ENVIRONMENTAL ASSESSMENT

s75W Modification of Concept Plan MP 08_0116 for Library Retrieval System and Storage Building and Thomas Street Building Bulk Excavation

University Of Technology Sydney

City Campus - Broadway

MARCH 2011

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Contents

Appendices

Appendix M **Preliminary BCA Assessment Report**

Prepared by Advance Building Approvals Pty Ltd

Appendix N **Preliminary Construction Environmental Management Plan**

Prepared by University of Technology Sydney

1 Introduction

In accordance with the provisions of Section 75W (s75W) of the Environmental Planning and Assessment Act 1979 (EP&A Act) and on behalf of our client the University of Technology Sydney (UTS), we provide this Environmental Assessment to modify the Minister's approval for the Broadway Precinct Concept Plan as part of UTS's City Campus redevelopment (MP 08_0116).

The aim of this modification is to allow the construction and operation of the Library Retrieval System (LRS) and Storage Building, located beneath Alumni Green and bulk excavation works for the basement levels of the Thomas Street Building without any further environmental assessment. Both of these buildings are included in the current Concept Plan approval.

This report describes and explains the proposed modifications to the approved project, and assesses the environmental impacts of the changes.

1.1 Background

On 23 December 2009, the Minister for Planning granted approval, subject to conditions, for the Major Project Application MP 08_0116, comprising the Concept Plan for the redevelopment of the University of Technology Sydney (UTS) Broadway Precinct. This included a new Broadway Building and Thomas Street Building, alterations to Buildings 1, 2, 3, 4, 6 and 10 and associated landscape and public domain works.

This approval identifies specific parts of the Concept Plan that are to be considered under either:

- Part 3A of the EP&A Act and subject to further environmental assessment requirements listed in Schedule 2 of the approval,
- Part 4 of the EP&A Act, and
- Those that do not require any further environmental assessment.

Relevant to this proposal, the LRS and Storage Building is identified as part of the Concept Plan that is required to be considered under Part 4, whilst the construction of the Thomas Street Building is required to be considered under Part 3A of the EP&A Act.

In accordance with the approval, and under Part 3A of the EP&A Act, the Preliminary Environmental Assessment Reports have been submitted to the Department of Planning and the Director General's Requirements (DGRs) have since been issued, for the following projects:

- Buildings 1 and 2,
- Thomas Street Building, and
- Broadway Building.

A development application (DA) made under Part 4 of the EP&A Act to widen Ramp CB01 and remove Ramp CB02 in the location of the subject site, is currently being considered by the City of Sydney. These works are proposed to be carried out prior to the construction of the LRS and Storage Building and the bulk excavation works for the basement levels of the Thomas Street Building.

An application is also currently with the Department of Planning seeking a modification to the subject Concept Plan approval (MP 08_0116) to include approval for bulk excavation works for the proposed Broadway Building.

1.2 Description of Concept Approved Buildings

The Environmental Assessment, Volume 1 of 3 prepared by JBA dated May 2009, which is included as part of the Concept Plan approval documentation, describes the LRS and Storage Building and Thomas Street Buildings as follows:

Book Vault (LRS) Building

A new book vault (LRS) comprising an area of 2,250m^2 within a basement level under Alumni Green and includes an automatic book retrieval system. The book vault (LRS) will accommodate up to 750,000 books and will be accessed from the below ground extension to Buildings 1 and 2.

Thomas Street Building

The Thomas Street Building is a new 10,000m^2 building for educational purposes and café/ cultural or retail uses with a height of approximately 27.10m (adjacent to Building 4) and 18.05m (adjacent to Jones Street).The majority of the building will be limited to four storeys above ground, with the fourth level set back from the south to provide good year-round solar access to Alumni Green. This height is designed to allow a minimum of 10 metres of sun along the southern edge of Alumni Green at 12 noon at the winter solstice. A garden that will collect rainwater for reuse in other parts of the site will be provided on part of the roof. A colonnade or awning will be provided on the Alumni Green façade of the building to provide year-round shelter for pedestrians.

1.3 Amendment to the Concept Plan Approval

This modification is seeking that the Minister:

- determine under section 75P(1)(c) of the EP&A Act, that the excavation of the construction and the operation of the Library Retrieval System and Storage Building, and the excavation of the basement levels of the Thomas Street Building require no further assessment and approve this development under s75J(1) subject to any conditions; and
- grant Project Approval for the construction and operation of the Library Retrieval System and Storage Building, and the excavation of the basement levels of the Thomas Street Building, as described in this report.

1.4 Structure of the Report

This report is divided into six subsequent sections.

Section 2	examines the context of the site by describing its location, ownership, existing character and uses and the local context in which it is situated.
Section 3	describes the development proposal.
Section 4	assesses the planning context of the proposal by examining its conformity with the relevant prevailing planning controls.
Section 5	analyses the possible environmental effects of the proposed development.
Section 6	provides a list of commitments to appropriately mitigate and manage potential environmental impacts associated with the proposed modification.
Section 7	concludes the environmental assessment.

The main body of the report is followed by the appendices and plans.

2 Site Context

2.1 Site Location

The site is located within the grounds of UTS's City Campus at 15 Broadway and forms part of the UTS Broadway Precinct. It is bound by Thomas Street to the north, Jones Street to the west, Building 4 to the east and Buildings 1 and 2 to the south (see Figure 1).

The real property description for the site is Lot 2004 DP 105348 and Lot 2003 DP 1053548.

The area for the Library Retrieval System and Storage Building shown in blue at Figure 2 is 2,530 sqm. The area for the Thomas St Building shown in red at Figure 2 is 2,105 sqm. The combined site area is 4,635m^2.

Figures 3 to 8 show the site and surrounds.

Figure 1 Site Context Plan

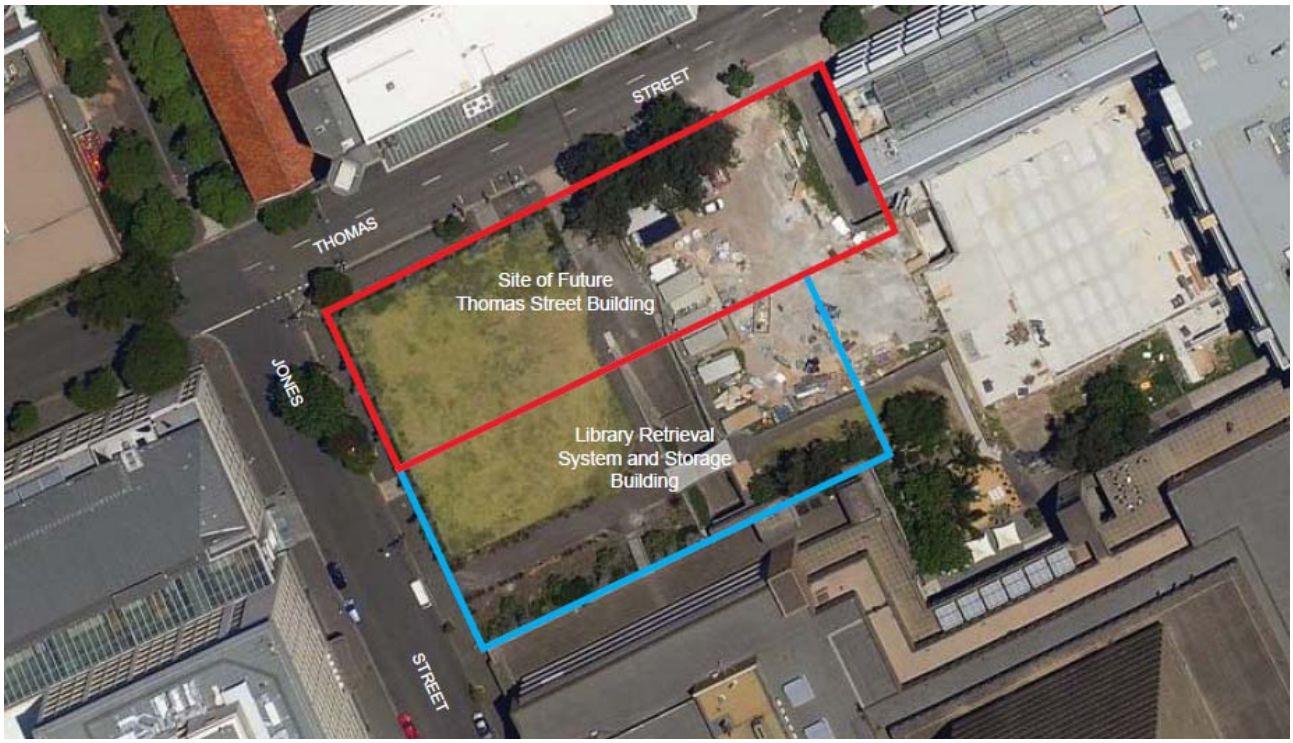

Figure 2 Site Plan

Figure 3 Alumni Green looking east

Figure 4 Looking south towards site from Thomas Street

Figure 5 Looking west towards site from Thomas Street. Landscaping was planted following demolition of the previous building approximately 3 years ago

Figure 6 Looking west along Thomas Street

Figure 7 The eastern Thomas Street ramp located at eastern edge of subject site. The Ramp is to be widened as part of a separate DA

Figure 8 Existing western Thomas Street ramp to be removed as part of the same DA.

