Science Research and Education Facility

Australian Institute of Nanoscience
The University of Sydney

Response to Submissions

(SSD 5087-2011)

August 2013

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Statement of Validity

Response to Submissions prepared by

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Applicant Details

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Site Details

Site Address	Physics Road, Camperdown Campus
Lot and DP	Part Lot 101 in DP 11171804; and Part Lot 1966 in DP 1117595

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1 Introduction

1.1 Overview

A Statement of Environmental Effects for a State significant development application [SSD 5087-2011] involving the construction and use of a research and education facility for the Australian Institute of Nanoscience (AIN) at Sydney University, Camperdown was publicly exhibited for a period of five weeks between the 24th January 2013 and the 28th February 2013.

In total five (5) submissions were received in response to the public exhibition of the application – 4 from government authorities and one from a private organisation.

The Department of Planning and Infrastructure has also issued a letter to the University of Sydney, dated 27 September 2012, setting out additional information or clarification required prior to final assessment of the project.

Sydney University with its specialist team has reviewed and considered the submissions and, in accordance with clause 75H(6) of the Environmental Planning and Assessment Act 1979 (EP&A Act) has responded to the issues raised. This Response to Submissions (RtS) sets out the proponent's response to the issues raised in the consultation process, details the resulting changes to the proposed development, and includes a summary of the Mitigation Measures proposed.

This report should be read in conjunction with the Statement of Environmental Effects (SEE) dated August 2012 and forms part of the development application.

1.2 Submissions Received

In addition to the preliminary assessment provided by the Department of Planning and Infrastructure, a total of five (5) submissions on the development application were received after the exhibition period from the following organisations:

- Sydney City Council
- Heritage Council of New South Wales
- Roads and Maritime Services
- Wesley College
- Sydney Water

A summary of the submissions received and a comment on how particular issues have been addressed in this submission are contained in Table 1. A copy of each of the submissions is provided in the appendices.

Table 1 Summary of Submissions Received

COMMENT		How Addressed
NSW Department of Planning & Infrastructure		
1,2,3	Legislation & Planning	Addressed in Section 3.2

COMMENT		How Addressed
	• Update the submission in accordance with new LEP 2012. • Supply a copy of the material submitted to Council with the approved Early Works DA. • The State Environmental Planning Policy (Urban Renewal) 2010 is not relevant.	
4,6	Pedestrian Walkway – More detail required.	Addressed in Section 2.2
	Pedestrian Access - Amend architectural drawings to eliminate direct pedestrian access from the western courtyard onto Wesley College's land.	Direct access eliminated. See Drawing DA-1000
5	Western facades – improve design to provide greater visual interest.	Facade Redesigned. Drawing DA-3001
7,8,10	Impact on Adjacent properties: additional information is requested with respect to Noise, Light Spill and Overshadowing.	Addressed in Section 3
9	Access to Premises – ensure compliance with the provisions of the BCA and D D Act.	See Appendix B
11	Update Mitigation Measures.	See Section 4
12	Provide details of operational and construction jobs associated with the proposed development.	See Section 2.2
Sydney City Council		
1	Ensure the accessibility review meets the relevant requirements of the BCA and DD Act.	See Appendix B
2,10	• Obtain archaeological assessment if the subject development site is extended. • A range of consent conditions are proposed	Noted General agreement with suggested conditions with the exception of the number of bicycle parking spaces.
3-6,8	Trees and Landscaping • Retain the fig tree near the rear of the Edward Ford Building along with trees 1, 2, 6, 7, 8, 39 and 40 (total 7) (as identified on the Arboriculture Impact Assessment Report). • Provide explanation for the removal of the Jacaranda Tree (numbered 40). • Obtain advice from a qualified arbourist regarding plant selection, tree planting locations, tree management and ensure canopy coverage is replaced. • Engage a qualified Arbourist with minimum Australian Qualification Framework (AQF) of Level 5. • Update the review to ensure compliance with the Australian Standard AS 4970-2009 Protection of Trees on Development Sites (AS4970).	• Comments Noted. • Jacaranda Tree was uprooted during a storm and was subsequently removed.
9	Recommends community consultation regarding noise and dust, and the use of intrusive appliances.	Noted – to be addressed in CEMP.
11	Specify the actual number of bicycle parking and end trip facilities proposed by the development.	The recommended number of bicycle parking spaces to be provided is not agreed.
12	Car spaces should meet the requirements of the LEP2012 and AS/NZS 2890.1 – 2004.	Agreed
21	Accessible Parking Spaces must comply with Australian Standard	Agreed

