



UNIVERSITY OF
TECHNOLOGY SYDNEY

RPS

University of Technology, Sydney
Dr Chau Chak Wing Building

Environmental Assessment Report
Volume I Main Report

March 2011



Dr Chau Chak Wing
Building, University of
Technology, Sydney

**Environmental Assessment Report
Volume I Main Report**

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Prepared by:

RPS

Level 12

92 Pitt Street

Sydney NSW 2000

T: +61 02 8270 8300

F: +61 02 8270 8300

E: sydney@rpsgroup.com.au

W: rpsgroup.com.au

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University of Technology, Sydney

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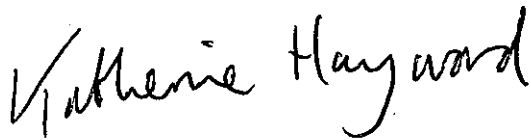
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Statement of Certification

As the author of the Environmental Assessment Report, I confirm that the information contained in this Environmental Assessment Report is considered to be a true and accurate report of the environmental assessment of the proposed Dr Chau Chak Wing Building and is not considered to be false or misleading.



.....
Katherine Hayward
Principal Environmental Planner

RPS Australia East Pty Ltd

Executive Summary

The University of Technology, Sydney (UTS) proposes a new building for the Faculty of Business, the Dr Chau Chak Wing Building. The building would be located on the former Dairy Farmers Co-operative building site at 14-28 Ultimo Road, Sydney.

Gehry Partners was commissioned by UTS and has designed the building being proposed. Frank Gehry is an internationally acclaimed architect, known for iconic buildings including the Guggenheim Museum in Bilbao, Spain; the Walt Disney Concert Hall in Los Angeles and the Dancing House in Prague. The Dr Chau Chak Wing Building would be the first building in Australia to be designed by Gehry Partners and is expected to be a major Australian landmark building.

The building has been named in recognition of Australian business leader Dr Chau Chak Wing with regard to a donation of \$25 million to UTS (\$20 million to support the new building for the Faculty of Business and \$5 million to create an endowment fund for student scholarships).

The Faculty of Business is currently mainly located in the Haymarket Precinct of the City Campus (Building 5) (and partly in Kuring-gai Campus and Mary Ann House) and UTS considers that these locations can no longer accommodate the projected increase in the number of students or the changing trends in university education. In addition, the Faculty seeks to establish itself as one of the world's leading business schools and a new Faculty building designed by internationally recognised architect Frank Gehry would support this aim.

An Environmental Assessment Report for the Dr Chau Chak Wing Building has been prepared to accompany a development application under Part 3A of the Environmental Planning and Assessment Act 1979 (the EP&A Act).

The Site and Surrounding Area

The site is located at 14-28 Ultimo Road in Ultimo, Sydney. It is bounded by Mary Ann Street to the north, the embankment of the former Darling Harbour Railway Line to the east, Ultimo Road to the south and Omnibus Lane to the west. The site is approximately 0.28 hectares in area (approximately 35m wide and 70m long). Its topography is generally flat with a slight fall to the south east. The current land use is an at grade concrete open car park.

To the north, beyond Mary Ann Street are commercial buildings and the Powerhouse Museum. To the east is the Transgrid Building (containing ventilation equipment for the Transgrid Cable Tunnel and a generator room), the embankment of the former Darling Harbour Railway line and beneath this an Energy Australia building (the Mary Ann Street Shaft). The embankment forms part of the Ultimo Pedestrian Network (UPN) which runs north south along the embankment. The bridge over Ultimo Road is closed and therefore continuous access, via the UPN between Central Station and Darling Harbour, is not currently available. Beyond this is Darling Drive and the Haymarket Precinct of the City Campus.

To the south east of the site is the Ultimo Street Railway Underbridge which is a heritage item. Beyond Ultimo Road, to the south is the ABC Headquarters and a child care centre with an outdoor play area.

On the opposite side of Omnibus Lane to the west is a residential building of 9-10 storeys on the corner of Ultimo Road; a vacant lot owned by the TAFE and currently used as a car park; and on the corner of Omnibus Lane and Mary Ann Street is the former National Cash Register Building which is a heritage item.

There are three trees immediately adjacent to the site to the south, within the footpath along Ultimo Road.

The Proposed Dr Chau Chak Wing Building

Scale, Massing and Materials

The proposed building comprises ground level plus levels 1 to 11 (a rise of 12 storeys). The upper level is not habitable, containing only plant and equipment.

The façade which extends to conceal the upper level plant varies in height and is generally RL58.5 but extends to a maximum height in one location of RL59.2. The site area of the proposed building at ground level would be approximately 2,816 square metres. The excavation will go to a depth of 7.3m from ground level to the base of the elevator pit and including a 0.6m wide slab.

The materials for the facades would comprise flat and curved brick and inclined glazing (window boxes and recessed windows). The brick would be a buff colour similar to Sydney sandstone.

A Signage Strategy is proposed detailing the nominal locations of the proposed signage including active graphic ticker tape displays at the north and south facades.

Landscape and Public Domain

Two of the existing trees would be removed and one existing tree at the south eastern corner of the site would be retained. Eleven new trees would be planted comprising Plane Trees and Crepe Myrtle. With the exception of the areas of tree planting, surfaces would be paved.

A key pedestrian link with the UPN is intended with an entrance and coffee bar on the eastern façade. Whilst UTS intends that the Dr Chau Chak Wing Building be linked to the UPN, plans for such a link are not part of this proposal as land ownership issues are being investigated. The Sydney Harbour Foreshore Authority (SHFA) is currently developing options for the revitalisation of the UPN and this together with the Dr Chau Chak Wing Building would enliven and open up access along the length of the UPN.

Floor Space and Uses

The total proposed floor space (gross floor area) is 15,488 square metres. There would be the following uses:

- Basement Car parking; truck parking; bicycle storage and showers; substation; storage; waste storage; plant.
- Ground Entrance; reception; entrance to basement ; café; seminar and lecture rooms.
- Level 1 Student lounge; seminar and lecture rooms; coffee bar.
- Level 2 Student lounge; seminar rooms.
- Level 3 Seminar rooms; administration.
- Level 4 Research centres/discipline groups; roof deck.
- Level 5 Research centre/discipline groups.
- Level 6 Seminar rooms; four roof decks.
- Levels 7, 8 and 9 Research centre/discipline groups.
- Level 10 Dean's unit; function area and faculty boardroom.
- Level 11 Plant; cooling tower.

Access and Parking

Vehicular access is proposed via a single driveway crossing from Ultimo Road. This would comprise left in/left out access/egress for the basement parking and loading dock level. An on-street drop off/pick up area would be located on Mary Ann Street. There would be pedestrian access points to the ground floor at Ultimo Road and Mary Ann Street and pedestrian access to the UPN to the first floor (however the link to the UPN is not part of the scheme).

Within the basement there would be parking for 28 cars of which one would be an accessible car bay and three would be dedicated courier spaces; space for either one medium rigid vehicle (MRV) or two trucks; and 53 bicycle parking spaces.

Outdoor bicycle parking racks are proposed at ground floor level that would accommodate an additional 24 bicycles.

Flood Protection

There would be a flood barrier located at the entrance of the vehicular access to the basement car park.

Sustainability and Trigeneration

The Dr Chau Chak Wing Building has been designed to achieve high levels of sustainability through the following strategies:

- Designed to achieve 5 Star Green Star Educational rating.
- Low carbon emissions through a combination of high performing façade, low energy air conditioning and lighting design and on-site trigeneration.
- High levels of daylight would penetrate the building because of the inherent small floor plate design, window arrangement and glazing visible light transmission.
- Low water consumption through the use of high efficiency tap ware.
- Rainwater capture and storage for use in cooling towers and toilet flushing.
- Promotion of sustainable transport usage by the provision of bicycle storage, lockers and shower facilities within the building.
- Specification of sustainable materials resulting in the reduction in the use of PVC, concrete and non-recycled steel.
- A target of 80% construction waste recycling.

Construction

It is currently anticipated that construction would take approximately two years with commencement in February 2012 and anticipated completion of the building by January 2014.

A Preliminary Construction Environmental Management Plan has been prepared. This contains management processes, controls and other mitigation measures that would be implemented in order to ameliorate potential adverse construction impacts for inclusion in a more detailed version prepared by the contractor as part of the Construction Certificate documentation.

Operation

Occupation and full operation of the Dr Chau Chak Wing Building is anticipated by March 2014.

Access to the building would be available to students 24 hours per day, 7 days a week. The primary use of the building would be for university teaching and study and additional uses are anticipated to include commercial conferences and meetings, executive education, public lectures that may incorporate a day or evening function, external or internal events located on the ground floor. Activities are anticipated to occur mainly in the day or evening periods.

The café on the corner of Omnibus Lane and Mary Ann Street and the coffee bar on the UPN would be open to the public.

Consultation

Community consultation was undertaken from 17th December 2010 to 15th January 2011 on a voluntary basis. This comprised an exhibition, a series of meet and greet sessions and a website providing information about the scheme and enabling online feedback. Responses were received as described in the Environmental Assessment Report.

Stakeholder consultation has also been undertaken, including organisations such as Department of Planning, City of Sydney Council, Sydney Harbour Foreshore Authority, Powerhouse Museum and Transgrid.

Planning Controls

The extent of compliance with relevant environmental planning instruments, policies and guidelines has been considered. The proposed development is mostly consistent with the planning provisions and is an appropriate form of development within its context.

Environmental Assessment

The Director General's Requirements (DGRs) for the environmental assessment were issued in August 2009. The environmental assessment addresses the matters raised in the DGRs and has also included additional studies.

Built Form, Urban Design and Public Domain

Close consideration has been given to the form, scale and character of surrounding locality and to determine the appropriate massing, setbacks, building articulation, colour and finishes.

The scale and masonry components of the façade with punched windows are a linkage with the warehouse character of the locality along the former goods railway line and former wharf buildings in Ultimo and Pyrmont. The large glazed shards which are concentrated on the western elevation serve to enliven the lane and would literally reflect other buildings including the significant heritage listed TAFE building west of Harris Street.

The UPN has not yet reached its full potential. When this is realised it would become a direct pedestrian and bicycle linkage from Darling Harbour and Ultimo to Railway Square, Central Station and Surry Hills beyond. The proposed building seeks to engage with the UPN and enhance the potential of the space with a linkage platform from level 1. The proposal would engage with the public domain on all sides. The main entry on Ultimo Road is enlivened with a landscaped forecourt plaza space, appropriate for what is a very public building. A glazed component of the façade signals the building entry.

The proposed building would contribute to further developing the sense of place in the local area through the creation of a unique landmark and would provide a positive contribution to the character of the area. In the wider context, the proposed building would provide a valuable addition to Sydney's architecture.

Access

An Access Review has been undertaken. Subject to the incorporation of a number of design matters it is considered that compliance with statutory requirements pertaining to site access, common area access, accessible parking and accessible sanitary facilities can be readily achieved.

Solar Access

Shadow diagrams have been prepared showing shadows cast by the proposed building at the during the winter and summer solstices and the equinox.

Shadow impacts from the building at the summer solstice and equinox are generally minor. The most relevant shadow impacts are those associated with the winter solstice.

During the winter solstice the adjacent residential building would be impacted by the shadows cast by the proposed building. This impact is considered acceptable due to factors such as the windows being of a type not designed to capture large amounts of sunlight and the planning controls providing for a building of a similar size and bulk to the current proposal which would result in similar impacts.

In relation to the Inner City Child Care Centre the proposed building would not cause shadow impacts during the summer solstice and the equinox. On the winter solstice, direct sunlight would be maintained to the building and outdoor play area through until approximately 12 midday when the outdoor play area would be partially (less than 50%) overshadowed. By 1 pm in the afternoon, the outdoor play area would be in

complete shadow cast by the proposed building however parts of the play area would maintain some direct sunlight and by 3pm some direct sun would return to the open space. Maintaining 3 hours of morning sunlight is considered to be adequate and reasonable for the amenity of child care centres in this highly urbanised environment and is consistent with what the UPD requires for public and private communal open space. Sometime between the winter solstice and the equinox the shadow impact would recede to provide continuous sun access to the outdoor play area, throughout the day.

The UPN would be part shadowed by the proposed building at 3.00pm during the summer and winter solstices and the equinox although is considered acceptable in relation to the relevant planning controls.

Noise

A Noise Impact Assessment has been undertaken and existing noise levels were surveyed in November and December 2010.

During construction and based upon a worst case scenario whereby sources of construction noise would be closest to noise sensitive receptors there are predicted to be exceedances of DECCW's noise criteria at the apartment building on the corner of Ultimo Road and Omnibus Lane; the former Cash Register Building; and the apartment building at 82 Mary Ann Street. Therefore, notification would be provided of the proposed construction activities to nearby residents and non residential receivers and community consultation and negotiation would be undertaken during the construction process.

During operation the noise emissions from the building such as from car parking, truck access during the day and night to the loading dock and building services would comply with the Industrial Noise Policy criteria.

The potential for sleep disturbance from garbage truck access and outdoor activity at night has been assessed. Noise from truck access was found to comply with the DECCW criteria of 65dBA Lmax. Maximum noise levels from outdoor activity such as a rowdy group of people has the potential to exceed the criteria for sleep disturbance at the nearest sensitive receiver. It will be the responsibility of UTS to manage events and the general operation of the building such that the potential for sleep disturbance to nearby residents is minimised.

A range of mitigation measures to control construction noise and vibration are identified and have been used to inform the Preliminary Construction Environmental Management Plan. Noise control measures are also identified for the building plant including the incorporation of acoustic louvres.

Views

The proposed building would make a significantly positive contribution to the urban amenity and architectural integrity of Ultimo.

The adjacent residential building currently benefits from views across the site toward Darling Harbour and the southern part of the CBD. These views are not considered significant or iconic views of Sydney or Sydney Harbour. The construction of the proposed building would result in the loss of these views to the city from the north/north east facing apartments within the residential building on the corner of Omnibus Lane and Ultimo Road. Middle and long distance views of the city to the east and north east would be replaced by short distance views of a building designed by an internationally renowned architect. Views to the north east would maintain some view sharing because the setbacks of the north western corner of the building would provide for a northerly site line and some district view.

The apartments currently benefit from the existing views because the subject site is undeveloped. The local planning controls have since 1992 provided for the construction of a building of 42m in height on this site and it is reasonable to assume that occupants of these apartments would be aware that these controls provide for a building up to this height. The proposed building is slimmer than a compliant building as it does not build out to the full site footprint and also has a reduced plan area from level 6 upwards and thus allows for the retention of some views when compared to a compliant building envelope. The construction of any building within an envelope that complies with the local planning controls on this site would therefore have an equal or potentially greater impact on views from the apartments.

No responses were received about view loss during the community consultation.

The façade of the building would be visible from the public domain but it would not obstruct, interrupt or adversely affect any important views from the public domain.

The proposed building would also to some extent impact on existing views from other surrounding commercial buildings, such as the ABC building. However, the quality and design interest of the proposal would introduce new and interesting views for occupiers of surrounding buildings and the public domain.

Visual privacy is considered adequate to maintain the amenity of adjacent residential buildings.

Wind

A pedestrian wind environment study has been undertaken. The results showed that most of the areas tested would satisfy relevant comfort and safety criteria however areas to the north of the site are exposed to stronger winds from the north east and treatments are recommended in the following areas to ameliorate wind speeds:

- Tree planting at the north western corner of the site is required to ameliorate wind speeds from the north east for the area of outdoor seating associated with the proposed café. It has been confirmed that the proposed tree planting (shown on the landscape plan provided with the Environmental Assessment Report) would be adequate.
- Treatments comprising screens and planting are recommended to ameliorate wind speeds at the UPN to the east of the site and in the area of minimal seating associated with the proposed coffee bar. It is UTS's intention that wind speeds along the UPN to the east of the site would be ameliorated to acceptable levels for comfort and safety. The land on which the recommended treatments are identified are not owned by UTS and therefore the exact nature of the treatments would need to be subject to agreement with the parties and possibly further testing.
- At the terrace on the north western corner and the southern terrace of the sixth floor an impermeable balustrade is recommended. It is UTS's intention that there would be planting in place of the recommended balustrades.

Transport

A Transport Impact Assessment has been undertaken and this comprised a survey of traffic and pedestrian volumes in November 2010.

There would be a reduction of traffic generated to and from the site compared to the existing traffic generation from the car park.

The site is well served by public transport and the relatively low level of parking proposed is in keeping with the aims of the NSW Government and of City of Sydney Council in seeking to reduce the demand for travel to the CBD by private car.

There would not be adverse impacts on pedestrian and cyclist facilities.

During construction a Traffic Management Plan would be prepared and the specifics to be included are identified including for example avoiding peak traffic hours, a safe and convenient pedestrian environment to be maintained at all times, loose materials on trucks to be covered and vehicles leaving the site to be cleaned to prevent the tracking of debris onto public roads.

A location specific Travel Access Guide/ Green Travel Plan would be prepared for the operation of the building.

Ecologically Sustainable Development

A range of ESD strategies have been designed into the scheme as identified in the scheme description above. This includes a trigeneration plant. Such plants are typically much more efficient than standard generators with energy efficiencies of between 80-90% compared to around 35% for conventional electricity supply. Notably, they have lower carbon emissions.

It is predicted that the building would achieve sufficient points for a 5 Green Star rating.

Built Heritage

A Heritage Impact Statement has been prepared. The site is not listed as a heritage item nor is it contained within a heritage conservation area. However, there are heritage items adjacent to or in close proximity to the site. Also, there is also a Conservation Area in close proximity.

Whilst the design of the proposed scheme is dramatic and bold, it is responsive to its urban context and nearby heritage items with its modulated components of varying site setbacks, forms, scales and materials. The proposal would not have adverse heritage impacts on heritage items, the heritage streetscape and the conservation area in the vicinity of the site and, subject to other separate future approvals for the UPN (together with the proposed scheme), would provide for better public access to, and appreciation of, heritage items in the vicinity.

An identification of the heritage fabric of the foundations and retaining wall on Ultimo Road of the former signal box adjacent to the Ultimo Road Railway Underbridge and immediately adjacent to the site would be undertaken prior to construction and then protected during construction.

Archaeology

An Archaeological Assessment and Research Design has been prepared.

The site contains remains of local significance. These remains include:

- Pre and post-1788 natural environment - a swampy headwater of Darling Harbour.
- Reclamation of the area by c1850 and modification of the course of a creekline.
- 1850s timber housing, possible dairy and other structure.
- Replacement of early housing with terrace housing by c1874 with Chinese occupation in the early twentieth century at numbers 20 and 22.
- Occupation of most of the study area by the NSW Shale and Oil Company from the 1870s to 1920s.
- Demolition of early buildings and construction of the Dairy Farmers Garage in 1953.
- The sandstone culvert known from the adjacent Energy Australia site is not heritage listed and is outside of the study area. It was dismantled in 2003.
- The existing sewer that runs along the eastern side of the site is separate to the culvert as it is part of a c.1880 Sydney Council infrastructure. This is not heritage listed and would be retained in its current position.

The proposed development includes bulk excavation of the site and due to the potential for remains of local significance a program of archaeological investigation would be undertaken prior to the commencement of other site works.

Aboriginal Heritage

A Due Diligence Aboriginal Heritage Report has been prepared. A site inspection with the Metropolitan Local Aboriginal Land Council (MLALC) was undertaken on 5th January 2011.

The upper alluvial layers of soil, below the fill, have low to moderate archaeological potential to contain Aboriginal objects.

The impact of the excavation of fill and deposits across the site would be the removal (destruction) of any Aboriginal site and/or object that might be contained therein. Therefore, a watching brief would be undertaken (following the historical archaeological investigation) and recommendations are made in the Due Diligence Report would be adhered to in the event that Aboriginal objects are identified. GML has advised that whilst a watching brief is recommended an alternative approach could be adopted whereby an Archaeological Research Design (ARD) could be prepared prior to the start of the historical archaeological investigations and then in the event that Aboriginal objects are found, the ARD could be implemented. Construction program constraints will determine whether a watching brief or further investigation would be undertaken.

Drainage

A Drainage Strategy Report has been prepared that includes a Soil and Water Management Plan for construction and also a Hydraulic Services and Stormwater Concept Plan.

The stormwater drainage system comprises the collection of stormwater discharge from downpipes, grated drains, rainwater outlets and rain water tank overflows and discharges via gravity to Sydney Water's stormwater main. Sydney Water advised in September 2010 that on site detention is not required at the site. The system would be designed to cater for a 1:20 year storm with overflow provisions to cater for a 1:100 year storm.

The rainwater collection system would collect rainwater from roof outlets and gutters at Level 11 and convey via gravity to the 10,000 litre rain water storage tanks. As part of a Water Sensitive Urban Design, it is proposed that a Gross Pollutant Trap be included as an end of line treatment measure for the roof runoff and the runoff captured by the rainwater outlets.

Flooding

A Flood Risk assessment has been undertaken. The site is currently a concrete car park and has an impervious surface area. The proposed building would not increase the impervious surfaces.

Major stream flooding is not considered a risk to the site because the site is not located in the immediate vicinity of water courses. However, the site is potentially subject to overland flooding from the rainfall runoff that falls on the site and the adjacent catchments.

There would be a flood gate on the basement ramp. This would have a Flood Defence Level with an RL of 5.0m consistent with the ground floor slab levels.

There remains a residual hazard that either the floodgate is not operated in time to prevent water entering the basement or that a larger rainfall event occurs and overtops the floodgate even once operated. Therefore, additional flood resilience measures are identified.

Utilities

A report describing the proposed mechanical, electrical, hydraulic, communications and fire services has been prepared.

Applications have been made to Energy Australia for a dedicated basement chamber substation to supply the proposed development and to Sydney Water for a Section 73 Compliance Certificate.

Contamination

An Environmental Site Screening was undertaken in 2004 and subsequently a Stage 2 Environmental Site Assessment, comprising an intrusive investigation, was undertaken in October 2010. Elevated concentrations of Polycyclic Aromatic Hydrocarbons (PAHs) and Total Petroleum Hydrocarbons (TPH) were found within the soil. Within the groundwater elevated concentrations of arsenic, copper and zinc were identified.

As the site is contaminated a Remedial Action Plan has been prepared which identifies the procedures to be undertaken to remediate and manage contamination issues identified.

Geotechnical

A geotechnical investigation has been undertaken during October 2010. The subsurface profile below the concrete paved surface comprises fill over natural soils predominantly comprising alluvial clays with sand bands then sandstone bedrock at moderate depth. Groundwater levels were identified at shallow depth within the soil profile. There might also be traces of old footing systems and other infrastructure associated with the former building on the site and these could be encountered during bulk excavations.

The main geotechnical issues are the stability of the proposed excavation; de-watering the excavation; and limiting ground surface movements outside the excavation, in particular the old brick sewer which crosses the eastern side of the site.

Air Quality

An Air Quality Assessment has been undertaken to predict the potential effects of the operation of the trigeneration plant on receptors and local air quality using dispersion modelling.

The predicted pollutant concentrations are below guideline levels for PM₁₀, CO, NO₂ and SO₂ and no significant air quality impacts are anticipated from the operation of the plant. Therefore, the operation of the facility would have an acceptable air quality impact upon receptors.

Reflectivity

A Reflectivity Study has been undertaken to assess the likelihood of undesirable solar reflections off the proposed development on traffic and pedestrians in the surrounding area and on occupants of nearby buildings.

Preliminary analysis, undertaken prior to the finalisation of the proposed design, indicated potential glare to traffic on Mary Ann Street and Ultimo Road. In response, further analysis was undertaken and the glazing responsible for this glare has been rotated to eliminate this impact. Reflections towards traffic on Darling Drive would be masked by trees and therefore excessive reflections have been discounted.

The proposed building performs well in terms of solar reflectivity and glare affecting motorists on surrounding streets would not exceed the limits of acceptability according to the methodology of David N.H. Hassall of the University of New South Wales.

There would be reflections of varying durations towards the ABC building, the TAFE building (The Muse) and buildings along Omnibus Lane. The intensity of reflected sunlight and any resulting discomfort to occupants is minimised by the 20% limit on glazing reflectivity (a requirement from the Urban Development Plan for Ultimo-Pymont Precinct).

Economic

An Economic Impact Assessment for the whole City Campus Master Plan has been prepared. Given the building's innovative design and the high profile status of the architect, the building is expected to gain significant public interest and produce substantial economic benefits including those generated from:

- Business tourism
- Leisure tourism
- International students
- Skilled workers
- Precinct activation and improved amenity

Cumulative Impacts

The area is undergoing substantial change with a number of major redevelopments underway or planned in the local area such as those associated with the UTS Broadway Concept Plan, Frasers Broadway and Metro Plaza.

The UTS City Campus Master Plan includes a number of projects to be delivered over the next 10 years including new buildings, refurbishments and internal upgrades. The anticipated timeframes for construction of a number of these projects would potentially coincide with the construction of the Dr Chau Chak Wing Building. Also, construction of the Frasers Broadway site is underway and the Metro Plaza is likely to involve construction phases at the same time as the Dr Chau Chak Wing Building. Therefore, there would be potential cumulative construction effects on local residences and businesses from a number of construction projects in the area. The Dr Chau Chak Wing Building has a Preliminary Construction Environmental Management Plan that sets out how impacts from the construction of this building such as construction noise, dust and construction traffic would be minimised.

Mitigation and the Draft Statement of Commitments

The mitigation measures identified in the Environmental Assessment Report and its accompanying appendices need to be adhered to in order to avoid, and where not possible to avoid, minimise environmental impacts. However, there would be residual impacts comprising shadowing and reflected light to adjacent properties.

The Environmental Assessment Report sets out a draft Statement of Commitments by UTS that comprises the environmental management, mitigation and monitoring measures to be implemented in order to minimise potential impacts of the project. These have been informed by the mitigation measures identified in the Environmental Assessment Report.

I Introduction

1.1 Background

The University of Technology, Sydney (UTS) proposes a new building for the Faculty of Business, the Dr Chau Chak Wing Building. The building would be located on the former Dairy Farmers Co-operative building site at 14-28 Ultimo Road, Sydney.

Gehry Partners were commissioned by UTS and have designed the building being proposed. Frank Gehry is an internationally acclaimed architect, known for iconic buildings including the Guggenheim Museum in Bilbao, Spain; the Walt Disney Concert Hall in Los Angeles and the Dancing House in Prague. The Dr Chau Chak Wing Building would be the first building in Australia to be designed by Gehry Partners and is expected to be a major Australian landmark building.

The building has been named in recognition Australian business leader Dr Chau Chak Wing with regard to a donation of \$25 million to UTS (\$20 million to support the new building for the Faculty of Business and \$5 million to create an endowment fund for student scholarships).

The Faculty of Business is currently mainly located in the Haymarket Precinct of the City Campus (Building 5) (it is partly located at Kuring-gai Campus and Mary Ann House) and UTS considers that this location can no longer accommodate the projected increase in the number of students or the changing trends in university education. In addition, the Faculty seeks to establish itself as one of the world's leading business schools and a new Faculty building designed by internationally recognised architect Frank Gehry would support this aim.

