

Mechanical and Manufacturing Engineering Precinct State Significant Development - Environmental Impact Statement



University of New South Wales

Kensington Campus

Submitted to NSW Department of Planning and Infrastructure
On Behalf of University of New South Wales

November 2012 ■ 12574

Reproduction of this document or any part thereof is not permitted without prior written permission of JBA Urban Planning Consultants Pty Ltd.

JBA Urban Planning Consultants Pty Ltd operates under a Quality Management System. This report has been prepared and reviewed in accordance with that system. If the report is not signed below, it is a preliminary draft.

This report has been prepared by: Stephen Gouge

Signature  Date 30/11/12

This report has been reviewed by: Oliver Klein

Signature  Date 30/11/12

Contents

Executive Summary	i
1.0 The Proposal	1
1.1 Objectives of the Project	1
1.2 The Proposal	1
1.3 Analysis of Alternatives	2
2.0 Introduction	3
2.1 Environmental Assessment and Approvals Process	3
2.2 Project Team	5
3.0 Site Analysis	6
3.1 Site Location and Context	6
3.2 Site Description	8
3.3 Surrounding Development	13
4.0 Development Application	14
4.1 Scope of works	14
4.2 Development Principles	17
4.3 Building Layout and Gross Floor Area	17
4.4 Building Population	21
4.5 Demolition, Bulk Earthworks and Site Preparation	21
4.6 Car Parking, Loading and Access	22
4.7 Water Cycle Management	22
4.8 Utilities and Services	23
4.9 Waste Management	24
4.10 Staging	24
5.0 Director-General's Environmental Assessment Requirements	25
6.0 Environmental Assessment	29
6.1 Consistency with Relevant Strategic and Statutory Plans and Policies	29
6.2 Environmental Risk Assessment	33
6.3 Site Suitability and Implications of Proposed Land Uses	37
6.4 Built Form and Urban Design	37
6.5 Visual Impact	38
6.6 Solar Access and Overshadowing	40
6.7 European Heritage	41
6.8 Parking, Traffic and Access	41
6.9 Water Cycle Management	42
6.10 Soils, Geotechnical and Groundwater	43
6.11 Wind Impacts	44
6.12 Acoustic Impacts	45
6.13 Environmentally Sustainable Development	47
6.14 Building Code of Australia	48
6.15 Accessibility	49
6.16 Fire Safety	49
6.17 Economic and Social Benefits	49
6.18 Consultation	49
6.19 Construction Impacts	50
6.20 Operational Waste	53

Contents

7.0	Conclusion and Justification of the Proposal	54
8.0	Mitigation Measures	55

Figures

1	Figure 1 - UNSW Kensington Campus in its sub-regional context	6
2	Figure 2 - UNSW Kensington Campus	7
3	Figure 3 - UNSW Kensington Campus map and the site of the proposed development.	7
4	Figure 4 – Site Plan	8
5	Figure 5 – Building J17 (Mechanical and Manufacturing Engineering Building)	9
6	Figure 6 – Historic ground plane of Building J17.	9
7	Figure 7 – John Lions Gardens and Western elevation of the Building J17 south wing.	10
8	Figure 8 – Willis Lane looking north	10
9	Figure 9 – Building J17 and University Mall	11
10	Figure 10 – Northern elevation (frontage) of Building J18.	11
11	Figure 11 – Landscaping Concept	16
12	Figure 12 – Activation of the proposal	18
13	Figure 13 – Floor by floor of Building J17 proposal.	19
14	Figure 14 – Proposed facade replacement of centred screening to Building J17	20
15	Figure 15 – Building J17 eastern elevation facade treatment	20
16	Figure 16 – DCP 2020 – Building Height Map	32
17	Figure 17 – Risk Assessment Matrix	34
18	Figure 18 – View of Building J17 and J18 from Willis Street stairs.	39
19	Figure 19 – Existing view west from the eastern side of Willis Street	39
20	Figure 20 – Proposed awning to Willis Lane.	40
21	Figure 21 – Proposed window amelioration measures to Building J17.	45

Tables

1	Table 1 – GFA Figure – Floor by floor	21
2	Table 2 – Director General’s Requirements	25
3	Table 3 - Summary of consistency with key strategic and statutory plans and policies	29
4	Table 4 - Noise criteria for MMEPD Mechanical Plant Noise Assessment	46
5	Table 5 – Construction Noise Criteria for most affects receivers	51
6	Table 6 – Construction noise management measures	51
7	Table 7 – Hours of Construction	52
8	Table 8 - Mitigation Measures	55

Contents

Appendices

- A** Director General Requirements (DGRs) – SSD 12_5572
Department of Planning and Infrastructure
- B** Architectural Plans
Bates Smart
- C** Architectural Design Report
Bates Smart
- D** Capital Investment Value Report
MBM Quantity Surveyors
- E** Geotechnical and Contamination Investigation
Pells Sullivan Meynink and JBS Environmental
- F** Landscape Concept and Statement
Aspect Studios
- G** Stormwater Management Plan
SLR Consulting
- H** Hydraulic and Fire Services Concept Design Report
Waterman AHW Pty Ltd
- I** Operational Waste Management Plan
UNSW
- J** Construction and Waste Management Plan
Aurora
- K** Traffic and Transport Report
Arup
- L** Qualitative Wind Impact Assessment
SLR Consulting
- M** Acoustic Report
Acoustic Studios
- N** Environmentally Sustainable Design Report
Arup
- O** Building Code of Australia Capability Statements (Buildings J17 and J18)
Vic Lilli and Partners
- P** Access Report
Morris Goding Accessibility Consulting

Contents

- Q** Fire Engineering Consultant Advice
Exova Warringtonfire (Aus) Pty Ltd
- R** Pre-lodgement Minutes
Randwick City Council
- S** Correspondence with Sydney Airport Corporation Limited
Sydney Airport Corporation Limited
- T** Erosion and Sediment Control Plan
Robert Bird Group

Statement of Validity

Environmental Impact Statement prepared by

Name	Oliver Klein
Qualifications	BA (Geography) MURP, MPIA, CPP
Address	Level 7, 77 Berry Street, North Sydney
In respect of	Mechanical and Manufacturing Engineering Precinct Development (MMEPD)

Applicant name	University of New South Wales
Applicant address	Level 3, Mathews Building F23, Botany Street, via Gate 11, Kensington
Land to be developed	Lot 3 in DP 1104617
Proposed development	Mechanical and Manufacturing Engineering Precinct Development (MMEPD)

Environmental Assessment Certificate

An Environmental Assessment (EA) is attached
I certify that I have prepared the content of this Environmental Assessment and to the best of my knowledge:

- It is in accordance with the Environmental Planning and Assessment Act and Regulation.
- It is true in all material particulars and does not, by its presentation or omission of information, materially mislead.

Signature



Name

Oliver Klein

Date

November 2012

Executive Summary

Purpose of this report

This submission to the Department of Planning and Infrastructure (the Department) comprises an Environmental Impact Statement (EIS) for a Development Application under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). It relates to the redevelopment of the Mechanical and Manufacturing Engineering Precinct of the Kensington Campus, consisting of Buildings J17 and J18, and Willis Lane.

The proposed development works have a Capital Investment Value (CIV) of approximately \$46.5million and is therefore classified as State Significant Development (SSD) pursuant to Schedule 1 of the *State Environmental Planning Policy State and Regional Development* (SEPP SRD).

A request for the issue of Director General's Environmental Assessment Requirements (DGRs) was sought on 3 September 2012. Accordingly, the DGRs were issued to the University of New South Wales (UNSW) on 28 September 2012. A copy of the DGRs is included at **Appendix A**.

This submission is in accordance with the Department's guidelines for SSD applications lodged under Part 4 of the EP&A Act, and addresses the issues raised in the Director General's Requirements.

Project Overview

The State Significant Development Application (DA) relates to the redevelopment of the Mechanical and Manufacturing Engineering Precinct Development (MMEPD) including Buildings J17 – Mechanical and Manufacturing Engineering Building and J18 – Willis Annex. The precinct is located to the middle of the University's Kensington Campus, at grid reference J17 and J18.

The proposal includes alterations and additions, refurbishments and fitout works to the Mechanical and Manufacturing Engineering Building, Willis Annex and Willis Lane including:

- Demolition of the southern wing of Building J17 (and the link bridge between Building J17 and Building J18) and its replacement with a new wing with internal fitout;
- A "warm shell" fitout only, of Level 5 of the new southern wing of Building J17;
- Internal alterations, refurbishment and fitout of the east-west wing of Building J17;
- Internal alterations, refurbishment and fitout of Building J18, with some minor external alterations; and
- Public domain works to Willis Lane and landscaping of areas within the site, with access improvements around the perimeter of the John Lions Garden.

Planning context

Section 6.0 of the EIS considers the relevant legislation applying to the proposal. The proposal complies with all relevant planning controls.

The site is currently zoned No 5 – Special Uses under Randwick Local Environmental Plan 1998. The proposal is permissible with consent and meets the objectives of the subject zone. Further, the zoning does not have specific controls for FSR or height, however, it is considered the building form is consistent with the scale of existing University buildings and surrounding uses. It is noted that under the draft Randwick

Local Environmental Plan 2012 the proposal is consistent with the objectives of the SP2 Infrastructure zone.

Environmental Impacts

This EIS provides an assessment of the environmental impacts of the project in accordance with the DGRs and sets out the undertakings made by UNSW to manage and minimise potential impacts arising from the development.

Conclusion

The EIS addresses the DGRs, and the proposal provides for timely redesign and upgrade of significant Engineering laboratory and research space within the Campus. The potential impacts of the development are minor and can be adequately managed. Given the planning merits of the proposal, the proposed development warrants approval by the Minister for Planning and Infrastructure.

1.0 The Proposal

1.1 Objectives of the Project

UNSW is a teaching and research institution of international, national and state significance. It is ranked 46th worldwide in the World University Rankings (2010) and is a member of the Group of Eight (Go8), a coalition of Australia's leading universities. Amongst others, it has Faculties of Medicine, Science and Engineering and is a key driver of economic growth. It is renowned for the quality of its graduates and its commitment to new and creative approaches to education and research. Notably, it is also the largest employer within the Randwick LGA.

The Campus was established in 1949 and has grown to a dynamic urban environment of more than 45,000 enrolled students, over 6,000 staff and 140 buildings over the Kensington Campus' 38 hectares. Currently the School of Mechanical and Manufacturing Engineering (the School) supports the following:

- 43 academic & research staff;
- 26 support staff;
- 1,300 undergraduate students;
- 100 postgraduate coursework students; and
- 95 postgraduate research students.

The School is one of 10 Schools within the Faculty of Engineering at UNSW being one of the country's largest offering a diverse range disciplines. The School offers both undergraduate and post graduate degrees in both course work and research. A notable trait of the School is its research component supported by well-resourced facilities, equipment and staff.

Application-orientation, and close collaboration with industry is an essential part of the School's strategy. Students and staff work in conjunction with industry in research and teaching, and with engineers working in industry who undertake postgraduate studies in the School on a part-time basis. The collaboration also extends to the other engineering schools within the Faculty, which highlights the multi-disciplinary nature of the work, especially in product design and development.

The School's existing buildings (designed by Spencer, Hanson and Partners and were opened in the 1960's) have failed to respond to a maturing teaching and research environment and are now inadequate and out dated having a consequent impact on the School's operation and image, particularly the research space which is central to its function.

1.2 The Proposal

The proposal includes alterations and additions, refurbishments and fitout works to the Mechanical and Manufacturing Engineering Building (J17), Willis Annex (J18) and Willis Lane. This is known as the Mechanical and Manufacturing Engineering Precinct Development (MMEPD). The proposal includes:

- Demolition of the southern wing of Building J17 (and the link bridge between Building J17 and Building J18) and its replacement with a new wing with internal fitout;
- A "warm shell" fitout only, of Level 5 of the new southern wing of Building J17;

- Internal alterations, refurbishment and fitout of the east-west wing of Building J17;
- Internal alterations, refurbishment and fitout of Building J18, with some minor external alterations; and
- Public domain works to Willis Lane and landscaping of areas within the site, with access improvements around the perimeter of the John Lions Garden.

Details of the proposal are illustrated on plans prepared by Bates Smart are provided at **Appendix B**.

1.3 Analysis of Alternatives

The use of the site will remain unchanged as a result of the proposal. The proposal involves an update to the existing building layout, elements of facade, and efficiency of floor plates and internal space. The proposal allows for a design better suited to meet the needs of the School and Faculty.

A 'do-nothing' alternative is not an option on this site, as the operation of the School and Faculty would be significantly disadvantaged in its ability to provide education and research as a leading undergraduate and graduate Engineering School. The proposed upgrades will allow the School to provide the highest standard of teaching and research facilities into the future, and deliver valuable facilities for the University.

The current proposal offers the best functional and financial option to UNSW, and allows the re-use of built-fabric without relocating or dislocation the School from its Faculty base. Accordingly, the life-cycles of the buildings will be extended by the proposal, without significant negative impact upon UNSW's teaching and research operations, and to the environment by either construction or operational impacts.

2.0 Introduction

This Environmental Impact Statement (EIS) is submitted to the Minister for Planning and Infrastructure pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) in support of the State Significant Development (SSD) Development Application. This is to fulfil the Environmental Assessment Requirements issued by the Director General for the preparation of an EIS for the development of the MMEPD.

The report has been prepared by JBA for the proponent, the UNSW, and is based on design information provided by Bates Smart and HDR as well as supporting technical documents provided by the expert consultant team.

This EIS describes the site, its environs and the proposed development, and includes an assessment of the proposal in accordance with the Director General's Requirements (DGRs) under Part 4 of the EP&A Act. It should be read in conjunction with the information contained within and appended to this report.

The studies appended to this report provide a technical assessment of the environmental impact of the proposed development, and recommend proposed mitigation measures to manage potential environmental impacts associated with the proposal.

2.1 Environmental Assessment and Approvals Process

On 1 October 2011 the *Environmental Planning and Assessment Amendment (Part 3A Repeal) Regulations 2011* came into force which makes provision for the commencement of the *Environmental Planning and Assessment Amendment (Part 3A Repeal) Act 2011* which repeals the provisions for Part 3A development. In addition, the Part 3A Repeal Act also establishes an environmental assessment framework for two broad categories of development, namely State Significant Development (SSD) and State Significant Infrastructure (SSI).

Under the State Environmental Planning Policy State and Regional Development (SEPP SRD), a project is classified as SSD if it falls into one of the classes of development listed in Schedule 1 of SEPP SRD. 'Educational establishment (including associated research facilities)' with a CIV of \$30 million or more are identified as SSD under SEPP SRD, and are considered to be development of State significance.

The proposed MMEPD has a Capital Investment Value (CIV) of approximately \$46.5 million, and therefore satisfies the requirements to qualify as a SSD. The project is considered to have State significance and will contribute significant social benefit to the locality, region and the state. A Quantity Surveyor's Capital Investment Report confirming the project's CIV is included at **Appendix D**.

The SSD application will be assessed against the relevant provisions under Part 4 of the EP&A Act. However, in accordance with clause 11 of SEPP SRD, the requirements of Development Control Plans (DCPs) do not apply.

A copy of the DGRs is included in **Appendix A**.