COMMENT		How Addressed
	AS/NZS 2890.6 – 2009.	
13	Ensure new roads are designed and constructed in accordance with the City's "Development Specification for Civil Works Design and Construction" and associated costs to be borne by developer.	Not applicable
14-17	Traffic Works & Management: • Alterations to the public road designed in accordance with RMS Technical Directives and reviewed by the Committee. • Configure the site to allow vehicles to enter and exit the site in a forward direction. • Submit a Construction Traffic Management Plan. • Construct access driveways in accordance with Council's specifications.	Agreed
18-20	Lists a range of requirements for Construction Management Plan.	Noted – see Section 4
NSW Heritage Council		
1-4	Comments – The development will materially affect the significance of the place in terms of heritage impacts to view lines, vistas and landscape character. It appears that the AIN Building will be seen above the roof of the Physics building and is not symmetrical about the axis. The photomontages do not accurately depict the extent of trees proposed to be removed in the St Paul's master plan.	Noted – See heritage Impact Assessment in Appendix F.
5	Recommends the applicant: a) Provide an 'urban' section along the Wilkinson (Hockey) Axis, drawn by the University's architect. b) Provide a physical or computer three-dimensional model to examine significant views and vistas. c) Provide a photomontage from the Education Building of the Physics Building. d) Provide a copy of the School of Physics Conservation Management Plan.	Noted.
6-12	Recommended Conditions provided.	Noted – See Mitigation Measures in Section 4.
Roads and Maritime Services		
1-8	Recommend s the following requirements: • Installation of vehicular crossing and kerb and gutter works on Parramatta Road & City Road in accordance with RMS requirements. • Submit a Construction Traffic Management Plan (CTMP) and a Traffic Control Plan. Traffic Control must be carried out by RMS accredited controllers. • Obtain a Road Occupancy Licence for works impacting flows on City Road. • Submit a swept paths plan for the longest vehicle accessing the site, which complies with AUSTROADS. • Ensure the layout of car parking areas, loading docks and access driveways comply with AS 2890.1- 2004 and AS 2890.2 - 2002 for heavy vehicle usage.	Noted. Issues raised will be addressed in CTMP.
Wesley College		
2,4-8,10,11	The development will have a major impact on the College: • Noise from traffic flow in the area between the Physics building & Wesley college,	See Section 4

COMMENT		How Addressed
	• visual amenity (western facade), • overshadowing, • machinery noise, • pedestrian activity, • privacy of residential wing; and • light spill.	
3,9	Concern about level of consultation. Future consultation proposed.	See Section 1.4
12	Construction Noise should be minimised.	See Mitigation Measures Section 4.
Sydney Water (SW)		
1,2,8	Detailed water servicing strategy required at Section 73 Application stage.	Noted
3	The developer will need to protect Sydney Water mains traversing the site.	Agreed
5	• Sheet piling adjoining Sydney Water asset requires written approval from SW, • Groundwater Impact Analysis on Building over or adjacent to wastewater main - design to comply with allowable loading conditions.	Noted. Where required requisite approvals will be obtained.
6.	Deviation of the stormwater channel will address issues for the University and St Paul's College and is subject to further discussion and approval.	Noted
7	An application should be submitted for permission to discharge trade wastewater to the sewerage system before business activities commence, if required.	Noted. Where required requisite approvals will be obtained.

1.3 Response to Submissions

While none of the submissions received objected to the proposed development of the site for the AIN facility, the submissions contain detailed comments and suggestions on various aspects of the building design and its potential environmental impacts. In response to the issues raised in the submissions, and as a result of further detailed design investigations, a number of changes to the design of the AIN facility have been made. However, while the volume, height and bulk of the modified building have been reduced the original functional specification has been retained. Accordingly, the description of the operation of the facility provided in the original EIS is unchanged.

The environmental impacts of the development have been significantly reduced, particularly in terms of:

- Reducing the heritage impact on the adjoining Physics Building to which it is lightly linked;
- Improving the separation between the AIN Building and the proposed St Paul's residential development; and
- Reducing the potential impacts (overshadowing, noise, light spill, pedestrian congestion etc) on the adjoining Wesley College.

The main changes incorporated into the revised design include:

- A change to the size, location and shape of the AIN Building's footprint;
- The western wing is symmetrically positioned to provide a 20m visual opening on the Wilkinson Axis;
- The setback of levels 2-4 of the AIN Building's southern facade has been increased by 18m from the southern site boundary;
- The separation between the AIN Building and the Physics Buildings (A28) has been increased;
- The linkages between the AIN Building and the existing Physics Building (A28) have been reduced to a single level;
- A green roof has been added to level 2 of the AIN Building opposite St Paul's proposed development;
- The eastern overhead pedestrian bridge has been replaced by an external stairway engaged with the eastern side of the AIN Building; and
- Consequential internal changes to the distribution of activities within the AIN Building by eliminating the internal court yard and relocating the ground floor cafe, concentrating like functions where possible and moving the main lecture theatre closer to the eastern end of the building, all of which have consolidated the extent of the building.

The proposed changes are described in Section 2 and illustrated in the architectural drawings contained in the drawing set prepared by Architectus. A revised Mitigation Measures has also been prepared and provided in Section 4 of this Report.

1.4 Consultation

Following the exhibition of the development application and the receipt of submissions, contact was made with respondents where an issue of substance was identified. Discussions were held with officers of the Department of Planning and Infrastructure to outline proposed changes to the design in response to the submissions received. Revised drawings sets illustrating the proposed changes were sent to the NSW Heritage Council and Wesley College.

2 Development Modified in response to Submissions Received

2.1 Introduction

This Section of the report provides a description of the proposed development as modified. The AIN facility is also described in the architectural drawings and illustrations contained in the drawing set. A Landscape Masterplan for the open space areas and public domain, prepared by Aspect Studios, is contained in Appendix G.

The information on the site and contextual information presented in Section 2 of the Statement of Environmental Impact (ISD, January 2013) as originally submitted with the development application is unchanged. So also is Section 3 of the EIS, which addressed regulatory matters, with the exception that the Sydney Local Environmental Plan 2013 has replaced the South Sydney Local Environmental Plan 1998. Section 3.2 of this report updates the regulatory statement.

