

# Environmental Assessment Report

## UTS City Campus, Broadway Precinct Modification to Concept Plan 08\_0116

Submitted to  
NSW Department of Planning  
On Behalf of the University of Technology Sydney

October 2010 ■ 10222

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

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

This report has been prepared by: Vivienne Goldschmidt

Signature  Date 08/10/10

# Statement of Validity

## Environmental Assessment

This Environmental Assessment has been prepared and submitted under Part 3A of the *Environmental Planning and Assessment Act, 1979* (as amended) by:

Name	Vivienne Goldschmidt
Qualifications	BA (Hons) MPIA CPP
Company	JBA Urban Planning Consultants Pty Ltd
Address	Level 7, 77 Berry Street, North Sydney

## Project Summary

Applicant	University of Technology Sydney, PO Box 123 Broadway NSW 2007
Land to be developed	UTS City Campus, Broadway Precinct, Ultimo
Proposed development	Modification to approved Concept Plan 08_0116 to enable bulk earthworks for the Broadway Building to proceed early.

## Declaration

I certify that the following Environmental Assessment Report has been prepared in accordance with the requirements of Part 3A of the *Environmental Planning and Assessment Act, 1979* and Regulation and that, to the best of my knowledge, is not false or misleading.

Signature: 

Name: Vivienne Goldschmidt

Date: 8 October 2010

# Contents

<b>1.0</b>	<b>Introduction</b>	<b>1</b>
1.1	Background to the Modification	1
1.2	Approval Sought under the Modification	1
1.3	The Site	2
<b>2.0</b>	<b>Description of Modification</b>	<b>4</b>
2.1	Need for the Modification	4
2.2	Proposed Works	5
<b>3.0</b>	<b>Environmental Assessment</b>	<b>9</b>
3.1	Noise and Vibration	9
3.2	Hydrogeology and Geotechnical Conditions	11
3.3	Contamination	12
3.4	Archaeology	13
3.5	Air Quality	14
3.6	Construction Traffic	14
3.7	Tree Management	16
3.8	Incomplete Works	16
3.9	Consistency with Concept Plan approval	17
<b>4.0</b>	<b>Draft Statement of Commitments</b>	<b>18</b>
4.1	Noise	18
4.2	Vibration	18
4.3	Geotechnical Conditions	18
4.4	Contamination	18
4.5	Archaeology	18
4.6	Construction Traffic	18
4.7	Trees Management	18
4.8	Construction Management	19
4.9	Site Rectification	19
<b>5.0</b>	<b>Conclusion</b>	<b>20</b>

## Figures

<b>1</b>	<b>UTS Broadway Precinct and the Broadway Building site</b>	<b>2</b>
<b>2</b>	<b>The site</b>	<b>3</b>
<b>3</b>	<b>Plan of bulk excavation (Source: DCM)</b>	<b>6</b>
<b>4</b>	<b>Section of bulk excavation at Broadway (Source: DCM)</b>	<b>7</b>
<b>5</b>	<b>Section of bulk excavation at Building 10 (Source: DCM)</b>	<b>7</b>

# Contents

## Appendices

---

- A** Quantity Surveyor's Report  
*Davis Langdon*
- B** Correspondence from Department of Planning regarding modification  
(22 March 2010)
- C** Structural Drawings  
*Aurecon Australia Pty Ltd*
- D** Noise and Vibration Assessment  
*Renzo Tonin Associates*
- E** Geotechnical Investigation and Hydrogeological Assessment  
*Jeffrey and Katauskas Pty Ltd*
- F** Stage 2 Environmental Site Assessment - Volume 1  
(Volume 2 provided in soft copy only)  
*Environmental Investigation Services*
- G** Interim Excavation Report and Archaeological Assessment Review  
*Archaeological & Heritage Management Solutions Pty Ltd*
- H** Construction Management Plan Framework  
*Denton Corker Marshall Pty Ltd*
- I** Construction Traffic Management Plan - Early Works  
*Halcrow*
- J** Arboricultural Impact Assessment  
*Tree Wise Men Australia Pty Ltd*



## 1.0 Introduction

This Environmental Assessment Report for modifications to the approved Concept Plan for the Broadway Precinct of the UTS City Campus is submitted to the Minister for Planning in accordance with Section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Concept Plan was approved by the Minister for Planning under Section 75J of the Act on 23 December 2009 subject to a series of conditions (MP08\_0116). The Minister for Planning also granted Project Approval for the demolition of Buildings 11, 12 and 13 which are currently located on the Broadway Building site.

Subsequently, a Preliminary Environmental Assessment Report (PEAR) was submitted to the Department of Planning (DOP) for the development of the Broadway Building, a major component of the Concept Plan. The Director General Requirements (DGRs) for the Project Application (MP09\_0212) were issued by the Department on 19 January 2010.

The approved Concept Plan allows for the demolition, construction and extension of several buildings on the Broadway Precinct to enable UTS to provide an additional 84,750m<sup>2</sup> of gross floor area of education, social and sporting facilities, and student housing. The approved Concept includes the development of the Broadway Building - consisting of 34,650m<sup>2</sup> of educational and ancillary floor space for the Faculty of Engineering and Information Technology. This report has been prepared by JBA Urban Planning Consultants Pty Ltd on behalf of UTS based on plans and supporting technical information provided by several specialist consultants (listed in the Table of Contents). The report describes the proposed modification and the reasons it is required and includes an assessment of the potential environmental impacts. It should be read in conjunction with the appended supporting plans and reports.

### 1.1 Background to the Modification

Since the approval of the Concept Plan and the preparation of the PEAR for the Broadway Building, UTS has been engaged in finalising the detailed design, preparing the works program, and letting of the tenders for the development of the Broadway Building. In so doing, it came to the view that, for a number of cogent reasons associated with managing the risks inherent in the project (detailed in Section 2.1), the development of the Broadway Building should be staged to separate the proposed bulk earthworks from the development of the building itself. Neither the Concept Plan nor the PEAR contemplated this eventuality.

