Major Projects

Facilities Management

PRELIMINARY CONSTRUCTION MANAGEMENT PLAN

for the

MATERIALS SCIENCE & ENGINEERING BUILDING

UNSW Kensington Campus

17 October 2012

Principal	***UNSW***
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1. INTRODUCTION

This Preliminary Construction Management Plan (PCMP) has been prepared to address the Director General's Requirements in relation to the construction of the new Material Sciences and Engineering Building (MS&EB) project on the UNSW Kensington Campus. The PCMP addresses how the UNSW Project Team has planned to address construction impacts associated with implementation of the MS&EB Project.

UNSW will not be building the MS&EB Project directly but will contract the building works to a suitably qualified Tier 1 or 2 Main Contractor who will be responsible for undertaking the works in accordance with the principles detailed within this Plan.

The MS&EB Project Main Contractor (the "Contractor") once appointed, will prepare a comprehensive Construction Management Plan prior to the commencement of the work that will detail specific methods for the management of the site activities. In addition, the University will undertake to ensure that the Contractor will comply with the minimum requirements of this Preliminary Construction Management Plan as well as the requirements of the conditions of approval to be sought under State Significant Development Application number SSD 5373.

1.1 MS&EB Project Description

Figure 1: MS&EB Building

UNSW has identified the need to provide new facilities to accommodate growth in the School of Materials Science and Engineering (the School) at its Kensington Campus. The key objectives of the new facility will be to:

- provide a point of focus for UNSW's defined research strength of next generation materials and technologies;
- provide a world class showcase to enable the School to grow and respond to opportunities;
- attract funding, academics and students;
- foster collaboration across faculties and schools;
- support and encourage learning; and
- support and showcase UNSW's commitment to leadership in sustainability.

The site of the new facility, located at campus grid reference E10, lies north-east of the Law building (F8) and north of the Chemical Sciences building (F10) and east of the

existing Materials Science and Engineering Building.

Figure 2: Site E10 (Currently a car park and dance studio).

The building will be located in a densely populated campus environment. Roadways to accommodate deliveries by truck will be located within 10 meters of the building on two sides.

2. PROJECT SCOPE OF WORK

The new MS&EB facility will consist 20,300 m^2 GFA in a multi-storey building that will house a variety of laboratories conducting material science research, ranging from macro-scale traditional testing to nano-scale fabrication and analysis. The building will also contain an atrium, classrooms, offices, and research spaces housing heavy testing equipment. Some of these spaces will incorporate the use of high temperature ovens and other heat sources which may pose potential fire risk. The building must be designed to be flexible enough to contain a range of other potential uses with a focus on sciences.

At the current time, a concrete building structure is anticipated.

The basement will have laboratories containing leading edge electron microscopy and other high sensitivity instruments. Several passenger elevators will be located in the eastern third of the building and a large goods elevator located on the western end adjacent to delivery waste holding facilities.

Proposed equipment to be installed includes, scanning tunneling microscopes, scanning probe microscopes and aberration corrected transmission electron microscopes. Additionally, one or more laboratory spaces may require shielding to limit electromagnetic fields.

2.1 Project Delivery

UNSW intends to engage a contractor on a Design Finalisation and Construct (DF&C) form of contract under a fixed lump sum price. Key design consultants engaged by the UNSW will be novated to the DF&C Contractor during the design development phase. The DF&C Contractor will be responsible for coordinating and delivering the entire project comprising the following components:

- Main building works;
- Civil and landscaping works; and
- Relocation and reinstallation works for the School.

2.2 Timeframe

The key target project dates are:

Item	Timeframe
Completion of Scheme Design	August 2012
Lodge Development Application	October 2012
Completion of Design Development	January 2012
Site Enabling Works Commencement	November 2012
Main Building Approval	April 2013
Main Contractor Engagement	April 2013
Main Construction Commencement	April 2013
Main Construction Completion	November 2014
Relocations Completion & Project Completion	February 2015

The target dates reflect the current DF&C Contractor form of delivery proposed for the project. The targeted date for occupation of the MS&EB is from December 2014.

