

**The Australian Institute
of Nanoscience**

At

**The University of
Sydney**

**State Significant
Development
Declaration Application**

Table of Contents

1	Background	1
2	Site Description	1
3	Development Description	3
4	Permissibility and Strategic Planning	4
5	Preliminary Environmental Impacts	6
6	Justification	7
7	Consultation	8
8	Capital Investment Value	8

1 BACKGROUND

The University of Sydney has received an award from the Federal Government for the construction of an Australian Institute of Nanoscience (AIN) within the Camperdown Campus of the University of Sydney.

The building that will house the AIN will undertake a number of functions including:

- **Research:** the centrepiece of the building will be a suite of around 4,000 m² of high quality laboratory space, including up to 1,200 m² of clean rooms for research into nanoscience and laboratories supporting five Centres of Excellence, two of which are headquartered in and three of which have major nodes located in the School of Physics.
- **National access:** Also located in these laboratories will be the national access facility of the AIN, built around the University's fully-owned subsidiary Bandwidth Foundry International, which provides research services to the Australian academic community with support from the National Collaborative Research Infrastructure Scheme (NCRIS).
- **Postgraduate training:** The building will accommodate teaching laboratories for postgraduate courses in Physical Sciences and for advanced undergraduate activities, including a laboratory for third year experimental physics to replace the facility lost in the demolition of the Physics Annexe.

2 SITE DESCRIPTION

The Camperdown Campus of the University of Sydney is bounded by Parramatta Road, City Road and Missenden Road as Shown in Figure 1. The proposed development site will be wholly within the grounds of the University - well removed from residential, commercial and other land uses.

The new AIN building will be located behind the Physics Building near the Edward Ford Building, and adjacent to Wesley College and St Paul's College. Figure 2 shows the indicative AIN - Physics Building location and adjacent buildings.

The total site area of the proposed development is approximately 5,500m².

Agreement has been reached with St Paul's College for the transfer of land from St Pauls to the University.