2.2 Description of Revised Development

The Australian Institute of Nanoscience (AIN) project involves the development of a major science research and education facility in a purpose designed building. The new AIN Building and its connections to the existing Physics Buildings are shown in the accompanying Architectural Drawing Set. **Figures 1 & 2** visually illustrate the previous and the amended development: the outline in red superimposed on the amended development shows the extent of the proposed change - also shown in Drawings DA-9000 to DA-9005.

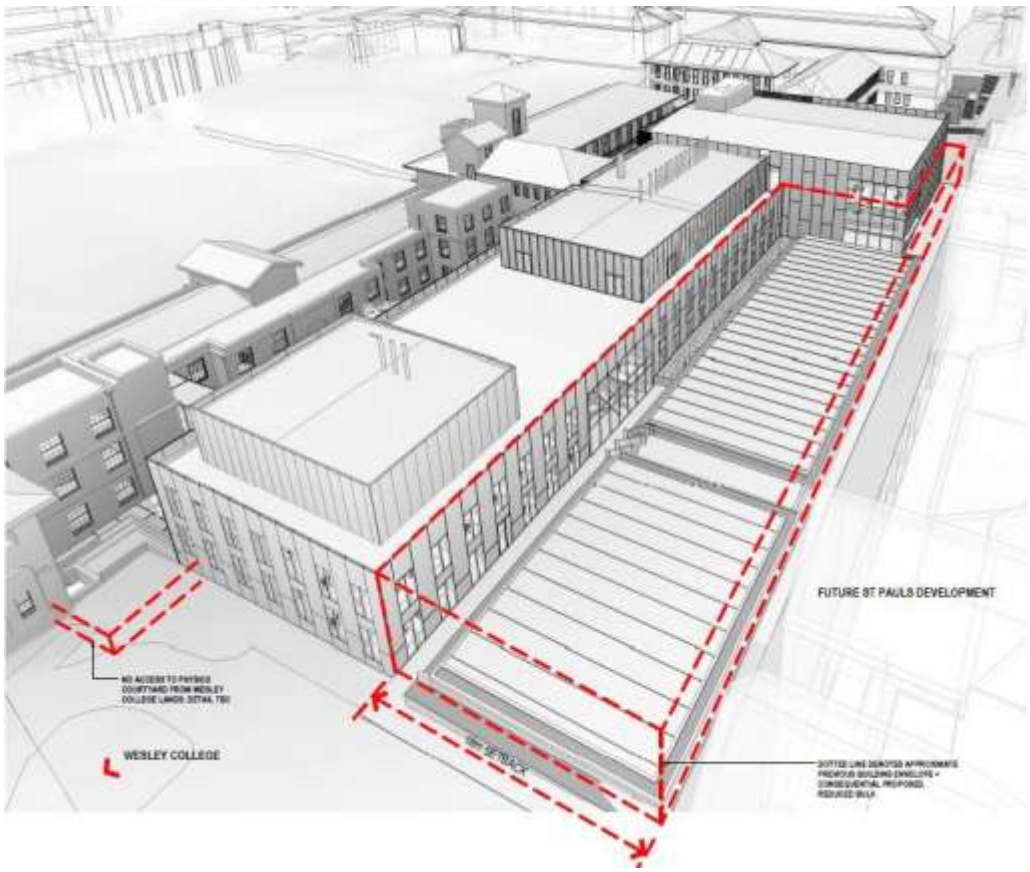

Figure 1 Relationship of the modified development to that originally proposed.

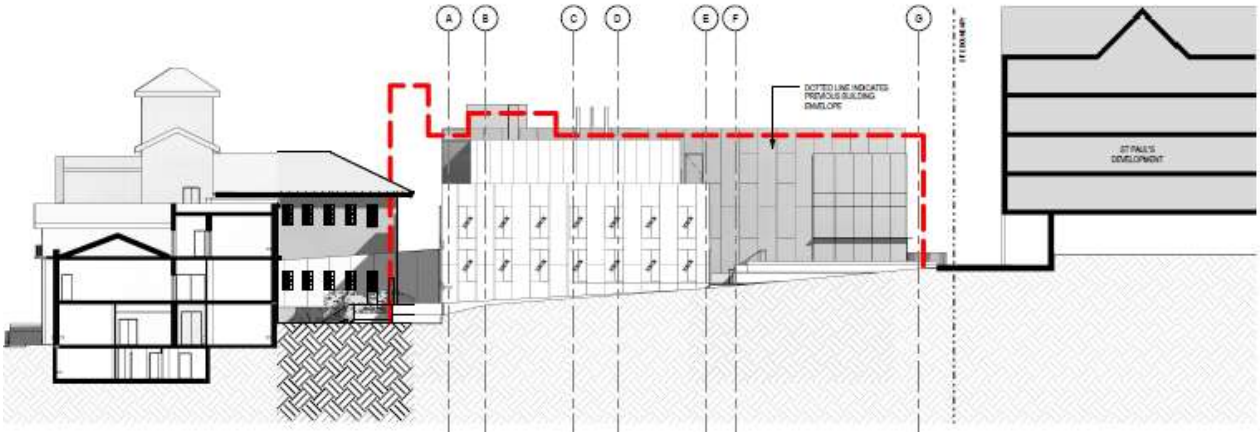

Figure 2 **Proposed Developments in Cross Section**

Figure 3 **Perspective of Proposed AIN Building viewed from North East (Drawing DA-5000)**

Figure 1, 2 & 3 show that compared to the original design, the proposed AIN Building:

- The building has a smaller footprint;
- The building is generally lower in height and the taller elements are concealed behind the eastern wing of the Physics Building;

- The depth of the building is significantly less – providing a greater separation from the existing Physics Building, the proposed St Pauls development and a smaller facade to Wesley College; and

- The north-south pedestrian link has been joined and integrated with the AIN Building.