Accordingly, the University is seeking approval to undertake the bulk earthworks component of the project ahead of the rest of the Project Application for the Broadway Building. The works the subject of this modification are consistent with the existing approval and the DGRs for the Project Application and involve bulk excavation and associated stabilisation works and water management.

The capital investment value of these works is \$9.902 million (see Quantity Surveyors report prepared by Davis Langdon at **Appendix A**).

The need to modify the Concept Plan was canvassed with the Department of Planning in March 2010. In correspondence received by JBA on 22 March 2010 (attached at **Appendix B**), the Department advised that a modification under s.75W of the EP&A Act would be necessary.

### 1.2 Approval Sought under the Modification

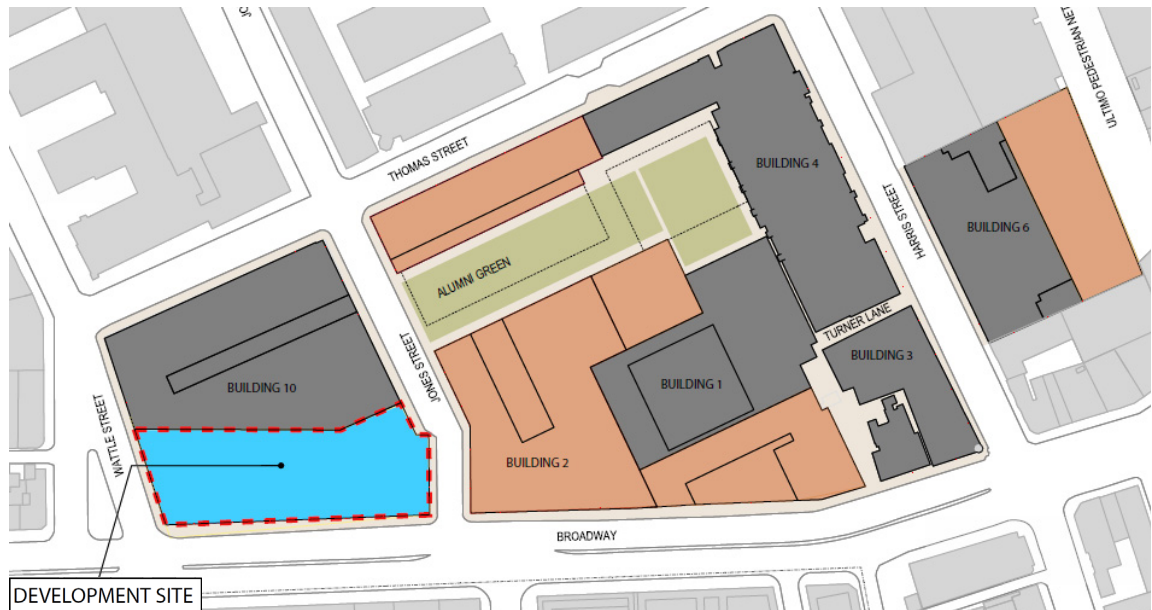
Specifically, this modification is seeking that the Minister:

- determine under section 75P(1) (c) of the EP&A Act, that the excavation of the Broadway Building requires no further assessment and approve this development under s75J(1) subject to any conditions; and
- grant Project Approval for the bulk earthworks for the Broadway Building as described in this report.

## 1.3 The Site

The Broadway Precinct of the UTS City Campus is located on the southern edge of the Sydney Central Business District with frontages to Broadway, and Thomas, Wattle and Harris Streets. As shown in **Figure 1**, the approximately 3,540 square metres Broadway Building site is on the north of Broadway between Jones and Wattle Street. The site slopes from east (Jones Street) to west (Wattle Street) by some 3 to 5 degrees, with the Wattle Street end 4.35 metres lower.

The land is owned by UTS and consists of two lots legally described as Lot 1 in DP 554602 and Lot 1 in DP 89492.



**Figure 1** - UTS Broadway Precinct and the Broadway Building site (FIX)

Formerly used as a car park, the site is highly disturbed and is largely surfaced with bitumen and gravel (see **Figure 2**). The three buildings currently on the site are to be demolished prior to commencement of any excavation in accordance with the Minister's determination of the Concept Plan. The trees associated with the buildings on the site are to be removed in accordance with City of Sydney tree removal requirements.





Figure 2 - The site

The site is zoned **Residential-Business** under Sydney Local Environmental Plan 2005 (SLEP). Uses that are consistent with one or more of the zone objectives are permissible with development consent in the zone. None of the zone objectives are directly or specifically relevant to the proposed educational use, however the UTS campus is a significant educational use in the zone and the locality, and the proposed development would not be inconsistent with the zone.

The proposed modification is entirely consistent with the approved Concept Plan.

## 2.0 Description of Modification

The need for, and the description of, the proposed modification to the approved Concept Plan are covered in this section. It essentially seeks to modify the originally proposed program for the Broadway Building by bringing forward the bulk earthworks for the development. Accordingly, approval to undertake these works is needed ahead of the project application and subsequent approval for the Broadway Building.

### 2.1 Need for the Modification

The modification is needed to manage the risks inherent in the Broadway Building project. To do this, the development needs to be staged to separate the proposed bulk earthworks from the construction of the building itself. The risks are described below.

#### 2.1.1 Development Program Risks

In accordance with its relocation and accommodation program, UTS requires that the Broadway Building be available to be occupied by December 2013. To achieve this, construction of the building itself - the Main Contract - must commence in March 2012.

In the original program the construction contract period followed immediately after the completion of the excavation works, allowing no room for slippage - that is, delays due to bad weather or to deal with unexpected site conditions - geotechnical, archaeological and the like. Therefore any delay in the excavation works would mean a delay in the start of the main contract works and thus a delay in completing and occupying the Broadway Building.

Because of the time required to finalise the design of the building and undertake the studies necessary for the Project Application, it will not be possible to lodge the EAR until mid 2011. Accordingly, the proposed alternative is to secure staged approval for the bulk earthworks, so enabling:

- commencement of the bulk earthworks in January 2011;
- completion of bulk earthworks by July 2011; and
- commencement of the Main Contract in March 2012.

