

RICHARD CROOKES  
  
CONSTRUCTIONS

SYDNEY BIOMEDICAL ACCELERATOR  
1330

# CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

30 June 2025



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Modified (PMP extract for dedicated CEMP)

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# APPENDICIES

Modified (PMP extract for dedicated CEMP)

		Status: Y, N
<b>4</b>	<b>ENVIRONMENT</b>	
4.1	RCC Environment Policy	Yes
4.2	Environmental Risk Matrix	Yes
4.3	Environmental Controls	Yes
4.4	Project Roles, Responsibilities and Authorities Matrix	Yes
<b>6</b>	<b>ASSOCIATED PLANS/DOCUMENTS</b>	
6.1	Dewatering Management Plan	Yes
6.2	Construction Traffic and Pedestrian Management Plan	Yes
6.3	Construction Noise and Vibration Management Plan	Yes
6.4	Construction Waste Management Sub-Plan	Yes
6.5	Construction Flood Emergency Management Plan	Yes
6.6	Remediation Action Plan	Yes
6.7	Asbestos Management Plan	Yes
6.8	Erosion and Sediment Control Plan	Yes
6.9	Erosion and Sediment Details	Yes
6.10	Community Consultation and Engagement Plan	Yes
6.11	Heritage Induction	Yes
6.12	Project specific forms	Yes

## 4 ENVIRONMENTAL MANAGEMENT

### 4.1 RCC ENVIRONMENTAL MANAGEMENT SYSTEM (EMS) OVERVIEW

Richard Crookes Constructions (RCC) is committed to best practice environmental management and operates in compliance with an AS/NZS ISO 14001 verified Environmental Management System (EMS), with ongoing accreditation maintained since initial certification in 2010.

RCC's corporate EMS establishes the framework for managing its operational environmental impacts via policies, forms and procedures.

Our approach to environmental management reflects our First Step Safety value, promoting and encouraging a sustainable environment that embraces legislative compliance and aims to minimise environmental impacts via the implementation of robust and site-specific management plans, waste minimisation and the use of proven practices to minimise the impact of potential environmental pollutants.

### 4.2 ENVIRONMENTAL MANAGEMENT PLAN

This Construction Environmental Management Plan (CEMP) has been prepared as a standalone document from regular inclusion within Section 4 of RCC's overarching Project Management Plan (PMP). While modified to suit the requirements of the Sydney Biomedical Accelerator (SBA) project, section numbering has been maintained for consistency with RCC systems.

This CEMP has been prepared to document how the SBA project will minimise and manage environmental impacts during delivery. The CEMP may be subject to periodic updates during construction to ensure accurate and current information is maintained.

RCC's Environmental Policy has been included in **Appendix 4.4**.

### 4.3 PURPOSE OF THE ENVIRONMENTAL MANAGEMENT PLAN

The purpose of this Environmental Management Plan is to:

- Identify the environmental issues (aspects and impacts) for this project.
- Establish, communicate & implement environmental operational controls to reduce any adverse impacts on the environment from RCC's activities, products and services.
- Implement and Monitor compliance by RCC and its suppliers & subcontractors with the requirements of all relevant environmental legislation, conditions of any applicable licence, approval and permit, regulatory requirements and this CEMP.
- Action any outcomes from incidents or accidents, project audits or other identified non-conformances to continually improve the RCC environmental management system.

### 4.4 PROJECT OBJECTIVES AND TARGETS - ENVIRONMENT

RCC's project level environmental objectives and targets have been listed below.

- Progress in meeting these objectives and targets will be reported in the relevant Project Reports.
- Project specific objective and targets are to be identified, listed and tracked internally.

- ENVIRONMENT
- “O/T” Minimise impacts on the community by action community complaints within 24hrs, no repeat complaints
  - “O” Reduce environmental impacts by investigating, documenting and rectifying non-effective environmental controls.
  - “O/T” Legal compliance by aiming for zero EPA/Local council cleanup notices per year
  - “T” 4 site walks per month documented, excludes wet weather inspections
  - 90% waste recycling on projects that utilise a waste contractor

## 4.5 RESPONSIBILITIES

Refer to the project Responsibilities and Authorities Matrix in **Appendix 4.4**.

## 4.6 ENVIRONMENTAL RISKS/ ENVIRONMENTAL ASPECTS

Potential environmental obligations and risks associated with RCCs projects will be identified in the project risk workshop, as described in Section 1, Project Planning.

Additionally, environmental impacts associated with trades/activities etc will be identified using the Environmental Risk Matrix, **Appendix 4.2**

The Environmental Risk Matrix will be reviewed and updated as a (minimum 6 monthly) and updated in section 4.2 of the PMP. Where risks are identified as medium to high in the matrix, the impacts associated with RCC’s activities, Contractual requirements and consent conditions. Products and services will be deemed as “significant” and require operational controls as described in Appendix section 4.3.

Significant aspects may impact on the environment positively (e.g. recycling) or negatively (e.g. pollution).

The Environmental Risk Matrix will be provided to subcontractors and suppliers as part of the subcontract and supply contracts.

## 4.7 LEGISLATIVE COMPLIANCE

Legislative requirements that apply to the project are detailed in **Appendix 3.8** of the Work Health and Safety (WHS) Management Plan, Legal Requirements Matrix. The legal register has been amended to be project specific.

Where Development Consents, permits or approvals relate specifically to the project, these issues will also be deemed as “significant” and will be included in the project environmental risk assessment, Project Environmental Management Plans & environmental procedures.

The RCC intranet provides a summary of key environmental legislation and how it relates to the company’s activities, products and services.

## 4.8 CONDITIONS OF CONSENT

The following section outlines the compliance requirements of the Conditions of Consent relating to this CEMP. Should any development modifications trigger an update of these requirements, this section will be amended as needed and the revised CEMP distributed as

required. Noting, works relating to SSD-7974 (Mod 3 – Susan Wakil Health Building) will prompt an update of the CEMP for Crown Works Verification Certificate (CWVC) 3.

TABLE 1: CONDITION B18 COMPLIANCE MARTIX

SSD-55388456: CONDITION B18 ENVIRONMENTAL MANAGEMENT PLAN REQUIREMENTS	REFERENCE	Y / N / N/A
Management plans required under this consent must be prepared having regard to the relevant guidelines, including but not limited to the <i>Environmental Management Plan Guideline: Guideline for Infrastructure Projects</i> (DPIE April 2020).	Note	N/A
<b>Appendix A. EMP preparation checklist EMP Guideline</b>	Note	N/A
<b><i>Document preparation and endorsement</i></b>	Note	N/A
Has the EMP been prepared in consultation with all relevant stakeholders as per the requirements of the conditions of consent?	N/A	N/A
Have the views of the relevant stakeholder been taken into consideration? Have appropriate amendments been made to the EMP and does the EMP clearly identify the location of the changes?	N/A	N/A
Has the EMP been internally approved by an authorised representative of the proponent or contractor?	Page 2	Y
<b><i>Version and content</i></b>	Note	N/A
Does the EMP describe the proponent’s Environmental Management System (EMS) (if any), and identify how the EMP relates to other documents required by the conditions of consent?	Sections 4.1 and 4.13.2	Y
Does the EMP include the required general content and version control information?	Pages 2 to 4	Y
Does the EMP have an introduction that describes the project, scope of works, site location and any staging or timing consideration?	Section 4.9	Y
Does the EMP reference the project description?	Section 4.9	Y
Does the EMP reference a Community Stakeholder and Engagement Plan (or similar) or include community and stakeholder engagement actions (if required)?	Section 4.13.2	Y
Have all other relevant approvals been identified? Has appropriate information been provided regarding how each approval is relevant?	N/A	N/A
Has the environmental management structure and responsibilities been included?	Appendix 4.4	Y

SSD-55388456: CONDITION B18 ENVIRONMENTAL MANAGEMENT PLAN REQUIREMENTS	REFERENCE	Y / N / N/A
Does the EMP include processes for training of project personnel and identify how training awareness need will be identified?	Section 4.16.1	Y
Does the EMP clearly identify the relevant legal and compliance requirements that relate to the EMP?	Sections 4.7 and 4.8	Y
Does the EMP include all the conditions of consent to be addressed by the EMP and identify where in the EMP each requirement has been addressed?	Section 4.8	Y
Have all relevant guidelines, policies and standards been identified, including details of how they are relevant?	Section 4.7 and Appendix 4.2	Y
Is the process that will be adopted to identify and analyse environmental risks included?	Appendix 4	Y
Have all the environmental management measures in the EIA been directly reproduced into the EMP?	Section 4.14	Y
Have any additional environmental management measures been reproduced into the EMP?	Section 4.14	Y
Have environmental management measures been written in committed language?	Section 4.14	Y
Have project environmental management measures, including hold points, been identified and included?	Section 4.13.3	Y
Are relevant details of environmental monitoring that will be carried out included?	Section 4.15	Y
Have the components of any environmental monitoring programs been incorporated?	Section 4.11	Y
Are environmental inspections included?	Section 4.15	Y
Does the EMP document all relevant compliance monitoring and reporting requirements for the project?	Section 4.15	Y
Does the EMP describe the types of plans or maps (such as environmental control maps) that will be used to assist with the management of environmental matters on site?	Section 4.14.2	Y
Does the EMP list environmental management documents?	Section 4.13.2	Y
Is an auditing program referenced?	Section 4.15.3	Y
Does the EMP include the incident notification and reporting protocols that comply with the relevant conditions of consent?	Section 4.14	Y

SSD-55388456: CONDITION B18 ENVIRONMENTAL MANAGEMENT PLAN REQUIREMENTS	REFERENCE	Y / N / N/A
Does the EMP identify the project role/position that is responsible for deciding whether an occurrence is an incident?	Section 4.14	Y
Does the EMP describe a corrective and preventative action process that addresses the requirements?	Section 4.20	Y
Does the EMP include details of a review and revision process that complies with the requirements?	Section 4.2	Y

TABLE 2: CONDITION B19 COMPLIANCE MATRIX

SSD-55388456: CONDITION B19 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	REFERENCE
Prior to commencement of construction, the Applicant must submit a Construction Environmental Management Plan (CEMP) to the Certifier and publish a copy of the CEMP on the Applicant's website in accordance with condition A26 (Access to Information). The CEMP must include, but not be limited to, the following:	Note
(a) Details of:	N/A
(i) Hours of work;	Section 4.8.2
(ii) 24-hour contact details of site manager;	Section 4.8.3
(iii) Heritage induction for staff;	Appendix 6.11
(iv) Management of dust and odour to protect the amenity of the neighbourhood;	Section 4.14.1
(v) Stormwater control and discharge	Section 4.14.3
(vi) Measures to ensure that sediment and other material are not tracked onto the roadway by vehicles leaving the site;	Sections 4.14.1 and 4.14.2
(vii) Groundwater management plan including measures to prevent groundwater contamination;	Section 4.14.4
(viii) External lighting in compliance with AS 4282:2019 Control of the obtrusive effects of outdoor lighting;	Section 4.14.12
(ix) Community consultation and complaints handling;	Sections 4.1.6.2 and 4.16.4

SSD-55388456: CONDITION B19 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	REFERENCE
(b) Construction Traffic and Pedestrian Management Sub-Plan (see condition B20);	Section 4.14.7
(c) Construction Noise and Vibration Management Sub-Plan (see condition B21)	Section 4.14.8
(d) Construction Waste Management Sub-Plan (see condition B22);	Section 4.14.9
(e) Construction Flood Emergency Management Plan (see condition B23)	Section 4.14.10

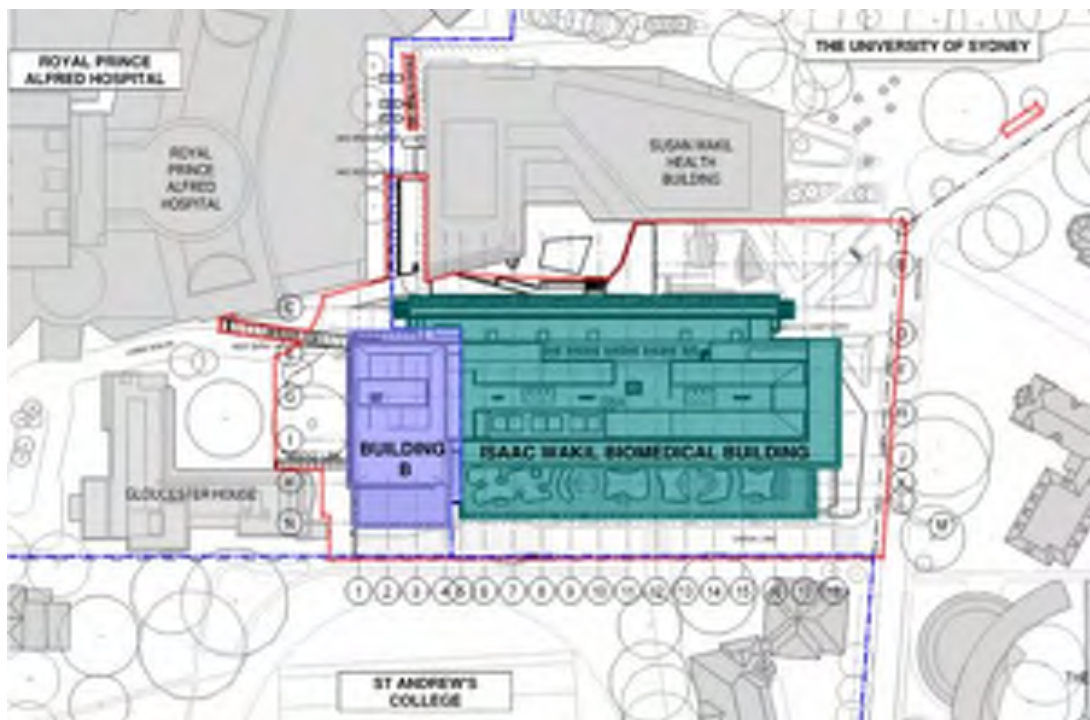
## 4.9 PROJECT OVERVIEW

### 4.9.1 PROJECT DESCRIPTION

The Sydney Biomedical Accelerator (SBA) is a co-funded partnership project between the NSW Government (NSW Health), Sydney Local Health District (SLHD) and the University of Sydney (USYD), comprising a state-of-the-art biomedical research complex spanning SLHD’s Royal Prince Alfred Hospital (RPAH) campus and University of Sydney’s Camperdown Campus Health Precinct.