3. EXISTING SITE CONDITIONS

3.1 Traffic Movements

Cars and service vehicles currently access the MS&EB site and surrounding buildings via Gate 2 Avenue and exit via Gate 2 Avenue and International Drive. The UNSW Lower and Western Campus Urban Design Framework discusses the need to reduce the number of access points along High Street and forecasts the potential closure of International Drive in the longer term.

Cars and service vehicles access car parking (D12, E9 and E10) and deliveries to buildings in this precinct via Gate 2 Avenue which currently extends through to Union Road. The Lower Campus Development Enabling Works Project will divert this access to the east of the new MS&EB into a new “D12 Lane”.

Union Road provides delivery access and disabled parking to key buildings including the existing Material Sciences Building (E8), The Faculty of Law (F9), Chemical Sciences Building (F10) and the Australian School of Business (E12) and Science Theatre (F13) to name a few. Union Road is also a significant pedestrian route providing access to all the buildings above and to the Quadrangle and College Road.

A more detailed description of the existing traffic and pedestrian conditions are included in the URaP-TTW Traffic and Parking Report for the MS&EB (September 2012).

4. SITE CONSTRAINTS AND OPPORTUNITIES

A key requirement in the implementation of the MS&EB Project is to maintain continued vehicular access from Gate 2 to service the buildings located off Union Road and College Road. The service vehicles are generally in the range from utilities to 19-metre long articulated trucks which deliver liquid nitrogen to Building F10.

Waste collection and Fire Brigade access is to be maintained at all times to existing buildings. Generally these vehicles are in the range up to 12.5 metres in length.

Stage 1 of the Lower Campus Development Enabling Works project (Proposed from November 2012 through to end February 2013) will have established a new link road from

3rd Avenue through to Union Road. This link road, referred to as D12 Lane, will also connect to the western end of College Road but more importantly, will allow the closure of Gate 2 Avenue (south) to allow consolidation of the MS&EB construction site as described below:

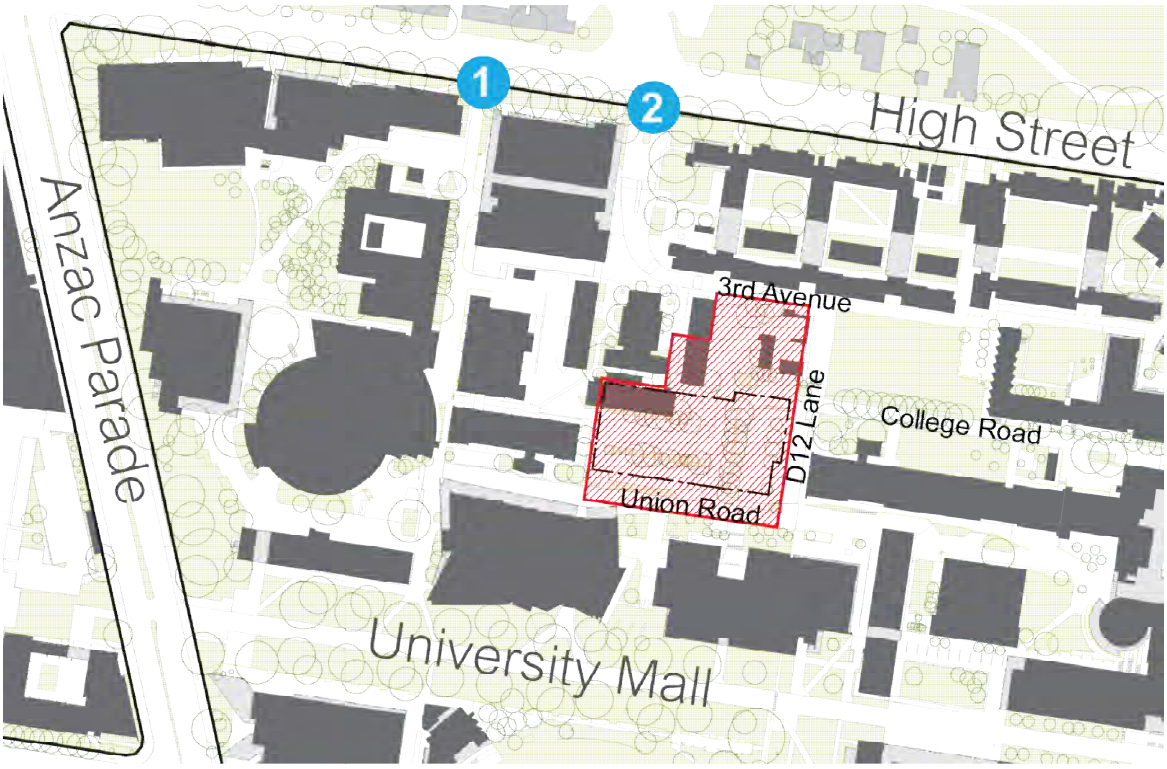


Figure 3: Location of MS&EB construction site, D12 Lane, and the need to maintain UNSW vehicular access to 3rd Avenue, College Road and Union Road and pedestrian access off Gate 2 to the remainder of the UNSW Kensington Lower Campus. The larger version of the MS&EB Campus Location Plan is provided in Attachment A.

Site constraints particular to the implementation of the MS&EB project include:

- The MS&EB site is adjacent to academic and student residential uses. Refer the requirements for noise vibration management in Section 5.21 of this PCMP.
- Maintain pedestrian and vehicular access to buildings off Union Road, College Road and 3rd Avenue.
- Maintain pedestrian access from Gate 2 through to Union Road.
- The provision of disabled car spaces are to be no fewer than currently exists at all times throughout the construction of the MS&EB.
- Trees to be protected are as described in the Arborist Report. Tree protection is to meet UNSW guidelines.

Site Opportunities particular to the implementation of the MS&EB project include:

- The ability to power the construction crane from existing substation in D11B (note that both this substation and adjacent bore water treatment plant are to be decommissioned and demolished as part of main contractor works when the new substation and bore water plant have been commissioned in the MS&EB).
- The ability to retain D10 (South) for Contractor site offices.

5. CONSTRUCTION SITE MANAGEMENT

5.1 General

Refer the requirements of UNSW MS&EB Project - Preliminaries for UNSW standard requirements.

5.2 Site Induction

All contractors engaged to work on UNSW campuses and properties are required to complete a UNSW WHS Induction and must have all relevant certificates of competency and/or licenses for the equipment being used or tasks performed. The person engaging the contractor (the project manager) must ensure that all necessary inductions take place and that all required certificates of competency and licenses are current.

Site Inductions can be completed online at:
http://www.facilities.unsw.edu.au/about-fm/ohs/ohs-induction/.

Following satisfactory completion of inductions, contractors will seek UNSW authorization to access the site and obtain a UNSW Contractor ID Card from the following location:

UNSW Facilities Management
Mathews Building F23, Level 2 (Pavilions Level)
Botany Street, via Gate 11,
Kensington 2052.

5.3 Prior to the Commencement of the Works

The following procedures are required prior to commencing work on site:

- Ascertain all relevant project information, applicable standards, and statutory requirements and conditions, including those of authorities having jurisdiction over the works.
- Obtain all relevant insurances, permits and approvals and pay all associated fees, deposits and the like.
- Ensure all contractors and subcontracts have completed site inductions.
- Retain a copy of the development approvals and the construction certificate on site at all times during the progress of the works. Where foreseeable, notify the Consent Authority of proposed variations to project requirements and conditions.
- Undertake a dilapidation report that provides both a photographic record of the site and surrounds as well as a record of existing noise and dust levels for use as a base for ongoing monitoring.

5.4 Hoardings/Protection

Hoardings will be of adequate construction and dimensions to provide protection and to control the emission of debris into the University grounds and into neighbouring properties & footpaths. Hoardings are to be designed to relevant standards, including AS 1725-2003, AS 1158 - 2007, AS 1170 Part 1-2002, AS 1170, Part 2- 2002, AS 1742 Part 3 – 2008 and Guide to Traffic Engineering Practice and as well as relevant WorkCover requirements.

A regular review of the site hoardings will be carried out to ensure that it maintains the required levels of safety, security and changing needs of the construction progress.

