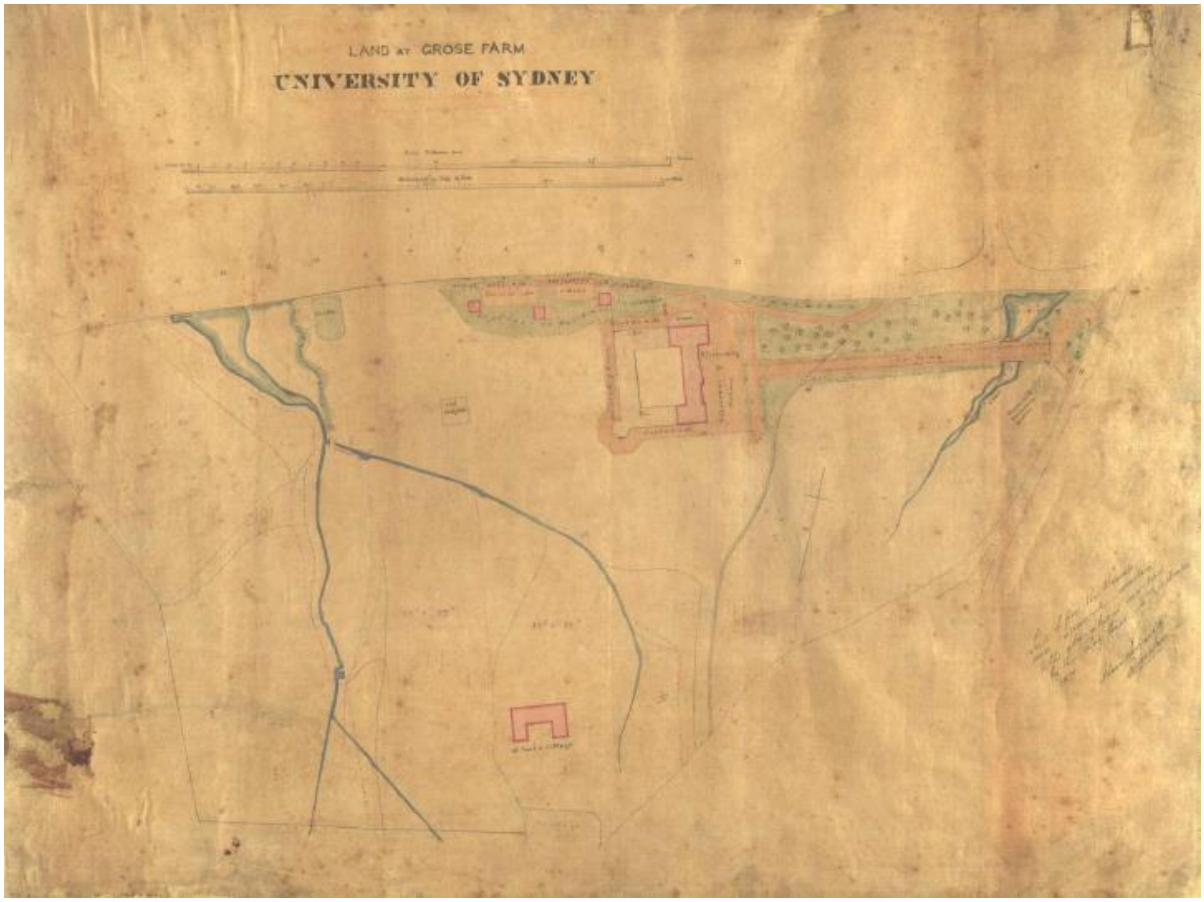
Landscaping of the grounds were overseen by Professors Madsen and EG Waterhouse. The plantings that occurred during the 1920s represented the first attempts at beautifying areas of the campus other than the main approaches. Waterhouse was responsible for many of the plantings in front of the main building and down Science Road including camellias, azaleas and Japanese Maples along with the plantings in the Pleasaunce and Vice-Chancellors Courtyard.

In the 1950s, following the adoption of the Cumberland County Planning Scheme, the Darlington area was rezoned by the State Government to be used as a 'special uses' or University Extension Area, which enabled the University of Sydney to extend its campus across City Road and establish the Darlington Campus of the university. This expansion began in the late 1950s and continued in the decades to follow.

Figure 25 – A 1789 – 91 map of the hitherto explored country contiguous to Port Jackson: lain down from actual survey.

Source – *Trove, Libraries Australia ID – 27650819*

Figure 26 – 1857 map showing the university grounds

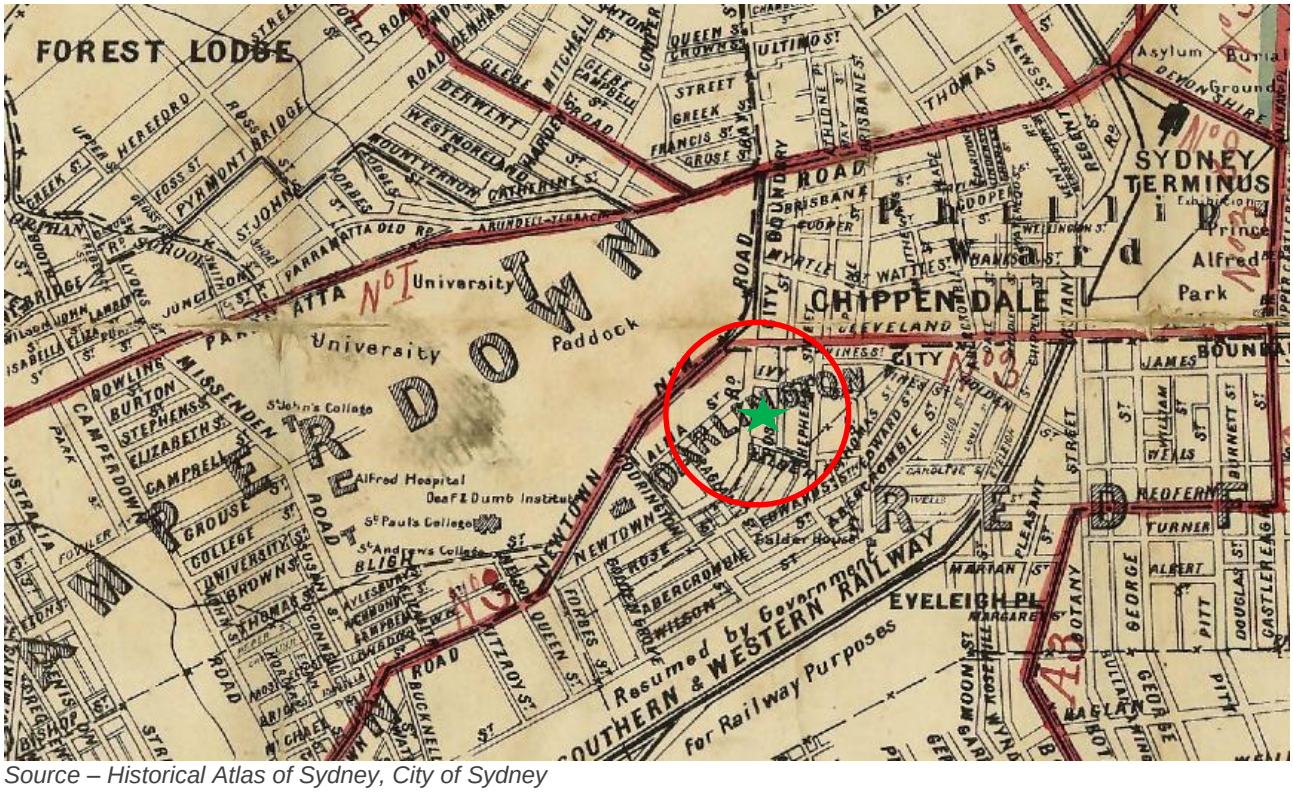


Source – University of Sydney Archives, G74/1/

Figure 27 - New plan of Sydney, NSW / ST, published by Leigh & Co, 1865-1871

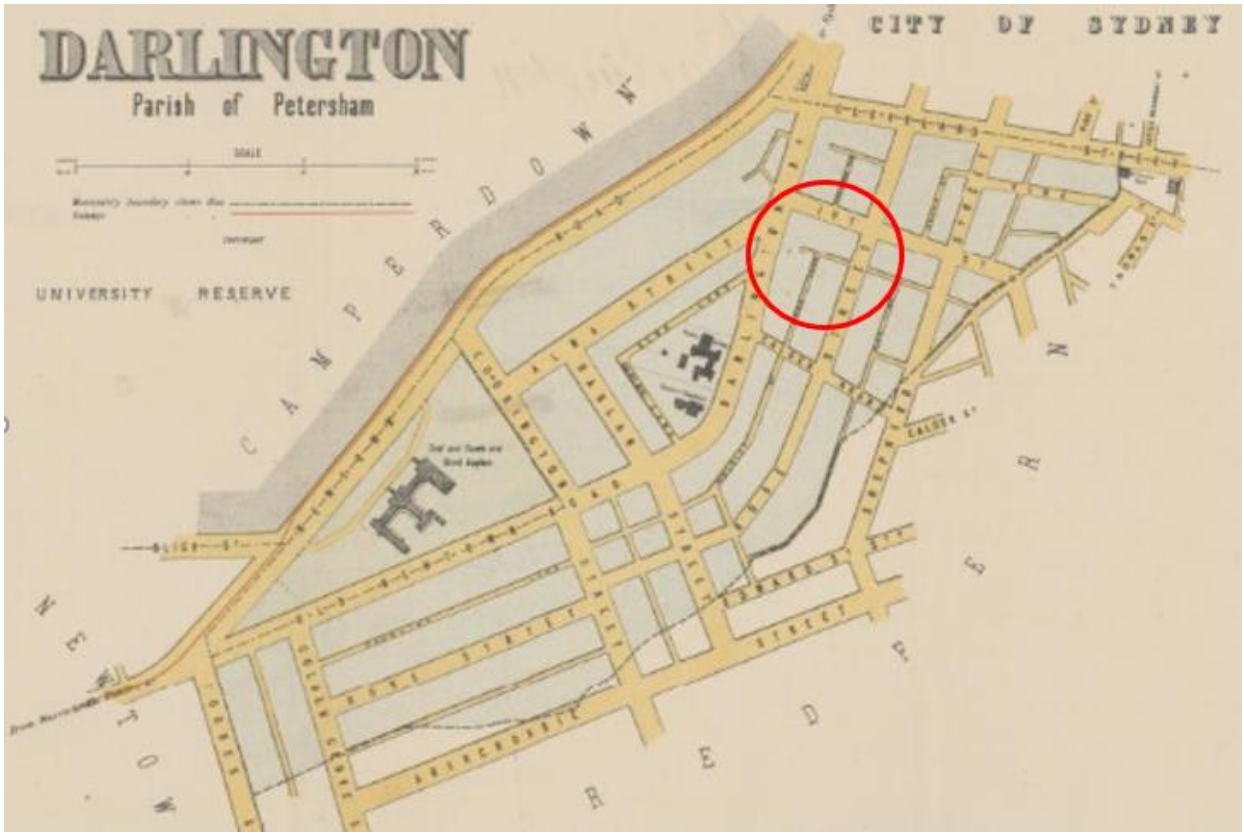
Source: National Library of Australia, MAP RM 4893