The UTS City Campus Masterplan 2020 prepared by Bligh Voller Nield which sets out a plan for the development of new buildings and the extension and refurbishment of existing buildings across the city campus and revitalising the southern CBD of Sydney. The aims are to:

- deliver a revitalised campus to match UTS's position as a leading university of technology;
- create a global city campus with an identifiable heart;
- create a 'sticky' campus: a place where students want to study, learn and socialise;
- embrace new teaching and learning paradigms, including the library of the future;
- create a vital campus with a clear pedestrian network and connections to adjacent transport, commercial and cultural hubs;
- commit to holistic sustainability goals;
- consolidate faculty locations and student services hubs; and
- accommodate future student and staff growth.

Subsequently, the UTS City Campus Ecologically Sustainable Development (ESD) Masterplan 2020 was to identify recommendations for the strategies, performance targets and technologies that should be employed to meet UTS's sustainability aspirations. A conceptual design framework is provided for each building including the Dairy Farmers Site (the Dr Chau Chak Wing Building). These recommendations have been taken into account in the design of the scheme.

An environmental assessment of the Dr Chau Chak Wing Building has been undertaken and this document is the report of that process. This Environmental Assessment Report accompanies a development application under Part 3A of the Environmental Planning and Assessment Act 1979 (the EP&A Act).

1.2 Environmental Assessment Process

A Preliminary Environmental Assessment was prepared by JBA and issued to the Department of Planning in July 2009. It requested the Minister's opinion as to whether the proposal is a 'project' to be determined under part 3A of the EP&A Act and if so, that the Director General's Requirements (DGRs) for the environmental assessment be provided. It provided preliminary information about the scheme and the potential environmental issues as anticipated at that time.

The DGRs were issued in August 2009 providing the terms of reference for the environmental assessment (see Section 6.2). Section 6 of this report provides a table (Table 6.1) identifying the issues raised in the DGRs and where they are addressed in the Environmental Assessment Report.

1.3 Environmental Assessment Team

The environmental assessment team is identified in Table 1.1 below.

Table 1-1 Environmental Assessment Team

Role	Organisation
Architect	Gehry Partners
Executive Architect	Daryl Jackson Robin Dyke
Planning and EA Management	RPS Sydney
Quantity Surveyor	Rider Levett Bucknall
Community Consultation	Elton Consulting
Topography	Rygate & Company Pty Ltd
Arboriculture	Urban Forestry Australia
Access	Morris Goding
Shadow diagrams/solar access	Shadow diagrams by Gehry Partners with analysis by RPS
Noise	Marshall Day Acoustics
Views	Photomontages by Dbox and model images from Gehry Partners with analysis by RPS
Wind	Windtech
Transport	Arup
Ecologically Sustainable Development (ESD)	AECOM
Built Heritage	Godden Mackay Logan
Archaeology	Casey and Lowe
Aboriginal Heritage	Godden Mackay Logan
Flooding	Arup
Drainage	AECOM and Arup
Services	AECOM
BCA	AE & D
Contamination	Environmental Investigation Services
Geotechnical	Jeffery and Katauskas Pty Ltd
Air Quality	AECOM
Reflectivity	Arup
Economics	Urbis

1.4 Format of this Report

The main text and associated figures of the Environmental Assessment Report are presented in Volume 1 (this document) with the appendices including technical assessment reports are presented in Volumes 2, 3 and 4.

Within this Volume 1:

- Section 2 describes the site and its surroundings;
- Section 3 provides the scheme description upon which the environmental assessment has been undertaken;
- Section 4 describes the legislative and planning context and assesses the proposal against this;
- Section 5 outlines the community and stakeholder consultation undertaken;
- Section 6 provides the assessment of environmental impacts and this refers to a number of technical reports that are appended (Volumes 2 and 3);
- Section 7 identifies the Draft Statement of Commitments by UTS. These have been informed by the mitigation measures identified through the environmental assessment process; and
- Section 8 concludes the assessment.

2 The Site and Surrounding Area

2.1 The Site

The site is located at 14-28 Ultimo Road in Ultimo, Sydney as shown in Figure 2.1. It is bounded by Mary Ann Street to the north, the embankment of the former Darling Harbour Railway Line to the east, Ultimo Road to the south and Omnibus Lane to the west.

The site is approximately 0.28 hectares in area (approximately 35m wide and 70m long). Its topography is generally flat with a slight fall to the south east. The site's current land use is an at grade concrete open car park (see Photograph 2.1). It is the former site of the Dairy Farmers building which has been demolished.

An aerial photograph of the site is provided in Figure 2.2.

2.2 The Site's Surroundings

To the north, beyond Mary Ann Street are commercial and residential buildings and the Powerhouse Museum (a view along Mary Ann Street is shown in Photograph 2.2). To the east is the Transgrid Building (containing ventilation equipment for the Transgrid Cable Tunnel and a generator room), the embankment of the former Darling Harbour Railway line and beneath this an Energy Australia building (the Mary Ann Street Shaft). The embankment forms part of the UPN which runs north south along the embankment. The bridge over Ultimo Road (see Photograph 2.3) is closed and therefore continuous access, via the UPN between Central Station and Darling Harbour, is not currently available. Beyond this is Darling Drive and the Haymarket Precinct of the UTS City Campus (including Building 5 which is where the Faculty of Business is currently mainly located) – see Photograph 2.4.

To the south east of the site is the Ultimo Street Railway Underbridge which is a heritage item. Beyond Ultimo Road, to the south is the ABC Headquarters and a child care centre with an outdoor play area.

On the opposite side of Omnibus Lane to the west is a residential building of 9-10 storeys on the corner of Ultimo Road (646 Harris Street); a vacant lot owned by the TAFE and currently used as a car park; and on the corner of Omnibus Lane and Mary Ann Street is the former National Cash Register Building which is a heritage item and part of the TAFE. Further to the west, beyond Harris Street, is the TAFE building also referred to as The Muse and Building C Ultimo College and this is a heritage item (this is shown in Photograph 2.5). The former NCR building is shown in Photograph 2.6. Photograph 2.7 shows a view looking north along Omnibus Lane from Ultimo Road with the residential building on the left.

There are other heritage items in the vicinity of the site and Harris Street Conservation Area is to the north of the site (further information about heritage is provided in Sections 6.11 to 6.13).

A sandstone culvert and brick drain located below the former Darling Harbour Railway line adjacent to the site were exposed during the excavation of the MetroGrid Tunnel and it is understood the remains were recorded and removed.

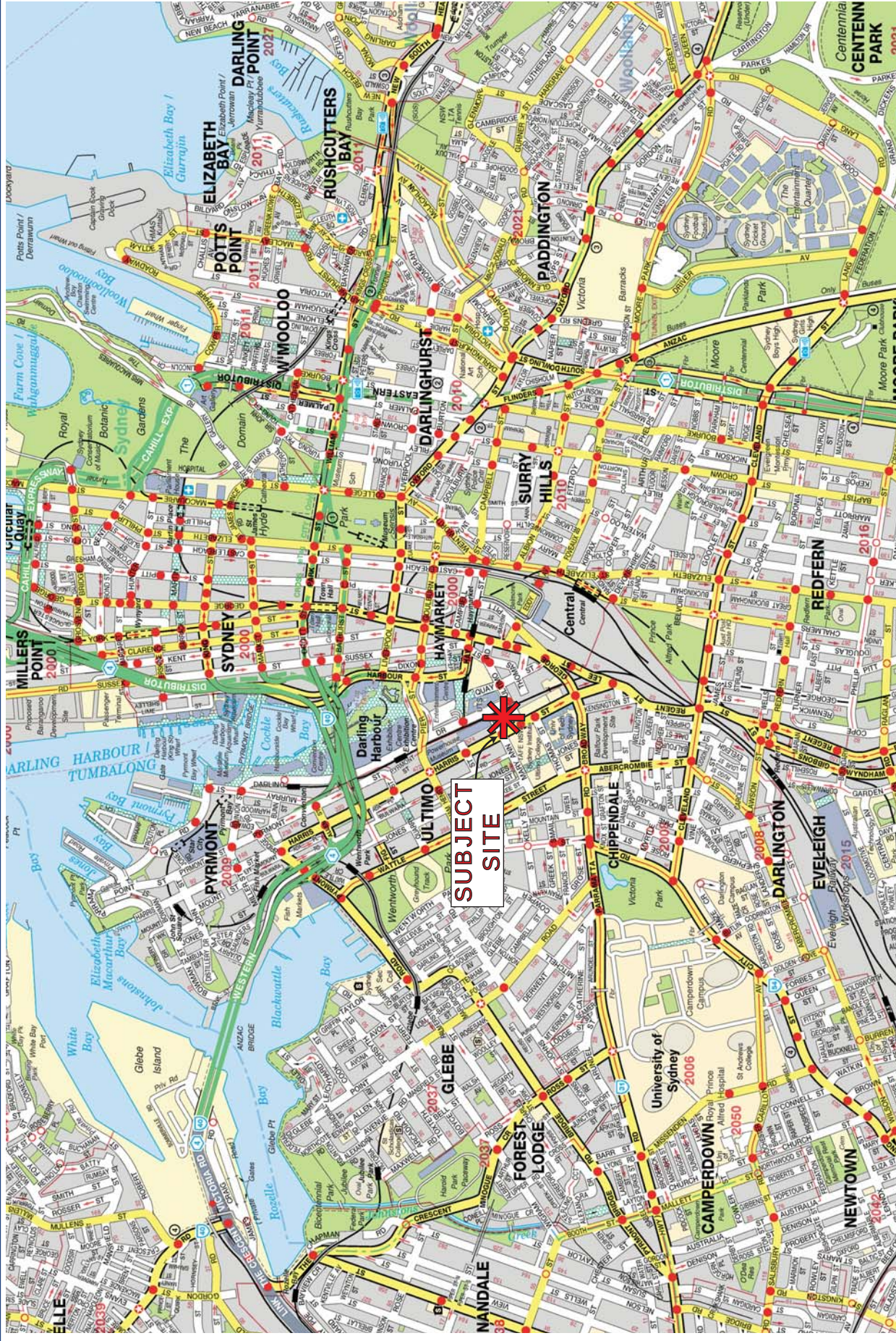
Beneath the surface of the site is a sewer (this is not heritage listed although is part of a c.1880 Sydney Council infrastructure) located on the eastern side of the site, two underground storage tanks to the north of the site and a petroleum arrestor pit at the western boundary.

There are three trees immediately adjacent to the site to the south, within the footpath along Ultimo Road.

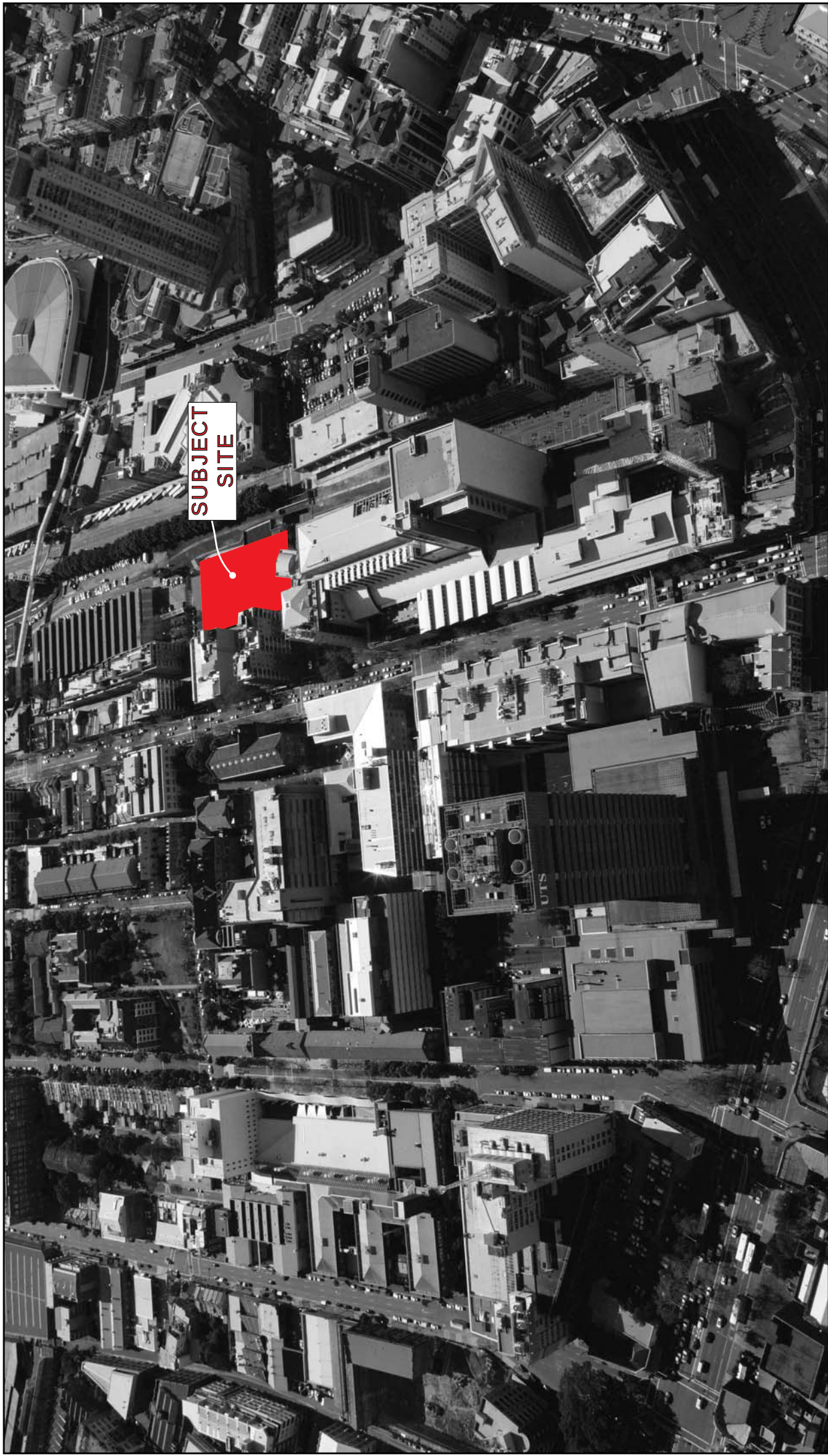
A Site Analysis Plan is provided in Figure 2.3 including existing vegetation, vehicular access points, neighbouring properties. A plan showing the context of the site including the heritage items nearby, the locations and uses of surrounding buildings is provided in Figure 2.4.

The topographical plan of the existing site has been provided by Rygate and Company Pty Limited and is presented in Appendix 2.1. It shows aspects including levels, utilities infrastructure, vegetation and other existing features of the site and the immediate surroundings.

Site Location
Figure 2.1



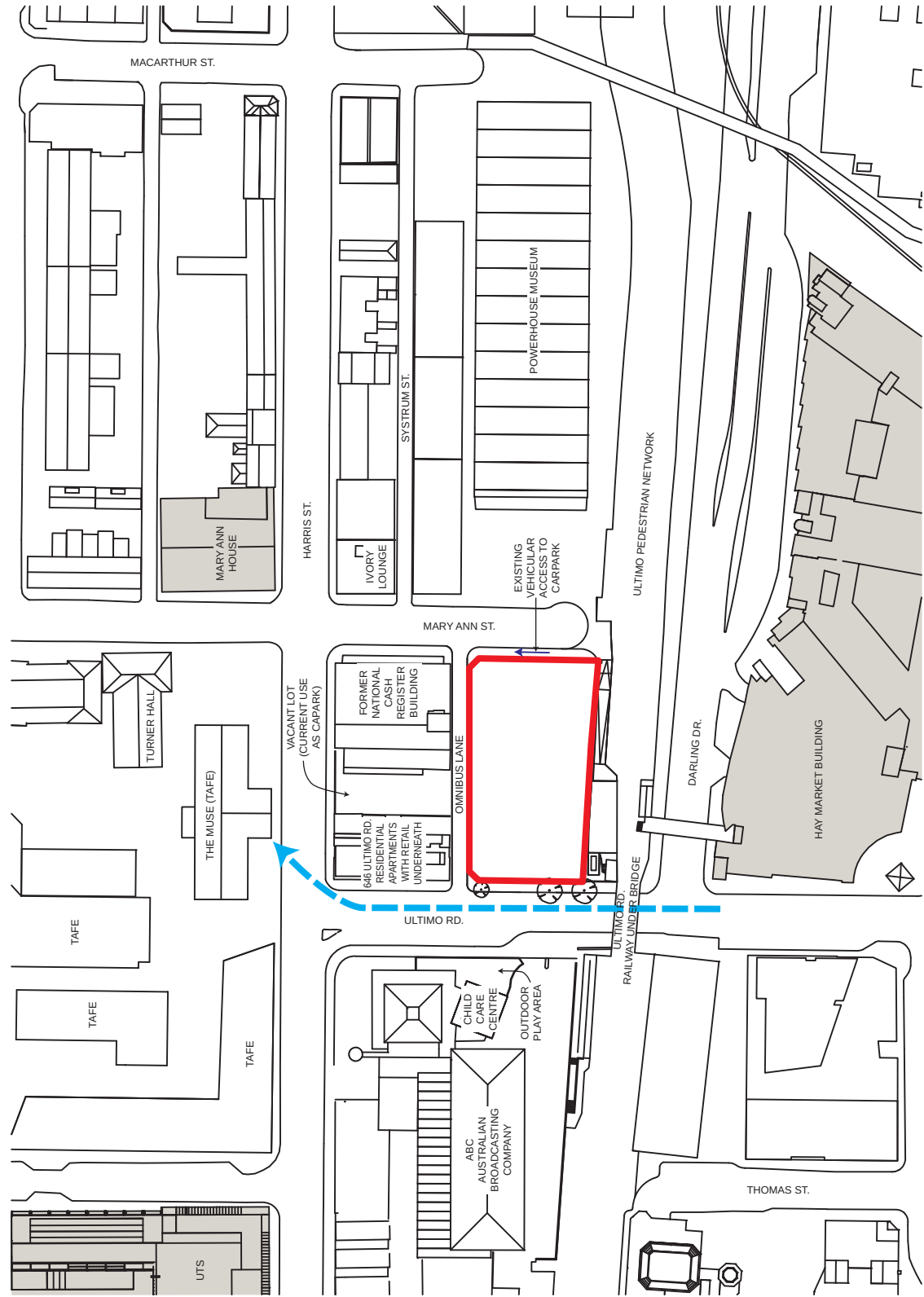
Aerial Photograph
Figure 2.2



Project: Dr Chau Chak Wing Building
Client: University of Technology, Sydney
Ref Number: 105711.02
Source: UTS
Scale: Not to Scale

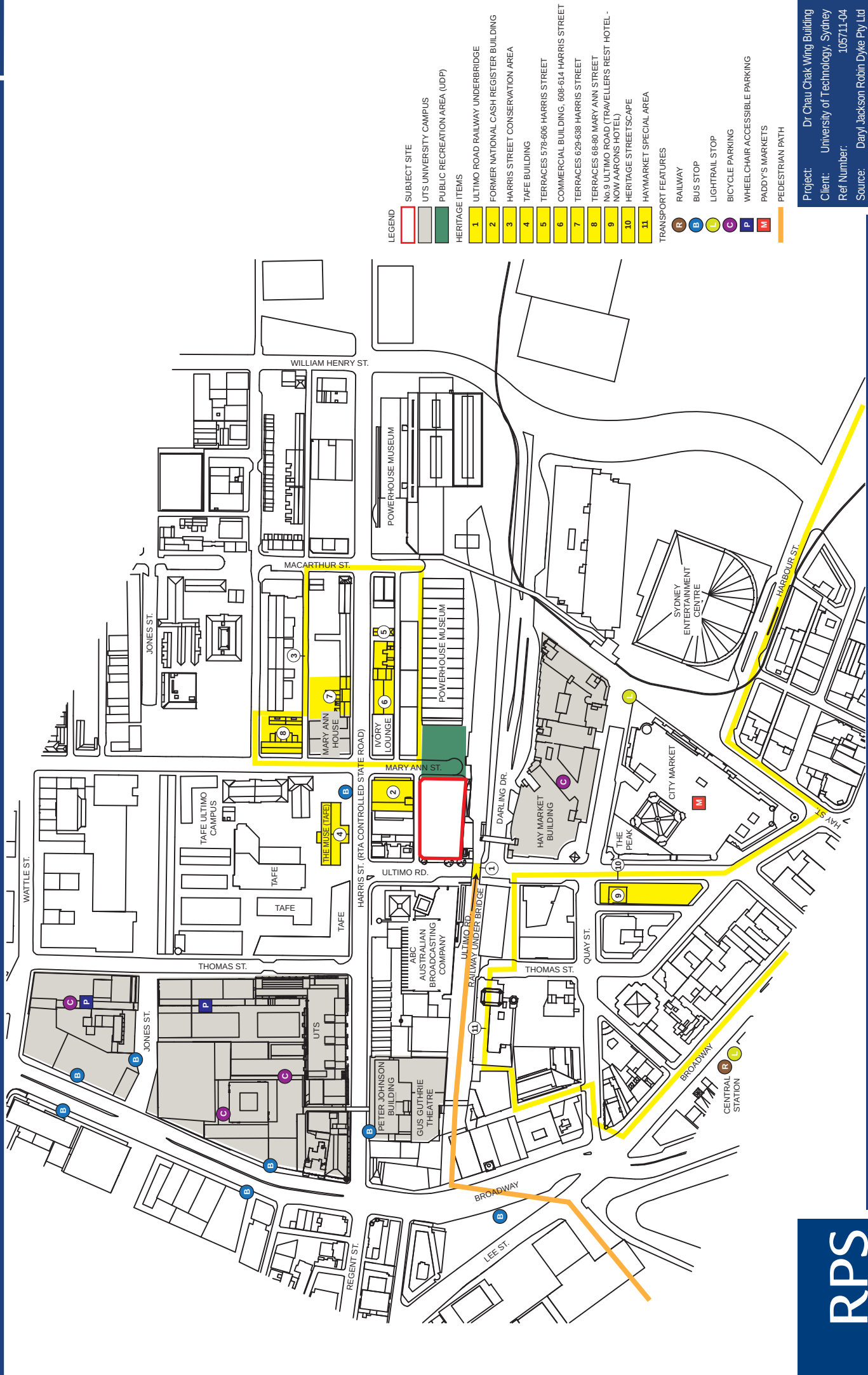


Site Analysis Plan
Figure 2.3



Site Context Plan

Figure 2.4



Photograph 2.1 The Current Site (view from Ultimo Road looking north west). *Source: Daryl Jackson Robin Dyke Pty Ltd*



Photograph 2.2 Mary Ann Street from adjacent to the UPN looking west.



Photograph 2.3 The bridge over Ultimo Road (Ultimo Street Railway Underbridge).



Photograph 2.4 Darling Drive and UTS Haymarket Precinct of the City Campus.



Photograph 2.5 The TAFE building (The Muse).



Photograph 2.6 The former National Cash Register Building.



Photograph 2.7 Looking north along Omnibus Lane from Ultimo Road.



3 Scheme Description

3.1 Introduction

This section describes the scheme that has been the subject of the environmental assessment. The design context for the Dr Chau Chak Wing Building is explained below and this is followed by a description of the following aspects of the proposed scheme:

- Scale, Massing and Materials
- Landscape and Public Domain
- The Scheme in Context
- Floor Space and Uses
- Access and Parking
- Sustainability
- Utilities
- Flood Barrier
- Remediation
- Construction
- Operation

3.2 Design Context

The Architectural Design Statement by Gehry Partners is presented in Appendix 3.1 and describes the evolution of the scheme, alternatives considered, context, conceptual form, architectural design and functional relationships, ecologically sustainable design strategy and materials and finishes. A summary of the thinking behind the scheme design is provided below.

In the Concept Design phase the design team analysed the accommodation requirements and liaised with the Faculty of Business to familiarise themselves with the goals and objectives of the teaching, research, and industry engagement that are at the heart of the school's mission. This knowledge has informed many iterations of the design, studying the building from the inside out.

The urban issues of building siting, access, massing and height have shaped the building design within its context. The Gehry Partners process values the resolution of these most important functional and social aspects of any project, and the architectural expression evolves slowly from a deep understanding of these issues.

The building façade has been explored through several design iterations. A variety of materials were studied. Window locations have been considered to bring light into all of the teaching spaces and to bring the maximum amount of daylight into work spaces throughout the building. Gehry Partners has run computer sun studies to understand the light and shadow relationships to the adjacent sites and to spaces within the building. The current design places large areas of glass at the street level to promote transparency and to create a welcoming body language for the building. The work spaces themselves have large windows punched through areas of solid façade. The proportion and spacing of these windows has been studied in relation to office modules in order to provide as much flexibility as possible for the future evolution of uses.

The façade of the building would have two aspects and two different personalities. The east facing façade that contains an entry from the Ultimo Pedestrian Network (UPN) is made of a buff coloured brick similar in colour to Sydney sandstone. The form of this façade curves and folds like soft fabric. The brick would be set in horizontal courses and would step or corbel to create the shape. The texture of the surface would be rough and would emphasize the mass of the material. The shape flattens as it wraps around the north and south corners. Large windows punch this façade. The west facing façade that contains the ground level entry from Ultimo Road is composed of large shards of glass. This glass would be slightly reflective to fracture and mirror the image of the surrounding buildings of the neighbourhood, including heritage items. Sculptural brick towers would stand at the northwest and southwest corners of this façade.

3.3 Scale, Massing and Materials

The architectural drawings are provided in Appendix 3.2 and comprise the following:

- Model Images Z0-4.00;
- Vicinity Plan Z1-1.01;
- Site Plan Z1-1.02;
- Floor Plans Z2-1.01 to Z2-2.12;
- Elevations in colour Z3-1.01 to Z3-1.04;
- Sections Z3-2.01 to Z3-4.01;
- Exterior Wall Systems Z4-2.01 to Z4-3.01;
- Enlarged Plans Z5-4.01 to Z7-1.04; and
- Landscape plans ZL1-1.01 to ZL1-1.02.

The building comprises ground level plus levels 1 to 11 (a rise of 12 storeys). The upper level is not habitable, containing only plant and equipment.

The ceiling of the upper habitable floor is at RL50.4m which translates to a height of 46.2m above the lowest footpath ground level of RL 4.2m. Above this the roof level slab of the building is at RL55.4m. The façade which extends to conceal the upper level plant varies in height on each elevation and is generally RL58.5 but extends to a maximum height in one location of RL59.2

The longitudinal site sections in Appendix 3.2 show the height of the proposed building in the context of surrounding buildings, referring to the lower component of the ABC building at RL 57.8m, (the highest point of the ABC tower is RL76m), the apartment building at the corner of Ultimo Road and Omnibus Lane at RL40m, the former National Cash Register building at RL25m, the UTS Haymarket Precinct of the City Campus building at RL25m.

The site area of the proposed building at ground level would be approximately 2,816 square metres. It is set back from the site boundary as shown in the Site Plan in Appendix 3.2.

The building is wider at the lower storeys and becomes narrower at the upper storeys as shown on elevations in Appendix 3.2.

The excavation will go to a depth of 7.3m from ground level to the base of the elevator pit and including a 0.6m wide slab.

The building encroaches the boundary with Omnibus Lane in four locations ranging from 1m to 1.5m.

The materials for the facades would comprise flat and curved brick and inclined glazing (window boxes and recessed windows). The brick would be a buff colour similar to Sydney sandstone. The full building elevations in Appendix 3.2 show each of the facades in detail. Further information about the materials and

finishes is provided in the Architectural Design Statement in Appendix 3.1 and the materials sample board submitted to the Department of Planning separately.