2.2 Surrounding Uses

The site is surrounded by a mix of medium to high rise commercial, educational, residential and tourist buildings.

The area to the north of the site forms the light industrial and commercial precincts of Ultimo, Haymarket and Pyrmont. Directly opposite the site on Thomas Street is the Sydney Institute of Technical and Further Education (TAFE).

To the west of the site on Thomas, Jones and Wattle Streets are other educational facilities and associated developments including the UTS Building 10 and Sydney International School. New student accommodation is currently under construction at 718 Harris Street to the west of the site and is anticipated to be occupied by late 2011.

The ABC headquarters is located to the east of the site on Harris Street adjoining UTS Building 6 and the UTS's Haymarket Precinct is to the north east.

The 5.795 hectare Frasers Broadway site (the former Carlton and United Brewery) located on Broadway directly opposite UTS's City Campus buildings fronting Broadway is currently undergoing major redevelopment.

2.3 Site Characteristics

The site comprises a large open space area known as "Alumni Green" which will eventually be the focal point of the UTS City Campus. Two concrete ramps, referred to as Ramp CB01 (eastern ramp) and Ramp CB02 (western ramp), are located below Alumni Green and provide north south connections between Thomas Street and the basement car park levels of Buildings 1 and 2. These ramps are currently subject of a DA being considered by the City of Sydney, to remove Ramp CB02 and widen Ramp CB01.

With the exception of the vehicle ramps, the subject site is relatively flat with a mild slope from south to north falling approximately 1.25m along the western site boundary and 0.6m along the eastern site boundary. The site consists of open grassed areas, with a bitumen path and garden at the southern edge between Ramp CB02 and Jones Street. There is a stand of trees along the northern Thomas Street boundary between the two ramps with another two trees adjacent to Ramp CB01 and central to the site. These trees have been approved for removal under the subject Concept Plan Approval.

2.3.1 Geology

The subsurface profile below Alumni Green comprises fill over residual silty clay soils with weathered shale and sandstone bedrock below. Groundwater is likely to be present at a reduced level of about RL7m to RL10m, though the bedrock is expected to be relatively tight based upon information from this and previous nearby projects, and so relatively low flows are expected. The fill at the site is classified as "General Solid Waste" and is relatively deep in some sections of the site. The underlying natural silty clay and bedrock are classified as Virgin Excavated Natural Material (VENM).

2.4 Ownership

Ownership of the site is held by the University of Technology Sydney.

3 Proposed Development

This amendment seeks to modify numerous aspects of the Concept Plan relating to the LRS and Thomas Street Buildings. The aim of this modification is to allow the construction and operation of the LRS and Storage Building, located beneath Alumni Green, and the bulk excavation of the basement levels of the Thomas Street Building, without any further environmental assessment. The provisions of Section 75W of the EP&A Act enable this.

Approval for the construction of the Thomas Street Building will be sought in the future. It is anticipated that the construction of the LRS and Storage Building will take place at the same time as the construction of the Thomas Street Building. This modification would provide significant timing and cost benefits to the overall redevelopment of the City Campus by allowing the excavation and the construction of the two buildings to take place at the same time. This will also decrease the overall construction timeframe of the development and therefore minimise environment impacts associated with the excavation and construction stage.

This section details the proposed development and the necessary changes to the consent.

3.1 LRS and Storage Building

The LRS and Storage Building would be located beneath Alumni Green. It is bound by the future Thomas Street Building to the north, the existing driveway access the car park levels of Building 1 and 2 to the east, Jones Street to the West and Building 2 to the south. The building is approximately 69m in length, 31.29m in width, and ranges in depth from 18.8m to 15.9m, comprising a total area of approximately 4,719m^2. The proposed development is detailed in the architectural plans at **Appendix A**).

The LRS and Storage Building is comprised of two main components:

- the western part of the building which contains the LRS, and
- a storage area within the eastern part of the building.

These components are further detailed below.

3.1.1 LRS

The LRS is the first stage of the development of a new campus library, with the new library retrieval system acting as the book storage facility for the new Library. Its purpose is to free up floor space for more social and interactive use of the learning common areas. The LRS will be able to accommodate up to approximately 950,000 books which represents 60%-80% of the UTS Library collection. This is 200,000 more books than originally anticipated in the Concept Plan. The facility also has the ability to store larger items such as art pieces.

The LRS is comprised of:

- twelve (12) storage racks, each of which are area approximately 22.8m long and 15.4m high and are separated by 8 aisles which allow for the movement of a mechanical picking crane;
- a Picking Area located on a mezzanine floor on Level 2;
- an Operational Area located on Level 2 between Store 01 and a services corridor;
- a lift , accessing levels between the working level and ground level, located on the northern edge of the building;
- stairs accessing levels between the working level and ground level located at the south west and north east of the building;

- lift lobby, plant and staff amenities on Level 2 between the LRS and Store 01; and
- vehicle loading area located at the south eastern end of the LRS and Storage Building and connecting to the existing ramp to Thomas Street.

The area containing the storage racks is to be secure and will be accessible for servicing purposes only. This access will be from the operational floor via the lift lobby. The area is to be a humidity, temperature and water controlled environment, designed in accordance with the relevant standards. Figure 9 provides an example of a similar racking facility with secure access.

Figure 9 Example of Secure Access to be provided between Picking Station and Racking Area

The picking station is the primary interface between the library and the library retrieval system. It will include access terminals which allow staff to select a container to be picked from the shelves by a picking crane. The container will then be placed into a delivery area and the user will either select or replace a book before returning the container to its position in the racks by the picking crane. Access to the picking station will be from the loading area, Building 2, or the lift lobby. Figure 10 below provides an example of a picking area at the Mathewson IGT Knowledge Centre, University of Nevada.

The Operational Area will be used to process inbound and outbound books. It is anticipated that palettes will be delivered to and from the Operational Area via forklift from the loading dock. This area will also include bench space to process books and load them into trolleys. Books will be manually moved to and from the Operational Area via wheeled trolleys to the Picking Area. The Operational Area is accessed from the LRS Loading Dock.

Figure 10 Picking Area at the Mathewson IGT Knowledge Centre, University of Nevada

3.1.2 Storage Facility

The Storage Facility is located over three levels. Store 01 is located on the upper level and is accessed from the LRS Loading Area or from the services corridor. Store 02 and Store 03 are located beneath Store 01 on the consecutive levels below. These areas are accessed from the lift or the stairs at the northern end of the building.

3.1.3 Operations

The LRS will mostly be operated by a single staff member at a time with an additional staff member assisting during busy times.

3.1.4 Numerical Overview

The gross floor area for the proposed LRS and Storage Building is detailed in Table 1 below.

Table 1 GFA of proposed LRS and Storage Building

Level	Use	Sydney LEP 2005 GFA (m^2)	Draft Sydney LEP 2011 GFA (m^2)
RL-7.000 (below LRS Operational Floor)	Services plenum	217	217
RL-5.00 (Level 00)	ASRS Operating Floor, lift, lift lobby, Equipment access shaft, stairs	738	738
RL-2.10 (Store 03)	Store, corridor egress, stairs	1,362	44
RL 2.70 (Level 1, Store 02)	Table and chair store, egress corridor	1,362	44

Level	Use	Sydney LEP 2005 GFA (m^2)	Draft Sydney LEP 2011 GFA (m^2)
RL 8.53 (Level 02)	Loading dock, Picking station, plant, store, lift lobby, operational area, staff amenities	1,040	515
RL 14.00 (Level 03)	fire indication panel, control panel, sprinkler booster	0	0
Totals		**4,719**	**1,558**

The amended GFA calculations, under Sydney Local Environmental Plan 2005, for the redevelopment of UTS Broadway Precinct site that is bounded by Broadway, Harris, Thomas and Wattle Streets, are detailed in the table below.