The site is located on the corner of Western Avenue and Cadigal Lane in Camperdown. The University of Sydney (Lot 1 DP1171804) and Royal Prince Alfred Hospital (Lot 1000 DP1159799). The overall site has an area of 8,600sqm and is bound by existing Royal Prince Alfred Hospital and the Susan Wakil Health Building to the North, Western Avenue and Wesley College to the East, Cadigal Lane and St. Andrews College to the South, and Gloucester House to the West.

FIGURE 1: SITE LOCATION PLAN



The project involves the Design and Construction of a collaborative world class biomedical research and innovation precinct that will integrate world leading fundamental biomedical science with clinical research and innovation. The SBA development comprises two functional integrated buildings that straddle the University of Sydney’s Camperdown Campus Health Precinct and the adjoining RPAH site.

Within the University of Sydney campus, the development comprises the following:

- Isaac Wakil Biomedical Building (IWBB): approximately 29,050sqm gross floor area (GFA) over 8 floors for physical containment level 2 (PC2) wet lab research, mortuary and advanced anatomy teaching, clinical research facilities, core research facilities and plant space. The IWBB scope also includes all landscaping and inground services works to the Eastern side of the adjusted property boundary.

On the RPAH site, the development comprises:

- Building B: approximately 8,000sqm gross floor area (GFA) over 8 floors of primarily PC2 laboratories with a specialist PC3 laboratory, biobank facility, and plant space. The Building B scope also includes all landscaping and inground services works to the Western side of the adjusted property boundary.

### BUILDING LINKS

The SBA building also includes several physical building links critical to the function and operation of the project, including:

TABLE 3: BUILDING LINKS

FLOOR	RPAH	USYD
Basement 1		Susan Wakil Health Building (SWHB) Overland Flow Path
Level 1	Pedestrian entry	SWHB Back of House and Carpark
Level 2		SWHB Common Area Main campus pedestrian entry
Level 3	RPAH Link Bridge (Level 4)	SWHB Common Area

## 4.10 CONSTRUCTION HOURS

In accordance with Condition C4 of the development Consent, construction, including the delivery of materials to and from site, is restricted to the following hours:

Monday to Friday (inclusive):	7am to 6pm
Saturday:	8am to 1pm
Sunday and public holidays:	No work permitted

RCC’s Site Manager will be responsible for ensuring these hours are strictly adhered to.

## 4.11 24 HOURS SITE CONTACT DETAILS

In line with Condition B19 of the SSDA, this section outlines the 24 hour point of contact for the project.

RCC Senior Site Manager:	Dane Lalic
Mobile Number:	0411 406 559

## 4.12 CONSTRUCTION STAGING

Consistent with the Staging Report prepared in response to Conditions A13 through A16 of the SSDA, construction works are to be delivered in five (5) separate stages. All staging has been named to correspond with the intended delineation of Crown Works Verification Certificates (CWVC). However, staging may be subject to modification should design or construction progress prevent a CWVC to be issued for the full scope of the intended stage.

TABLE 4: CONSTRUCTION STAGING

STAGE	SCOPE	FOECAST PROGRAM <sup>1</sup>
CWVC 1	Civil Works: <ul style="list-style-type: none"> <li>• Stormwater Diversion</li> <li>• Bulk Earthworks</li> <li>• Shoring</li> </ul>	Commencing: June 2025 Stage Completion: Nov 2025
CWVC 1A	Structure Works: <ul style="list-style-type: none"> <li>• Piling</li> <li>• Foundations</li> </ul>	Commencing: July 2025 Stage Completion: March 2026
CWVC 2	Structure Works: <ul style="list-style-type: none"> <li>• Substructure</li> <li>• Inground Services</li> <li>• Services Risers</li> </ul>	Commencing: September 2025 Stage Completion: July 2026
CWVC 3	Structure Works: <ul style="list-style-type: none"> <li>• Superstructure</li> <li>• Building Envelope</li> <li>• Services (horizontal)</li> </ul>	Commencing: January 2026 Stage Completion: September 2026
CWVC 4	Internal Works: <ul style="list-style-type: none"> <li>• Fitout</li> <li>• Services (detail)</li> </ul>	Commencing: April 2026 Stage Completion: Mar 2028
CWVC 5	External Works and Landscaping Commissioning	Commencing: May 2026 Stage Completion: May 2028

<sup>1</sup> Dates noted above are indicative and may be impacted by changes to construction completion due to inclement weather and obtaining necessary approvals. Each stage will not commence until the requisite approvals have been obtained.

## 4.13 ENVIRONMENTAL IMPACTS AND CONTROLS

### 4.13.1 PROJECT ENVIRONMENTAL MANAGEMENT PLANS

Project Environmental Management Sub-Plans describe operations controls to manage environmental issues. The Project Environmental Management Sub-Plans have been developed as part of the consent conditions requirements.

The Site Manager or nominated personnel will inspect the environmental controls in accordance with these plans.

Information on hazardous materials, including each material's potential impact on the environment and measures to be taken in the event of accidental release will be managed via the Hazardous Substances Register on Hammertech.

### 4.13.2 SUPPLEMENTARY ENVIRONMENTAL PROCEDURES

Supplementary procedures required by the contract, development consent, or deemed necessary by the Project Manager are appended to this plan. Where required, these documents have been prepared by a specialist consultant.

Also refer to the RCC intranet for internal procedures relating to the discharge of surface water to stormwater or sewer, waste management, paint and pigment wash up and disposal, and management of concrete waste washdown water.

Supplementary Management Plans relevant to the SBA project are listed below:

- Dewatering Management Plan
- Construction Traffic and Pedestrian Management Plan
- Construction Noise and Vibration Management Plan
- Construction Waste Management Plan
- Construction Flood Emergency Management Plan
- Remediation Action Plan
- Asbestos Management Plan
- Erosion and Sediment Control Plan
- Community Consultation and Engagement Plan
- Emergency Management Plan
- Arboricultural Impact Assessment

### 4.13.3 HOLD POINTS AND STOP WORKS

The hold points established within this section are applicable to the SBA activities. Works associated with the hold points will not proceed without consent from the nominated authorised personnel. Stop works prompts, identified in the Sub-plans and supplementary plans, have also been included in this section.

TABLE 5: HOLD POINTS AND STOP WORKS

ITEM	ACTION REQUIRED	REFERENCE	AUTHORISED PERSONNEL
<b>HOLD POINTS</b>			
<b>Prior to construction</b>	Establish Tree Protection Zone (TPZ) to Tree 54	Arboricultural Impact Assessment Report	Project Manager in consultation with the Project Arborist
<b>Works within a TPZ</b>	<ul style="list-style-type: none"> <li>Prior to works, notify Project Arborist</li> <li>Supervision by Project Arborist</li> </ul>	Arboricultural Impact Assessment Report	Project Arborist
<b>Discharge of water (surface and ground)</b>	<ul style="list-style-type: none"> <li>Daily visual inspection to monitor for visible oil and grease and/or discolouration</li> <li>Water quality tested to verify within permitted parameters</li> </ul>	Dewatering Management Plan	Site Manager / Site Supervisor
<b>Volume of water discharged</b>	<ul style="list-style-type: none"> <li>Weekly monitoring and recording of dewatering volumes</li> <li>Weekly reporting of volumes to the Environmental Consultant</li> </ul>	Dewatering Management Plan	Environmental Consultant (Douglas Partners)
<b>STOP WORKS</b>			
<b>Unexpected find – heritage</b>	<ul style="list-style-type: none"> <li>Cease works immediately and demark area to protect artefact/item/object/site</li> <li>Record details, take photos of the find and ensure that the area is adequately protected from additional disturbance</li> <li>Notify the Principal's Representative (UI Project/Contract Manager) and AMBS project archaeologist for determination of potential significance</li> </ul>	<ul style="list-style-type: none"> <li>Contractors Handbook</li> <li>Condition C28, SSD-55388456</li> <li>Historic Archaeological Assessment</li> <li>Aboriginal Heritage Management Plan</li> </ul>	University of Sydney / Planning Secretary

ITEM	ACTION REQUIRED	REFERENCE	AUTHORISED PERSONNEL
<b>Unexpected find – contamination</b>	<ul style="list-style-type: none"> <li>• Cease works immediately and prevent access to affected area via barrier tape and warning signs</li> <li>• Notify Environmental Consultant, Principal’s Representative (UI Project/Contract Manager) and relevant Authorities</li> </ul>	<ul style="list-style-type: none"> <li>• Remediation Action Plan</li> <li>• Contractors Handbook</li> </ul>	Environmental Consultant (Douglas Partners)

#### 4.13.4 SUBCONTRACTORS AND SUPPLIERS

Sub-contractors, and where relevant suppliers, engaged at the site must meet the environmental management requirements specified in the CEMP.

The Subcontractors are made fully aware of their responsibilities under the terms of the applicable environmental legislation, all subcontractors will be provided a copy of the project Construction Environmental Management Plan and will participate in site induction.

Subcontractors whose activities may have a significant impact on the environment (refer Risk Assessment) will be requested to submit Safe Work Method Statements (SWMS), ITPs or Environmental procedures with details of how they manage any environmental aspects and impacts associated with their activities.

Consideration of normal and abnormal operations, along with emergency scenarios will be included in the SWMS as required.

Subcontractor performance will be monitored against their contract requirements and appropriate environmental management practices are being followed.

#### 4.13.5 CONTAMINATED SITE PROCEDURE & WASTE MANAGEMENT

Projects undertaken by RCC on contaminated sites will have Contaminated Site Assessment (CSA) reports available. The CSA reports are required to be provided as part of planning approvals process of a proposed development.

It is essential that any obligations on recommendation made with the CSA or associated approvals are reviewed in detail.

All relevant CSA reports, documents and relevant approvals will be obtained and reviewed prior to site activities commencing. Operational controls will include any specific procedures described in the report or approvals.

For the SBA project, Douglas Partners has prepared a Remediation Action Plan (RAP) and Report on Supplementary Contamination Investigation. An Addendum to the RAP is under development by Douglas Partners to consider the scope relevant to this phase of works. Details pertaining to the RAP Addendum will be included in the CEMP when available.

Where required, ITPs and/or SWMS will be developed and completed to address requirements of CSAs.

The Site Manager or nominated personnel will notify the site workforce of potential contamination issues associated with the contaminated site development and that they seek advice should problems be identified. Details on the project specific contamination issues will also be delivered to all personnel within the site induction.

The Site Manager or nominated personnel will maintain spoil disposal records using Form 18.1 Record of Waste and Form 18.4 Waste Tracking. Disposal dockets are to be reconciled with quantities of materials leaving the site. Dockets are to be retained for RCC records.

#### 4.13.6 IMPORTED FILL

The Project Manager and/or nominated representative will ensure that records will be maintained of all products such as imported fill, recycled products etc used on site to enable traceability if future health and safety issues arise.

No fill is to be imported to site without a Consultants Validation report for the material that indicates its suitability for the land use.

Form 25.08 Imported fill register will be used along with marked up drawings of the fill areas.

### 4.14 ENVIRONMENTAL MANAGEMENT MEASURES

#### 4.14.1 AIR QUALITY AND DUST CONTROL

The primary impact to air quality during construction is the generation of localised dust associated with bulk earthworks. Given the proximity to nearby sensitive receivers, there is potential for neighbouring properties to be impacted by dust, particularly on windy days. To mitigate these impacts, RCC's project team and earthworks subcontractor will implement the following dust suppression strategies:

- Wetting of ground surfaces via use of hoses, sprinklers and/or water carts to minimise dust generation during ground disturbance
- Equipment and machinery to be switched off when not in use to minimise combustion emissions, where possible
- All haulage vehicles to be fitted with covers to ensure loads are contained when leaving the site compound
- Stabilised access, shaker grid (cattle grid), and washout bay/facility, including ongoing maintenance, will be established to all vehicle access/egress points to prevent tracking of dirt onto the public road network
- Sweep and water haul routes, material handling areas, site entry points as necessary to ensure they remain free of sediment
- Land stabilisation works will be carried out progressively to minimise exposed surfaces. For example, shotcrete batters, compacted road base, piling mats, and covered stockpiles.

#### 4.14.2 EROSION AND SEDIMENT CONTROL

Erosion and sediment control will be instated during the site establishment phase of the project in accordance with the Erosion and Sediment Control Plan and Erosion and Sediment Control details prepared by WScE.

To protect the amenity of waterways, erosion and sediment control measures will be provided in accordance with *'Managing Urban Stormwater, Soils & Construction Guidelines' (the 'Blue Book')* (Landcom, 2004)

Construction vehicles leaving the site will be required to pass over a dedicated Construction Vehicle Access/Egress Gate consisting of a 15m long by 3m wide stabilised pavement and shaker grid with wheel wash facility, which will be monitored and maintained throughout the works.

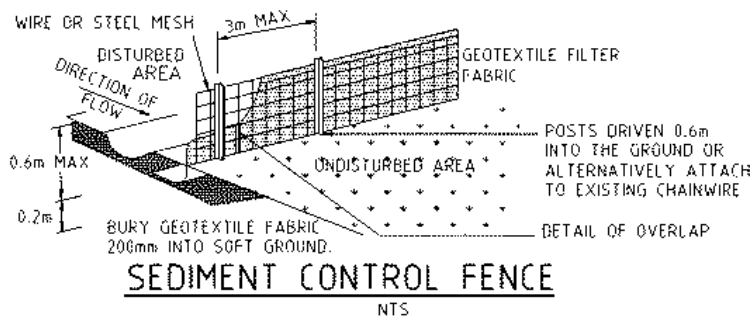
All exposed earth areas where it may be possible for runoff to transport silt down slope will be protected with a sediment and erosion control silt fence, generally installed along the boundaries of the site.