Figure 28 – Excerpt of City of Sydney and Suburbs 1887 Map showing approximate location of subject site



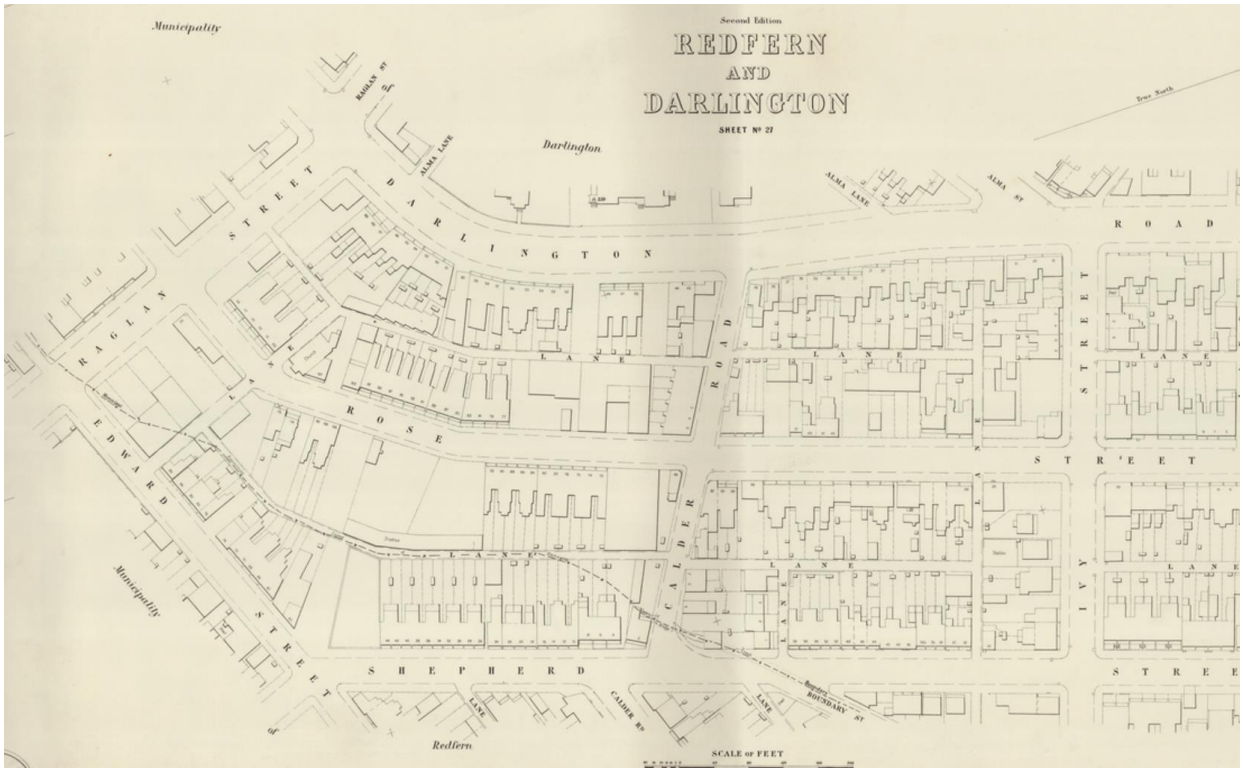
Source – Historical Atlas of Sydney, City of Sydney

Figure 29 – Darlington. Parish of Petersham, Plate 19, published by Higginbotham & Robinson, 1890-99



Source: National Library of Australia, Bib ID: 3766467

Figure 30 - Redfern and Darlington, Sheet No 27, NSW Department of Lands, 1883, showing the development within the subject site at the end of the 19th century. The subject site is bounded by Darlington Road (now Maze Crescent), Ivy Street (now Blackwattle Creek Lane), Shepherd Street and Calder Lane (no longer evident)



Source: State Library of NSW, Mitchell Map Collection (Z/M Ser 4 811.17/1)

Figure 31 – Detail of Redfern and Darlington, Sheet No 27, NSW Department of Lands, 1883, showing the approximate location of the Electrical Engineering Building (J03) shown outlined in red

Source: State Library of NSW, Mitchell Map Collection (Z/M Ser 4 811.17/1)

Figure 32 – 1943 aerial map of the locality with approximate location of subject property indicated

Source – *Sixmaps 2017*

3.2. DEVELOPMENT OF THE DARLINGTON CAMPUS

The Electrical Engineering Building falls within the boundaries of the Darlington Campus of the University of Sydney. The following chronology of the physical development has been extracted from the "Grounds Conservation Management Plan" (2014) prepared by the University of Sydney Planning Team Campus Infrastructure Service based on information provided by Clive Lucas, Stapleton and Partners Pty. Ltd and Circle Square Design Landscape Architects.

Table 1 – Chronology of the physical development of the Darlington Campus

Date	Darlington Campus: Event
1820s	During Governor Macquarie's administration, when land in the *Grose Farm* area was fenced for pastoral purposes the land to the south-east of Newtown Road was granted to various individuals. William Hutchinson received 52 acres, known as 'Golden Grove'. The Golden Grove Estate was also known as the 'Bullock Paddock' as it was used to pasture cows destined for the Sydney meat market. Thomas Shepherd, a botanist, received 28 ½ acres and Robert Cooper, 17 ½ acres on which he established a brewery. The remainder of the area was included in William Chippendale's grant.
1827	Shepherd establish a garden and nursery business at Darlington and named his property the Darling Nursery, presumably in honour of the then incumbent Governor Darling. The nursery became a landmark in the area and is commemorated by the streets named Shepherd, Pine, Ivy, Vine, Myrtle and Rose. It is believed that the name Darlington was derived from Shepherd's Darling Nursery.
1850s	The beginnings of residential development in the area and the establishment of hotels and commercial buildings.
1864	The municipality of Darlington was established, its boundaries being Blackwattle Creek, Cleveland Street and Codrington Street.
1879	'Golden Grove' Estate was subdivided into 36 sections for housing.
1878	The school, located on half an acre next to the Town Hall on the Old Newtown Road, was opened. The school was designed by George Allen Mansfield, architect to the Council of Education.
1880s	Further school buildings and a teacher's residence were erected on land next to the original school, purchased from a Roman Catholic trust.
1950s	Following the adoption of the Cumberland County Planning Scheme, the State Government re-zoned part of the Darlington area as a 'special uses' or University Extension Area, enabling the University of Sydney to extend its campus across City Road into Darlington (refer to above). This expansion, which began in the late 1950s and continued throughout the next decades resulted, despite increasing community opposition and resentment, in the loss of about 650 dwellings as well as shops, factories, bank, post office, Town Hall and other amenities, which were demolished. Roads and lanes were progressively closed or removed and the population of Darlington decreased by about 2,000.

3.3. DEVELOPMENT OF THE ENGINEERING PRECINCT (1950s-PRESENT)

Following the rezoning of land in 1958 which saw an area of land in Darlington set aside under the Cumberland County Council Plan for 'Special Uses – Educational and Medical', a reorientation of the campus occurred which represented a departure from previous construction as the University constructed a large, purpose designed complex using state-of-the-art architecture.[10]

In 1959, the first building in the University extension area was completed for Architecture. The eastern section of the Darlington area, towards Cleveland Street, was designated for development as a large Engineering precinct. Development of the engineering precinct began in 1963 when the Civil and Mining Engineering Building was constructed. This was closely followed by the Chemical Engineering in 1964, Electrical Engineering and Mechanical and Aeronautical Engineering in 1965 and the Peter Nichol Russell Building in 1966. By 1975, the entire engineering faculty had been relocated to the Darlington campus.

Much of the Late Twentieth-Century engineering precinct designed by Ancher Mortlock & Murray is constructed in concrete and/or steel-framed masonry buildings with brick infill, roofed in metal (copper, Zincalume, steel), concrete with applied membrane or ceramic tiles. The precinct contains a range of concrete structures and finishes, most notably "off form" concrete in a "béton brut" style. No finishes were originally applied to the concrete. Generally, light hues of the concrete contrast with dark brickwork with oxide-darkened mortar to heighten the colour and materials contrast. On the northwest corner of the precinct, at the intersection of Shepherd and Cleveland Streets, the Allen, Jack + Cottier (AJC) Shepherd Street Carpark was designed in the "Brutalist-style", comprising concrete structure with reeded finish applied to the concrete on the prominent elevations.

Three buildings of the precinct buildings rely on traditional brick treatments, the Rose Street Building, the Civil Engineering Workshop (225 Shepherd St) and the Gazzard Sheldon designed Engineering Link Building (completed in 1993).

The Gordon Yu-Hoi Chiu building (1998), associated with the Chemical Engineering Department, contrasts with the remainder of the precinct by the use of glass, steel and aluminium.

The engineering precinct has a strong east-west axial plan defined by the "Engineers' Walk", a covered way extending from the Peter Nichol Russell (PNR) Building to the Mechanical Engineering Building. With the exception of the Aeronautical Engineering building, all engineering faculties have physical and visual connections with this pedestrian-spine. This linear planning, along with the use of off-form concrete, has led to the description of the precinct as "Brutalism".[11]

In 1955, Reyner Banham outlined the principal features of "Brutalism" in the *Architectural Review* as follows:

1. Formal, axial plans (a formal legibility of plan);

2. An emphasis on basic structure (a clear exhibition of structure);

3. Candidly expressed materials and finishes (materials "as found" or "off-form");

4. Predominantly concrete, but integrating glass, brick and timber,[12]

Ancher Mortlock & Murray adopted "Brutalism" as the methodology for the engineering precinct master planning. Ancher Mortlock & Murray's designs for the Civil Engineering (1961-1963), Chemical Engineering (1962-1964) and Electrical Engineering (1963-1965) buildings established a precinct-wide methodology and materials palette of timber, brick and off-form concrete. The Shepherd Street carpark in 1975 was a break from this tradition.[13]

The architectural style of "Brutalism" at The University of Sydney's engineering precinct forms part of a group of NSW educational commissions by the firm. Following their success with the Sydney University

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[10] University of Sydney Planning Team Campus Infrastructure Service, 2014, Grounds Conservation Management Plan, p. a53

[11] Trevor Howells, University of Sydney Architecture, Watermark Press, 2007, p.106, p.114, p.117.