Table 2 Amended GFA calculations for UTS Broadway Precinct site that is bounded by Broadway, Harris, Thomas and Wattle Streets

Building	GFA Sydney LEP 2005		
	Existing (m^2)	Additional (m^2)	Final (m^2)
Building 1	49,639	4,050	53,689
Building 2	22,096	6,750	28,846
Building 3	7,060	-	7,060
Building 4	25,672	-	25,672
Building 8	1,052	-	1,052
Building 9	205	-	205
Building 10	32,229	-	32,229
Broadway Building	-	32,500[1]	32,500
Thomas Street Building	-	12,150	12,150
Multi Purpose Sports Hall	-	1,733	1,733
LRS and Storage Building	-	4,719	4,719
Total	**137,953**	**61,902**	**199,855**

Floor Space Ratio

The area of the City Campus Broadway Precinct site that is bounded by Broadway, Harris, Thomas and Wattle Streets, subject of the recent Concept Plan approval (MP 08_0116), has an area of 36,898m^2. As shown in Table 2 above, the amended gross floor area, including the reduction in GFA for the future Broadway Building, is 199,855m^2. This equates to an increase in GFA by 2,402m^2.

[1] The proposed GFA calculations for the future Broadway Building has recently been reduced from 34,650m^2 to 32,500m^2 and the future Thomas Street Building has been increased from 10,000m^2 to 12,150m^2.

3.1.5 Ecologically Sustainable Development

The proposal targets an equivalent 4 Green Star Rating. Steensen Varming have provided a summary of the range of ESD initiatives (refer to **Appendix B**) that will be implemented to help achieve this target. These include:

- Minimisation of energy demand by taking advantage of the local characteristics of the site
- Specification and installation of energy efficient mechanical, electrical and lighting equipment
- Incorporation of humidity control measures to prevent mould growth.
- Energy metering to facilitate monitoring of energy use.
- Environmentally sustainable materials will be utilised. This includes non-PVC, low VOC, low formaldehdye products and FSC certified timber products.

The Stormwater Management Plan at **Appendix C** details how water sensitive urban design principles such as stormwater reuse, rainwater capture, and stormwater treatment will be incorporated into the design of the development.

Other ESD initiatives that will be considered in the detailed design of the development, to achieve the ESD commitments and to work towards achieving a 4 Green Star Rating include:

- Integrating energy efficient systems such as a heat recovery system and high-efficiency fans to regulate plant loads
- Utilising the passive heating and cooling strategies to supplement the mechanical services arrangement
- Incorporating a thermal labyrinth around the LRS, to take advantage of the constant temperature of the surrounding earth. The labyrinth would be integrated into the service plenum around the LRS vault
- Incorporating a 'heat recovery system' to capture waste heat from relief air and transfer it to the supply air.

An Energy Efficient Report has been prepared in accordance with Section J of the Building Code of Australia (BCA) (**Appendix D**). It has found that the proposal can meet the relevant criteria and is deemed to satisfy provisions of Section J of the BCA or provide an acceptable appropriate solution where it cannot.

3.1.6 Landscaping

The area above the structure will be covered with 1.2m of soil and turfed before being comprehensively landscaped when other nearby elements of the Concept Plan redevelopment are complete.

Trees located on the site have been approved for removal under the Concept Plan MP 08_0116.

3.1.7 Bulk Earthworks

The extent of the earthworks for the LRS and Storage Building will cover the entire site as described in Section 3.1 and shown in the architectural plan at **Appendix A**.

The bulk excavation works are to be carried out at the same time as the proposed excavation of the basement levels of the Thomas Street Building. A total of 75,931m^3 of earth is to be removed. This will then be transported in accordance with an approved Construction Environmental Management Plan. Details of the location of excavation materials to be transported will be provided when a contractor is appointed. Any contaminated spoil will be disposed of appropriately at a licensed landfill.

There will be approximately 40 truck movements a day or 4 to 6 trucks per hour for 6 months during the excavation process for the combined LRS and Storage Building and basement levels of the Thomas Street building. To ensure pedestrian safety and to minimise potential environmental impacts, traffic movements to

and from the site are to be managed in accordance with Construction Traffic Environmental Management Plan at **Appendix L** of this report.

Shoring to the structural engineering design specification will be installed to the Jones Street and Thomas Street elevations. Shoring may be required adjoining the existing eastern Thomas Street vehicle ramp and tests for structural integrity will be conducted throughout the excavation process. No shoring will be required on the southern elevation (Building 1) as the excavation will be in sandstone bedrock and self supporting.

Sampling of the groundwater will be undertaken during excavation works. Where necessary the following treatment measures will be carried out to process the groundwater and discharge it to stormwater acceptable standards:

- oil water separator to remove discreet oil droplets;
- pH correction unit to keep water at required pH level;
- hydrocarbon adsorbent stage to remove any trace hydrocarbons; and
- a activated carbon filter to remove heavy metals.

Type B hoardings will be installed on the Thomas Street and Jones Street elevations. Other hoardings will be installed on the eastern and southern elevations. These hoardings will prevent unauthorised persons from entering the construction site. All hoardings will be structurally certified by an appropriately qualified practising structural engineer. Treatments of hoardings will be in accordance with the design approved (D/2010/2139) by the City of Sydney Council on the 28 January 2011 and as indicated in Figure 11 below. Pedestrian access to the campus will be maintained in accordance with the approved Concept Plan.

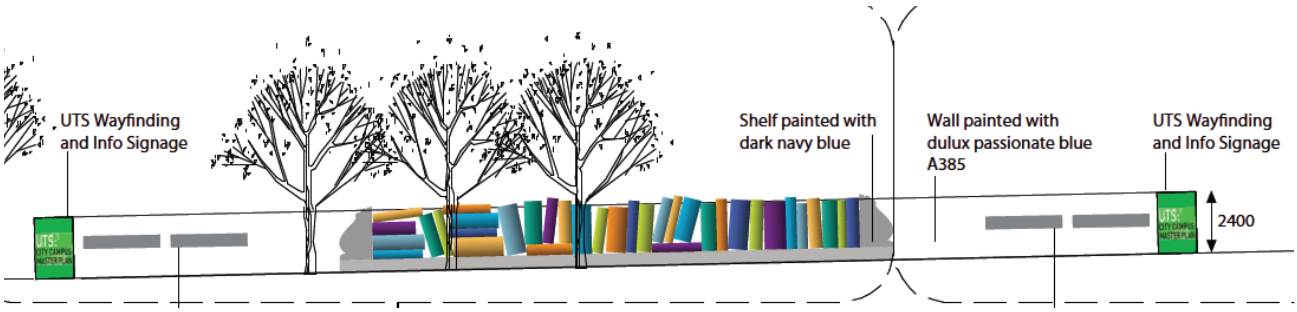

Figure 11 Approved Hoarding Design Treatment (D/2010/2139) - Jones Street Elevation

3.1.8 Timing

The program for the excavation and construction of the LRS and Storage Building will be as follows:

- site operations to begin – September 2011;
- excavation to begin – End of September 2011;
- heavy digging to begin – 01 December 2011 (to coincide with the end of university semester);
- completion of excavation – May 2012; and
- construction – July 2012 to April 2013.

It should be noted that both the LRS and future approved Thomas Street Building would be constructed at the same time.

3.2 Excavation of Basement Levels of Thomas Street

3.2.1 Bulk Earthworks

In accordance with the approved envelope for the Thomas Street Building, the extent of the excavation of the basement levels of the Thomas Street Building is described as follows:

- the Thomas Street boundary to the north;
- the existing eastern Thomas Street Ramp which provides access to the car park levels of Buildings 1 and 2;
- the proposed LRS and Storage Building to the south;
- the Jones Street boundary to the west; and
- a depth of RL -2.7m to allow for two basement levels and a part ground level.

This is also demonstrated in the architectural plans at **Appendix A**.

The bulk earthworks, shoring and post excavation management of the site is to be carried out as described in Section 3.1.7 above.

As discussed also at Section 3.1.7, including the LRS and Storage Building and the basement levels of the Thomas Street Building, the total earth to be removed from the site during excavation is 75,931m^3.

4 Relevant Planning Policies and Guidelines

4.1 Environmental Planning and Assessment Act 1979

Table 3 addresses the objects in Section 5 of the EP&A Act.