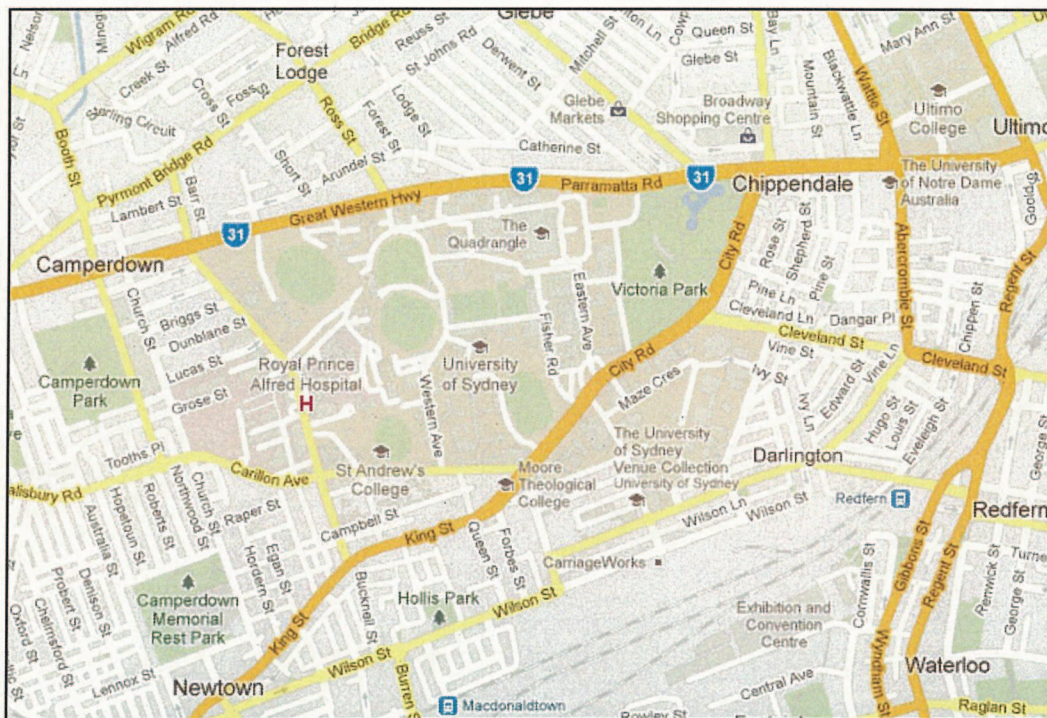


Figure 1 Location Plan

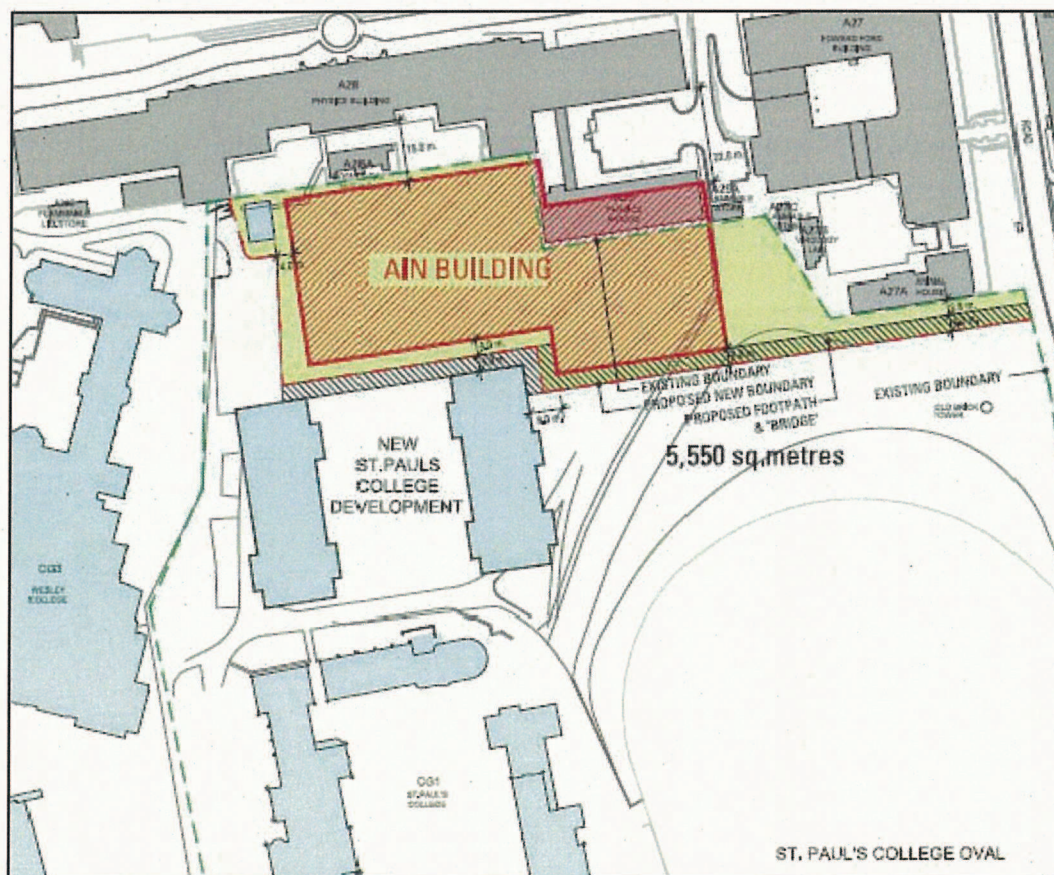


Figure 2: Indicative AIN - Building site area

3 DEVELOPMENT DESCRIPTION

The project involves the development of a major science research and education facility with a total budget of \$110m including research equipment.

The new building will be the first stage of an overall Master Plan that integrates a shared student common and lecture theatres across three faculties on land made available by St Pauls College. With access to an almost green field site (only an annexe to the present School of Physics needs to be removed) all significant laboratories can be built underground. The associated office spaces, seminar rooms, postgraduate teaching facilities and shared facilities will be positioned within an area that also contains undergraduate teaching theatres. This common area runs through the campus linking the medical faculties, Physics and the University's medical research precinct.

The centrepiece of the AIN project is a multi storey building that has yet to be designed but will contain clean rooms, rated from ISO grade 4 to grade 7 according to ISO standard 14644-1. Inside will be "tools" capable of sculpting nano-scale features into advanced materials using lithography and plasma etching, depositing atomically thin layers of other materials, attaching electrical or optical connectors using robotically operated alignment tools, and performing sophisticated measurements that will elucidate fundamental physical concepts or evaluate fitness of purpose for applications in communications, medicine or astronomy. Much of this equipment will be provided by funding agencies for collaborative access, and the clean rooms will have provision for training, levels of access, and observation corridors for information tours.