[12] Reyner Banham. op cit, p357.

[13] Smithson, Alison, and Peter Smithson. *Without Rhetoric. An Architectural Aesthetic 1955-1972,* Latimer New Dimensions, 1973, p.6. "Respect for materials" became a popular phrase for the "As Found" textural qualities of off-form concrete work.

engineering precinct, in 1965, the practice commenced design development of the Macquarie University Student Union.[14] Other architects embraced the style. In 1966, the NSW Government Architect, under EH Farmer, designed concrete construction technique of expressed structure, precast elements and off-form finishes with commissions for Randwick Girls High School (1966), Macquarie University Library (1966), the University of Technology Sydney (NSWIT) Tower (1966), Goldstein Hall (UNSW) (1964), Ku-ring-gai William Balmain Teachers College (1967) (Now UTS) and the Hornsby Technical College, Hornsby (1968).[15]

The Chemical Engineering building (1963-1965) is considered one of the pivotal buildings in the complex establishing the Engineers Walk axis. The building featured horizontal window treatments (repeated in an elevation of the PNR building), the ratio of concrete to face brick and one of the Smithson-inspired "Brutalism" tenets. Off-form concrete is an integral part of the design language.

The PNR building (1965-1966) completed the enclosure of the Engineers' Lawn and established a series of elevated concourses, wings and pedestrian walkways. This structure integrated the Chemical Engineering, Civil Engineering and Electrical Engineering structures into a unified whole.

The Electrical Engineering building (1964-1966) was one of the first Australian educational buildings to commit to a full expression of "Brutalism".[16] A survey article in *Constructional Review* cites the architects' specification as calling for "not a perfect finish, not an imitation of cement render, but good concrete without pronounced surface blemishes"[17]. The Electrical Engineering Building should be seen in the context of the small-scale Wollongong Teachers College library (1968) and Macquarie University's Union building (1965-1968) designed by architects, Ancher Mortlock, Murray & Woolley, and engineers, Taylor, Thomson and Whitting, who collaborated on the Sydney University engineering buildings. Here, the practice turns to an industrial-scale "Brutalism" where reinforced concrete allows cavernous spaces. The building's concrete elevations have now been painted. This diminishes the visual impact of the building.

Mechanical and Aeronautical Engineering was designed by Ancher, Mortlock, Murray and Woolley and built in two stages, Mechanical Engineering (1970-1971) and the Aeronautical Engineering structure (1973-1975). The design architect was Stuart Murray. The buildings are committed to the "Brutalist" methodology including brises soleil, "light scoops", cantilevered terraces and/or balconies and internal concourses and explore new methods of interior architecture bringing light and space deep into the interiors.

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[14] During this same period, the practice won the 1967 Blacket Award for the modestly scaled Union building at the University of Newcastle with Ken Woolley as design architect and Glen Murcutt as his assistant. *Architecture in Australia,* November 1968.

[15] In 1968, a spokesperson for the NSW Government Architect said that the "as found" off-form finish of Hornsby Technical College were selected not because of any fashion for "brut" concrete but because years of school and college maintenance has shown the Government Architect the value of upkeep-free materials." "Technical College." *Constructional Review*, March 1968, pps.14-17.

[16] Geoffrey London's entry on Brutalism in the *Encyclopaedia of Australian Architecture* claims the Hale School Memorial Hall, Wembley Downs (1961) as amongst the earliest educational buildings in this aesthetic. *Encyclopaedia of Australian Architecture,* Philip Goad, et al. Cambridge University Press, 2012, p.110.

[17] "Electrical Engineering Building." *Constructional Review*, October, 1967, p.13.

3.4. CONSTRUCTION DATES

The following table outlines the designer, construction dates and details of each of the buildings within the Engineering Precinct at The University of Sydney.

Uni Syd Bldg No	Building Name	Construction Dates	Architects[18]	NSW Heritage Office listing[19]	AIA Register of 20th century significant buildings 2013[20]	Awards
J01	Chemical and Biomolecular Engineering Building	1963-1965	Ancher Mortlock & Murray.	SHI only cites bldgs 1858-1940. SHI No: 2431001	AIA Register Number 4703280	N/A
J02	PNR (Peter Nichol Russel) Building	1964-6 1970?	Ancher Mortlock & Murray	SHI states bldgs 1858-1940. No: 2431001	AIA Register Number 4702718	N/A
J03	Electrical Engineering Building	1963-1965	Ancher Mortlock & Murray,	SHI states bldgs 1858-1940. No: 2431001	AIA Register Number 4703281	N/A
J04	Rose Street Building (former Boxton & Carr printery and carton manufactory)[21]	1935-40	Unknown	CMP prepared by students	N/A	N/A
J05	Civil and Mining Engineering Building	1961-1963	Ancher Mortlock & Murray	SHI only cites bldgs 1858-1940. SHI No: 2431001	AIA Register Number 4703277	N/A
JO5	Materials and Structures Laboratory	1960-1962	Ancher Mortlock & Murray	Materials and Structures Laboratory,	AIA Register Number 4703276	N/A
J06	Civil Engineering Workshop, 225 Shepherd Street[22]	c1920	Unknown	SHI states bldgs 1858-1940. No: 2431001	N/A	N/A
J07	Mechanical (and later Aeronautical	1970-1 (Stage 1)	Ancher Mortlock Murray & Woolley	SHI states bldgs 1858-1940. No: 2431001	AIA Register Number 4702719	N/A

[18] Attributions from Trevor Howells. *University of Sydney Architecture*, Watermark Press, 2007.

[19] City of Sydney LGA

[20] Now the AIA Register of Significant Architecture.

[21] Boxton & Carr, carton makers and printers, 56-62 Rose Street, Darlington advertising for labourers, *Sydney Morning Herald*, 19 November 1949, p.33. Firm previously located in Abercrombie Street, Sydney

[22] Lewis Joseph bedding factory, 225 Shepherd St

	Engineering) Buildings					
JO7 A	Chemical Store, nr Mechanical Engineering. Shepherd St	Unknown				
JO7 B	Meter Room, nr Mechanical Engineering. Shepherd St	Unknown				
JO11	Aeronautical Engineering	1973-1975, 2nd stage	Ancher Mortlock Murray & Woolley	SHI states bldgs 1858-1940. No: 2431001	AIA Register Number 4703285	N/A
J10	Shepherd Street Carpark	1975-6	Allen Jack & Cottier	SHI states bldgs 1858-1940. No: 2431001	AIA Register Number 4703284	N/A
J10A	Electrical & Hazardous Material Store	Unknown		N/A	no	N/A
J10B	Meter Room	Unknown		N/A	no	N/A
J11A	University Store, Shepherd St nr carpark	Unknown		N/A	no	N/A
J11B	Engineering Workshop, Shepherd St nr carpark	Unknown		N/A	no	N/A
J13	Engineering Link Building	1993	Gazzard Sheldon	SHI states bldgs 1858-1940. No: 2431001		1993 Horbury Hunt Award, Excellence in Brickwork
J14	Gordon Yu-Hoi Chiu Building	1997-1998	Hassell Pty Ltd	SHI states bldgs 1858-1940. No: 2431001	AIA Register Number 4703286	1998 RAIA Award, Public Buildings

3.5. CAMPUS IMPROVEMENT PROGRAM (CIP) 2014–20

The Campus Improvement Program 2014-2020 (CIP 2014-2020) is a concept proposal for the delivery of new buildings, infrastructure and accessible public domain areas to support the University's vision for the future. It is a strategic concept plan that looks at the future evolution of the Camperdown-Darlington campus to 2020 through land uses and building envelopes. The CIP is not a proposal for the detailed design and construction of new buildings.

Objectives of the CIP

The CIP aims to create a physical environment that will:

- support the undertaking of world-class teaching and research;
- attract the best students and staff;
- provide affordable student accommodation on campus to enrich student experience and campus life;
- ensure safer, easily navigated access to and through campus;
- allow the University to integrate and streamline provision of services and facilities;
- provide the opportunity for multi-disciplinary facilities and deliver efficiencies through co-location;
- develop a healthy and sustainable campus;
- recognise and celebrate Aboriginal and Torres Strait Islander significance;
- establish the campus as a visitor destination; and
- be respectful to the significance of the established environment.

In 2013, the CIP 2014–20 was lodged with the NSW Department of Planning and Infrastructure (DP&I) as a State Significant Development (SSD). An Environmental Impact Statement (EIS) has been prepared on behalf of the University of Sydney in accordance with the Director General's Environmental Assessment Requirements, as issued by the department. The Campus Improvement Program (SSD 6123) was approved by the Minister for Planning on 16th February 2015.

4. HERITAGE SIGNIFICANCE

4.1. WHAT IS HERITAGE SIGNIFICANCE?

Before making decisions to change a heritage item, an item within a heritage conservation area, or an item located in proximity to a heritage listed item, it is important to understand its values and the values of its context. This leads to decisions that will retain these values in the future. Statements of heritage significance summarise a place's heritage values – why it is important, why a statutory listing was made to protect these values.

The Heritage Council of NSW has developed seven criteria for assessing heritage significance, which are used to make decisions about the heritage value of a place or item. There are two levels of heritage significance used in NSW: state and local. The assessment of heritage significance is prepared in accordance with the 'Assessing Heritage Significance' (2001) guidelines. For the purposes of this HIS, Urbis has utilised previous heritage assessments prepared for The University of Sydney - Engineering Precinct and the Electrical Engineering Building (J03) as outlined below.