Table 3 Objects of the EP&A Act

Objects of the EP&A Act	Proposal
(a) to encourage:	
(i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment, *(ii) the promotion and co-ordination of the orderly and economic use and development of land,* *(iii) the protection, provision and co-ordination of communication and utility services,* *(iv) the provision of land for public purposes,* *(v) the provision and co-ordination of community services and facilities, and* *(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and* *(vii) ecologically sustainable development, and* *(viii) the provision and maintenance of affordable housing, and*	The proposal is a tertiary education facility and will support teaching and research within the highly urbanised central Sydney area. The proposed LRS Building results in the highly efficient use of an existing educational facility site within an inner city location. The development retains the existing open area currently known as Alumni Green which is to be become the City Campus's Central courtyard. The building is a leading edge example of library storage buildings located wholly below the ground. The location of the book retrieval and storage facility adjacent central to the City Campus represents orderly and economic use of the land for public purpose. The proposal, as a key building within the UTS City Campus Masterplan, extends many of the existing community services and facilities that UTS provides. The existing environment would be protected. The site is highly urbanised and is not a habitat for any threatened species. Ecologically Sustainable Development (ESD) principles are a major focus of the design approach. Refer to Sections 3.1.5 and 5.6.
(b) to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and	As a project which is subject to Part 3A of the Act, both State and local government have been involved in the development assessment process for the Concept Plan Approval
(c) to provide increased opportunity for public involvement and participation in environmental planning and assessment.	Extensive public involvement has been provided through consultation processes in the preparation of planning policies and strategy for the area, the community consultation undertaken by UTS leading up to the submission of the Broadway Precinct Concept Plan (MP 08_0116), and as part of the statutory exhibition period as Part of the Part 3A Project Application.

4.2 State Environmental Planning Policy (Major Development) 2005

The UTS Broadway Precinct Concept Plan, which included the LRS and the Thomas Street Buildings, was approved by the Minister for Planning under Part 3A of the EP&A Act, subject to conditions, on the 23 December 2009. This proposal seeks to modify this consent in accordance with s75W of the EP&A Act.

4.3 State Environmental Planning Policy No 55–Remediation of Land

This policy introduces state-wide planning controls for the remediation of contaminated land. It states that land must not be developed if it is unsuitable for a proposed use because it is contaminated. If the land is unsuitable, remediation must take place before the land is developed. The policy states that a consent authority must not consent to the carrying out of any development on land unless:

> *(a) it has considered whether the land is contaminated, and*
>
> *(b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and*
>
> *(c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.*

A Stage 1 Environmental Site Assessment was carried out by EIS over the UTS campus in January 2011. An extract of this report is provided at **Appendix E**.

The investigation identified a number of potential sources of contamination on the site, including potential contaminated imported fill material, potential asbestos contamination associated with demolition of the former site buildings/sheds, historical use of the site for commercial/industrial purposes and historical activities such as use of pesticides.

Soil samples were obtained from seven sampling locations (refer Figure 2 of Stage 1 Environmental Site Assessment at Appendix E). This density is approximately 54% of the minimum sampling density recommended by the NSW EPA (now DECCW) for Stage 2 Investigations and was considered adequate for a Stage 1 investigation. All soil samples results were below the Site Assessment Criteria (SAC) and no asbestos was detected.

The assessment included the installation of four (4) groundwater monitoring wells in selected boreholes (refer Figure 2 of Stage 1 Environmental Site Assessment in Appendix E). The two shallow groundwater monitoring wells (MW201 and MW204A) remained effectively dry throughout the duration of investigation. The remaining two groundwater monitoring wells (MW202 and MW204) encountered groundwater. The groundwater sample obtained from MW202 encountered an elevated concentration of copper (2 µg/L) and the groundwater sample from MW204 encountered an elevated concentration of arsenic (29 µg/L) above the site assessment criteria. The results of the remaining analyses were below the site assessment criteria. The arsenic and copper concentrations were considered to be the result of a regional groundwater conditions rather than a site specific issue due to the absence of significant elevations of these metals in the soil.

EIS have advised that the levels identified in the groundwater sampling are marginal and that contamination levels usually fluctuate and drop on re-sampling. Sampling of the groundwater will be undertaken during excavation works. Based on the findings of Stage 1 Environmental Site Assessment, Eclipse Environmental (refer **Appendix F**) have advised that, if necessary, the following treatment measures can be carried out to process the groundwater for it to be discharged to the stormwater system at acceptable standards:

- oil water separator to remove discreet oil droplets;
- pH correction unit to keep water at required pH level;
- hydrocarbon adsorbent stage to remove any trace hydrocarbons; and

- a activated carbon filter to remove heavy metals

Council will be consulted prior to dewatering to determine whether the contamination levels, will require the treatments outlined above prior to discharging to the stormwater drainage system.

The Stage 1 Environmental Site Assessment in Appendix E concludes that based on the results from the site investigations undertaken by EIS, the site can be made suitable for the proposed development provided that the site is inspected by experienced environmental personnel during demolition and excavation works to assess any unexpected conditions or subsurface facilities that may be discovered between investigation locations. This should facilitate appropriate adjustment of the works program and schedule in relation to the changed site conditions. EIS deem this precaution necessary due to the historical activities associated with the greater area.

All of the above management measures will be implemented by the proponent in accordance with the Draft Statement of Commitments (refer Section 6).

4.4 State Environmental Planning Policy (Infrastructure) 2007

The Infrastructure SEPP deals with infrastructure provision, and provides development controls in relation to airports, correctional facilities, educational establishments, hospitals, electricity, gas, sewerage and water infrastructure, forestry, public housing, ports, rail and road infrastructure and telecommunications.

It allows for certain development associated with educational establishments, such as UTS, to be carried out without development consent, or as exempt development. This does not apply to this application.

This policy also provides controls in relation to proposals considered to be traffic generating developments. The policy requires educational establishments involving 50 or more additional students to be referred to the RTA. The operation of the LRS building does not result in additional students at the university. The proposed works for the Thomas Street Building are limited to bulk excavations only. A separate application will be lodged in the future for the construction and operation of the Thomas Street building itself. As such, the proposal is not required to be referred to the RTA under the Infrastructure SEPP 2007.

4.5 Sydney Metropolitan Strategy and Draft Sydney Subregional Plan

The proposed development was found to be consistent with, and supportive of, the aims of the Sydney Metro Strategy and the Draft Sydney Subregional Plan, in the Environmental Assessment for the Concept Plan prepared by JBA dated May 2009.

4.6 Sydney Local Environmental Plan 2005

Sydney Local Environmental Plan 2005 (Sydney LEP 2005) commenced on 9 December 2005 and is the current applicable LEP. The subject site falls within the Ultimo-Pyrmont boundary as specified under Chapter 3 of the LEP. The relevant provisions of the LEP 2005 are addressed below and demonstrate the proposal is consistent with the LEP.

Zoning

The subject site is zoned Residential-Business under Sydney LEP 2005, which allows uses that the consent authority is satisfied are consistent with one or more of the zone objectives. The use of the LRS building falls within the definition of an “educational establishment” under the Sydney LEP 2005 and has been approved under the Concept Plan approval subject of this modification application.

Planning Principles

The Sydney LEP 2005 contains planning principles to be considered in relation to developments. The proposed building would be consistent with these principles as set out in Table 4.

Table 4 Sydney LEP 2005 Planning Principles

Planning Principle	Proposal
(1) Role and land use activities	
(a) Development in Ultimo-Pyrmont is to provide for a significant increase in residential population in a mixed-use development pattern also accommodating employment, educational and other uses.	The proposal seeks to provide additional services to accommodate the current and future student population of UTS.
(c) Where possible, development is to make use of existing under-utilised buildings and large areas of land which are either vacant or occupied by out of date facilities.	The LRS building is to be located beneath Alumni Green and therefore represents good utilisation of an existing inner city educational facility.
(d) Development is to take full advantage of the existing facilities, proximity to Darling Harbour, Central Station and other facilities of the City centre, and the extensive Pyrmont waterfront.	The development is in a prime location relative to public transport, particularly Central Station, available for use by students and staff, near other UTS faculties and buildings and associated student services.
(f) Uses at the ground level of buildings fronting the public domain should complement the functions of the public domain.	Not relevant as the proposal is limited to the LRS Building beneath Alumni Green and the excavation of the basement levels of the future proposed Thomas Street Building.
(3) Social issues	
(a) A range of services and facilities should be provided to meet the needs of the existing and new residents and workers, including retail, leisure, recreational and welfare facilities that promote the health and well-being of the community and recognise its cultural and ethnic diversity.	The LRS building will provide a new state of the art book storage and retrieval system to meet the needs of the existing and future educational facilities at the City Campus.
(b) Urban design is to enhance the conviviality and sense of place of Ultimo-Pyrmont and reflect the character and heritage of Ultimo-Pyrmont.	The proposal maintains a significant area of Alumni Green which will form a central courtyard with the future construction of the Thomas Street Building. Only minor parts of the LRS will be visible above the ground which will not diminish the character or heritage significance of the area.