2.1.1 Crown Development

Clause 226(1) of the *Environmental Planning and Assessment Regulation 2000* provides that a development carried out by an Australian University (under the meaning of the *Higher Education Act 2001*) is a Crown development. UNSW is listed as an Australian University under Schedule 1 of the *Higher Education Act*

2001 and as the development will occur on University land, it is a Crown development for the purposes of Division 4 of the EP&A Act.

Under the special provisions for Crown developments, the DA cannot be refused (except with the approval of the Minister for Planning), and the DPI (consent authority) cannot impose conditions of consent without the applicant's agreement, and the applicant has the opportunity to review the draft conditions.

2.1.2 Development Contributions

The relevant contributions plan for the site is the *Randwick City Council Section 94A (s94A) Development Contributions Plan 2012*, effective since July 2012.

Exemptions from a levy under the existing s94A Plan may be considered by Council or the relevant consent authority for the following development, or components of development:

- *Places of worship, public hospitals, police stations, fire stations, and other emergency services*
- *Works proposed to be undertaken for charitable purposes by, or on behalf of, a not-for-profit charity (as defined by the ATO) but only in cases where the development is of a small scale, for example a retail outlet operated by the Salvation Army, St Vincent de Paul or similar organisations, and where the Council considers that there will not be an increase in the demand for public works or infrastructure as a result of the development which would warrant the payment of a Section 94A levy*
- *Seniors housing, as defined in the State Environmental Planning Policy (Seniors Living) 2004, which is undertaken by a social housing provider*
- *Applications submitted by or on behalf of Randwick City Council*

Those applicants which seek exemption from a levy under this Plan must provide a comprehensive submission to the Council, which clearly demonstrates how the proposed development falls within one of the development types defined above, prior to the Council determining whether such an exemption applies.

In considering any application for an exemption the Council will take into account:

- *the extent to which the proposed development comprises or includes the provision, extension or augmentation of public amenities or public services that provide a public benefit, and/or*
- *whether the applicant is affected by any adverse financial circumstance which will impact on its ability to fund the payment of any levy which is imposed in accordance with this Plan.*

Whilst developments by the Crown are not automatically exempt from payments under this section 94A Plan, development that in the opinion of Council does not increase the demand for the categories of public facilities and services addressed by the Plan should warrant a merit-based exemption.

In this instance, (and consistent with the Department's existing Circular D6) a full exemption is considered appropriate for the proposed development on the following grounds:

- The proposal will not contribute to an increase in students or staff within the School, particularly with regard to parking and requirements for additional physical or social infrastructure or services;
- The Kensington Campus and its buildings have a public character, and already provide a number of material public benefits consistent with wider strategic planning objectives;

- The proposal is predominantly replacing existing and redundant university floorspace, and so will not generate any additional staff or students on the site, or any additional demand in terms of traffic and transport infrastructure or open space;
- UNSW is not a developer and is a charitable not-for-profit public institution (and registered as such by the Australian Tax Office) and relies on significant grants, donations, and external funding to provide new facilities for both the UNSW community and the wider local community;
- The payment of development contributions would consume resources which should be devoted to the University's core business of teaching and research and the strategic benefits that would result from such a development; and
- UNSW provides a wide range of social, cultural, and recreational public benefits and contributions to Randwick LGA and its resident and worker population.

Under the current plan, a 1% levy on the CIV of the development is payable unless it is exempted. As has been outlined above, it is considered that the proposal warrants an exemption from these contributions.

2.2 Project Team

An expert project team has been formed to deliver the project and includes:

Proponent	UNSW
Architectural Plans	Bates Smart/HDR
Architectural Design Statement	Bates Smart
Landscape Plan	Aspect Studios
Contamination Report	JBS Environmental Pty Ltd (Contamination)
Geotechnical Report	PSM Consulting Pty Ltd (Geotechnical)
Acoustic Report (Operational and Construction noise)	Acoustic Studios
Mechanical Services	Sinclair Knight Mertz (SKM)
Traffic Report (Operational and Construction)	Arup
ESD Report	Arup
Stormwater Concept Plan and Drainage Plan	Waterman AHW
Sediment Erosion and Dust Management Plan	Robert Bird Group
Utilities	Sinclair Knight Mertz (SKM)
Preliminary Construction Management Plan, Inclusive of Construction Traffic Management Plan	Aurora/ARUP
Waste Management Plan	UNSW
BCA Report	Vic Lilli and Partners
Access	Morris Goding Accessibility Consulting
Noise and Vibration	Acoustic Studio

3.0 Site Analysis

3.1 Site Location and Context

The UNSW Kensington Campus is located within the Randwick LGA and lies to the south of the Royal Randwick Racecourse, to the west of the Prince of Wales Hospital Campus / Randwick Health Hub, and between the Kensington and Kingsford town centres on Anzac Parade. The Campus is located some 8km south of the Sydney CBD and about 6km north-east of Sydney Airport.

The Campus' sub-regional location relative to the Sydney CBD, Sydney Airport, Port Botany and other sub-regional landmarks is shown at **Figure 1**.

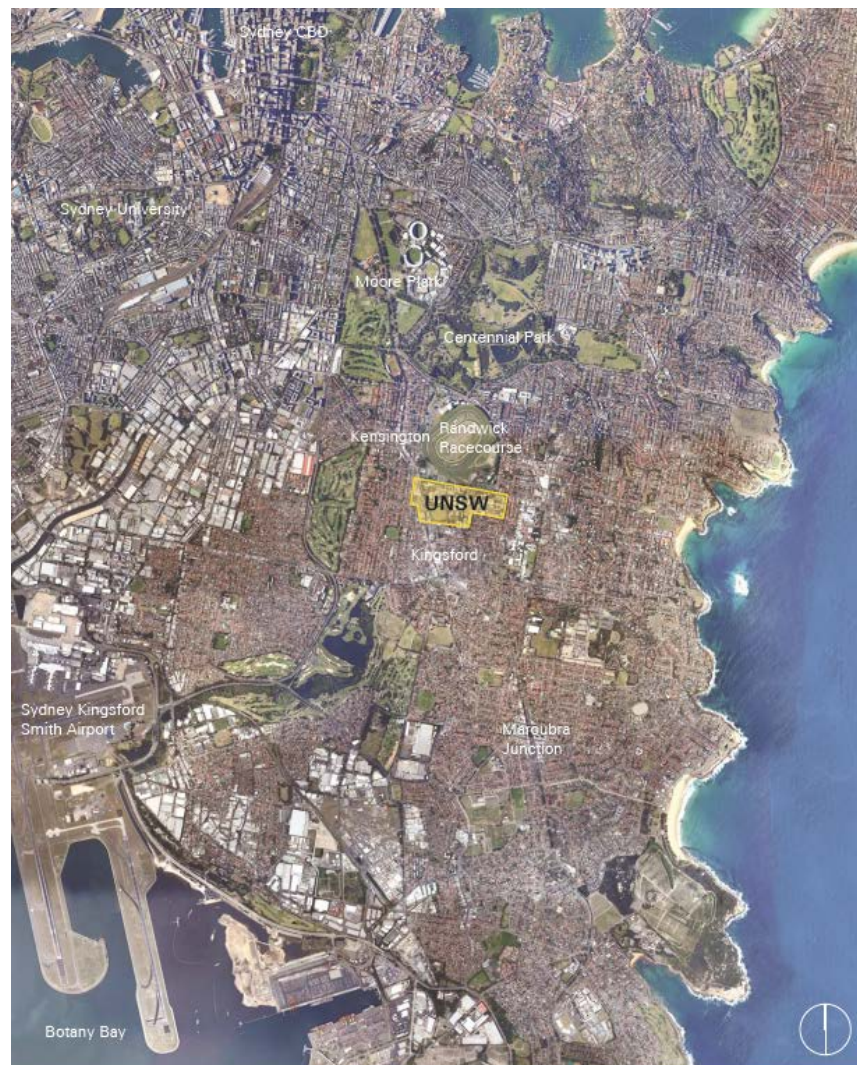


Figure 1 - UNSW Kensington Campus in its sub-regional context

Source: Nearmap 2011

The Campus includes development that sits within the main Campus boundaries of Anzac Parade (to the west), High Street (to the north), Botany Street (to the east), and Barker Street (to the south). It also includes developments to the west of Anzac Parade and north of Day Avenue, such as NIDA, the University Regiment, and the New College Post-Graduate Village.

An aerial photograph of the Campus is shown below at **Figure 2**. A map of the Campus, and the location of the development site within it, is provided at **Figure 3**.



Figure 2 - UNSW Kensington Campus

Source: Nearmap 2011

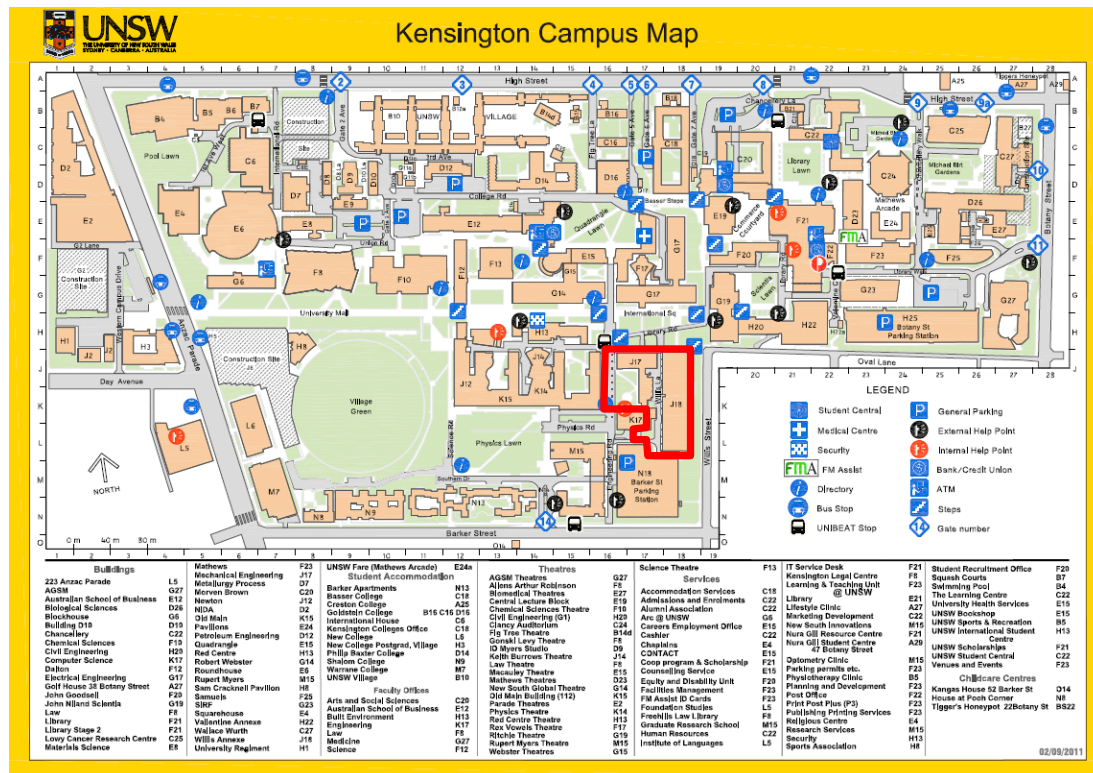


Figure 3 - UNSW Kensington Campus map and the site of the proposed development.

Source: UNSW

3.2 Site Description

The Kensington Campus is L-shaped, and covers an area of approximately 38 hectares. The site is owned by UNSW, and is legally described as Lot 3 in DP 1104617. The site is zoned No 5 – Special Uses under Randwick Local Environmental Plan 1998 (LEP 1998).

The Campus was established in 1949, and houses a number of academic faculties, within some 140 buildings, as well as residential colleges, areas of open space and car parking in both at-grade and multi-deck car parks.

Development Site and Surrounding Development

The development site is located within the UNSW Kensington Campus (being the “middle campus”) and is bounded by University Mall and International Square to the north, Willis Street to the east, Barker Street parking station and K17 to the south, and Engineering Road to the west as shown in **Figure 4** below.

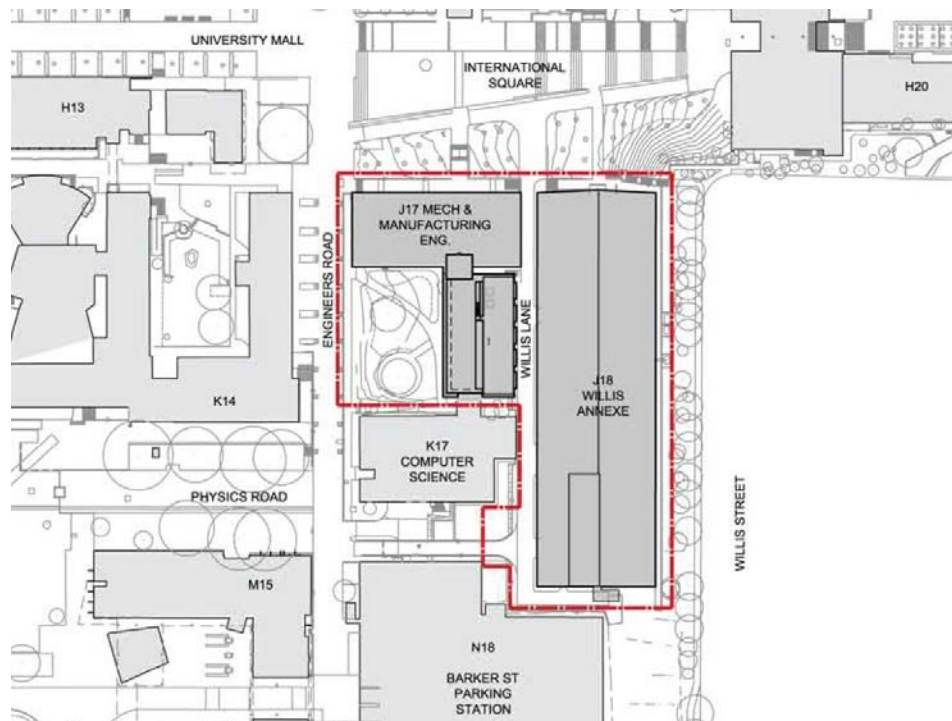


Figure 4 – Site Plan

Source: *Bates Smart*

The Buildings (J17 and J18) were designed by Spencer, Hanson and Partners and opened in 1963. Building J17 is a six storey building with east-west and north-south wings. Historic photos of this building are provided below in **Figures 5** and **6**. J17 is primarily utilised by the School with lecture and tutorial rooms, post graduate studios, computer based teaching spaces and a cafe located at the ground floor to the courtyard and the John Lions Garden. Building J18 (Willis Annexe) is a two storey building (with mezzanine) with frontages to Willis Lane and International Square. It is currently used as teaching and laboratory space for the School.



Figure 5 – Building J17 (Mechanical and Manufacturing Engineering Building)

Source: *Bates Smart Architectural Design Statement*



Figure 6 – Historic ground plane of Building J17.

Source: *Bates Smart Architectural Design Statement*

A landscaped area known as John Lions Garden is located to the west of the north-south wing of Building J17 (see **Figure 7**) with pedestrian connections to Engineering Road and between Buildings K17 and J17.

Willis Lane, a bitumen surfaced road, is located between the two buildings and facilitates servicing of the buildings from Engineering Road and University Mall/International Square (**Figure 8**). **Figures 9** and **10** below show the University Mall frontage of Buildings J17 and J18.