4.2. STATEMENT OF SIGNIFICANCE

4.2.1. Preliminary Statement Significance - Engineering Precinct

The educational setting of The University of Sydney's Engineering Precinct is the work of the prominent architectural firm, Ancher, Mortlock, Murray and Woolley. The Faculty of Engineering is planned as part a pedestrian-scale link. The Chemical Engineering and PNR building capture the scale of the Late Twentieth-Century Brutalist style. The Electrical Engineering and Mechanical Engineering buildings are early examples of large-scale "Brutalist" commissions in NSW. Bryce Mortlock later became disenchanted with large-scale "Brutalism" and wrote in an extended essay stating: "So no more brutalism. One that was not our baby, but we adopted, was the belief in bigness and the clean sweep. So no more monster towers, slab blocks, comprehensive redevelopment."[23]

The following Statement of Significance for the Engineering Precinct is taken from the "Engineering Precinct Redevelopment, The University of Sydney, Darlington Campus – Preliminary Assessment of Significance" report prepared by GB&A, Architects Heritage Consultants (October 2013):

> *The University of Sydney acquisition and development of Darlington is an example of both the expansion of Sydney University and tertiary education in general from the 1950s, related to the increasing role of the Commonwealth in funding the sector.*
>
> *The Engineering Precinct is associated with the 1960s major expansion of the University of Sydney across to the eastern side of City Road. The move of the Engineering Faculty to this precinct resulted in the appointment of the well-known and established architectural firm, Anchor Mortlock & Murray, to design the associated buildings between 1960 and 1973, with Bryce Mortlock being the principal architect for the Engineering Precinct. The first building was the Civil Engineering Workshop which was the firm's largest commercial building at the time. This resulted in the stylistically consistent precinct through the evolution of Brutalist architecture which range from single storey to multi storey buildings.*
>
> *Materials consist of concrete, face brickwork and glass. Individual buildings were leading edge architecture in their day, responding to the specific building uses.*
>
> *Bryce Mortlock was engaged by the University in 1964 to work on the Master Plan which included the Engineering Precinct. The Precinct is significant to the Anchor Mortlock & Murray architectural firm as it was a major project for the firm that allowed for the shift in the firm's work from residential to commercial.*

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[23] Mortlock is responding to Malcolm MacEwen's essay "Crisis in Architecture". Bryce Mortlock. *Architecture in Australia*, June 1978, pp.73-79.

The Precinct is of social significance because of its affiliation with the engineers who have been educated at the faculty.

The history of the former suburb is reflected in surviving buildings within the Engineering Precinct, including the Civil Engineering Workshop (J06) and the Rose Street Building (J04), the road network which still demonstrates the former suburb layout of Darlington and the Engineer's Walk and pedestrian spine which are indicative of the former Rose Street and Rose Lane locations.

"Darlington Campus – Preliminary Assessment of Significance", prepared by GBA, states architect Ken Woolley assessed the Civil and Mining Engineering Building (J05) as having the highest level of architectural significance, followed by the Electrical Engineering Building (J03) and other Anchor Mortlock and Woolley engineering buildings. This assessment is based on the building's age and relevance on Brutalist style. Figure 33 identifies the grading of significance for the various buildings within the Engineering Precinct.

Figure 33 – Grading of significance form the Engineering Precinct, based on the preliminary assessment of significance

Figure 3.1
Grading of significance of buildings within the Engineering Precinct, based on the preliminary assessment of significance.

Source: GBA, "Sydney University Engineering Precinct - Preliminary Assessment of Significance", Oct 2013, Fig 3.1

Heritage Recommendations for Moderate Significance

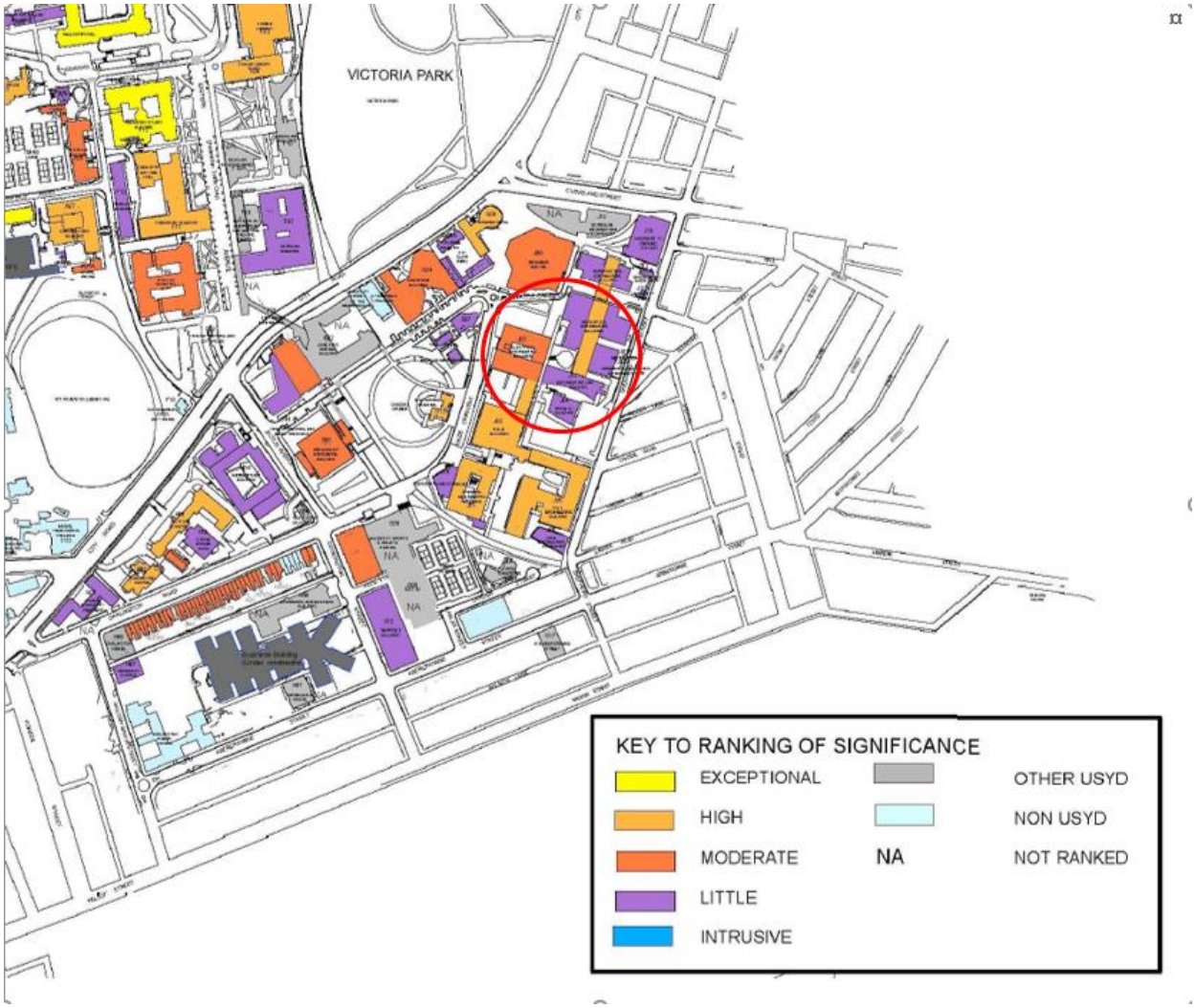
The GBA Preliminary Assessment of Significance identifies the Electrical Engineering Building (J03) as having "Moderate" heritage significance. The following recommendations are defined as follows:

- Retain principal building if possible within Master Plan context.
- Sympathetic alterations and additions to the exterior are acceptable.
- Interior alterations and refurbishment acceptable.
- Additional levels may be acceptable if within Master Plan context.
- Demolition of buildings of moderate significance may be considered if acceptable within the Master Plan context if there is a significant overall benefit to the Engineering Precinct.

The grading of significance for the Electrical Engineering Building is associated with the external form and fabric of the building rather than interiors. The significance of the exterior of the Electrical Engineering Building is described as follows:

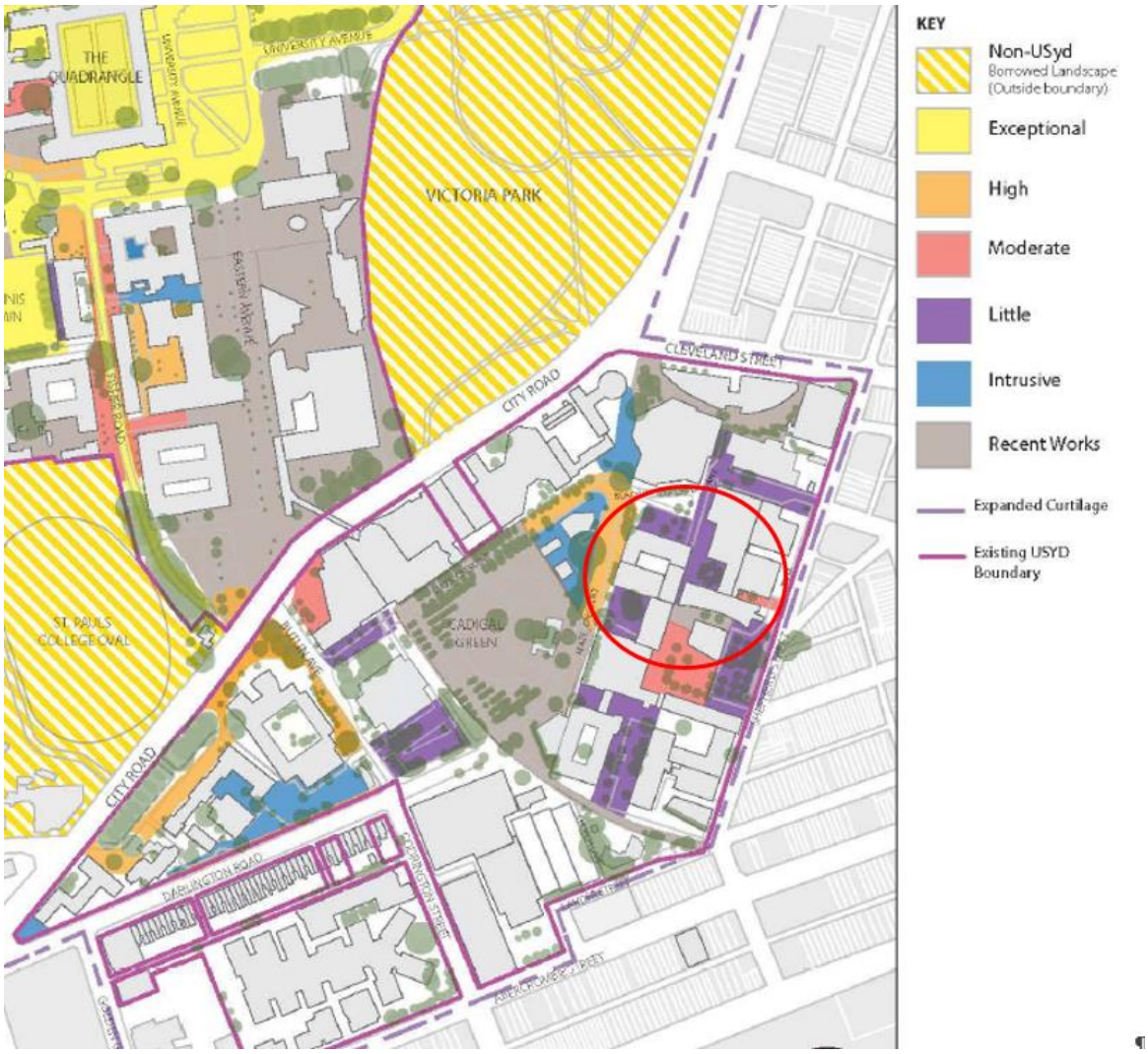
> *Contribution to the strong Brutalist architecture within the Engineering Precinct. Typical examples of strong Brutalism architecture at its peak. Contributes to the integrity of the precinct.*