2.3 Matters for which consent is sought

Consent is sought for the following matters as described in the reports and drawings submitted with the original EIS as amended by subsequent and drawings.

• Demolition of minor structures, construction of earthworks and services.	Drawing DA-0011
• Construction of the AIN Building	Architectural Drawing Set generally but especially DA-1000 to DA-1004.
• Construction of new links to the Physics Building (A28)	Architectural Drawings DA-4000 to DA-4007.
• Ancillary Works.	Site Landscaping - See Appendix G

2.4 Description of Development

An architectural statement prepared by Architectus contained in Appendix C summarises from an architectural perspective the changes to the design of the AIN Building. The statement explains how the revised scheme addressed concerns raised in submissions to the SSD application by improving the proposed building's relationship to its campus condition and immediate neighbours, and by reducing its impact on adjacent heritage items, whilst providing a high quality piece of contemporary architecture with an external expression appropriate to its function.

The AIN Building will seek to achieve a 4 green star rating in line with the University's Policy on environmental sustainability. The total gross floor area of the development is approximately 10,540 m^2 (previously 11,600 m^2). An area schedule for functional areas within the building is contained in Appendix D.

In summary the building will provide:

- Specialist laboratories for research groups with stringent vibration, temperature control and cleanliness requirements;

- Teaching spaces, including: lecture theatre spaces comprising a traditional tiered space, 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;

- Workspace for staff and research students in a mixture of open and private work setting; and

- Shared support services including plant room, storage areas, loading dock, cafe and security.

The distribution of functions within the building is given in **Table 2.**

Table 2 Activities by level in the AIN Building

Level	Uses
Level 1 (RL 25.0) Drawing DA-1000	Entry including cafe and exhibition space
	Labs – Types A (4), B(6), C (12), TEM (2) + preparation space
	Grey spaces
	Amenities and offices
	Clean Room and Clean Storage Room and associated plant space
	Plant, Loading Dock and Garbage Rooms
	Hazardous and other storage rooms for chemical and gas
	Substation
Level 2 (RL 30.0) Drawing DA-1001	Pedestrian Links to Physics Building (A28)
	Southern Entry from East West Link
	Eastern Entry from pedestrian stairs
	Landscaped Green Roof
	28 Offices
	2 Meeting Rooms
	Breakout space and amenities
	Lecture Theatres – Main + Case Study Theatre
	Medium Seminar Room
	Plant and Storage Rooms
	Server and Communication rooms
Level 3 (RL 33.6) Drawing DA-1002	28 Offices
	Amenities
	2 Meeting Rooms
	Case Study Lecture Theatre
	Storage and Plant Rooms
	Learning Studio
	Large Seminar Room
Level 4 (RL 37.0) Drawing DA-1103	Student Commons
	Plant Rooms
	3rd Year Teaching Lab

The key features of the proposed development are described in Table 3.

Table 3 Key features of proposed development

Feature	Original Proposal	Current Proposal
Gross floor area	11,600m^2	10,541m^2
Storeys	4	4
No. Laboratories	24	24
No. Offices	54	57
No. Seminar Rooms	5 plus informal breakout spaces.	2 plus informal breakout spaces.
Car parking	12 Spaces	2
Loading Bays	1	1
Bicycle Storage	16	20

Sections and elevations of the modified development are provided in Drawings DA-2200- DA-2003 and Drawings DA-3001/2, DA-4006/7 respectively. These drawing show that the maximum roof height is 42.5m

AHD while the highest point of the development is the exhaust flue stacks in the North West corner of the building at 45.0m (previously 46.0m). The ridgeline of the eastern roof is set at 42.5m while the ridgeline for the western roof is 41.75m. This compares to building heights in the proposed St Pauls College development of 58.0m AHD and 53.85m AHD for the Academic and Graduate Houses respectively.

The proposed linkages between the proposed AIN Building and the existing Physics Building now provide only single level access. These links are shown in plan form in Drawings DA-4005, and in elevation on Drawings DA-4006 and DA-4007 for the East and West Links respectively.

The cafe remains the social heart of the facility serving the adjoining courtyard for staff, students and visitors. Food and beverage facilities to be provided by the cafe will be limited to coffee and other beverages and light snack food although visitors can bring their own food. The cafe space is intended to operate 24/7.

Details of the elevations and sections of the proposed development are shown in Drawings DA-2000 to DA-2003 and DA-3001 and DA-3002 respectively.

2.5 Landscaping and Public Domain

Landscape and Public Domain improvements will be undertaken in accordance with the principles of the Physics Building Conservation Management Plan.

The revised landscape design statement and Landscape Masterplan are contained in Appendix G which responds to the re-design of the AIN Building particularly with the incorporation and treatment of the new green roof. The Masterplan also recognises and provides for the recommendations contained in the arboricultural assessment prepared by treeIQ contained in Appendix C of the original EIS.