The proposed separation of the bulk earthworks adjusts the program by providing leeway of 10 months before the Main Contract works commence. Thus if the excavation works are delayed for any reason, the program has some flexibility to extend before the Main Contract works become delayed.

#### 2.1.2 Risk associated with Ground Conditions

The greatest sources of risk on a construction project are any latent conditions in the ground. The earlier these unknowns are uncovered the less impact they have on the project budget, the design program and the construction program. These latent conditions are:

- Small scale contamination not identified in the Stage 2 Environmental Site Assessment, but uncovered in the course of the excavation works. This will impact on the program of the bulk excavation work and consequently the Main Contract Works.
- Unrecorded structures or services or discovery of further archaeological finds that could delay the bulk excavation.
- Unexpected geological conditions such as natural faults in the rock which would impact on basement and foundation design. While a series of test boreholes has been drilled, the full extent of any geological faults, bedding partings and the like can only be confirmed following the excavation of the site.

Undertaking the bulk excavation works earlier enables any geological issues to be discovered earlier in the design documentation process, so allowing any consequential changes to the design and documentation of the foundations to be undertaken in a timely manner and integrated into the procurement program without delaying the Main Contract works.

### 2.1.3 Financial Risk

UTS intends tendering the Main Contract - the construction of the Broadway Building - as a lump sum contract. The separate approval for the bulk earthworks would give financial certainty to the tenderers for this contract because the financial and timing risks associated with unexpected site conditions would be known.

Specifically, the alternative program inherent in bringing forward the bulk earthworks removes significant financial risks from UTS:

- The seven month separation between completion of bulk excavation and commencement of the Main Contract works allows any latent geological conditions to be accommodated within the contract documentation and tender price, rather than delaying the contract while documentation is altered to accommodate these conditions.
- The contractors tendering for the Main Contract will have greater certainty as to the ground conditions. Since a major risk element would be removed or reduced, tenderers will be able to price more competitively - so advantaging UTS with a lower contract price.
- The certainty of ground conditions significantly removes the likelihood of costly variations to the Main Contract later.

In short, tendering contractors will be able to view the site conditions they will be asked to price against, and will therefore be able to reduce or eliminate the premium they will price in for risk/latent ground conditions. This will result in UTS obtaining a more competitive price.

## 2.2 Proposed Works

The proposed works which constitute the modification are contained within the approved envelope for the Broadway Building and consist of:

- bulk excavation of the basement areas as per the approved Concept Plan; and
- construction of temporary retention /stabilisation systems for the basement areas.

### 2.2.1 Bulk Excavation Details

#### Excavation

In accordance with the approved envelope for the Broadway Building, the site is to be excavated for the future basements variously to depths of RL -8.01 (at Jones Street), RL- 6.21(at the centre of the site), and RL- 4.76 at Wattle Street - see the sketches in **Figures 3, 4 and 5** below and the engineering drawings prepared by Aurecon at **Appendix C**. Due to the stepped nature of the hole, the depth will vary from approximately 14.2 metres at Wattle Street to approximately 23.5 metres at its deepest along Jones Street.

In all, approximately 58,900 cubic metres of spoil (soil, clay and rock) is to be removed and transported off site. Contaminated spoil will be disposed separately in accordance with the findings and recommendations set out in Section 3.3 of this report.

Shoring to the structural engineering design specification will be installed to the perimeter of the Jones Street, Wattle Street and Broadway elevations. The northern elevation, adjacent to UTS Building 10, will require no retention due to the location of the rock levels and the existing basement structure.

Excavation of the bedrock may include measures such as rock sawing, and/or non-explosive breaking techniques such as Penetration Cone Fracture (PCF) or similar methods as these typically have less noise impact and lower energy emissions. The underlying sandstone exposed to the full depth of the basement is expected to be largely good quality Class I and II sandstone.

### Retention and stabilisation works

Retention and stabilisation works for temporary and permanent conditions will be required to ensure that the basements are stabilised. The detailed design of these works will consider:

- management of any groundwater seepage inflows into basement excavations both during construction (short term) and in the long-term following completion of building works;
- control of ground movements adjacent to excavations to ensure stability and to protect adjacent roads and nearby sensitive structures; and
- the short and long term stability of the basement in terms of soil and rock loads, stability and groundwater pressures.

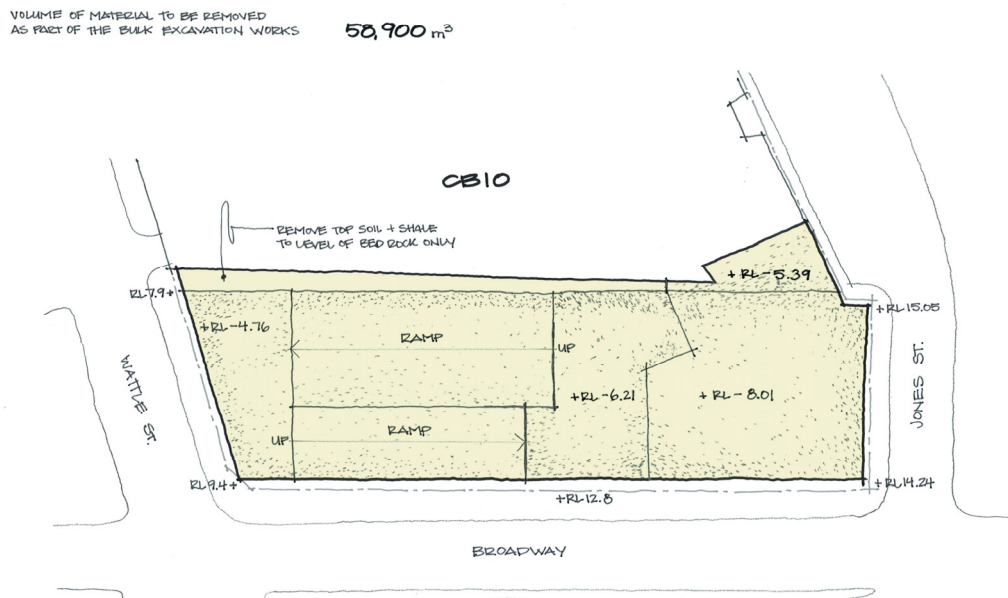


Figure 3 - Plan of bulk excavation (Source: DCM)