The clean rooms and associated discipline-defined laboratories will be underground to ensure maximal control over vibration and temperature with dust control achieved by a purpose-built air conditioning system with high grade (HEPA) air filters.

The ground floor will contain flexible research training spaces and research seminar rooms to suit varying pedagogies from traditional research seminars to collaborative training, arranged along either side of the new pedestrian thoroughfare.

Offices for over 200 research staff and postgraduate students on the first floor will be modular and reconfigurable, to promote collaboration and cross-disciplinary research, allowing for expansion of academic and research staff numbers and teams, and with the capacity to accommodate more than 50 visiting academics and students.

The building will meet a minimum 5 green star rating in line with the University's Policy on environmental sustainability. The low profile ensures compliance with heritage constraints and with best practice examples internationally.

Environmental sustainability will be an integral consideration from the commencement of the design phase, not an add-on after construction. It is critical that the AIN embody

innovative design practices and comprehensive utility and waste monitoring and that these are linked to meaningful key performance indicators (KPIs) that inform management targets. The clean rooms at the heart of the AIN require particular levels of energy and resource use.

In summary, the anticipated total gross floor area of the development is approximately 12,000 m², made up of the following components:

- Approximately 4,540m² of specialist laboratories space for research groups with stringent vibration, temperature control and cleanliness requirements.
- Approximately 3,375m² of teaching spaces, including: 960m² of lecture theatre space comprising a traditional tiered space for 320 people; a flexible flat floored seminar space for up to 90 people; smaller seminar rooms for 45 - 50 people each; and a collection of teaching laboratories;
- Approximately 2,950m² of workspace for 218 occupants (including staff and research students) in a mixture of open and private work setting; and
- Approximately 1,135m² of shared support services including a full service café and a concierge / security point;

The new building will be integrated with the existing heritage-protected Physics Building and will contain multiple floors and zones whose conditions span a range of functions and very specific technical requirements on cleanliness, vibration, electromagnetic environment and temperature control.

4 PERMISSIBILITY AND STRATEGIC PLANNING

The key planning controls are contained in the following instruments and documents:

State

- State Environmental Planning Policy (State and Regional Development) 2011;

Local

- South Sydney Local Environmental Plan 1998
- South Sydney Development Control Plan 2007 - Urban Design
- City of Sydney Heritage Development Control Plan

Other Policies and Plans

Sydney City Council has prepared a draft local environmental plan identified as the Sydney LEP 2011. However, although a draft of this planning instrument has been adopted by Council and the Central Sydney Planning Committee, the draft Plan has not been certified

for exhibition by the Director-General of the Department of Planning and is therefore not currently relevant to this application.

Strategic direction for the application is also provided by the Sydney Metropolitan Strategy (the Metro Strategy) released in December 2005 and Sydney City Subregional Strategy. The proposed development is considered to be consistent with these strategies which respond to the challenges of Sydney's Growth to 2030.

Permissibility

The permissibility of the site is given by the local planning instrument which is the South Sydney Local Environmental Plan (SSLEP) 1998. Under SLEP the site is zoned 5 Special Uses (University).

The objectives of zone 5 of SLEP are:

- (a) *to facilitate certain development on land which is, or is proposed to be, used by public authorities, institutions, organisations or the Council to provide community facilities, services, utilities or transport facilities, and*
- (b) *to allow other ancillary development which is incidental to the primary use specified on the map, and*
- (c) *to provide flexibility in the development of sites identified for special uses by allowing development which is permissible on adjoining or adjacent land, and*
- (d) *for land in the zone and within Green Square, in addition to the above:*
 - (i) *to reflect and reinforce the need for proper recognition of community land and facilities as part of a robust public domain in the Green Square locality, and*
 - (ii) *to recognise that protecting and improving the quality, accessibility and impact of the public domain makes a fundamental contribution to the social, economic, environmental and urban design outcomes for the area, and*
 - (iii) *to ensure that development contributes to a sustainable, vibrant community, and reflects equal and integrated consideration of social, economic and environmental design issues.*

Development for the following purposes is permissible in zone 5 of SSLEP:

The particular land use indicated by red lettering on the map, or land uses which are ancillary or incidental to that land use; development that may be carried out (with or without consent) on adjoining or adjacent land in the same or a different zone; roads; temporary buildings.