Figure 34 – Significance Ranking of the Buildings at the University of Sydney showing the subject site circled in red. The Electrical Engineering Building is assessed as having Moderate heritage significance



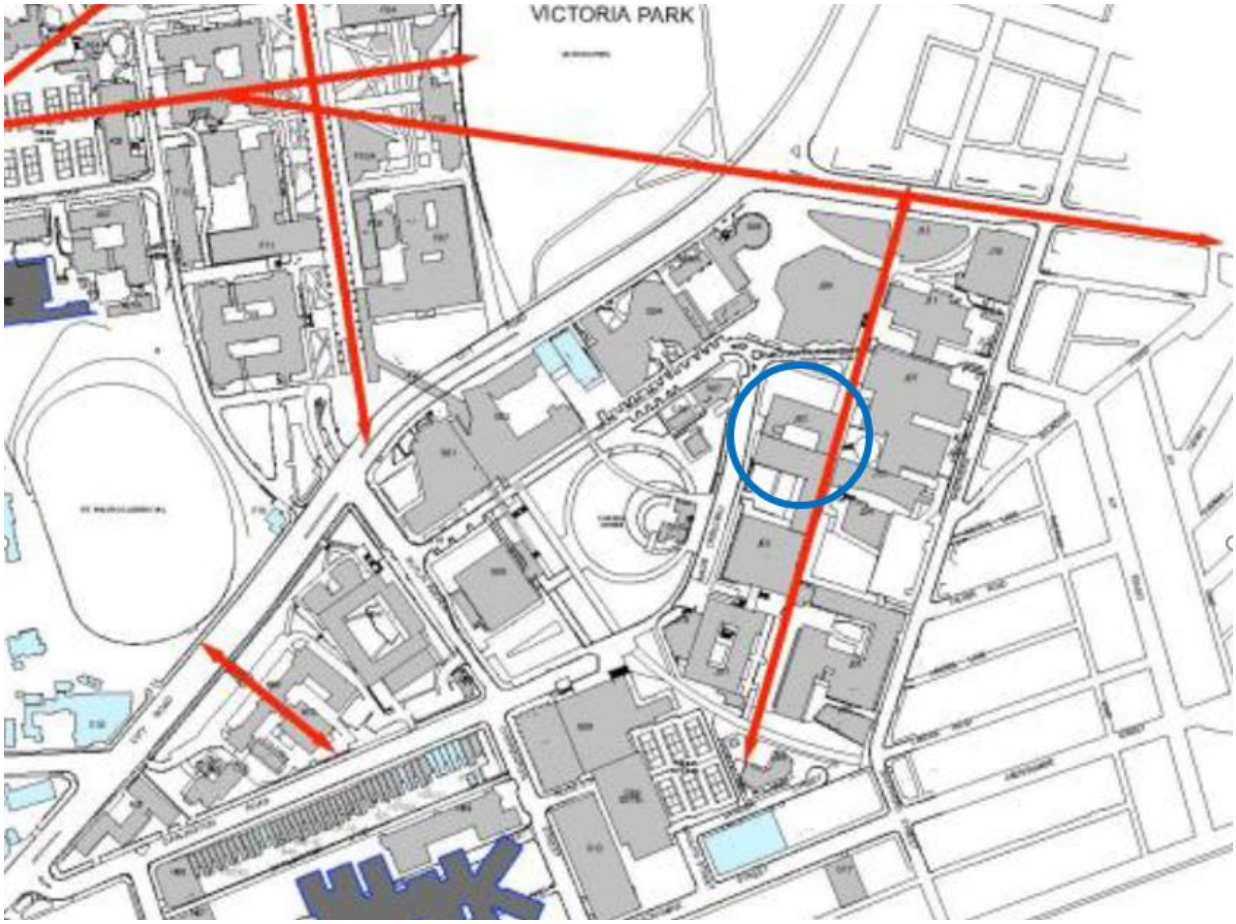
Source: Figure 4.1, "The University of Sydney Camperdown – Grounds CMP"

Figure 35 – Grading of Significance Character Areas and Landscapes, showing the subject site circled in red. The landscaped areas around the Electrical Engineering Building is assessed as having Little heritage significance



Source: Figure 4.2, "The University of Sydney Camperdown – Grounds CMP"

Figure 36 – Significant Views to and from the expanded curtilage and internal views within the University grounds



Source: Figure 6.1, "The University of Sydney Camperdown – Grounds CMP"

5. IMPACT ASSESSMENT

5.1. HERITAGE LISTING

Built Heritage

The University of Sydney is not listed on the State Heritage Register (SHR), NSW Heritage Council.

The University of Sydney is listed on the s.170 NSW State Agency Heritage Register as follows:

- University of Sydney, City Road, Camperdown (comprising The University of Sydney: Camperdown Campus & Darlington Campus) - Database number: 4726001

The subject property is not listed as a heritage item heritage under the *Sydney Local Environmental Plan 2012* (Sydney LEP), as shown on the heritage map below (Figure 37). The following heritage item of local significance is located in close proximity to the subject site:

- 96–148 City Road, Darlington (Former Darlington Primary School including interior) – Item No: I524.

The subject property is not listed in a conversation area on the *Sydney Local Environmental Plan 2012* (Sydney LEP), Schedule 5 Environmental heritage, Part 2 Heritage conservation areas (see Figure 37). The University of Sydney campus between Parramatta Road and City Road is identified as a conservation area of local significance as follows:

- University of Sydney Heritage Conservation Area, Camperdown (Map reference: C5)

In addition, two conservation areas of local significance adjoin the Engineering Precinct of the Darlington Campus with a boundary at Shepherd Street:

- Chippendale/Darlington - Darling Nursery Estate (Map reference: C10); and
- Darlington/Newtown - Golden Grove (Map reference: C18).

Archaeological Heritage - Non-indigenous archaeological sites and relics

The University of Sydney is not an identified archaeological site.

The University of Sydney does not lie within a known archaeological area.

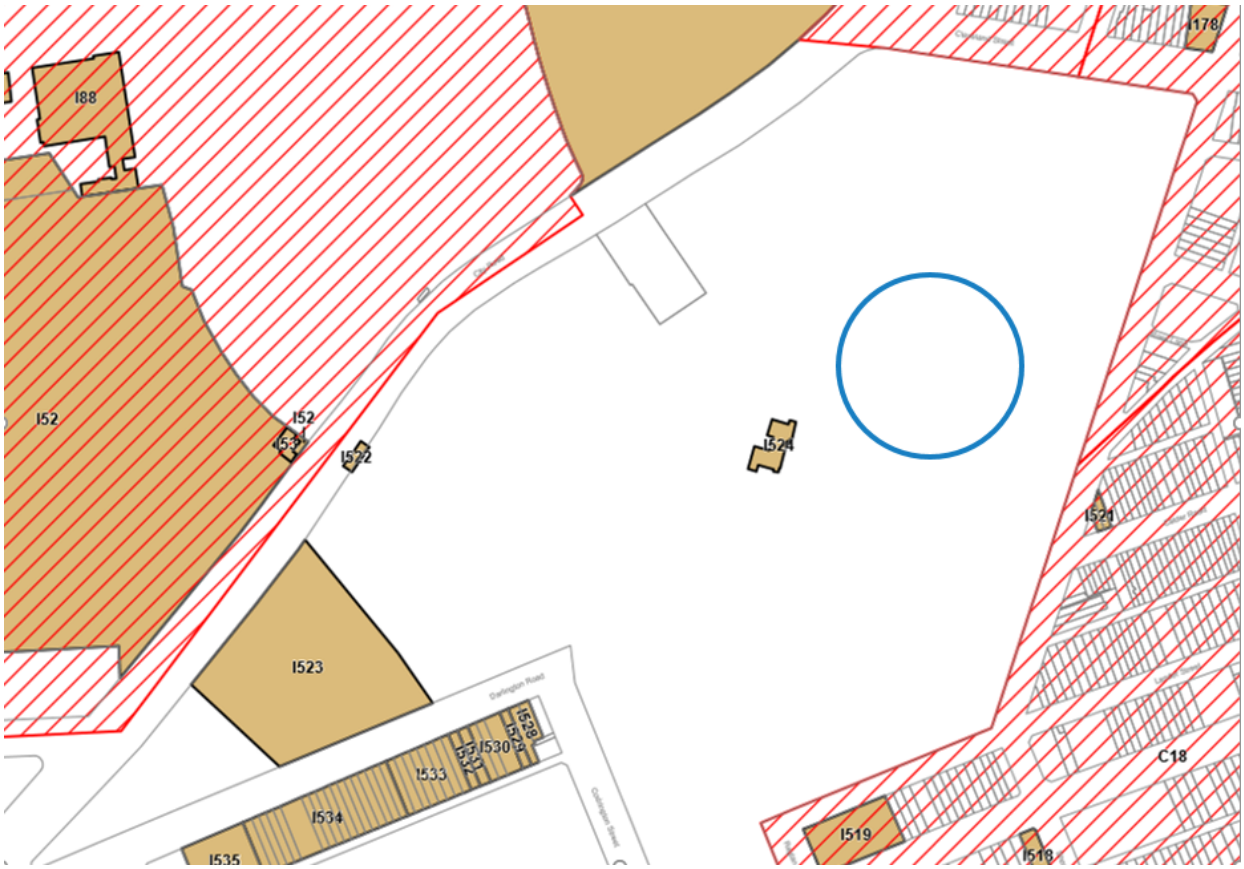
Because of the history of the site, the potential to discover relics during intervention at the University of Sydney is low to moderate.