A Signage Strategy is proposed that details the nominal locations of the proposed signage as shown in Appendix 3.2 on drawings Z3-1.01, Z3-1.02, Z3-1.03 and Z3-1.04 including the following:

- East elevation: 1 x entry/naming hamper sign above entry, 2 x hamper signs above the café doors
- West elevation: 2 x building entry/location signs above northern and southern entries, 3 x window signs to café windows.
- South elevation: 1 x entry/naming hamper sign above entry, 1 x garage entry sign, 1 x active graphic tickertape display.
- North elevation: 1 x entry/naming hamper sign above entry, 2 x window signs to café windows, 1 x active graphic tickertape display.

Images of the vertical 'ticker tape' signage at the Ultimo Road and Mary Ann Street entrances and provided in photographs of the physical model in Appendix 3.3.

3.4 Landscape and Public Domain

The proposed landscape plans for soft planting and hard landscaping are shown in Appendix 3.2 drawings ZL1-1.01 and ZL1-1.02.

There are three existing trees within the pavement of Ultimo Road to the south of the site. An Arboricultural Survey has been undertaken to determine the condition of these trees (see Section 6.3.1). Two of these trees would be removed and the tree to the south eastern corner of the site would be retained. Eleven new trees would be planted comprising Plane Trees and Crepe Myrtle. The trees around the north west corner of the site are required for wind amelioration purposes (see Section 6.7).

With the exception of the areas of tree planting, surfaces would be paved. The paving material would be light brown finish concrete saw cut into modules with a $\frac{3}{4}$ offset earthquake pattern.

It is intended that the scheme engages with and activates surrounding streets. With regard to Omnibus Lane, the main building entrance is on the corner of Omnibus Lane and Ultimo Road and the publicly accessible café is on the corner of Omnibus Lane and Mary Ann Street. Additionally large areas of glass provide visibility of the internal activities.

A key pedestrian link with the UPN is intended with an entrance and coffee bar on the eastern façade. The link itself does not form part of the scheme proposed as ownership matters are currently being resolved however UTS intends that this be added in the near future. The Sydney Harbour Foreshore Authority (SHFA) is currently developing options for the revitalisation of the UPN and this together with the Dr Chau Chak Wing Building would enliven and open up access along the length of the UPN.

3.5 The Scheme in Context

Appendix 3.3 identifies eight viewpoints and also presents photographs of the physical model of the building and its context to provide an indication of the views from six of these viewpoints. Additionally, model images showing the vertical 'ticker tape' signage at Ultimo Road and Mary Ann Street entrances are provided. Photomontages have been prepared for two of these views to represent key public views of the building looking north and south along the UPN.

The photomontages are presented in Appendix 3.4. Together with the photographs of the model in Appendix 3.3, they have been used to inform the visual analysis in Section 6.6.

Shadow diagrams have been prepared to show where shadows would be cast by the building on its surroundings. These are presented in Appendix 3.5 and have been used to inform the analysis for solar access in Section 6.4.

3.6 Floor Space and Uses

The detailed Floor Space Schedule is provided in Appendix 3.6.

The total proposed floor space (gross floor area) is 15,488 square metres. This equates to a floor space ratio (FSR) of 5.5:1 which is the maximum FSR allowable under the Sydney LEP 2005 (see Section 4.9).

There would be one basement level with 12 levels above and Table 3.1 below identifies the uses on each level.

Table 3-1 Uses at Each Floor Level

Floor Level	Uses
Basement	Car parking; truck parking; bicycle storage and showers; substation; storage; waste storage; plant.
Ground	Entrance; reception; entrance to basement car and bicycle parking; café; seminar and lecture rooms.
Level 1	Student lounge; seminar and lecture rooms; coffee bar.
Level 2	Student lounge; seminar rooms.
Level 3	Seminar rooms; administration.
Level 4	Research centres/discipline groups; roof deck.
Level 5	Research centre/discipline groups.
Level 6	Seminar rooms; four roof decks.
Level 7	Research centre/discipline groups.
Level 8	Research centre/discipline groups.
Level 9	Research centre/discipline groups.
Level 10	Dean's unit; function area and faculty boardroom.
Level 11	Plant; cooling tower.

An outdoor seating area associated with the publicly accessible café is proposed on the corner of Omnibus Lane and Mary Ann Street. There would also be a coffee bar on the eastern façade along the UPN that might include minimal seating.

External roof decks are proposed on Level 4 and Level 6 and are anticipated to be used for breakout sessions and group discussions outdoors in pleasant weather.

Whilst the Preliminary Environmental Assessment Report of 2009 anticipated recreational uses on the roof such uses are not proposed as part of the scheme.

The Architectural Drawings in Appendix 3.2 show a potential future bridge over Darling Drive to provide linkage between the proposed building, the UPN and the ongoing Faculty of Business uses in the Haymarket Precinct of the City Campus (Building 5). Whilst this future bridge is not part of the proposed development it is UTS's intention that this is part of works for the refurbishment of Building 5 which would follow the relocation of the library to Building 2 at the Broadway Precinct of the UTS City Campus in approximately mid 2016.

3.7 Access and Parking

Vehicular access is proposed via a single driveway crossing from Ultimo Road. This would comprise left in/left out access/egress for the basement parking and loading dock level. An on-street drop off/pick up area would be located on Mary Ann Street.

There would be pedestrian access points to the ground floor at Ultimo Road and Mary Ann Street and pedestrian access bridged from the UPN to the first floor.

There would be parking for the following within the basement:

- 28 car parking spaces of which one would be an accessible car bay and three would be dedicated courier spaces;
- Space for either one medium rigid vehicle (MRV) or two trucks; and
- 53 bicycle parking spaces.

Outdoor bicycle parking racks are proposed near the pedestrian entrances from Ultimo Road and Mary Ann Street at ground floor level. Each of these would comprise six racks that would accommodate 12 bicycles. Therefore, the total number of bicycle parking spaces proposed is 77. Also, although not part of the proposed development, it is intended that there would be six racks for 12 bicycles on the potential future link with the UPN.

3.8 Sustainability and Trigeneration Plant

The Dr Chau Chak Wing Building has been designed to achieve high levels of sustainability through the following strategies:

- Designed to achieve 5 Star Green Star Educational rating.
- Low carbon emissions through a combination of high performing façade, low energy air conditioning and lighting design and on-site trigeneration (see below). In particular:
 - » the air conditioning system has been designed to turn off when occupants leave their offices for an extended period of time;
 - » modulation of outdoor air in response to occupancy through the monitoring of CO₂ within the space;
 - » lighting has been designed to modulate in response to daylight penetration and turn off if occupants are not present in their respective offices;
 - » trigeneration would consist of three natural gas fired micro-turbines generating electricity and heat on site; and
 - » the heat generated by the gas turbines would be used to provide space heating for the facility in winter and cooling through the application of an absorption chiller in summer.
- High levels of daylight would penetrate the building because of the inherent small floor plate design, window arrangement and glazing visible light transmission.
- Low water consumption through the use of high efficiency tap ware.
- Rainwater capture and storage for use in cooling towers and toilet flushing.
- Promotion of sustainable transport usage by the provision of bicycle storage, lockers and shower facilities within the building.
- Specification of sustainable materials resulting in the reduction in the use of PVC, concrete and non-recycled steel.
- A target of 80% construction waste recycling.

The ESD strategies are illustrated in Figure 3.1.

Three 65 KW gas fired trigeneration plants are proposed within the Dr Chau Chak Wing Building. The generators would be C65 Micro turbines located on Level 11. The height of the stack would be approximately 50.2m above ground level.

The process of trigeneration comprises the simultaneous production of mechanical power that is converted into electricity, heat and cooling from one heat source. Heat created from electricity production is used to heat water. The hot water can be used to power boilers and other plant that operate on hot water as well as in an absorption chiller and cools water for use in air conditioning and other cooling applications.

Trigeneration plants are typically much more efficient than standard generators with energy efficiencies of between 80-90% compared to around 35% for conventional electricity supply. Notably, trigeneration plants have lower carbon emissions. Further information is provided about the specifications of the trigeneration plant and the predicted emissions in the Air Quality Assessment by AECOM, addressed in Section 6.18.

3.9 Utilities

The existing services are shown in the Services Plan in Appendix 3.7. The proposed mechanical and electrical services are described in the Schematic Design Report by AECOM in Appendix 3.8 (see also Section 6.15).

Current surveys commissioned by UTS do not have complete survey information of the existing underground services within the site due to the concrete slab over the area. Further surveys would need to be conducted when the concrete slab is removed to confirm existing underground services. Where existing services are found and are servicing the existing car park site they would be retired. If the utility services are found to be traversing the site they would be relocated. In both instances the relevant utility company would be notified.

Underground services around the property boundary would be appropriately relocated or protected from the proposed construction works. The relevant utility company would be notified. Their requirements for protection of the underground services including depth of cover would be sought.

3.10 Flood Barrier

In accordance with the recommendations from the Flood Risk Assessment by Arup (see Section 6.14.2) there would be a flood barrier located at the entrance of the vehicular access to the basement car park (as shown on the Ground Floor Plan in Appendix 3.2). This would be either manually or hydraulically operated and would be set within a trench.

3.11 Remediation

A Screening Assessment and a Stage 2 Site Investigation were undertaken by EIS in June 2004 and October 2010 respectively and the site has been found to contain contaminants. Section 6.16 provides a summary of the findings and the full reports are appended.

EIS identified contaminated fill, underground storage tanks and the petroleum arrestor pit at the site and it is proposed that these be removed as part of the scheme. In their Stage 2 report, EIS state that excavation of contaminated fill soil from around the sewer will be difficult and may not be viable. Any contaminated fill on site will trigger a requirement for an Environmental Management Plan and public notification of the Environmental Management Plan under Section 149(2) of the Environmental Planning and Assessment Act 1979 or a covenant registered on the title to land under Section 88B of the Conveyancing Act 1919.

One of EIS's recommendations from the Stage 2 report is to prepare a Remedial Action Plan. This has been prepared and is presented in Appendix 3.9. This identifies the procedures that would be undertaken to remediate and manage contamination issues identified during the previous investigations (see Section 6.16).

Two options are being investigated for basement construction, as recommended by EIS, and these are a tanked or drained basement.

3.12 Construction

It is currently anticipated that construction would take approximately two years. The mobilisation of works is likely to commence in February 2012 with the completion of the building by January 2014.

A Preliminary Construction Environmental Management Plan has been prepared and is presented in Appendix 3.10. This contains management processes, controls and other mitigation measures that would be implemented in order to ameliorate potential adverse construction impacts for inclusion in a more detailed version prepared by the contractor as part of the Construction Certificate documentation. This has been informed by the environmental assessment process and the recommendations contained within the specialist technical reports (as reported in Section 6 and associated appendices) and include:

- The construction of a cut off wall around the basement prior to dewatering for excavation to protect groundwater and the dewatering treated prior to disposal;
- The sewer beneath the site is of fragile masonry construction and would be avoided and/or protected;
- The implementation of the Remedial Action Plan (Appendix 3.9);
- Adherence to the Acid Sulphate Soil Management Plan in the Remedial Action Plan (Appendix 3.9);
- The tree to be retained would be appropriately protected and managed during construction in accordance with the recommendations contained within the Arboricultural Assessment and Development Impact Report (see Section 6.3.1 and Appendix 6.3);
- Inspection for contamination during excavation as set out in the Stage 2 Environmental Site Assessment (see Section 6.16 and Appendix 6.16) to assess any unexpected conditions or subsurface facilities that may be discovered between investigation locations;
- A suitably qualified asbestos consultant would be contacted for advice in the event that fibro fragments are encountered during excavation;
- Analysis of excavated soil for waste classification prior to disposal;
- The recommended construction traffic management measures from the Transport Impact Assessment (see Section 6.8 and Appendix 6.8);
- Adherence to the Soil and Water Management Plan within the Drainage Strategy Report (see Section 6.14.1 and Appendix 6.13);
- Preparation of a waste management plan as set out in the ESD Strategies Report (see Section 6.9 and Appendix 6.9);
- Adherence to the noise and vibration management measures in the Noise Impact Assessment (see Section 6.5 and Appendix 6.5);
- Protection of the foundations of the former signal box building (see Section 6.11 and Appendix 6.10);
- Implementation of a program of archaeological investigation during excavation as recommended in the Archaeological Assessment and Research Design Report (see Section 6.12 and Appendix 6.11);
- Implementation of a protocol for supervision of construction works for Aboriginal archaeology as set out in the Aboriginal Heritage Due Diligence Report (see Section 6.13 and Appendix 6.12); and
- Acknowledgement of other developments in the vicinity that are under construction concurrently.

The staging of infrastructure works would be determined in collaboration with the contractor, anticipated to be on board by April 2011. The detailed staging would be included within the final Construction Environmental Management Plan.

An assessment of the proposed scheme against the Building Code of Australia (BCA) has been undertaken by AE&D and the report is provided in Appendix 3.11. The report confirms that the building would be capable of complying with the BCA. The BCA report identifies a number of provisions to be addressed and clauses where compliance is required. Details demonstrating compliance with clauses are to be submitted at the Construction Certificate stage. It is also recommended that the Fire Engineering Brief should be revised.

3.13 Operation

Occupation and full operation of the Dr Chau Chak Wing Building is anticipated by March 2014.

The Faculty of Business is currently mainly accommodated in the Haymarket Precinct of the City Campus (Building 5) and there are approximately 297 staff and approximately 7,098 students (undergraduate, post graduate and research students). Once the Dr Chau Chak Wing Building is operational in 2014 this building would be renovated to provide retained undergraduate teaching space for the university, for approximately 5,127 students and would also accommodate part of the expansion for the Law Faculty. Blocks C & D of the Haymarket Precinct of the City Campus are currently planned to be refurbished for Insearch. It is anticipated that there would be approximately 326 staff and approximately 2,907 post graduate and research students based predominantly at the Dr Chau Chak Wing Building once it is operational. However, it is envisaged that Faculty of Business students would share facilities within the two buildings. There would also be an additional 25-30 support staff that would be accommodated at the building.

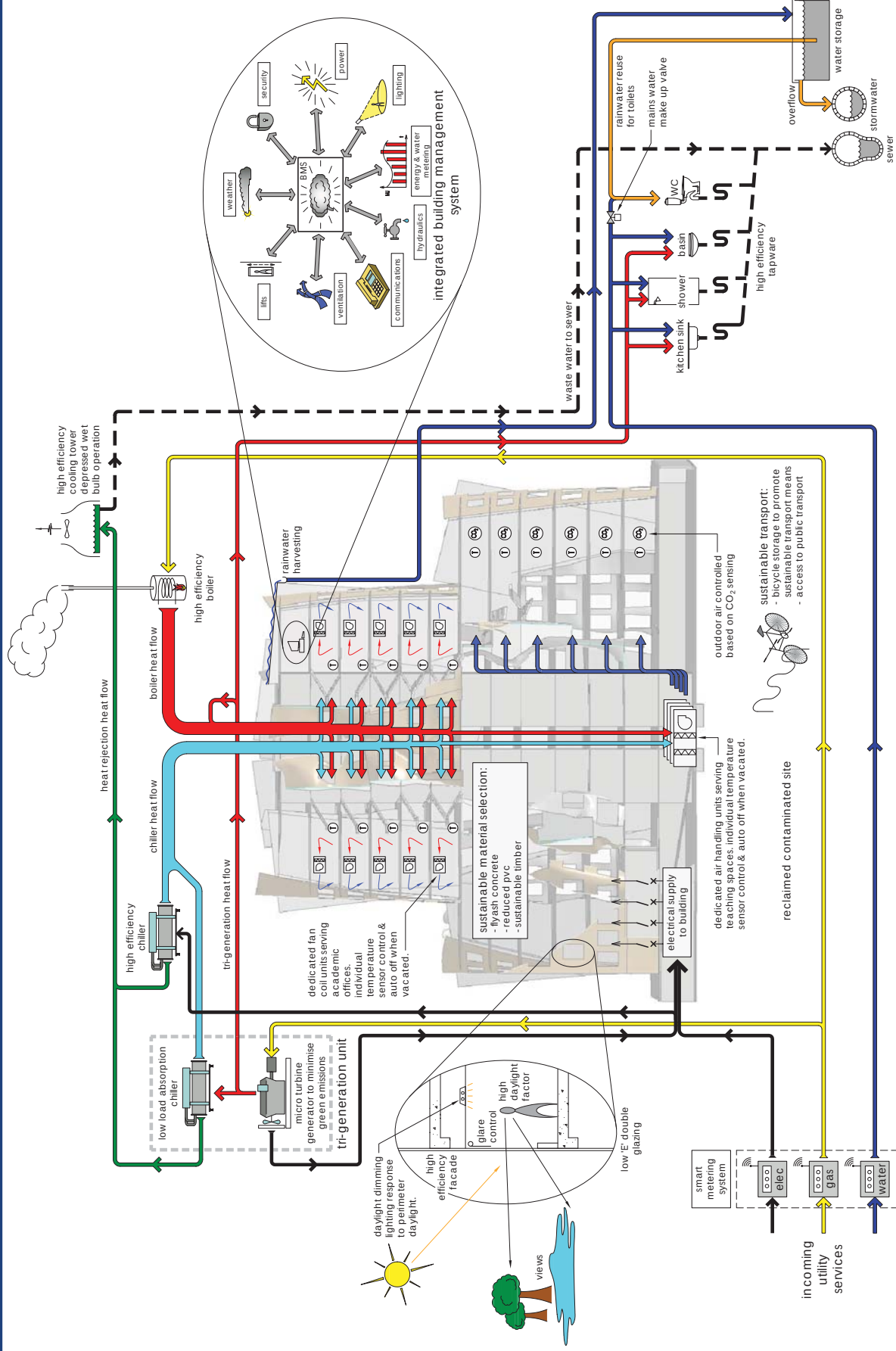
Access to the building would be available to students 24 hours per day, 7 days a week.

The primary use of the building would be for university teaching and study and additional uses are anticipated to include commercial conferences and meetings, executive education, public lectures that may incorporate a day or evening function, external or internal events located on the ground floor. Activities are anticipated to occur mainly in the day or evening periods.

The café on the corner of Omnibus Lane and Mary Ann Street and the satellite café on the UPN would be open to the public.

ESD Strategies

Figure 3.1



UTS DR CHAU BUILDING - SUSTAINABILITY DIAGRAM

4 Legislative and Planning Context

This section identifies the planning provisions of relevance to the proposed Dr Chau Chak Wing Building. Relevant environmental planning instruments, policies and guidelines are addressed in accordance with the DGRs. As such, the extent of compliance is identified and justification provided for non-compliances. It demonstrates that the proposal is mostly consistent with the planning provisions and is an appropriate form of development within its context.

4.1 Environmental Planning and Assessment Act 1979

Table 4.1 addresses the objects in Section 5 of the Environmental Planning and Assessment (EP&A) Act.

Table 4-1 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 building for teaching and research within the highly urbanised central Sydney area. The site is currently under utilised as a hard stand car park, relative to the development potential permitted by the local planning controls. The architectural approach is leading edge example of contemporary and innovative design which is compliant with the core planning controls. This combined with the use as the UTS Faculty of Business Building represents orderly and economic use of the land for public purpose. UTS extends many community services and facilities. The proposal, as a key building within a broader campus master plan will enhance this, as outlined in Section 1.1. 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 Section 3.8 and Section 6.9). Affordable housing has been considered pursuant to the Sydney LEP 2005.
(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 are involved in the development assessment process.
(c) to provide increased opportunity for public involvement and participation in environmental planning and assessment.	Public involvement is provided through consultation processes both in the preparation of planning policies and strategy for the area and community consultation undertaken for this EA. Refer to Section 5 Consultation.

4.2 State Environmental Planning Policy (Major Development) 2005

The Minister has formed the opinion that the proposed development is of a kind described in Schedule 2 of the Major Development SEPP, namely Group 7, Clause 20 “Educational facilities” as it is for teaching and research at a university and has a capital investment value of more than \$30 million. Subsequently the Director General’s Requirements for the environmental assessment were issued on 27 August 2009 (see Section 6.1).

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 makes remediation permissible across the State, defined when consent is required, requires all remediation to comply with standards, ensures land is investigated if contamination is suspected, and requires councils to be notified of all remediation proposals.

The investigation established that there is contamination on the site (see Section 3.11 and 6.16). A Remedial Action Plan has been prepared in accordance with SEPP 55, provided at Appendix 3.9. Section 6.16 also contains a summary of the assessment and Remedial Action Plan.

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. As the proposal exceeds this, it is required to be referred under the Infrastructure SEPP 2007.

4.5 State Environmental Planning Policy No. 64 – Advertising and Signage

The State Environmental Planning Policy No. 64 – Advertising and Signage (SEPP 64) regulates signage to ensure that it is compatible with the amenity and visual character of an area, is effective and suitable and of high quality design and finish.

No actual signage is proposed under this application. Rather, a Signage Strategy is proposed indicating nominal locations and size of future signs on the site. The signs will improve legibility around the site and not have adverse impacts on the local amenity. They will be of high design quality and finish to complement the building. The tickertape signs are an integral part of the building design and will be representative of its innovative form and character.

Signage will be considered by at a later date with the establishment and presentation of their details.

4.6 NSW State Plan

The NSW Government's State Plan sets priorities to guide Government decision making and resource allocation. Its challenge is to balance competing demands in an environment of change, high expectations and limited resources.

The NSW State Plan is the community's vision for the future of NSW in which the:

- Transport network is world class – safe, reliable and integrated; so that cities and towns are great places to live, and experience a high quality of life.
- Economy will grow to be stronger – supporting jobs and attracting business investment.
- Children are better educated to be more skilled and known for research and innovation.
- Health system provides the highest quality care accessible to all.
- Energy is produced from clean sources and the natural environment is protected as a lead to tackle climate change.
- Community is strong and the most disadvantaged communities and most vulnerable citizens are supported.
- The Police and justice system keeps the community safe.

The State Plan includes priorities, targets and many actions in response to the issues raised by communities. The proposal supports several of these directions. The UTS expansion will increase job and business opportunities in the area as magnet infrastructure. It will enhance the available education facilities as a step towards achieving more skilled people. As a university with a research centre, it will work towards increasing the knowledge and skills and contribute to the gross expenditure on research and development in accordance with the plans priorities and targets. The proposal encourages innovation in NSW with a globally unique contemporary architectural design of world class standard. As such, beyond the educational benefits the development will further benefit the economy through leisure and business tourism and attract international students and skilled workers.

4.7 Sydney Metropolitan Strategy 'City of Cities' and Sydney City Subregional Strategy

The Sydney Metropolitan Strategy is a broad framework to strengthen Sydney's place in the global economy by outlining a vision for growth and development over the next 25 years. The strategy has five key aims:

1. Enhance liveability
2. Strengthen economic competitiveness
3. Ensure fairness
4. Protect the environment
5. Improve governance

The metropolitan strategy identifies the Sydney Global Centre as a focal area for education precincts. It explains the importance of this area (including Ultimo-Pymont) as it contains the most appropriate uses to service metropolitan Sydney. The proposed expansion of UTS supports the strategy's aims and the Sydney centre through the expansion of learning resources and facilities to service residents from Sydney's metropolitan area, NSW and Australia alike. Relevant objectives are addressed in Table 4.2 below.

Table 4-2 Sydney Metropolitan Strategy Objectives

Objectives	Proposal
<i>A2 – Increase innovation and skills development</i>	The scheme is both representative of and encourages innovation. It would enhance the availability and quality of learning facilities and knowledge exchange and be a source of magnet infrastructure, drawing business opportunities and overall improved economic gain to the area.
<i>B1 – Provide places and locations for all types of economic activity and employment across the Sydney Region</i>	The site is located within the Global Sydney Centre amongst centres of economic activity. As outlined in the Economic Impact Assessment (See Section 6.20), the proposal would contribute to generating economic activity particularly through business and leisure tourism and would contribute to greater activation of the precinct.
<i>B3 – Cluster business and knowledge-based activities in strategic centres</i>	The proposed educational facility would be located amongst a clustering of knowledge based activities within the core economic centre of Sydney.
<i>B4 – Concentrate activities near public transport</i>	The area is very well supported by public transport and other transport infrastructure and services.
<i>D3 – Influence travel choices to encourage more sustainable travel</i>	Limited parking spaces are being provided on the site to encourage the use of the available public transport, pedestrian networks and cycling facilities. Bicycle storage and change facilities are part of the proposal.
<i>E2 – Protect Sydney's natural environment</i>	ESD principles have formed a strong driver of the design of the building. It has been designed to achieve a 5 Star Green Star Educational rating, low carbon emissions, high levels of natural daylight, low water consumption, rainwater capture and reuse, promotion of sustainable transport, use of sustainable materials and recycling of construction waste (see Section 3.8 and 6.9).
<i>E3 – Achieve sustainable use of natural resources</i>	

The Sydney City Subregional Strategy is currently in draft form and when finalised, will guide land use planning until 2031 for the Sydney centre area including the CBD, Pyrmont-Ultimo, Central, Green Square and the City East areas. The strategy identifies the Ultimo- Pyrmont area as containing existing industry concentrations of property/business (see Figure 10 in the strategy). It also specifies UTS as magnet infrastructure and includes an action for The Department of State and Regional Development to continue to undertake programs that encourage clustering of business activities around magnet infrastructure (SC A2.3.1). In considering these aspects of the strategy, Ultimo is a prime location for the proposed UTS facility. The Sydney Metropolitan Strategy also contains a direction to support magnet infrastructure (A2.3). Accordingly, the expansion of the UTS facilities in the area is responsive to the strategy vision. The proposed development is in accordance with the key directions of the strategy as addressed in Table 4.3 below.

Table 4-3 Sydney City Subregional Strategy Objectives

Objectives	Proposal
<i>A2 – Increase innovation and skills development</i>	The location of the proposed Faculty of Business building is within an area containing other university and educational facilities. The education industry cluster would be strengthened. It would contribute to developing Pyrmont-Ultimo as a business location for emerging information technology, communications and media as well as a destination for tourists and visitors.
<i>B4 – Concentrate activities near public transport</i>	The area generates substantial business activity and is well serviced by transport.
<i>D3 – Influence travel choices to encourage more sustainable travel</i>	Limited parking spaces are being provided on the site to encourage the use of the available public transport, pedestrian paths and cycling facilities. Bicycle storage and change facilities are proposed.
<i>E2 – Protect Sydney's natural environment</i>	ESD principles have been used in the design of the building. It has been designed to achieve a 5 Star Green Star Educational rating, low carbon emissions, high levels of natural daylight, low water consumption,

Objectives	Proposal
<i>E3 – Achieve sustainable use of natural resources</i>	rainwater capture and reuse, promotion of sustainable transport, use of sustainable materials and recycling of construction waste (see Sections 3.8 and 6.9).
<i>E6 – Conserve Sydney's cultural heritage</i>	A Heritage Impact Statement and Archaeological report has been prepared which conclude that the proposal would not have any adverse impacts on the heritage items in the vicinity of the site.
<i>F4 – Enhance cultural life and tourism precincts</i>	The proposal would contribute substantially to building upon Sydney's cultural life as the construction of an innovative and inspiring building by one of the world's most recognised architectural firms, Gehry Partners. The Economic Impact Statement prepared for UTS (See Section 6.20) outlines the expectations of the building to generate significant public interest, providing social and economic benefits through business and leisure tourism, international students and skilled workers. It would provide a state-of-the-art space suitable for hosting business events and exhibitions.