Planning Principle	Proposal
(c) Development is to enable surveillance and to enhance street level activity to increase actual and perceived security.	The LRS Building is located below ground and does not impact on street level activity.
(e) The needs of existing and future communities, including needs for social facilities and services are to be accommodated.	The proposed development responds to planning strategies for Sydney including the NSW State Plan, Sydney Metropolitan Strategy 'Cities of Cities', the Sydney Subregional Strategy and the Urban Development Plan for Pyrmont-Ultimo 1999 Update, which guide development according to the needs of communities. The scheme will improve the existing services for existing and future students at UTS.
(4) Urban Design	
	This modification is limited to the LRS Building located beneath the ground and the excavation of the basement levels of the Thomas Street Building. As such this planning principle which relates to building height is not relevant to this application. The height and built form of the future Thomas Street building will be the subject of a separate Part 3A Project Application in the future.
(6) Education	
Development relating to educational establishments should be based on strategies for their growth and response to technological and other changes, and their integration with surrounding development.	This application is for development that was recently concept approved (MP 08_0116) and forms part of the redevelopment of the UTS's City Campus. The building is highly innovative in its design and represents leading edge technology. Being beneath the ground, the LRS Building integrates extremely well with surrounding development whilst allowing the area above the building to be continued to be used as an open space area for UTS students and staff.
(8) Heritage	
The items and areas of heritage significance in Ultimo-Pyrmont are to be conserved and enhanced. New development is to complement the character of heritage items and conservation areas. The re-use of heritage buildings through adaptation and modification is to be encouraged.	Two buildings within the UTS Broadway Precinct are currently listed as heritage items within the Sydney Local Environmental Plan 2005 (Sydney LEP) – Buildings 3 and 8. Building 11, another heritage item, was recently demolished. These buildings are not subject of the proposed development nor are they located within the vicinity of the subject site. The site is also not within a conservation area.
(9) Movement and parking	
(a) A range of housing and work, leisure and service facilities is to be provided in Ultimo-Pyrmont so that the need for travel is minimised.	Ultimo-Pyrmont currently has a range of facilities including a large amount of residential, commercial and leisure facilities. The proposed development would contribute to the existing educational facilities on the site and in the surrounding area.
(b) A high degree of accessibility is to be provided to places in and outside Ultimo-Pyrmont for both able and disabled persons. Walking, cycling	The proposed development is adequately accessible for persons with disabilities as detailed in the Preliminary Report on Accessibility (**Appendix I**). To encourage the use of the excellent availability of public transport, pedestrian paths and cycling facilities that are available within the area, no

Planning Principle	Proposal
and use of public transport are to be encouraged as the means of movement.	car parking spaces are proposed. The City Campus currently provides bicycle storage and change facilities. The proposal will not result in an increase in the number of staff or students who access the campus.
(c) Development in Ultimo-Pyrmont is to facilitate the provision and operation of a comprehensive regional public transport network.	The site will continue to be serviced by existing public transport and road networks with no impact.
(d) Development, particularly employment related development, is to be within the capacities of existing and proposed public transport and arterial road systems.	The proposal does not result in an increase in students or workers at the site. Service vehicle movements to and from the site associated with the proposed LRS and Storage Building will be minimal. As such there will be no impact on existing transport and road systems.
(e) The provision for vehicular movement is to be consistent with the development of a high-quality pedestrian environment within the street system.	A development application is currently with the City of Sydney Council for changes to the existing vehicle access arrangements to and from Thomas Street adjoining the site of this modification. This involves the demolition of the existing western vehicular ramp and the widening of the eastern ramp to facilitate the development subject of this modification. The existing pedestrian environment is maintained by both applications.
(f) Parking controls are to support public transport strategies of the Government and to reflect road network capacities.	There will be no increase in student or worker numbers and hence no impact.
(10) Implementation and phasing	
Development is to contribute towards the efficient use of Ultimo-Pyrmont's existing infrastructure and towards the provision of physical and social infrastructure as part of the development process, in accordance with the provisions of the Act.	The proposed development provides facilities that will contribute to social and physical infrastructure without increasing the permanent population. It is a positive improvement to local infrastructure on a site which is currently underutilised.

Development Standards

There is one (1) applicable development standard in the Sydney LEP 2005 relating to the development.

Floor Space

The Sydney LEP 2005 prescribes a permissible floor space ratio for business uses in Ultimo-Pyrmont of 5.0:1. The Concept Plan approval applied the permissible FSR plus Clause 10 of the LEP which allows a 10% bonus for achieving design excellence. The allowable FSR for all the lots bounded by Broadway, Harris, Thomas and Wattle Streets, is therefore 5.5:1, which equates to 202,939m^2 of GFA. As shown in Table 2 above, the proposed modification results in an amended GFA across this area of 199,855m^2 and therefore remains consistent with the approved GFA.

Heritage Conservation

Two buildings within the UTS Broadway Precinct are currently listed as heritage items within the Sydney Local Environmental Plan 2005 (Sydney LEP) – Buildings 3 and 8. Building 11, another heritage item, was

recently demolished. These buildings are not subject of the proposed development, nor are they located within the vicinity of the subject site. The site is also not within a conservation area.

Nonetheless, before granting consent to any such development, the consent authority must consider:

(d) whether any archaeological site or potential archaeological site would be adversely affected.

An Aboriginal and Historical Archaeological Assessment (AHAA) and a Heritage Impact Statement (HIS) were carried out by Godden Mackay Logan to assess the potential for Aboriginal and Non-Aboriginal Heritage on the site and to determine the potential impact on such items as a result of the realisation of the Concept Plan for the site. Findings from these reports, relevant to the subject site, are provided at **Appendix G** and **Appendix H** respectively.

The AHAA has found that due to the highly modified built environment with a complex history of site disturbances, the potential for the study area to contain Aboriginal objects or places is considered to be very low. There is however, potential for Non-Aboriginal relics as a result of the former use of the site as part of Ultimo House and the original Parramatta Street alignment which traverses UTS and Alumni Green.

The HIS recommends the following relevant measures to mitigate the impact of development on historical archaeological remains that may survive at the UTS site:

- *suitable clauses should be included in all contractor and subcontractor contracts to ensure that on-site personnel are aware of their obligations and requirements in relation to the potential archaeological resource. In particular, site personnel should recognise the authority of the archaeologist(s) on site to halt or redirect site works as required;*
- *in the event that unexpected or significant archaeological remains not identified by the archaeological assessment or HIS are discovered during excavation at the site, all works in this area should cease and the Heritage Branch, Department of Planning must be notified in accordance with Section 146 of the Heritage Act; and*
- *a copy of this report should be submitted to the Department of Planning, NSW, in support of a Concept Plan Major Project Application pursuant to Section 75M of the EP&A Act.*

The HIS also recommends that:

> *Any proposed ground disturbance in areas identified as having historical archaeological potential should be undertaken in conjunction with or preceded by appropriate archaeological investigation and recording by a suitably qualified archaeologist. In the western third of the Broadway frontage, where archaeological potential is greatest, this should take the form of archaeological test excavation and salvage excavation, where appropriate. In other areas, archaeological monitoring and recording by a suitably qualified archaeologist would be appropriate.*

This recommendation is not relevant as the proposal is not located within the western third of the Broadway frontage and therefore does not require archaeological test excavations to be carried out.

Subject to meeting the above recommendations, the proposed development can be carried out without unacceptable impact on any potential archaeological heritage relics.

4.7 Urban Development Plan for Ultimo - Pyrmont Precinct 1999 Update

The Urban Development Plan for Ultimo Pyrmont (UDP 1999) was prepared in accordance with clause 36 of the Sydney Regional Environmental Plan (REP) No. 26 – City West to provide planning and urban design principles and controls to reflect those in the SREP. Clause 83(2) of the Sydney LEP 2005 requires consideration of the UDP 1999.

The UDP 1999 predominately relates to new buildings above the ground. As such, a majority of the controls do not apply to this development. The relevant sections of the UDP 1999 are discussed below.