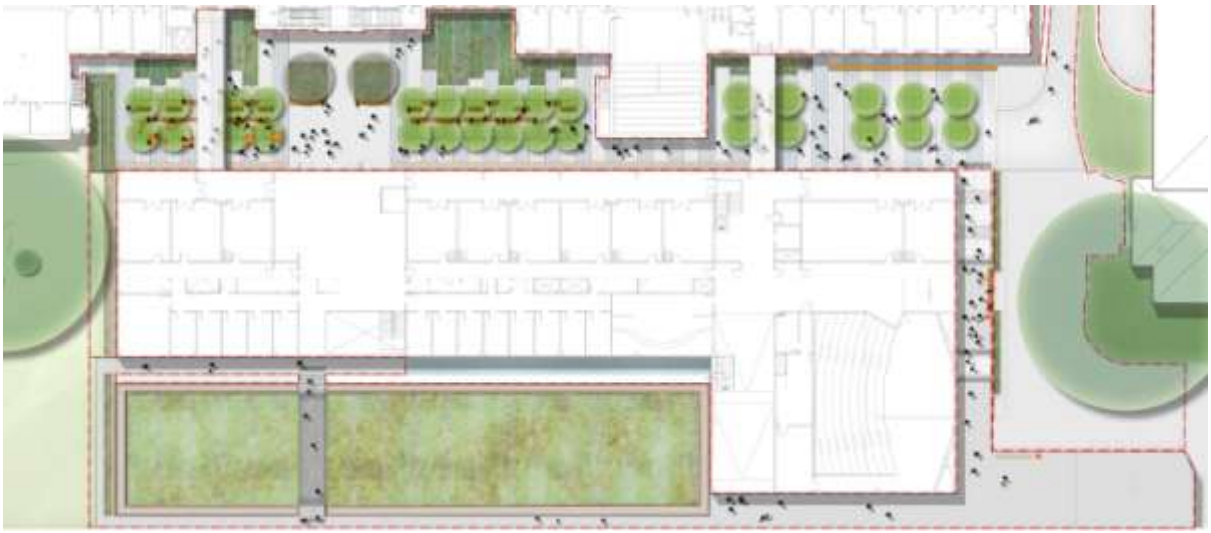

Figure 4 Revised Landscape Master Plan.

3 Assessment and Response to Submissions

3.1 Introduction

In this section of the Report we provide an assessment of the proposed development for each of the issues identified from the responses received and summarised in Table 2 of this Report. It also updates relevant sections of the original EIS in response to the proposed changes in the AIN facility.

3.2 Statutory Planning Issues

The Department of Infrastructure and Planning asked that the proposal be assessed against the provisions of the *Sydney Local Environmental Plan 2012*. This environmental Planning instrument was gazetted after the development application was originally submitted. It si also noted that SEPP (Urban Renewal) 2010 does not apply.

The following assessment relates to the SSD application as modified in response to the submissions received and reflected in the accompanying architectural drawing set.

3.2.1 Sydney Local Environmental Plan 2012

The permissibility of the proposed development is given by the local planning instrument which is now the *Sydney Local Environmental Plan 2012* (SLEP). At the time the original application was lodged the applicable environmental planning instrument was the South Sydney Local Environmental Plan 1998 (SSLEP) and the development as proposed was permissible with consent.

Under SLEP 2012 the site is zoned SP2 Infrastructure (Educational Establishment).

The objectives of the SP2 Infrastructure zone are:

- To provide for infrastructure and related uses; and
- To prevent development that is not compatible with or that may detract from the provision of infrastructure.

Developments for the following purposes are permitted with consent under SLEP 2012 under the SP2 Infrastructure zone:

3 Permitted with consent

Horticulture; Roads; Water storage facilities; Water treatment facilities; The purpose shown on the Land Zoning Map, including any development that is ordinarily incidental or ancillary to development for that purpose.

The purpose shown on the Land Zoning Map is 'Educational Establishments', which is defined in the SLEP 2012 as follows:

educational establishment *means a building or place used for education (including teaching), being:*
(a) a school, or

(b) a tertiary institution, including a university or a TAFE establishment, that provides formal education and is constituted by or under an Act.

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.

This planning instrument contains development standards for height and for floor space ratios. An inspection for the relevant maps discloses that the site of the proposed AIN facility is neither subject to a maximum height limit nor a maximum floor space ratio.

SLEP contains provisions in relation to the following environmental planning matters:

- Conservation of heritage items and heritage conservation areas (Clause 5.19). The heritage impacts of the proposed development are considered in section 3.6 of this report and the heritage consultant's report contained in Appendix F.

- Parking (clause 7.9). The maximum number of car parking spaces for a building used for information and educational facilities is 1 space for every 200m^2 of the gross floor area of the building used for those purposes. The provision of parking in the grounds of the University of Sydney is subject to the University's Transport Masterplan which discourages the use of private car parking and promotes pedestrian movement and cycling within the campus. The provision of parking proposed is in line with the University's strategy for the provision of car parking.

- Acid Sulphate Soils (Clause 7.14). The site is classified a Class 5 on the SLEP 2012 Acid Sulphate Site Map; however, the works proposed are not within 500m of Classes 1-4, or below 5m AHD, and will not lower the water table below 1m AHD on adjacent land classed 1-4. Accordingly an acid soils management plan is not required.