Figure 7 – John Lions Gardens and Western elevation of the Building J17 south wing.

Source: *Bates Smart*



Figure 8 – Willis Lane looking north

Source: *Bates Smart*



Figure 9 –Building J17 and University Mall

Source: *Bates Smart*



Figure 10 – Northern elevation (frontage) of Building J18.

Source: *Bates Smart*

Topography

The local topography falls from east to west from the Willis Street boundary at the east (Willis Street road level), down to Engineering Road at the west of approximately 15m (refer to the Architectural Design Report at **Appendix C**). Building J18 is nestled within the cut of the topography directly west of Willis Street. To the west of Willis Lane, a retaining wall to a height of approximately 3-4m currently exists, separating the ground floor of Building J17 and the street level of Willis Lane above it.

Vegetation/Flora and Fauna

The site is largely built upon with only limited landscaping being the John Lions Garden and planting to Engineering Road (not located within the site) as well as minor landscaping to the eastern side of the existing south wing of Building J17.

Stormwater and Overland Flow

The existing stormwater drainage across Kensington Campus is managed in accordance with the *UNSW Kensington Campus, Campus 2020 Masterplan Stormwater Strategy* prepared for UNSW and approved by Randwick City Council (RCC). It includes five major catchments that have various discharge conditions, sub-catchments, flow controls, overland flow paths and diversion structures. The proposed building and surrounding roads are located within catchment 'A', with stormwater run-off to the 100yr ARI discharging to the Village Green detention basin. This basin recharges the Botany Sands Aquifer, which in turn is used as a source for bore water supply across the site.

The Stormwater Strategy identifies major overland flow paths that cross the proposed site. Overland flow paths run along Library Road, and Engineering Road, with a secondary flow path over University Mall. This overland flow is diverted west from Engineering Road into an exposed drainage channel that runs through the Physics Lawn to the south of the Old Main Building, discharging directly to the Village Green detention basin.

Vehicular and Pedestrian Access

The main vehicular entry and exit point to and from the middle campus is via Gate 14 located on Barker Street to the south west of the site. This provides access to the University's car parking areas and services facilities, specifically the Barker Street car parking station and at-grade parking along Engineering Road.

Within the Campus, there is a strong pedestrian network with the east-west orientated University Mall forming the main pedestrian spine between the upper and lower campuses. The site also links in with the north-south pedestrian routes along Engineering Road between International Square and the Quadrangle.

Anzac Parade forms the major north-south arterial road of the region and accounts for the majority of traffic movements to the site. Barker Street also connects to Botany Street / Avoca Street to the east via a roundabout and traffic signals, respectively.

Heritage Conservation

The Campus contains a localised Heritage Conservation Area (HCA) identified under LEP 1998 and centred around the Old Tote Courtyard. The HCA is located north of the development site, and well removed from the MMEPD. As a result, the proposed development will not have any impacts on the significance of the HCA.

Public Transport

The Campus is well serviced by public transport infrastructure. The closest railway stations are Green Square (approximately 3 km away), Bondi Junction (approximately 3 km away) and Central (approximately 4.5 km away).

There are a several bus services operated by Sydney Buses to UNSW. The main bus stops are located at Anzac Parade (Gate 1) and High Street (Gate 9) and provide regular express services between Central railway station and UNSW as routes: 890 / 891 / 892. UNSW express bus routes from Central Railway Station constitute the busiest regular bus route in Australia, carrying up to 20,000 passengers per day. Some services also stop at the city centre and Circular Quay for ferry interchange, and are listed above as route numbers: 890 / 892. These bus stops are approximately 600m walking distance of the site via Gate 2 and University Mall (approximately 7-8 minutes' walk).

Soils and Contamination

Pell Sullivan Meynink (PSM) and PBS Environmental have undertaken Geotechnical and Contamination Reports to determine the potential for onsite contamination and suit subsurface qualities of the site (refer to **Appendix E**). The assessment concludes that there are no significant groundwater flows, site contaminants or subsurface constraints. As such, the site is considered to be suitable for the continued use as an education facility.

Utilities and infrastructure

All services (i.e. water, sewer, gas, electricity and telecommunications) are available to the site, and can be connected / augmented to service the proposed development. Further details are provided in **Section 4.8**.

3.3 Surrounding Development

The Campus is bordered by Royal Randwick Racecourse to the north and medical, residential, retail and commercial uses associated with Randwick Town Centre to the east. To the south, the Campus is bounded by low-medium density residential development, with retail, residential and educational uses to the west, on the opposite side of Anzac Parade.

The development site itself forms part of the eastern boundary of the Campus. Residential development along Willis Street sits above the cutting within which Building J18 sits. Willis Street residences are setback from the site by the width of Willis Street and the residential setbacks from Willis Street itself.

Building K17 (Computer Science) is located south of the Building J17. Building J17 and Building K17 are interconnected (as shown in **Figure 4**) with access between these buildings on all levels. Building K17 forms the western wing of the built form that surrounds the John Lions Garden.

4.0 Development Application

UNSW has identified the need to provide new and upgraded facilities to accommodate the School at its Kensington Campus. The key objectives of the development are to:

- Upgrade teaching, research and learning spaces;
- Provide a point of focus for UNSW's defined research strength of next generation materials and technologies;
- Provide a world class showcase to enable the School to grow and respond to opportunities;
- Attract funding, academics and students;
- Continue to foster collaboration across faculties and schools;
- Support and encourage learning; and
- Support and showcase UNSW's commitment to leadership in sustainability.

4.1 Scope of works

The proposal includes alterations and additions, refurbishments and fitout works to the Buildings J17 and J18 and to Willis Lane including:

- Demolition of the southern wing of Building J17 (and the link bridge between Building J17 and Building J18) and its replacement with a new wing with internal fitout;
- A "warm shell" fitout only, of Level 5 of the new southern wing of Building J17;
- Internal alterations, refurbishment and fitout of the east-west wing of Building J17;
- Internal alterations, refurbishment and fitout of Building J18, with some minor external alterations; and
- Public domain works to Willis Lane and landscaping of areas within the site, with access improvements around the perimeter of the John Lions Garden.

Architectural plans have been by Bates Smart are provided at (**Appendix B**).

4.1.1 Building J17 – Mechanical and Manufacturing Engineering Building

It is proposed to rebuild the southern wing of Building J17 to provide a more functional floor plate and energy-efficient design and create an additional level. The proposal will be consistent with the building footprint that currently exists on the site, with minor variation to the building envelope to the east of the southern wing of Building J17. The proposal will result in net gain in GFA of 1,930m² to Building J17.

Level 5 of the new southern wing of Building J17 is proposed as a 'warm shell' space that will not be occupied in the short term, but available for future use by the School and Faculty as a student computer laboratory. Importantly, this space will be occupied by students already on the campus and will not cater for an additional population.

As a consequence, there will be no new or additional traffic or parking impacts as a result of the future occupation of Level 5.

The centre-piece of the new south wing extension will be a 350-seat circular lecture theatre, one of the largest on campus, further activating the ground level

with student activity. The theatre will be surrounded by circulation and student breakout space, which directly connects to the John Lions Garden through large operable doors. This allows Willis Lane to be used as an extension to research and laboratory function of the School if required.

The additional floor space will assist in maintaining the current Centrally Allocated Teaching Space (CATS) allocation within the University, while providing floorplates more suited to large, column-free teaching spaces. The additional GFA will cater for existing deficiencies and out-dated design rather than for increased staff or student population.

The proposal includes internal alterations and refurbishments to the existing east-west wing of Building J17. The works primarily consist of an upgrade of building services and redesign of the internal layout. The floorplates are revised remove the existing east-west corridor and provide suitable spaces for a cafe to the ground floor, administration space on level 1, and computer laboratories and CATS to the levels above. The building services will be upgraded on level 5 of the east –west wing, although internal alterations to layout are not proposed to this level.

4.1.2 Building J18 – Willis Annex

Works to Building J18 primarily include the internal fitout and redesign of what is currently a highly-compartmentalised layout. Due to the current layout, the interaction between laboratory spaces and different fields of research is complex. The external facade will also be activated, especially at Willis Lane, to provide openable glass garage style doors creating a highly transparent 'approach' to the Lane, and providing a practical purpose for research and laboratory uses from Building J18 into Willis Lane.

The proposed works will include a refurbishment of the existing building to provide open-plan areas (balancing needs for security and acoustic privacy), visual inter-connectivity between spaces, well considered adjacencies of academics, and research staff and post-graduate students, and allocation of complementary laboratory spaces. The works proposed to the building will markedly improve the layout and quality of the internal spaces, most of which have not been updated since the building's original construction in the early 1960's. The proposal will result in a net reduction of GFA for Building J18 by 265m².

4.1.3 Willis Lane and Public Domain Works

It is proposed to upgrade Willis Lane. The works will pedestrianize Willis Lane with improvement works such a resurfacing, installation of bollards and addition of a canopy for a limited section between J17 and J18, providing limited vehicle access. Public domain works to Willis Lane and landscaped areas within the site include the improvement to the existing pedestrian access, and entry to John Lions Garden.

Aspect Studios has prepared a Landscape Statement and Landscape Plans (refer to **Appendix F** and **Figure 11**). The landscape scheme seeks to:

- Provide clear and accessible entries;
- Upgrade Willis Lane as a shared way, with better pedestrian amenity;
- Consider the wider campus context in the selection of ground materials; and
- Use robust materials and planting species to avoid intense maintenance regimes.

The landscape scheme comprises two main elements, being a paved platform surrounding Building J17 and upgrading of Willis Lane, described below.

Paved Platform

The paved platform allows for a relationship between interior activities and the external areas of landscaping and open space, allowing the cafe to flow out into these areas. The platform will allow for circulation as well as frame Building J17.

A selection of decorative insitu concrete will extend into the cafe to provide a simple and robust ground plane treatment without competing with the sculptural elements proposed in the building upgrades.

The installation of the paved platform will involve minor relocation of the southern edge of the building and access stairs, as well as the widening of the footpaths.

Upgrade to Willis Lane

It is proposed to develop Willis Lane into a pedestrian priority shared space as a kerb-less paved through site link. The upgrades to the Lane will improve pedestrian amenity, including bollards to limit for limited and Two courtyard spaces are proposed adjacent to these (see **Appendix F**) that will be landscaped with shade tolerant plants. These are located to the lower level and therefore viewed from above from Willis Lane.

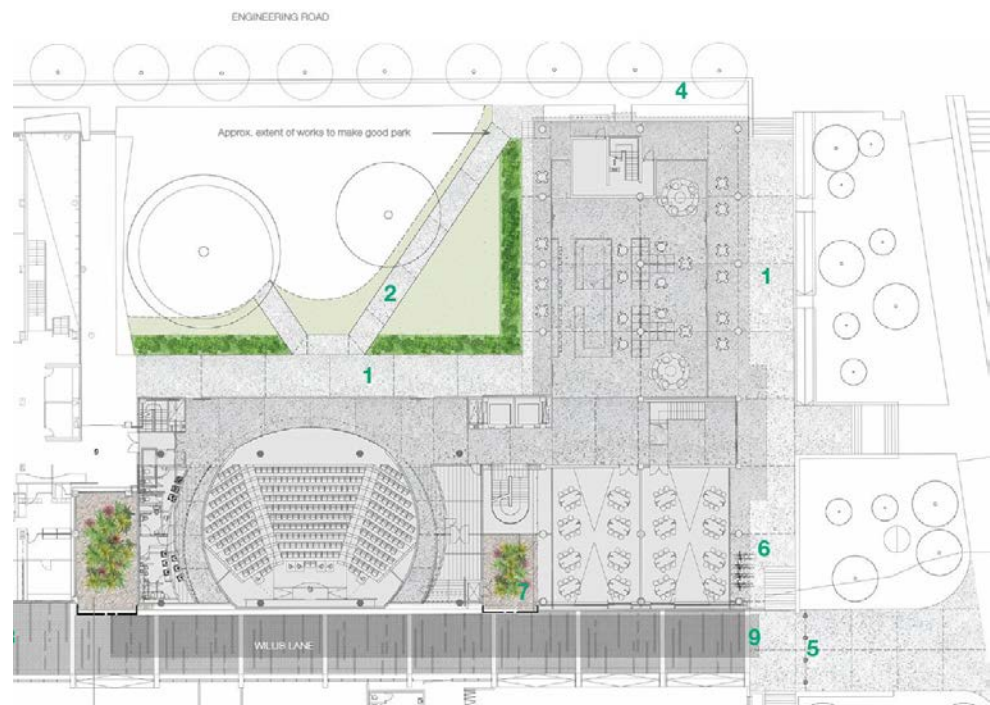


Figure 11 –Landscaping Concept

Source: *Aspect Studios*

4.2 Development Principles

Currently, operational inefficiencies are adversely impacting teaching and research outcomes and the School's ability to attract research funding, academics and students. Refurbishment of the laboratory and teaching spaces has therefore been a growing priority for the University. The proposal for the development is further described section 4.3-4.10 below.

The proposal includes the activation of the ground floor plane, with the relocation of the existing cafe, and redesign of the landscaping and ground floor plate, as well as the creation of an undercroft area. The use of large frameless glass exposes original columns as well as creating indoor/outdoor social spaces for the University and School.

The proposed development will provide the potential to deliver a range of opportunities that meet the current and future needs of the School. The development will also allow for new teaching and research opportunities, all of which have been identified as integral to the key objectives to:

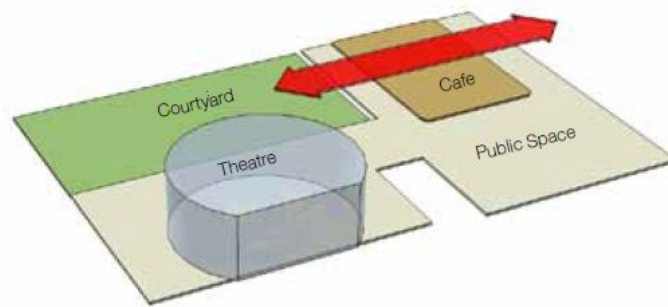
- Upgrade teaching, research and learning spaces;
- Provide a point of focus for UNSW's defined research strength of next generation materials and technologies;
- Provide a world class showcase to enable the School to grow and respond to opportunities;
- Attract funding, academics and students;
- Continue to foster collaboration across faculties and schools;
- Support and encourage learning; and
- Support and showcase UNSW's commitment to leadership in sustainability.

4.3 Building Layout and Gross Floor Area

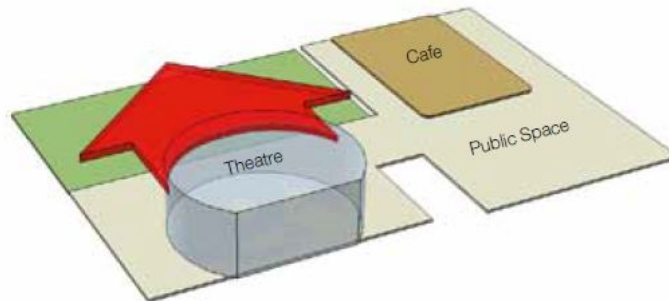
4.3.1 Building Layout

The layout, circulation and design approach is shown on the Bates Smart architectural plans at **Appendix B** with an excerpt provided in **Figure 12**. The details of the use of each level and design approach have been addressed level by level in this attached report. The building layout has been determined based on an analysis of the School's existing accommodation and required facilities (See **Figure 12**).