Ecologically Sustainable Development

Ecologically Sustainable Design (ESD) principles have been incorporated into the design of the building to aim to achieve an equivalent 4 Green Star Rating. A detailed description of these initiatives is provided at Section 3.1.5.

Access, Parking and Circulation

- The proposal does not result in any additional floor space and does not result in an intensification of the use of the site.
- The proposal will not result in any additional students or workers at the site.
- The existing City Campus bicycle storage and change facilities will be maintained.
- The minimum allowed parking is nil. No car parking is proposed. The proposal therefore complies with the control for car parking.
- The loading dock provides room for a minimum of one (1) service vehicle. This is considered sufficient for the operation of the LRS and Storage facility and generally meets the requirements of the controls for service vehicles.
- The LRS loading dock, subject of this modification, is located below ground level with a single secure access driveway ramp on the eastern side, separate from pedestrian entrances and access. The proposal will not impact on existing traffic arrangements and will not result in any potential pedestrian / vehicle conflicts.
- The service vehicle loading areas is a designated space in the basement level and is not visible from the street.

Accessibility

Access and facilities are proposed for people with disabilities in accordance with applicable standards and requirements as outlined in the Preliminary Report on Accessibility provided at **Appendix I**.

4.8 City of Sydney Heritage Development Control Plan 2006

Two buildings within the UTS Broadway Precinct are currently listed as heritage items within the Sydney Local Environmental Plan 2005 (Sydney LEP) – Building 3, 8. These buildings are not subject of the proposed development, nor are they located within the vicinity of the subject site. The site is also not within a conservation area.

Sydney LEP 2005 requires consideration of the impact of developments on the heritage significance of heritage items. The consent authority must be satisfied that development will be compatible with the conservation of the heritage significance of items or the character of conservation areas in the vicinity. In addition, clause 102 provides heads of consideration for heritage assessment. These have been adequately addressed at Section 4.6 above.

4.9 City of Sydney Contaminated Land Development Control Plan 2004

A Stage 1 Environmental Site Assessment was carried out by EIS over the UTS campus in January 2011 (refer to **Appendix E** for an extract of this report). It concluded that based on the results from the site investigations undertaken by EIS, the site can be made suitable for the proposed development provided that the site is inspected by experienced environmental personnel during demolition and excavation works to

assess any unexpected conditions or subsurface facilities that may be discovered between investigation locations. This should facilitate appropriate adjustment of the works program and schedule in relation to the changed site conditions. EIS deem this precaution necessary due to the historical activities associated with the greater area.

This is addressed in more detail at Section 4.3 above.

4.10 Sydney Draft Local Environmental Plan 2011

The draft City of Sydney Local Environmental Plan 2011 (draft LEP 2011) is currently on public exhibition and is applicable to most of the City of Sydney local government area, including the subject site. The relevant sections of the draft LEP 2011 are discussed below.

Zoning

Pursuant to the draft LEP 2011, the subject site is zoned B4 – Mixed Use which permits business premises and educational facilities. One of the objectives of the zone is to encourage uses that provide facilities and services to the community. The LRS and Storage Building provides a service which will support the existing and future educational uses of the site.

Floor Space

The draft LEP 2011 identifies the site as having a maximum FSR of 5:1. The area of the City Campus Broadway Precinct site that is bounded by Broadway, Harris, Thomas and Wattle Streets has approval for 202,939m2 of floor area. As shown in Tables 1 and 2 above, the proposed modification results in an amended GFA which is below the approved floor area.

5 Environmental Assessment

5.1 Urban Design and Public Domain

The proposed LRS and Storage Building is located entirely beneath Alumni Green with the exception of three (3) structures above ground structures as detailed in Section 3.1. The two northern structures (Stairs 1 and 2) are temporary and will be relocated and integrated with the construction of the future Thomas Street Building. Stair 3, which also comprises the fire indication panel, master emergency control panel and fire brigade booster, is located directly adjacent to Building 2 and does not impact on the sense or quality of open space of Alumni Green. The area above the LRS and Storage Building will be turfed following the completion of the works before being comprehensively landscaped when other nearby elements of the Concept Plan redevelopment are complete.

Short term impacts on the visual amenity of the area during the construction stages of the development will be minimised through the use of specially designed hoardings which were approved by the City of Sydney Council on the 28 January 2011(D/2010/2139). These hoardings are shown in Figure 11at Section 3.1.7 above.

Pedestrian access throughout the campus will be maintained in accordance with the approved Concept Plan.

5.2 Geology and Hydrogeology Conditions

The lowest level of the LRS and Storage Building and Thomas Street Building will have a finished floor level of RL -5.00 which will require excavating approximately 20.5m below the existing surface of the site.

Jeffrey and Katauskas Pty Ltd has prepared a Geotechnical Investigation of the site (refer **Appendix J**) which provides information on subsurface conditions. These investigations have found that the subsurface profile below Alumni Green comprises fill over residual silty clay soils with weathered shale and sandstone bedrock below.

The fill at the site is classified as “General Solid Waste” and is relatively deep in some sections of the site. The underlying natural silty clay and bedrock are classified as Virgin Excavated Natural Material (VENM).

Groundwater is likely to be present at a reduced level of about RL 7m to RL10m, though the bedrock is expected to be relatively tight based upon information from this and previous nearby projects, and so relatively low flows are expected.

Based on the investigation results, the principal geotechnical issues associated with the proposed development will be the shoring of the soil, shale and more weathered sandstone at the top of the excavation faces, dewatering of the excavation and assessing ground movements outside the excavation, in particular with regard to the footings for the existing Building 2 and the Multi-Purpose Sports Hall (MPSH) currently under construction, which contains excavation to about RL3.0m.

The report makes recommendations in relation to excavation, dewatering, footing design, and subgrade preparation and pavement design, soil and groundwater aggression and earthquake design. Subject to carrying out the recommendations of the Geotechnical Investigation, the development can overcome the identified geotechnical issues satisfactorily. These recommendations have been included within the Draft Statement of Commitments at Section 6.

5.3 Contamination

A Stage 1 Environmental Site Assessment was carried out by EIS over the site in January 2011 (refer to **Appendix E** for an extract from this report). Result from this investigation conclude that the site can be made suitable for the proposed development provided that the site is inspected by experienced environmental personnel during demolition and excavation works to assess any unexpected conditions or subsurface facilities that may be discovered between investigation locations. This should facilitate appropriate adjustment of the works program and schedule in relation to the changed site conditions. EIS deem this precaution necessary due to the historical activities associated with the greater area. Section 4.3 above provides a detailed discussion of the environmental site assessment carried out and its findings.

Excavated material will predominately be disposed of off-site. The fill soils classed as 'General Solid Waste (non-putrescible)' will be disposed of at a suitable NSW DECCW (EPA) licensed landfill, in accordance with the criteria in the Waste Classification Guidelines 2009. Once the fills soils are removed the natural material located below will be validated to confirm that it is VENM. VENM soils are suitable for reuse and will be relocated accordingly.

The recommendations of the Stage 1 Environmental Site Assessment have been included within the Draft Statement of Commitments at Section 6.

5.4 Noise and Vibration

Noise and vibration impacts associated with the proposal will be limited to the construction stage of the development. Noise has the potential to impact on adjoining and nearby uses. Impacts from vibration may damage other buildings on site or nearby.

Acoustic Logic has prepared an Excavation and Construction - Noise and Vibration Management Plan (**Appendix K**) which addresses the following principal issues:

- identification of the noise and vibration standards which are applicable to this project;
- formulation of a strategy for construction to comply with the standards identified in the above point; and
- development of a monitoring programme to measure and regulate noise and vibration at all potentially affected locations.

The noise and vibration standards that are applicable to the development are:

- German Standard DIN 4150-3 (1999-02): “Structural Vibration – Effects of Vibration on Structures”;
- British Standard BS 6472:1992 “Guide to Evaluation of Human Exposure to Vibration in Buildings (1Hz to 80Hz);
- City of Sydney “Construction Hours/Noise Within the Central Business District “ (1992);
- Australian Standard 2436-1981 “Guide to Noise Control on Construction Maintenance and Demolition Site”; and
- Draft Department of Environment, Climate Change and Water (DECCW) Construction Noise and Vibration Guideline.

Sensitive noise receivers were identified as the neighbouring UTS buildings and to a lesser extent the adjacent TAFE facility to the north. It is anticipated that the new student accommodation building located at 718 Harris Street, Ultimo will be occupied by late 2011 and as a result would become a potentially affected residential receiver during the construction phase of the project.