The Strategy was updated in December 2010 and renamed to the Sydney Metropolitan Plan for Sydney 2036. The directions of the Plan are consistent with those under the Strategy and does not contain varied provisions in relation to the proposal.

4.8 Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005

The Sydney Regional Environmental Plan 2005 (SREP 2005) is aimed at protecting Sydney Harbour and its foreshores from inappropriate development which does not optimise the foreshore qualities and attributes. The Guiding Principles must be considered when determining a DA on the site.

The site is located approximately 700m from the foreshore and is not included in the Foreshores and Waterways Area Boundary under the SREP 2005. The upper portion of the proposed Dr Chau Chak Wing Building may be visible at a distance from the waterway or foreshore areas. The only relevant Principles to this application are:

- (c) decisions with respect to the development of land are to take account of the cumulative environmental impact of development within the catchment,*
- (f) development that is visible from the waterways or foreshores is to maintain, protect and enhance the unique visual qualities of Sydney Harbour,*
- (e) significant fabric, settings, relics and views associated with the heritage significance of heritage items should be conserved.*

The proposal is consistent with the SREP 2005 principles. The proposed development would have minimal cumulative environmental impacts in the catchment and has been designed with strong emphasis on ESD principles. Any views to the building from the Harbour would enhance the foreshore as a development presenting high design contribution to Sydney. These mid to long distance views would capture the top portion of the building. The Heritage Impact Statement (see Section 6.11) concludes that the heritage significance of heritage items and conservation area in the vicinity would not be impacted.

4.9 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 generally consistent with the LEP.

4.9.1 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 proposed use of the site as a faculty building for UTS is an educational establishment by definition under the Sydney LEP 2005. Ancillary facilities including two cafés and exhibition and function space also form part of the proposal. These proposed uses meet more than one of the objectives of the Residential-Business Zone as follows:

- (a) *to promote a wide range of uses, particularly business development including tourist, leisure, commercial, retail and office development consistent with Ultimo-Pyrmont's proximity to the Sydney CBD, harbour locations and transport infrastructure, and*
- (b) *to accommodate residential development to a level compatible with adjoining business uses and consistent with the objective of creating a mixed-use area, and*
- (c) *to accommodate uses which generate employment opportunities and provide facilities and services that enable people to live and work in the same community, and*
- (d) *to ensure that the total amount of employment-generating development is compatible with the traffic capacity of Ultimo-Pyrmont and adjoining areas, and*
- (e) *to encourage sustainable transport modes for journeys to work and other trips, including walking, cycling and all forms of public transport, and*
- (f) *to limit advertising to a level compatible with the creation of a high-quality mixed-use area.*

As an area comprising a mix of educational, cultural, residential and commercial uses such as the Sydney Institute of TAFE, UTS Haymarket Precinct of the City Campus and the Powerhouse Museum, the proposed educational establishment and ancillary facilities are consistent with objective (a). The Economic Impact Assessment (see Section 6.20) indicates high numbers of business and leisure tourism which the development would attract and international students. The proposed development is adjacent to residential development adding to the creation of a mixed use area. The construction of additional accommodation for students is being provided adjacent to the UPN in conjunction with the proposed Dr Chau Chak Wing Building providing local housing for 720 students. It would generate employment opportunities and provide facilities which enable people to live and work in the same community and is compatible with the traffic capacity of the area as outlined in the Transport Impact Assessment (see Section 6.8). The provision of on-site parking spaces has been limited to encourage use of the available public transport, and walking and cycling facilities. A Signage Strategy is proposed indicating the nominal location of proposed signs. These do not include advertising and would retain the visual integrity of the mix-used area.

4.9.2 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 4.4.

Table 4-4 Sydney LEP 2005 Planning Principles

Planning Principle	Proposal
<i>(1) Role and land use activities</i>	
<i>(a) Development in Ultimo-Pyrmont is to provide for a significant increase in residential population in a</i>	As a substantial educational facility accommodating approximately 2,907 postgraduate students and 326 staff (plus 25-30 support staff) on a site comprising a hard stand car park, the development provides education and employment services to support the residential population of the area and

Planning Principle	Proposal
<i>mixed-use development pattern also accommodating employment, educational and other uses.</i>	further afield.
<i>(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.</i>	The site is currently an at grade car park which is accessible for use by the public. Given the prime location of the land, the proposed use, which includes a car park, is responsive to and maximises the site potential relative to its surrounds.
<i>(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.</i>	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. As a building of architectural excellence, it would be a significant destination point, acting as magnet infrastructure drawing visitors to the area benefiting other local facilities such as the Powerhouse Museum and Darling Harbour, through precinct activation. The building also takes advantage of its setting through obtaining harbour views from the highest habitable floor.
<i>(f) Uses at the ground level of buildings fronting the public domain should complement the functions of the public domain.</i>	The ground floor level comprises uses which compliment the public domain through the provision of a reception area for enquiries and a café with space for indoor and outdoor seating that would engage with and activate adjoining streets. The first floor level fronts the UPN on the eastern side of the building whereby a student lounge space is provided adjacent to doors at the entrance to the building and a satellite café. This would complement the functioning of the UPN as an entry space to the building and a future pedestrian network.
(3) Social issues	
<i>(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.</i>	The educational facility and ancillary services would contribute to the array of services provided and quality of education in the locality. The proposed use recognises and builds upon the cultural qualities of the area as a hub containing facilities of high technology, diversity and as a place of interest for visitors.
<i>(b) Urban design is to enhance the conviviality and sense of place of Ultimo-Pyrmont and reflect the character and heritage of Ultimo-Pyrmont.</i>	Ultimo-Pyrmont celebrates its diverse character as recognised under the Sydney LEP 2005 with key objectives to promote a mix of uses and to take advantage of its surrounds. The area has developed into a precinct that houses unique and identifiable landmarks such as the Powerhouse Museum and the Sydney Entertainment Centre. It is recognised as a creative, trendy and exciting area with a mix of heritage and contemporary development. The proposed contemporary and innovative Dr Chau Chak Wing Building would draw on and significantly enhance the character of the locality. It would contribute to further developing the sense of place of the area, through the creation of a unique landmark representative of creativity and innovation. Visual connectivity between the public domain and building interior would be achieved through design principles allowing open view corridors into the core of the building. This was a conscious design decision

Planning Principle	Proposal
	to maximise the relationship of the building use with its surrounds. The scale and unique form of the building are consistent with development in the area. By understanding and appreciating the character and uses of Ultimo-Pyrmont, the proposed unconventional contemporary building is entirely suited to the area. The Planning Principle for Compatibility in the Urban Environment (<i>Project Venture Developments v Pittwater Council [2005] NSWLEC 191</i>) outlines that compatibility between proposed and existing is not always desirable where differences in scale and appearance can produce great urban design involving landmarks. This is highly representative of the proposed development and the positive contribution it would have to the character of the area.
<i>(c) Development is to enable surveillance and to enhance street level activity to increase actual and perceived security.</i>	The design places large shards of glass at street level and floors directly above facilitating views into and from the building and neighbouring public spaces and through the view corridor to Harris Street. Activity would also be generated through the interaction of the ground and first floor level uses with adjoining streets. Additional surveillance to improve actual and perceived surveillance would be created by the many windows proposed, particularly on the southern, northern and western sides. As a public building, accessible at all hours through the night, local surveillance to surrounding streets and the UPN would be enhanced significantly. The sixth floor deck would also contribute towards providing surveillance to the surrounding streets and public space below.
<i>(e) The needs of existing and future communities, including needs for social facilities and services are to be accommodated.</i>	The proposed educational facility responds to planning strategies for Sydney including the NSW State Plan, Sydney Metropolitan Strategy 'City 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 works towards improving the availability of local educational facilities and boosting the local economy in accordance with these plans (see Section 6.20).
(4) Urban Design	
<i>Building heights are to reflect and emphasise the topography of Ultimo-Pyrmont by increasing in height as distance increases from the nearest waterfront. Building heights should allow a reasonable sharing of distant views from buildings by their occupants.</i>	The proposed height is generally consistent with the building height contemplated in the planning controls and is an appropriate response to the context which comprises numerous buildings of 55m and greater. Refer to the discussion of built form in Section 6.3. There would be minimal view loss resulting from that part of the building height which seeks to rely on the 10% variation to the height development standard. The site is located approximately 700m from the foreshore at Cockle Bay and distant views may only be obtained from above RL 47.4 (level 10) on the site. Distant views can also be unreasonable to retain, particularly in a setting where the land is relatively flat. If the building was reduced height to fully comply with the building envelope there would be no significant variation in view benefits and the additional floor space required would be relocated within the available setbacks having a greater adverse impact on neighbouring properties. It is also considered that neighbouring properties would benefit from having views to a contemporary building of high architectural achievement and design merit.
<i>The heights and scale of buildings are to form a transition between the high-rise buildings in the City and low-rise buildings in the suburbs adjoining Ultimo-Pyrmont.</i>	
<i>The heights and scale of new buildings are to</i>	Heritage significance of items and conservation areas in the vicinity would

Planning Principle	Proposal
<i>respect existing buildings in the locality, particularly heritage items and buildings in conservation areas.</i>	not be impacted by the proposal as outlined in the Heritage Impact Statement (see Section 6.11).
<i>The heights and form of buildings are to take account of visual impact, solar access, wind impact and, where appropriate, the privacy of residences, in order to contribute to a high quality of environmental amenity in intensively used parts of the public domain and in residential areas.</i>	The anticipated impacts of the proposed building are reasonable given the development controls for the site and its location within an inner city setting. The height is managed through larger setbacks and design integrity of the building. Though there would be some overshadowing to neighbouring residential properties and private open space, the overall shadow impacts are less than if the building setbacks were consistent with those nominated under the UDP 1999. Above 31m the building is set back substantially which enhances the façade and bulk appearance from the public domain.
<i>Buildings fronting the public domain should have appropriate height, bulk, finish and street alignment so as to enhance its quality by complementing its character. In general the scale of street facades must be appropriate to the width of adjoining streets or lanes, adjoining heritage items or other contextual elements.</i>	The building is in a unique setting benefiting from a frontage to a public pedestrian thoroughfare, two low volume local roads (a cul-de-sac and a narrow lane) and a more prominent road in the local arterial system, Ultimo Road. There is also a direct view of the western façade from Harris Street, across a vacant lot that contains a ground level car park. The neighbouring built form varies significantly with a mix of older, heritage listed and contemporary buildings. The height, bulk and street alignment are appropriate in the setting. The finish and design compliment the character of Ultimo-Pymont as an area that promotes diversity, yet the palette of materials including sandstone coloured brick provides a relationship between the unconventional building and its surrounds. The street walls and façade are further discussed under Section 4.15.
<i>(f) Higher buildings may be accommodated: (i) if they will emphasise existing or former high points in the natural ground level on Distillery Hill, Pymont Point, Darling Island and adjoining the CSR Stables, they will reflect the former vertical smoke-stack elements of the Pymont Point Power Station, or (ii) if they will provide a suitable axial focal point in the vista down to Liverpool Street, and they will not compromise the environmental amenity and general scale of buildings in their locality.</i>	Not relevant to this site.
<i>(g) Development on the waterfront and on adjoining land is to maximise the environmental quality of those parts of the peninsula</i>	The development is not on the waterfront or on adjoining land.

Planning Principle	Proposal
for all users.	
(6) Education	
<i>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.</i>	The development is an educational establishment, in close proximity to many others, and responds to Sydney's strategies of growth including the Sydney Metropolitan Strategy 'Cities of Cities' and the Sydney City Subregional Strategy (see Section 4.7). The building is highly innovative in its design and represents leading edge technology. Though visually distinct, the development would complement its surrounds as an area focused on providing mixed development and a representation of modern technologies. As such it is consistent and integrated with the character of surrounding development.
(8) Heritage	
<i>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.</i>	Heritage items and conservation areas in the vicinity of the subject site would be conserved with there being no adverse impacts on their significance from the proposal as supported by the Heritage Impact Statement (see Section 6.11).
(9) Movement and parking	
<i>(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.</i>	Ultimo-Pyrmont currently has a range of facilities including a large amount of residential, commercial and leisure facilities. The proposed Dr Chau Chak Wing Building would contribute to providing educational services in the area adding to this mix alongside the many existing local educational facilities.
<i>(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 and use of public transport are to be encouraged as the means of movement.</i>	The proposed development is adequately accessible for disabled persons as detailed in the Access Review (see Section 6.3.2). Limited parking spaces are being provided on the site to encourage the use of the available public transport, pedestrian paths and cycling facilities. Bicycle storage and change facilities are proposed.
<i>(c) Development in Ultimo-Pyrmont is to facilitate the provision and operation of a comprehensive regional public transport network.</i>	The proposed Faculty of Business would be serviced by the public transport and road networks with minimal impact. It would further support the existing services which have capacity as reported in the Transport Impact Assessment (see Section 6.8).
<i>(d) Development, particularly employment related development, is to be within the capacities of existing and proposed public transport and arterial road systems.</i>	The Transport Impact Assessment (see Section 6.8) reports that the development is within the capacities of public transport and road systems.
<i>(e) The provision for vehicular movement is to</i>	The vehicular and pedestrian movement environments are of high quality and potential.

Planning Principle	Proposal
<i>be consistent with the development of a high-quality pedestrian environment within the street system.</i>	
<i>(f) Parking controls are to support public transport strategies of the Government and to reflect road network capacities.</i>	Minimal parking is provided as part of the proposed development which is located in an area within close proximity to a range of public transport services.
(10) Implementation and phasing	
<i>Development is to contribute towards the efficient use of Ultimo-Pymont'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.</i>	The proposed development provides local facilities that would contribute to social and physical infrastructure without increasing the permanent population. A high level of self sufficiency would be achieved as the primary required services for the use are being provided as part of the Scheme. It is a positive improvement to local infrastructure on a site which is currently underutilised as a single level car park.

4.9.3 Development Standards

There are two (2) applicable development standards in the Sydney LEP 2005 relating to the development. Departures to the development standards are addressed in accordance with relevant clauses and clause 10 of the Sydney LEP 2005 below.

Building Height

The Sydney LEP 2005 details that the maximum permissible building height for the site is 42m. Having regard to the 'height of building' definition for Ultimo-Pymont under the Sydney LEP 2005, the proposed building height is 46.2m being a 4.2m or 10% variation. The proposed height is a minor and appropriate transition in height between the subject building and adjacent heritage item No. 622-632 Harris Street, in accordance with clause 96 of the Sydney LEP 2005. The alignment of the building is consistent with neighbouring buildings in Ultimo Road and Mary Ann Street with overall greater setbacks from the streets.

Floor Space

The Sydney LEP 2005 prescribes a permissible floor space ratio for business uses in Ultimo-Pymont of 5.0:1. The subject site has an area of 2,816m². The proposed building has a gross floor area of 15,488m² which translates to an FSR of 5.5:1. This floor space is within a 10% variation. Clause 10 of the Sydney LEP 2005 allows for variation to the FSR development standard, as discussed below.

Clause 10 - Waiver of certain development standards

Pursuant to clause 10 of the Sydney LEP 2005, consent may be granted to development of land in Ultimo-Pymont even though the proposed development contravenes a maximum height or floor space ratio imposed by a development standard if the consent authority is satisfied that it meets the following:

(a) *all the objectives of the development standard will be fulfilled*

There are no specific objectives for the applicable development standards. As discussed above the proposal fulfils all other stated aims and objectives of the Sydney LEP 2005.

(b) *the contravention will not:*

- (i) create an undesirable precedent for other development, or*
- (ii) diminish the overall effect of the development standard for development in the vicinity of the site, and*

The variation would not create an undesirable precedent. The proposal represents a new bench mark for contemporary and innovative architecture, designed by an esteemed and internationally renowned architectural firm. The built form has been developed through a lengthy and iterative design process and with close consideration of the form, bulk and scale and character of surrounding development and in this regard the building sets a highly desirable precedent for further high quality and innovative design in the locality.

The height is a relatively minor exceedance of the maximum and mediates between higher buildings to the south and east and the lower buildings to the north and west.

(c) the particular physical attributes of:

- (i) the site, in terms of location, context, slope, site configuration and the like, and*
- (ii) the proposed development, in terms of urban form, bulk, height, floor space ratio, carparking, and the like,*

will render the strict application of the development standard unreasonable or unnecessary in the circumstances, and

The physical attributes of development in the area vary considerably. As the local topography is relatively flat, the use of RLs is a reliable means for considering the relative height of buildings, above the surrounding streets. Buildings directly adjacent to the site include:

- the ABC building in the south which has two components. The northern component is directly adjacent to the site and at RL 57.8. The second component is a tower located towards the southern side of the building and directly adjacent to the UPN and reaches to RL 76.8.
- the residential building No. 646 Harris Street in the west at RL 40.0.
- the Haymarket Building in the east at RL 23.0.

The proposed Dr Chau Chak Wing Building is reaching RL 59.2 or 54.2m at its highest point. This is consistent with neighbouring building heights as outlined above. Being significantly lower than the overall height of the adjacent ABC tower building, the height of the proposed Dr Chau Chak Wing Building is an appropriate transition of built form on land closer to Darling Harbour.

With these notably tall buildings in the near vicinity of the site along with many other buildings similar in scale to that proposed, the development is consistent with the height character of the surrounds and satisfactory given its location in an inner city setting. The sculptural form of the building results in varied and larger than required setbacks to completely alter the overall perception of building height and bulk. Reliance on the allowable 10% tolerance for variation to the height control is considered to be reasonable in this circumstance.

(d) the proposed development will improve or contribute positively to the public domain and would achieve design excellence.

The proposed development would make an exceptional contribution to the public domain resulting in the revitalisation of surrounding spaces. Its relationship with the public domain has been carefully considered in the design process with its unique positioning with public frontages to all sides. The existing car park does not contribute positively to the public domain being underutilised and a 'hole' in the otherwise generally intact street walls. A number of design features will contribute to the upgrade of the adjacent public areas. Visual interest and interactive facades and frontages will enliven the surrounding footways and streets. The building has been designed to achieve this on all four frontages, maximising its contribution to the public domain. Particular focus has been given to revitalising Omnibus Lane, consistent with the City of Sydney's laneway

revitalisation initiative. Highly accessible forecourt plazas on the northern and southern sides would result in valuable extensions to the public domain with additional landscaping contributing to local amenity. Legibility and accessibility will also be improved with easy and equitable public access through the building to the UPN.

Gehry Partners are internationally renowned for their pursuit of innovation and excellence in design. This proposal is no exception with a unique and captivating form that would contribute positively to short, medium and long distance views of the building. It will pride in design excellence with its unique sculptural form and materials of high quality and leading technology. Its inclusion within Sydney's urban landscape would be a significant milestone in the city's architectural history.

In addition to the above, consent may be granted pursuant to this clause only if the building concerned:

- (a) *does not contravene the maximum building height set for the building by Chapter 2 or 3 by more than 10% of that maximum building height or the height of one floor of the building, whichever is the greater, and*

The proposed building height is 46.2m and does not exceed the maximum building height by more than 10%.

- (b) *does not contravene the maximum floor space ratio for the building set for the building by Chapter 2 or 3 by more than 10% of that maximum floor space ratio or the proportion of the floor space ratio of the building attributable to one floor in the building, whichever is the greater, and*

The proposed FSR is 5.5:1 and does not exceed the maximum FSR by more than 10%.

4.9.4 Heritage

The subject site is not listed as a heritage item or included in a conservation area. It is in the vicinity of heritage items as identified in the Heritage Impact Statement (see Section 6.11) including:

- Ultimo Road Railway Underbridge;
- former National Cash Register Co Building;
- Harris Street Conservation Area;
- Ultimo Road Railway Underbridge;
- Former National Cash Register Co Building;
- Building C Ultimo College TAFE NSW;
- terraces 578-606 Harris Street;
- commercial building terraces 608-614 Harris Street;
- terraces 629-637 Harris Street;
- terraces 68-80 Mary Ann Street; and
- 9 Ultimo Road (Travellers Rest Hotel – now Aarons Hotel).

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 assessment. The assessment has demonstrated that the heritage significance of the above items would not be adversely impacted by the proposed development. A Heritage Impact Statement has been prepared and is reviewed at Section 6.11. It concludes that the development would be compatible with the conservation of the heritage significance of the items. In accordance with clause 105 of the Sydney LEP 2005, an Archaeological Report and Aboriginal Archaeology

Due Diligence Report (see Sections 6.12 and 6.13) are discussed. An overall summary of the impact of the proposal on the heritage significance of items in the vicinity is provided in Section 6.

4.9.5 Affordable Housing

Pursuant to Part 8 of the Sydney LEP 2005, for proposed development to land within the Residential-Business zone within Ultimo Pyrmont, the consent authority is to consider the affordable housing principles. Clause 122 describes development that does not apply to Part 8, including community facilities. By definition under the LEP, the proposed development is a community facility and as such is not subject to provisions within Part 8 of the Sydney LEP 2005.

4.10 City of Sydney Heritage Development Control Plan 2006

Provisions relating to heritage listings and conservation areas are outlined in the City of Sydney Heritage Development Control Plan 2006 (DCP 2006), with its primary aim to protect the significance of heritage items. Section 2 of the DCP outlines provisions for development in the vicinity of heritage items. The proposed building has been designed to respect heritage items in the vicinity, providing reflective materials to create subtle and abstract reflections of the adjacent item. The Heritage Impact Statement concludes that there would be no impacts on the heritage significance of items in the vicinity, as discussed in Section 6.11.

The site is a potential archaeological resource. An Archaeological Report and Aboriginal Heritage Due Diligence Report are provided at Sections 6.12 and 6.13 with recommendations and investigations.

4.11 City of Sydney Access Development Control Plan 2004

The City of Sydney Access Development Control Plan 2004 (DCP 2004) aims to provide non-discriminatory, equitable and dignified access for all people who use the City of Sydney. The proposal is assessed against a list of design criteria are included in the DCP 2004 in the Access Review (see Section 6.3.2) which demonstrates that the scheme is consistent with the DCP 2004 in that it provides excellent access both internally and externally of the building. The scheme contributes to improved public access between Ultimo Road and Omnibus Lane and the UPN with twenty-four hour access through the continuous accessible path of travel. Refer to the discussion of the Access Review at Section 6.3.2.

4.12 City of Sydney Contaminated Land Development Control Plan 2004

The City of Sydney Contaminated Land Development Control Plan 2004 (Contaminated Land DCP 2004) establishes procedural framework for the integration of contaminated land management into the planning and development processes within the City of Sydney. The Contaminated Land DCP 2004 outlines stages to be undertaken in the assessment of contamination. These have been followed in the determination of contaminated land on the site. The first two (2) stage investigation of contamination were undertaken (see Section 6.16). Following identification of soil and groundwater contamination a Stage 3 Remedial Action Plan (RAP) was prepared and is provided at Appendix 3.9. A discussion of these reports is provided in Section 6.16. Stage 4 validation and monitoring report would be submitted if required in accordance with the Contaminated Land DCP 2004.

4.13 City of Sydney Signage and Advertising Structures Development Control Plan 2005

The City of Sydney Signage and Advertising Structures Development Control Plan 2005 (DCP 2005) applies to all signage and advertising structures and came into force 28 March 2005. As described in Section 3 a

signs are proposed in the form of a Signage Strategy indicating the approximate size and approximate locations of signage as indicated in Volume 2 Appendix 3.2 architectural drawings.

The tickertape signage will be an integral component of the design of the building and relate to the use of the building as an education facility for business. The remaining signs will be identification signs, relating to the building and its uses.

All signage except the tickertape signs will be located less than 5m above ground level. This is suitable and consistent with the DCP 2005 objectives. The tickertape signs are wall signs will be visually subtle and representative of the modern building design and character.

Further approval for the content of signage will be sought in accordance with the approved Signage Strategy.

4.14 Sustainable Sydney 2030

The Sustainable Sydney 2030 Vision, introduced in 2010 by City of Sydney Council, works towards making Sydney City more environmentally, economically and socially sustainable. The proposed Dr Chau Chak Wing Building is consistent with the strategies and directions of the strategy and would contribute significantly towards reaching its vision.

It nominates both Harris Street and Haymarket as Activity Hubs which are centres projected to provide core services including learning centres. Both of these would be serviced by the proposed educational facility. An overall reduction in greenhouse gas emissions is targeted and the promotion of more sustainable forms of transport, pedestrian and cycle in particular. The proposed design has been guided by ESD Principles and encourages the use of cycle, pedestrian and public transport facilities for transport to and from the site. The proposed trigeneration plant and rainwater harvesting and reuse are further demonstration of the projects dedication to ESD.

Liveliness, activity, creativity and culture are also key visions for the City, to provide a platform for creative expression, a concentration of world class cultural destinations and the growth of business engaged in creative industries. The proposed development exhibits design excellence via highly creative architecture, high quality materials and innovative construction techniques. It would be a world class cultural destination and attract more creative development and business to Sydney as a physical representation of innovation and Sydney's love of creativity. The adjacent UPN forms part of the 'cultural ribbon' which provides access to many of Sydney's cultural attractions. It runs along the eastern edge of the City and foreshore to the Powerhouse Museum. The location of the proposed Dr Chau Chak Wing Building is highlighted by its position along the cultural ribbon. The building would provide an exceptional contribution to the precinct and build upon its cultural significance.

4.15 Urban Development Plan for Ultimo Pyrmont – Update 1999

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. It is stated within the UPD 1999 that although the Plan should be complied with, where there is circumstance of variation the consent authority may approve the proposal, provided it is satisfied with the argument for the non compliance. The proposal is addressed in accordance with relevant provisions in the UDP 1999 in the following Table 4.5.