- Flood Planning (Clause 7.15). SLEP 2012 defines a flood planning level of 1:100 ARI (average recurrent interval) flood event plus 0.5m freeboard. Section 6.5 of the original EIS Report and the accompanying Appendix J in the EIS assessed that the original development would have no off-site detrimental impacts and the building is adequately protected from flooding. These conclusions are unchanged by the modified proposal for the AIN Building.

- Airspace operations (clause 7.16). It was a requirement of the original Director General's requirements that the requirements of the Sydney Airport Corporation be sought in relation to the height of the proposed development. Sydney Airport Corporation Limited's (SACL) advice (which is contained in Appendix A of the EIS) is that provided that the height of the building and any vents etc does not exceed 46.3 m above AHD further consultant and approvals would not be required. As the height of the proposed development (top of flue - 45.0m AHD) which does not exceed the height approved by SACL further consideration of this issue is not required.

- Development requiring the preparation of a development control plan (clause 7.20). This clause requires the preparation of a development control plan (DCP) for land outside of the Central Sydney if the site is greater than 5,000m2 or if the development will result in a building with a height greater than 25m above the existing ground level. As neither conditions apply the preparation of a site specific DCP is not required.

3.3 Accessibility

Morris-Goding has prepared an Access Report for the modified development and a copy of this report is contained in Appendix B. The assessment reviews the ingress and egress provisions, paths of travel, circulation areas and sanitary facilities for people with a disability against the AS1428 series Building Code of Australia (BCA) and the Commonwealth Disability Discrimination Act (DDA).

The conclusion reached by Morris-Goding is that compliance with statutory requirements can be readily achieved. Recommendations, which are to be addressed prior to the application for a construction certificate, are provided to assist in the detail design of the development.

3.4 BCA and Fire Safety issues

A revised BCA assessment of the proposed AIN Building, its relationship to the existing Physics Building, and with regard to the Deemed to Satisfy (DTS) provisions of the BCA 2013 is submitted in Appendix H.

In terms of the building description the following applies which is essentially the same as the previous assessment:

Building Use	Education (Assembly), Laboratory, & Office
Class of Occupancy	9b,8 & 5
Type of Construction	Type A
Rise in Storeys	4
Levels Contained	4
Effective Height	12.2m approximately (less than 25)

A number of issues are identified in the assessments that need to be resolved prior to construction. Section 8.2 of the report identifies the key issues that need further details or documentation. Section 8.3 reports issues to be addressed by a Fire Safety Engineer via an alternative solution and the issues involved are discussed further in a Concept Fire Engineering Report contained in Appendix I. However, the BCA report concludes that the design is capable of complying with the relevant sections of the BCA subject to compliance with the recommendations contained within the report and the satisfactory resolution of identified areas of non-compliance.

3.5 Ecologically Sustainable Development

The proposed development has been assessed as consistent with the principles of ecologically sustainable development (SSD) as defined in Clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000.

An assessment of the ESD performance of the proposed AIN Building and its use has been undertaken by Surface Design. A copy of this report is contained in Appendix E. The development has been assessed in accordance with the DGR's for ESD. The AIN Buildings has been designed to be sustainable, achieving benchmarks for energy efficiency, water efficiency and indoor environmental quality. The report identifies the Sustainable Design initiatives to be included in the final development.

The project is targeting a 4 Star Green Star rating. In relation to energy efficiency it is considered that for an educational establishment the most appropriate standard to adopt is the Building Code of Australia Part J

Energy Efficiency verification benchmark.

3.6 Heritage Issues

The following controls and guidelines were considered in the preparation of the Statement of Heritage Impact for the proposed development:

- South Sydney LEP 1998
- Draft Sydney LEP 2011
- City of Sydney Heritage DCP 2006
- University of Sydney Grounds Conservation Plan
- School of Physics Conservation Management Plan
- Edward Ford Conservation Management Plan
- New South Wales Heritage Council Guidelines, Altering Heritage Assets and Statements of Heritage Impact

As indicated in the Architectural Statement in Appendix C, three strategies have been adopted to reduce the heritage impacts through the proposed redesign of the AIN Building:

- The volume height and bulk of the building has been reduced;
- The tallest elements of the building have been relocated to the east immediately behind the highest levels of the Physics Building; and
- The plant room spaces on the western wing have been positioned to provide a 22m visual opening that is centred on the Wilkinson Axis.

A revised statement of heritage impact prepared by Graham Brooks and Associates has been prepared. This report assesses the modified development against the above planning controls and policies and the comments received on the exhibited development. The assessment supports the amended proposal subject to the inclusion of a range of conditions. A copy of this assessment is included in Appendix F. The proposed mitigation measures have been included in the Mitigation Measures contained in Section 4.

3.7 Relationship to the St Paul's Development

The AIN Building has retained its commercial/industrial character which is appropriate to it location within a campus dedicated to higher education and research; the adjoining development proposed by St Pauls College, which is residential in purpose and scale, is within a residential/open space precinct of the University. The main built form and urban design issues relate to the separation of the proposed buildings, the height of the respective developments, and permeability.

The separation between the two building has been increased and this is illustrated in Drawing DA-9000 and the sectional elevation through the courtyard looking east in Figure 5 (see Drawing DA-2000).