The fence will be constructed in accordance with details provided by the Department of Conservation and Land Management incorporating geotextile fabric which will not allow suspended particles greater than 50mg/L non-filterable solids to pass through, and as such, comply with the Provisions of the Clean Waters Act 1970.

Silt fence construction guidance as follows:

- Geotextile fabric buried to a maximum of 100mm below the surface;
- Overlapping any joins in the fabric; and
- Turning up on the ends for a length of 1m to prevent volumes of suspended solids escaping in a storm event

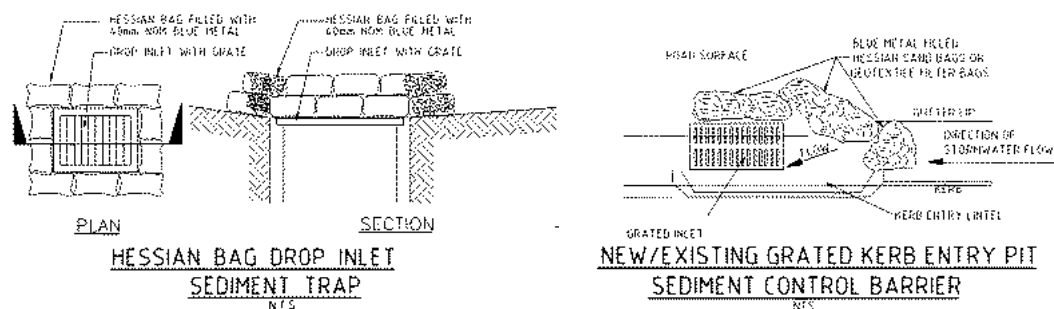
FIGURE 2: SEDIMENT CONTROL FENCE EXAMPLE



Existing stormwater infrastructure will also be protected from incoming sediment via the following methods, which will be subject to monitoring throughout construction and maintenance as required:

- Council owned road kerb inlet pits will be protected by geofabric layers to the pit lid and poly woven silt bags in the gutter, which cannot protrude onto the road beyond the gutter; and
- Internal site drainage pits will be protected by sediment traps.

FIGURE 3: STORMWATER PIT SEDIMENT TRAP EXAMPLE



#### 4.14.2.1 SEDIMENT BASIN

A Temporary sediment basin will be required to capture site runoff during construction. The construction of the basin may be undertaken in stages to enable maximum runoff capture assisted by diversion swales and direct runoff to the basin.

To ensure the sediment basin is working effectively, it will be subject to ongoing monitoring and maintenance during the works. This will include ensuring adequate settle times or flocculation and pumping of clean water to reach the minimum storage volume at the lower level of the settling zone. The settling zone will be identified by pegs to clearly demarcate the level at which design storage capacity is available.

The pumped water from the sediment basin can be reused for dust control during construction.

#### 4.14.3 STORMWATER CONTROL AND DISCHARGE

In accordance with Condition C24 of the SSD, RCC is required to obtain written approval of Council prior to connecting or discharging site stormwater into Council's drainage system. It should be noted that connection of the site's temporary stormwater discharge will be into Sydney Water's drainage system. RCC has contacted Council to advise of the proposed temporary discharge arrangements.

RCC's civil subcontractor, Moits, will be responsible for designing and ongoing maintenance of the temporary stormwater and treatment system. Details pertaining to the proposed system will be included in the CEMP upon finalisation.

Water quality monitoring and discharge will be subject to the proposed methodology outlined in the Dewatering Management Plan prepared by Douglas Partners.

Records of water quality testing and discharge events will be maintained in accordance with Form 18.6 Environmental Inspection Dewater.

#### 4.14.4 GROUNDWATER QUALITY AND CONTROL

Preliminary geotechnical investigations were undertaken by Douglas Partners, with findings documented in a Dewatering Management Plan (DWMP). During this process, water samples were collected from wells within BH501, B502 and BH503A. Bore hole (BH) locations are shown in the below extract of the Test Location Plan (Appendix B, DWMP).

FIGURE 4: TEST LOCATION PLAN



Samples were analysed at a NATA accredited laboratory for a suite of Contaminants of Potential Concern (CoPC). Elevated concentrations of heavy metals (copper and zinc) were detected, which are summarised below.

FIGURE 5: WATER QUALITY RESULTS – ELEVATED CONCENTRATIONS

COPC	RESULTS	AUSTRALIA AND NEW ZEALAND GUIDELINES FOR FRESH AND MARINE WATER QUALITY (ANZG (2018))	NOTES
<b>Copper</b> (BH502)	2 µg/L	1.4 µg/L	Exceeds freshwater guideline (MWG) for the protection of slightly to moderately disturbed freshwater aquatic ecosystems
<b>Zinc</b>	14-23 µg/L	8 µg/L	Detected in all samples (BH501, BH502 and BH503A) with results ranging as indicated, and exceeding MWG.

Contaminants identified in the well samples potentially represent contaminants expected to require treatment prior to disposal.

#### 4.14.4.1 GROUNDWATER INFLOW CONTROL

Groundwater inflows during construction will be controlled by pumping from sumps for discharge to stormwater. Seepage is subject to temporary increase following high rainfall events.

#### 4.14.4.2 WATER QUALITY CONTROL

Seepage water quality must be tested prior to discharge to the stormwater to prevent contamination and adverse impacts during construction.

Water quality testing will be conducted as follows:

- Collection of water samples and quality control samples from seepage water stored in sumps
- Measurement of general groundwater physical parameters (EC, pH and temperature) prior to sampling using a calibrated water quality meter
- Analysis of the samples by an NATA accredited laboratory

#### 4.14.4.3 GROUNDWATER LEVEL MONITORING

Continuous groundwater level monitoring using data logger recording at six hours intervals in monitoring wells within the site is to be undertaken during construction and continued one month after cessation of dewatering.

### 4.14.5 TRAFFIC AND PEDESTRIAN MANAGEMENT

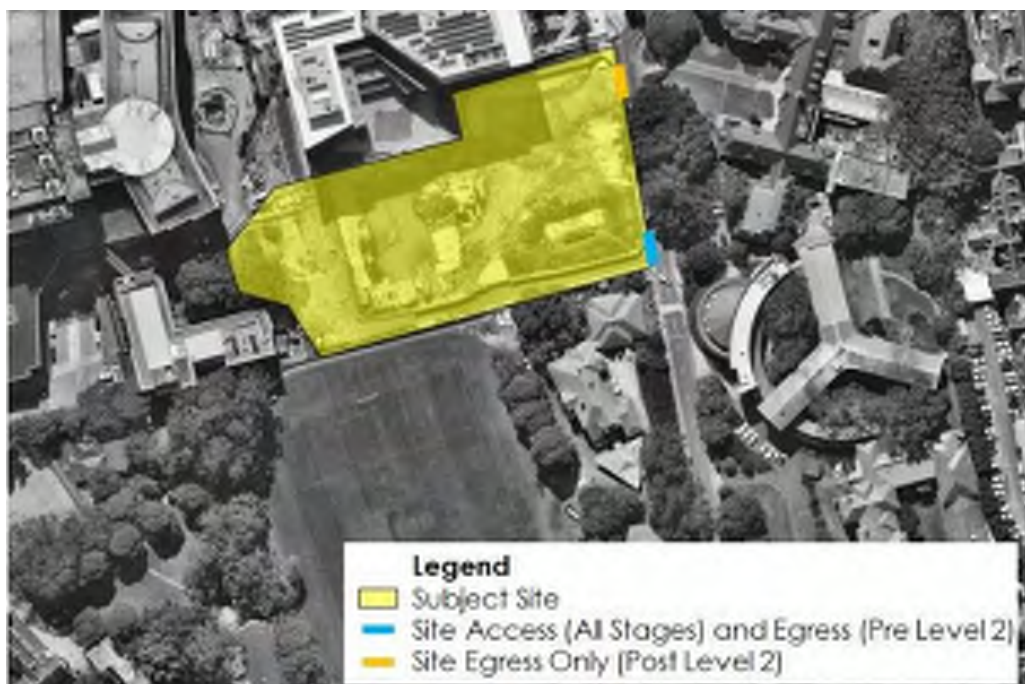
Construction traffic and pedestrian impacts will be mitigated by the implementation of the Construction Traffic and Pedestrian Management (CTMP) Sub-Plan prepared by TTPP. Proposed vehicle and pedestrian management protocols are detailed in the following sections.

#### 4.14.5.1 CONSTRUCTION VEHICLE ACCESS

Construction vehicle access to site will be provided off Western Avenue via Cadigal Lane. Cadigal Lane will be closed to general traffic for the duration of the project. The proposed closure of Cadigal Lane will also prohibit vehicle access to and from the existing underground carpark located just off St Andrews Oval. This site access will accommodate two-way construction traffic during the early works stages.

After Level 2 of the building has been constructed, a secondary access will be provided near the northern boundary of the site, which is also accessed via Western Avenue.

FIGURE 6: PROPOSED CONSTRUCTION VEHICLE SITE ACCESS

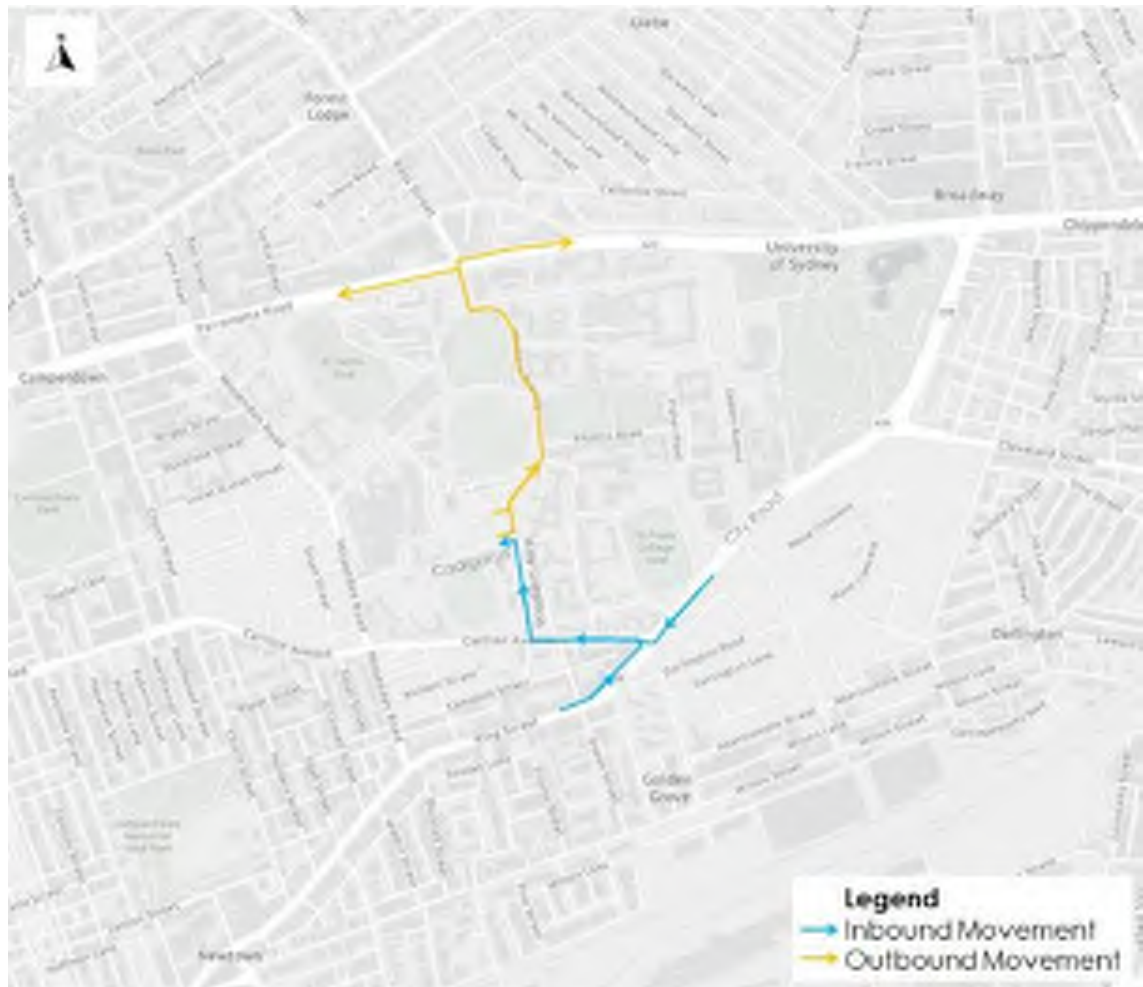


#### 4.14.5.2 CONSTRUCTION VEHICLE HAULAGE ROUTE

Haulage routes have been selected on the basis that construction vehicles are to maximise travel on state and regional roads prior to travelling on local roads.

All construction vehicles are to access the site from City Road/Princes Highway before turning into Carillon Avenue, turning right onto Western Avenue, and then turning into the site. During both early works stage and post-Level 2 stage, all construction vehicles will exit the site by turning left onto Western Avenue before turning onto Parramatta Road.

FIGURE 7: NOMINATED CONSTRUCTION VEHICLE ROUTES



#### 4.14.5.3 PEDESTRIAN MANAGEMENT

Hoarding has been installed and will be maintained around the construction site to create separation between the construction works and pedestrians, including along the eastern boundary of site on Western Avenue.

To the north, A-class hoarding will be installed, which would extend to the courtyard stairway located along the southern boundary of the Susan Wakil Health Building (SWHB), with the stairway to remain partially open. The extension of hoarding across the stairway will be agreed with USYD. To the south, water-filled barriers with anti-gawk screen will be installed along the gutter of the southern footpath to create separation between pedestrians travelling on the footpath and construction traffic in Cadigal Lane.

The western footpath on Western Avenue and the footpath on Cadigal Lane adjacent the site frontage will remain closed per existing conditions, with pedestrian diversions to the footpath along the eastern side of Western Avenue to continue.