Table 4-5 UDP 1999 Controls and Requirements

Applicable controls and requirements	Proposal
3. Built form	
Street walls <i>The maximum height of building facades on street frontages is controlled by a plane drawn at 45 degrees to the horizontal as indicated in the following formula: $H = D + 6.1$</i> <i>Except where sites front onto activity strips, the relationship of the built form must provide for some visual extension of the public domain.</i> <i>Within the general envelope, the upper levels of street facades and set-backs must be modulated to increase visual variety in the streetscape and skyline.</i>	The proposal is consistent with the street wall controls relating to Mary Ann Street and Ultimo Road. This is displayed diagrammatically in the section plans provided in Appendix 3.2. The Omnibus Lane elevation does not fully comply with the formula however; it has been designed to provide consistency with its neighbouring buildings creating a considered amount of enclosure by the street wall. The organic and varied approach to setbacks is a response to the architectural concept and would significantly improve the activity and interest along the Lane. Due to the north-north-west south-south-east orientation of the Lane, solar access would be maintained to the street, thus preserving one of the key objectives of the street wall height control. Visual functional extensions of the public domain are provided through external landscaped spaces, courtyards and other spaces of interest, between the boundary and the building.
Narrow streets and lanes <i>Allow for potential street widening for streets less than 12m</i>	This control seems to be aimed at widening streets to favour priority of use by cars. Omnibus Lane carries very little traffic and it is preferable to give priority to other users of the Lane such as pedestrians and cyclists by maintaining a limited width. The interesting and historically important linear geometry of the Lane would also be eroded if it were widened. It is therefore not desirable or necessary to require lane widening.
Heritage <i>Proposal must be justified in terms of heritage and streetscape impact.</i> <i>For sites adjoining heritage items or conservation areas, the new building façade must be compatible in form and linked appropriately to the adjoining buildings and not exceed one and a half times the height of the adjoining lower scale buildings.</i>	A Heritage Impact Statement has been prepared concluding that there would be no adverse impacts on the heritage significance of the items in the vicinity. Archaeological Report and Aboriginal Heritage Due Diligence Report have been provided (see Sections 6.12 and 6.13).
Privacy <i>Keep a minimum separation distance of:</i> <i>6m between non-habitable rooms</i> <i>9m between habitable and non-habitable rooms</i> <i>12m between habitable rooms</i>	The proposed educational facility would be located adjacent to a residential apartment building, an educational building on the western side of Omnibus Lane and a residential apartment building and the Powerhouse Museum on the northern side of Mary Ann Street. Separation distances between these neighbouring buildings and the proposed Dr Chau Chak Wing Building would vary with the building articulation and angled window positions. The UDP 1999 controls do not account for the angles of windows and window reveals and their intrinsic management

Applicable controls and requirements	Proposal
	of sight lines. A similar concept is supported by the Planning Principle for the Protection of Privacy (<i>Meriton v Sydney City Council [2004] NSWLEC 313</i>) which outlines that the required separation distance depends upon density and whether windows are at the same level and directly facing each other. Though there are some minor non-compliances in the separation distances, loss of privacy to neighbouring buildings is being managed to an acceptable level through the building design as explored below. <i>646 Harris Street</i> There is one highlight window and balcony on each level of the apartment building which would be potentially visible from the proposed building. The highlight window is narrow and above eye level and would not facilitate overlooking. The balconies are considered as habitable rooms under the UDP 1999. They are relatively enclosed, with a relatively small window opening appearing on each level of the eastern façade. On the first four levels (ground floor to third floor) the windows facing the apartment building on the south-western wing are located at varying distances from approximately 10m to 15m from the eastern elevation of No. 646 Harris Street. The proposed façade is located to the north of the neighbouring residential apartment building, resulting in any views into the balconies of the apartment building to be on a sharp angle and obscured as such. Views from the subject windows on the ground and first floor levels would be further obscured by the proposed trees adjacent to the northern boundary. The fourth and fifth levels would have lesser separation distances ranging from approximately 5m to 10m. These windows are designed as punctures out of the building with deep window reveals at differing angles, directing views from almost all the windows away from the window openings to the balconies of the apartment building. The proposed roof top deck on the sixth level has been setback to allow a separation of approximately 11m to 13m with several metres of roofing to block views, ensuring the privacy of the residential apartment block. Windows on levels above this are setback more than 12m. This is an adequate separation distance to mitigate privacy impacts as nominated by the UPD 1999 and would not have any overlooking impacts.

Applicable controls and requirements	Proposal
	<i>622-632 Harris Street</i> The separation distances from the portion of the western façade of the proposed building adjacent to the TAFE building vary from approximately 8.5m to 10m, with one window on the fourth level at approximately 7m. Views from the ground and first floor windows would be obscured by tree planting along the western boundary. As two commercial buildings located in the inner city these separation distances and the provided level of privacy is reasonable. <i>82 Mary Ann Street and Powerhouse Museum</i> The separation between the proposed building and the residential apartment building and Powerhouse Museum is greater than 30m and would therefore not have privacy impacts.
Views, vistas and siting <i>The sense of dramatic entry into the precinct should be heightened by development which maintains and enhances views and vistas.</i> <i>Views along streets from public spaces to buildings and places of architectural, streetscape or heritage significance should be maintained.</i> <i>Care must be taken to protect views</i>	The building would not obstruct any important views and vistas in the area. By contrast it would make an outstanding architectural contribution and building of visual interest.
4. Character and detail	
Ground level activities <i>Street spaces must be interesting and safe with an adequate range of facilities and concentrated along major pedestrian routes and be visually interesting.</i> <i>Pedestrian circulation patterns should not be diverted away from ground level use.</i> <i>Car parking should be located below ground level.</i>	The design facilitates 24 hour surveillance of the public domain. Dynamic building entries and forecourts are proposed on each of the building's four public interfaces and a transparency to enable views of movement and activity happening within the building, particularly from street level in Omnibus Lane. The proposed building would result in a quantum leap for the amenity, liveliness and usability of the UPN, as the next step towards it becoming an interesting, more extensive and viable pedestrian linkage. Parking is proposed in the basement.
Façade treatment <i>Facades must be rich in treatment and modelling so that the development contributes to a lively environment and harmonious streetscapes and built edges of the public domain.</i> <i>Facades should relate sympathetically to existing buildings in the vicinity.</i> <i>Should develop appropriate rhythm, proportions and depth.</i> <i>Long facades should be articulated by breaking the building into distinct segments and indented courtyards.</i> <i>Articulation may be reinforced by the use of different materials or segments of the building.</i>	The façade is leading technology and would make exceptional and unprecedented contribution to the local environment and architectural excellence in Sydney. The design concept involves changes in rhythm and depth to resemble a crumpled building presenting an abstract appearance unique to other buildings. Though unique in shape and form, materials and colours are responsive to masonry and sandstone character of the locality and central Sydney generally. Reflective surfaces would 'bounce' the texture, colour and form of nearby

Applicable controls and requirements	Proposal
<i>Entries to buildings should be articulated.</i> <i>Building detailing must add interest to facades</i> <i>Horizontal elements of buildings such as string courses, cornices, parapets, window sills and heads should relate to those of existing buildings, particularly heritage buildings and together with vertical elements, such as bay widths, setbacks and changes in facade planes, establish a well proportioned rhythm.</i> <i>New development must complement existing buildings in the vicinity in materials and colour.</i> <i>Reflective glass must not be used</i> <i>Light and warm colours should predominate and draw on their context such as sandstone cliffs.</i>	buildings.
Roof design <i>Lift over-runs and rooftop plan should be concealed within roof structures so to minimise visual and noise impacts.</i> <i>Roofscapes must be attractive and enhance the skyline.</i>	The roof is an integral design feature of the building facades. Lift overruns and structures would be obscured by the upper façade extensions.
7. Environmental Issues	
Wind impact <i>Development is to be designed and sited to avoid unsafe and uncomfortable winds at pedestrian level in public areas and in the private and semi-public open spaces of development sites.</i>	The Pedestrian Wind Environment Study is addressed in Section 6.7. Treatments to ameliorate wind speeds to acceptable levels for two balconies, the café outdoor seating area at the north west corner of the proposed building and for the UPN are addressed.
Reflectivity impact <i>Building materials and finishes which minimise adverse reflectivity must be use. Glass of more than 20% reflectivity and other highly reflective materials are not permitted.</i> <i>Mirror glass is not to be used</i> <i>Reflected solar radiation should not have an adverse impact on the heat loading of other buildings.</i>	The reflective surfaces of the proposed building are limited to an external reflectivity of 20%. The Reflectivity Report is addressed in Section 6.19.
Solar access to open space <i>No more than 50% of major open space areas and communal private open space should be overshadowed between 10am and 2pm between 21st April and 21st August.</i>	The outdoor play area of the Child Care centre would be shaded less than 50% during the specified period, as discussed in detail in Section 6.4.
8. Ecologically sustainable development	
<i>All development must contribute to the achievement of ESD.</i>	ESD principles have been used in the design of the building which incorporates sustainability initiatives that include: - Tri-generation - Rainwater harvesting and reuse - Reduced reliance on cars - Promotion of bicycle use. - Engagement with pedestrian linkages - The commitment to and investment in

Applicable controls and requirements	Proposal
	exceptionally high quality architecture and material to promote the longevity of the building's life and the robustness of the design to enable different future uses. The low embodied energy and selection of materials based on their sustainability.
9. Access, parking and circulation	
Access facilities for cyclists <i>Provision of secure bicycle storage for 1 bicycle per 300m² of business space and 1 visitor space per 2500m² of business space.</i> <i>A grade ramp or lift access should be provided to bicycle storage areas.</i>	The proposal provides well in excess of the 58 spaces (including visitor spaces) suggested in the UDP 1999. The proposal is for 53 space within the basement with a further 12 bike racks in the southern and northern ground level forecourt entries to accommodate 24 bicycles and potentially a further 6 racks adjacent to the UPN (although these latter 6 racks are not part of the proposed scheme). In these convenient locations the bike racks would be in high use. Basement bike storage would be accessed via a separated ramp adjacent the vehicle ramp and are supplemented by showers and change facilities.
Parking and servicing <i>Minimum allowed parking space is nil.</i> <i>Maximum allowed parking spaces is 1 space per 200m of gross floor area</i> <i>Business developments must also provide:</i> - 1 service vehicle space per 4000m² gross floor area for first 20000m² - 50% of the service vehicle spaces should be suitable for trucks - 1-2% of total parking spaces must be designed for people with disabilities and located adjacent lifts. <i>Business developments located in close proximity to public transport routes are encouraged to reduce car parking levels.</i>	Car parking rates are expressed as a maximum with the policy placing an emphasis on reduced car parking supply. A maximum of 77 spaces are suggested. A total of 28 car spaces are proposed and therefore the proposal is well within the suggested limits. In relation to loading the UDP 1999 suggests provision for two trucks and two vans. One medium rigid vehicle and two small rigid vehicles are proposed. The servicing proposed is a direct response to the known servicing demands of the building. Unlike speculative commercial development proposals, the proposed building has been designed with a full and thorough understating of all aspects of the use and therefore the servicing demands. Space for two vans and one truck are is sufficient. There is excellent access to public transport from the subject site.
Parking for people with physical disabilities <i>Disabled car parking must be provided in accordance with AS2890.1 and the Access DCP.</i>	One (1) accessible space is proposed near the lifts, which complies with these requirements.
Design of parking and servicing facilities <i>On-site parking is to be provided below ground level. Give priority to pedestrian movement along major street frontages, vehicle entries/exits to and from buildings should be as narrow and few as possible, and</i>	The parking is below ground level with a single access driveway ramp on the southern side, separate from pedestrian entrances and

Applicable controls and requirements	Proposal
<i>consolidated and separated from pedestrian entries and to the side or rear of buildings.</i> <i>Access for loading, unloading and service should be combined with parking access unless the size and height of such access would adversely affect the streetscape or rear lane exit.</i>	access. The service vehicle loading areas are proposed in a designated space in the basement level and would not be visible from the street.
Access and facilities for people with disabilities or mobility impaired <i>All buildings and facilities should be designed to accommodate the needs of people with disabilities and for people who are mobility impaired.</i> <i>People with disabilities should be able to conveniently use the same main entry as other people.</i>	Access and facilities are proposed for people with disabilities in accordance with applicable standards and requirements as outlined in the Access Review provided (see Section 6.3.2).

4.16 Conclusion

A thorough planning assessment has been undertaken for the proposal having regard to relevant environmental planning instruments, policies and guidelines. The development demonstrates extensive compliance with planning provisions, highlighting its suitability for the site. It is widely responsive to objectives of both State and local planning policies and legislation in providing a teaching, learning and research facility of world-class standard within a building of architectural excellence and principles of sustainability. The controls have been carefully considered in the design process, with some variation where deemed suitable and reasonable. Departures from non-statutory controls are insignificant and include setbacks, overshadowing, privacy, delivery vehicle spaces. Justifications for these have been provided and they are found to be reasonable in the context of the proposed development within its setting.

Overall the proposed development would make exceptional contribution to built form in the precinct and result in a high quality local environment, consistent with the desired future character of the area and is considered to be rational, economic and orderly development of the land.

5 Consultation

5.1 Introduction

The following consultation has been undertaken and is described below:

- Community consultation; and
- Stakeholder consultation.

Consultation has also been undertaken for the purposes of the specialist reports appended to this Environmental Assessment Report and this is identified within those reports.

5.2 Community Consultation

UTS appointed Elton Consulting to organise and implement the community consultation. This was undertaken from 17th December 2010 to 15th January 2011.

The Community Consultation Outcomes Report, prepared by Elton Consulting is provided in Appendix 5.1. It outlines the consultation activities undertaken and the feedback received. This consultation was undertaken on a voluntary basis and is beyond statutory requirements. Consistent with Department of Planning's Major Project Community Consultation Guidelines 2007 the consultation was designed to provide those with the potential to be 'directly impacted by the project' an opportunity to receive information and provide feedback.

The key objectives of the consultation were to:

- Identify key community stakeholders with an interest in the project;
- Provide accurate and relevant information about the proposal to local residents and community stakeholders to create an awareness of the proposal;
- Provide a means by which stakeholders could comment on the proposed plans prior to their finalisation; and
- Provide the project team with the opportunity to incorporate stakeholder feedback into the planning and development process.

The consultation activities undertaken included:

- Letter to residents (broad distribution) on 6 December 2010 including information about the proposal, an invitation to attend the community information and feedback sessions also referred to as 'meet and greet sessions', invitation to the Frank Gehry design media launch on 17 December and information about the website and providing feedback online. The letter went to approximately 1,000 residents including those who could potentially experience construction impacts.
- A flyer to residents (targeted distribution) including a reminder for the meet and greet sessions, the information display, information about the website and providing feedback online and email newsletters/invitations sent to targeted community stakeholder groups. This was distributed to approximately 100 immediate residences and displayed at the convenience store near the site.
- Information boards and models were on display throughout the community consultation period available for viewing between 8am and 6pm seven days a week (with the exception of public holidays).
- Three community information and feedback sessions held on Saturday 8 January between 11am and 2pm, Wednesday 12 January between 5pm and 6.45pm and Saturday 15 January between 11am and 2pm.

- An email containing information about the project and community information and feedback sessions was sent on 22 December 2010 to:
 - » Ultimo Village Voice
 - » The Ultimo Society
 - » Haymarket Chamber of Commerce
- The project website www.utsmasterplan.com.au provides information about the Dr Chau Chak Wing Building, the consultation process and the 'Have Your Say' online feedback form.

Approximately ten community members and stakeholders attended the community information and feedback sessions and three online feedback forms were received.

Feedback and comments from the community information and feedback sessions included:

- Enquiries about the possibility of the Ultimo Pedestrian Network (UPN) being extended further into the Chinatown/Haymarket area, creating a connection;
- Questions regarding the timeframe and the availability of a detailed program of works;
- A desire for information about and illustrations of the interface with the UPN;
- Request for further consultation and co-ordination with Sydney Harbour Foreshore Authority (SHFA);
- A need for public spaces in the design of the building. For example, spaces that community groups such as the Haymarket Chamber of Commerce, could access;
- The possibility of building a bridge connection to UTS Building 5, at a future time; and
- Queries about the facade texture and materials.

The following matters were raised via three online feedback forms and one direct email:

- Desire to change the appearance of the 'crumpled brick' design;
- Desire for 'ergonomic, flow, smooth lines';
- Desire about more information about the sustainability features (response provided); and
- Desire for more information about disabled access and facilities (response provided).

5.3 Stakeholder Consultation

During the course of the environmental assessment consultation has been undertaken as set out in Table 5.1 below.

Table 5-1 Stakeholder Consultation

Stakeholder	Date	Purpose of Consultation
Department of Planning	28 October 2010	To present the scheme and obtain feedback.
City of Sydney Council	28 October 2010	To present the scheme and obtain feedback.
Department of Planning	14 January 2011	To present and discuss the 1:100 and 1:500 physical models.
Sydney Harbour Foreshore Authority	18 November 2010	Initial presentation of scheme
	15 December 2010	Co-ordination of UPN
Powerhouse Museum	18 November 2010	Initial presentation of scheme
	15 December 2010	Co-ordination of UPN
Transgrid	22 September 2010	Site visit

Stakeholder	Date	Purpose of Consultation
	30 November 2010	Meeting to review proposal
Ultimo Cultural and Education precinct (UCEP)	26 November 2009, 20 April 2010 and 14 October 2010	Co-ordination with UTS Master Plan.

6 Environmental Assessment

6.1 Introduction

This section presents the results of the environmental assessment. It responds to the Director General's Requirements (DGRs) issued in August 2009 (see Appendix 6.1). This section describes the general approach to the assessment, the application of Part 3A including the way in which the DGRs have been addressed and this is followed by a description of the potential environmental impacts and, where appropriate the recommended mitigation measures, associated with the following matters as identified in the DGRs:

- Built Form, Urban Design and Public Domain
- Environmental and Residential Amenity:
 - » Solar Access
 - » Noise
 - » Visual Privacy and View Analysis
 - » Wind impacts
- Transport and Accessibility
- Ecologically Sustainable Development
- Heritage
- Archaeology
- Drainage, Flooding and Stormwater
- Utilities
- Geotechnical
- Contamination

In addition to the matters identified for the DGRs, an Aboriginal Assessment, Reflectivity Study and an Air Quality Assessment has also been undertaken and a description of the findings of these are provided in this section with the technical reports appended.

An Economic Impact Assessment was prepared for the whole city campus Master Plan. A summary of the relevant impacts for the Dr Chau Chak Wing Building is included in this section with the full report appended. This section is followed by an outline of potential cumulative impacts.

6.1.1 General Approach to the Assessment

This environmental assessment has been undertaken through an iterative process whereby members of the environmental assessment team have liaised with the design team prior to establishing the scheme for submission to the Department of Planning. This has enabled preliminary results of the environmental assessment process to be used to inform specific aspects of the scheme in order to avoid or reduce potential adverse environmental impacts. Examples of this include the angles of specific windows being amended in order to avoid reflections to car drivers on Ultimo Road and Mary Ann Street (see Section 6.19); a flood barrier in response to the Flood Risk Assessment (see Section 6.14.2 below); and construction mitigation measures included within the proposals in the form of a Preliminary Construction Environmental Management Plan (see Section 3.12 and Appendix 3.10).

The mitigation measures identified in this section have informed the Draft Statement of Commitments in Section 7. The mitigation measures identified for construction are taken forward in a Preliminary Construction Environmental Management Plan (as outlined in Section 3.12 and presented in Appendix 3.10).

6.2 Application of Part 3A

The scheme is a Major Project under the State Environmental Planning Policy (SEPP) 2005 as it is of the kind described in Schedule 1. In accordance with the definition contained in this SEPP, the Capital Investment Value of the project is \$131,942,000 as set out in the Quantity Surveyors Certificate of Cost at Appendix 6.2.

The provisions of Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act) apply to the proposed scheme. A Preliminary Environmental Assessment was prepared by JBA and submitted to the Director General at the NSW Department of Planning in July 2009. This provided information to support a request for an opinion on whether the project is of a kind described in Schedule 1 of State Environmental Planning Policy (Major Development) 2005 and therefore a project to be determined under the EP&A Act and also to request that the Director General issue the requirements for an environmental assessment to accompany a Project Application (should the Minister form the opinion). The DGRs for the environmental assessment were issued in August 2009 (this is provided in Appendix 6.1).

Table 6.1 below provides a summary of the matters identified in the DGRs and identifies where they are addressed in this Environmental Assessment Report.

Table 6.1 Summary of Director General's Requirements for the Environmental Assessment

Summary of Director General's Requirements	Report Reference
Key Issues (Core)	
1. Relevant EPIs Policies and Guidelines to be Addressed	Section 4 Legislative and Planning Context
2. Built Form	Section 3 Scheme Description; Appendix 3.1 Architectural Design Statement; and Section 6.3 Built Form, Urban Design and Public Domain.
3. Urban Design and Public Domain	Section 3 Scheme Description, Appendix 3.1 Architectural Design Statement and Section 6.3 Built Form, Urban Design and Public Domain.
4. Environmental and Residential Amenity	Section 6.4 Environmental and Residential Amenity – Solar Access; Section 6.5 Environmental and Residential Amenity – Noise; Section 6.6 Environmental and Residential Amenity – Views; Section 6.7 Environmental and Residential Amenity – Wind.
5. Transport and Accessibility	Section 6.8 Transport
6. Ecologically Sustainable Development	Section 6.9 ESD
7. Contributions	Section 6.10 Section 94 Contributions/Voluntary Planning Agreement
8. Consultation	Section 5 Consultation
Key Issues	

Summary of Director General's Requirements	Report Reference
Heritage	Section 6.11 Heritage; Section 6.12 Archaeology; and Section 6.13 Aboriginal Heritage.
Drainage	Section 6.14.1 Drainage Strategy
Flooding	Section 6.14.2 Flood Risk
Utilities	Section 3.9 Utilities and 6.15 Utilities and Fire Safety
Staging of Infrastructure Works	Section 3.9 Utilities
General	
1. Executive Summary	The front of Volume 1
2. Site analysis	Section 2 The Site and the Surroundings and associated figures.
3. Description of the proposed development	Section 3 Scheme Description
4. Assessment of the key issues identified above	Section 6 Environmental Assessment and associated appendices.
5. Assessment of potential impacts and draft Statement of Commitments	Section 6 Environmental Assessment and associated appendices; and Section 7 Draft Statement of Commitments
6. Plans and documents identified below	See below
7. Signed statement from author	In front of the Executive Summary
8. Quantity Surveyor's Certificate of Cost	Appendix 6.2 Quantity Surveyors Certificate of Cost
9. Conclusion	Section 8 Conclusion
Plans and Documents	
1. Existing site survey plan	Appendix 2.1 Topographical Plan
2. Site analysis plan	Figure 2.3 Site Analysis Plan
3. Locality/context plan	Figure 2.4 Site Context Plan
4. Architectural drawings	Appendix 3.2
5. Public domain/landscape plan	Appendix 3.2
6. Other plans:	
• Stormwater concept plan	Appendix 6.13 Drainage Strategy Report
• Erosion and sediment control plan	A Soil and Water Management Plan is presented within Appendix 6.13 Drainage Strategy Report
• Geotechnical report	Appendix 6.17 Factual Geotechnical Report; and Appendix 6.18 Interpretive Geotechnical Report.
• View analysis	Section 6.6 Environmental and Residential Amenity – Views; Appendix 3.4 Photomontages; and Appendix 3.3 Viewpoints and Model Images.
• Shadow diagrams	Appendix 3.5 Shadow Diagrams

6.3 Built Form, Urban Design and Public Domain

6.3.1 Built Form

The proposal would establish a new bench mark for contemporary and innovative architecture in Sydney, designed by a highly esteemed and internationally renowned architectural firm. The Design Context description in Section 3 explains the design concept and its evolution, developed through a lengthy and iterative design process.

While there is an emphasis on understanding the internal spaces and the social organisation of the users, close consideration has been given to the form, scale and character of surrounding locality to determine the appropriate massing, setbacks, building articulation, colour and finishes.

The built form has a massing which comprises a lower 6 storey element to achieve street wall definition. Varied and in some cases generous setbacks above these lower edges separate the taller 11 storey (plus one plant storey) building above. The façade is uniquely modulated to produce outstanding visual variety both in streetscape views and where the building is visible in middle and longer distance views such as from the Ultimo Pedestrian Network (UPN), Darling Harbour and Haymarket. This is achieved through the use of a combination of materials, window box treatment, glazed shards that sail past the façade and curves and folds in both plan (horizontal) and section (vertical). Apart from the unique sculptural quality that these façade treatments achieve in the built form, they also serve to break down the building mass and bulk considerably more than a building with more traditional and geometric scale and proportions which the planning controls otherwise prescribe.

The scale and masonry components of the façade with punched and boxed windows are a linkage with the warehouse character of the locality along the former goods railway line and former wharf buildings in Ultimo and Pyrmont. The large glazed shards concentrated on the western elevation enliven the lane and would literally reflect other buildings including the heritage listed TAFE building west of Harris Street.

At the upper levels the building encroaches beyond the boundary into Omnibus Lane up to 1500mm. The encroachment is by architectural building elements rather than floor space and is part of the overall architectural concept to engage with and enliven the lane.

As an infill building the height is generally consistent with the height of buildings that line either side of the UPN to the south. The relationship with these buildings and the urban design context is discussed below. The uniqueness of the sculptural and textured built form are appropriate for a university campus building.

The site has a relatively unique characteristic of being set within an established and generally regular street and lane pattern and adjacent to the UPN, a raised pedestrian corridor along a disused goods railway line. The UPN has not yet reached its full potential due in part to the inability for pedestrians to move beyond Ultimo Road via the rail way bridge. When this impasse is resolved the UPN would become a direct pedestrian and bicycle linkage from Darling Harbour and Ultimo to Railway Square, Central Station and Surry Hills beyond. It would also be an important spine of activity and passage between a number of UTS's campus buildings including the new student housing building fronting the UPN and currently nearing completion.

The proposed building engages with the UPN architecturally and with a future linkage platform from level 1. The platform does not form part of this application because of complexities associated with multiple landowners of a small slither of land between the subject site and the UPN. However when these issues are able to be overcome, UTS is committed to constructing the connecting platform, recognising that the UPN would be a valuable addition to the proposed building and UTS campus generally. Similarly the proposed building would have a major benefit for the usage, activity and visual interest of the UPN.

Other buildings that front the UPN combine to create a generally uniformly scaled enclosure, south of the subject site. These buildings include the ABC headquarters, the new UTS student housing building, buildings fronting Broadway and the Citigate Hotel to the east. The construction of a previously approved tower

building above the Transgrid substation would continue this dense urban edge which has a generally consistent height of approximately 50m. As such the UPN exists as a public space carved out of a generally uniform building mass. The proposal would provide a continuation of this built form north of the railway bridge over Ultimo Road.

The proposed building would also engage with the public domain on all other street frontages. The main entry on Ultimo Road is enlivened with a landscaped forecourt plaza space, appropriate for what is a very public building. A glazed component of the façade signals the building entry. New trees would be planted and one of the existing trees would be retained (an Arboricultural Survey report for the three existing trees is provided in Appendix 6.3).

The overhanging and layered glass shard on the Omnibus Lane elevation are flanked at either end with masonry elements and more regular punched openings. Activity occurring over all levels in the building would be visible providing passive surveillance and contributing visual interest to the lane. At the northern end where Omnibus Lane meets Mary Ann Street, the building is setback to provide another landscaped plaza. This second forecourt entry has the potential to engage with any future plans for a reinvigorated forecourt entry to the powerhouse museum.

In addition to the valuable contribution the proposal would make to Sydney's architecture, the careful planning would ensure that uses and users engage with all public interfaces. Setbacks of the building's ground level footprint reduce the overall building bulk and overshadowing and produce valuable extensions of the public domain which would be well used and which are appropriate for a publicly oriented university campus building.

6.3.2 Access

Morris-Goding Accessibility Consulting has reviewed the Dr Chau Chak Wing Building to ensure that ingress and egress, paths of travel, circulation areas and toilets comply with relevant statutory guidelines. Advice and strategies have been provided to maximise reasonable provisions for access for people with disabilities. The detailed report is provided at Appendix 6.4 and a summary is provided below.

The following standards/documents have been used for the Morris-Goding report:

- AS 1428.1 - (80% of people with disabilities accommodated)
- AS 1428.2 - (90% of people with disabilities), where relevant
- AS 1735.12 - (Lifts, Escalators, & Moving Walks)
- BCA - Building Code of Australia
- DDA - Disability Discrimination Act (DDA Premises Standards)
- UTS Design Guidelines Accessible Environments Policy
- Access DCP 2004

Morris-Goding report the following continuous paths of travel:

- From transport links to the building;
- From the boundary streets to the building;
- From the pedestrian footpath near Ultimo Road to the main entrance although the path has a non-compliant gradient;
- From the doors to the passenger lifts to all levels;
- From the doors of the secondary entrance near Mary Ann Street to the lifts;
- In general the main paths of travel throughout the development are level and have appropriate

clearances that are generally wide enough to allow two wheelchair users to pass each other in accordance with AS1428.1:2009 and the DDA Premises Standards.