The MMEPD will not only accommodate uses for the School, but will also include CATS and computer facilities for the use of the University. The combination of these uses will promote collaboration between other Schools within the Faculty as well as other faculties.



Cafe: Ground plane activation



Theatre: Ground plane activation

Figure 12 – Activation of the proposal

Source: *Bates Smart*

Building J17 – Mechanical and Manufacturing Engineering Building

The layout of Building J17 places the CATS, cafe, and lecture theatre to the lower levels with School, and Faculty uses to the levels above. In accordance with UNSW policy, this design promotes interaction, circulation and activity to the lower levels of the building and allows for more specific and passive uses to the levels above. A typical stacking plan is provided, in **Figure 13** which outline the stacking of the floor plans.

Circulation is proposed to be altered from the existing north-south and east-west axis to a single north-south axis to utilise the space within the building (including the additional built form) more efficiently. As can be seen in **Figure 13**, teaching spaces are generally allocated to the northern wing of the building to utilise light and ventilation, and staff offices to the southern wing.

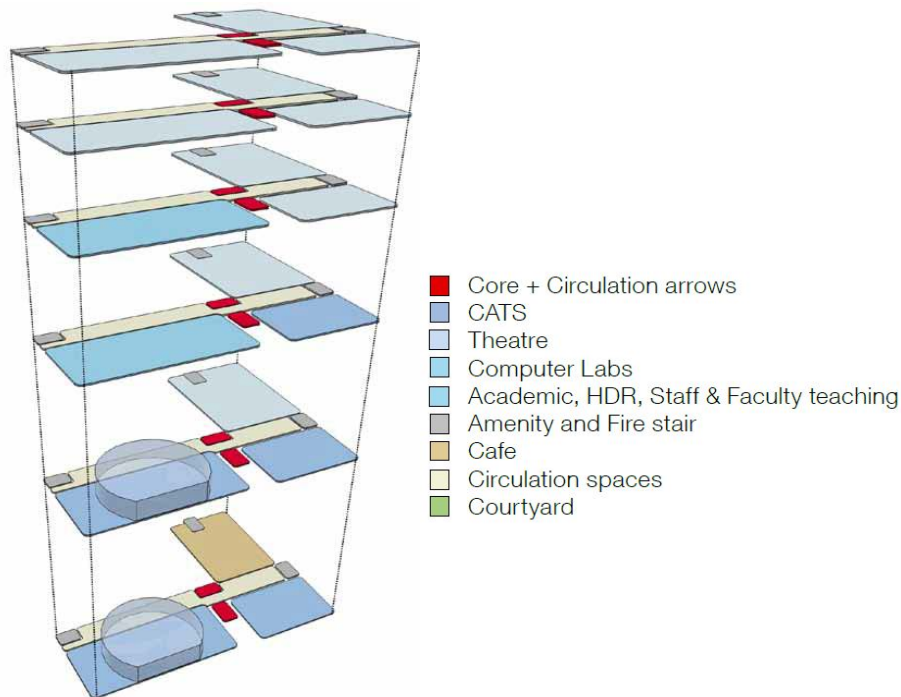


Figure 13 – Floor by floor of Building J17 proposal.

Source: *Bates Smart*

The interconnection between the southern wing of Buildings J17 and the K17 was important in the consideration of the scale of the proposal, as well as the proportional floor plate height required to match Building K17. The lecture theatre proposed to the lower floors of Building J17 is framed within the courtyard when viewed from the western elevation, exposing the underbelly of the building.

Building J18 – Willis Annex

The form of Building J18 is not proposed to be altered, with the proposal relating principally to the internal fitout works and alteration of space. A new entry will be created to the western elevation onto Willis Lane, and facade upgrades including glazing to the upper levels and new vertical slide up panel doors to laboratory space.

Buildings J17 and J18 - Facade Designs and Entrance Screens

The proposed building façade can be separated into three hierarchical layers that have been derived from the existing building; a primary layer consisting of:

- vertical terracotta tile cladding;
- concrete spandrel; and
- vertical glass glazing.

Due to difficulties in cleaning and maintenance, it is proposed to provide an alternative screen design to the northern elevation of Building J17, as well as the northern and southern facade of Building J18. A sympathetic circular pattern on rectangular grid is proposed, introducing additional light and passive shadowing treatment, utilising light weight aluminium as shown in **Figure 14** below to replicate elements of the existing facade. The existing mullion division is also to be retained below the window heads to improve sun shading to the site.

New treatment is also proposed to the eastern and western elevations of the Building J17 building through the use of concertina pattern as shown below in **Figure 15**.



Figure 14 – Proposed facade replacement of centred screening to Building J17

Source: *Bates Smart*

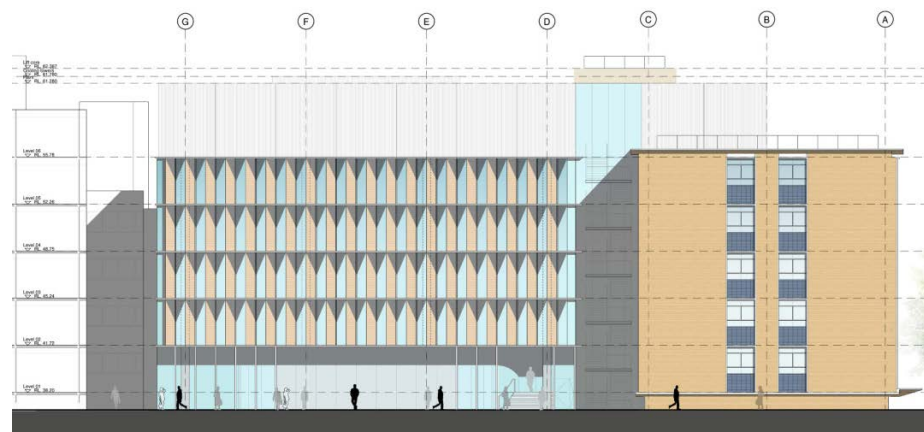


Figure 15 – Building J17 eastern elevation facade treatment

Source: *Bates Smart*

4.3.2 Gross Floor Area by Level and Uses

The proposed use and GFA for each level within the existing Building J17 and the redesigned Building J18 floor plates are provided in **Table 1** below. The proposed GFA provides a range of advantages and opportunities for UNSW including:

- maximising the site potential on a Campus with limited growth opportunities;
- rationalisation of enabling costs across a greater floor area with a resultant lower cost per square metre; and
- capitalising on opportunities to establish new research projects and CATS in 'warm shell' space as they become available.

Table 1 – GFA Figure – Floor by floor

Floor	Use	Total GFA (m ²) using existing LEP definition	Change in GFA
J17 – Mechanical and Manufacturing Engineering			
Ground	CATS, Cafe, Services and Admin Support	1,340	
First	CATS, services and administrative support	1,019	
Second	CATS, academic spaces, MME Computer Labs	1,361	
Third	academic spaces, CSE Computer Labs	1,324	
Fourth	academic spaces	1,358	
Fifth	academic spaces, CSE Computer Labs and warm shell (570m ² - use TBC by UNSW)	1,326	
Sixth	Workshop space and plant	114	
(existing J17 GFA = 5,912)		TOTAL	7,842
J18 – Willis Annex			
Level 01	Laboratory spaces	2,266	
Level 02	Laboratory spaces and laboratory support spaces	3,178	
Mezzanine	Mezzanine Level	240	
(existing J18 GFA = 5,949)		TOTAL	5,684
			+1930
			-265

4.4 Building Population

The proposal primarily involves internal refurbishment, and reconfiguration and minor increase to building GFA and envelope to Building J17. The proposal is designed to improve existing teaching, learning and research space, and does not involve an increase in student numbers or staff numbers in this development. Any increase in the building occupancy would be associated with the existing campus population and not the introduction of additional staff and students to the site.

Level 5 of the new southern wing of Building J17 is proposed as a 'warm shell' space that will not be occupied in the short term, but available for future use by the School and Faculty as a student computer laboratory. Importantly, this space will be occupied by students already on the campus and will not cater for an additional population.

As a consequence, there will be no new or additional traffic or parking impacts as a result of the future occupation of Level 5

4.5 Demolition, Bulk Earthworks and Site Preparation

Demolition of the southern wing of the Building J17 is proposed due to the small structural grid and narrow floor plate design. The bridge linking the existing Buildings J17 and J18 over Willis Lane is also proposed for demolition.

Bulk excavation works will be required to create a level ground floor plate for the circular lecture theatre within Building J17. This lower level will be excavated to RL 34. Excavation to this level will be in shallow fill and sand overlying the sandstone layer.

4.6 Car Parking, Loading and Access

4.6.1 Car Parking

The proposal (including the 'warm shell' space) will not result in any additional car parking, increased demand, or relocation of existing car parking areas as a result of no change in population. The MMEPD will be serviced by the existing on and off Campus car parking areas.

4.6.2 Loading

Loading areas currently exist on the site to the western side of the Building J18 on Willis Lane with access from a ramp from Engineering Road. Access is available for vehicles up to a medium rigid vehicle (8.8m length).

4.6.3 Vehicular Access

The proposed development will continue to utilise the existing internal road network via Gate 14 on Barker Street to access the site. The upgrades to Willis Lane are focused on the pedestrian elements of the Lane and will allow for limited vehicles access for delivery and servicing, as is currently provided. The ramp to the south of Building K17 off Engineering Road will be available to two way traffic, to allow for access and servicing, particularly to the southern elevation of Building J18.

4.6.4 Pedestrian Access

Pedestrian footpaths and access routes will be upgraded within Willis Lane as part of the proposal. The MMEPD will assist in reinforcing the role of Gate 14 as the main access point to middle campus from Barker Street.

The main entry to the Building J17 from International Square on the northern elevation will be preserved in the proposal. The western elevation entry from John Lions Garden will be enhanced and articulated.

Pedestrian access to the ground floor cafe of Building J17 and access through the John Lions Garden will be redesigned with the relocation of stairs to the south of the cafe to Engineering Road.

The existing pedestrian bridge linking Building J17 and J18 is to be removed as part of the proposal. New pedestrian access to Willis Lane will be added to the eastern elevation of the Building J17 at level 1. This entry is located directly opposite the entry to the ground floor of the Willis Annex (Building J18). Pedestrian entry to the Willis Annex from the northern elevation will be retained as part of the proposal as well as the addition of a new lift to provide access throughout this building, with direct connection to Willis Lane, resulting in no loss of amenity of access through the Building.

4.7 Water Cycle Management

SLR Consulting has prepared a Stormwater Design Statement, outlining the proposed upgrades required for the system that meets the DGRs to ensure that adequate stormwater capacity and infrastructure to service the proposed development is available. Further detail is provided at **Appendix G** and **Section 6.9**.

4.8 Utilities and Services

4.8.1 Electrical and Telecommunications

The existing UNSW electricity network has adequate capacity to service the utility requirements of the proposed MMEPD, and will not require any upgrades or augmentation, other than new connections to the refurbished buildings.

4.8.2 Hydraulic, Gas and Fire Services

A Hydraulic and Fire Services Report has been prepared by Waterman AHW Pty Ltd (**Appendix H**) which establishes the hydraulic and fire system design criteria for the refurbishment of Buildings J17 and J18.

The report concludes that the existing gas and water (potable and non potable) network has adequate capacity to service the site without requiring any augmentation or amendments. New connections will be created for the buildings in response to the upgrades, including meters and regulator assemblies to each building.

Buildings J17 and J18 will continue to be connected to the sewer system, gas main, and water mains located on Engineering Road.

The fire services within the Building will be provided in accordance with the Deemed-to-satisfy requirements of the Building Code of Australia, and relevant Australia Standards. Details of these fire services are included at **Appendix H** including:

- Automatic fire sprinkler system throughout the buildings;
- External and or internal fire drenchers where required as part of the Fire Engineers Solution;
- Fire hydrant and hose reel systems;
- Fire detection system;
- Emergency warning and intercom system (EWIS); and
- Portable fire extinguishers.

4.8.3 Stormwater

Upgrades and redirection of the existing stormwater facilities will be carried out in order to comply with the relevant Australian Standards, the Stormwater Strategy, and to mitigate existing impacts (as detailed at **Appendix G**). The stormwater works include:

- Rebuilding of the existing pipe to the northeast of Building J17 to flow north; and
- Replace existing 150mm pipe with 225mm pipe with a 1% grade to the east of the Willis Annex (J18) to reduce overland flow and improve stormwater drainage.

4.9 Waste Management

4.9.1 Operational Waste

Details of the Operational Waste Management Plan are provided at **Appendix I**. UNSW targets best practice management of operational waste. Through UNSW Facilities Management, waste management policies have been established.

The achievement of reduced waste and reduction in green house gas emissions on the site is targeted within the Operational Waste Management Plan. The operational waste will be consistent with the standard UNSW procedures and requirements for waste disposal and treatment.

4.9.2 Construction Waste

Demolition and construction waste will be managed by the selected building contractor. A Construction and Waste Management Plan prepared by Aurora Projects is included at **Appendix J**. This includes details of the types of material and waste destination, and encourages the objective of waste minimisation via avoidance, reuse and recycling. Details of construction waste are considered in further detail below in **section 6.19.4**.

4.10 Staging

The MMEPD is intended to be delivered as a single development project, however as part of the overall construction this includes successive phasing of works. The design and configuration of the project does allow for contingency in the delivery and the potential for staging if required.

During demolition and construction of the project, staff and students will be temporarily relocated and accommodated within existing campus buildings as part of a decanting exercise.

5.0 Director-General's Environmental Assessment Requirements

On 28 September 2012, the Director-General of the Department of Planning and Infrastructure issued the requirements for the preparation of an EIS. A copy of the DGRs is included at **Appendix A**.

Table 2 provides a detailed summary of the individual matters listed in the DGRs and identifies where each of these requirements has been addressed in this report and the accompanying technical studies.