Wayfinding signage will be installed to assist pedestrians in navigating around the site, which will be coordinated with USYD.

#### 4.14.5.4 PARKING

Due to the site's proximity to major public transport connections, onsite parking will not be permitted for subcontractors and construction workers. RCC will encourage site personnel to utilise public transport to avoid congestion of the RPAH / USYD road networks and local parking.

#### 4.14.5.5 TRAFFIC CONTROL

To ensure the safe passage of vehicles and pedestrians, dedicated traffic controllers will manage the interface between construction vehicles, pedestrians, and general traffic on Western Avenue as indicated within the Traffic Guidance Schemes contained in Appendix C of the CTMP Sub-Plan.

Advanced warning signs will also be established per the Traffic Guidance Schemes to caution approaching vehicles of the forthcoming modified traffic conditions.

### 4.14.6 NOISE AND VIBRATION

Bulk earthworks and construction of the development have the potential to cause short term noise and vibration impacts to nearby stakeholders. Surrounding sensitive receivers are identified in the table below.

TABLE 6: NEARBY SENSITIVE RECEIVERS

RECEIVER	LAND USE	NOTES
SWHB	Educational	Susan Wakil Health Building to the north of the SBA site
StAC	Student Accommodation	St Andrew's College to the south of the SBA site. Used for student accommodation purposes for approximately 350 students during the year.
RPAH	Hospital	Royal Prince Alfred Hospital to the west of the SBA site
WC	Student Accommodation	Wesley College located to the east of the SBA site
TWC	Student Accommodation	The Women's College located to the south-east of the SBA site
R1	Residential	Nearest residential receiver is located on Campbell Street approximately 270m from the SBA site. Largely shielded from the development by other buildings.

Potential noise and vibration impacts associated with the earthworks and construction activities would likely result from the movement and operation of heavy vehicles and construction plant. The following mitigation strategies will be implemented to minimise these impacts:

- Construction works will be executed in accordance with the Construction Noise and Vibration Management Sub-Plan (CNVMP) prepared by Resonate
- Equipment selection to consider where necessary, silencers, acoustic enclosures and other noise attenuation measures to minimise noise emissions.

- Installation of noise and vibration monitors at locations agreed with RPAH and USYD prior to construction commencing
- Stakeholder consultation to keep nearby sensitive receivers informed of planned activities with potential noise impacts
- Strict adherence to high impact works hours / respite periods per SSD Condition C7 when undertaking rock breaking, rock hammering, sheet piling, pile driving and similar activities

#### 4.14.7 WASTE MANAGEMENT

Waste streams predicted during the construction of the SBA development include excavated spoil and construction waste. Waste management will be prioritised in accordance with the waste hierarchy principles detailed within the Construction Waste Management Sub-Plan (CWMP), which is outlined below.

- Waste generation will be avoided and where avoidance is not reasonably practicable, waste generation must be reduced
- Where avoiding or reducing waste is not possible, waste must be re-used, recycled or recovered.
- Where re-using, recycling or recovering waste is not possible, waste will be disposed.

Waste management areas will be established during construction for temporary onsite storage. Most construction waste will be stored in co-mingled bins for processing offsite to maximise resource recovery. Stockpiles and bins will be appropriately labelled, managed and monitored.

The following mitigation measures will be implemented to minimise the impacts associated with waste handling and disposal:

- Construction works will be executed in accordance with the CWMP
- Waste classification of all material transported offsite in accordance with the EPA's Waste Classification Guidelines, with appropriate records and disposal dockets retained for auditing purposes
- Contaminated/hazardous waste will be handled and disposed of by suitably qualified subcontractors
- Non-recyclable waste will be disposed of at an EPA licensed facility
- Monthly waste reports detailing waste streams, recycling rates and project cumulative totals will be monitored by RCC

#### 4.14.8 FLOOD EMERGENCY

Due to local topography, the SBA site is subject to overland flow flooding from catchment area to the south. The overland flow enters the site from four locations as depicted in the image below (indicated by blue arrows).

FIGURE 8: OVERLAND FLOW PATHS



Flooding at the site will not be preceded by any formal warning. Flooding will typically occur during or immediately following short rainfall events with high intensity rainfall lasting up to six hours. These rainfall events can cause 'flash flooding', which is the main flood risk for the site.

Flooding is anticipated to last a matter of minutes or at worst, several hours.

As construction activities at the site involve bulk excavation works, any area below surrounding ground levels should be treated as subject to flooding during or following heavy rainfall and evacuated as a priority.

Potential localised flooding impacts will be mitigated via the implementation of a Construction Flood Emergency Management Sub-Plan (CFEMP). The following measures will be adopted to minimise flood emergency impacts during delivery:

- All contractors and subcontractors involved in the construction works will be briefed on flood emergency procedures prior to commencing works. This will be delivered as part of the site induction and will identify flood behaviour and risks within the site, actions to take when evacuating, and the designated assembly area.
- RCC's Senior Site Manager and Senior Site Supervisor will sign up to receive weather warnings from the Bureau of Meteorology to ensure preparedness when anticipating inclement weather
- Upon receipt of Severe Weather or Severe Thunderstorm warning, the site will be evacuated in accordance with Appendix B - Evacuation/Emergency Response Process of the Emergency Management Plan.
- Routine emergency evacuation drills will be undertaken during construction to examine the efficacy of RCC's emergency response procedures. Planned scenarios are critical to ensuring preparedness and effectiveness of these procedures during a live event.

#### 4.14.9 TREE PROTECTION

In accordance with the Arboricultural Impact Assessment (Martin Peacock Tree Care) prepared for the SSD, tree protection will be established for Tree 54 (*Cinnamomum camphora* - Camphor Laurel) located within the Gloucester House Courtyard prior to construction. Tree 54 is identified as a Rear Garden Group, which forms part of a group of trees listed in the City of Sydney Significant Tree Register.

FIGURE 9: TREE LOCATION PLAN



FIGURE 10: PHOTOGRAPHIC RECORD OF TREE 54



The required tree protection zone (TPZ) has a radius of 15m, measured from the centre of the trunk at ground level. Installation of trunk protection will also be required to protect the tree when undertaking soft landscaping works in the final stages of the project. Tree specific TPZ requirements will be determined in consultation between the Project Arborist and Project Manager prior to installation. The Project Arborist will inspect and approve the established TPZ prior to construction commencing. During the construction phase, the TPZ will be maintained and regularly inspected by the Project Arborist to ensure the tree's condition is preserved. RCC will also undertake routine inspections on a weekly basis to ensure the integrity of the TPZ is maintained throughout the works.

FIGURE 11: EXAMPLE OF TPZ ESTABLISHMENT

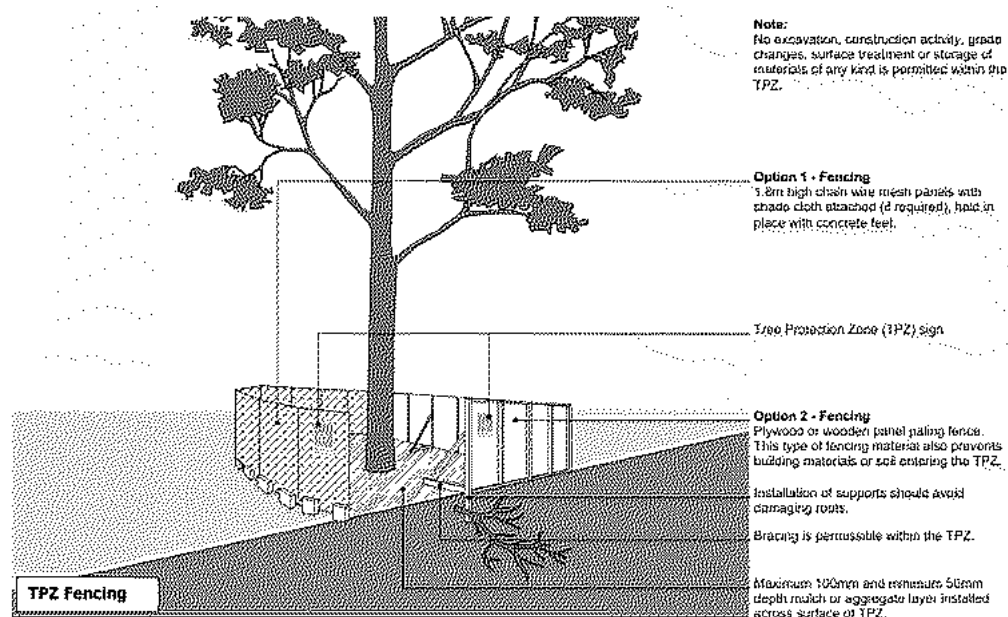
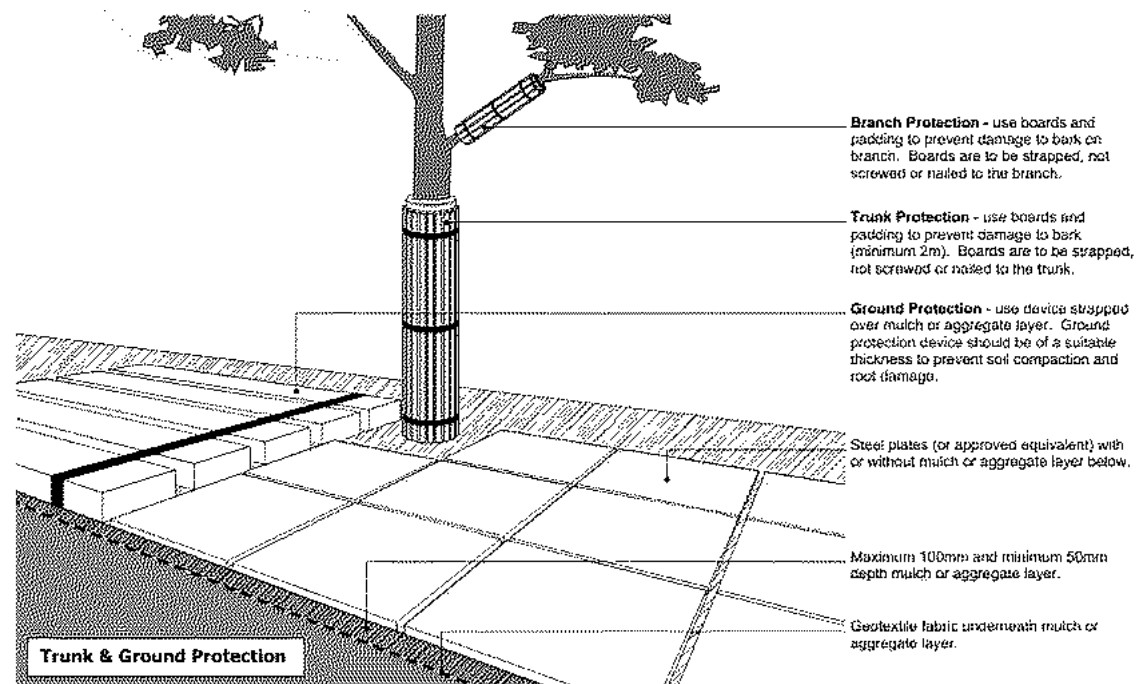


FIGURE 12: EXAMPLE OF TREE TRUNK AND GROUND PROTECTION



Landscaping works within the TPZ of Tree 54 include the installation of pavements, a bench and seating, elevated walkway, a swale and vegetation planting. The proposed works are located on all sides of the tree and represent a Major Encroachment within the TPZ, as defined by *Australian Standard AS 4970 (2009) Protection of trees in Development Sites*.

Stormwater pipe diversion works are also to be undertaken within the TPZ, with the proposed new stormwater pipe location representing a Major Encroachment.

All works undertaken within the TPZ will be supervised by the Project Arborist. To minimise the impact of the proposed works, tree sensitive methods are to be utilised, which include the below:

- Ground protection (plywood sheets or ground mats) will be installed within the TPZ to minimise soil compaction. Access within the TPZ will be restricted to compact machinery (<2T) and pedestrian traffic only.
- Existing organic layer and ground cover vegetation will be carefully removed using hand tools only
- Non-destructive methods of excavation will be used (hand/hydrovac)
- Pavement within the TPZ will be installed above grade including the sub-base layer
- Any surface roots shall be protected with a 50mm covering of blue metal dust (<5mm) prior to installation and compaction of the sub-base layer
- Compaction of the sub-base layer shall be undertaken using pedestrian operated plate compactors only
- The elevated walkway, seating and study table will be installed on piered footings. Where roots >25mm diameter are encountered, the pier location shall be adjusted to allow for retention of roots (unless root pruning is approved and undertaken by the Project Arborist).
- Cultivation of garden beds and installation of planting will be undertaken using hand tools only
- Top dress/mulch will not be built up around the root collar of the tree

#### 4.14.10 HERITAGE

Works on the SBA development involve minor heritage impacts however, careful consideration and planning is still required due to its proximity to adjacent heritage significant listings and its heritage contextual setting. Heritage items directly affected by the SBA works are detailed below:

- Tree 54 (*Cinnamomum camphora* – Camphor Laurel) detailed in Section 4.14.10, is identified as a heritage significant tree due to its vicinity, the State Heritage Inventory listing (S170) for ‘Glouster House Lawn Gardens’ notes that “*the mature trees and camellias in the garden to the east of the lawn are significant and should be retained*”.

To manage potential impacts associated with the proposed works, the following will be implemented:

- All contractors and subcontractors involved in the construction works will be briefed on the heritage significance of the site prior to commencing works. A heritage induction (**Appendix 6.11**) will be delivered as part of RCC’s site specific induction.
- Implementation and appropriate management of a TPZ to Tree 54 (detailed in Section 4.14.10)
- All work involving heritage fabric will be carried out by suitably experienced tradespersons
- As detailed in Section 4.13.3, if an unexpected item (which may include Aboriginal objects; historic (non-Aboriginal) heritage items; or human skeletal remains) is discovered during the works, works will stop immediately and will not recommence until appropriate approvals are received.