The MS&EB will require as a minimum, Type A hoarding with chain wire and shade cloth protection to prevent the emission of any debris into the University campus. Type A

hoarding will enclose the construction compound and work areas adjacent the site as deemed necessary for protecting the safety of UNSW staff, students and visitors. Type A hoardings will remain in place until such time as the area of work has been completed and the Contractor has been made the area safe for access by University users.

It is envisaged that Type B hoardings with solid fencing will be provided adjacent to the excavation/construction site for the MS&EB. Type B hoardings will allow for the provision of contractor's site accommodation immediately adjacent to the work site. The Type B hoarding will remain on site as long as required to protect pedestrian and vehicular public from the impact of construction activities.

All hoardings will be located so as not to hinder the access and movement of pedestrians and vehicles.

Refer also *Preliminaries - Clause P.47* for UNSW standard requirements.

5.5 Construction Compound

The Construction Compound will be maintained and managed by the Contractor in consultation with UNSW. The proposed location for the Contractor's Construction Compound is immediately to the north of the new building, bounded by Building D10, 3rd Avenue and the new link road between 3rd Avenue and Union Road.

Refer also *Preliminaries - Clause P.4* for UNSW standard requirements.

5.6 Excavation

The ramp into the excavation zone is to be fully incorporated within the excavation zone.

5.7 Location of Crane

Movement of materials around the site will be conducted utilising the following means:

- Mobile cranes will used in the initial stages of the construction of the structure where sufficient staging areas are available adjacent to the site. When practicable a tower crane will be erected to service the project.
- The tower crane will be positioned on the project to ensure site coverage is maximized to reduce the need to establish secondary mobile cranes on the site. Retracting landing platforms will be installed to aid the movement of heavy materials on and off the leading levels of structure.
- Each building will also be serviced by a 'man and materials' or 'materials only' type hoist to transport workers vertically up the building. These hoists will also be used to transport smaller materials onto the working floors.

The Contractor is to determine the ideal location within the construction zone for the crane in relation to the site.

5.8 Materials Handling and Storage

All materials, plant and equipment will be loaded directly into the site and stored on site. At no stage throughout the construction will there be any materials stored outside of the construction zones, or on any public property around the UNSW Kensington site.

5.9 Construction Traffic Management

Refer to Traffic and Car Parking Report for the MS&EB prepared by URaP-TTW for a description of construction traffic access. The traffic management approach for the proposed works will be based on the following principles:

- safe provision for vehicular and pedestrian access;
- minimise traffic and access delays; and
- minimise pedestrian and vehicular conflict; and
- efficient, separate entry and exit of construction vehicles.

The following provides a summary of the key considerations:

- Contractor vehicles/trucks will enter and leave via Gate 2.
- No materials shall be offloaded or picked up directly from the University road network. If this is impractical, permission is to be sought from UNSW to undertake kerbside loading and unloading out of hours.
- When approaching site, all construction traffic will be under the directions of the Contractor's Traffic Controller.
- The Contractor will control access to the construction zone by way of gates (or boom gates) which are overseen/managed by the Traffic Controller during planned periods for vehicular access.
- The Contractor will provide clear advisory information (both passive and active as required) to notify motorists and pedestrians of changed conditions, changes to access routes and to ensure safe access to their destination.
- The Contractor acknowledges that the work will be undertaken within a noise and vibration sensitive environment and that all activities should seek to minimise noise and vibration generation.

5.10 Road Occupancy

Construction work will impact on the operational efficiency of the existing road network that is currently serviced from Gate 2. The activities that will generate the most traffic to and from site are as follows:

- Excavation and removal of spoil;
- Installation of hoardings and site sheds;
- Delivery of construction materials including steel and concrete;
- Installation of prefabricated of precast construction elements; and
- Delivery or transfer of significant equipment and furniture.

Continued access to the buildings serviced by Union Road, College Road and 3rd Avenue is a key requirement for the implementation of the MS&EB. As part of the project, the surface of Union Road will be re-levelled to suit the ground level interface and loading areas within the new MS&EB. The works to Union Road will need to be carefully coordinated with completed zones to ensure access for pedestrian and vehicles to existing buildings is maintained.

5.11 Road Signs

All temporary roadwork signs shall comply with AS 1742.2-2002 and shall be suitable for use on RTA roads.