Table 2 – Director General's Requirements

Requirement	Location in Environmental Assessment	
General		
The Environmental Impact Statement (EIS) must meet the minimum requirements in Schedule 2 the Environmental Planning and Assessment Regulation 2000, specifically: - form specifications in clause 6; and - content specifications in clause 7.	Section i, ii, iii	
Where relevant, the assessment of the key issues below, and any other significant issues identified in the risk assessment, must include: - adequate baseline data; - consideration of potential cumulative impacts due to other development in the vicinity; and - measures to avoid, minimise and if necessary, offset the predicted impacts, including detailed contingency plans for managing any significant risks to the environment.	Section 6.2	
Key Issues	Report / EIS	Technical Study
1) Environmental Planning Instruments (EPIs) Address the relevant statutory provisions applying to the site contained in the relevant EPIs including: - State Environmental Planning Policy (State and Regional Development) 2011; - State Environmental Planning Policy No 33 – Hazardous and Offensive Development - State Environmental Planning Policy (Infrastructure) 2007; - Randwick Local Environmental Plan 1998 (Consolidation); and - Draft Randwick Local Environmental Plan 2012.	Section 6.1 Section 6.1 Section 6.1 Section 6.1 Section 6.1	
Permissibility Detail the nature and extent of any prohibitions that apply to the development.	Section 6.1	

<i>Development Standards</i> Identify the development standards applying to the site. Outline and justify any non-compliance with development standards.	Section 6.1	
<i>Contamination</i> - Demonstrate that the site is suitable for the proposed use in accordance with SEPP 55. - Relevant policies and guidelines: <i>Managing Land Contamination: Planning Guidelines – SEPP55 Remediation of Land</i>	Section 6.1, 6.10	Appendix E
2) Policies, Guidelines and Planning Agreements Address the relevant planning provisions, goals and strategic planning objectives in the following: - NSW State Plan 2021 - Metropolitan Plan for Sydney 2036; - Draft East Subregional Strategy; and - Campus 2020, UNSW Kensington Campus DCP.	Section 6.1 Section 6.1 Section 6.1 Section 6.1	- - -
3) Built Form and Urban Design - Address the height, bulk and scale of the proposed development within the context of the Campus and the locality. - Design quality, with specific consideration of the overall site layout, axis, vistas and connectivity, open spaces and edges, primary elements, gateways, facade, rooftop, mechanical plant, massing, setbacks, building articulation, materials, choice of colours.	Section 6.3, 6.4	Architectural Plans and Report Appendix B Appendix C
4) Amenity Impacts Provide information detailing the impact and provision of solar access, overshadowing, acoustic impacts, visual privacy, view loss and wind. A high level of environmental amenity must be demonstrated.	Section 6.5, 6.12	Appendix B Appendix C Appendix M
5) Ecological Sustainable Development (ESD) - Detail how ESD principles (as defined in clause 7(4) of Schedule 2 of the <i>Environmental Planning and Assessment Regulation 2000</i>) will be incorporated in the design, construction and ongoing operation phases of the development. - Include a description of measures that would be implemented to minimise consumption of resources, water and energy, including an Integrated Water Management Plan which details any proposed alternative water supplies, proposed end uses of potable and non-potable water, and water sensitive urban design.	Section 6.13	Appendix N
6) Noise Identify the main noise generating sources and activities at all stages of construction, and any noise sources during operation. Outline measures to minimise and mitigate the potential noise impacts on surrounding occupiers of land: <i>Relevant Policies and Guidelines</i> <i>NSW Industrial Noise Policy (EPA)</i> <i>Interim Construction Noise Guidelines (DECC)</i> <i>Assessing Vibration: A Technical Guideline 2006</i>	Section 6.12, 6.19	Appendix M

7) Transport and Accessibility (Operation) - Detail access arrangements at all stages of operation and measures to mitigate any associated traffic impacts. - Demonstrate how users of the development will be able to make travel choices that support the achievement of State Plan targets. - Detail existing pedestrian and cycle movements within the vicinity of the site and determine the adequacy of the proposal to meet the likely future demand for increased public transport and pedestrian and cycle access. - Describe the measures to be implemented to promote sustainable means of transport including public transport usage and pedestrian and bicycle linkages in addition to addressing the potential for implementing a location specific sustainable travel plan. - Demonstrate the provision of sufficient on-site car parking having regard to the availability of public transport. (<i>Note: reduced car parking provision maybe supported in areas well serviced by public transport.</i>). - Estimate the total daily and peak hour trips generated by the proposed development, including accurate details of the current and future daily vehicle movements and assess the impacts of the traffic generated on the local road network, including intersection capacity and any potential need for upgrading or road works, having regard to local planning controls. Relevant Policies and Guidelines: <i>Guide to Traffic Generating Developments (RTA)</i> <i>EIS Guidelines – Road and Related Facilities (DoPI)</i> <i>NSW Planning Guidelines for Walking and Cycling.</i>	Section 4.6, 6.8, 6.19	Appendix K
8) Transport and Accessibility (Construction) Detail access arrangements at all stages of construction and measures to mitigate any associated pedestrian, cycleway or traffic impacts.	Section 6.19	Appendix K Appendix J
9) Heritage Where relevant, a Statement of Significance and an assessment of the impact on the heritage significance of any heritage items and / or conservation areas should be undertaken in accordance with the guidelines in the NSW Heritage Manual.	Section 6.7	-
10) Sediment, Erosion and Dust controls (Construction and Excavation) Identify measures and procedures to minimise and manage the generation and off-site transmission of sediment, dust and fine particles. Relevant Policies and Guidelines: <i>Managing Urban Stormwater - Soils & Construction Volume 1 2004 (Landcom)</i> <i>Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (EPA)</i>	Section 6.19	Appendix T

11) Utilities In consultation with relevant agencies, the existing capacity and any augmentation requirements of the development for the provision of utilities including staging of infrastructure shall be addressed.	Section 4.8	Appendix H
12) Staging Provide details regarding the staging of the proposed development (if proposed).	Section 4.10	-
13) Contributions Address Council's Section 94A Contribution Plan and/or details of any Voluntary Planning Agreement.	Section 2.1	-
14) Drainage Detail drainage associated with the proposal, including stormwater and drainage infrastructure.	Section 4.7, 6.9	Appendix G Appendix T
15) Servicing and Waste Identify, quantify and classify the likely waste streams to be generated during construction and operation and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste. Identify appropriate servicing arrangements (including but not limited to, waste management, loading zones, mechanical plant) for the site.	Section 4.9, 6.19	Appendix I Appendix J
Plans and Documents	Report	Technical Study
The EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Schedule 1 of the <i>Environmental Planning and Assessment Regulation 2000</i> . Provide these as part of the EIS rather than as separate documents. In addition, the EIS must include: ■ Stormwater Concept Plan ■ Landscape Plan ■ Preliminary Construction Management Plan, including of a Construction Traffic Management Plan and ■ Geotechnical and Structural Report.	Section 6.9 Section 4.1.3 Section 6.19 Section 6.10	Appendix G Appendix F Appendix J Appendix E
Consultation		
During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners. In particular you must consult with: ■ Randwick City Council; ■ Sydney Airport Corporation Limited. The EIS must describe the consultation process and the issues raised, and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided.	Section 6.18	Appendix R Appendix S

6.0 Environmental Assessment

This section of the report assesses and responds to the environmental impacts of the proposed DA. It addresses the matters for consideration set out in the DGRs (see Section 5.0).

The Mitigation Measures at Section 8.0 complement the findings of this section.

6.1 Consistency with Relevant Strategic and Statutory Plans and Policies

The DGRs require the following legislation, strategies and planning instruments to be addressed:

- NSW State Plan 2021;
- Metropolitan Plan for Sydney 2036;
- Draft East Subregional Strategy;
- Environmental Planning and Assessment Act 1979 (EP&A Act);
- Environmental Planning and Assessment Regulation 2000 (EP&A Reg);
- State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP);
- State Environmental Planning Policy (Infrastructure) 2007 (SEPP Infrastructure);
- State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33);
- State Environmental Planning Policy No. 55 – Remediation of Land (SEPP 55);
- Randwick Local Environmental Plan 1998 (Consolidation);
- Draft Randwick Local Environmental Plan 2012; and
- Campus 2020, UNSW Kensington Campus DCP.

The Development Application's consistency with the relevant strategic and statutory plans and policies is summarised in **Table 4** below. Variations to, and non-compliance with, the key standards and guidelines highlighted in the table are discussed in detail in the following sections of this environmental assessment.

Table 3 - Summary of consistency with key strategic and statutory plans and policies

Instrument/Strategy	Comments
Strategic Plans	
NSW State Plan	NSW 2021 is a 10 year plan to rebuild the economy, return quality services, renovate infrastructure, strengthen our local environment and communities and restore accountability to Government. A section of the Plan is devoted to the delivery of Education, and a key component of this is improving access to post-school education and training. The aim of this is to ensure that people have the skills required to get a good job and actively participate in the community. The proposed development is evidently consistent with the goals of the State Plan.
Metropolitan Plan for Sydney 2036	The proposal will support Randwick's role as a strategic centre for education and health, promoting the development of education, research and development clusters in and around Universities. The proposal also supports the desire to promote skills development, capacity for innovation and lifelong community learning, as put forward by the Plan.
Draft East Subregional Strategy	The draft East Subregional Strategy was released in 2007, and is intended to guide land-use planning until 2031 in the Randwick, Botany Bay, Waverley and Woollahra

	local government areas. The proposed development is consistent with a key relevant direction of the Draft Subregional Strategy, being to consolidate and strengthen the Randwick Education and Health Specialised Centre, and to recognise UNSW as a key driver of the Centre and one of Australia's foremost academic and research institutions as well as one of the largest in terms of student numbers.																																				
State Legislation																																					
EP&A Act	The proposed development is consistent with the objects of the EP&A Act, in particular: ■ it promotes the social welfare of the community; ■ it allows for the orderly and economic development of land; ■ it is development for public purposes and will facilitate the delivery of educational services to the community; and ■ opportunities for public involvement and participation will be provided.																																				
EP&A Regulation	The EIS has addressed the specification criteria within clause 6 of Schedule 1. Similarly, the EIS has addressed the principles of ecologically sustainable development through the precautionary principle, which assesses the threats of any serious or irreversible environmental damage. Clause 7(1)(d)(v) of Schedule 2 is addressed below. <table border="1"> <thead> <tr> <th>Act</th><th>Approval Required</th></tr> </thead> <tbody> <tr> <td colspan="2">Legislation that does not apply to State Significant Development</td></tr> <tr> <td><i>Coastal Protection Act 1979</i></td><td>N/A</td></tr> <tr> <td><i>Fisheries Management Act 1994</i></td><td>N/A</td></tr> <tr> <td><i>Heritage Act 1977</i></td><td>N/A</td></tr> <tr> <td><i>National Parks and Wildlife Act 1974</i></td><td>N/A</td></tr> <tr> <td><i>Native Vegetation Act 2003</i></td><td>N/A</td></tr> <tr> <td><i>Rural Fires Act 1997</i></td><td>N/A</td></tr> <tr> <td><i>Water Management Act 2000</i></td><td>N/A</td></tr> <tr> <td colspan="2">Legislation that must be applied consistently</td></tr> <tr> <td><i>Fisheries Management Act 1994</i></td><td>No</td></tr> <tr> <td><i>Mine Subsidence Compensation Act 1961</i></td><td>No</td></tr> <tr> <td><i>Mining Act 1992</i></td><td>No</td></tr> <tr> <td><i>Petroleum (Onshore) Act 1991</i></td><td>No</td></tr> <tr> <td><i>Protection of the Environment Operations Act 1997</i></td><td>No</td></tr> <tr> <td><i>Roads Act 1993</i></td><td>No</td></tr> <tr> <td><i>Pipelines Act 1967</i></td><td>No</td></tr> <tr> <td><i>Protection of the Environment Operations Act 1997</i></td><td>No</td></tr> </tbody> </table>	Act	Approval Required	Legislation that does not apply to State Significant Development		<i>Coastal Protection Act 1979</i>	N/A	<i>Fisheries Management Act 1994</i>	N/A	<i>Heritage Act 1977</i>	N/A	<i>National Parks and Wildlife Act 1974</i>	N/A	<i>Native Vegetation Act 2003</i>	N/A	<i>Rural Fires Act 1997</i>	N/A	<i>Water Management Act 2000</i>	N/A	Legislation that must be applied consistently		<i>Fisheries Management Act 1994</i>	No	<i>Mine Subsidence Compensation Act 1961</i>	No	<i>Mining Act 1992</i>	No	<i>Petroleum (Onshore) Act 1991</i>	No	<i>Protection of the Environment Operations Act 1997</i>	No	<i>Roads Act 1993</i>	No	<i>Pipelines Act 1967</i>	No	<i>Protection of the Environment Operations Act 1997</i>	No
Act	Approval Required																																				
Legislation that does not apply to State Significant Development																																					
<i>Coastal Protection Act 1979</i>	N/A																																				
<i>Fisheries Management Act 1994</i>	N/A																																				
<i>Heritage Act 1977</i>	N/A																																				
<i>National Parks and Wildlife Act 1974</i>	N/A																																				
<i>Native Vegetation Act 2003</i>	N/A																																				
<i>Rural Fires Act 1997</i>	N/A																																				
<i>Water Management Act 2000</i>	N/A																																				
Legislation that must be applied consistently																																					
<i>Fisheries Management Act 1994</i>	No																																				
<i>Mine Subsidence Compensation Act 1961</i>	No																																				
<i>Mining Act 1992</i>	No																																				
<i>Petroleum (Onshore) Act 1991</i>	No																																				
<i>Protection of the Environment Operations Act 1997</i>	No																																				
<i>Roads Act 1993</i>	No																																				
<i>Pipelines Act 1967</i>	No																																				
<i>Protection of the Environment Operations Act 1997</i>	No																																				
SRD SEPP	The aim of this policy is to identify development that is State Significant Development (SSD). Pursuant to the SEPP SRD a project will be a SSD if it falls into one of the classes of development listed in Schedule 1 of the SEPP. 'Educational establishment (including associated research facilities)' with a CIV of \$30 million or more are identified as SSD and are considered to be development of State significance. The works have a CIV of approximately \$46.5 million, and so qualifies as a State Significant Development. A Quantity Surveyor's certificate prepared by MBM Quantity Surveyors confirming the total CIV of the proposal is included at Appendix D.																																				
SEPP 33	SEPP 33 aims to define potentially hazardous and offensive uses and to establishes an assessment regime for such uses. The Applying SEPP 33 Guideline specifies screening criteria to determine whether a development is for potentially hazardous or offensive uses in accordance with the definition of the SEPP. As detailed in Section 6.20 of this report, the development will not include the																																				

	storage of any dangerous goods (including any wastes) in exceedance of the screening thresholds specified in the guideline. As such the proposed use of the building is not considered to be potentially hazardous or offensive and no further assessment under SEPP 33 is required.	
SEPP 55	SEPP 55 aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment. The SEPP specifies when consent is required for remediation of contaminated land. As detailed in Section 6.10.1 of this report, a Geotechnical and Environmental Report has been prepared by PSM and PBS Environmental (Appendix E). The assessment found that there is no history of contaminating activities on the site. Further, testing revealed that reportable concentrations of contaminants on-site were less than the test thresholds.	
SEPP (Infrastructure)	The aim of this SEPP is to facilitate the effective delivery of infrastructure across the State, including providing for consultation with relevant public authorities about certain development during the assessment process. The proposed development will not result in any increase to the number of staff or students on campus or utilising the MMEPD. The works proposed relate to a refurbishment and redesign of existing teaching spaces, Centrally Allocated Teaching Space, laboratories and research space. No traffic-related provisions are therefore triggered.	
Local Planning Instruments and Controls		
Randwick LEP 1998	Clause 17 – Zone 5 Special Uses Zone	The site is zoned Special Uses. Development that is associated with, or ancillary to Educational Establishments is permissible with consent in the zone The LEP does not have specific controls for FSR or height within the SP2 zone, however it is considered that the building form is appropriate, and is consistent with existing development on the site.
	Clause 20F – Floor Space Ratio	There is no maximum FSR stated for educational uses on the site.
	Clause 20G – Building heights	There is no maximum building height control for the Special Uses zone.
	Clause 37A - Development in Special Uses Zone	The MMEPD is located within the Kensington Campus, and is entirely consistent with the character of the locality and in accordance with the relevant mitigation measures (Section 8) will not adversely affect the amenity of nearby and adjoining development.
	Clause 42B – Contaminated Land	A Geotechnical and Environmental Report by PSM and PBS to address the potential for contamination on the site – refer to Section 6.10.1 and Appendix E.
	Clause 43 Heritage Conservation	The development site is outside of the Heritage Conservation Area under Randwick LEP 1998.
Draft Randwick LEP 2012	Clause 2.1 - Land Use Zones	The site is zoned SP2 Educational Establishment under draft LEP 2012. Development for the purposes of educational establishments (including any development that is ordinarily incidental or ancillary to development for that purpose) is permissible with consent.
	Clause 4.3 – Height of Buildings	There is no maximum building height control for the site.
	Clause 4.4 – Floor Space Ratio	There is no maximum FSR control for the site.
Development Control Plans		
Campus 2020, UNSW Kensington Campus DCP	Refer below for a discussion of consistency with the provisions of DCP 2020, noting DCPs do not apply to SSD DAs.	