Indigenous Heritage, Officer of the Environment and Heritage Aboriginal Heritage Information Management System (AHIMS)

Three sites located in or near the University of Sydney are recorded on the Office of the Environment and Heritage AHIMS.

It should be noted, the site status of #45-6-2745 and #45-6-2833 should be updated in the AHIMS Registrar to reflect their destruction. This conclusion was stated in the “Aboriginal Heritage Impact Assessment” (AHIA) prepared by AHMS (February 2016) in consultation with the local Aboriginal community to identify places across the University’s Camperdown and Darlington campuses which have Aboriginal cultural heritage values.

Figure 37 - Heritage Map showing the subject site circled in blue. Heritage items are coloured ochre and identified with an Item No. Conservation areas are hatched in red and identified with a Map reference number



Source: SLEP, Heritage Map, Sheet HER_009

The following statement of significance for the University of Sydney Heritage Conservation Area is taken from the NSW Office of Environment and Heritage Inventory sheet (Database number: 2431001):

> *The university is a heritage cultural landscape containing buildings of exceptional individual value set within a designed landscape with large areas enclosed by a historic fence. The place developed into a series of precincts each with a special character. The Conservation Area has significance as the site of the first University in Australia established in 1850, operating continuously at Camperdown since 1858. The site has historic significance for its continuing association with the development of tertiary education in Australia. Incorporating Prince Alfred Hospital and various residential colleges, the Area represents the establishment and continued expansion of institutional uses on Grose Farm. The area has high aesthetic significance for its collection of fine buildings and public spaces dating from the 1850s, and has association with several prominent architects including Blacket, Vernon and Wilkinson.*
>
> *The continuing function of the institution as a University is also of exceptional cultural significance. An important Sydney landmark, containing what is probably the most significant group of Gothic Revival buildings in the country.*

The University of Sydney – Grounds CMP (p104) provides the following Owners Requirements associated with the subject site:

> ***Precinct C –Engineering, Darlington campus:*** *The precinct is bounded by Shepherd Street, Cleveland Street (Shepherd Street car park), and the eastern edge of the campus' Cadigal Green. The systematic refurbishment and redevelopment of the existing Engineering precinct is proposed to deliver world class teaching learning and research facilities over time.*

5.2. STATUTORY CONTROLS

5.2.1. State Heritage Register (SHR), NSW Heritage Council

The University of Sydney is not listed on the State Heritage Register.

5.2.2. NSW Heritage Act - s.170 NSW State Agency Heritage Register

The University of Sydney and a number of individual buildings, precincts, site features and components are listed on the s.170 NSW State Agency Heritage Register.

The Electrical Engineering Building (J03) is not listed as an individual building on the s.170 Register.

5.2.3. Sydney Local Environmental Plan 2012

The proposed works are addressed in the table below in relation to the relevant clauses in the Sydney Local Environmental Plan 2012 (Sydney LEP).

Table 2 – Sydney Local Environmental Plan 2012 (Sydney LEP)

CLAUSE	DISCUSSION
(2) Requirement for consent Development consent is required for any of the following: (a) demolishing or moving any of the following or altering the exterior of any of the following (including, in the case of a building, making changes to its detail, fabric, finish or appearance): (i) a heritage item, (ii) an Aboriginal object, (iii) a building, work, relic or tree within a heritage conservation area, (b) altering a heritage item that is a building by making structural changes to its interior or by making changes to anything inside the item that is specified in Schedule 5 in relation to the item, (e) erecting a building on land: (i) on which a heritage item is located or that is within a heritage conservation area, or (ii) on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance.	The subject property is not listed as a heritage item nor is it located within a heritage conservation area. Whilst there is no heritage listing for buildings within the Engineering Precinct, the "Darlington Campus – Preliminary Assessment of Significance", prepared by GBA, identified the Engineering Precinct as having some heritage significance associated with being a group of Late Twentieth-Century Brutalist buildings purpose built for the School of Engineering and designed by Anchor Mortlock and Woolley in the 1960s and 1970s. The Preliminary Heritage Assessment identified the Electrical Engineering Building (J03) as having "Moderate" grading of significance. The subject site is located in close proximity to a heritage item, the (Former Darlington Primary School including interior) – Item No: I524. The subject proposal as outlined in Section 1.6 of this report includes the partial demolition of the subject property, construction of a new wing and alterations and refurbishment to the existing southern wing. Accordingly, consent for this work is not required under Clause (2) of the Sydney LEP.
(4) Effect of proposed development on heritage significance The consent authority must, before granting consent under this clause in respect of a heritage item or	This HIS satisfies this requirement, and has been undertaken to assess the potential impact of the proposed works on the significance of heritage items in

CLAUSE	DISCUSSION
heritage conservation area, consider the effect of the proposed development on the heritage significance of the item or area concerned. This subclause applies regardless of whether a heritage management document is prepared under subclause (5) or a heritage conservation management plan is submitted under subclause (6).	close proximity and heritage conservation areas in close proximity.
(5) Heritage assessment The consent authority may, before granting consent to any development: (a) on land on which a heritage item is located, or (b) on land that is within a heritage conservation area, or (c) on land that is within the vicinity of land referred to in paragraph (a) or (b), require a heritage management document to be prepared that assesses the extent to which the carrying out of the proposed development would affect the heritage significance of the heritage item or heritage conservation area concerned.	The subject site is located within the vicinity of a heritage item, the Former Darlington Primary School (Item No: I524). The subject site is located within the vicinity of the two conservation areas: • Chippendale/Darlington - Darling Nursery Estate (C10); and • Darlington/Newtown - Golden Grove (C18). The subject proposal, as outlined in Section 1.6 of this report, includes the partial demolition of the subject property, construction of a new wing and alterations and refurbishment to the existing southern wing. Accordingly, consent for this work is required under Clause (5) of Sydney LEP 2012. This HIS satisfies this requirement, and has been undertaken to assess the potential impact of the proposed works on the significance of heritage items in close proximity and heritage conservation areas in close proximity.
(6) Heritage conservation management plans The consent authority may require, after considering the heritage significance of a heritage item and the extent of change proposed to it, the submission of a heritage conservation management plan before granting consent under this clause.	"The University of Sydney Camperdown NSW – Grounds Conservation Management Plan" (Revised – December 2014) was prepared by The Planning Team, Campus Infrastructure Services. One of the aims of the report was to focus on assessing the modern and late modern architecture of the Camperdown and Darlington campuses. See section 5.2.5 below

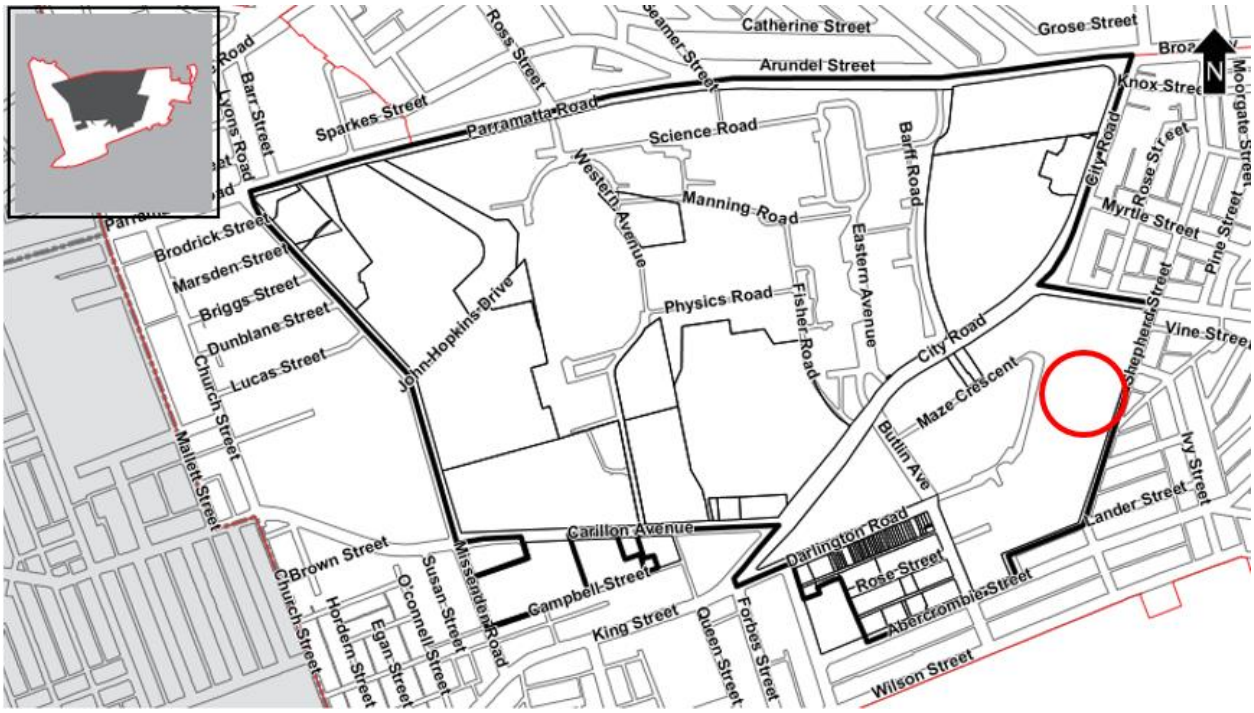
5.2.4. Sydney Development Control Plan 2012

The subject site is located within Locality 2.3.5 - "University of Sydney / Royal Prince Alfred Hospital" and is identified in Figure 38. The following is taken from the Sydney DCP and describes the Locality of "University of Sydney / Royal Prince Alfred Hospital":

The University of Sydney and Royal Prince Alfred Hospital will continue to play significant roles in the city as specialised centres for education, research and health. Their heritage values are to be conserved and supplemented by contemporary facilities. Renewal of the campus grounds is to include strong connections to surrounding areas with a network of walking and bicycle links. The boundaries of the campus are to be improved with landscaping particularly along Shepherd Street, Darlington. The connection to the emerging cultural precinct at Eveleigh Railway workshops is to be reinforced.

The proposed works are addressed in the table below in relation to the relevant provisions in the Sydney DCP.