- To ground floor lecture room (although doors require modification);
- From main entry doors to the smaller lecture spaces;
- To each of the four computer rooms;
- To the kitchenette areas;
- To the café;
- To the accessible toilets;
- To the accessible shower; and
- From the accessible car parking bay to the lift.

The wheelchair spaces in the lecture space reviewed would be compliant with the DDA Premises Standards.

There are some issues relating identified in Morris-Goding's report in Appendix 6.4 that would need to be incorporated into the detailed design. These relate to, for example, details associated with the emergency egress, paths of travel, doors, lifts, ramps, stairs, roof decks, auditoriums, kitchenette and café, toilets and car parking. These issues are able to be addressed during design development and prior to the issue of a Construction Certificate. Morris-Goding considers that compliance with statutory requirements pertaining to site access, common area access, accessible parking and accessible sanitary facilities can be readily achieved.

6.4 Environmental and Residential Amenity – Solar Access

Shadow diagrams have been prepared showing shadows cast by the proposed building at the following times.

- Summer solstice (December 21) at 9.00am, 12.00 midday and 3.00pm;
- Winter solstice (June 21) at 9.00am, 12.00 midday, 1.00pm, 2.00pm and 3.00pm; and
- The equinox (March 21 and September 21) at 9.00am, 12.00 midday and 3.00pm.

Shadow diagrams are provided in Appendix 3.5.

For each of the dates and times specified, a diagram showing the existing site is presented together with diagrams of the site as proposed (shown in both plan and 3D perspective) to demonstrate the change in shadowing.

The DGRs require consideration of solar access specifically with respect to:

- the apartment building to the south west of the site (646 Harris Street);
- the TAFE building to the west (known as The Muse);
- the ABC headquarters immediately to the south;
- the Inner City Child Care Centre, on the Ultimo Street frontage of the ABC building; and
- the Former National Cash Register Building fronting Mary Ann Street.

The change in shadow to the buildings above are described qualitatively in Tables 6.1 to 6.3 below. Analysis of solar access to the UPN is also included.

Table 6-1 Change in Shadow Cast from the Proposed Building Compared to Existing: Summer Solstice

Date/ Time	Apartment Building at 646 Harris Street	TAFE (The Muse)	ABC Building	Child Care Centre	Former NCR Building	UPN
Summer Solstice 9.00am	No change	No change	No change	No Change	Shadow over part of building	No change
Summer Solstice 12.00 midday	Small shadow on building	No change	No change	No change	Small shadow on building	No change
Summer Solstice 3.00pm	No change	No change	No change	No change	No change	Shadow over part of area

Table 6-2 Change in Shadow Cast from the Proposed Building Compared to Existing: Winter Solstice

Date/ Time	Apartment Building at 646 Harris Street	TAFE (The Muse)	ABC Building	Child Care Centre	Former NCR Building	UPN
Winter Solstice 9.00am	Change from mostly shaded to full shadow	Change from part shaded to mostly shaded	No change	No change	Shadow over part of building	No change
Winter Solstice 12.00 midday	Shadow over part of building	No change	Shadow over part of building	Shadow over part of play area	No change	No change
Winter Solstice 1.00pm	Shadow over part of building (greater than at 12.00)	No change	Shadow over part of building	Shadow over part of building and all of play area	No change	No change
Winter Solstice 2.00pm	Shadow over part of building (greater than at 1.00)	No change	Shadow over part of building	Shadow over part of building and all of play area	No change	No change
Winter Solstice 3.00pm	No change	No change	Shadow over part of building	Shadow over part of building and most of play area shaded	No change	Shadow over part of area

Table 6-3 Change in Shadow Cast from the Proposed Building Compared to Existing: Equinox

Date/ Time	Apartment Building at 646 Harris Street	TAFE (The Muse)	ABC Building	Child Care Centre	Former NCR Building	UPN
Equinox 9.00am	Small shadow on building	Shadow over part of building	No change	No change	Change from shadow over part of building to full shadow	No change
Equinox 12.00 midday	Shadow over part of building	No change	No change	No change	Shadow over part of building	No change
Equinox 3.00pm	No change	No change	No change	No change	No change	Shadow over part of area

The shadow impact from the building at the summer solstice and the equinox are generally minor. At these times of the year there is reduced importance on direct sunlight to public and private spaces.

The most relevant shadow impacts are those associated with shadowing at the winter solstice.

In relation to the adjacent residential building, the proposed building would result in additional shadowing through until approximately 1pm. The proposed building would cease to cast shadows upon the adjacent residential apartment building for the afternoon period. The shadow impact is considered acceptable for the following reasons:

- The windows in the eastern elevation of the residential building are secondary windows with a high level sill. They are not designed to capture large amounts of direct sunlight.
- Similarly the glazed side walls to the balconies facing south are obscured with frosted glazing which prevents direct sun access to the balconies.
- The planning controls have for many years provided for a building of a similar size and bulk to the current proposal which would result in similar impacts.
- Due to the sculptural building elevations, and the generous and varied setbacks to Ultimo Road and along the length of Omnibus Lane, the proposed building would provide for greater sunlight penetration at certain times of the day that would be achieved with a building built within an allowable building envelope.
- The proposal would not result in overshadowing of any communal open space associated with the residential building and is therefore compliant with the overshadowing controls in the Urban Development Plan for Ultimo–Pyrmont Precinct 1999.

In relation to the Inner City Child Care Centre there would be no change to shadow impacts on the summer solstice and the equinox. On the winter solstice, direct sunlight would be able to be maintained to the building and outdoor play area through until approximately 12 midday when the outdoor play area would be partially (less than 50%) overshadowed. By 1 pm in the afternoon, the outdoor play area would be in complete shadow cast by the proposed building however parts of the building would maintain some direct sunlight and by 3pm some direct sun would return to the open space. Maintaining three hours of morning sunlight is considered to be adequate and reasonable for the amenity of a child care centre in this highly

urbanised environment and is consistent with what the UDP requires for public and private communal open space. Sometime between the winter solstice and the equinox the shadow impact would recede to provide continuous sun access to the outdoor play area, throughout the day. The Urban Development Plan for Ultimo Pyrmont requires that no more than 50% of communal private open space is overshadowed between 21 April and 21 August. The proposal maintains sunlight to the childcare centre in accordance with this control.

The UPN would be partly shadowed by the proposed building at 3.00pm during the summer and winter solstices and the equinox. The effectiveness of the UPN as a pedestrian corridor requires that it be enclosed with a building to continue an established built form and draw activity along its edges. The planning controls provide for this and the proposed building, being generally compliant with these controls, results in a degree of overshadowing of this public space that is acceptable.

6.5 Environmental and Residential Amenity – Noise

A Noise Impact Assessment has been undertaken by Marshall Day Acoustics. The full report is presented in Appendix 6.5 and a summary is below.

Marshall Day has also provided advice on acoustic design and the report is provided in Appendix 6.6. Design sound levels for internal noise from external sources have been recommended by Marshall Day for the different room types/uses in order to comply with Australian Standard 2107-2000 Acoustics: Recommended Design Sound Levels and Reverberation Times for Building Interiors.

The Noise Impact Assessment has been undertaken in accordance with the Department of Environment, Climate Change and Water's (DECCW) Industrial Noise Policy (INP), Interim Construction Noise Guideline (CNG), Environmental Criteria for Road Traffic Noise (ECRTN) and sleep disturbance criteria.

The report has undertaken an assessment of noise impacts associated with both construction and operation of the proposed building. This involved background noise monitoring at the nearest sensitive noise receivers on Harris Street and Mary Ann Street.

Representative receivers were identified as:

- Receiver A – 646 Harris Street
- Receiver B – 622-632 Harris Street
- Receiver C – 82 Mary Ann Street
- Receiver D – 700 Harris Street

In relation to construction noise, the report concludes that construction noise management levels would be exceeded. However the exceedance is not considered to be a non-compliance but a trigger for consultation with the community and adherence to certain management practices, as discussed in the mitigation section below.

During operation the noise emissions from the building such as from car parking, truck access during the day and night to the loading dock and building services would comply with DECCW's Industrial Noise Policy. With regard to functions and outdoor facilities, whilst there is anticipated to be an exceedance of 1dB during the evening period at C this is considered to be negligible as it is not noticeable.

The potential for sleep disturbance from garbage truck access and outdoor activity has been assessed. Noise from truck access was found to comply with the DECCW criteria of 65dBA L_{max}. Maximum noise levels from outdoor activity such as a rowdy group of people has the potential to exceed the criteria for sleep disturbance at the nearest sensitive receiver. It will be the responsibility of UTS to manage events and the general operation of the building such that the potential for sleep disturbance to nearby residents is minimised.

Traffic from the proposed building is not considered significant and would be below the 2dBA increase limit recommended by the ECRTN.

The cumulative impact of all noise sources associated with the development would exceed limits by 1dB at receivers A, B and C however this is considered to be negligible as it is not noticeable. A number of mitigation measures have been proposed in the report to ensure that noise impacts are acceptable. These are addressed below.

6.5.1 Mitigation

Marshall Day recommends the following construction and vibration noise control measures with detailed measures identified in Appendix 6.5:

- Community notification and consultation for construction;
- Operation of plant in a quiet and efficient manner through programming, maintenance and using all feasible and reasonable mitigation measures;
- Involve workers in minimising noise and vibration; and
- Handle complaints in a prompt and responsive manner and keep responsible staff informed.

Table 6.4 below identifies Marshall Day's recommended mitigation for the proposed mechanical services.

Table 6-4 Mechanical services noise control recommendations

Item	Noise control recommendation
Ground floor plant room air intake	Acoustic louvre
Basement Sub Station exhaust outlet	Acoustic louvre
Basement Sub Station air intake	Acoustic louvre
Trigeneration plant area	Acoustic louvre
Level 11 plant room	Roof constructed of 9mm fibre cement sheet/90mm cavity/0.6mm Colorbond steel or a similar construction

UTS would need to manage events and the general operation of the building to minimise potential outdoor noise at night.

With regard to road noise potentially affecting the building's occupants, glazing has been designed to enable compliance with Australian Standards criteria. The glazing would sufficiently attenuate regular commercial aircraft noise emissions.

6.6 Environmental and Residential Amenity – Views

6.6.1 View Analysis

Appendix 3.3 provides a map showing the locations of nine key viewpoints surrounding the proposed building. Viewpoints 1 and 2 are located on the UPN to the south of the site and the pedestrian walkway above the UPN to the north of the site, respectively. Photomontages of these two views with the proposed building have been prepared to illustrate how the building would look within its context. Images of the proposed building which are indicative of viewpoints 3 to 9 are provided by the photographs of the physical

model within Appendix 3.3. This appendix also provides model images showing the vertical ticker tape signage at the Ultimo Road and Mary Ann Street entrances.

The two photomontages from viewpoints 1 and 2 are provided below and are presented at a larger scale within Appendix 3.4. These two photomontages also include imagery of the potential upgrade to the UPN based on draft designs supplied by SHFA.

The following commentary provides a visual analysis of viewpoints 1 and 2.

Viewpoint 1 – Looking north along the UPN

The existing view from the UPN to the south of the site and looking north is provided in Photograph 6.1. It shows the UPN, the ABC building on the left and beyond this the residential building on the corner of Ultimo Road and Omnibus Lane and the former National Cash Register Building to the west of the site. The photomontage showing the proposed building within the view is provided at Photomontage 6.1 below (and this photomontage is shown at a larger scale within Appendix 3.4).

The existing view would change with the introduction of the proposed building, as shown in Photomontage 6.1. A view of part of the former National Cash Register Building would be retained from this viewpoint.

The visual prominence of the proposed building from this viewpoint, as shown in the photomontage, would increase as pedestrian and cyclist activity on the UPN also increases over time. From this location, the various elements of the building can be appreciated including:

- the more regular south eastern corner element with window boxes of varied depth punched into the masonry façade;
- the layered glazing which marks the main entry point from Ultimo Road;
- the lower scaled glazed wall and skylights to the north of the future link bridge entry from the UPN; and
- the sculptured and folded façade.

The overall height of the building continues the height line established by the ABC building, which is visible on the left side of the photomontage. Similarly, the site of the Transgrid Station, as identified on the right side of the photomontage, has previously received approval for the construction of a 50m tower. The current planning controls applying to this site permit development of a similar scale.

The texture of the bricks, particularly where the façade folds, and the array of punched openings and window boxes with deep reveals combine to create a distinctive and human scale to the building. The lower 6 storey component of the building (5 storeys above the UPN level) surrounds the central 11 storey building element to reinforce this scale. The open sky backdrop enables a full appreciation of the innovative and skilfully crafted façade.

The loggia openings in the east wall of the nearest residential building can be seen on the left side of the image, enabling some appreciation of the separation and scale relationship between the two buildings. Images from viewpoints 3 and 5 (Appendix 3.3) also demonstrate how the lower 6 storey building element continues the scale and height of the established street wall to Ultimo Road.

Photograph 6.1 Existing View Looking North from UPN to the South



Photomontage 6.1 The Proposed Building within the View Looking North from the UPN to the South



Viewpoint 2 – View looking south along the UPN

The existing view looking south from the pedestrian bridge above the UPN to the north of the site is provided in Photograph 6.2. It shows the UPN, trees along Darling Drive and the Powerhouse Museum in the foreground. In the middle ground are the ABC and Child Care centre buildings and the UTS tower is shown to the west. The photomontage showing the proposed building within the view is provided at Photomontage 6.2 below (and this photomontage is shown at a larger scale within Appendix 3.4).

The existing view would change with the introduction of the proposed building, as shown in Photomontage 6.1 (and shown at a larger scale in Appendix 3.4).

The photomontage shows the building's potential to enliven the UPN and provides an indication of future public domain improvements to the UPN (as noted above the image of the UPN is based upon draft designs by SHFA).

The massing, height and scale of the building integrates with existing buildings to the south, namely the lower and higher components of the ABC building, the Citigate Hotel and the building fronting Broadway which terminates the vista along the UPN. Against this backdrop and as discussed above, the image shows how the sculpted facade and series of punched openings break up the massing of the building, contributing to a distinctive and human scale.

On the left hand side of the image is the recently completed Quay Street student housing project and an earlier residential apartment building between it and the Citigate Hotel. The overall height of the proposed building is consistent with the height of the 50m buildings to the south which have been developed under the existing planning controls that enable a 50m height. In terms of massing the proposal is also consistent with the established urban form of buildings that address the UPN edge and rise to their full height without a lower 'street wall' edge. As such the proposed building reinforces and contributes to a northern extension of this built edge of the UPN which is consistent with the traditional masonry edge to Ultimo, established by the many original warehouses and wool stores.

The lower 6 storey building components which surround either end of the taller central element reduce and modulate the building mass. The 6 storey element which folds and flattens to the north, eases a transition to the forecourt entry plaza adjacent the eastern tip of Mary Ann Street and to the lower scaled saw-toothed roof of the Powerhouse Museum. The pedestrian activity associated with the stairs linking the UPN to the Mary Ann Street plaza space are visible in this image, as is the proposed future bridge connection from UPN to level 1 of the proposed building, marked by the glazed wall and skylights.

In contrast to the predominantly folded buff coloured brick work of the southern, eastern and northern facades, the western façade has a different personality, being composed of large "shards" of glass. The glass is transparent but reflective enough to mirror fractured images of the buildings that surround, namely the two adjacent heritage items.

Photograph 6.2 View Looking South from the Pedestrian Bridge to the North of the Site



Photomontage 6.2 Proposed Building within View Looking South from the Pedestrian Bridge to the North of the Site



Viewpoints 3 to 9

The photographs of the physical model are indicative of the views towards the proposed building from viewpoints 3 to 9 (see Appendix 3.3) and demonstrate the scale and form of the building in relation to its surroundings. Viewpoint 9, from the residential building at the corner of Omnibus Lane and Ultimo Road, is discussed further below.

From the above visual analysis of photomontages, the model images presented in Appendix 3.3 and as discussed in further detail in the Architectural Design Statement included in Appendix 3.1, the proposed building would make a significantly positive contribution to the urban amenity and architectural integrity of Ultimo. In addition to its iconic qualities it would fit well into its context and add positively to the aesthetics of the neighbourhood.

6.6.2 View Loss

Existing vistas in the public domain are rectilinear following the street grid and the UPN. The façade of the building would be visible from the public domain but it would not obstruct, interrupt or adversely affect any important views from the public domain. Whilst there are some existing views from the public domain to the former National Cash Register building (a heritage item) to the west of the site that would be lost, the Heritage Impact Statement (see Section 6.11) finds that there would not be any adverse impacts on heritage items themselves in terms of the components within views of the heritage items.

The proposed building would to some extent impact on existing city views from other surrounding commercial buildings, such as the ABC building. However, the quality and design interest of the proposal would introduce new and interesting addition to those views while maintaining opportunity for outlook beyond the site.

View Impact to the Residential Building at the Corner of Omnibus Lane and Ultimo Road

Some of the apartments in the adjacent residential building currently benefit from views across the site toward Darling Harbour and the southern part of the CBD. These views are not considered significant or iconic views of Sydney or Sydney Harbour. Photographs 6.3 and 6.4 below were taken from a north east facing apartment on Level 8 of the building, with permission from the occupiers, to illustrate existing views from this building. Permission to access other apartments for the purposes of taking photographs of the existing view could not be obtained.

Photograph 6.3 shows the view looking north east across the site towards the CBD skyline. In the foreground and middle distance the UPN and trees along Darling Drive are visible with buildings of Darling Harbour and East Darling Harbour present in the longer distance sky line views. This district and skyline outlook does not include a view to Sydney Harbour or to iconic features such as the Opera House, the Harbour Bridge or other significant natural features of Sydney and Sydney Harbour.

Photograph 6.4 shows the view looking more easterly than in Photograph 6.3. In the longer distance skyline views the Centrepont Tower is visible amongst the southern CBD buildings.

The construction of the proposed building would result in the loss of these views to the city from the north/north east facing apartments within the residential building on the corner of Omnibus Lane and Ultimo Road. Middle and long distance views of the city to the east and north east would be replaced by short distance views of a building designed by an internationally renowned architect. Views to the north east would maintain some view sharing because the setbacks of the north western corner of the building would provide for a northerly site line and some district view. Images of the 3D computer model are provided in Appendix 3.3 to illustrate the potential view of the building from approximately the upper, middle and lower levels of the apartment building.

The apartments currently benefit from the existing views because the subject site is undeveloped. The local planning controls have since 1992 provided for the construction of a building of 42m in height on this site and it is reasonable to assume that occupants of these apartments would be aware that these controls provide

for a building up to this height. The proposed building is slimmer than a compliant building as it does not build out to the full site footprint and also has a reduced plan area from level 6 upwards and thus allows for the retention of some views when compared to a compliant building envelope. The construction of any building within an envelope that complies with the local planning controls on this site would therefore have an equal or potentially greater impact on views from the apartments.

The existing views over the site are available mainly from secondary windows and a side opening to the loggia on the northern elevation.

The occupants of all apartments in the residential building were notified directly and invited to comment on the proposal as part of the community consultation exercise as described in Section 5. No responses were received in relation to view loss.

6.6.3 Visual Privacy

Visual privacy is a relevant issue for the nearest residential property located on the corner of Omnibus Lane and Ultimo Road, a 10 storey residential apartment building. Apartments in the building have small secondary high level windows and obscure glazed balcony side walls in the eastern elevation. A loggia is located on the northern side of each level with an opening in the eastern wall.

The Residential Flat Design Code (RFDC) which supports SEPP 65 suggests a separation distance between habitable and non-habitable rooms of 9 metres up to 4 storeys, 13 metres from 5 to 8 storeys and 18 metres for 9 storeys and above.

The minimum separation distance between the windows in the proposed building to the secondary windows in the residential apartment building is approximately 8.1m. This separation occurs only at levels 4 and 5. The separation between terrace areas on level 6 is increased to between 11m and 13m. Above this, the separation increases to 19.5m. While the separation distance at level 4 and 5 and a small part of the level 6 terrace would not be strictly compliant with the guidelines of the RFDC, the separation distances are considered adequate to maintain the amenity of adjacent residential apartments for the following reasons:

- The sculptural form of the building with windows comprising varied and deep reveals formed by window boxes punched into a masonry façade would obscure and limit direct sight lines to the adjacent building.
- The separation is a function of the narrow width of Omnibus Lane which is part of the historic character of the area.
- The windows in question are indicative of secondary (bathroom kitchen) windows which are and high set and would limit direct sightlines between the 2 buildings. The high level windows in the adjacent building may service a bathroom which is defined in the UDP as a non-habitable room. The proposal would comply with the RFDC's recommended separation distances for non-habitable windows.
- The separation distances represent a greater degree of compliance with the privacy separation control in the UDP which require 9m separation between habitable and non-habitable windows, irrespective of the building height.
- The outlook from the loggia is in a northerly direction and not directly towards the proposed building.
- The level of usage of the building reduces outside of normal business hours and is therefore not in conflict with the adjacent residential uses.

There is another residential apartment building to the north west of the site however the separation distances are significantly greater and it is not considered that the relationship would contribute to any visual privacy issues.

Photograph 6.3 View From a North East Facing Apartment on Level 8 Towards Darling Harbour



Photograph 6.4 View From a North East Facing Apartment on Level 8 Towards the Southern CBD



6.7 Environmental and Residential Amenity – Wind Impacts

A Pedestrian Wind Environment Study has been undertaken by Windtech. The full report is provided in Appendix 6.7 with a summary below.

Testing has been undertaken using Windtech's boundary layer wind tunnel facility. A 1:300 scale model of the proposed Dr Chau Chak Wing Building was constructed and this was set within a proximity model of the surroundings that extended approximately 375m from the site centre. Thirty three testing points were identified at the ground and first floors and at the levels of the terraces at the fourth and sixth floors. These were selected to represent critical outdoor areas within and around the proposed development. Wind tests to measure wind speeds at these points were undertaken both without and with the proposed scheme in order to understand any changes in wind conditions and further testing was undertaken to determine the effectiveness of the recommended mitigation measures or treatments. Measurements were taken in relation to criteria for both safety and comfort.

6.7.1 Impacts

At ground level the pedestrian footpaths to the south, west and north were tested although it should be noted that this was without the proposed tree planting shown in the Landscape Plan ZL1-1.01 in Appendix 3.2. The results showed that most of these areas would satisfy the comfort and safety criteria. However, areas to the north of the site are exposed to stronger winds from the north east and recommendations by Windtech for mitigation are identified below.

At the UPN to the east of the site (adjacent to the proposed building's level 1) it was found that, with the building in place, wind levels would exceed comfort and safety criteria. Therefore, options are recommended by Windtech that would adequately ameliorate conditions to below the comfort and safety criteria (see Mitigation below).

At the outdoor terraces on the fourth and sixth floors, one terrace at the north western corner terrace of the sixth floor was found to exceed wind levels and therefore mitigation is identified (see below). Also wind levels on the southern terrace of the sixth floor were close to safety limit therefore mitigation is recommended for this terrace too (see below).

6.7.2 Mitigation

Windtech recommend the mitigation/treatment measures as summarised below. These measures/treatments have been tested and if implemented would reduce wind levels at the relevant points to within comfort and safety criteria.

In order to mitigate wind levels at the proposed outdoor seating area of the café on the north western corner of the site, trees should be planted as shown in the Windtech report in Appendix 6.7. Windtech have advised that the proposed trees as shown on the landscape plan in Appendix 3.2 would be adequate for this purpose.

In order to mitigate wind levels for pedestrians using the UPN and for those using the minimal seating associated with the proposed coffee bar at the eastern façade two treatment options are recommended by Windtech:

- Two impermeable screens of 2m in height and shrub planting of 1.5m in height located as shown in Figure 9b(i) within Appendix 6.7; or
- Three impermeable screens of 2m in height located as shown in Figure 9b(ii) within Appendix 6.7.

In response to this recommendation, it is UTS's intention that wind speeds along the UPN to the east of the site would be ameliorated to acceptable levels for comfort and safety. The land on which the recommended treatments are identified is not owned by UTS and therefore the exact nature of the treatments would need to be subject to agreement with the parties and possibly further testing.

To mitigate wind levels at the north western corner terrace of the sixth floor it is recommended that an impermeable balustrade be included around the trafficable portion of the terrace (as shown on Figure 9c of Appendix 6.7). To mitigate wind levels at the southern terrace of the sixth floor it is recommended that an impermeable balustrade be included around the trafficable portion of the terrace (as shown on Figure 9c of Appendix 6.7). In response to this recommendation, planting (in place of balustrades) would be provided for the sixth floor terraces on the north west and south of the building. Windtech has advised that densely foliating shrubs grown to the height of the recommended balustrades located around the perimeter of the trafficable portions of the terraces are an acceptable alternative to the balustrades recommended in their report.

6.8 Transport and Accessibility

A Transport Impact Assessment has been undertaken by Arup and the report is provided at Appendix 6.8 with a summary of the key issues below.

6.8.1 Existing Situation

The traffic and pedestrian volumes of Harris Street/Ultimo Road and Ultimo Road/Darling Drive were surveyed by ROAR DATA (contractor appointed by Arup) on Wednesday 17th November 2010 in the peak traffic periods of the morning 7am – 9am and the afternoon 4pm – 6pm.

Road Traffic

The main RTA controlled State Roads in the area are Broadway, to the south of the precinct, and Harris Street, to the west of the site. Ultimo Road provides east west connection between Harris Street (west) and Thomas Street (east). By examining Average Annual Daily Traffic (AADT) data for these roads, it has been found that:

- the traffic on Broadway has reduced by almost 20% since 1996 (possibly due to the opening of City West Link Road, Cross City Tunnel and the introduction of a kerbside bus lane on Broadway);
- a reduction of traffic on Harris Street, to a lesser extent, since 1999; and
- the traffic volume on Ultimo Road is just under 15,000 vehicles per day. It has an important role for traffic circulation in the precinct providing access to the arterial road system.

The main intersections in the vicinity of the site are Harris Street/Ultimo Road, Ultimo Road/Darling Drive and Harris Street/Mary Ann Street.

The site currently generates 57 vehicular trips during the peak traffic period (all inbound in the am peak and outbound in the pm peak).

Parking

The site currently provides parking for students, staff and contractors with 114 on grade parking spaces. Parking is also available in the vicinity of UTS at Wilson parking on the south west corner of Ultimo Road/Quay Street, UTS Building 1, 6 and 10 basement car parks.

Pedestrian Facilities

Pedestrian facilities are generally well provided in the locality as all of the signalised intersections have pedestrian crossing facilities. There is an underground pedestrian link from Central Station to the UPN and there is a wide footpath on both sides of Ultimo Road. There is no pedestrian footpath along Omnibus Lane which carries low levels of traffic.

Public Transport

Bus frequency in the Broadway area is one of the highest of any Sydney area (see – Appendix 6.8). Generally buses from the west and southern region travel along Broadway/Harris Street and buses to other regions are also within walking distance such as:

- Lee Street bus interchange – direct buses to the Northern Beaches, North West sector and some eastern suburb services.
- Eddy Avenue – express bus services to UNSW and eastern suburb services.

Central Station, through which suburban, intercity and country-link train services pass, is located within 5 to 10 minutes walk from the site. Light rail services operate between Central Station and Lilyfield via Rozelle, Glebe and Pyrmont and stations are located at Central, Haymarket and Paddy's Market.