5.12 Waiting Zones

Waiting zones for construction vehicles will be coordinated within the Construction Zone or in designated areas on High Street (subject to the Contractor obtaining necessary approvals from UNSW, Randwick City Council and RTA (if applicable). Under no circumstances are construction vehicles permitted to wait in UNSW road network, on UNSW marked loading zones or UNSW parking spaces without the prior approval of UNSW.

5.13 Pedestrian Public

The ability for pedestrians to access Union Road will be maintained at all times. The ability for pedestrian to move from High Street/Gate 2 to access buildings D7, E8, F8 F10 and the University Mall must be maintained at all times. The Contractor is responsible for providing clear signage and protective measures to ensure safe pedestrian access should any of these routes change.

5.14 Construction Personnel Access

All construction personnel will be inducted to enter the site via site offices on the south end of Building D10. Provision will be made for an emergency exit gate on the western side of the construction compound to allow construction personnel to meet at a safe emergency evacuation point.

5.15 Neighbour Management

In order to ensure that UNSW neighbours are fully informed and aware of the proposed construction activities the Contractor will provide regular updates to the project's nominated UNSW Communications Officer who will also be available to respond to specific issues that may be raised by UNSW tenants and the general public. The Contractor will nominate a site liaison officer to maintain a high level of dialogue is maintained between UNSW and the Contractor and that project communications protocols are enforced.

5.16 Site Security

The Contractor will provide mechanisms to ensure the site is kept secure at all times and that students, parents, staff and the public are made aware of the construction via signage and/or traffic controllers.

Site security will be set up and maintained as follows:

- Install statutory warning signage to fencing in prominent positions
- The footpaths and roadways will be kept clear and safe for use during the works
- Provision of hoardings and signage to direct pedestrians away and around construction areas
- Provision of security lighting and guard inspections as required
- Ensure the site is secured at the end of each day's work to prevent people climbing scaffolding and entering the site particularly at night and on weekends

The Contractor will ensure safe loading and unloading practices in accordance with

WorkCover and usual practices. During construction, the Contractor will minimise secondary movements on site by delivering materials as close to their work area as possible.

Construction materials and plant will not be stored on a roadway or footpath. Materials will be stored in such a fashion as to minimise any nuisance to neighbouring properties, students or staff.

5.17 Protection of trees

The site has a number of trees of varying sizes that are proposed to be removed to allow construction of the new building. The exact number and extent of trees to be removed will be subject of an arborist's assessment and recommendations (refer Arborist's Report).

Where possible, trees in the vicinity of the new building will be retained and integrated into the adjacent landscaping or building external works. Trees designated to be "retained" within proximity to the vehicular and pedestrian accessways, are to be fully protected from damage during construction in accordance with the recommendations of the arborist's report. Trees are to be identified by signage as being "retained" and physical barriers are to be installed to prevent damage to the truck or root zone.

5.18 Waste Disposal

The site for the proposed new building is currently open space and on-grade car parking.

The anticipated demolition waste generated (and approximate quantities) is:

- Excavated materials and topsoil (approx 16,000 tonnes)
- Trees and ground vegetation as cleared (approx 50 tonnes).
- Bitumen and concrete kerbing from car park surface (1,000 tonnes)

The following procedures will be adopted for the waste control and rubbish removal during the demolition/construction period:

- The Contractor will ensure the lawful disposal of all solid, liquid and gaseous wastes, debris and rubbish in accordance with the requirements of Authorities having jurisdiction over the works.
- In accordance with UNSW Waste Minimisation Policies, the contractor will separate demolished materials into separate waste streams on-site (including concrete, bricks, blocks, timber, metals, plasterboard, paper and packaging, glass and plastics, oils, etc) and recycle materials wherever possible. Otherwise dispose of waste materials in appropriate landfill.
- All hoppers, chutes, buckets and other containers used for the disposal of waste will be of the types that fully contain the waste material and prevent the spread of airborne particles and dust.
- No fires to be lit on site at any time.
- Bins will be emptied regularly to avoid any odours or spread of debris.

The Contractor will be required to prepare a construction waste management plan (incorporating a Construction Site Waste Minimisation Plan) to ensure that all trades are aware and conform to the above principles.