Consistency with UNSW Kensington Campus DCP 2020

The UNSW Kensington Campus DCP 2020 (DCP 2020), as adopted by Randwick Council in 2007, contains detailed provisions for development of the Campus to support the Randwick LEP 1998.

The aims of this DCP are to provide planning and design objectives and provisions which will optimise:

- the physical, social, educational and environmental quality of the UNSW Kensington Campus,
- the role and environmental 'fit' of the campus within its Randwick City context and its compatibility with the evolving character of adjoining lands, and
- the Campus Experience.

The DCP contains key control drawings and indicative illustrative principles to be followed for the ongoing development and renewal of the Campus. In addition to the Building Heights, Building Alignments, and Campus Legibility and Street Layout plans, the other following plans also guide development.

- Gathering and Connective Spaces;
- Important Public Rooms;
- Hubs;
- Existing Trees;
- Landscape;
- Indicative Sections;
- Housing;
- Retail and Child Care; and
- Transport.

The proposal is consistent with the objectives of the DCP in that it will enhance the Kensington Campus and improve environmental sustainability when compared to the current Buildings J17 and J18. However, it is acknowledged that the proposal departs from some of existing DCP controls, particularly with respect to building heights.

The existing Building J17 currently exceeds the maximum wall height provision of the DCP 2020 (See **Figure 16**) having a height of approximately 21m (6 storeys). Whilst the proposal involves an additional level to the south wing of Building J17, the maximum height of the building will not increase given the height of the existing lift overrun is to remain.

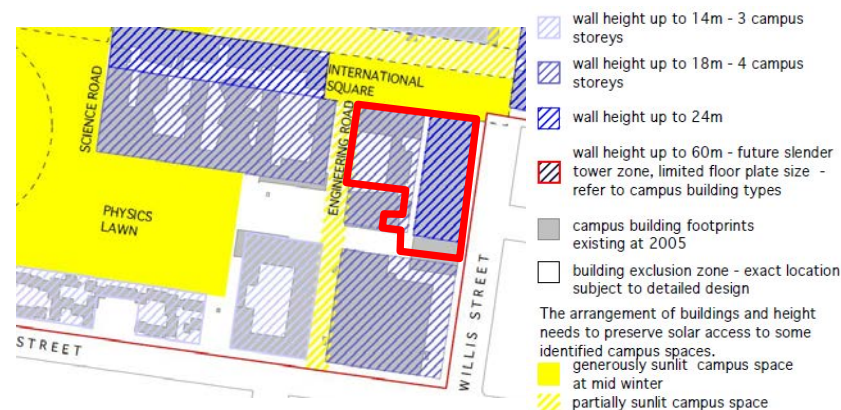


Figure 16 – DCP 2020 – Building Height Map

Source: *UNSW DCP 2020*

On its merits, and based the low level of impacts resulting from the proposal, the development is considered to meet the objectives of the DCP. It is noted that DCP 2020 will carry no weight in assessment because of clause 11 of State Environmental Planning Policy (State and Regional Development) 2011 due to the status of the application as a SSD DA.

6.2 Environmental Risk Assessment

The Environmental Risk Assessment (ERA) establishes a residual risk by reviewing the significance of environmental impacts and the ability to manage those impacts. The ERA for the University site has been adapted from Australian Standard AS4369.1999 Risk Management and Environmental Risk Tools.

In accordance with the DGRs, the ERA addresses the following significant risk issues:

- the adequacy of baseline data;
- the potential cumulative impacts arising from other developments in the vicinity of the site; and
- measures to avoid, minimise, offset the predicted impacts where necessary. This includes the preparation of detailed contingency plans for managing any significant risk to the environment.

Figure 17 indicates the significance of environmental impacts and assigns a value between 1 and 10 based on:

- the receiving environment;
- the level of understanding of the type and extent of impacts; and
- the likely community response to the environmental consequence of the project;

The manageability of environmental impact is assigned a value between 1 and 5 based on:

- the complexity of mitigation measures;
- the known level of performance of the safeguards proposed; and
- the opportunity for adaptive management.

The sum of the values assigned provides an indicative ranking of potential residual impacts after the mitigation measures are implemented.

Significance of Impact	Manageability of Impact				
	5 Complex	4 Substantial	3 Elementary	2 Standard	1 Simple
1 - Low	6 (Medium)	5 (Low/Medium)	4 (Low/Medium)	3 (Low)	2 (Low)
2 - Minor	7 (High/Medium)	6 (Medium)	5 (Low/Medium)	4 (Low/Medium)	3 (Low)
3 - Moderate	8 (High/Medium)	7 (High/Medium)	6 (Medium)	5 (Low/Medium)	4 (Low/Medium)
4 - High	9 (High)	8 (High/Medium)	7 (High/Medium)	6 (Medium)	5 (Low/Medium)
5 - Extreme	10 (High)	9 (High)	8 (High/Medium)	7 (High/Medium)	6 (Medium)

Figure 17 – Risk Assessment Matrix

Item	Phase	Potential Environmental Impact	Proposed Mitigation Measures and / or Comment	Risk Assessment		
				Significance of Impact	Manageability of Impact	Residual Impact
Noise	C+O	– Increase in noise levels during construction activities – Increase in noise levels of operations including students and staff	– Adoption of a noise management plans to minimise and managed noise and vibration emissions from the site. – Appropriate sound minimisation measures to be incorporated within the plant and mechanical areas.	3	1	4 Low / medium
Traffic and Parking	C	– Increased traffic on local roads – Increased parking on local roads	– The proposal does not result in any increased numbers of students or staff and therefore will not have any adverse impacts on the surrounding road networks and intersections. – The existing parking arrangements and access to public transport have been assessed by Arup in the Traffic and Transport Report (Appendix K). – The Traffic and Transport Report outlines that the construction traffic volume peaks would likely occur in the early stages of construction, most likely during the demolition phase, and will be determined and adequately managed by the contractor in preparation of the final Construction Traffic Management Plan (CTMP) in accordance with the Construction Management Plan (CMP).	3	2	5 Low / medium
Visual	O	– Visual impact from local residences, public roads and public open space.	– Visual impacts arising from the form and scale of the proposed buildings, particularly the addition to the Building J17 will be mitigated through, building setbacks, and location of plant. – The development has been designed to be generally consistent with the exiting building envelope, below the existing maximum building height, and is not considered to have and significant adverse impacts to surrounding dwellings and views to the west from Willis Street.	3	2	5 Low / medium
Heritage	C+O	– Impact on heritage items/Conservation areas – Impact on heritage items in the vicinity.	– The proposed development will not result in any material impact on the significance or value of the Heritage Conservation Area (HCA), and as a result, no further assessment or mitigation measures are considered necessary. There are no heritage items in the immediate vicinity of the site.	1	1	2 Low
Air Quality	C+O	– Decrease in air quality	– The proposed development is not expected to significantly change pollution levels in the area. Measures will be implemented during construction to minimise dust generation, as outlined in the Preliminary CMP included at Appendix J.	2	2	4 Low/medium
Biodiversity	C+O	– Loss of trees within the development site – No significant impact identified in regard to flora and fauna	– Given the developed nature of the site and current and historical uses, there are not likely to be any significant impacts on any threatened species, populations or ecological communities or their habitats. – The proposal does not involve any tree removal and existing trees will not be impacted directly by the proposed development. Appropriate management measures will be put in place to mitigate any impacts to this vegetation	1	1	2 Low

Contamination	C	Exposure of contamination or hazardous materials during construction	A Contamination Assessment has been carried out on the site (Appendix E) which found that there is no history of contaminating activities on the site. Further, testing revealed that reportable concentrations of contaminants on-site were less than the test thresholds.	1	2	3 Low
Water Quality	C+O	No significant impact identified	- During construction, erosion and sediment controls will be undertaken in accordance with the construction management plan. - Stormwater management protocol will be put in place.	1	2	3 Low
Waste	C + O	Generation of waste	- Waste management would be addressed as part of the Construction and Waste Management Plan prepared by Aurora and will be prepared by the contractor on site. This would include initiatives such as: - Investigate the use of recycled materials in construction materials; - Maximisation of the recycling of wastes where possible; - All waste for disposal would be removed by a licensed waste contractor and disposed of at a licensed landfill facility if required.	1	1	2 Low
Crime	O	Potential areas of crime associated behaviour	The proposal encourages increase ground floor and lower level activation within the buildings that will promote passive surveillance with the site and surrounding areas,	2	2	4 Low / medium
Greenhouse	C + O	Potential increase in emissions	- The proposal does not generate any additional demand for car parking. - Consideration of non-car travel modes including public transport, walking and cycling for staff and visitors. - Incorporation of ESD targets in the design of the proposed building.	1	1	2 (Low)

Key: C – Construction, O: Operation

6.3 Site Suitability and Implications of Proposed Land Uses

The site is considered suitable for the proposed development for the following reasons:

- it is within the Kensington Campus and is co-located with other key and supporting education and research services;
- Does not propose to change the existing use of the site;
- the location of the MMEPD will facilitate future development on the Campus, acting as a catalyst for the creation of a grouping of science and engineering facilities on the lower Campus;
- the provision of MMEPD will strengthen the research and education facilities available on the Campus and within the broader health and education precinct; and
- the utilisation of the existing built form and building envelope does not result in any significant adverse impacts on the use of surrounding buildings or the amenity of adjoining occupants.

Further to the site suitability, the project demonstrates State significance by providing a number of social benefits, including

- upgrade teaching, research and learning spaces;
- provide a point of focus for UNSW's defined research strength of next generation materials and technologies;
- provide a world class showcase to enable the School to grow and respond to opportunities;
- attract funding, academics and students;
- continue to foster collaboration across faculties and schools;
- support and encourage learning; and
- support and showcase UNSW's commitment to leadership in sustainability.

6.4 Built Form and Urban Design

6.4.1 Built Form

Envelope

The building envelope of Building J17 will increase by one level to the south wing, while Building J18 remains generally consistent as a result of the proposal. The demolition and reconstruction of the southern wing to Building J17 involves a minor increase in building height to an RL of 62.38 to the southern wing, but not exceeding the existing maximum building height (lift overrun). The existing Building J17 currently exceeds the maximum wall height provision of the DCP 2020 having a height of approximately 21m (6 storeys) to the northern elevation to International Square. The additional level to the southern wing of Building J17 will result in a wall height to Willis Lane of five storeys (approximately 20m).

Besides the minor increase in building envelope and height to the southern wing of Building J17, the remainder of the building form is consistent with the existing built form. The visual impact of the proposed development is addressed at **Section 6.5**.

Materials

The proposal uses the following materials as shown on the Architectural Plans at **Appendix B** and sampled in the Architectural Design Statement at **Appendix C**:

- Terracotta tiles;
- Clear anodized aluminium;
- Red back glass;
- Clear glass; and
- Charcoal metal louvers.

6.4.2 Urban Design

An Architectural Design Report has been prepared by Bates Smart and is provided at **Appendix C**. This report includes an analysis of the site, design approach, materials and description of the design. The urban design and built form of the buildings draw on the existing character of the buildings and precinct, whilst including modern and energy-efficient treatments to the facades as well as activation and interconnection. The key urban design issues identified by Bates Smart that have been addressed in the proposal include:

- New volume;
- Circulation (vertical and horizontal);
- Stacked floors;
- Ground plane activation;
- Vertical circulation ;
- Connection to Building K17;
- Proportional relationship between Building J17 and J18; and
- Courtyard framing lecture theatre.

6.5 Visual Impact

The proposal responds to the demand for an update to the existing facilities, functionality and efficiency of the buildings' floor plates. As demonstrated, the architectural plans as well as the Architectural Design Report, the proposal predominantly relates to an upgrade to the existing buildings which includes the demolition and reconstruction of the southern wing of Building J17, although results in minor amendments to the building forms.

The key potential for impacts is to the view available from Willis Street to the west. The views that currently exist from these dwellings are district views over the Campus and beyond and will not be adversely affected as a result of the proposal, particularly given the height of other building on the Campus such as Rupert Myers (M15) and Chemical Sciences (F10) (to the left and far right of **Figure 18** respectively).



Figure 18 – View of Building J17 and J18 from Willis Street stairs.

Source: *Bates Smart*

Figure 19 below illustrates the existing views available from the residential properties to the east of the site on the eastern side of Willis Street. The existing views are substantially screened by the existing well established landscaping to the western side of Willis Street. Accordingly, there will be no substantial or discernible increase in height or loss of view from outside of UNSW.



Figure 19 – Existing view west from the eastern side of Willis Street

6.6 Solar Access and Overshadowing

As part of the Architectural Design Report provided at **Appendix C**, solar analysis diagrams have been prepared. Given the proposed works primarily relate to the refurbishment and additions to Building J17, the impact of overshadowing and solar access is minimal. The additional mass and floor level to the southern wing of Building J17 is located such that the impacts of the addition are minimal.

The solar analysis diagrams demonstrate that due to the size of the Campus and the location of the site, as well as the immediate topography, the buildings will not have any impact on any neighbouring (off-site) properties such as Willis Street at any time of the year.

Importantly, the proposal will have no significant additional impact to the existing solar access to John Lions Garden or open space to University Road, International Square or University Mall. These areas, particularly the Garden, will become a focal point of social activity within the MMEPD.

Given the proximity and the orientation of the adjoining Building K17, the proposal will result in some additional overshadowing to the northern elevation of this building. The additional overshadowing is considered to be minimal and will not significantly impact the use or amenity of the teaching space/offices within Building K17.

The addition of a canopy/awning between Buildings J17 and J18 along Willis Lane will provide solar and weather protection, ultimately improving the amenity of this space as shown in **Figure 20**).

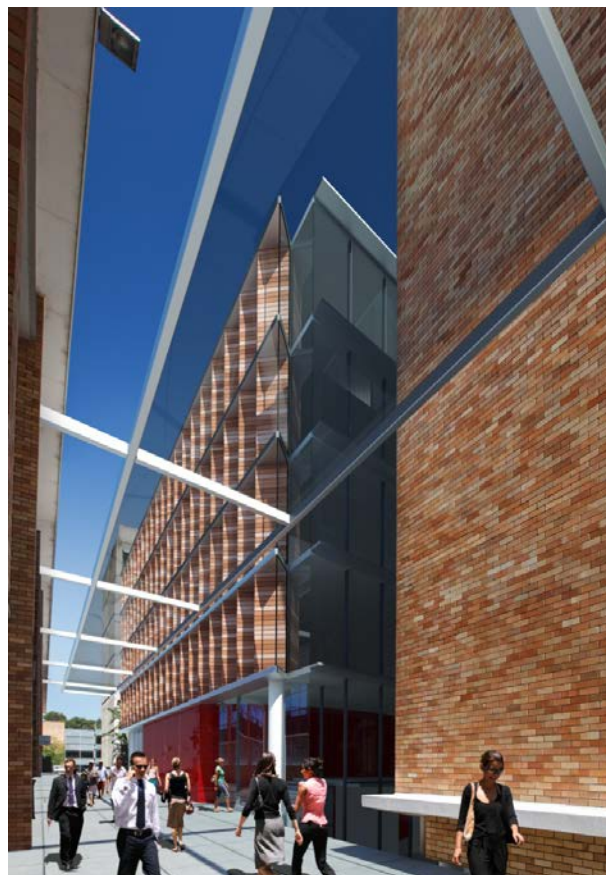


Figure 20 – Proposed awning to Willis Lane.