Cyclist Facilities

There is an on road bicycle route along Ultimo Road. The City of Sydney's Cycle Strategy and Action Plan 2007-2017 identifies proposed regional cycle routes and this includes a route that runs along the site frontage at Ultimo Road.

6.8.2 Impacts

Road Traffic

The proposed scheme would provide 28 car parking spaces (generally parking would be allocated for senior staff of the University only). Assuming 70% of the cars arrive/depart the site in the peak period, the peak hour traffic generation would generate approximately 20 vehicles per hour. Therefore, this represents a peak hour reduction of traffic to/from the site by 37 vehicles/hour.

The proposed vehicular access is in a different location to the existing car park access therefore the existing and future peak hour traffic distribution would be different. All future traffic would access the site via Ultimo Road using approach routes along Mary Ann Street from the west and Harris Street from the north and depart via Ultimo Road turning left into Darling Drive or proceeding through to George Street and Eddy Avenue. Arup predict that the future traffic volume in Harris Street/ William Henry Street, Harris Street/Ultimo Road (pm peak) and Ultimo Road/ Darling Drive (am peak) would be lower.

The intersections of Harris Street/Ultimo Road and Ultimo Road/Darling Drive have been analysed, identifying existing and future operation. Arup predict that the scheme would have a negligible impact on the Harris Street/Ultimo Road intersection and the Ultimo Road/Darling Drive intersection during both the am and pm peaks.

A left in / left out driveway arrangement is proposed and Arup report that this would not incur any loss of parking on Ultimo Road.

It is anticipated that there would be between 10 and 20 deliveries per day by a range of vehicle types from Vans up to SRV. Garbage and recycling is anticipated to be collected 3 to 4 times per week usually at night. The delivery vehicles (MRV, SRV or courier vans) are expected to access the site predominantly during the off – peak hours, therefore there would be a negligible impact on peak hour traffic.

Parking

With regard to the proposed parking, the relatively low level of parking proposed is in keeping with the aims of the NSW Government and City of Sydney in seeking to reduce the demand for travel to the CBD by private car. The site is well served by public transport and therefore it is considered that alternatives to the car are readily available. Also, there are public parking stations in proximity to the site.

Pedestrian Facilities

The site is well served by pedestrian facilities allowing for convenient connections to other parts of the Ultimo area and the volume of pedestrians generated by the development would not have a significant impact on pedestrian traffic on surrounding streets.

Public Transport

The majority of staff, students and visitors are expected to use public transport or walk to the building as they do at present. The site is well served by public transport and Arup anticipates that as levels of activities increase in the Ultimo area the level of public transport service would improve.

Cyclist Facilities

The development is unlikely to result in any significant impact on cyclists.

Facilities for cyclists cycling to and from the building include adequate secure bicycle parking, outdoor bicycle parking and shower and locker facilities for students and staff. Based on the amount of floor space proposed, the Urban Development Plan requires 58 bicycle parking spaces. A total of 77 bicycle parking spaces would be provided (53 within the basement and 24 within outdoor racks) and therefore this is in compliance.

6.8.3 Mitigation

A construction traffic management plan/ traffic control plan would be prepared by the construction contractor prior to obtaining the Construction Certificate for the development. The specific measures to be included are identified in Arup's Transport Impact Assessment in Appendix 6.8.

During operation it is recommended that a location specific Travel Access Guide/Green Travel Plan be prepared.

6.9 Ecologically Sustainable Development

An Ecologically Sustainable Development (ESD) Strategies Report has been prepared by AECOM. The full report is presented in Appendix 6.9 and a summary of the key issues are identified below.

UTS is committed to achieving demonstrable environmentally sustainable outcomes across both its existing and new buildings. In particular, UTS has developed its own environmental sustainability policy, has prepared sustainability design guidelines and Arup has prepared the UTS City Campus ESD Masterplan 2020 that includes the Dr Chau Chak Wing site (referred to in the report as the Dairy Farmers site) and other sustainability initiatives.

UTS's Environmental Sustainability Policy of 3rd September 2008 states:

"This policy provides a framework for environmentally sustainable and responsible practices, activities, and operations at UTS. Through this policy, the University aims to demonstrate leadership in sustainable development in the university sector, and work towards developing environmentally sustainable campuses that will foster sustainability values and principles to students and employees."

The general approach to the ecologically sustainable design concept is to minimise the carbon footprint and water consumption of the facility and for the building to target the 5 Star rating under the Green Star – Education v1 environmental rating system. For context, a 4 star rating represents best practice, 5 star represents Australian Excellence and 6 star represents World Leadership. Further information is provided in the ESD report at Appendix 6.9.

AECOM has worked with the design team to develop a passive low energy facility within the constraints of the site form and orientation. The strategies that have been designed into the facility are:

- Designed to achieve 5 Star Green Star Educational rating.
- Low carbon emissions through a combination of high performing façade, low energy air conditioning and lighting design and on-site trigeneration. In particular:
 - » the air conditioning system has been designed to turn off when occupants leave their offices for an extended period of time;
 - » modulation of outdoor air in response to occupancy through the monitoring of CO₂ within the space;
 - » lighting has been designed to modulate in response to daylight penetration and turn off if occupants are not present in their respective offices;
 - » trigeneration would consist of three natural gas fired micro-turbines generating electricity and heat on site; and
 - » the heat generated by the gas turbines would be used to provide space heating for the facility in winter and cooling through the application of an absorption chiller in summer.
- High levels of daylight would penetrate the building because of the inherent small floor plate design, window arrangement and glazing visible light transmission.
- Low water consumption through the use of high efficiency tap ware.
- Rainwater capture and storage for use in cooling towers and toilet flushing.
- Promotion of sustainable transport usage by the provision of bicycle storage, lockers and shower facilities within the building.
- Specification of sustainable materials resulting in the reduction in the use of PVC, concrete and non-recycled steel.
- A target of 80% construction waste recycling.

AECOM predict that the proposed building is capable of achieving sufficient points for a 5 star rating.

6.10 Contributions – Section 94/Voluntary Planning Agreement

It is not proposed to enter into a voluntary planning agreement as part of this project application.

The site is subject to the City of Sydney's Section 94 Contributions Plan – Ultimo Pyrmont 1994 (the Plan) which seeks to levy developer contributions as part of development that will increase the resident and worker population. Development for education purposes is not a specifically defined land use in the Summary of Contributions table to Schedule 4 of the Plan.

Therefore it is considered that the proposed development should not attract developer contributions for the following reasons:

- UTS is a not for profit organisation and UTS's functions and operations are determined by the University of Technology Sydney Act 1989.
- In contrast to the development industry UTS contributes significantly to the realisation of outcomes which the Plan seeks to facilitate through the provision of open space, community buildings for teaching and learning, library facilities and public domain improvement works.
- The proposed development is one component of an overall campus redevelopment in accordance with an adopted campus masterplan which has an investment value of around 1Billion dollars. Unlike other universities, UTS campus is a part of the urban fabric and therefore this investment has a direct benefit to the local community and the public domain.
- As set out in the Economic Impact Assessment prepared by Urbis (refer to Appendix 6.21), the proposed building generates significant economic benefits due to its iconic status and world class

standard of teaching and research facilities. Economic benefits are also derived from the business events, conferences, meetings, exhibitions and public lectures that it would house. Business events alone could generate around \$36 million expenditure each year (Urbis 2010).

- The proposed development contains all of the facilities necessary to support the users of the building and, together with all of the public spaces and social infrastructure in other parts of the university, would not contribute to additional demand on local infrastructure in the same way that business or residential development would. Indeed the immediate local infrastructure is largely UTS infrastructure housed in the surrounding university campus.
- The proposed building has been designed to integrate with the UPN. UTS is a member of a newly formed UPN Project Control Group that is investigating and facilitating change and improvement to the UPN. UTS is in discussion with SHFA with regard to funding these improvements and is open and committed to be a contributor to the funding requirements of these (UPN) improvement works.
- The proposed development is designed with a minimal number of car parking spaces and would not therefore generate significant additional traffic demand on the surrounding street network.

6.11 Built Heritage

A Heritage Impact Statement has been prepared by Godden Mackay Logan (GML), the full report is provided in Appendix 6.10 and the key issues are summarised below. Separate assessments have been undertaken for archaeology and Aboriginal heritage (see Sections 6.12 and 6.13 below).

6.11.1 Existing Situation

The site is not listed as a heritage item nor is it contained within a heritage conservation area. The following heritage items are adjacent to or in close proximity to the site:

- Ultimo Road Railway Underbridge; and
- Former National Cash Register (NCR) Co Building.

Harris Street Conservation Area is also within close proximity to the site.

The Ultimo Road Railway Underbridge is part of the UPN and is located to the east of the site on a linear allotment running northwest-southeast. It is one of two remaining structures associated with the Darling Harbour goods line and is listed as a built heritage item on the NSW State Heritage Register (SHR) and the RailCorp Section 170 Heritage Conservation Register. Immediately to the west of the Underbridge is the brick plinth of the former railway signal box.

The Former National Cash Register Co Building at 622-632 Harris Street is located to the west of, and is adjacent to, the site across Omnibus Lane. The building is listed as being of local heritage significance in the Sydney LEP 2005.

Harris Street Conservation Area is bounded by Harris Street, Mary Ann Street, Macarthur Street and Omnibus Lane and is located approximately 100m northwest of the site. It contains nineteenth-century Victorian and Federation terraces that are identified as heritage items in the Sydney LEP 2005.

Other heritage items in the vicinity of the site include:

- Building C Ultimo College TAFE NSW;
- terraces 578-606 Harris Street;
- commercial building terraces 608-614 Harris Street;
- terraces 629-637 Harris Street;

- terraces 68-80 Mary Ann Street
- Ultimo Road Streetscape (South side of Ultimo Road east of Quay Street Haymarket);
- 9 Ultimo Road (Travellers Rest Hotel – now Aarons Hotel); and
- Haymarket Special Area (identified in the Sydney LEP 2005).

The heritage culvert adjacent to the site and the sewer beneath the site are addressed in Section 6.12 below.

6.11.2 Impacts

There would not be any impacts on built heritage on the site itself because the site does not contain built heritage items and is not located within a conservation area. The proposal would not physically impact the Ultimo Road Railway Underbridge, the foundations for the former signal box adjacent to Ultimo Road or the alignment of the Darling Harbour railway goods line. There is potential for positive heritage effects with the eventual improvements to the UPN by SHFA and corresponding repairs to the bridge to enable better access to other heritage sites in the vicinity.

The former NCR Building contributes to the Harris Street streetscape and this contribution would not be impacted by the proposal. The proposal would be visible at the rear of the NCR building in views from Harris Street. The section of the proposed building that faces Mary Ann Street comprises six levels, is set back and GML considers it would be within the scale of the NCR building which has an effective scale of four levels. GML reports that the window proportions and the percentage of solid to void on the parts of the proposed building near the former NCR building would be responsive to the proportion and expressed form of the NCR building windows. Also, given the variety of existing building forms and heights in this location and the modulation of the proposed building the scale difference between the NCR building and the higher parts of the proposed building would not impact on the significance of the NCR building.

There would not be adverse heritage impacts on the Harris Street Conservation Area. GML considers that the northern end of the proposed building would be of an appropriate scale to those of the conservation area to the north of the site and the masonry components of the proposed building are anticipated to reflect the palette of building materials within the conservation area, including the face-brick Federation period commercial building at 608-614 Harris Street which is the closest heritage building to the site within the conservation area. The proposed building would not be able to be seen in the same view as the commercial building at 608-614 Harris Street. There are not anticipated to be adverse heritage impacts on the terraces at 578-606, 608-614 Harris Street and 68-80 Mary Ann Street within the conservation area.

Building C Ultimo College TAFE would be visible with the proposed building in views to the west along Ultimo Road. GML considers that whilst these are of different architectural styles, the masonry character and the solid to void composition of both buildings provides an appropriate visual relationship.

The Ultimo Road streetscape and the heritage building that faces it (9 Ultimo Road – Aaron's Hotel) are relatively remote from the site and would be visible from the west along Ultimo Road past the Underbridge where these can be seen together. GML considers that the masonry construction and form of the component of the proposed building adjacent to Ultimo Road would provide an appropriate visual relationship between the site and these two items.

The proposed building would activate Omnibus Lane that would be beneficial for both the lane itself and the NCR Building.

Whilst the Haymarket Special Area is in the vicinity of the site and not adjacent to it, the proposal responds positively to the significance of this area through the sandstone colour of the brick, the masonry and the punched windows and the relevant objectives in the Sydney LEP and would therefore not cause an adverse impact.

Whilst the design is dramatic and bold, it is responsive to its urban context and nearby heritage items with its modulated components of varying site setbacks, forms, scales and materials; the proposal would not have adverse heritage impacts on heritage items, the heritage streetscape and the conservation area in the vicinity of the site; and, subject to other separate future approvals for the UPN (together with the proposed scheme), would provide for better public access to, and appreciation of, heritage items in the vicinity.

6.11.3 Mitigation

GML recommends that an identification of the heritage fabric of the foundations and retaining wall on Ultimo Road of the former signal box adjacent to the Ultimo Road Railway Underbridge and immediately adjacent to the site be undertaken prior to construction and then protected during construction.

During operation, the proposal would not have adverse heritage impacts on heritage items, the heritage streetscape and the conservation area in the vicinity of the site and therefore no mitigation measures are required.

6.12 Archaeology

An Archaeological Assessment and Research Design has been undertaken by Casey & Lowe Pty Ltd, the full report is provided in Appendix 6.11 and key issues are identified below.

6.12.1 Existing Situation

The site is a potential archaeological site within the Urban Development Plan for Ultimo-Pymont Precinct. It contains remains of local significance. These remains include:

- Pre and post-1788 natural environment - a swampy headwater of Darling Harbour.
- Reclamation of the area by c1850 and modification of the course of a creek line.
- 1850s timber housing, possible dairy and other structure.
- Replacement of early housing with terrace housing by c1874 with Chinese occupation in the early twentieth century at numbers 20 and 22.
- Occupation of most of the study area by the NSW Shale and Oil Company from the 1870s to 1920s.
- Demolition of early buildings and construction of the Dairy Farmers Garage in 1953.
- The sandstone culvert known from the adjacent Energy Australia site is not heritage listed and is outside of the study area. It was dismantled in 2003.
- The existing sewer that runs along the eastern side of the site is separate to the culvert as it is part of a c.1880 Sydney Council infrastructure. This is not heritage listed and would be retained in its current position.

6.12.2 Impacts

The proposed development includes bulk excavation of the site and due to the potential for remains of local significance, Casey & Lowe recommends that an archaeological investigation be undertaken as set out below.

6.12.3 Mitigation

Casey & Lowe recommends that a program of archaeological investigation be undertaken prior to the commencement of other site works and detailed recommendations are provided within the Archaeological Assessment and Research Design at Appendix 6.11.

6.13 Aboriginal Heritage Assessment

A Due Diligence Aboriginal Heritage Report has been prepared by GML consistent with DECCW guidelines. The full report is provided in Appendix 6.12 and is summarised below.

6.13.1 Existing Situation

GML undertook a search of the AHIMS database for an area of a 1km radius from the site and these records identified six recorded Aboriginal sites comprising a midden, two stone artefact sites and four Potential Archaeological Deposits (PADSs) – one PAD was associated with one of the stone artefact sites. GML found no Aboriginal sites or areas with PADs that have been recorded within or immediately adjacent to the site.

The environmental context of the site has been reviewed drawing information from the Geotechnical report by J&K (see Section 6.17), the Contamination reports by EIS (see Section 6.16) and historical mapping. The site contains alluvial soils beneath the fill and that this could contain Aboriginal archaeological deposits. The site may be located on what were the margins of a creek and swamp lands and these would have represented landforms that supported plant and animal species that Aboriginal people would have collected and used on a daily basis. It is likely that Aboriginal people would have at some point occupied and used the landforms in the study area although the likelihood that Aboriginal activities were undertaken that resulted in an archaeological signature is no more so than any other area associated with Cockle Bay (the area now referred to as Darling Harbour).

A desktop assessment was undertaken to obtain information about the Aboriginal Ethno-history and to identify recent archaeological works in the area. GML report that the traditional owners of the site are the Cadigal, who today are united under the Metropolitan Local Aboriginal Land Council (MLALC).

A site inspection with a representative from the MLALC was undertaken on 5th January 2011. Due to the concrete slab no determination with respect to the presence or absence of archaeological material within the site could be attained from the visual inspection. An on site discussion between GML and the MLALC addressed the following topics: the historical build up of material above natural soil levels, the long-term build up of alluvial soils, Aboriginal late Holocene subsistence patterns, the nature of potential Aboriginal deposits, site formation and impacts therein, the significance of Aboriginal deposits to the MLALC should any Aboriginal objects or midden material be present, and possible Aboriginal social values connected to this area.

The key issues and management requirements identified by the MLALC included:

- the concrete slab covering the study area prevented any ground surface visibility;
- the study area was noted to be located at the edge of a late Holocene wetland and associated with a creek. These landforms were favourable for Aboriginal habitation activities which may have created an archaeological signature;
- historical activities may have impacted some Aboriginal archaeological deposits but a low to moderate level of potential still exists for Aboriginal objects to be present;
- deposits associated with shell and bone are unlikely to have survived due to acidic soil conditions;
- if present, archaeological deposits that are extensive (such as a midden larger than 2m or a large artefact scatter) would be viewed by the MLALC as culturally significant. Smaller sites would have to be judged on their merits;
- given the unknown nature of soil deposits beneath the concrete slab, the MLALC wish to be present after the removal of the slab to assess the condition of soil horizons and determine whether any Aboriginal cultural material is present; and
- the MLALC wish to see the development of an Aboriginal Heritage Plan of Management prior to any development activity on the site, including historical archaeology.

Appendix 6.12 also includes a letter from the MLALC.

The site has been historically subjected to modification due to the processes of land reclamation and consequent repeated building development although the site is likely to have retained residual soils and alluvium that in comparable local situations have previously yielded Aboriginal objects.

The upper alluvial layers of soil, below the fill, have low to moderate archaeological potential to contain Aboriginal objects. It is anticipated that the condition of an archaeological deposit may be average (due to historical impacts) while the integrity of such a deposit is likely to be low to moderate (due to historical impacts). Any Aboriginal objects present are most likely to be stone artefacts and/or midden material.

GML report that the presence of older Aboriginal archaeological deposits within deeper undisturbed alluvium cannot be inferred at this time because prior identification of such deposits within the Sydney CBD region has not previously been made. In line with the DECCW due diligence process a more detailed investigation and further impact assessment is required (see Mitigation below).

6.13.2 Impacts

The impact of the excavation of fill and deposits across the site would be the removal (destruction) of any Aboriginal site and/or object that might be contained therein.

6.13.3 Mitigation

As there may be Aboriginal objects in the area of the proposed activity, GML make recommendations for further investigation as identified Due Diligence Aboriginal Heritage Report at Appendix 6.12. This includes the report being made available to the MLALC for review, a watching brief (following the historical archaeological investigation) and recommendations in the event that Aboriginal objects are identified. GML has advised that whilst a watching brief is recommended an alternative approach could be adopted whereby an Archaeological Research Design (ARD) could be prepared prior to the start of the historical archaeological investigations and then in the event that Aboriginal objects are found, the ARD could be implemented. Construction program constraints will determine whether a watching brief or further investigation would be undertaken.

6.14 Drainage and Flooding

Issues relating to drainage and flooding are addressed within the Drainage Strategy and Flood Risk Assessment as outlined below.

6.14.1 Drainage Strategy

A Drainage Strategy Report was prepared by Arup and AECOM, the full report is provided in Appendix 6.13 and the key issues are set out below. The Hydraulic Services and Stormwater Concept Plan have been compiled into one plan by AECOM and this is provided in Appendix A of the Drainage Strategy Report. The Soil and Water Management Plan, detailing the measures that can be used throughout the construction phase to lessen the risk of sediment laden run off entering the stormwater network untreated, has been produced by Arup and is provided in Appendix B of the Drainage Strategy Report.

The stormwater drainage system comprises the collection of stormwater discharge from downpipes, grated drains, rainwater outlets and rain water tank overflows and discharges via gravity to Sydney Water's stormwater main. Sydney Water advised in September 2010 that on site detention is not required at the site. The system would be designed to cater for a 1:20 year storm with overflow provisions to cater for a 1:100 year storm.

The surface water collected at ground level by rainwater outlets would not be collected for reuse.

The rainwater collection system would collect rainwater from roof outlets and gutters at Level 11 and convey via gravity to the 10,000 litre rain water storage tanks. It is estimated that a 57% reduction in stormwater runoff volume can be achieved from this area. The tanks would have 100% overflow provisions connected to the stormwater drainage system.

Two options are being considered for the construction of the basement these are either tanked or drained options. In the event that the drained basement option is selected the Drainage Strategy Report summarises the way in which the drainage would operate. If tanked, this would involve a continuous and completely waterproof membrane to be applied on the basement walls which would physically hold back groundwater.

Sydney Water has specified particular pollutant reduction targets as indicated within the NSW EPA – Managing Urban Stormwater – Council Handbook 1997. As part of a Water Sensitive Urban Design, it is proposed that a Gross Pollutant Trap be included as an end of line treatment measure for the roof runoff and the runoff captured by the rainwater outlets. Because the existing site does not have Water Sensitive Urban Design or measures to treat runoff the inclusion of a GPT is anticipated to significantly improve water quality and meet the reduction requirements for litter, suspended solids and coarse sediments. Also, the change of use from a car park to a building is anticipated to provide the required reduction for oils and greases.

It is not anticipated that the amount of nitrogen and phosphorous in the runoff would increase because the proposed building occupies most of the site and only contains limited ground runoff.

Mitigation

Arup and AECOM recommend the following:

- Adherence to the Hydraulic Services and Stormwater Concept plan in Appendix A of the Drainage Strategy.
- During construction, adherence to the Soil and Water Management Plan (Appendix B of the Drainage Strategy).

6.14.2 Flood Risk Assessment

A Flood Risk Assessment has been undertaken by Arup, the detailed report is provided in Appendix 6.14 and is summarised below.

The site is currently a concrete car park and has an impervious surface area. The proposed building would not increase the impervious surfaces.

Based on a review of a 1:2000 scale Orthophotomap and a Capacity Assessment report prepared by Sydney water in 1996, Arup find that the external catchment size contributing runoff to the stormwater network in the vicinity of the site is approximately 18-20ha.

Arup report that major stream flooding is not considered a risk to the site because the site is not located in the immediate vicinity of water courses. However, the site is potentially subject to overland flooding from the rainfall runoff that falls on the site and the adjacent catchments. This may generate overland flow to converge upon the sag on Ultimo Road and consequently the site itself, in particular the basement. Furthermore, the Capacity Assessment by Sydney Water shows that the existing stormwater network in the vicinity of the site is undersized and not capable of taking a two year Average Recurrence Interval event without surcharge. This reinforces the position of Sydney Water to omit the requirement of on site detention as it is improbable to assume that this would be likely to improve the efficiency of the already inundated stormwater network. Rather, Arup have investigated three options for mitigation of the overland flow inundation by either raising levels, increasing stormwater network capacity or installing a floodgate.

Of these options, the use of a floodgate on the basement ramp, has been recommended. This would have a Flood Defence Level with an RL of 5.0m consistent with the ground floor slab levels. The design considerations for the floodgate are set out in the Flood Risk Assessment.

Arup note that climate change is resulting in changes to rainfall patterns across Australia that can lead to larger, more extreme rainfall events with increased rainfall intensities. With regard to the proposed building, this suggests a greater risk of overtopping the floodgate which reinforces the need to provide flood reliance measures in the basement and more frequent operation of the floodgate.

Mitigation

There remains a residual hazard that either the floodgate is not operated in time to prevent water entering the basement or that a larger rainfall event occurs and overtops the floodgate even once operated.

Therefore, the following additional flood resilience measures to lessen the impacts in the event of flood waters entering the basement are recommended:

- Bunding around the Energy Australia substation and any other rooms within the basement that would be adversely affected in the event of inundation of water.
- Grading of the basement to a subsoil sump to allow for pump out of water.
- Hydraulic operation of the floodgate to accommodate potential frequent use.

6.15 Utilities and Fire Safety

A plan showing the existing services is provided in Appendix 3.7. The Schematic Design Report has been prepared by AECOM and is provided in Appendix 3.8. It describes service and utility requirements for the scheme. This appendix also includes the Fire Safety Engineering letter of support from AECOM. A description of the anticipated works is provided in Section 3.9 and key issues from the Schematic Design Report are outlined below.

6.15.1 Mechanical

The mechanical services are described in Appendix 3.8. These would include chilled water plant, heating hot water plant, trigeneration (see below), air conditioning and ventilation, mechanical ESD initiatives (thermal mass, displacement ventilation), smoke hazard management systems.

A micro-trigeneration plant, to be installed within the roof plant, would be sized at approximately 195kWe and would comprise three 65kWe micro turbines and a single absorption chiller. This would simultaneously provide electrical, heating and cooling energy. Waste heat produced by the electrical generation process would be used to generate heating hot water and chilled water. The key benefits of trigeneration include:

- Reductions in operating costs;
- Reductions in carbon emissions;
- Potential increase in the security of supply of thermal and electrical energy; and
- Peak electrical grid demand reduction.

6.15.2 Electrical Services

The electrical services are described in Appendix 3.8. The proposed building would be located within the Energy Australia Electricity Supply Authority Area.

AECOM has advised that an application has been lodged with Energy Australia for a dedicated basement chamber substation to supply the proposed development. Energy Australia has advised that power supply

can be made available to the proposed development with alterations to Energy Australia's network and the provision of a 2 x 100kVA chamber substation.

6.15.3 Hydraulic Services

The hydraulic services are described in Appendix 3.8. The systems requiring connection to the existing authority infrastructure are as follows:

- sanitary drainage system (Sydney Water Corporation's sewer main)
- stormwater drainage (Sydney Water Corporation's stormwater main)
- domestic cold water service (Sydney Water Corporation's water main)
- natural gas system (Jemena's natural gas main)
- fire hydrant system (Sydney Water Corporation's water main)
- fire sprinkler water system (Sydney Water Corporation's water main)

Sydney Water has assessed the application for a Section 73 Compliance Certificate for the proposed development and has advised that:

- water is available from the 150mm CICL main on the east side of Omnibus Lane;
- sewer is available from the 812mm x 1219mm brick drain located inside Lot 1; and
- on site detention is not required.

AECOM have advised that natural gas connection and supply establishment, with Jemena, would be made during the detailed design phase.

6.15.4 Communications

The communications services are described in Appendix 3.8. The works would comprise:

- connection to UTS Campus network;
- connection to utility carrier network;
- building backbone cabling infrastructure; and
- horizontal field outlet cabling infrastructure.

6.15.5 Fire

The Fire Engineering Brief has been prepared and is included in Appendix 3.8. The letter of support by AECOM is provided in Appendix 3.8 following the Schematic Design Report.

The following fire service systems are addressed in the report:

- Fire sprinkler system;
- Fire detection system;
- Sounds system and intercom system for emergency purposes;
- Portable fire extinguishers; and
- Fire control centre.

The infrastructure works include:

- Connection for the sprinkler system from the Sydney water main (further investigation required to determine whether the existing connections can be maintained);

- Telecommunications to the NSWFB including connection costs of Telstra lines.