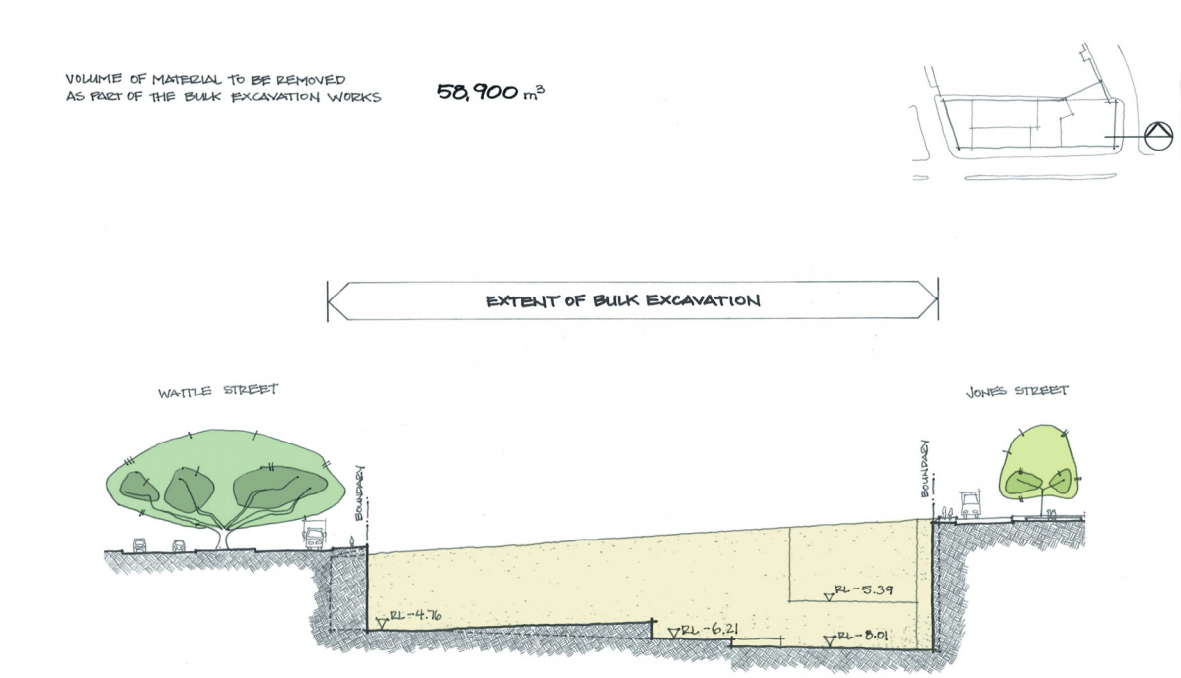


Figure 4 - Section of bulk excavation at Broadway (Source: DCM)

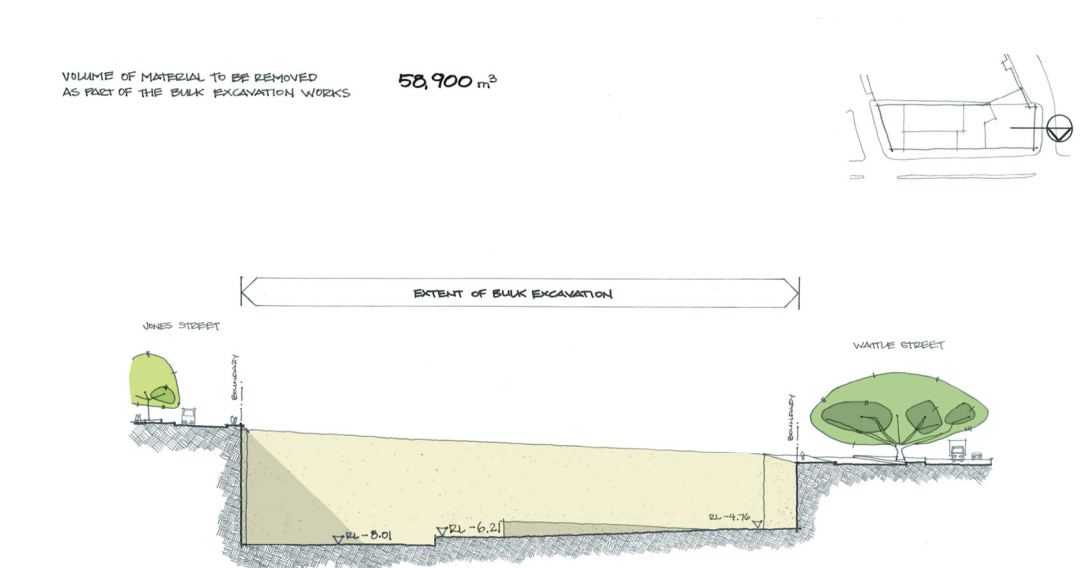


Figure 5 - Section of bulk excavation at Building 10 (Source: DCM)

### 2.2.2 Hours of Work

In accordance with the Instrument of Approval for the Concept Plan, hours of work will be as follows:

- Monday to Friday: 7am to 7pm;
- Saturday: 7am to 5pm.

There will be no work on Sundays or public holidays.

Within these working hours excavation will be managed to avoid disruption to university activities.

### 2.2.3 Construction Management

All work will be undertaken in accordance with a Construction Management Plan for the Broadway Building site prepared in accordance with the Construction Management Plan Framework at **Appendix H**.