Source: *Bates Smart*

6.7 European Heritage

As detailed at **Section 3.2**, the UNSW Kensington Campus contains the Old Tote Courtyard HCA. The HCA is located in the centre of the Campus' High Street frontage (near Gate 6), approximately 250m north of the MMEPD. There are no other HCA's or individual heritage items surrounding the development site external to the Campus.

The proposed development will not result in any material impact on the significance or value of the HCA, and as a result, no further assessment or mitigation measures are considered necessary.

6.8 Parking, Traffic and Access

A Traffic and Parking Report has been prepared by Arup and is included at **Appendix K**. The report outlines the existing surrounding road network arrangements and conditions, traffic volumes, traffic generation and demand for parking for the Campus.

As outlined in **Section 4.6** above, the proposal will not contribute to any additional staff or student capacity, with no additional students to be accommodated on the site as a result of the proposal. The additional GFA (including the 'warm shell' space) will provide space for a future student computer laboratory for the School, and Faculty, and will therefore not generate any additional demand for car parking.

6.8.1 Car Parking

The Traffic and Parking Report, outlines that the proposal does not include any on-site car parking and will not result in any increase in parking demand, nor the relocation or modification of existing parking areas. The proposal will also not result in an increase to parking requirements on or off the campus.

Parking is provided at pay-parking stations to the south and east of the site on the UNSW campus, as well as on-street parking in the surrounding streets. Parking for workers will be addressed in the Construction Traffic Management Plan (CTMP) will be prepared which prior to the commencement of construction works.

6.8.2 Traffic Generation

Given that the proposal does not involve an increase in the UNSW student/staff population, or an increase in parking provision, there will be no change to total site traffic generation compared with existing levels. Furthermore, no public roads will be closed during construction and completion with vehicular site access maintained from Gate 14 on Barker Street. The proposal therefore does not result in any requirement for surrounding road upgrades.

6.8.3 Access

Vehicular

Vehicular access to the site will remain as existing from Gate 14, Engineering Road, and Library Road in a clockwise direction. Willis Lane is proposed to be converted to a pedestrian priority shared way with removable bollards. Vehicle access will remain available for delivery and serving to Willis Lane with two-way controlled access for service vehicles. The maximum service vehicle size is an 8.8m medium rigid vehicle (MRV), usually for garbage collection. The impact of this is addressed in **section 6.8.4**.

Pedestrians and Cyclists

The Kensington Campus is well serviced by an extensive pedestrian network which is supported and enhanced by the proposed development. Further to these pedestrian networks, the proposal will also foster bicycle use.

Bicycle facilities including 21 bicycle racks adjacent to Building J17 are currently provided along with end of trip facilities including lockers and shower within Building K17. These elements will be retained with the addition of one disabled access shower within Building J17 at level 1 and two public accessible showers within Building J18 providing a total of four showers in proximity to bicycle parking. In addition to the existing bicycle parking racks throughout the Campus, the proposed development will accommodate new bicycle racks to the front of the Building J17 (see **Appendix F**).

6.8.4 Loading and Servicing

Loading areas currently exist on the site to the western side of the Willis Annex (J18) on Willis Lane with access from a ramp from Engineering Road. As part of the proposal, the loading arrangement will be managed via two-way use of the access ramp south of Building K17 from Engineering Road. A limited number of vehicle trips will utilise the existing internal road network to access Willis Lane for servicing and deliveries.

Adequate manoeuvring space for MRV (8.8m) which represents a garbage vehicle and other delivery vehicles is available, with sufficient manoeuvring space for vans, cars, and small rigid vehicle (SRV). Given the infrequent deliveries, deliveries from MRV will be managed via the two way access, with waiting space provided. Given the lack of pedestrian access and main entries to the southern part of Willis Lane, impacts to pedestrian movements are considered negligible.

6.9 Water Cycle Management

A Stormwater Management Plan has been prepared by SLR Consulting (refer to **Appendix G**) to assess the capacity of the existing Buildings J17 and J18 Stormwater drainage and provides recommendation for modification to meet the demands of the MMEPD and meet requirements of Australian Standards and DGRs.

The Stormwater Management Plan outlines the main components of the new stormwater system, which has been designed to comply with the Council-endorsed Stormwater Strategy. The site does not incorporate any detention on site, with flow directly through the UNSW stormwater system to the Village Green detention basin. This basin recharges the Botany aquifer with stormwater from low intensity rain events and in high intensity rain events discharges into the local streets.

The key element of stormwater upgrades are the rebuilding and diversion of an existing undersized pipe to the east of Building J18. This pipe will be diverted north, rather than south where it is currently 'trapped' between Building J18 and the Barker Street car park and integrated with the existing system.

The existing stormwater infrastructure shows that the network for Building J17 and J18 was constructed in the early 1960's and subsequent development has resulted in 'low points' and 'traps' for overland flows.

The Stormwater Management Plan confirms that the works will increase the capacity of pipe drainage and divert stormwater away from a 'trapped' low point, relieving existing above floor flooding in J17 in a 100 year ARI storm event. Plans have been included to indicate the approved stormwater drainage system, and how it connects to the proposed surrounding stormwater network.

The existing stormwater harvesting scheme at the Village Green include filtration, storage and recovery instruments, and therefore no additional stormwater quality treatments are required to be incorporated in the upgrade works. Details of the sediment, erosion and dust controls during construction are discussed in **Section 6.19.6**.

6.10 Soils, Geotechnical and Groundwater

6.10.1 Site Contamination

Pells Sullivan Meynik (PSM) has prepared a cover letter and summary of the Contamination Investigation prepared by JBS Environmental (**Appendix E**). The Contamination Investigation has determined the potential for on-site contamination. The investigation considers the historical uses, site conditions, surrounding uses and the potential contamination issues.

A review of historical aerial photographs has shown that whilst the site was previously part of the Kensington Racecourse, it has been used for University purposes since the early 1960s. Specifically, the current Engineering Buildings appear to have commenced construction in the 1961 aerial photograph and were fully constructed by the time of the 1970 photograph.

Based on the site's history and visual observations, the following areas of the site levels suggest that there is potential fill material underlying the site

Soil samples were tested from four drilled boreholes on the site for the presence of volatile organics. The results of the laboratory analysis indicated the following:

- concentrations of TPH, BTEX, OCP, OPP and PCB were all less than the laboratory limit of reporting (LOR) and less than EPA-endorsed investigations for secondary schools (considered suitable for University use);
- concentrations of benzo(a)pyrene, PAHs, and phytotoxicity investigation levels were all below the adopted assessment criteria and/or the laboratory LOR;
- detectable concentrations of heavy metals were reported, however these were less than both the health-based and ecological assessment criteria; and
- asbestos was not detected in the soil samples

The Investigation concludes that the site in its current condition is considered suitable for the continued university/open space land use without further investigation or need for long term site management,

6.10.2 Geotechnical

A Geotechnical Investigation been prepared by Pells Sullivan Meynink (PSM) (**Appendix E**) to assess the surface and subsurface conditions of the site and to advise on the foundations, excavation, and slope for the proposal.

Two boreholes were drilled on site and were tested for conductivity, pH, chloride and sulphate concentration. The geology of the site as identified on the Sydney 1:100,000 geological map is underlain by medium to coarse sandstone with very minor shale and laminite lenses.

Based on the results of the site investigations, the report provides advice on the geotechnical aspects of the proposed civil and structural design, with discussion of retaining walls due to the site geometry and fill. These recommendations relate to earthworks, excavation, retention systems, foundation options and earthquake design.

6.10.3 Groundwater

The investigations carried out by PSM at **Appendix E** identified that minor perched groundwater was noted above the sandstone layer. The groundwater could not be observed due to the use of water for coring. Testing revealed groundwater at around 6m below ground level.

The contamination report (**Appendix E**) identified that ground water is anticipated at depths of over 3.9m before the ground surface within the natural material. Based on the proposed level of excavation, the geotechnical reports identifies that the excavation conditions will be predominately within shallow fill and sand sitting over the sandstone.

The recommendations of PBS and PSM Environmental Report are included in the Mitigation Measures at Section 8.0.

6.11 Wind Impacts

SLR Consulting has undertaken a Qualitative Wind Impact Assessment for the MMEPD (refer to **Appendix L**). As part of the assessments, the existing wind climate, seasonal winds, and existing local wind environments have been considered.

SLR Consulting identify that the existing street levels wind conditions are likely to be under 16m/sec and fall into the 'walking comfort' criterion. The availability of shielding from a number of surrounding buildings including K17, M15, and J17 and J18 are acknowledged, however the ability for exceedance is identified.

The existing upper level wind conditions at the site are likely to exceed the 16 m/sec "walking comfort" criterion for stronger prevailing wind directions (e.g. west) given the absence of surrounding buildings of significant height from the west.

The Wind Impact Assessment predicts the wind flow patterns and future wind environment as a result of the proposal. The wind environment to the surrounding footpaths, primary entry points, internal public access areas, seating and dining areas, will remain largely unchanged as a result of the proposal as remain within the 'walking comfort' criterion.

Due to the design of the undercroft of the outdoor cafe to the ground floor of Building J17, vertical windbreaks of a minimum 1.5m high to the north of the cafe perimeter are proposed as a wind mitigation measure as shown in **Figure 21** below.



Figure 21 – Proposed window amelioration measures to Building J17.

6.12 Acoustic Impacts

An Acoustic Report for the building's operational phase has been prepared by Acoustic Studio and is included at **Appendix M**. The report considers the impact of noise emissions from mechanical services and services vehicles as well as operational noise emission and impacts. Construction noise and vibration has also been considered in this report although is addressed separately in **section 6.19.3** of this EIS. Mitigation measures to manage noise emissions from plant and equipment are provided in **Section 8**.

6.12.1 Noise Emission

The report establishes the existing noise environment based on long-term and short-term monitoring data. Unattended noise measures were conducted to determine the existing ambient noise levels for the area (as shown in **Table 4** below). The nearest residential noise sensitive locations include:

- off Campus - single and double storey houses and unit buildings sited along Willis Street to the east, approximately 25m from the eastern boundary of the site;
- off Campus - single and double storey houses sited along Barker Street approximately 90 metres from the site; and
- on Campus - southwest of the proposed project, at a group of 3-storey buildings, namely Barker Apartments, on Barker Street approximately 100 metres from the site.

The nearest educational receivers surrounding the site are:

- on Campus - teaching premises are located within Building K17 (Computer Science) to the south of the proposed project and adjacent to the site; and
- on Campus - teaching premises are located within Building K15 (Old Main), Building M15 (Rupert Myers) and Building G19 (John Niland Scientia) to the west, southwest and northeast of the proposed project, respectively, and all more than 25 metres from the site.

The report outlines the noise criteria for these receivers based on the *EPA Industrial Noise Policy*. These criteria (refer to **Table 4**) have been used as the basis for the assessment.

Table 4 - Noise criteria for MMEPD Mechanical Plant Noise Assessment

Receiver	Noise Level
Residential – Urban (external)	
Day	56 LAeq,
Evening	46 LAeq,
Night	43 LAeq,
Classroom (Internal)	
Noisiest 1-hr period when in use	40 LAeq

The following acoustic noise control measures are to be put in place to minimise noise impacts associated with plant and equipment:

- Noise enclosures;
- Noise barriers;
- Acoustic louvers;
- In-duct attenuation;
- In-built attenuation for noisy equipment; and
- Sound absorptive panels.

6.12.2 Assessment of Operational Noise Sources

Mechanical Services Noise

Whilst detailed noise levels for mechanical plant are unable to be determined prior to detailed design, the Acoustic Report confirms that the final plant will be capable of meeting the relevant noise criteria subject to the implementation of standard noise control measures such as attenuators, acoustic louvres, barriers, enclosures, and the careful location and orientation of the plant, air inlets and air outlets.

By ensuring that the adjoining teaching and nearby residential buildings meet the relevant operational noise criteria, development on neighbouring sites will also comply with noise controls.

Operational Noise

The proposed MMEPD will continue to be used for educative facilities with internal upgrade to teaching facilities laboratories and testing facilities. The acoustic report considers the worst case noise emitting activities (other than mechanical plant and equipment) would be:

- Building J17: Noise from café operation in the ground level; and
- Building J18: Noise from laboratories operations

It is considered that upon completion of the proposal, the operational noise impacts for the most affected residential receivers will not result in any change, or any increase to the noise impacts, and no operation noise controls are recommended.

6.13 Environmentally Sustainable Development

An Environmentally Sustainable Design Report has been prepared by Arup, and is included at **Appendix N**. The report includes a description of the measures that would be implemented to minimise consumption of resources, water and energy. Details relating to water management, specifically integrated water management are addressed under **Section 6.9** of this report.

The ESD scheme seeks to achieve this by managing key elements of the proposal, including:

- Sustainable management;
- Indoor environmental quality;
- Energy efficiency;
- Transport;
- Water management; and
- Materials.

UNSW has a commitment to sustainability in the planning, design and management of all new buildings on the Campus. The main sustainability objectives Buildings J17 and J18 are to:

- Demonstrate environmental leadership, responsibility, and a reduced carbon footprint;
- Contribute to, and improve the Campus wide approach to energy and water issues;
- Establish targets for saving water, energy and waste that can be monitored through the life of the two buildings; and
- Enable flexibility and adaptability to extend the life span of the two buildings.

The implementation of sustainable design initiatives set out in **Appendix N** will ensure consistency with the sustainability objectives outlined in the University's Planning and Design Guide, which seek to demonstrate leadership and responsibility in sustainability by developing a campus that is environmentally sound, socially responsible and economically viable.

Many of the standard sustainability rating and tool systems are intended to guide design of office, education, or health buildings but are inherently unsuitable when applied to laboratories. The operation of research buildings requires special consideration to be invested in energy and water reduction systems to minimise health and safety conflicts. Additionally, the Kensington Campus provides an infrastructure system where energy and water are managed across the whole Campus. This leverages the potential of the shared system to realise greater reductions in resources than any of the individual buildings alone.

The environmental performance of the development has also been assessed by using clause 7(4) of Schedule 2 of the EP&A Regulation. The proposed development is consistent with the five accepted principles of ESD described below.

Precautionary Principle

If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

The proposal is supported by environmental studies and technical reports which conclude that there are no environmental constraints that would preclude the development of the site, subject to appropriate management during the design, construction and operational stages. It is considered that through adherence to the mitigation measures outlined in **Section 8.0** the proposal will not result in negative environmental impacts.

Integration Principle

The integration principle states that decision-making processes should effectively integrate both long-term and short-term economic, environmental and social considerations. The design of the additions to Building J17, demolition and construction and internal fitout have been developed to integrate the short and long-term effects of economic, environmental and social considerations in the provision of specialised educational facilities at the University.