Figure 38 – Locality 2.3.5 – University of Sydney / Royal Prince Alfred Hospital with the location of the subject site shown circled in red



Source: Sydney DCP, Section 2 Locality Statements, p2.3-8

Table 3 – Sydney Development Control Plan 2012

PROVISION	DISCUSSION
Section 2 – Locality Statements **2.3.5 University of Sydney / Royal Prince Alfred Hospital** (a) Development must achieve and satisfy the outcomes expressed in the character statement and supporting principles. (c) Enhance the university's landscape campus setting and provide a more legible internal street and pedestrian network. (d) Encourage landscaping of the university's campus boundaries to improve the interface to adjacent neighbourhoods. (i) New University development adjoining the surrounding neighbourhoods is to step down to the scale of those streets and the predominant scale of adjoining heritage conservation areas. (j) Provide sufficient curtilage around existing significant buildings, structures and landscape elements to maintain their setting.	(c) The proposed development includes the retention and enhancement of existing landscapes located on adjacent sites to the north and south of the Electrical Engineering Building. A carpark area to the south is to be removed and converted to a Retention Basin with landscape planted over. This will increase the landscaped area within the Engineering Precinct. The landscaped area to the north, at the corner of Maze Crescent and Blackwattle Creek Lane, will be extended as part of the proposed development. This will increase campus amenity. (d) Tree plantings will occur along the Shepherd Street campus boundary to improve the interface with the Darlington/Newtown - Golden Grove Conservation Area (C18). (i) The proposed development, an 11-storey educational building is located some distance from the residential

PROVISION	DISCUSSION
	neighbourhood of the Darlington/Newtown - Golden Grove Conservation Area. This is well away from the residential area and so will not impact on the difference in scale between the proposed development and the existing residences. Shadow diagrams indicate there will be no overshadowing of the existing residential neighbourhood, located to the east of the subject site, during the Winter Solstice. (j) the proposed development proposes landscaped areas adjoining the new building to the north and south. This will maintain and enhance the landscape character of the Engineering Precinct and provide a curtilage to the proposed built development.
3.9 Heritage **3.9.1 Heritage Impact Statements** (1) A Heritage Impact Statement is to be submitted as part of the Statement of Environmental Effects for development applications affecting: (a) heritage items identified in the Sydney LEP 2012; or (b) properties within a Heritage Conservation Area identified in Sydney LEP 2012	The subject site is not a heritage item, nor is it a located within a conservation area. Preliminary heritage assessments of the Engineering Precinct have identified the Electrical Engineering Building (J03) has Moderate heritage significance associated with being part of a group of Brutalist style educational buildings. The group does not meet the threshold for heritage listing, nor for listing as a conservation area.
3.9.1 Heritage Impact Statements (2) The consent authority may not grant consent to a development application that proposes substantial demolition or major alterations to a building older than 50 years until it has considered a heritage impact statement, so as to enable it to fully consider the heritage significance of a building and the impact that the proposed development has on the building and its setting.	The subject site, the Electrical Engineering Building (J03), designed by architects Ancher Mortlock & Murray, was constructed in 1963-1965. The subject building is older than 50 years. Proposed works to the building include demolition to a substantial portion of the building and alterations to the remainder of the building. This HIS has been prepared to satisfy this requirement. The HIS assesses the heritage significance of the building the potential impact of the proposed works.
3.9.1 Heritage Impact Statements (3) A Heritage Impact Statement is to be prepared by a suitably qualified person, such as a heritage consultant.	This HIS has been prepared to satisfy this requirement and has been prepared by experienced heritage consultants at Urbis.
3.9.1 Heritage Impact Statements (4) The Heritage Impact Statement is to address:	This HIS satisfies this requirement, and has been undertaken to assess the potential impact of the proposed works on the significance of heritage items in close proximity and heritage conservation areas in close proximity.

PROVISION	DISCUSSION
(a) the heritage significance of the heritage item or the contribution which the building makes to the heritage significance of the heritage conservation area; (b) the options that were considered when arriving at a preferred development and the reasons for choosing the preferred option; (c) the impact of the proposed development on the heritage significance of the heritage item, heritage items within the vicinity, or the heritage conservation area; and (d) the compatibility of the development with conservation policies contained within an applicable Heritage Conservation Management Plan or Conservation Management Strategy, or conservation policies within the Sydney Heritage Inventory Report.	The HIS will assess the heritage significance of the Electrical Engineering Building (J03), which is older than 50 years.
3.9.3 Archaeological assessments (1) An archaeological assessment is to be prepared by a suitably qualified archaeologist in accordance with the guidelines prepared by the NSW Office and Environment and Heritage. (3) An archaeological assessment is to be submitted as part of the Statement of Environmental Effects for development applications affecting an archaeological site or a place of Aboriginal heritage significance, or potential archaeological site that is likely to have heritage significance.	The historic overview indicates there was residential development on the site that dates to the mid-nineteenth century. This was replaced in the 1960s when the Darlington Precinct was purchased by The University of Sydney for the construction of the Engineering Precinct. There is the some potential for sub-surface remains on the site. An archaeological assessment has been prepared to accompany the development application to determine the potential for impacts on significant archaeological relics and the management of such items. The archaeological assessment has been prepared by a qualified archaeologist from the heritage team at Urbis. “The University of Sydney Camperdown – Grounds CMP” (p65) described The Engineering Precinct as being “Heavily disturbed” and having “Low” archaeological potential for Aboriginal heritage. “The University of Sydney Camperdown – Grounds CMP” does not assess The Engineering Precinct for European Archaeology. See accompanying Archaeological Assessment prepared by Urbis (November 2017).
3.10 Significant Architectural Building Types **3.10.5 Public and community buildings older than 50 years**	The Electrical Engineering Building (J03) at the University of Sydney was constructed for educational purposes. The 1960s was a period of expansion in the field of Engineering and the buildings within the Engineering Precinct were built as a collection of

PROVISION	DISCUSSION
Public and community buildings include churches, schools, hospitals and community halls. Current and former public and community buildings often provide a landmark within an area or streetscape and may have social and aesthetic significance in addition to their built form character and detailing. (1) Alterations and additions to current and former public and community buildings are to retain: (a) significant external fabric or building elements including original design details like lead lighting, doors, windows and joinery; (b) significant internal fabric and building elements including original design details, structural elements associated with roofing, fixed joinery, galleries, lighting and fixtures; and (c) sufficient evidence of the significant internal layout to enable interpretation.	buildings built specifically for that purpose, all in the Brutalist style, which was considered *avant-garde* and progressive. The Engineering buildings have become outmoded and no longer provide suitable facilities for their purpose nor adequately accommodated the changes and trends in teaching and learning. The University of Sydney has prepared a Campus Improvement Program 2014-20 for the Engineering Precinct (SSD 6123), which was approved on 16 February 2015.

5.2.5. Conservation Management Plans

"The University of Sydney Camperdown NSW – Grounds CMP" (Revised – December 2014) was prepared by The Planning Team, Campus Infrastructure Services. One of the aims of the report was to focus on assessing the modern and late modern architecture of the Camperdown and Darlington campuses. Table 4 identifies the relevant policies with discussion.

Table 4 – The University of Sydney Camperdown NSW – Grounds CMP

CMP POLICY	DISCUSSION
Policy 10: The extent of the significant fabric should be identified as: • All of the landscape (including gardens), vegetation, buildings, contents and site features (including road and fence alignments) introduced to the place prior to 1975, including significant landscapes, character areas and the physical manifestation of visual and planning axes. • The subsurface remains (archaeology) of former landscape, vegetation, buildings, contents and site features introduced prior to 1950.	The Electrical Engineering Building (J03), built 1963-65, would be identified as significant fabric. The subject site, is located in an area where residential development in the suburb of Darlington existed prior to 1950. There is the possibility of their being subsurface remains (archaeology) from that phase of development.
Policy 12: The following fabric should be retained and conserved: • All fabric identified as being of exceptional, high and moderate significance introduced	The Electrical Engineering Building (J03), built 1963-65, has been assessed as having "Moderate" significance. In accordance with CMP

prior to 1975 (including fabric denoted EN, MN, LN, ET, MT in surveys in this report)	Policy 12, the building should be retained and conserved. The proposed works involve the retention of the 9-storey southern wing of the subject building. This amounts to more than half of the building. The two-storey wing of the subject building will be demolished and a new wing constructed to allow for facility upgrades and state-of-the-art teaching facilities to ensure the university can offer optimum educational services and attract students and teaching staff.
Policy 13: The following fabric should be retained and conserved with the qualification indicated: • All fabric identified to be conserved graded 'Moderate' - Except where alteration or removal is important for continuing historical use as a University, important for the maintenance of the place, or to make a better reconstruction of a component previously reconstructed.	The Electrical Engineering Building forms part of a group of Late Twentieth-Century Brutalist buildings designed by architects, Ancher Mortlock & Murray. The subject building was not considered one of the best of the group within the Engineering Precinct. The subject building has been altered with the introduction of paintwork to the concrete finish and has been assessed to have Moderate significance. Other Brutalist buildings within the Engineering Precinct have High heritage significance and therefore offer less opportunity for change. There is pressure within the Engineering Precinct to have additional teaching spaces. The southern wing of the subject building is the tallest Brutalist building within the Engineering Precinct. There is also a requirement to maintain landscaped areas throughout the campus. There is an opportunity to increase the height of the northern wing of the subject building to accommodate further development. The subject building is located away from the Darlington/Newtown - Golden Grove conservation area (C18) which is predominantly 1-2 storey in height and sensitive to a scale difference of a development of 11 stores in height.
Policy 14: Any fabric other than that listed in Policy 12 and 13 could be removed without reducing the cultural significance of the place.	Landscaped areas around the subject site are identified as having "Little" heritage significance. There is an opportunity to modify these landscaped areas without reducing the cultural significance of the place. It is proposed to remove the carpark to the south of the subject site, construct a Retention Basin and have a landscaped area over. This will have a positive heritage impact on the setting of the

	adjoining PNR Building (J20), which has been assessed as having “High” heritage significance.
Policy 18: Significant views to and from the expanded curtilage and internal views within the University grounds (see Figure 36) should be retained and if possible enhanced.	The Engineer Walkway forms part of a prominent visual axis. This will be retained as part of the proposed works.
Policy 23: When planning new buildings in an established precinct of historic continuing use the traditional use of the precinct should be taken into account.	The proposed works to the Electrical Engineering Building are located within the university’s Engineering Precinct. The proposed new building wing will provide additional learning spaces for the engineering faculty. This will continue the historic use of the Engineering Precinct form the 1960s to the present.
Policy 32: The adaptation of the exterior of an individual building or other component of heritage significance should be guided by the conservation management plan prepared for that building or component.	No CMP has been prepared for the Electrical Engineering Building. The grading of significance for the subject building has been assessed in both the University of Sydney University Grounds CMP (2014) and the CIP (2014-2020) Engineering Precinct HIS (2013) as “Moderate”. In the light of this, the preparation of a CMP is unwarranted.
Policy 55: Systematic Photographic Survey. Systematic photographic surveys of the place should be carried out before, during and after any works and the results catalogued and archived.	We recommend photographic archival recordings be undertaken as part of the DA Conditions of Approval.