6.16 Contamination

Environmental Investigation Services (EIS) prepared an Environmental Site Screening report in June 2004 and this is provided in Appendix 6.15. This included a site inspection, a limited review of historical site use and a review of geology and groundwater conditions. Soil sampling from eight boreholes found elevated levels of contaminants. Underground storage tanks and associated pipework and other facilities were found on site. EIS stated that further analysis of samples for waste classification should be undertaken prior to off site disposal of excess soil.

Subsequently, EIS undertook a Stage 2 Environmental Site Assessment in October 2010, the full report is provided in Appendix 6.16 and key issues are identified below. The objectives were to:

- assess the extent of soil and groundwater contamination conditions previously encountered at the site during the 2004 investigation;
- assign a waste classification to the soil to be excavated for the proposed development; and
- undertake a preliminary assessment of acid sulphate soil conditions at the site.

6.16.1 Soil Contamination

Samples for the EIS Stage 2 investigation were obtained from 15 boreholes and one testpit. Additionally, six groundwater monitoring wells were installed in selected boreholes. EIS found elevated concentrations of Polycyclic Aromatic Hydrocarbons (PAHs) within the fill in two boreholes. These concentrations were considered to be associated with the ash and slag material encountered in the fill. The investigation also encountered elevated concentrations of Total Petroleum Hydrocarbons (TPH). The report concluded that potential spills and leaks from the former underground storage tanks and the petroleum arrestor pit has resulted in the TPH contamination at the site. The extent of the contamination is confined to the fill soils however some of the natural soils may contain traces of hydrocarbons.

EIS did not find any obvious visual indications of potential asbestos containing materials on the site surface and the boreholes and testpits did not encounter fibro fragments visible to the naked eye. On this basis EIS did not undertake soil sampling or analysis for asbestos. In the event that fibro fragments are encountered during excavation a suitably qualified asbestos consultant be contacted for advice.

6.16.2 Acid Sulphate Soils

The Stage 2 investigation included the analysis of four samples for potential acid sulphate soil condition. The laboratory results indicated that the risk of generating acid sulphate soil conditions following the disturbance of the natural soils at the site was high. The report recommended the preparation of an acid sulphate soil management plan for the site.

6.16.3 Groundwater Contamination

Six samples were examined and elevated concentrations of arsenic, copper and zinc were identified which are considered by EIS to be a result of regional groundwater concentrations rather than site specific issues. TPH concentrations were below the site assessment criteria.

EIS consider that the proposed removal of the contaminated fill, underground storage tanks and the petroleum arrestor pit would result in a reduction of TPH concentrations in the groundwater.

EIS conclude that during excavation the groundwater may require treatment prior to disposal.

6.16.4 Waste Classification

EIS have classified the fill material in accordance with the NSW DECCW Waste Classification Guidelines 2009 as follows:

- General Solid Waste (non-putrescible)
- Restricted Solid waste (non-putrescible)

An excavation plan showing the extent of fill soils classed as Restricted Solid Waste is included in the Stage 2 report with a requirement for additional testing be undertaken during excavation works to confirm the extent of soil classed as Restricted Solid Waste.

Due to the acid sulphate soil encountered in the natural soils, the natural material is classed as General Solid Waste (non-putrescible). The classification of the natural soil may also be affected by the potential presence of hydrocarbons and/or mixing with the overlying fill soils.

6.16.5 Mitigation

EIS recommend the following be implemented:

- A Remediation Action Plan (RAP) (see below and Appendix 3.9).
- A Validation Report for remedial works undertaken.
- An Environmental Management Plan with public notification for any contaminated fill material remaining on site.
- An Occupational Health and Safety Plan addressing the contaminants encountered.
- During excavation works, the site should be inspected by experienced environmental personnel 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.

Remedial Action Plan

As stated in the scheme description in Section 3, a Remedial Action Plan has been prepared by EIS and is presented in Appendix 3.9. This identifies the procedures to be undertaken to remediate and manage contamination issues identified during the previous investigations. An Acid Sulphate Soil Management Plan is provided within the Remedial Action Plan.

The key issue for remediation works is to minimise the volume of fill that would need to be disposed of as Restricted Solid Waste. There are three areas of the site that contain material likely to be classified as Restricted Solid Waste. Following validation of the removal of fill material classified as such the remainder would be disposed of as General Solid Waste. The underlying natural soils that would be excavated are classed as Potential Acid Sulphate Soils and would need to be assigned a classification following treatment with lime.

Although it is not considered to be a significant risk to the proposed development, potential groundwater contaminants would need to be treated during dewatering to enable discharge to the stormwater system.

The proposed remediation is based on point source data that has been spatially interpreted between previous sampling points, the precise extent of the remediation works will not be defined until a successful validation report has been obtained.

The proposed remediation details are described in Section 10 of EIS's report (see Appendix 3.9). Generally it comprises the following stages:

- Stage 1 Groundwater Sampling

- Stage 2 Removal of underground storage tanks, arrestor pit and Restricted Solid Waste
- Stage 3 Excavate the remaining fill material from the site
- Stage 4 Excavate and dispose of the potential acid sulphate soil
- Stage 5 Groundwater treatment
- Stage 6 Removal of ramps and batters
- Stage 7 Capping of the contaminated backfill around the sewer
- Stage 8 Implementation of the Environmental Management Plan

6.17 Geotechnical

A geotechnical investigation has been undertaken by Jeffery & Katauskas Pty Ltd (J&K) during October 2010, the factual and interpretative reports are provided in Appendices 6.19 and 6.20 respectively and key issues are identified below. The purpose of the investigation was to obtain geotechnical information on subsurface conditions to provide a basis for comments and recommendations on excavation, retention, drainage, footings, on-grade floor slabs and geotechnical issues and constraints.

The subsurface profile below the concrete paved surface comprises fill over natural soils predominantly comprising alluvial clays with sand bands then sandstone bedrock at moderate depth. Over the south-western corner of the site, dolerite corresponding to an igneous dyke was found at depth. Groundwater levels were identified at shallow depth within the soil profile.

Groundwater levels were recorded at depths of between 3.3 and 6.6m from the surface and one of the trial pits recorded water at 0.8m depth a number of days after the completion of the test pit.

J&K state that the main geotechnical issues are:

- The stability of the proposed excavation;
- De-watering the excavation; and
- Limiting ground surface movements outside the excavation, in particular the old brick sewer which crosses the eastern side of the site.

There might also be traces of old footing systems and other infrastructure associated with the former building on the site and these could be encountered during bulk excavations.

The report refers to the contamination report by EIS and confirms that the removal and appropriate disposal of contaminated soils would need to be completed in accordance with the advice set out in that report.

The location of the TransGrid tunnel and associated infrastructure below Ultimo Road and adjacent to the southern end of the eastern boundary would also need to be considered. TransGrid need to be contacted regarding the installation of anchors or alternatively internal propping systems would need to be utilised.

J&K confirm that the bedrock underlying the site would provide appropriate support for the envisaged building loads and a piled footing system would be required.

6.18 Air Quality Assessment

An Air Quality Impact Assessment has been undertaken by AECOM, is summarised below and the full report is provided at Appendix 6.19. The purpose of the assessment is to predict the potential effects of the operation of the trigeneration plant on receptors and local air quality using dispersion modelling.

Potential pollutants emitted from the trigeneration plant are formed by the combustion of natural gas. The air pollutants investigated were particulate matter (PM₁₀), nitrogen dioxide (NO₂), sulphur dioxide (SO₂) and carbon monoxide (CO). Ground level concentration criteria specified by DECCW (as referred to in Appendix 6.19) to minimise adverse effects of airborne pollutants on sensitive receptors have been used in the assessment.

6.18.1 Existing Situation

Data about the existing environment has been sourced from the Randwick air quality monitoring station (approximately 5.5km east-northeast of the site). This is the closest DECCW operated air quality monitoring station to the site.

All existing background pollutant concentrations are below the relevant assessment criteria.

6.18.2 Impacts

Atmospheric dispersion modelling was undertaken using AUSPLUME 6.0 in accordance with the Department of Environment and Conservation's Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales, 2005.

The assessment has been based on a worst case operation comprising the three engines operating continuously over a year at a maximum emission rate. In reality these engines would operate at less than maximum capacity over the year. Therefore, the predictions are expected to be overestimates of the actual concentrations that are likely to occur.

The predicted pollutant concentrations are below guideline levels for PM₁₀, CO, NO₂ and SO₂ and no significant air quality impacts are anticipated from the operation of the plant.

6.18.3 Mitigation

There are not anticipated to be any significant impacts on air quality from the operation of the plant, therefore mitigation is not required.

6.19 Reflectivity

A Reflectivity Study has been undertaken by Arup. The assessment responds to the controls set out in section 7.2 of the Urban Development Plan for Ultimo-Pyrmont and has followed the methodology of David N.H. Hassall of the University of New South Wales which includes a maximum threshold of 500Cd/m². It assesses the likelihood of undesirable solar reflections off the proposed development on traffic and pedestrians in the surrounding area and on occupants of nearby buildings. The key issues are summarised below and the full report is provided in Appendix 6.20.

Preliminary analysis, undertaken prior to the finalisation of the proposed design, indicated potential glare to traffic on Mary Ann Street and Ultimo Road. In response, further analysis was undertaken and the glazing responsible for this glare has been rotated to eliminate this impact.

The façades comprise punched windows that have an external reflectivity of 20% which is in line with the Urban Development Plan. Due to the undulating façade, most windows have an individual orientation. The full height glazed areas comprise several two to six storey high panes at different angles of inclination and plan orientation and this also has an external reflectivity of 20%.

The extent of the surroundings modelled is described in the report in Appendix 6.20 and includes the following roads:

- Mary Ann Street;

- Harris Street;
- Darling Drive;
- Ultimo Road;
- Broadway; and
- Thomas Street.

More detailed perspective studies involving modelling were undertaken for Mary Ann Street, Darling Drive and Ultimo Road. Reflected light in Harris Street, Thomas Street and on Broadway and in other surrounding streets was found to be either entirely blocked by other buildings or outside drivers' expected view directions.

Arup's studies found that reflections from the northern areas of the western façade of the building hit the northern side of Mary Ann Street in the later afternoon during summer. As a result of preliminary studies on an earlier version of the design Arup found that one glazing plane produced reflections over the threshold and therefore the plane of this window was altered to avoid this impact. Analysis of the proposed design found that reflections to Mary Ann Street exceeded thresholds only where the view of the building is obscured by trees. The reflections would occur during the summer when these trees are carrying leaves. As several trees block the line of sight towards the façade the removal of a single tree would not affect the obscuration. On this basis, Arup discounted excessive reflections causing glare in Mary Ann Street.

Reflections off punched windows on the building's north and north east could be thrown towards Darling Drive throughout the year for minutes at a time. Arup report that any reflections at lower levels would be effectively masked by trees that are evergreen. Arup consider that the removal of a single tree would not affect the obscuration. On this basis, Arup discounted excessive reflections causing glare to drivers in Darling Drive.

On Ultimo Road small flashes of reflections are cast from punched windows on the south east of the building. These could be seen by drivers travelling west and would occur from April to October varying between 0 and 10 minutes and shifting between 8.30am and 11am. Preliminary analysis on an earlier version of the design identified three windows that produced reflections over the threshold. As a result these windows were rotated to avoid this impact. Analysis of the proposed design has found that no reflections reaching viewpoints of drivers travelling Ultimo Road exceeded the threshold. Therefore, Arup discounted excessive reflections causing glare in Ultimo Road.

Pedestrians are easily able to adjust their view in any location where unwanted reflections may be received, reducing the impact of the reflections and that it is acceptable to assume it will be safe for pedestrians to divert their vision to avoid glare.

The report addresses the assessment of reflections that would be cast on the following surrounding buildings:

- ABC building;
- The TAFE building ('The Muse');
- The former National Cash Register building and the apartment building along Omnibus Lane.

Reflections on the ABC building would scatter across the Ultimo Road façade for varying durations in the afternoon throughout the year. Arup anticipate that individual patches of reflected sunlight would not fall into individual windows for longer than 30 minutes. Given the short duration of the reflections and that reflective surfaces are limited to 20% reflectivity it is unlikely that reflections of its façades would cause significant additional discomfort to the occupants of the ABC building.

Reflections at the TAFE building (The Muse) on the western side of Harris Street would be scattered across the façade from the proposed Dr Chau Chak Wing Building for varying durations during summer afternoons.

Arup report that while these reflections can cause subjective nuisance to occupants, the intensity of reflected sunlight is significantly reduced by the 20% limit on glazing reflectivity in accordance with the Urban Development Plan for Ultimo Pyrmont Precinct and that this is adequate to limit the likelihood of any discomfort to occupants. The report notes that the building is currently exposed to direct sunlight during morning hours which is more intense than the reflections from the building due to the 20% limit on glazing reflectivity.

Reflections onto the facades of the apartment building and former National Cash Register building along Omnibus Lane would be scattered for varying durations, intermittently during afternoons throughout the year. Patches of reflected sunlight from both punched windows and the larger areas of glazing could fall onto individual locations for up to 90 minutes during summer afternoons. As with reflection at the TAFE building, the intensity of reflected sunlight is significantly reduced by the 20% limit on glazing reflectivity which is adequate to limit the likelihood of any discomfort to occupants. Additionally, the windows in the apartment building facing east are mostly small high level windows that might be kitchens or bathrooms and therefore Arup consider that the impact is mainly limited to spaces where less permanent occupancy is expected as well as the size of sun patches reaching inside. Windows in the former National Cash Register building have blinds so that occupants can control the level of sunlight penetration.

Arup report that the proposed building performs well in terms of solar reflectivity and glare affecting motorists on surrounding streets would not exceed the limits of acceptability according to the Hassall methodology.

6.20 Economic Impact Assessment

An Economic Impact Assessment for the whole City Campus Master Plan was prepared by Urbis. A summary of the key issues of relevance to the Dr Chau Chak Wing Building is provided below and the full report provided at Appendix 6.21.

Given the building's innovative design and the high profile status of the architect, the building is expected to gain significant public interest and produce substantial economic benefits including those generated from:

- Business tourism
- Leisure tourism
- International students
- Skilled workers
- Precinct activation and improved amenity

The building is anticipated to provide a modern, state of the art space suitable for business events such as conferences, conventions and public lectures. Urbis estimate that such events hosted at the Dr Chau Chak Wing Building could attract up to 24,000 interstate visitors and 2,000 international visitors annually. These travellers are estimated by Urbis to spend \$36 million annually of which approximately \$25 million would be captured within Sydney with the balance being dispersed nationally.

The building is also likely to generate leisure tourism, travellers with an interest in building and design that may be drawn to the area to see the building, as well as other significant buildings in Sydney. The economic value of the leisure tourism is expected to be significant although substantially less than the business tourism.

The proposed building is anticipated to raise UTS's profile internationally, improving UTS's ability to compete in a global market and drive growth in the international student population and delivering significant economic value to the state and national economies.

The proposed building would add to Sydney's cultural offering which is seen as a key influencing factor on a city's ability to attract skilled overseas migrants that are important to economic growth and development.

6.21 Cumulative Impacts

The area is undergoing substantial change with a number of major redevelopments underway or planned in the local area. Those other schemes in proximity to the proposed Dr Chau Chak Wing Building are identified in Table 6.5 below.

The UTS City Campus Master Plan includes a number of projects to be delivered over the next 10 years including new buildings, refurbishments and internal upgrades. The anticipated timeframes for construction of a number of these projects would potentially coincide with the construction of the Dr Chau Chak Wing Building. Also, construction of the Frasers Broadway site is underway and the Metro Plaza is likely to involve construction phases at the same time as the Dr Chau Chak Wing Building. Therefore, there would be potential cumulative construction effects on local residences and businesses from a number of construction projects in the area. The Dr Chau Chak Wing Building has a Preliminary Construction Environmental Management Plan that sets out how impacts such as construction noise, dust and construction traffic would be minimised (see Appendix 3.10).

Table 6-5 Other Schemes in the Vicinity

Scheme	Type	Timescale
UTS Broadway Concept Plan	New buildings and refurbishments	Works from present until 2018
Frasers Broadway	Redevelopment for mixed uses and public open space	Construction underway
Metro Plaza, 61-79 Quay Street	Two 16-storey towers, four levels of retail and basement parking	Scheduled for completion in mid to late 2013

7 Draft Statement of Commitments

7.1 Introduction

The Director General's Requirements (Appendix 6.1) states that the environmental assessment must include a draft Statement of Commitments that outlines the environmental management, mitigation and monitoring measures to be implemented to minimise any potential impacts of the project. UTS makes the following commitments that have been informed by the environmental assessment process.

7.1.1 General

The proposed development will be undertaken in accordance with this Environmental Assessment Report dated February 2011 prepared by RPS including the architectural drawings prepared by Gehry Partners in Appendix 3.2 of this Environmental Assessment Report.

The applicant will obtain all necessary approvals required by State and Commonwealth legislation and relevant City of Sydney Council policies.

All works will comply with the Building Code of Australia.

UTS will work with SHFA, the Powerhouse Museum, Transgrid and the City Council to resolve a design and implementation program including shared funding to extend and improve the UPN. A platform link to the Dr Chau Chak Wing Building and any required wind mitigation measures will be included in the design and implementation program.

7.1.2 Construction

A Construction Environmental Management Plan will be prepared prior to the Construction Certificate and will include the measures identified in the Preliminary Construction Environmental Management Plan provided in Appendix 3.10 of this Environmental Assessment Report.

7.1.3 Access

The detailed design will comply with the Building Code of Australia and the City of Sydney Access DCP 2004 and incorporate the recommendations identified in the Access Review by Morris-Goding in Appendix 6.4 of this Environmental Assessment Report.

7.1.4 Noise

The construction noise and vibration control measures and work practices recommended in the Noise Impact Assessment by Marshall Day in Appendix 6.5 of the Environmental Assessment Report will be adhered to and are included in the Preliminary Construction Environmental Management Plan in Appendix 3.10 of this Environmental Assessment Report.

To control noise from mechanical services, the design of the acoustic louvres will be as recommended in the Noise Impact Assessment by Marshall Day in Appendix 6.5 of the Environmental Assessment Report; the inlets and outlets of supply and exhaust fans will be directed away from the nearest dwellings; and the roof of the plant room will be constructed of 9mm fibre cement/90mm cavity/0.6mm Colorbond steel or of a similar construction.

UTS will manage events and the general operation of the building to minimise potential outdoor activity noise at night by the provision of information to students and staff

7.1.5 Wind

The proposed trees at the north west corner of the site will be at least semi mature.

Planting of densely foliated shrubs will be incorporated around the trafficable areas of the north western terrace on the sixth floor and the southern terrace on the sixth floor to the same height of and in place of the balustrades recommended by Windtech in the Pedestrian Wind Environment Study in Appendix 6.7 of this Environmental Assessment Report.

A solution to mitigate wind levels to acceptable comfort and safety levels along the Ultimo Pedestrian Network to the east of the site at the points tested by Windtech in the Pedestrian Wind Environment Study in Appendix 6.7 of this Environmental Assessment Report will be determined in liaison with adjacent land owners as appropriate.

7.1.6 Transport

The construction traffic management measures recommended in the Transport Impact Assessment by Arup in Appendix 6.8 of this Environmental Assessment Report and are included in the Preliminary Construction Environmental Management Plan in Appendix 3.10 of this Environmental Assessment Report.

A location specific Travel Access Guide/Green Travel Plan will be prepared prior to the occupation of the proposed building.

7.1.7 ESD

The construction and operation of the Dr Chau Chak Wing Building will be in accordance with the ESD Strategies set out in the ESD Strategies report by AECOM in Appendix 6.9 of this Environmental Assessment Report to achieve Green Star Education v1 design rating of 5 Star.

A waste management plan will be prepared and implemented in accordance with the ESD Strategies Report by AECOM in Appendix 6.9 of this Environmental Assessment Report.

7.1.8 Built Heritage

The heritage fabric of the foundations and retaining wall on Ultimo Road of the former signal box building adjacent to the Ultimo Road Railway Underbridge and immediately adjacent to the site will be protected during construction in accordance with the recommendation in the Historic Impact Statement at Appendix 6.10 of this Environmental Assessment Report. This measure is included in the Preliminary Construction Environmental Management Plan in Appendix 3.10 of this Environmental Assessment Report.

7.1.9 Archaeology

A program of investigation will be undertaken prior to the commencement of site works and the recommendations identified within the Archaeological Assessment by Casey and Lowe in Appendix 6.11 of this Environmental Assessment Report implemented. These measures are included in the Preliminary Construction Environmental Management Plan in Appendix 3.10 of this Environmental Assessment Report. The appointment of a contractor to undertake this work will be subject to UTS's procurement processes.

7.1.10 Aboriginal Archaeology

An Aboriginal Plan of Management will be prepared in consultation with the Metropolitan Local Aboriginal Land Council (MLALC) and a watching brief undertaken following the archaeological program of investigation and in accordance with the recommendations identified in the Due Diligence Aboriginal Heritage Report by Godden Mackay Logan in Appendix 6.12 of this Environmental Assessment Report. These measures are included in the Preliminary Construction Environmental Management Plan. The appointment of a contractor to undertake this work will be subject to UTS's procurement processes.

7.1.11 Drainage, Flooding and Stormwater

During construction the Soil and Water Management Plan presented within the Drainage Strategy Report by AECOM and Arup in Appendix 6.13 of this Environmental Assessment Report will be adhered to and this is included in the Preliminary Construction Environmental Management Plan in Appendix 3.10 of this Environmental Assessment Report.

To protect features within the basement in the event that either the floodgate is not operated in time or that a larger rainfall event occurs and overtops the floodgate once operated, there will be bunding around the Energy Australia Substation and all other rooms within the basement.

The basement will be graded to the subsoil pump to allow for the pump out of water in the event that high levels of road runoff enter the basement.

7.1.12 Utilities

All services that are disrupted by the construction of the Dr Chau Chak Wing Building will be appropriately relocated or protected.

7.1.13 Contamination

The site will be remediated in accordance with the Remedial Action Plan by Environmental Investigation Services in Appendix 3.9 of this Environmental Assessment Report.

The recommendations contained within the Stage 2 Environmental Site Assessment by Environmental Investigation Services in Appendix 6.16 of the Environmental Assessment Report will be implemented.

7.1.14 Geotechnical

The recommendations contained within the Geotechnical Factual and Interpretative Reports by Jeffery and Katauskas Pty Ltd in Appendices 6.17 and 6.18 respectively of this Environmental Assessment Report will be implemented.

8 Conclusion

The University of Technology, Sydney (UTS) proposes a new building for the Faculty of Business, the Dr Chau Chak Wing Building, to be located on the former Dairy Farmers Co-operative building site at 14-28 Ultimo Road, Sydney.

Gehry Partners was commissioned to design the building. Frank Gehry is an internationally acclaimed architect, known for iconic buildings including the Guggenheim Museum in Bilbao, Spain; the Walt Disney Concert Hall in Los Angeles and the Dancing House in Prague. The Dr Chau Chak Wing Building would be the first building in Australia to be designed by Gehry Partners and is expected to be a major Australian landmark building.

The Faculty of Business is currently mainly located in the Haymarket Precinct of the City Campus (Building 5) and UTS considers that this location can no longer accommodate the projected increase in the number of students or the changing trends in university education. In addition, the Faculty seeks to establish itself as one of the world's leading business schools and a new Faculty building designed by internationally recognised architect Frank Gehry would support this aim.

This Environmental Assessment Report for the Dr Chau Chak Wing Building has been prepared for a development application under Part 3A of the Environmental Planning and Assessment Act 1979.

The building incorporates one basement level with twelve storeys above, is for educational use and includes a publicly accessible café and coffee bar. A range of sustainability measures have been designed into the scheme such as a trigeneration plant and the intention of achieving a 5 Green Star rating. The site is contaminated with elevated levels of a number of pollutants and would therefore be remediated in accordance with the Remedial Action Plan prior to construction. There is potential for both historical and Aboriginal archaeological objects to be present within the site. A historical archaeological investigation would be undertaken prior to construction. An Aboriginal Plan of Management would be developed in consultation with the MLALC and a watching brief would be carried out (an alternative approach may instead be implemented comprising the preparation of an Archaeological Research Design (ARD) prior to the start of the historical archaeological investigations and then in the event that Aboriginal objects are found, the ARD would be implemented).

In addition to the matters identified in the Director General's Requirements for the environmental assessment an Aboriginal Heritage Due Diligence Report, Air Quality Impact Assessment Report and Reflectivity Study have been prepared

During the environmental assessment process, preliminary findings have informed amendments to the design in order to avoid or reduce potential environmental impacts. A number of windows have been re-angled to avoid glare to traffic and a flood barrier has been included in the scheme.

There are residential properties and businesses located within proximity of the site and in recognition of this, a voluntary community consultation process has been undertaken prior to the Environmental Assessment Report being lodged.

With regard to potential impacts in the vicinity arising from construction, a Preliminary Construction Environmental Management Plan has been prepared in order to manage and minimise potential construction impacts (such as noise, vibration and construction traffic). This has been informed by the findings of the environmental assessment process.

During operation, there would be impacts to surrounding properties in relation to shading, reflected light to buildings and views and also, UTS would need to manage events and the general operation of the building to minimise any potential night time noise. Some additional, overshadowing of adjacent buildings would occur. In particular the outdoor play area of the child care centre would be overshadowed around the winter solstice although this is anticipated to be less than the 50% criteria identified in the Urban Development Plan. Whilst glare impacts to traffic have been avoided, there would be reflected light towards adjacent buildings.

The reflective materials would not exceed the 20% reflectivity limit in the relevant planning controls. With regard to views, the building would impact on existing middle to longer distance city views from surrounding buildings and would change some of these to views of a building designed by an internationally renowned architect. As the site is subject to controls allowing for a building of 42m there is an expectation that a building of this height could occur. Indeed the proposed building is slimmer than a compliant building as it does not build out to the full site footprint and also has a reduced plan area from level 6 upwards and therefore allows for the retention of some views when compared to a compliant building envelope. The construction of any building within an envelope that complies with the local planning controls on this site would therefore have an equal or potentially greater impact on views.

These impacts can be considered alongside beneficial aspects of the scheme. The building would engage with and enliven the public realm at the street frontages of Ultimo Road, Omnibus Lane and Mary Ann Street and also with the Ultimo Pedestrian Network (for which SHFA is developing options for revitalisation). It would contribute to further developing the sense of place in the local area through the creation of a unique landmark and would provide a positive contribution to the character of the area. In the wider context, the proposed building would provide a valuable addition to Sydney's architecture. Also, traffic generation from the site would be lower than at present due to the provision of minimal car parking spaces. This is possible due to the good standard of public transport in the area and the provision of facilities for cyclists and it is intended that a Green Travel Plan for the building would be prepared.

The mitigation measures identified in this Environmental Assessment Report and its accompanying appendices need to be adhered to in order to avoid, and where not possible to avoid, minimise environmental impacts. However, there would be residual impacts to adjacent properties associated with changes in shadowing, reflected light to buildings and also changes to views as identified in this Environmental Assessment Report.

The proposed development is mostly consistent with the relevant planning provisions and is an appropriate form of development within its context. The Dr Chau Chak Wing Building is considered to be in the public interest as it would introduce a new iconic building to Sydney, boosting the profile of UTS and would enliven the public domain surrounding the site, in particular the Ultimo Pedestrian Network.