In developing the site, UTS is targeting a range of sustainability outcomes. In relation to the bulk excavation works, UTS will aim to:

- minimise the amount of excavation needed on the site;
- maximise the reuse of clean excavated materials (VENM) where possible; and
- minimise the total volume of materials to be disposed of off-site.



## 3.0 Environmental Assessment

This section of the report describes and assesses the potential environmental impacts associated with the proposed works; considers the highly unlikely eventuality of the works remaining incomplete for a considerable period; and addresses the proposal's consistency with the Conditions of Approval (CoA) for the Concept Plan.

As demonstrated in the following assessment, there are very few potential impacts from the works and none that cannot be managed. The following are the potential environmental impacts associated with the proposed works:

- Noise and vibration;
- Hydrogeology and geotechnical conditions;
- Contamination;
- Archaeological finds;
- Air quality;
- Construction traffic; and
- Trees in the immediate locality.

### 3.1 Noise and Vibration

Noise from the works have the potential to impact on neighbouring education activities and the buildings on the western side of Wattle Street. Ground vibration could damage on and off-site structures. Renzo Tonin Associates has assessed the noise and vibration impacts associated with the bulk earthworks (see **Appendix D**).

#### 3.1.1 Noise

##### Assessment

Given the significant scale of the excavation works proposed for the UTS Broadway Building site, a quantitative noise assessment was undertaken consistent with the requirements in the Department of Environment, Climate Change and Water (DECCW) recently released NSW Interim Construction Noise Guideline (ICNG) requirements. Sensitive noise receivers were identified as a residential building on Wattle Street, a commercial building on the corner of Wattle Street and Broadway, and all floors of UTS Building 10.

As actual plant and equipment to be used for excavation was not yet known, for the purposes of the assessment typical plant and equipment likely to be used for the works were identified with the sound power for the majority of activities based on maximum levels. The estimated noise levels at the nearest affected receiver locations were based on a 'worst case' scenario with all the plant and equipment operating concurrently and in the areas closest to the corresponding critical receivers. The calculations took into consideration attenuation due to the distance between the receiver and the excavation activity, but did not consider shielding provided by intervening structures or noise mitigation treatments applied to plant and equipment on site.

The assessment showed that noise emissions will generally exceed the set noise criteria for all locations and that noise mitigation measures will be required.

## Management

To mitigate the impacts of noise the proponent will implement a combination of management measures recommended by Renzo Tonin, as follows:

- General engineering controls, such as:
  - fitting noise control kits to plant engines;
  - use of partial acoustic enclosures;
  - use of temporary hoarding for stationary equipment; and
  - managing the movement of trucks on site.
- Specific noise mitigation measures to reduce airborne noise through the existing windows on the southern side of Building 10, using - variously - compressed fibre cement, glass and Perspex.
- Noise management measures, including:
  - time management measures where noise level exceedances cannot be avoided or where physical noise control measures are not reasonable or feasible; and
  - relocation of affected classes elsewhere.

Other management measures will also be implemented such as regular periodic noise monitoring, establishing complaints procedures and ensuring that plant and equipment are properly maintained.

These measures will be implemented as part of the Construction Management Plan for the site and are included in the draft Statement of Commitments.

### 3.1.2 Vibration

#### Assessment

The excavation plant and equipment that are typically likely to cause significant levels of vibration are bulldozers, excavators, rock saws/rippers, rock breakers and truck traffic. The effects of ground vibration from this plant and equipment fall into the following three categories:

- disturbance to building occupants - in this case in the buildings on Wattle Street and UTS Building 10;
- effects on building contents - ranging from visible movement to rattling; and
- effects on building structures - where the integrity of the building or the structure itself may be prejudiced.

The assessment details the vibration measurement criteria for building occupants and structural damage.

#### Management

The proponent will implement a number of measures to manage and mitigate the effects of vibration from excavation plant.

Firstly, the assessment recommends indicative minimum buffer distances for some common construction plant to reduce human discomfort. These buffer distances are applicable to residential type receivers only. For commercial type receivers, such as UTS Building10, buffer distances will be lower and less stringent. As the human comfort criteria are more stringent than the structural damage criteria, if compliance is achieved for the assessment of human comfort, then compliance will also be achieved for the assessment of structural damage to buildings.

As the buffer distances provided are indicative, more detailed site specific buffer distances will be determined by the proponent once vibration emission levels are measured from each plant item prior to the commencement of their use on site.



In addition, periodic vibration monitoring will be conducted at all critical or sensitive areas and the vibration levels tested for compliance with the set vibration limits. Monitoring will be undertaken in accordance with the vibration monitoring methods described in the Renzo Tonin report.

Secondly, the proponent will implement a range of measures to minimise the impacts of vibration on people and structures, including:

- a vibration management plan;
- procedures to deal with vibration complaints;
- conducting vibration testing of actual equipment on site prior to the excavation works to determine acceptable buffer distances to the sensitive receivers;
- carrying out additional vibration monitoring as specified in Appendix D to the Renzo Tonin report when excavation activities are at the nearest point to the nominated occupancies;
- carrying out periodic vibration monitoring at all critical or sensitive areas and assessing the vibration levels for compliance with the set vibration limit;
- where vibration is found to be excessive, implementing management measures to ensure vibration compliance is achieved; and
- before excavation works, preparing a Dilapidation Report on the state of the existing buildings surrounding the construction site.

These measures will be implemented as part of the Construction Management Plan for the site and are included in the draft Statement of Commitments.

## 3.2 Hydrogeology and Geotechnical Conditions

The lowest basement of the Broadway Building (B4) will have a finished floor level of approximately RL-7.76 which will require excavating 13 to 23 metres below the existing surface of the site.

Jeffrey and Katauskas Pty Ltd has prepared a Geotechnical Investigation and Hydrogeological Assessment of the site (see **Appendix E**) which provides information on subsurface and hydrological conditions and makes recommendations in relation to excavation, support systems, retaining wall design parameters and footing design. Overall no major geotechnical conditions were encountered that cannot be managed through standard engineering practices.