5.19 Hazardous Materials Disposal

Asbestos and other hazardous materials within the site will be removed by subcontractors in compliance with the recommendations of the Hazardous Materials Report, the Code of Practice for the Safe Removal of Asbestos and other applicable standards and guidelines. Whilst asbestos removal works are being undertaken, air monitors will be used around the proximity of the site to ensure toxicity levels in the air are safely within required levels. Hazardous materials will be secured and placed in lined and sealed transport bins. These bins will be transported to the approved landfill conforming to EPA guidelines. Tipped volumes of hazardous materials will be recorded for evaluation by UNSW against the volumes presented in the hazardous materials audit.

The Contractor will comply with WorkCover Codes of Practice and engage a licensed hygienist to certify the site to be free of hazardous materials. Certification may be staged as required to suit handover of areas.

5.20 Dust Control

The Contractor is to control dust by watering (or other approved means) of demolition material during demolition and loading activities to prevent airborne dust particles being generated. Additional precautions include the covering of haulage trucks with a tarpaulin, the use of mobile water points during the hammering of concrete. Use of suitable Class A fencing around the site including silt control measures will also reduce the spread of dust out of the site.

5.21 Noise Control and Hours of Operations

Refer the requirements of the *Demolition Noise and Vibration Management Plan* prepared by SLR Consulting. All practicable steps will be taken to reduce the noise and vibration arising from the construction activity. Noise restrictions apply in accordance with *Clause P.39: Dust and Noise* of UNSW's Standard Preliminaries.

Hours of work will be restricted in accordance with the conditions of consent assumed to be:

- Monday to Friday 7:00am – 6:00pm
- Saturday 8:00am – 5:00pm
- No work on Sunday & Public Holidays.

5.22 Complaints Mechanism

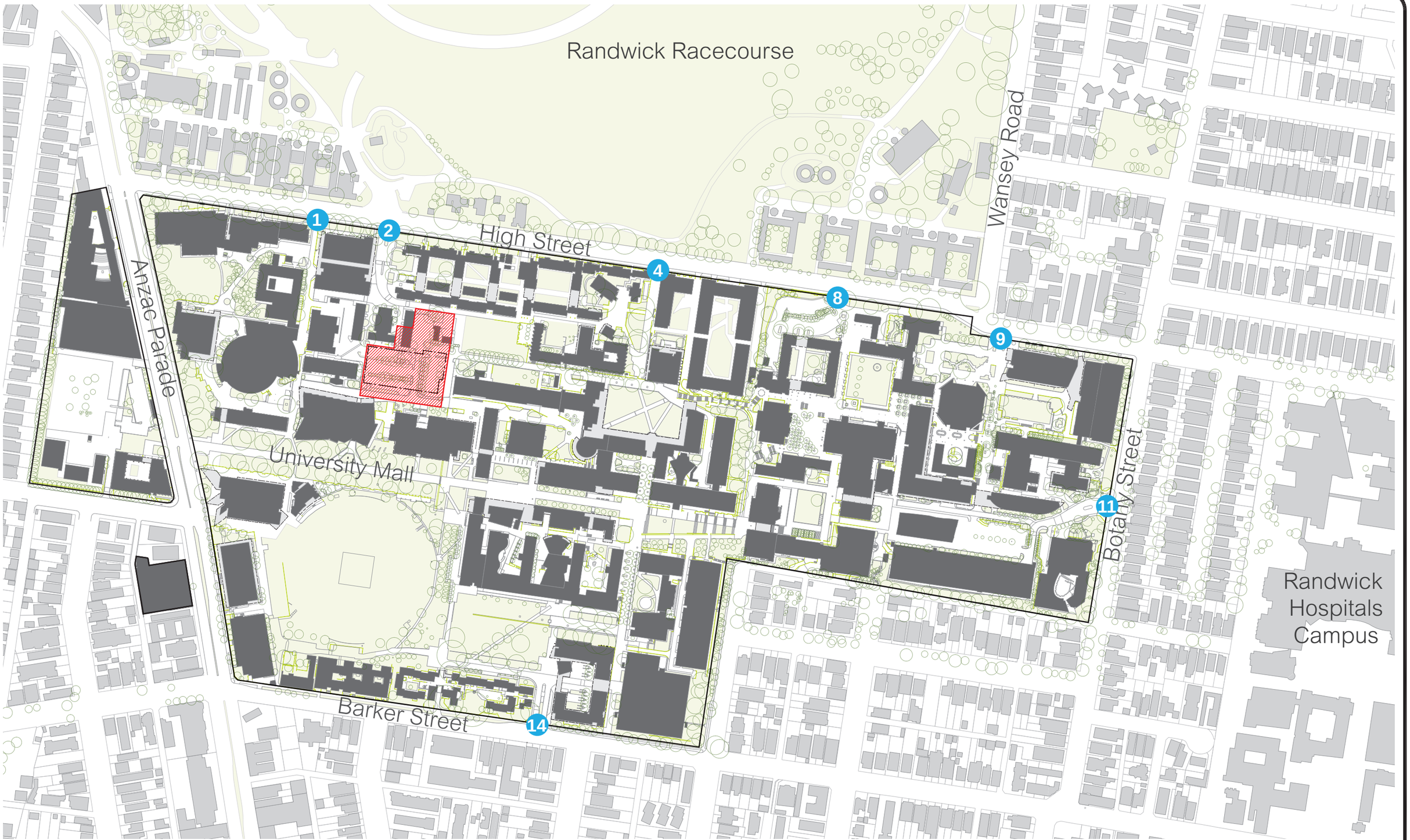
From the commencement of site activities until completion of the works the Contractor will be required to maintain a site liaison officer on the project. This officer with be contactable by both a mobile phone and email and the contact details will be clearly advertised on site hoardings, community updates and the like. Any members of the community with complaints or concerns regarding construction activities will be able to contact this officer to express their concerns. The Contractor will be required to maintain a register of complaints and to report on the status of complaints on a monthly basis. In addition the University will provide site signage that clearly notes the relevant contact within the University with responsibility for addressing complaints during the construction phase.