The following table provides a summary of the statutory listings provided heritage protection within and adjacent the development area:

TABLE 7: SUMMARY OF HERITAGE LISTINGS

ITEM NAME	STATUTORY LISTING	ITEM NUMBER
The University of Sydney, University Colleges and Victoria Park	State Heritage Register	01974
University of Sydney Heritage Conservation Area	Sydney LEP 2012	Area C5
The University of Sydney locality	Sydney Development Control Plan 2012	Area C5
Royal Prince Alfred Hospital group including buildings and their interiors, trees and grounds	Sydney LEP 2012	I68
St Andrew's College, University of Sydney including main building and interior, quadrangle and grounds	Sydney LEP 2012	I45
St John's College, University of Sydney including main building and interior, quadrangle, gate lodge and interior, fence and gate, and grounds	Sydney LEP 2012	I67
Royal Prince Alfred Hospital – Admission Block	State Heritage Register	00830
Royal Prince Alfred Hospital – Victoria and Alfred Pavilions	State Heritage Register	00829
Gloucester House Lawn Gardens	S170 Heritage Conservation Register	
Gloucester House		
D Block and Gloucester House Drive		
John Hopkins Drive		
Immunology Building		
Missenden Road – Main Front Garden		
Morgue and Chapel		
Resident Medical Officers' Quarters		
Salisbury Street		
Schlink Block Courtyard		

The below extracts from the Sydney Local Environmental Plan (SLEP) 2012 depict the site in relation to heritage context. The SBA development (indicated by blue arrows) is not an individual item on the map, however, falls within the Area C5 heritage conservation area. Specific adjacent items shown on the map are I45, I46, I67 and I68 listed in Table 7 above.

FIGURE 12: EXTRACTS FROM SLEP 2012 (HERITAGE MAPS HER\_002 AND HER\_009)



#### 4.14.11 EXTERNAL LIGHTING

All temporary external lighting required to facilitate the SBA works will be selected and installed/used to minimise the effects of obtrusive lighting in accordance with the requirements of *AS 4282:2019 Control of the obtrusive effects of outdoor lighting*. Mitigation measures to minimise the impact on neighbouring premises and the night sky will consider the following:

- Selected light fittings to have less than the permissible 5% upward spill light (also known as Upward Light Output Ratio (ULOR))
- Mounting orientation - no upward facing lights
- Awnings - overhead protection to block potential upward spill light

#### 4.15 MONITORING

##### 4.15.1 INSPECTIONS AND FIELD TESTING

Environmental site inspections will be undertaken using Form 18.3 located on Hammertech at a frequency listed in the Site Task Checklist, **Appendix 1.3** of the PMP. The form is to be made site specific based on the identified risks.

Field testing of water collected on site (excavations, trenches, paint washout etc) will be tested prior to discharge and results record on the Dewatering & Field Test Sheet. Form 18.6

Other inspections and testing will be performed as required by plans described in Section 4.13.2

##### 4.15.2 PERFORMANCE OF THE CEMP

The Project CEMP will be monitored following implementation:

- Environmental operational controls are being effectively applied.
- Project specific environmental monitoring targets specified in the Development Consent or other planning permits for air, water and noise are met.
- Unpredicted impacts are identified, and remedial action is taken; and
- The project objectives being met.

Responsibilities for monitoring and compliance requirements are detailed in the Project Environmental Plans.

Monthly reports are provided to the RCC Directors for review and the performance of projects against RCC's company objectives and targets is reviewed on a quarterly basis.

### 4.15.3 MONITORING PROCEDURES

Inspections and audits of the site including environmental controls will be undertaken in accordance with RCC standard procedures. The following inspections will be conducted onsite during project delivery:

- Weekly site inspections and environmental walks
- Monthly observations and reviews
- 3-6 monthly internal audits by RCC's Business Systems Manager
- External audits (EMS – undertaken by Global Mark, as interim or recertification)
- Independent Environmental Audit (consistent with Conditions C41 through C45 of the SSD)

## 4.16 COMMUNICATION AND CONSULTATION

### 4.16.1 TRAINING

Prior to the commencement of project activities, all site personnel (including sub-contractors) will attend a site induction. This will include an outline of the requirements of this CEMP and the responsibilities and accountabilities of all site personnel.

The project environmental site rules will be included in the induction session.

Training records will be kept verifying who has attended the training. Refer Site Inductions Section 3.5 of the PMP.

### 4.16.2 COMMUNITY CONSULTATION

The Site Manager or nominated personnel shall conduct and encourage RCC employees and subcontractors to conduct toolbox meetings to address safety & environmental hazards in and around the site, community interactions & feedback, company alerts posted on HQ (Intranet), Client raised environmental issues, safe work practices, coordination and responsibilities.

The Project Manager and/or nominated representative will advise relevant stakeholders of the nature and scope of works.

Refer Appendix 1 Section 6 Community Consultation and Engagement Plan.

### 4.16.3 KEY STAKEHOLDERS

Key stakeholders are generally identified as people or groups of people who are impacted by our operations, and those who have an interest in or influence on what we do.

Key stakeholders relevant to the SBA project have been nominated within Section 2.1 of the Community Consultation and Engagement Plan.

### 4.16.4 COMMUNITY COMPLAINTS

Upon receiving a community complaint, site personnel are to complete Form 18.5 Community Feedback (Complaint Register).

Remedial action must be taken as soon as practical. Noting, it is an RCC objective to have all complaints actioned within 24 hours. Any action taken must be recorded on the form.

The Site Manager or nominated personnel is to include the completed Complaint Register in the site files.

## 4.17 EMERGENCY PLANNING & RESPONSE

Refer to the Emergency Management Plan in Appendix 1 of the PMP.

## 4.18 ENVIRONMENTAL INCIDENT MANAGEMENT

Under the SSD for this development, an incident is defined as “an occurrence or set of circumstances that causes, or threatens to cause, material harm and which may or may not be, or cause, a non-compliance”.

Material harm is further defined as a harm that:

- (a) Involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial; or
- (b) Results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment)

In accordance with Section 7.3 of the Contractor Handbook, a pollution incident includes a leak, spill or other escape of a substance, where pollution has occurred or is likely to occur. Pollution incidents do not include noise. A spill does not need to leave University premises to cause material harm to the environment.

### 4.18.1 INCIDENT CLASSIFICATION

Environmental incidents are classified into one of three Classes that are based on the consequence descriptors for environmental risks. Each of these classifications trigger various management actions and/or legislative requirements depending on the severity of consequence described, where Class 3 represents minor consequences and Class 1 represents major consequences.

TABLE 8: INCIDENT CLASSIFICATION MATRIX

CLASS 3	CLASS 2	CLASS 1
Minor Leak, spill or escape off site of liquids all less than 10lts, Dust, Vibration	Major leak, spill or escape off site of liquids, near miss/dangerous occurrence i.e. plant/equip damage, disruption to services.	Dangerous occurrence, or actual harm to an ecosystem, property loss or clean up exceeds \$10,000

### 4.18.2 INTERNAL INVESTIGATION AND REPORTING

Refer to procedure [QAP-8.5-001](#) for internal incident reporting and investigation (accessible via Holocentric on Crookesnet).

**Class 1:** Class 1 incidents and some cases Class 2 (as determined by senior management) will be investigated, as directed by Business Systems Environmental Manager (BSEM), WHS Head of Safety and/or where required initiate the RCC Business Continuity Plan.

Incident/Investigation Report will be completed by the Site Manager or nominated personnel and will forward to the Project Manager to endorse for review by the BSEM, WHS Head of Safety and reported to Senior management and Executives/Board.

**Class 2:** Some Class 2 will be investigated at the discretion of the BSEM / WHS Head of Safety

The Site Manager or nominated personnel will ensure that all Class 2 and Class 3 incidents in or around the site, involving but not limited to RCC personnel, subcontractors, visitors or passers-by, external authorities, Unions are reported regardless of how minor they appear at the time of the occurrence.

#### 4.18.3 NOTIFIABLE EVENTS

Various Acts and regulations include a specific requirement to notify a Regulatory Authority. Separate to regulatory requirements, planning conditions and contract documentation also include specific notification protocols in relation to environmental matters. When an environmental incident or unexpected find triggers one of these notification requirements, this is classified as a notifiable event.

TABLE 9: NOTIFIABLE EVENTS

EVENT TYPE	LEGISLATION / CONTRACT DOCUMENTATION	TRIGGER FOR NOTIFICATION
Pollution Incident	UI Contractor Handbook	Section 7.3
	SSD-55388456	Condition A28
	POEO Act 1997	Part 5.7
	POEO Act 1997	Section 148
	POEO (General) Regulation 2009	Section 101
Discovery of suspected contamination	UI Contractor Handbook	Sections 4.16.1 and 5.9
	Remediation Action Plan	Appendix Q
Land Contamination	Contaminated Land Act 1997	Section 60(1)
Discovery of a relic	UI Contractor Handbook	Section 5.7.1
	SSD-55388456	Condition C28

EVENT TYPE	LEGISLATION / CONTRACT DOCUMENTATION	TRIGGER FOR NOTIFICATION
	Heritage Act 1977 Section 146	If AMBS project archaeologist advises unexpected find is potential Aboriginal object or significant historical relic

Where a notifiable event occurs onsite, the following measures will be taken to ensure the affected area is not disturbed:

- All plant, substance, structure or other material/object associated with the incident must remain in situ. The person with management or control of the workplace is responsible for preserving the incident site, so far as reasonably practicable.
- Demarcation of the area through means such as barrier tape and warning signs
- The incident site will be preserved unless it prevents any action needed to:
  - o To minimise the risk of further notifiable incident
  - o To facilitate an EPA investigation

#### 4.18.4 EXTERNAL REPORTING

##### 4.18.4.1 UNIVERSITY INFRASTRUCTURE (UI)

###### POLLUTION INCIDENT

In accordance with Section 7.3 of the Contractor Handbook, a pollution incident with potential to materially harm the environment must be reported immediately to the University Infrastructure (UI) Project/Contract Manager and UI Health & Safety Partner ([adrian.powell@sydney.edu.au](mailto:adrian.powell@sydney.edu.au) / 0404 487 470) to advise the notifiable incident.

Any of the above incidents must be followed up with a full written report by the contractor detailing the incident, actions taken and recommendation to avoid a reoccurrence.

In the instance of a notifiable environmental *pollution incident*, University Security must be contacted to ensure compliance with notification requirements of the POEO Act. Refer Section 4.18.3 above regarding definition of a notifiable pollution incident. A pollution incident includes a leak, spill or other escape of a substance, where pollution has occurred or is likely to occur. Pollution incidents do not include noise.

###### UNEXPECTED FIND - CONTAMINATION

As outlined in Section 4.16.1 of the Contractor Handbook, if unknown asbestos containing material (ACM) or other hazardous materials are encountered during works, RCC must contact the UI Project/Contract Manager to discuss required action.

###### UNEXPECTED FIND - HERITAGE

In accordance with Section 5.7.1 of the Contractor Handbook, if unexpected historical archaeological relics or Aboriginal objects are found during works, RCC's Safety Manager and/or Project Manager will immediately notify UI's Project/Contract Manager and the AMBS project archaeologist on (02) 9518 4489.

If UI and/or AMBS confirms the find is a potential significant historical relic or Aboriginal object, the Planning Secretary and Heritage NSW must be notified as outlined in sections 4.18.4.2 and 4.18.4.4 below.

#### 4.18.4.2 NSW DEPARTMENT OF PLANNING, HOUSING AND INFRASTRUCTURE (DPIE)

##### POLLUTION INCIDENT

Pursuant to Condition A28 of the SSD, the Planning Secretary must be notified through the major projects portal immediately after the Applicant (The University of Sydney) becomes aware of an incident.

In accordance with Appendix 2 of the SSD, a written report of the incident must be issued to the Planning Secretary via the major projects portal within seven (7) days after the Applicant (The University of Sydney) becomes aware of an incident. RCC's written report detailed in section 4.18.4.1 above will facilitate reporting to DPIE.

##### UNEXPECTED FIND - HERITAGE

Consistent with Condition C28 of the SSD, if UI and/or AMBS advises an unexpected find is a potential significant historical relic or Aboriginal object, the Planning Secretary must be notified.

As the Applicant, UI will manage notification requirements with DPIE, unless RCC is otherwise instructed.

#### 4.18.4.3 NSW ENVIRONMENT PROTECTION AUTHORITY (EPA)

The EPA will be immediately notified of pollution incidents where material harm to the environment is threatened or caused. Notification will be made via the NSW EPA Environment line on 131 555.

Notification of pollution incidents to the EPA will be managed by University Security, as detailed within section 4.18.4.1 above, unless RCC is otherwise instructed by UI.

For Regulator notifiable incidents, the Site Manager or nominated personnel will notify the Project Manager, Business Systems Environmental Manager and/or WHS Head of Safety to seek advice, then immediately prepare the incident report to facilitate reporting by the client.

Business Systems Environmental Manager and or WHS Head of Safety will confirm and organise legal representation to assist in the preparation of reports, and where required, initiate the RCC Business Continuity Plan.

#### 4.18.4.4 HERITAGE NSW

Consistent with Condition C28 of the SSD, if UI and/or AMBS advises an unexpected find is a potential significant historical relic or Aboriginal object, RCC's Safety Manager and/or Project Manager will notify Heritage NSW via the Environmental Line on 1300 361 967.

### 4.19 INCIDENT DEBRIEF / CLOSURE

Where an investigation is undertaken and it is determined that an "incident debrief" is to be carried out using Form 04 0, the Incident debrief will be distributed to all relevant stakeholders and Senior / Executive Management.

Outcomes of Investigations / findings may initiate an internal Alert for distribution.

### 4.20 NON-CONFORMANCE

In the event of breach in the requirements of the EMP, such as:

- Non-compliance with the RCC/ subcontractors SWMS or other environmental procedures.
- Noncomplying activities noted during site inspections (high risk or potential for legal breach);

- Following concerns regarding potential breaches in environmental legislation raised by RCC, the client or other stakeholders such as local council, Dept of Planning or the EPA.
- Changes to the RCC system or subcontractors' procedures, as a result of corrective or preventative action following an environmental incident, inspection or external audit.