An assessment of the principal sources of noise emission has been undertaken to identify the activities that may produce noise and/or vibration impacts so that appropriate ameliorative measures can be formulated. The findings from this assessment are as follows:

Excavation Stage

Excavation will be undertaken primarily by ripping. Noise levels produced by the excavation equipment may exceed the noise goals in adjacent UTS buildings when works are undertaken near the boundary of the site, even when quieter excavation methods such as ripping are used.

On site measurements will establish noise/vibration levels at sensitive receivers. If noise levels exceed the criteria then the possibility of reducing noise will be investigated and all practical methods should be employed to reduce noise to the target levels in order to preserve the amenity of the nearby occupancies. Given the proximity of the nearest receivers, the most feasible noise mitigation will involve scheduling of noise intensive works at times when the adjacent receivers are not in use/noise sensitive.

Noise impacts outside of the UTS precinct are not predicted to exceed City of Sydney construction noise guidelines.

Construction Stage

Noise levels generated during the construction phase will be significantly lower than during excavation. Significant vibration is not anticipated to be produced during this phase. The main noise producing activities will be that attributed to the forming and pouring of the concrete floor slabs, and crane operation. These would be managed by placing the plant as far as practicable from the sensitive receivers. It is expected that the adopted noise guidelines will generally be achieved during this phase except during louder activities such as stripping out of formwork which will occur from time to time.

Vibration Monitoring

The excavation and construction contractor is to ensure that the recommended vibration levels are not exceeded at their respective distances.

In summary, these findings show that the set noise criteria is expected to be exceeded during the excavation stage but with careful management the adopted noise guidelines during the construction stage should not be exceeded.

Mitigation Measures

Although the exact excavation and construction techniques are not yet known the Noise and Vibration Management Plan (**Appendix K**) has provided mitigation measures to ensure that noise impacts are minimised, including:

- selection of alternate appliance or process;
- acoustic barriers;
- silencing devices;
- material handling;
- treatment of equipment;
- establishment of site practices;
- regular noise checks of equipment;
- noise monitoring;
- implementation of complaints register and resolution programme; and
- contingency plans.

In some cases it may be necessary that two or more control measures be implemented to minimise noise. The recommendations of this report have been included within the Draft Statement of Commitments at Section 6.

5.5 Traffic

Operational Traffic

The proposed modification does not result in an increase the amount of students or workers at the UTS Broadway Precinct. A new LRS loading dock is proposed on Level 02 adjacent to the LRS picking area and Store 01. The dock provides sufficient room for vehicles to manoeuvre in and out of the loading area and to enter and exit the ramp from Thomas Street, in a forward direction.

Construction Traffic

Based upon the gross excavation volume and assumptions on the building traffic requirements, it is estimated that the following number of trucks are required at each stage of the development:

- Excavation Approx. 40 truck movements a day or 4-6 trucks per hour for 6 months
- Construction Approx. 20 truck movements a day or 3-5 trucks per hour for 8 months
- Finishing Approx. 15 truck movements a day or 2-4 trucks per hour for 6 months

Construction traffic will access the site using the main routes into the city, from the west via the Anzac bridge and from the north via the Sydney Harbour Bridge onto the Western Distributer, which has exits onto Harris Street from both directions. Construction traffic will leave the site using either Wattle Street which leads to the Western Distributer to the north or Broadway onto Parramatta Road to the south.

Arup have prepared a Construction Traffic Environmental Management Plan (CTEMP) (**Appendix L**) to ensure that impacts from vehicles during the construction stages of the development are minimised. Arup conclude that construction traffic will add to the existing traffic, however, as the additional construction traffic volumes are low and Thomas and Jones Streets are local roads, construction traffic is not likely to have any significant impact. The CTEMP also states that on street parking adjacent to the works on both Thomas and Jones Streets will be marked as Works Zones during construction hours and will be used for construction related activities only. This reduces on-street parking on Thomas Street by approximately seven car spaces and 20 motorcycle spaces and on Jones Street by six spaces. UTS will ensure that motorcycle parking is retained by re-allocating three car spaces to motorcycle parking on Thomas Street.

The CTEMP concludes that construction traffic will add to the existing traffic, however, as the additional construction traffic volumes are low and Thomas and Jones Streets are local roads, construction traffic is not likely to have any significant impact.

In accordance with the recommendations of the CTEMP, the following mitigation measures are proposed:

- The contractor shall prepare a Traffic Management Plan (TMP) prior to the commencement of works. Traffic will generally be managed at the site in the following way:
  - » Designated transport routes shall be communicated to all personnel
  - » Strict scheduling of vehicle movements is to occur to minimize vehicles waiting off the site
  - » Site workers are to utilize local public transport and car sharing wherever possible
- The following issues will be considered in the TMP:

- Traffic Impact
- Parking Impact
- Pedestrian Activity at/ near the Site
- Impact to Adjacent Businesses/ Properties
- Construction Traffic Management

The site is adjacent to Sydney Buses Route 501 West Ryde which accesses Jones Street, Thomas Street and Harris Street. During the AM and PM peak, bus movements occur five times per hour. As part of the TMP, construction vehicle drivers will be notified of the bus route and ensure that bus movements are not affected by managing truck movements at peak bus times.

The recommendations of the CTEMP have been included within the Draft Statement of Commitments at Section 6.

5.6 Sustainability

The proposed Ecologically Sustainable Development (ESD) approach for the LRS and storage project has been developed in conjunction with the UTS City Campus ESD Concept Plan, which targets a 4 Star Green Rating, and the regulatory requirements. The Concept Plan included the following ESD initiatives within the statement of commitments:

- contribute to a reduction in overall water campus consumption by up to 20% by 2010 (based on 2002 levels);
- meet or exceed the requirements of Section J of the Building Code of Australia for energy efficiency in building fabric and environmental systems;
- adopt water sensitive urban design principles such as stormwater reuse and rainwater capture across the campus; and
- adopt practises to minimise construction and operational waste including reuse 80% of demolition waste and investigate strategies.

Steensen Varming has provided a summary of the range of ESD principles (refer to **Appendix B**) that will be implemented in the LRS and Storage Building to meet these commitments. These include:

- minimising energy demand by taking advantage of the local characteristics of the site;
- specification and installation of energy efficient equipment – mechanical, electrical and lighting;
- incorporate humidity control measures to prevent mould growth;
- energy metering to facilitate monitoring of energy use; and
- environmentally preferable materials will be utilised. This includes non-PVC, low VOC, low formaldehdye products and FSC certified timber products.

The Stormwater Management Plan at **Appendix C** details how water sensitive urban design principles such as stormwater reuse and rainwater capture will be incorporated into the design of the building.

Other ESD initiatives that are being considered to achieve the ESD commitments and to work towards achieving an equivalent 4 Star Green Rating include:

- Integrating energy efficient systems such as a heat recovery system and high-efficiency fans to regulate plant loads

- Utilising the passive heating and cooling strategies to supplement the mechanical services arrangement
- Incorporating a thermal labyrinth around the LRS, to take advantage of the constant temperature of the surrounding earth. The labyrinth would be integrated into the service plenum around the LRS vault
- Incorporate a 'heat recovery system'. The heat recovery system would capture waste heat from relief air and transfer it to the supply air.

An Energy Efficiency Report has been prepared in accordance with Section J of the Building Code of Australia (BCA) (**Appendix D**). It has found that the proposal can meet the relevant deemed to satisfy provisions of Section J of the BCA or provide an acceptable appropriate solution where it cannot.

5.7 Accessibility

Philip Chun Accessibility has prepared a Preliminary Report on Accessibility (**Appendix I**) addressing access to and throughout the proposed building work for the project. This report outlines the main issues relevant to the proposed building work with reference to the Building Code of Australia (BCA), Disability (Access to Premises - Buildings) Amendment Standards 2010 (No. 1), Disability Discrimination Act 1992 (DDA), and relevant Australian Standards as applicable to this project.

Generally, all areas of the development have been assessed in regard to accessibility to facilitate safe, equitable and independent travel. However, the following areas have been excluded from this report (which are either outside of the project scope or not required to be accessible):

- existing areas of building CB02 not within the ASRS facility project scope;
- LRS vault;
- car parking and loading areas (except at the vehicular ramp which shall be modified as a part of the project);
- external areas (except at the vehicular ramp), and
- service and maintenance areas (including plant room, TSG room and cleaners room).

The report did not identify any major issues which could not be overcome in the detailed design of the development and a series of recommendations have been made in regard to internal doors, internal paths of travel and finishes, stairs, lifts, sanitary and shower facilities, staff and office areas, lighting, signage and emergency evacuation.