The separation between the buildings is variable between 8m at the eastern end (minimum) and approximately 13.5m. At ground level provision is made for pedestrian movement between the two developments via a Colonnade on the northern boundary of the St Paul's development. In terms of visual privacy 12 m is an acceptable separation between non habitable and habitable uses[1]. The increased separation also provides opportunities for increased solar access to the St Paul's development.

[1] Better Urban Living, Department of Urban Affairs and Planning and the NSW Government Architect, 1998, p 31.

The height relationship between the developments is also shown in Figure 5. The AIN Building platform is set at a lower level to the proposed St Paul's development - a difference of approximately 6m – and each of the buildings in the St Paul's development rise above the AIN Building. Consequently, the redesigned AIN Building does not dominate the adjoining development and is visually isolated by it from St Paul's Oval and City Road.

Figure 5 Separation between the proposed AIN Building and the St Paul's College Developments.

3.8 Hazardous Substances and Dangerous Goods

The AIN Building has been designed to separate areas where dangerous goods are stored from laboratories and other teaching and administrative areas. An analysis of dangerous goods storage within the building for the original EIS was prepared by AECOM (Appendix N of the EIS) which:

- Defined the limits of dangerous goods that can be stored in the facility; and
- Detailed the safety requirements/features for the storage of dangerous goods on site in accordance with the relevant Australian Standards.

The report identified the requirement for a number of different stores within the AIN Building: grey spaces, clean room, gas store, bulk cryogenic nitrogen, and miscellaneous rooms with dangerous goods, and a chemical store/dispensing area. Providing the individual storage areas hold less than the amounts by class and by combinations of goods identified in Section 4 of the report they may be classified as a minor store under the provisions of ASA4332 (Ref.2). The report also detailed the precautions to be followed for storage and handling of dangerous goods.

The Department of Infrastructure and Planning has asked for more detailed assessment of the amounts of Dangerous Goods that would be stored in the premises against the relevant guidelines in *State Environmental Planning Policy No 33 Hazardous and Offensive Development* to determine whether the proposed development is a potentially hazardous facility. The amount of individual chemicals stored, singularly and in combination has been further assessed by AECOM and a copy of this assessment is contained in Appendix J of this Report. The assessment indicates that the majority of Dangerous Goods Stored will be below the relevant threshold. The exception was Class 2.3 toxic gases. Accordingly if the threshold limit for this class of goods is exceeded (100kg) the facility could be classed as a potentially hazardous.

Subsequently, the University has reviewed the quantity of gases that will need to be stored in the AIN Building. The University has other approved chemical storage facilities within the grounds and has concluded that the proposed amount of Class 2.3 toxic gasses can be substantially reduced. It is proposed that this issue be addressed by a condition of consent that restricts the total storage of all chemicals in the AIN Building to the thresholds specified in SEPP 33.

3.9 Landscape Design

A revised Landscape Masterplan and design statement prepared by Aspect Studios Pty Ltd is contained in Appendix G. The plan identifies three landscape open space areas in the AIN Precinct:

1. The Physics Courtyard, providing an interface between the existing Physics Building and the new AIN Building;

2. The Shared Way. This area includes a western court yard, loading dock, the Edward Ford interface, and new north-south pedestrian stairway;

3. The Green Roof between the AIN Building and St Pauls.

The landscape plan provides a comprehensive framework for both soft and hard landscaping of the open space and public domain associated with the proposed development.

3.10 Lighting

In the submissions received, the potential impact of light spill on the adjoining dorm rooms within Wesley College was expressed as an issue of concern given the development's proposed 24 hour operations.

Drawing DA 9000 shows that the southern facade has been moved back by approximately 18m compared to the original facade location. This results in the length of the western facade being reduced by approximately 50% substantially reducing the potential light spill, particularly as the upper level of the western facade is a blank wall. Accordingly, the potential impact of light spill has been significantly reduced and is not regarded as a significant issue.

3.11 Noise

The Department of Infrastructure and Planning has asked for additional information on the potential noise impacts prepared in accordance with the NSW Industrial Noise Policy and Interim Construction Noise Guidelines. Accordingly, a further noise assessment has been prepared and this is included in Appendix K.

The assessment demonstrates that during operation the proposed development, with the measures proposed, will comply at all assessment locations during daytime, evening and night-time periods. However, during construction operation noise and vibration levels may be exceeded during intensive construction activities. General recommendations have been presented to manage and mitigate potential noise and vibration impacts during construction. These recommendations have been included in the Mitigation Measures in Section 4.

3.12 Overshadowing

Wesley College questioned the accuracy of the original shadow diagrams. Whilst there was an error the extent of overshadowing depicted in the shadow diagrams, more accurate assessment showed that the

potential impact had in fact been overstated.

Given the change the development envelop a new set of shadow diagrams (Drawings DA 0013 & 0014) is contained in the drawing set. The revised drawings show that the following:

- Summer Solstice - no disenable impact on either Wesley College or the proposed St Pauls Development.

- Winter Solstice – the overshadowing on Wesley College is restricted to the north-eastern wing of the College but this has disappeared before 10am; overshadowing of the proposed St Pauls development will be restricted to the eastern third of the development site but is minimal between 10 am and 2 pm.

Overall the potential impact from overshadowing has been significantly reduced by the modified development proposal.

3.13 Visual Impact

The visual impact of the AIN Building can be understood through a consideration of the Visual Impact Assessment that has been undertaken and presented in Drawings DA-5000 to DA-5002 & DA-5004 to DA5009.