A Non-Conformance Report will be completed electronically and issued to the offending party. Non-conformance register to be maintained.

A copy of the Non-Conformance Notice will be forwarded to the Project Manager and the subcontractor, who will implement appropriate corrective action.

Additionally, Contractors Notices or Main Contractor Notices may be issued in certain circumstances, as described in Section 2 of the PMP.

# APPENDICES



# APPENDIX 4 - ENVIRONMENTAL POLICY, RISK MATRIX AND CONTROLS

## 4.1 RCC ENVIRONMENTAL POLICY

# ENVIRONMENTAL POLICY

---

Richard Crookes Constructions Pty Limited promotes and encourages a sustainable environment throughout our business activities and sources our supplies and services in ways that prevent pollution and promote compliance with legal and other requirements.

The company implements Environmental Management System to aid us in meeting our corporate responsibilities. The System is certified as meeting the requirements of AS/NZS ISO 14001:2016 Environmental Management Systems.

These form part of the company's Project Management Plans and are supported by company procedures and guidelines.

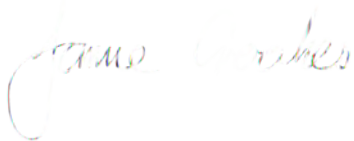
Management intends that all employees of our company, relevant subcontractors and suppliers, are made aware of their environmental responsibilities and the environmental impacts associated with their activities, products and services.

Our company objectives for continual improvement in environmental management include:

- Reducing the number of environmental notices issued on the projects by implementing a program of inductions, training and monitoring.
- Minimising the impacts to the community through the development of project specific Environmental, Traffic management plans, stakeholder consultation plans and by timely and appropriate response to complaints.
- Minimising impacts on the environment using dust, soil and water, waste and chemical management practices that are regularly inspected and maintained.
- Achieve a waste minimisation figure of 85% through monthly reporting

The Continual improvement of the project environmental management plans and progress with achieving the company's objectives will be reviewed during management meetings, project reviews and following the results of internal and external audits.

The Policy will be made available to the public and interested parties on request. This Policy will be reviewed every two years.



**JAMIE CROOKES**

Managing Director

22nd February 2024

## 4.2 ENVIRONMENTAL RISK MATRIX

Appendix 1 Environmental Risk Matrix

Project: Sydney  
Biomedical Accelerator

Construction

RCC Objectives and Targets / KPIs:  
<3 Environmental Notices issued by EPA or Local Council annually  
Action community complaints within 24 hours, no repeat complaints for same issue  
Investigate non effective operational controls / environmental incidents and report

Developed by:		Environmental Aspect - also consider if any legislation applies to activity or environmental aspect. See Intranet Legal and Other Requirements Table																						Impact - No Controls. Refer to EMPs or Operational Controls Table Appendix 4 of PMP		
Activity, Product or Service	Assessment of Significant Environmental Impact (no controls)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22			
		du	od	gr	st	aw	se	la	rew	rem	ree	no	vi	co	fl	fa	wa	lan	li	tr	ah	eh	cc			
		dust	odour	greenhouse	stormwater	Adjoining waterways	sewer	land	resources/water	resources/materials	resources/energy	noise	vibration	community concerns	flora	fauna	waste / chemicals	landfilling	litter	traffic	aboriginal heritage	European heritage	Climatic Change Event			
Site Set Up	likelihood	I					a																m	1. photochemical	#N/A	
	consequence						3																	4	#N/A	#N/A
	risk	1			#N/A	#N/A	1								#N/A	#N/A				#N/A				1	#N/A	#N/A
	Signif y=yes, n=no	Y			#N/A	#N/A	Y								#N/A	#N/A				#N/A				Y	6. pollution of aquatic ecosystem	22. project impact lost productivity
Demolition	likelihood																						a	#N/A	#N/A	
	consequence																							3	#N/A	#N/A
	risk	#N/A			#N/A							#N/A	#N/A	#N/A			#N/A	#N/A	#N/A	#N/A		#N/A		1	#N/A	#N/A
	Signif y=yes, n=no	#N/A			#N/A							#N/A	#N/A	#N/A			#N/A	#N/A	#N/A	#N/A		#N/A		Y	#N/A	#N/A
Hazardous Materials Removal - Asbestos, Lead Paint, SMF	likelihood																						a	#N/A	#N/A	
	consequence																							5	#N/A	#N/A
	risk	#N/A			#N/A									#N/A			#N/A	#N/A	#N/A			#N/A		1	#N/A	22. project impact lost productivity
	Signif y=yes, n=no	#N/A			#N/A									#N/A			#N/A	#N/A	#N/A			#N/A		Y	#N/A	#N/A
Site Stripping & Bulk Earthworks, Transport of spoil, Importation of fill	likelihood																							#N/A	#N/A	
	consequence																							#N/A	#N/A	
	risk	#N/A		#N/A	#N/A	#N/A					#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A		#N/A	#N/A			#N/A	#N/A	
	Signif y=yes, n=no	#N/A		#N/A	#N/A	#N/A					#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A		#N/A	#N/A			#N/A	#N/A	
Remediation	likelihood																						a	#N/A	#N/A	
	consequence																							3	#N/A	#N/A
	risk	#N/A	#N/A	#N/A	#N/A	#N/A						#N/A	#N/A	#N/A			#N/A	#N/A		#N/A	#N/A	#N/A		1	#N/A	#N/A
	Signif y=yes, n=no	#N/A	#N/A	#N/A	#N/A	#N/A						#N/A	#N/A	#N/A			#N/A	#N/A		#N/A	#N/A	#N/A		Y	#N/A	22. project impact lost productivity
Dewatering	likelihood																							#N/A	#N/A	
	consequence																							#N/A	#N/A	
	risk	#N/A			#N/A	#N/A	#N/A										#N/A							#N/A	#N/A	
	Signif y=yes, n=no	#N/A			#N/A	#N/A	#N/A										#N/A							#N/A	#N/A	
Detailed excavation / In ground Services	likelihood																							#N/A	#N/A	
	consequence																							#N/A	#N/A	
	risk	#N/A			#N/A	#N/A						#N/A					#N/A	#N/A						#N/A	#N/A	
	Signif y=yes, n=no	#N/A			#N/A	#N/A						#N/A					#N/A	#N/A						#N/A	#N/A	

Appendix 1 Environmental Risk Matrix

RCC Objectives and Targets / KPIs:  
 <3 Environmental Notices issued by EPA or Local Council annually  
 Action community complaints within 24 hours, no repeat complaints for same issue  
 Investigate non effective operational controls / environmental incidents and report

Project: Sydney  
Biomedical Accelerator

Construction

Developed by:		Environmental Aspect - also consider if any legislation applies to activity or environmental aspect. See Intranet Legal and Other Requirements Table																						Impact - No Controls. Refer to EMPs or Operational Controls Table Appendix 4 of PMP			
Activity, Product or Service	Assessment of Significant Environmental Impact (no controls)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				
		du	od	gr	st	aw	se	la	rew	rem	ree	no	vi	co	fl	fa	wa	lan	li	tr	ah	eh	cc				
Foundations - piling / anchors	likelihood																								#N/A	#N/A	
	consequence																									#N/A	#N/A
	risk	#N/A			#N/A							#N/A	#N/A	#N/A											#N/A	#N/A	
	Signif y=yes, n=no	#N/A			#N/A							#N/A	#N/A	#N/A											#N/A	#N/A	
Foundations - piling	likelihood																								#N/A	#N/A	
	consequence																								#N/A	#N/A	
	risk	#N/A			#N/A	#N/A						#N/A	#N/A	#N/A			#N/A	#N/A						#N/A	#N/A		
	Signif y=yes, n=no	#N/A			#N/A	#N/A						#N/A	#N/A	#N/A			#N/A	#N/A						#N/A	#N/A		
Structure - formwork, reinforcement, concrete & curing, post tensioning	likelihood																								#N/A	#N/A	
	consequence																								#N/A	#N/A	
	risk				#N/A	#N/A						#N/A	#N/A				#N/A				#N/A			#N/A	#N/A		
	Signif y=yes, n=no				#N/A	#N/A						#N/A	#N/A				#N/A				#N/A			#N/A	#N/A		
Wet trades: Blockwork, brickwork, render, waterproof membranes	likelihood																								#N/A	#N/A	
	consequence																								#N/A	#N/A	
	risk				#N/A							#N/A					#N/A					#N/A			#N/A	#N/A	
	Signif y=yes, n=no				#N/A							#N/A					#N/A					#N/A			#N/A	#N/A	
Services - hydraulic, electrical, mechanical, incl. cable chasing, concrete coring	likelihood																								#N/A	#N/A	
	consequence																								#N/A	#N/A	
	risk	#N/A			#N/A							#N/A					#N/A				#N/A			#N/A	#N/A		
	Signif y=yes, n=no	#N/A			#N/A							#N/A					#N/A				#N/A			#N/A	#N/A		
Roofing	likelihood																								#N/A	#N/A	
	consequence																								#N/A	#N/A	
	risk											#N/A	#N/A				#N/A				#N/A			#N/A	#N/A		
	Signif y=yes, n=no											#N/A	#N/A				#N/A				#N/A			#N/A	#N/A		
Finishes - Internal: partitions, ceilings, joinery, door hanging Wet trades: Gyprocking, painting, tiling, floor finishes,	likelihood																								#N/A	#N/A	
	consequence																								#N/A	#N/A	
	risk											#N/A	#N/A	#N/A			#N/A				#N/A			#N/A	#N/A		
	Signif y=yes, n=no											#N/A	#N/A	#N/A			#N/A				#N/A			#N/A	#N/A		
External works - pavements, landscaping, lighting	likelihood																								#N/A	#N/A	
	consequence																								#N/A	#N/A	
	risk	#N/A			#N/A	#N/A						#N/A	#N/A			#N/A	#N/A	#N/A			#N/A			#N/A	#N/A		
	Signif y=yes, n=no	#N/A			#N/A	#N/A						#N/A	#N/A			#N/A	#N/A	#N/A			#N/A			#N/A	#N/A		

## 4.3 ENVIRONMENTAL CONTROLS

# Appendix 4b - Environmental Actions and Monitoring Table

Environmental Aspect (to be read in conjunction with, Environmental Risk Matrix)	Environmental Actions, Controls and Criteria <b>Strike out non relevant activities</b>	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp
		Induction and/or toolbox	RCC	Subcont. SWMS & contracts	Consult reports	Visual	Form 18.3 Environmental Inspection Checklist	Form 40.2 SWMS Compliance	Form 31.1 NCR/ Site Notice Refer PMP Section 4	Check records during audit	
1 Dust Generation  Particulate Emissions  (General)	<ul style="list-style-type: none"> <li>Install shade cloth on perimeter fencing</li> <li>Vehicle corridors will be clearly identified and restricted to control vehicle access onsite.</li> <li>Limit vehicle speed onsite to 20km/hr</li> <li>Fixed and mobile (water tanker) water sprays</li> <li>Reduce work activities /stop work during moderate to high wind velocity periods.</li> <li>Maintain equipment. Smokey plant to be stopped until repair works completed.</li> <li>Turn off vehicle engines whilst not in use (no long periods of idling)</li> </ul>	✓	✓	✓		Daily	Weekly		As required		SS
1 Dust Generation (Demolition)	<ul style="list-style-type: none"> <li>Breakers and crushing equipment to be fitted with dust filtration equipment or water sprays to control dust emissions.</li> </ul>			✓		Daily	Weekly during works	✓	As required		SS
1 Dust Generation (Construction)	<ul style="list-style-type: none"> <li>Minimise areas of site disturbed and stage works where possible.</li> <li>Dust suppression strategies to be used, i.e. water sprays, soil binders, hydromulching, controlled speed onsite, roadbase + shaker grids.</li> <li>Stockpiled topsoils and rubble will be restricted to 4m high. Stabilise if insitu for &gt;4-6months.</li> <li>On site drilling or coring operations will be undertaken by equipment fitted with air filtration equipment.</li> </ul>	✓	✓			Daily	Weekly		As required		SS

## APPENDIX 4B - ENVIRONMENTAL ACTIONS AND MONITORING TABLE

Environmental Aspect (to be read in conjunction with Appendix 4a, Environmental Risk Matrix)		Environmental Actions, Controls and Criteria <b>Strike out non relevant activities</b>	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
2	Odour	<ul style="list-style-type: none"> <li>If odorous materials uncovered, recover immediately.</li> <li>Seek advice from consultant regarding soil /materials management.</li> </ul>		✓		✓	Daily	Weekly		As required		SS
3	Greenhouse	<ul style="list-style-type: none"> <li>Ensure purchased electrical products/whitegoods products comply with specification for CFCS &amp; energy ratings</li> <li>Low solvent paints to be used as a priority</li> <li>Building to conform to AGRB or GreenStar performance criteria</li> <li>Deliveries / transport from site effectively planned to limit inefficient transport, assist back loading etc</li> </ul>		✓						As required	✓	CA SS
4	Stormwater (Discharge from sedimentation basins, flooding)	<ul style="list-style-type: none"> <li>Water quality to meet ANZECC Water Quality Guidelines.</li> <li>→ Conduct water quality test (external test company) NTU and TSS to determine the best treatment and acceptable levels - (Generally) PH 6.5- 8.5, Turbidity &lt;50NTU, No visible oil &amp; grease</li> <li>Obtain advice for use of flocculants to settle sediment from water.</li> <li>Sedimentation pond to be maintained at low levels to ensure capacity during rainfall event.</li> <li>DO NOT DISCHARGE IF CONTAMINANTS SUSPECTED. Obtain advice.</li> </ul>	✓	EP-001		✓	Daily during discharge	Weekly		As required	✓	SS