5.3. HERITAGE DIVISION GUIDELINES

The proposed works are addressed in relation to relevant questions posed in the Heritage Office’s ‘Statement of Heritage Impact’ guidelines.

Table 5 – Heritage Division Guidelines (relevant guideline impact assessment

QUESTION	DISCUSSION
The following aspects of the proposal respect or enhance the heritage significance of the item or conservation area for the following reasons:	In the summary statement of significance in “The University of Sydney Grounds CMP” (p83) the following social significance is applicable to the Darlington Campus and the Electrical Engineering Building: *“Are held in regard by many Australians and other individuals and groups as a place of high university education, the place of their higher education, as the site of past events, including social protest, and especially for its research potential and for its fine buildings and landscape.”* The proposed works to the Electrical Engineering Building will provide exemplar buildings and

QUESTION	DISCUSSION
	facilities to ensure the high quality of tertiary education, research and academic excellence is maintained at Australia's oldest and most prestigious university. This will have a positive heritage impact on the heritage significance of the place. The proposed development will provide additional learning space for Engineering tertiary students and continue the historic use of the campus by the faculty of engineering from the late-1960s to the present. The proposed continued use of the building for the tertiary education of Engineering students will have a positive heritage impact on the significance of the place. A number of buildings within the Engineering Precinct, assessed as having "High" heritage significance, will be retained and the setting enhanced by the removal car parking and the establishment of landscaped areas as part of the proposed works. This will have a positive heritage impact on the Engineering Precinct.
The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:	The Engineering Precinct, located within the Darlington Campus of the University of Sydney, is designed predominantly in the Late-Twentieth Century Brutalist style. The partial removal of part of the Electrical Engineering Building (J03) will result in some loss of character of the building itself and the Engineering precinct. A mitigative measure is associated with less than half of the Electrical Engineering Building (J03) being proposed for demolition. It is proposed the taller, southern wing of the building be retained and conserve. This will ensure the character of the Late Twentieth-Century Brutalist style building is to some extent retained. The subject building has been assessed as having "Moderate" heritage significance. The proposed works are restricted to a building within the Engineering Precinct that has less heritage significance to ensure those of higher heritage significance are retained and conserved. The proposed construction of a northern wing that is higher than much of the existing southern wing will have some negative heritage impact on the building as a whole as well as the Engineering

QUESTION	DISCUSSION
	Precinct. The Electrical Engineering Building (J03) is the tallest building within the Engineering Precinct and offers the greatest potential for the addition of an 11-storey building wing within the precinct. The scale differentiation within the precinct will be minimised by grouping higher buildings together. In addition, the tower of the existing Electrical Engineering Building will continue to remain the prominent feature within the precinct. Located within the centre of the Engineering Precinct, away from the Darlington/Newtown - Golden Grove Conservation Area (C18), the scale differentiation associated with the predominantly one-storey and two-storey residential buildings will be minimised.
The following sympathetic solutions have been considered and discounted for the following reasons:	
Major partial demolition Is the demolition essential for the heritage item to function? Are particular features of the item affected by the demolition (e.g. fireplaces in buildings)? Is the detailing of the partial demolition sympathetic to the heritage significance of the item (e.g. creating large square openings in internal walls rather than removing the wall altogether)? If the partial demolition is a result of the condition of the fabric, is it certain that the fabric cannot be repaired? How is the impact of the addition on the heritage significance of the item to be minimised? Can the additional area be located within an existing structure? If no, why not? Will the additions visually dominate the heritage item? Is the addition sited on any known or potentially significant archaeological deposits?	The Engineering Precinct needs to increase the number of learning spaces and to upgrade the quality of those spaces. The University of Sydney has prepared a Campus Improvement Program 2014-20 for the Engineering Precinct (SSD 6123). This was approved on 16 February 2015 and increased the density of the Precinct. The proposed development is in line with the density of development required by the University. The proposal to develop the height of buildings, while retaining the footprint, will ensure a balance of built and landscape development across the campus. Development of a new northern wing, while retaining the southern wing, will ensure a greater portion of the building will be retained. Original features that are part of the stylistic character of the Late Twentieth-Century Brutalist building will conserved on the retained original southern wing. The impact of the proposed new northern wing has been minimised by keeping it lower in height that of the tower of the original southern wing of the building. The proposed development will not visually dominate the original wing of the building, the tallest element within the Engineering Precinct.

QUESTION	DISCUSSION
Is the resolution to partially demolish sympathetic to the heritage significance of the item? If the partial demolition is a result of the condition of the fabric, is it certain that the fabric cannot be repaired?	The fabric of the Electrical Engineering Building is in good to fair condition. The partial demolition of the building is associated with the need to increase learning spaces within the Engineering precinct. Original concrete surfaces and fabric of the building have been compromised by paint finish applied at later date. The use of "untreated" concrete surfaces was part of the character of the Brutalist style. There is limited possibility to recover the original surface finish. The proposed northern wing will be constructed using a variety of materials including metal sheet cladding, various painted surfaces and panels. This built character will contrast with the retained "Brutalist" style building and offer a contemporary contrast to the existing building.
New development adjacent to a heritage item How does the new development affect views to, and from, the heritage item? What has been done to minimise negative effects? How is the impact of the new development on the heritage significance of the item or area to be minimised? Why is the new development required to be adjacent to a heritage item? How does the curtilage allowed around the heritage item contribute to the retention of its heritage significance? Is the development sited on any known, or potentially significant archaeological deposits? If so, have alternative sites been considered? Why were they rejected? Is the new development sympathetic to the heritage item? In what way (e.g. form, siting, proportions, design)? Will the additions visually dominate the heritage item? How has this been minimised?	It is proposed to retain the external building form of the southern wing of the Electrical Engineering Building. This comprises more than half of the original engineering building. Whilst the principal internal spatial configurations of a number of the rooms will be retained where appropriate, there will be internal changes to ensure the building is upgraded to provide adequate learning facilities for undergraduate and post-graduate students and teaching staff. In the summary statement of significance in "The University of Sydney Grounds CMP" (p83) the Darlington Campus is described as follows: *"Contain part of the land developed during the 19th and early 20th centuries as the Sydney suburb of Darlington. Substantial remains of Darlington survive, represented by the Old Darlington School Building (G18), terraced housing along Darlington Road, several light industrial buildings and remnants of the former street pattern."* The proposed development will retain the early street patterns of the Darlington suburb. This will have a positive heritage impact on the area. The proposed development will not interrupt views to and from the Former Darlington Primary School, a listed heritage item located southwest of the subject site. The proposed new 11-storey wing has been located on the northern portion of the subject site on the footprint of the existing wing. This

QUESTION	DISCUSSION
Will the public, and users of the item, still be able to view and appreciate its significance?	proposed location of the wing, away from the heritage item of the Darlington School building. This proposed siting will minimise the negative heritage impact on the heritage item. The difference in scale will not be apparent when looking northeast from the single-storey heritage item will not be apparent because the existing tower of the Electrical Engineer Building is higher than the proposed northern wing.
Tree removal or replacement Does the tree contribute to the heritage significance of the item or landscape? Why is the tree being removed? Has the advice of a tree surgeon or horticultural specialist been obtained? Is the tree being replaced? Why? With the same or a different species?	To construct the loading dock to the east of the Electrical Engineering building, it is proposed to remove some established trees from the courtyard. In the CMP, the Grading of Significance Character Areas and Landscapes (Figure 35), identifies the landscape element as having “Moderate” heritage significance. The loss of plantings and landscape will have a minor negative heritage impact on the Engineering Campus as a whole. Any loss has been mitigated by the proposal to construct a new roof top garden above ground level. Landscaped area to the north of the Electrical Engineering Building and the carpark south to the south are identified as having “Little” heritage significance. It is proposed increase the landscaped area with new plantings. This will enhance the setting of other buildings within the Precinct of “High” heritage significance. Proposed tree plantings will be in accordance with the university’s existing tree planting programme.

6. CONCLUSION AND RECOMMENDATIONS

In conclusion, the proposed works described above do not adversely affect the identified heritage significance of the curtilage of the heritage item in close proximity to the proposed addition to the existing Electrical Engineering Building. It is acknowledged, the vision of the Engineering Precinct at The University of Sydney is evolving with the need to provide more, high calibre learning spaces to meet the future needs of the university. This has been formalised by the Campus Improvement Program 2014-20 for the Engineering Precinct (SSD 6123) which was approved on 16 February 2015.

The proposed works will ensure the visual curtilage of the Former Darlington Primary School, a heritage item in close proximity, will be conserved within the Engineering Precinct of the Darlington Campus. The Engineering Campus contains a number of buildings dating to the 1960s designed in the Late Twentieth-Century Brutalist style by architects, Ancher Mortlock & Murray. Those buildings assessed as having “High” heritage significance, that better represent the Brutalist style and character of the Engineering Precinct than the subject building, will be retained and enhanced by the proposed development. The proposed development has been located a considerable distance west of the “Darlington/Newtown - Golden Grove Conservation Area (C18) reduces the potential to visually impact on the scale difference between the single-storey and 2-storey residences and the proposed 11-storey institutional building.

The proposed introduction of landscaped settings and the removal of hard-stand areas of car parking will further enhance the Engineering Campus. This will conserve and enhance the balance of landscape area to built form, while increasing the university’s requirement to provide increased numbers of learning spaces of the highest calibre to enhance the educational environment of Australia’s first university.

In addition, the proposed works will retain, conserve and enhance historic views across the campus, in particular the Engineering Walk, and the early street patterns of the suburb of Darlington.

We recommend the heritage aspects of this application be approved.

7. BIBLIOGRAPHY AND REFERENCES

7.1. BIBLIOGRAPHY

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[Note: Some government departments have changed their names over time and the above publications state the name at the time of publication.]

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