Intergenerational Equity

The principle of inter-generational equity holds that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations. The proposal has been developed to directly benefit current and future generations in that it contributes to the provision of education services for the community without causing significant impact to the environment.

Biological Diversity

Under the biodiversity principle, the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making.

The development site does not contain any threatened or vulnerable species, populations, communities or significant habitats. The construction and ongoing operation of the MMEPD will be managed in accordance with the mitigation measures, ensuring no significant indirect impacts on the surrounding environment.

Valuation and Pricing of Environmental Resources

Under this principle, improved valuation, pricing and incentive mechanisms as well as environmental factors should be included in the valuation of assets and services.

The cost of infrastructure and other design measures to ensure an appropriate level of environmental performance has been incorporated into the cost of development. In addition, the level of waste will be appropriately managed during the construction and the operation of the development as outlined in **Appendix J**.

6.14 Building Code of Australia

Separate Building Code of Australia (BCA) Capability Statements have been prepared by Vic Lilli and Partners for Buildings J17 and J18 (**Appendix O**). These find that the proposed works are capable of meeting the requirements of the BCA, with the inclusion of fire engineering outcomes. Where compliance with the deemed-to-satisfy provisions of the BCA cannot be achieved, an alternative solution will be developed prior to the issue of a Construction Certificate (see **Section 8** - mitigation measures).

Section J of the BCA sets out minimum energy performance targets by which a development must adhere to with specific emphasis on the thermal performance of the building's envelope and the building services which assist in maintaining comfort conditions for the building's users.

6.15 Accessibility

An Access Review has been prepared by Morris Goding Accessibility Consulting (**Appendix P**) that reviews the proposed works to both buildings relating to ingress, egress, paths of travel, circulation areas and sanitary facilities in accordance with the AS1428 series, BCA, Disability Discrimination Act (DDA), and the UNSW Kensington Campus DCP 2020.

The proposal provides continuous paths of travel for people with disabilities and includes recommendations for each building. The recommendations of this report and solutions will be implemented prior to the issue of a Crown Certificate.

6.16 Fire Safety

Separate Fire Engineering Consultant Advice including a fire safety concept designs have been prepared for Buildings J17 and J18 by Exova Warringtonfire (Aus) Pty Ltd (**Appendix Q**). The report identified the variations from the Deemed to Satisfy Provision of the BCA (as identified in the BCA Report) and provides a fire engineered analysis. The alternative solutions provide in this advice for both buildings relate to:

- fire resistance and compartmentation;
- egress; and
- fire services and equipment.

The alternative solution identified in both reports can be readily addressed and is expected that the proposed redevelopment will readily achieve compliance with the relevant fire-safety provisions of the BCA 2012.

6.17 Economic and Social Benefits

The proposed MMEPD will include new research facilities, highly specialised laboratory spaces, learning and teaching spaces, computer laboratories, office space, and a top line lecture theatre well as 'warm shell' space for future School and Faculty use. The proposal will bring a number of social and economic benefits to UNSW and in turn the local and regional economy including:

- Upgrade teaching, research and learning spaces;
- Provide a point of focus for UNSW's defined research strength of next generation materials and technologies;
- Provide a world class showcase to enable the School to grow and respond to opportunities;
- Attract funding, academics and students;
- Continue to foster collaboration across faculties and schools;
- Support and encourage learning; and
- Support and showcase UNSW's commitment to leadership in sustainability.

6.18 Consultation

In accordance with the DGRs for this project, consultation has been undertaken with Randwick City Council and the Sydney Airport Corporation Limited (SACL).

A summary of the consultation undertaken to-date is provided below.

6.18.1 Council Consultation

A pre-lodgement meeting was held with Randwick City Council officers on 3 April 2012 to discuss the proposed works to Building J17, with comment received on 30 April and 14 June 2012. At this time the application was to proceed as a DA to Council for the upgrade and external addition to J17 only (as the CIV was to be under \$30million). The items raised in the pre-lodgement minutes listed below have been considered in the proposed re-design (see **Appendix R**):

- Statutory planning controls;
- Urban design;
- Impacts of the proposed development;
- Ecological sustainable development; and
- Servicing and engineering comments.

Whilst the pre lodgement meeting with Council related only to J17, the issue and potential amenity impacts identified by Council have been addressed for both Buildings J17 and J18 as part of the proposal. The substantive works as part of the MMEPD relate to J17, with internal fitout works and minor facade amendments to J18.

6.18.2 Sydney Airport Corporation Limited (SACL)

The University initiated the consultation process with SACL based on the proposed scheme, including lightning prevention infrastructure to the top of Building J17. Whilst the envelope of the existing Building J17 is amended as part of the proposal, the maximum building height, for the purposes of SACL (to the top of lightning rod) is intended to remain unchanged.

In telephone discussions between JBA and the Airfield Design Manager of SACL it was generally considered that given the existing height of the buildings and the height of surrounding buildings, the proposal would not raise any concerns to SACL. Details of the correspondence is included at **Appendix S**.

6.19 Construction Impacts

6.19.1 Air

Air emissions are likely to occur during demolition, excavation, construction involved with traffic movement, dust generation, and transportation of soils. Where this occurs, the management measures outlined in the preliminary Construction and Waste Management Plan (CWMP) prepared by Aurora (**Appendix J**) will be adopted to reduce any potential air quality impacts. These measures include truck wash down, air monitoring and use of a water cart.

6.19.2 Water

The CWMP also sets out a number of measures that will be employed to ensure that stormwater quality is maintained during construction ensuring stormwater that leaves the site has no unacceptable impacts to adjoining areas. These may include:

- construct earth bunds and similar diversion drains to divert surface water runoff, temporary sediment and erosion controls to prevent the erosion of soil from disturbed construction areas and stockpiles;
- Stormwater Re-use for Dist suppression;
- Limiting exist and entry points;

- Controlled discharge; and
- Limitation of land disturbance.

An Erosion and Sediment Control Plan has also been prepared by Robert Bird Group (**Appendix T**) which details the proposed sediment basins, silt traps and sediment fencing which will be installed on the site during the construction period. Further details for management measures during construction with regard to stormwater are included in the Stormwater Management Plan prepared by SLR Consulting (**Appendix G**).

6.19.3 Construction Noise and Vibration

The Acoustic Report prepared by Acoustic Studio includes construction noise and vibration, and the potential impact of construction activities on surrounding sensitive receivers and occupiers of land (refer to **Appendix M**).

The DGRs require construction noise to be addressed in terms of the potential impact on neighbouring off-site premises as well as on-site education premises and University buildings and recreation. The closest neighbouring residential developments are the dwellings to the east of the site on Willis Lane and some residents on Barker Street. Nearby teaching and university premises include K17 to the south. Building K15 (Old Main), Building M15 (Rupert Myers) and Building G19 (John Niland Scientia) are all located more than 25m from the site.

Noise

The Report sets out the airborne construction noise as prescribed by the *Interim Construction Noise Guidelines, 2009* which are provided below in **Table 5**.

Table 5 – Construction Noise Criteria for most affects receivers

Sensitive Receivers	Airborne Construction Noise Criteria in DA L_{Aeq}	
	Within Standard Hours	Outside Standard Hours
Residential Properties along Willis and Barker Streets		
Noise affected	51 + 10 = 61	50 + 5 = 55
Highly noise affected	75	N/A
Commercial and retail	70	
Education Premises	45 (internal)	

To mitigate the impacts of the construction the following noise management measures are proposed to implemented as per **Table 6**.

Table 6 – Construction noise management measures

Item	Strategy
Plant and Equipment	Use quieter equipment.
	Operate plant in a quiet and effective manner.
	Where appropriate, limit the operating noise of equipment.
	Maintain equipment regularly.
	Where appropriate, obtain acoustic test certificates for equipment.
On Site Noise management	Strategically locate equipment and plant.
	Avoid the use of reversing alarms or provide for alternative systems.
	Maximise shielding in the form of existing structures or temporary barriers.
	Schedule the construction of barriers and structures so they can be used as early as possible
Consultation, notification and complaints handling	Provide information to neighbours before and during construction.
	Maintain good communication between the community and Project staff.
	Have a documented complaints process and keep register of any complaints.
	Give complaints a fair hearing and provide for a quick response.

	Implement all feasible and reasonable measures to address the source of complaint
Working schedule	Schedule activities to minimise noise impacts.
	Ensure periods of respite are provided in the case of unavoidable maximum noise levels events
	Keep truck drivers informed of designated routes, parking locations and delivery hours.

The proposed hours of construction are as follows in **Table 7**.

Table 7 – Hours of Construction

Day	Times
Monday to Friday	7am to 6pm
Saturday	8am to 5pm
Sunday or Public Holidays	No works

Based on typical construction practices and equipment used, it is anticipated that the principal source of noise emissions during the construction process will be generated during the ground excavation phase.

The continuous noise associated with standard deliveries and internal demolition / construction works are expected to comply with stated standard noise criteria for residences on Willis Street. The predicted noise levels at the external walls of K17 will exceed the applicable criteria.

The Report notes that there will be times and situations during demolition and construction work that will exceed the established noise criteria for both the residential and educational receivers. Appropriate noise control measures have been recommended (where feasible and reasonable) and are included as mitigation measures in **Section 8**.

Vibration

The major sources of vibration during construction include, rock breakers and jack hammers. The nearest sensitive receivers with regard to vibrations are the occupants of residences in Willis Street and staff and students on the campus, particularly within the adjacent Building K17. The Report considers the vibration levels for human comfort and building damage.

Detailed information of plant and equipments is not available and the vibration assessment has considered the impacts of generic 'vibration-intensive' activities are the most affected receivers. On-site data obtained by Acoustic Logic for preliminary works to Building J18 has also been considered. Specifically for this site, it is noted that Nano Technology labs currently existing within Building J18 was far more stringent than the 'standard' human comfort and building damage criteria.

Vibration levels are expected to comply with the human comfort continuous vibration criteria at all sensitive receiver locations for all likely scenarios considered for the MMEPD works. Further, Acoustic Studio considered that 'vibration-intensive' works are likely to comply with the vibration criteria for both residential and educational vibration criteria for receivers surrounding the site.

- Eastern boundary facing nearest residential receivers on Willis Street; and
- Boundary of nearest on-campus educational receivers to MMEPD site (i.e. occupied areas within Building K17).

Acoustic Studio recommend that the University implement its own Noise (and Vibration) Management Plan to minimise any disruption, damage or interference to its own facilities, as well as a communications plan. The recommendations of this report are incorporated as mitigation measures in **Section 8**.

6.19.4 Construction Waste

The preliminary CWMP prepared by Aurora identifies the following practices and procedures for the management of waste during the construction period (refer to **Appendix J**). Before commencement of works on site, a detailed Construction Management Plan (CMP) will be prepared to outline the exact procedures during construction. Details of the types of material and waste destination are to be included in this detailed CMP.

6.19.5 Construction Traffic

The construction traffic impacts as a result of the proposed development have been considered within the Traffic and Transport Report prepared by Arup (**Appendix K**) with further details incorporated into the CMP prepared by Aurora (**Appendix J**).

The Traffic and Transport Report prepared by Arup outlines that the construction traffic volume peaks would likely occur in the early stages of the project, most likely during the demolition phase, and will be determined by the contractor in preparation of the final Construction Traffic Management Plan (CTMP). The impacts of construction traffic will be adequately managed through the preparation of this report with regard to the amenity of University buildings and surrounding residential dwellings.

6.19.6 Sediment, Erosion and Dust Controls

During construction to ensure the obligations under the *Protection of the Environment Operations Act* are maintained, downstream stormwater harvesting infrastructure will be preserved. Other methods include the following (as detailed in **Appendix G** and **Appendix T**):

- Silt fences will ensure sediment is not washed from stockpiled materials or blown from exposed areas;
- Silt traps and sand bags will filter sediment laden stormwater before entering the stormwater network;
- Catch drains will divert clean stormwater away from building sites, stockpiles and exposed earth;
- Wheel washes will remove sediment from construction vehicles tyres; and
- Irrigation will suppress dust during dry and windy weather.

Erosion controls will be installed prior to the start of construction and will be regularly inspected and maintained for the duration of the works period.

Details of the erosion and sediment control measures are shown on the Erosion and Sediment Control Plan (**Appendix T**) prepared by Robert Bird Group.

6.20 Operational Waste

A waste management statement has been prepared by UNSW which sets out the waste management operations and waste management policy on the Campus (**Appendix I**). The proposed uses of the building will not result in the storage or handling of waste generated within the building which constitutes dangerous goods in quantities above the screening thresholds set out in applying SEPP 33. As such the proposed generation of waste for this building has been considered against the provisions of SEPP 33, and based on the definitions within the policy, the proposed uses are not considered to be potentially hazardous or offensive.

7.0 Conclusion and Justification of the Proposal

This EIS has been prepared to consider the environmental, social and economic impacts of the MMEPD at the UNSW Kensington Campus. The EIS has addressed the issues outlined in the DGRs (**Appendix A**) and accords with Schedule 2 of the EP&A Regulation with regards to consideration of relevant environmental planning instruments, built form, social and environmental impacts including traffic, noise, demolition and construction impacts and stormwater.

It is considered the project warrants approval for the following reasons:

- the proposal is consistent with the principles of ecological sustainable development as defined by Schedule 2(7)(4) of the EP&A Regulation as well as Section J of the BCA;
- The alterations, refurbishment, fitout and redeveloped floor plate of Building J17 will allow for a more efficient use of space and the construction of one of the largest lecture theatres on Campus;
- The internal modifications of Building J18 (Willis Annex) allow for the upgrade and installation of highly specialised laboratory and facilities, positioning UNSW at the forefront of education and research;
- the proposal does not result in an increase to staff or student numbers and will therefore not have any impact on traffic generation and on-site parking, and will support the University's objectives of encouraging higher use of public and active transport and decreasing the use of cars;
- the proposed development will not impact on the University's HCA or any other heritage items or surrounding HCA's;
- the development will not have a significant impact on the quantities of general waste generated by the University; and
- the provision of upgraded modern research and education buildings will further support and strengthen the services and facilities provided in the Randwick Education and Health Specialised Centre.

Given the planning merits described above, and significant public benefits proposed, it is requested that the Minister approve the application.

8.0 Mitigation Measures

The collective measures required to mitigate the impacts associated with the proposed works are detailed in **Table 8** below. These measures have been derived from the previous assessment in **Section 6** and those detailed in appended consultants' reports.

Table 8 - Mitigation Measures

Mitigation Measures

Environmentally Sustainable Development

- Detail design will incorporate the Sustainability Design Indicatives outlined in the ESD Statement prepared by Arup dated 12 November 2012

Geotechnical

- Detailed design is to incorporate the recommendations of the Geotechnical and Environmental Report prepared by Pells Sullivan Melliak (PSM) dated November 2012.

Building Code of Australia (BCA)

- The recommendations of the BCA Capability Statements are to be employed before detailed design and prior to the issue of a Crown Certificate.

Preliminary Construction Management Plan

- A detailed Construction Management Plan will be prepared in accordance with the preliminary Construction Management Plan prepared by Aurora Projects prior to the issue of a Crown Certificate.

Wind

- Detailed design is to incorporate the recommendations of the Wind Report prepared by SLR Consulting dated October 2012.

Noise and Vibration

- Construction noise and vibration measures will be implemented in accordance with the recommendations of Acoustic Studios dated Nov 2012.