APPENDIX 4B - ENVIRONMENTAL ACTIONS AND MONITORING TABLE

Environmental Aspect (to be read in conjunction with Appendix 4a, Environmental Risk Matrix)		Environmental Actions, Controls and Criteria <b>Strike out non relevant activities</b>	Operational Controls			Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
5	Adjoining waterways (dewatering, soil erosion & runoff)	<ul style="list-style-type: none"> <li>Temporary drainage systems will be established to divert clean waters around the land development areas as appropriate.</li> <li>Erect silt fences, bunds and construct swale drains.</li> <li>Concrete Bunded washouts plastic lined</li> <li>Inspect atleast weekly &amp; after rainfall.</li> </ul>	EP-001		✓	Daily during discharge	Weekly		As required	✓	SS

## APPENDIX 4B - ENVIRONMENTAL ACTIONS AND MONITORING TABLE

Environmental Aspect (to be read in conjunction with Appendix 4a, Environmental Risk Matrix)		Environmental Actions, Controls and Criteria <b>Strike out non relevant activities</b>	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
5	Adjoining waterways (dewatering, soil erosion & runoff)	<ul style="list-style-type: none"> <li>Maintain and/or replace as required.</li> <li>Refer NSW Department of Environment and Heritage, Managing Urban Stormwater, commonly known as the 'Blue Book' (4<sup>th</sup> edition 2004).</li> <li>Street sweepers will be employed on regular basis.</li> </ul>										

## APPENDIX 4B - ENVIRONMENTAL ACTIONS AND MONITORING TABLE

Environmental Aspect (to be read in conjunction with Appendix 4a, Environmental Risk Matrix)		Environmental Actions, Controls and Criteria <b>Strike out non relevant activities</b>	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
6	Sewer (Trade waste)	<ul style="list-style-type: none"> <li>No paints or other chemical to be poured down drains.</li> <li>If required, obtain trade waste licence for discharge or local council approval.</li> </ul>		EP-001		✓				As required	✓	SS

## APPENDIX 4B - ENVIRONMENTAL ACTIONS AND MONITORING TABLE

Environmental Aspect (to be read in conjunction with Appendix 4a, Environmental Risk Matrix)		Environmental Actions, Controls and Criteria <b>Strike out non relevant activities</b>	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
7	Land  (Acid sulphate soils, contaminated soils, imported fill)	<ul style="list-style-type: none"> <li>Stop work if unexpected potentially contaminated soils are encountered.</li> <li>Obtain waste classification from consultant in accordance with EPA guidelines Environmental Guidelines: Assessment, Classification &amp; Management of Liquid &amp; Non-Liquid Wastes (June 2004) <a href="http://www.environment.nsw.gov.au/waste/envguidlms/index.htm">www.environment.nsw.gov.au/waste/envguidlms/index.htm</a>.</li> </ul>	✓		✓	✓	Daily	Weekly	✓	As required	✓	SS
		<ul style="list-style-type: none"> <li>Where required a Remediation Action Plan will be developed and implemented.</li> <li>Sign off by Site Auditor may be required to validate cleanup.</li> <li>Any groundwater or ponded rainwater will be tested and classified by consultants prior to disposal.</li> <li>Check geotech requirements. Ensure soil classification suitable for land use ie. Schools, residential, commercial etc.</li> </ul>	✓	EP-002	✓	✓	Daily	Weekly	✓	As required	✓	SS

## APPENDIX 4B - ENVIRONMENTAL ACTIONS AND MONITORING TABLE

Environmental Aspect (to be read in conjunction with Appendix 4a, Environmental Risk Matrix)		Environmental Actions, Controls and Criteria <b>Strike out non relevant activities</b>	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
7	Land	<ul style="list-style-type: none"> <li>Potential for acid sulphate soils will be assessed based on the sites proximity to low-lying coastal areas eg. coastal plains, wetlands and mangroves where the surface elevation is less than five metres above mean sea level.</li> <li>If odorous soils (rotten egg gas) or grey/yellowed mottled soils encountered, stop work.</li> <li>If suspected, consultant to prepare Acid Sulphate Soil management Plan (ASSMP).</li> <li>Excavation and neutralisation to be supervised by consultants as per ASSMP.</li> <li>The requirements to import fill will be minimised by utilising on site cut material wherever possible.</li> <li>All analysis certificates shall be handed over as part of the completion documents to the client.</li> <li>Record all imported fill on Form 25.08 - Product Identification &amp; Traceability.</li> <li>Mark up locations where fill compacted in site plan. Survey if required.</li> </ul>										
8	Resources - water, materials, energy	<ul style="list-style-type: none"> <li>For design and construct jobs, refer to the design specification for ESD requirements and product choices.</li> <li>Buy local wherever possible to reduce impacts of transport on environment.</li> </ul>		✓		✓					✓	PM

## APPENDIX 4B - ENVIRONMENTAL ACTIONS AND MONITORING TABLE

Environmental Aspect (to be read in conjunction with Appendix 4a, Environmental Risk Matrix)		Environmental Actions, Controls and Criteria <b>Strike out non relevant activities</b>	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
9	Noise	<ul style="list-style-type: none"> <li>Refer to DA for noise restrictions and working hours.</li> <li>Use hoarding or acoustic mats as required.</li> <li>Situate generators and plant away from sensitive receivers.</li> <li>Turn off machinery. Maintain equipment and stop noisy plant until repaired.</li> <li>No early deliveries.</li> </ul>	✓		✓	✓	Daily	Weekly	✓	As required	✓	SS
10	Vibration	<ul style="list-style-type: none"> <li>Conduct dilapidation report prior to work starting.</li> <li>Limit the use of vibratory rollers, rock breakers, impact piling etc adjacent to buildings (&gt;7m).</li> <li>Regenerated noise may also transfer through bedrock and building structures.</li> <li>Obtain advice if required.</li> </ul>	✓		✓	✓	Daily	Weekly	✓	As required	✓	SS
11	Community Concerns	<ul style="list-style-type: none"> <li>Provide information (eg. Signage, letterbox drops) to community on programmed works</li> <li>Provide contact name for inquires.</li> <li>Advice locals of “noisy” work.</li> <li>If required in noise sensitive areas and/or in response to complaints, engage consultants to undertake monitoring at nominated receivers.</li> <li>Vehicles will not be permitted to queue outside the site or in residential areas unless a defined area is established which does not adversely impact on neighbours.</li> </ul>	✓				Daily	Weekly		As required		PM SS

## APPENDIX 4B - ENVIRONMENTAL ACTIONS AND MONITORING TABLE

Environmental Aspect (to be read in conjunction with Appendix 4a, Environmental Risk Matrix)		Environmental Actions, Controls and Criteria <b>Strike out non relevant activities</b>	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
12	Flora	<ul style="list-style-type: none"> <li>Review planning documentation to determine the presence of any protected, threatened or significant flora. Obtain approvals as required.</li> <li>Engage aborist to develop tree management plan or refer DA and aborist reports.</li> <li>Education and training at site toolbox meetings and induction.</li> <li>Report all sightings to the site manager.</li> <li>Fence or barricade protected flora at the drip zone. Erect Keep Out signage.</li> <li>Do not stack materials under/against trees.</li> <li>The potential for reuse of vegetative wastes by mulching, chipping or on-site placement of trunks or limbs shall be reviewed for each project.</li> </ul>	✓	✓		✓	Daily	Weekly		As required	✓	SS
13	Fauna	<ul style="list-style-type: none"> <li>All native animals protected.</li> <li>Review planning documentation to determine the presence of any protected, threatened or significant fauna. Obtain approvals as required.</li> <li>Site rules/induction to include information regarding of the</li> <li>For injured animals, to relocate call WIRES</li> </ul>	✓	✓		✓	Daily	Weekly	✓	As required	✓	SS

## APPENDIX 4B - ENVIRONMENTAL ACTIONS AND MONITORING TABLE

Environmental Aspect (to be read in conjunction with Appendix 4a, Environmental Risk Matrix)		Environmental Actions, Controls and Criteria <b>Strike out non relevant activities</b>	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
14	Waste	<ul style="list-style-type: none"> <li>Hazardous materials surveys to be completed.</li> <li>Materials to be removed prior to demolition</li> <li>Hazardous waste tracking prior to disposal.</li> <li>Registers and waste disposal requirements as per WorkCover and EPA requirements for removal, storage, transport and disposal.</li> <li>General site wastes - use one bin system and sort in contractors yard to produce quantities of material for recycling, reuse, disposal etc.</li> <li>Empty drums are to be taken off-site for disposal.</li> <li>Empty drums shall be crushed prior to recycling/disposal.</li> <li>Do not overfill skip bins. Provide plenty for use. Cover where potential for windblown litter.</li> </ul>	✓	EP-002	✓	✓	Daily	Weekly	✓	As required	✓	SS
15	Litter											
16	Landfilling	<ul style="list-style-type: none"> <li>Reduce, reuse and then dispose</li> <li>Landfill space scare leading to increased tipping costs</li> <li>Dispose of hard construction wastes for recycled gravels and sands</li> <li>Do not send soil to landfill until alternatives for beneficial reuse have been explored as per consultants advice.</li> <li>Consideration should be given to chipping of the vegetation and reuse</li> <li>Reuse packaging to protect works</li> </ul>		EP-002			Daily	Weekly		As required	✓	SS

## APPENDIX 4B - ENVIRONMENTAL ACTIONS AND MONITORING TABLE

Environmental Aspect (to be read in conjunction with Appendix 4a, Environmental Risk Matrix)		Environmental Actions, Controls and Criteria <b>Strike out non relevant activities</b>	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
17	Chemicals	<ul style="list-style-type: none"> <li>Chemicals to be stored in bunded areas (impervious + 110% of largest container) away from stormwater drains &amp; pits.</li> <li>Refer Workcover Code of Practice for Storage &amp; Handling of Dangerous Goods, EPA Guidelines for Bunding &amp; Spill Management. Appropriate chemicals storage is in conformance with:                             <ul style="list-style-type: none"> <li>→ AS 1940 The Storage and Handling of Flammable and Combustible Liquids</li> <li>→ Storage and Handling of Dangerous Goods WorkCover Code of Practice 2005- refer p. 86</li> </ul> </li> <li>EPA requirements <a href="http://www.environment.nsw.gov.au/mao/bundingspill.htm">http://www.environment.nsw.gov.au/mao/bundingspill.htm</a></li> <li>Ponded water within bunds will not be discharged to stormwater.</li> <li>Fuel and hydraulic leaks to be cleaned up immediately.</li> <li>Drilling muds to be contained within bunds and reused.</li> <li>Liquid paints NOT to be poured down drains. Spread on waste cardboard or similar and leave to dry. Paint brushes to be rinsed and paint solids allowed to settle. Container of paint solids to be disposed to liquid waste facility.</li> <li>Construct concrete washout pit for washout, away from stormwater drains. Send back to batch plant where possible.</li> </ul>	✓	EP-002	✓		Daily	Weekly	✓	As required		SS

## APPENDIX 4B - ENVIRONMENTAL ACTIONS AND MONITORING TABLE

Environmental Aspect (to be read in conjunction with Appendix 4a, Environmental Risk Matrix)		Environmental Actions, Controls and Criteria <b>Strike out non relevant activities</b>	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
	Chemicals	<ul style="list-style-type: none"> <li>Concrete cuttings to be contained and wetvac to prevent runoff into stormwater drains.</li> <li>Storage of bulk fuels (&gt;200L) on site is prohibited. All refuelling shall be undertaken by a mobile facility with appropriate spill control and containment control equipment.</li> <li>MSDS's must be provided to the Site supervisor prior to a chemical being received on site and by subcontractors using chemicals/products.</li> </ul>	✓	EP-002 EP-005 EP-006	✓		Daily	Weekly	✓	As required		SS
18	Traffic	<ul style="list-style-type: none"> <li>Develop and implement traffic management plans. Submit to local council as required.</li> <li>Signage and notices regarding disruptions.</li> <li>Use crushed concrete, mulches etc along site access roads.</li> <li>Install shakers and wheel wash as required.</li> <li>Organise regular street sweeping.</li> <li>Haulage routes and rules will be provided to subcontractors prior to commencing on site.</li> <li>All loads of soil, demolition wastes, general wastes etc are to be tarped.</li> </ul>	✓	TMPs		✓	Daily	Weekly		As required		SS

## APPENDIX 4B - ENVIRONMENTAL ACTIONS AND MONITORING TABLE

Environmental Aspect (to be read in conjunction with Appendix 4a, Environmental Risk Matrix)		Environmental Actions, Controls and Criteria <b>Strike out non relevant activities</b>	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
19	Aboriginal heritage	<ul style="list-style-type: none"> <li>Education and training at site toolbox meetings and induction.</li> <li>It is illegal to destroy heritage items.</li> <li>Review local or regional environmental plans, or on the State Heritage Register is to be consulted prior to work starting onsite.</li> <li>Obtain excavation permit issued by the Heritage Council of NSW if required.</li> <li>Any heritage relics or sites discovered during construction shall be reported to the NSW Heritage Office.</li> <li>Work in the subject area to cease until specialist advice is obtained.</li> <li>The area will be fenced and signs erected to restrict access.</li> <li>Heritage consultants may be required to provide advice on demolition/construction processes and finishes.</li> <li>Notify the Principal's Representative (UI Project/Contract Manager)</li> </ul>	✓	✓		✓	Daily	Weekly		As required	✓	SS
20	European heritage	<ul style="list-style-type: none"> <li>Education and training at site toolbox meetings and induction.</li> <li>It is illegal to destroy heritage items.</li> <li>Check the Aboriginal Heritage Information Management System (AHIMS).</li> <li>Also check the register of the National Estate.</li> <li>Obtain approval from NPWS (Section 90 consent).</li> </ul>	✓	✓		✓	Daily	Weekly		As required	✓	SS