6. EROSION AND SEDIMENT CONTROL

The Contractor will be required to manage the erosion and sediment control in accordance with the Randwick City Council's *Sediment & Erosion Control Plan* guidelines, Landcom's *Managing Urban Stormwater, Soils and Construction Guidelines,* and will be required to undertake the following:

- Provide silt barriers and limit construction methodologies which produce run off
- Maintain all erosion control devices and measures in good working order, at all times for the duration of the works.
- Remove excess construction spoil from excavation areas immediately, stockpile and cover on site appropriately prior to timely removal
- Locate stockpiles away from drainage lines and street drains and gutters
- Protect gutters and storm water drains by appropriate barriers. Monitor barriers for build-up of sediment and the like, remove excess sediment and add to on-site stockpiles. Do not flush sediment materials down the gutter.
- Divert clean water sources from the site.
- Trap sediment as close as possible to the source utilising sediment fencing.
- If water is stored on site, it must be filtered in order to capture all sediment before releasing it into the storm water system.
- Excess materials such as cement, water from tool cleaning, paint brushes and brick and concrete slurry must not be washed into the storm water system.
- Where possible, construct a depression or earth dam below brick, concrete or tile cutting. If this is not possible, pass site water through a filtered pit.
- Backfill services trenches with specified materials immediately after services are laid.
- Connect downpipes to the storm water drainage system as soon as roofing is completed.

ATTACHMENT A – MSEB CAMPUS LOCATION PLAN



Key

- Extent of Work
- Material Science and Engineering Building Footprint
- 1 Gate Number

Note: This drawing is indicative and should be read inconjunction with final Architectural drawing set.

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THE UNIVERSITY OF NEW SOUTH WALES
FACILITIES MANAGEMENT

Created 04/10/12	Last Modified 10/10/12	Campus KENSINGTON	Campus No: KENC
Drawn Kuhu Gupta	Approved Eddie Swat	Location E10, Materials Science and Engineering Building	
Discipline P&D	Scale	Title Campus Location Plan - Contractor's Compound	
Section Planning and Development	CAD Reference	Drawing No: MS&EB - 03	Sheet No: 1 of 1 / Revision PRELIM