### Assessment

The investigation involved the drilling of 16 boreholes and one Dynamic Cone Penetrometer test. Ten of the boreholes were diamond cored through the underlying sandstone bedrock to depths at least 3 metres below the proposed future basement.

The subsurface profile of the site comprises predominantly asphaltic concrete pavements, fill and residual silty clays overlying weathered shale and sandstone bedrock at shallow to moderate depths. The majority of excavation will be through Class I/II sandstone bedrock that is slightly weathered, and fresh sandstone of at least medium and high strength at depths between 1.5 and 5 metres. No sub-vertical intrusions such as an igneous dyke, were encountered in the boreholes.

The groundwater below the site is located deep within the sandstone bedrock profile - the water table was not identified during the drilling process and no sandy alluvium was encountered. Moreover, due to the low permeability of the underlying sandstone bedrock, any groundwater inflows into the excavated area through defects present within the rock mass are expected to be limited and able to be pumped and drained to the stormwater system.

## Management

The report makes detailed recommendations to manage the subsurface conditions of the site during excavation and construction. These measures will be implemented by the proponent - which are, in summary:

- Engineered retention systems will be installed to support the expected vertical cuts in the upper soil and weathered bedrock profiles.
- During excavation stability will be maintained by perimeter retaining walls to support the neighbouring Building 10, buried services footpath reserves and adjoining roadways.
- Vibrations during excavation will be controlled to prevent damage to neighbouring buildings and nearby buried services.
- A structural engineer will advise on the effects of ground related movements due to stress relief - particularly in relation to Building 10 and nearby services.

## 3.3 Contamination

The previous uses of the site involved potentially contaminating activities, including underground storage tanks (USTs). In accordance with the commitments made by UTS in the Concept Plan, a Stage 2 Environmental Site Assessment was undertaken in accordance with State Environmental Planning Policy 55 – Remediation of Land and the *Guidelines for Consultants Reporting on Contaminated Sites* [DECCW], formerly EPA, 1997). The investigation, undertaken by Environmental Investigation Services (EIS), assessed the likelihood of soil and groundwater contamination (see **Appendix F**).

### Assessment

Soil samples were obtained from 11 boreholes across the site, but not beneath the existing buildings located in the west section along Broadway as access was not possible. The assessment also included the installation of 5 groundwater monitoring wells in selected boreholes including down gradient from the USTs to assess the potential for hydrocarbon contamination of the groundwater aquifer.

In relation to soil contamination, elevated concentrations of contaminants were encountered in the samples of fill from boreholes drilled along the northern boundary of the site. While the result for lead was below the site assessment criteria, the levels of Total Polycyclic Aromatic Hydrocarbons (PAHs) including Benzo(a)pyrene (B(a)P) and Total Petroleum Hydrocarbons (TPH) were of concern.

The elevated concentrations of PAHs may be attributed to the ash found in the fill material - not uncommon, as use of ash waste as fill material (either as ash or mixed with other soil and waste materials) was widespread and common in Sydney in the late 1800s/early 1900s. The fill sample from the borehole located in the north-east section of the site showed an elevated concentration of heavy fraction TPH C10 – C36. The site history search and field investigation indicated that several USTs had been abandoned in this section of the site, and leakages or spills from the USTs may have impacted the fill material in this location.

Asbestos above the reporting limit was not detected in any of the samples analysed for the investigation.

In relation to groundwater, the concentrations detected of potential contaminants (arsenic, copper and various VOCs) were below the site assessment criteria.

A substantial amount of excavated material has to be disposed of off-site. The fill soils contaminated with ash are classed as 'General Solid Waste (non-putrescible)'. In accordance with the criteria in the Waste Classification Guidelines 2009, this material will be disposed of at a suitable NSW DECCW (EPA) licensed landfill with a leachate monitoring system. The majority of the natural silty clay and underlying shale/sandstone bedrock at the site is considered to be virgin excavated natural material (VENM) which is suitable of reuse.

Following removal of the USTs in the west section of the site, the underlying natural material will be validated to confirm that it is VENM, as natural soils with an associated strong hydrocarbon odour cannot be classified as VENM.

### Management and site suitability

The Stage 2 investigation identified the following issues which require remediation and further assessment:

- Excavation and disposal of the abandoned USTs located in the east section of the site.
- Remediation of soil used as backfill around the USTs followed by validation of the tank pit excavation.
- Excavation and disposal of the contaminated fill material encountered along the north site boundary followed by validation of the excavation.
- Hazardous building material inspection prior to the demolition of the existing buildings.
- Additional sampling of fill material beneath the existing buildings.

Based on the scope of work undertaken, EIS considers that the site can be made suitable for the proposed development provided that the following recommendations are implemented:

- Preparation of a remediation action plan (RAP) to provide remedial procedures to be followed during the proposed works.
- Undertaking a validation assessment of the remedial works and preparation of a validation report.
- Preparation of an appropriate occupational health and safety plan for the contaminants encountered at this site.
- Inspection of the site by experienced environmental personnel during excavation works to assess any unexpected conditions or subsurface facilities that may be discovered between investigation locations.

In the opinion of EIS, after successful completion of the RAP the site contamination is unlikely to meet the Notification Triggers specified in the Guidelines on the Duty to Report Contamination under the *Contaminated Lands Management Amendment Act 2008*.

The proponent will implement all of the above measures in accordance with the draft Statement of Commitments.

## 3.4 Archaeology

In accordance with UTS's commitment in the Concept Plan in relation to the high archaeological potential of the Broadway Building site, an Interim Excavation Report and Archaeological Assessment Review was undertaken by Archaeological & Heritage Management Solutions Pty Ltd (AHMS) (see **Appendix G**).

### Assessment

Five test trenches were excavated to determine the level of survival and extent of features or deposits associated with the early occupation of the site. The test excavations were designed to ground-truth an earlier archaeological assessment which had identified that the site had potential to contain archaeological remains relating to previous land uses and occupation, and, that should they have survived, would be of high research value and of local heritage significance. Of specific interest was potential for archaeological resources associated with the Fowler pottery works (Fowler Ware).