These recommendations have been included within the Draft Statement of Commitments at Section 6 to ensure that the accessibility requirements of the BCA, Disability Amendment Standards 2010, DDA and the Australian Standards will be met.

5.8 Building Code of Australia

A building compliance assessment has been carried out by Advance Building Approvals Pty Ltd (**Appendix M**) for the proposed LRS and Storage Building. The assessment concluded that the proposed scheme is capable of meeting the performance requirements of the BCA, without modification to the extent that an amendment to the DA would be triggered. Where the deemed to satisfy provisions of the BCA cannot be met an appropriate alternate solution will be accommodated in the design.

5.9 Air Quality

The proposed bulk excavation works will generate dust at the site. A detailed Air Quality Management Plan will be prepared by the building contractor prior to the commencement of works. The following air quality management measures will be adopted during the construction works:

- dust emissions will be controlled by the use of water spraying when required;
- concrete decks to be kept clean to reduce dust emissions;
- all motorised equipment used on the site will be selected on the basis of its noise performance and will comply with regulatory standards for noise generation;
- high efficiency mufflers are to be installed for major plant items particularly those that would be used for long periods on the project to reduce construction noise;
- equipment will be operated in an efficient and correct manner;
- odour emissions which have the potential to adversely affect air quality or the amenity of the local area will be monitored;
- no materials will be burnt on site; and
- maintenance in order to control noise and associated exhaust emissions.

These dust minimisation measures are included within the proposed Preliminary Construction Environmental Management Plan which forms part of the Draft Statement of Commitments at Section 6.

5.10 Consistency with the Concept Plan Approval

The proposal is generally consistent with the Concept Plan as it seeks approval for the construction and operation of a LRS and for the excavation of the basement levels of the Thomas Street Building in the same locations as shown on the approved Concept Plan. The only departure from the Concept Plan approval is the inclusion of additional storage space in association with the LRS Building and a change in the approval pathway for the construction and operation of the proposed development.

These changes are considered to be minor for the following reasons:

- the proposed storage is to be located beneath the ground;
- the proposal is consistent with the approved GFA on the site;
- the proposed storage does not result in additional students or workers at the site and is ancillary to the approved and existing uses of the site;
- the construction and operation of the future Thomas Street Building will still need to be considered under Part 3A of the EP&A Act; and
- potential environmental impacts can be minimised appropriately in accordance with the draft Statement of Commitments (refer Section 6) and a final Construction Environmental Management Plan.

As such the proposal is considered to be generally consistent with the Concept Plan approval.

6 Draft Statement of Commitments

The following commitments are proposed by UTS to minimise potential environmental impacts that may occur as a result of this modification to the approved Concept Plan.

(1) Noise

Noise associated with the excavation and construction stages of the development will be mitigated through the implementation of the Construction Environmental Management Plan which refers to the management measures set out in the noise and vibration assessment at **Appendix K**.

(2) Vibration

Vibration associated with the excavation and construction stages of the development will be mitigated through the implementation of the Construction Environmental Management Plan which refers to the management measures set out in the noise and vibration assessment at **Appendix K**.

(3) Construction Traffic

The excavation and construction contractors shall prepare a Traffic Management Plan (TMP) prior to the commencement of works to ensure the safety of pedestrians and to mitigate potential traffic impacts. The TMP will be developed based on the recommendations of the Construction Environmental Traffic Management Plan at **Appendix L** and in accordance with the Construction Environmental Management Plan.

(4) Construction Management

To minimise impacts and to ensure safety during the construction stages of the development, prior to any works at the site a Construction Environmental Management Plan is to be prepared based on the Preliminary Construction Environmental Management Plan at **Appendix O**. This plan must cover, but not be limited to, the following matters:

- tree protection;
- protection of existing buildings;
- work program and working hours;
- noise and vibration;
- contamination;
- air quality;
- waste management;
- construction traffic environmental management;
- health and safety; and
- soil and water management.

(5) Contamination

To prevent possible contamination impacts as a result of soil removal or dewatering the following actions will be implemented:

- The recommendations of the Stage 1 Environmental Contamination Plan (**Appendix E**) will be adopted.
- Council will be consulted prior to dewatering to determine whether the groundwater will require any or all of the following treatments prior to discharging to the stormwater drainage system:
  - Oil water separator to remove discreet oil droplets.
  - pH correction unit to keep water at required pH level.
  - hydrocarbon adsorbent stage to remove any trace hydrocarbons.

- an activated carbon filter to remove heavy metals.

- The excavated fill soils classed as 'General Solid Waste (non-putrescible)' will be disposed of at a suitable NSW DECCW (EPA) licensed landfill, in accordance with the criteria in the Waste Classification Guidelines 2009.

(6) Geotechnical Conditions

To manage subsurface conditions of the site and adjoining land the recommendations of the Geotechnical Investigation, at **Appendix J** of this report, are to be implemented.

(7) Accessibility

To ensure that the appropriate access to the building in provided, the recommendations of the Preliminary Report on Accessibility, at **Appendix I** of this report, are to be implemented.

(8) Ecologically Sustainable Design

In an attempt to achieve an equivalent 4 Star Green Rating the following ESD measures will be implemented:

- the recommendations of the Energy Efficient Report, at **Appendix D** of this report, which has been prepared in accordance with Section J of the Building Code of Australia (BCA);
- energy demand will be minimised by taking advantage of the local characteristics of the site;
- specification and installation of energy efficient equipment – mechanical, electrical and lighting;
- incorporate humidity control measures to prevent mould growth;
- energy metering to facilitate monitoring of energy use;
- environmentally preferable materials will be utilised. This includes non-PVC, low VOC, low formaldehdye products and FSC certified timber products; and
- inclusions of water sensitive urban design principles such as stormwater reuse and rainwater capture to be incorporated into the design of the building.

Other measures to be considered during the detailed design of the building are to include:

- Integrating energy efficient systems such as a heat recovery system and high-efficiency fans to regulate plant loads
- Utilising the passive heating and cooling strategies to supplement the mechanical services arrangement
- Incorporating a thermal labyrinth around the LRS, to take advantage of the constant temperature of the surrounding earth. The labyrinth would be integrated into the service plenum around the LRS vault
- Incorporating a ‘heat recovery system’. The heat recovery system would capture waste heat from relief air and transfer it to the supply air.

(9) Archaeology

To minimise impact on any potential items of archaeological significance the recommendations of the Aboriginal and Historical Archaeological Assessment (AHAA) at **Appendix G** of this report are to be implemented.

(10) Building Compliance

To ensure that the LRS and Storage Building is compliant with all relevant sections of the BCA, the recommendations of the Preliminary (BCA) Assessment at **Appendix M** of this report will be implemented.

7 Conclusion

This report provides a thorough environmental assessment for the proposed modification to the Broadway Precinct Concept Plan a (MP 08_0116), to allow the construction and operation of the Library Retrieval System (LRS) and Storage Building located beneath Alumni Green, and bulk excavation works for the basement levels of the Thomas Street Building, without any further environmental assessment.

This report has found that:

- any potential environmental impacts associated with the proposed modification can be appropriately mitigated or managed through the commitments made by the proponent,
- the proposal will result in a number of benefits such as:
  - » timing and budget efficiencies for the redevelopment of the City Campus, and
  - » reducing the overall excavation timeframes associated with the LRS and Storage Building and the Thomas Street Building, thus minimising environmental impact.
- the proposal is consistent with all relevant State and local planning controls, and
- the modifications are generally consistent with the Concept Plan approval.

In conclusion, the proposed modification does not result in any adverse environmental impacts, is in the public interest, and should be approved in accordance with s75W of the EP&A Act.

Appendix A

Architectural Drawings

Appendix B

Summary of Ecologically Sustainable Design Principles

Appendix C

Statement on Provision of Stormwater Drainage

Appendix D

Energy Efficiency Report

Appendix E

Stage 1 Environmental Site Assessment – Extract

Appendix F

Correspondence from Eclipse Environmental

Appendix G

Aboriginal and Historical Archaeological Assessment – Extract

Appendix H

Heritage Impact Statement – Extract

Appendix I

Preliminary Report on Accessibility

Appendix J

Geotechnical Investigation

Appendix K

Excavation and Construction - Noise and Vibration Management Plan

Appendix L

Construction Traffic Environmental Management Plan

Appendix M

Preliminary BCA Assessment Report

Appendix N

Preliminary Construction Environmental Management Plan