Various perspectives of the relationship between the existing Physics Building and the proposed AIN Building to the south are shown in Drawing DA-5001 – DA002 & DA5004 – DA-5006 from vantage points. Existing and proposed views are presented from the hocky field and the Education and the Quad Buildings from the north and the north east respectively. The impact in heritage terms on the Physics Building and the heritage environment is discussed in Appendix F.

Drawing DA-007 illustrates the new stairway now joined to the eastern facade of the AIN Building which provides a north-south pedestrian link. Also illustrated on this drawing is the proposed cladding of the new building.

Of considerable interest is the presentation of the green roof in the area above level 2 between the AIN Building and the proposed St Pauls development. This is illustrated in Drawing DA-5008 which shows not only the improved separation between developments but also the improved amenity for users of the upper levels of the AIN Building.

The relationship between the proposed AIN Building and the Physics Building, the proposed landscaping and the activation of the Physics Courtyard is shown in Drawing DA-5009.

3.14 Conclusion

The redesign of the AIN Building, in response to the submissions received and further design considerations, has substantially reduced the impact of the proposed development on the adjoining Wesley College – in terms of visual impact, overshadowing, light spill, noise and pedestrian movement– and on the heritage values of the Physics Building (A28) and the immediate heritage environment. Accordingly, it is submitted that the issues raised in submissions have been adequately addressed.

The supporting consultant reports demonstrate that with the adoption of the mitigation measures proposed the proposed development will not have any adverse environmental impacts.

4 Revised Mitigation Measures

The measures previously recommended to mitigate the impacts of the proposed development on the environment have been updated to include the following commitments.

4.1 Accessibility

- The recommendations contained in the Access Review prepared by Morris-Goding (July 2013) will be incorporated into the design of the development prior to the application for a construction certificate.

4.2 Arboreal Impacts

- The following mitigation measures be implemented in accordance with the arboreal assessment prepared by TreeiQ dated 7 March 2012 (Appendix C, AIN EIS):

- Two significant trees should be retained (T2 and T39);

- The existing compost bins beneath Tree 39 should be removed by hand;

- The slab and footing from the brick shed at the base of Tree 39 should remain in-situ;

- The curved sandstone retaining wall at the base of Tree 40 should be retained. Columns and lintels may be removed using tree sensitive demolition methods;

- The existing building should not contact the trees' roots, trunk branches and crown;

- Identified pruning as described in the report should be carried out by an experienced and qualified arbourist;

- All pruning work should be undertaken in accordance with *Australian Standard 4373: Pruning of Amenity Trees (2007)* and the *Workcover Code of Practice for the amenity Tree Industry (1998).*

4.3 BCA Issues

- The design issues and recommendations in Sections 8.2 & 8.3 of the BCA Assessment Report prepared by Steve Watson & Partners (July 2013) and Section 1.7 of the Concept Fire Engineering Report prepared by ARUP (January 2013) will be resolved and documented prior to the application for a construction certificate to ensure compliance with the relevant sections of the BCA.

4.4 Contamination

- During excavation for the footings or other site works the site will be inspected by experienced environmental personnel to assess for unexpected conditions or facilities.

4.5 Construction and Traffic Management

- The following plans will be prepared in accordance with the requirements of the City of Sydney and implemented prior to the commencement of works:

- Construction Traffic Management Plan;
- Soil and Water Management Plan; and
- Construction Waste Management Plan.

4.6 Ecologically Sustainable Development

- The ESD targets and commitments outlined in sections 3.3 and 4 outlined in the ESD Report prepared by Surface Design (June 2013) contained in Appendix E will be implemented.

4.7 Hazardous material

- The storage of hazardous material shall not exceed the thresholds specified in SEPP 33 and in particular limit the total amount of Class 2.3 – toxic gasses to 100kg.

4.8 Heritage

- The mitigation measures contained in the heritage impact assessment prepared by Graham Brooks and Associates in Appendix F will be implemented;

- *Any original fabric removed from the Physics Building is to be tagged and stored for future conservation purposes.*

- *An experienced heritage consultant is to be appointed to work with the consultant team throughout the design development, contract documentation and construction stages of the project to resolve all matters that involve changes to, or removal of, existing significant fabric.*

- *The Construction Management Plan should include details of the protection measures to be undertaken to ensure there is no unforeseen damage to the adjacent heritage buildings and the significant tree that is to be retained.*

- *Archival Photographic Recording of the external and internal areas of the Physics Building that are affected by the development is to be prepared and submitted to the University of Sydney archives.*

4.9 Noise

- The mitigation measures contained in the Construction and Operation Environmental Noise and Vibration Impact Assessment prepared by AECOM (July 2013) will be implemented.

5 Conclusion and Recommendations

The public exhibition of the SSD development application for the proposed Australian Institute of Nanoscience at Camperdown resulted in a total of five (5) submissions.

The University of Sydney has carefully considered the issues raised and has made significant changes to the exhibited design to reduce environmental impacts and to include new design initiatives. However, the intent and scope of the development to create a world class teaching and research institute, which all the submissions endorsed, is unchanged.

The modified proposal shown in the accompanying architectural drawings and supported by additional specialist studies will significantly reduce the environmental and heritage impacts of the development.

It is submitted that the information provided in this submission, drawings and attachments sufficiently responds to the issues raised within the submissions and establishes a list of commitments to enable the approval of the proposed development which is recommended.