As detailed in the AHMS report, the archaeological testing has identified potential archaeological resources from the Fowler period (1837-1848) and subsequent development up to the 1860s.

The highest archaeological research value and heritage significance of the site lies in the remains associated with Enoch Fowler's occupation and use of the site. Fowler established his first pottery on the site soon after his arrival in Australia in 1837 in what was the beginnings of one of Australia's most enduring manufacturing companies. Fowler's place in the history of pottery manufacturing specifically and Australian manufacturing in general is considered important, and the firm was recognised for the introduction of new technologies, particularly mechanisation and mass-production on a significant scale. While the introduction of these techniques took place after Fowler left the site, his first 10 years of operation were significant in that they laid the foundation for the company's survival and later expansion.

Because there are few documentary records of Fowler's use and occupation of the Broadway site, any surviving archaeological resources that can be provenanced to his tenancy would be considered to be of research value and of local heritage significance. Because the site is only partially disturbed, it represents a significant archaeological research opportunity.

The AHMS report sets out the findings from the five test trenches and concluded that:

- The site has archaeological potential to varying degree.
- Any archaeological remains from the occupation and use of the site by Enoch Fowler, even if in relatively disturbed contexts, are likely to be of high research value and local heritage significance.
- Areas of moderate research value, but still of local heritage significance, include remains associated with structures from the 1830s in the south-east portion of the site and residences/ shops developed across the site from the late 1840s through the 1850s.

## Management

Given the above findings, UTS will undertake the following prior to the commencement of the bulk earthworks to appropriately manage the site's archaeological values::

- Archaeological salvage excavation with the focus on the Fowler allotment(s).
- Additional work in areas containing the footings of otherwise unrecorded 1830s structures in the south-east and the 1840s/1850s structures in the western area of the site.
- Preparation, as part of an Archaeological Management Plan for the site, of a detailed archaeological methodology to identify specific areas, extent and duration of any additional excavation work as well as post excavation reporting.

These measure are included in the draft Statement of Commitments.

## 3.5 Air Quality

Excavation of the site will generate dust. This will be managed in accordance with the Construction Management Plan for the site, and the dust control measures in the Instrument of Approval for the Concept Plan.

## 3.6 Construction Traffic

The Construction Traffic Management Plan (CTMP) prepared by Halcrow (see **Appendix I**) demonstrates that the proposed works can be satisfactorily accommodated by the surrounding road network. It is intended that loading will occur on site for the majority of the excavation works.

Traffic generation will primarily be associated with:

- removal of spoil during excavation by 'dog and trailer' and heavy rigid trucks; and
- delivery of machinery, cranes, and materials for fencing and hoardings by flat bed trucks and/or heavy rigid trucks.

## Assessment

Based on the removal of 58,900 cubic metres of spoil material over 26 weeks, 3-4 trucks will arrive /depart the site every hour on average (i.e. 6 - 8 truck movements), utilising:

- 20 tonne (17 metre) dog and trailers working for 10 weeks and entering and exiting in a forward direction via Jones Street; and
- 10 tonne (12.5 metre) rigid trucks working for 16 weeks, entering the site in a forward direction and exiting by reversing into Jones Street.

The entry and exit to Jones Street represents the shortest available route to the site from arterial roads and the truck routes nominated in the CTMP include RTA controlled arterial roads suitable for use by excavation trucks.

The number and frequency of trucks is estimated as relatively low and will not adversely impact on the traffic efficiency on the proposed routes.

A kerbside lane on Wattle Street will be closed to ensure no build up of trucks on Jones Street. As the proposed lane closure is on a section with a No Stopping restriction there would be no disruption to residential or customer parking or loading.

The signalised pedestrian crossings across Wattle Street, Jones Street and Broadway will not be affected by the internal construction activities, however, the footpath on Jones Street along the site frontage will be closed to pedestrians throughout the works. Type B hoardings will be installed on Wattle Street, Jones Street and Broadway but pedestrian access will be maintained.

Public transport services will not be detoured during construction works, but it will be necessary to temporarily relocate the bus stop on Jones Street - currently some 20 metres from the Broadway intersection - to a location further north.

Any potential impacts on emergency access will be managed as follows: access to the site and neighbouring sites by emergency vehicles will not be affected by the works; the fire exits from Building 10 will be kept unobstructed at all times; and emergency protocols will require traffic controllers to assist with emergency access from the street.

## Management

As set out in the CTMP, construction vehicles will access/exit the site from Jones Street via a dedicated access driveway, and a works zone will be established on Wattle Street to manage any build up of trucks. Large equipment, such as cranes, will be delivered at night to minimise disruption to vehicles and pedestrian flows.

To manage pedestrian safety along the footpaths surrounding the site, the driveway access will be controlled by traffic controllers, pedestrian warning signs will be installed, and traffic controllers will be used to assist with pedestrian diversions near Building 10 and Alumni Green. In addition, as part of the driver protocols to be established, truck drivers will be required to keep their speeds below 10km/h along Jones Street. Accordingly, Halcrow is of the view that the impact of the works on pedestrians will be safe, low and acceptable.

Worker and driver protocols are set out in the CTMP.

The management of pedestrian safety and construction traffic is included in the draft Statement of Commitments.

### 3.7 Tree Management

Ten trees - all protected under the City of Sydney Tree Preservation Order - located adjacent the site could be affected by the excavation of the site. Accordingly, UTS commissioned an Arboricultural Impact Assessment (AIA) by Tree Wise Men to assess and advise on the management of these trees during excavation of the site (see report at **Appendix J**).

These affected trees are:

- Hills Weeping Fig (*Ficus macrocarpa* var. *Hilli*) - located in the traffic island on the corner of Wattle Street and Broadway. This tree is listed in the City of Sydney's Significant Street Tree Register, is estimated to be 70-80 years old in age and 17 metres high, has a canopy radius of up to 17 metres, and is likely to have an extensive root system.
- A Kaffir Plum (*harpephyllum caffrum*) - also located in the traffic island on the corner of Wattle Street and Broadway ; and
- Eight London Plane trees - five in the footpath on the Broadway frontage and three at the corner of Jones Street and Broadway.