Development for 'University' purposes is permissible in the zone. As the proposed development is being undertaken by the University in accordance with its Charter, the

proposed development is permissible with consent. In terms of the zone objectives the proposed development is considered to be consistent with these objectives.

SLEP also contains provisions in clauses 22-27 that deal with the conservation of heritage items, heritage conservation areas and heritage streetscape areas.

The proposed development is State Significant development by virtue of the provisions of State Environmental Planning Policy (State and Regional Development) 2011. Clause 8 of the Policy provides:

8 Declaration of State significant development: section 89C

(1) Development is declared to be State significant development for the purposes of the Act if:

(a) the development on the land concerned is, by the operation of an environmental planning instrument, not permissible without development consent under Part 4 of the Act, and

(b) the development is specified in Schedule 1 or 2.

Clause 15 of Schedule 1 of the Policy provides that the following form of development has been declared to be State significant development:

Development for the purpose of educational establishments (including associated research facilities) that has a capital investment value of more than \$30 million.

5 PRELIMINARY ENVIRONMENTAL IMPACTS

It is considered that the proposal will need to be considered against the following issues

- Compliance and Consistency with Planning Controls and Policy
- Transport, Traffic Access and Parking
- Heritage and Archaeology
- Infrastructure
- Architectural form and treatment
- Social and economic benefits
- Mobility and access
- Visual assessment
- Waste Management
- Energy Efficiency

6 JUSTIFICATION

The justification for the proposed development is to provide:

- (i) Internationally competitive laboratory and research facilities to maintain the standing of the University. Such facilities are presently unavailable anywhere on campus as recognised by the Federal Government;
- (ii) Innovative new lecture and laboratory facilities for efficient undergraduate and high quality postgraduate education; and
- (iii) A national access facility for nanofabrication.

The centrepiece of the new building will be a nanoscience fabrication and experimental facility underpinning research in photonics, quantum science, astronomy and space physics and materials science. The building will be designed from the ground up to have all the features required of a high quality nanoscience facility, and more generally, a world-leading facility for modern physical sciences research and teaching. Design from the ground up ensures that the building will not only meet the demanding requirements of today's research and research-led teaching, but those of tomorrow as well.

This development of this facility positions the University and New South Wales as one of the few campuses/cities internationally that have such a facility.

The AIN will deliver these benefits and create impact through:

- Keystone infrastructure serving the national nano-science community and enabling Australian researchers to fabricate novel nano-structured devices and materials;
- Strategic realignment of the University's research in physics for translation of new technologies and materials into a wide variety of applications;
- Cohesion of several internationally leading and nationally collaborative research centres. These include the ARC Centres of Excellence CUDOS (in Photonics) and CAASTRO (in astrophysics and astronomy) which will be headquartered at the University from 2011 - 2017, and nodes of three other Centres of Excellence in quantum science and high energy physics; and
- Increased productivity and research capacity for 100 researchers who in the last 7 years have attracted over \$100m of non-capital research investment.

The purpose-designed space will accommodate 50 visiting researchers enabling deeper national and international partnerships both through the Centres of Excellence and with the CSIRO, Harvard University, and various EU groups.

7 CONSULTATION

The mission and vision of the AIN have been discussed with internal and external stakeholders including faculties and staff within the University, University Colleges, and other universities, government research laboratories (CSIRO, National Measurement Institute, Anglo Australian Observatory) and the NSW government departments (Department of Education and Training, and the Office of Scientific and Medical Research).

Following the declaration of the project as a State significant development it is proposed to undertake a program of consultation which will involve the following organisations and groups:

- Sydney City Council;
- Premiers Department;
- Roads and Traffic Authority;
- Department of Planning and Infrastructure;
- Heritage Office;
- Energy Australia; and
- Local community forums.

8 CAPITAL INVESTMENT VALUE

The project cost, including transfer of land from St Pauls to the University, site works and building construction and outfitting with advanced research infrastructure, is \$110.1 m.

The capital cost of the project is approximately \$75m