#### Assessment

With the exception of one London plane, all the trees were assessed to be in good condition with a safe useful life expectancy of 15-40 years. The Hills Weeping Fig and the Kaffir Plum were given an 'exceptional' significance rating, while the Plane trees were assigned a 'high' rating.

The assessment concluded that all ten trees can be retained in the context of the proposed development, and, in terms of retention value, that they should be retained. The trees along Broadway would however, require pruning to accommodate Type B scaffolding during excavation. To facilitate the survival of the trees during excavation (and later construction), a series of tree protection measures are recommended by the AIA, described below.

#### Management

To mitigate the impacts of excavation on the trees, the proponent will implement the following measures in accordance with the AIA prepared by Tree Wise Men at **Appendix J**:

- Engage an arborist prior to the commencement of excavation works to monitor and report on the condition and protection of the retained trees.
- Minimise root disturbance to the trees on the Broadway frontage.
- Minimise canopy pruning of the trees on the Broadway frontage to accommodate hoardings; however, where pruning is to be undertaken it will be under the supervision of an arborist.
- Implement and retain on site a Tree Protection Plan.

Management of the impacts of the bulk earthworks on the trees in the vicinity of the site is included in the draft Statement of Commitments.

### 3.8 Incomplete Works

To manage the unlikely risk of the development remaining incomplete for a lengthy period following excavation, the proponent will rectify the site by covering and sealing the hole in accordance with structural engineering advice if it remains undeveloped for three years after the completion of excavation. This matter is included in the Statement of Commitments.

The proposed commitment and approach to the issue of site rectification is considered adequate in the circumstances and accords with discussions between representatives of UTS and DoP officers. In addition, it should be noted that the development of the Broadway Building is part funded by a grant from the Commonwealth government Education Investment Fund. As the funding agreement requires strict adherence by UTS to agreed delivery milestones, the likelihood of the excavated area remaining incomplete for any length of time is minimised.

### 3.9 Consistency with Concept Plan approval

The proposed bulk earthworks are consistent with the relevant elements of the Conditions of Approval for the Concept Plan. In relation to consultation with Sydney Metro, the proponent has commenced discussions with Transport NSW and a Structural Engineering and Geotechnical Report is currently being prepared for review by Transport NSW with regard to the impact of the proposed excavation on the Metro corridor.



## 4.0 Draft Statement of Commitments

The modification has necessitated a number of additions to the commitments in the approved Concept Plan (MP08\_0118). The following are the commitments made by UTS to manage and minimise potential impacts arising from the proposed modification to the approved Concept Plan.

### 4.1 Noise

To mitigate the impacts of noise the proponent will, through the Construction Management Plan, implement the combination of management measures set out in the noise and vibration assessment at **Appendix D**.

### 4.2 Vibration

To mitigate the impacts of vibration on people and structures the proponent will, through the Construction Management Plan, implement the management measures set out in the noise and vibration assessment at **Appendix D** of this report.

### 4.3 Geotechnical Conditions

To manage the subsurface conditions of the site during excavation and construction, the proponent will implement the recommendations detailed in the geotechnical report at **Appendix E** of this report.

### 4.4 Contamination

The proponent will implement the measures to manage the contamination on site as detailed in the environmental site assessment at **Appendix F** of this report, including preparation of:

- a Remediation Action Plan; and
- a validation assessment and validation report of the remedial works.

### 4.5 Archaeology

UTS will undertake the following prior to the commencement of the bulk earthworks to manage the site's archaeological values:

- Archaeological salvage excavation with the focus on the Fowler allotment(s).
- Additional work in areas containing the footings of otherwise unrecorded 1830s structures in the south-east and the 1840s/1850s structures in the western area of the site.
- Preparation of an Archaeological Management Plan for the site in accordance with the archaeological assessment at **Appendix G** of this report.

### 4.6 Construction Traffic

UTS will ensure that pedestrian safety and construction traffic will be managed in accordance with the protocols set out in the Construction Traffic Management Plan for the bulk earthworks at **Appendix I** of this report.

### 4.7 Trees Management

To mitigate the potential impact of excavation works on the trees surrounding the site, the proponent will implement the management measures set out in the arboricultural impact assessment at **Appendix J** of this report.



## 4.8 Construction Management

Prior to the commencement of excavation works, UTS will prepare a detailed Construction Management Plan based on the framework plan at **Appendix H** of the report. As a minimum the plan will cover:

- Construction traffic management;
- Noise and vibration management;
- Waste management;
- Erosion and sediment control;
- Air and dust management; and
- Protection of existing street trees.

## 4.9 Site Rectification

If no development occurs on the site three years after the completion of the excavation works the subject of this modification, UTS will rectify the site by covering and sealing the hole in accordance with structural engineering advice.

## 5.0 Conclusion

The assessment of the proposed modification has demonstrated that separating the bulk earth works for the Broadway Building from the main works will have no adverse environmental impacts that cannot be managed or mitigated, and would provide a number of benefits to UTS. The proposed change is consistent with the approved Concept Plan for UTS and the works are contained within the approved building envelope for the Broadway Building.

### Why the modification should be approved

The modification to enable the bulk excavation works for the Broadway Building to proceed early should be approved on the grounds that it will facilitate the operational and economic efficiency of the development. Specifically, approval will enable UTS to better manage the risks inherent in the project by:

- minimising the financial risks associated with the construction of the building;
- establishing and resolving the unknown in-the-ground conditions of the site before proceeding to letting tenders, and
- avoiding unnecessary delays in the construction program.

The modification will have no adverse environmental impacts that cannot be managed through the commitments made by the proponent, and serves the public interest. We therefore request that the Minister or his delegate approve the modification in accordance with Section 75W of the *Environmental Planning and Assessment Act 1979*.