## APPENDIX 4B - ENVIRONMENTAL ACTIONS AND MONITORING TABLE

Environmental Aspect (to be read in conjunction with Appendix 4a, Environmental Risk Matrix)		Environmental Actions, Controls and Criteria <b>Strike out non relevant activities</b>	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
21	European heritage	<ul style="list-style-type: none"> <li>Any evidence of Aboriginal relics discovered during construction shall be reported to the National Parks and Wildlife Service.</li> <li>Local land Land Council representatives may be required to monitor stripping/excavation.</li> <li>Work in the subject area to cease until specialist advice is obtained.</li> <li>The area will be fenced and signs erected to restrict access.</li> </ul>	✓	✓		✓	Daily	Weekly		As required	✓	SS
	Emergency Preparedness:	<ul style="list-style-type: none"> <li>Spill kit onsite.</li> <li>Refer to the MSDS for advice and procedures.</li> <li>All spills must be reported to the FM &amp; cleaned up. Complete RCC Accident /Incident report.</li> <li>Sed pond pumped out regularly to maintain capacity in case of emergency</li> <li>Ensure you know where stormwater drains are and have materials to block them in case of a fire.</li> </ul>	✓	✓			Daily	Weekly		As required		SS

## 4.4 PROJECT ROLES, RESPONSIBILITIES, AND AUTHORITY MATRIX

KEY:  
R Responsible / Accountable for activity  
P Participant in activity  
C Communicate with or to this role

1330 - Sydney Biomedical Accelerator

TASK	Initials of Person Holding Position:											RCC Business Systems Management							Comments			
	Project Director (PD)	Project Manager (PM)	Site Manager (SM)	Project / Site Engineer (PE/SE)	Contracts Administrator (CA)	Design Manager (DM)	Services DM/ Engineer (SerVM)	Cadet (C)	Foreman (F)	OA Officer/ Finishes Foreman (OA)	WHS & Env Coordinator	Leading Hand	Construction Worker	Construction Manager	Business Systems Manager	HR Manager	WHS Manager	Commercial Manager		Bid/ Estimating Manager	Rehabilitation Coordinator	External Auditors
Reports To:	CM	PD	PM/CM	PM	PM/CM	PM	PM	PE/SE	SM	SM	SM	SM	SM									
<b>Project Management</b>																						
Project Management Plan (implement / update)	R	R	P	P	P	P								C	C							
Project Start up meeting	R	R	P	P	P	P																
Team R&R's (establish /communicate)	R	R																				
Meetings / workshops calendar (establish /communicate)	R	R	P	P	P	P																
Lines of communication	R	R	P	P	P	P																
Project Team meetings	R	R	P	P	P	P			P	P	P	P										
Commission Dilap Reports	P	P	P	P	P									C	C							
Audits	P	P	P	P	P	P		P	P	P	P			P	R	P	R	R		R		
<b>Contract Management/ Administration</b>																						
Monthly Project Report (MPR)	R	R	P	P	P	P								C	C							
Monthly Design Report for PMP						R	P															
Budget preparation and importation request						R																
Risk & Opportunity analysis	R	R	P	P	P	P								C	C							
Head Contract Administration	R	R			P	R	P	P														
Procurement Strategy	R	R			P	P																
Procurement Programme / Tender letting schedule	P	P			P	R	P															
Subcontractors Scope of Works					P	R																
Subcontract letting					P	R																
Consultants Scopes					P	P	R															
Consultants PSA's					P	P	P															
Selection of Consultants and Subcontractors	R	R			P	P	P															
Obtain Consultants and Subcontractors Insurance Certificates						R																
Progress Claim preparation and submission	P	P			P	R	C	C														
Manage Client Instructions	R	R	P	P	P	P								C	C							
Manage Head Contract variations						R																
Submit notices of delay	R	R																				
Submit extensions of time notices	R	R																				
Consultant Progress Claims					P	R	P	P														
Purchase Orders			C	C	R																	
Review of invoices	P	P	P	P	R	P	P															
Processing of invoices for payment						R																
Reconciliation of backcharges	P	P	P	P	R	P	P		C													
Records and Archiving post Project Completion	R	R	P		P																	
<b>Program Management</b>																						
Construction Programme - Contract/ Client	P	P			R																	
Target Construction Programme - Subcontractors	P	P			R																	
Construction Programme - Short range			P		R																	
Design Programme - Procurement (based on tender letting schedule)						P	R															
Design Programme - For Construction (based on Target program dates)					P		R															
Design Programme - Short and Mid range activities					P		R															
<b>Authorities</b>																						
Development Consent discharge conditions	P	P			R		P															
Construction Certificates	P	P			R		P															
Consent management- REFs, EDs	P	P			R		P															
WHS /SafeWork state authority management	R	R	P	P					P							P						
Authorities approvals- FRNSW					P		R	P														
Authorities approvals- other					R		P	P														
Utility Provider Approvals					P		R															
Utility site investigations (Dial before You Dig)			P	P			R	P														
<b>Design</b>																						
Design Management Plan	P	P			P		R	P														
RFI Registers					R		P	P														
Design related stakeholder management (client, user groups)					P		R	P														
Design related- Development Consent discharge conditions					P		R	P														
Design Building Practitioner Act MP implementation					P		R	P														
Sustainability requirements/ ESD MP implementation					P		R	P														
Obtain all Sustainability rating tool related info					R		P	R														
Design Meetings - Arrange / Chair							R															
Manage overall Design Coordination					P		R	P														
Services Coordination and Meetings					P		P	R														
Technical/ Specialist discipline Workshops					P		R	P														
High Risk Workshops (Waterproofing, Façade, Fire safety)					P		R	P	P													
Design coordination Meetings and Workshops - Minutes					P		R	P	P													
Design Change (and Departure ) management process set up					P		R	P	P													
Design Submissions - Progress					P		R	P	P													
Design Submissions - milestones &/or packages					P		R	P	P													
Design Presentation - Process					P		R	P	P													
Design Presentations - milestones &/or packages					P		R	P	P													
Sample & Technical Submissions					R		P	P	P													
Prototypes and Mock-ups					R			P	P													
Design Verification/ Document review (Consultants docs)					P		R	P	P													
Design Verification/ Document review (Sub-contractor docs)					R		P	R														
Peer review process management					P		P	R														
Design and Delivery verification - Reo tracking					R	P																
<b>Digital Design</b>																						
BIM Execution Plan					P		R	P														
Digital Co-ordination					P		R															
<b>Document Control</b>																						
Document Control Process - set-up					R		P	P	P													
Document Control Process management					P		P	P	R													
Aconex Protocol					P		R	P	P													
Project Contact and distribution list					P			P	R													
Workflow structure set up for Samples and shop drawings					R				P													
Workflow Template set up on Aconex									R													
Distribution of consultant drawings to key design team							C	C	R													
Distribution of drawings to site team									R													
Initiating and closing out Workflows - shop drawings					P	C	P	P	R													
Initiating and closing out Workflows - samples					P	C	P	P	R													
Aconex Doc register maintenance									R													
Sample register set-up					P			P	R													
Sample register maintenance									R													
Updating drawing racks and periodic reconciliation of drawings									R													
<b>Site Management</b>																						
Set up Subcontractor meetings, communicate and action outcomes					R	P		P		P	P	P										
Manage materials handling bookings					R																	
Coordinate deliveries					R																	
Issue and close out site instructions					R	P	P	P	P	P	P	P										
Site Diary					R																	
<b>Quality Control</b>																						
Prepare and manage Project Quality Plan	P	P			R																	
Develop ITP's and checklists					R			P	P	P	P											
Verify ITP's are completed					R			P														
Organise consultant inspections					P		R			P	P											
Respond to/close out consultant inspections					P		R			P	P											
Issue and close out NCRs and defect notifications					P		R			P	P											

KEY:  
R Responsible / Accountable for activity  
P Participant in activity  
C Communicate with or to this role

### 1330 - Sydney Biomedical Accelerator

TASK	Initials of Person Holding Position: Reports To:											RCC Business Systems Management								Comments			
	AC	JA	DL	BB	MA	PL	ME	LC	MM	TBC	MD	TBC	BN	CM	PM	HR	WHS	Comm	Bid		Rehab	Ext	
Passive Fire Penetration Plan and Schedule coordination				R				P														set-up by PE, allocate progressively to team members	
Maintain Test and Tag registers			R						P	P													
Maintain calibration records/ registers			R						P	P													
<b>WHS Management</b>																							
WHS policies, objectives and targets in compliance with legislative requirements	C	C	C																				
Identification of competency, allocation of WHS responsibilities	C	C	P																				
Assess RCC Service providers WHS compliance ability	C	C	P																				
RCC WHS training- inductions, refresher	P	P	P																				
RCC Safety review and audits	P	P	P																				
Project Risk Assessment Review	R	R	P	P			P	P															
Prepare and manage Project Safety Plan (part of PMP)	C	C	R																			incl updates for legislative changes	
Establish and implement WHS consultation	C	C	R																				
Project WHS Start-up	C	C	R	P																			
Provision of PPE and first aid supplies	C	C	R																				
Inductions and induction records	C	C	R																				
Safety in Design Process- obtain and manage SiD registers				R				R															
Safety in Design Process- set-up and record Workshop outcomes	P	P	P	R				R	P	P	P												
Safety in Design Process- close out report at completion				R																			
Maintain Project Risk Register and controls	C	C	R	P				P															
Prepare and implement SWMS (RCC)	C	C	R																				
Obtain and review Subcontractors SWMS and all WHS related info	C	C	P	P																			
Verify Material, Plant and Equipment physical safety and documentation for compliance with WHS legislation	C	C	R																				
Site Safety Walks	C	C	R	P																			
Safety Meetings, tool box talks	C	C	R																				
Task Observations	P	P	R	P				P	P	P	P												
Investigate incidents (incl near miss) and accidents	P	P	R	P																			
Initiate corrective and preventative action	P	P	R	P																			
Liaise with WHS regulatory authorities	P	P	P																				
Emergency Procedures & Drills	C	C	R	C																			
RCC Injury management program and rehab coordination	C	C	R																				
Collate and report injury and illness data and information	C	C	R																				
<b>Environmental Management</b>																							
EM policies, objectives and targets in compliance with legislative requirements	C	C	C																				
Develop and implement EM procedures	C	C	C																				
Monitor technology changes and management practices	C	C	C																				
Identification of competency, allocation of EM responsibilities	C	C	P																				
Assess RCC Service providers EM compliance ability	C	C	P																				
RCC EM training- inductions, refresher	P	P	P																				
RCC EM compliance verification and audits	P	P	P																				
Project Environmental Risk Assessment Review	R	R	P	P				P	P														
Prepare and manage Project Environmental Management Plan & contract specific environmental documentation	C	C	R																			incl updates for legislative changes	
Obtain and review Subcontractors EM related info	C	C	P	P																			
Waste Management Recycling Reports and site diary data input	C	C	R	C																			
Environmental Inspections, monitoring and testing			R																				
Incident management, procedures, drills and emergency response	P	P	R	P																			
Initiate corrective and preventative action	P	P	R	P																			
Liaise with Environmental regulatory authorities	P	P	P																				
Liaise with community on EM related matters and complaints	R	R	P																				
Site walks- environmental			R																				
<b>Project Completion</b>																							
Completion Checklist and Report production	R	R		P				P															
Fire Safety Certificate process				R				P															
Commissioning management				P				R															
Fire Brigade inspection				P	R			P															
Log and close out Defects / Quality Control				R	P			P															
Occupation Certificate				P	R			P															
Handover activities	R	R		P				P															
Operation & Maintenance Manuals incl.As-Builts, warranties and certifications				R				P															
Close out SiD Register for reference in Manuals				R				P															
Organising Training	R	R																					
Decommission site sheds etc				R																			

# APPENDIX 6 - ASSOCIATED PLANS AND DOCUMENTS

## 6.1 DEWATERING MANAGEMENT PLAN

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## **Dewatering Management Plan**

**Sydney Biomedical Accelerator (SBA)**

**Western Avenue and Cadigal Lane,  
Camperdown**

**Prepared for FDC Construction (NSW) Pty  
Ltd**

**Project 84711.01**

**5 September 2024**

## Document History

### Details

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<b>Project No.</b>	84711.01
<b>Document Title</b>	Dewatering Management Plan
<b>Site Address</b>	Western Avenue and Cadigal Lane, Camperdown
<b>Report Prepared For</b>	FDC Construction (NSW) Pty Ltd
<b>Filename</b>	84711.01.R.010.Rev0

### Status and Review

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<b>Status</b>	<b>Prepared by</b>	<b>Reviewed by</b>	<b>Date issued</b>
Revision 0	David Smith	Nizam Ahamed	5 September 2024

### Distribution of Copies

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<b>Status</b>	<b>Issued to</b>
Revision 0	Michael Baddoui, FDC Construction (NSW) Pty Ltd

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

### Signature

### Date

---

**Author**



5 September 2024

**Reviewer**

p.p. 

5 September 2024

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- Appendix A:** Notes About this Report
- Appendix B:** Drawings
- Appendix C:** Results of the Investigation
- Appendix D:** Summary of Water Quality Results
- Appendix E:** Water Laboratory Reports
- Appendix F:** Summary of Screening Criteria



# Plan Dewatering Management Plan Sydney Biomedical Accelerator (SBA) Western Avenue and Cadigal Lane, Camperdown

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## 1. Introduction

This report prepared by Douglas Partners Pty Ltd (Douglas) presents the results of a dewatering management plan undertaken for the Sydney Biomedical Accelerator (SBA) at Western Avenue and Cadigal Lane, Camperdown (the site). The investigation was commissioned by in an email from Michael Baddoui of FDC Construction (NSW) Pty Ltd and was undertaken in accordance with Douglas' proposal 84711.01.P.005.Rev2 dated 9 May 2024.

It is understood a water management plan is required as a part of a state significant development application (SSD 55388456) to the Department of Planning (DPE) for the disposal of any incidental water (i.e. other sources of water excluding groundwater) into Council stormwater system during construction, there being no requirement for active dewatering to lower the regional groundwater table.

This report provides reference to recent and previous investigations (where relevant) carried out within the site by Douglas. Reference has also been made to the NSW Aquifer Interference Policy (AIP) prepared by NSW Office of Water, dated September 2012 and the NSW DPIE minimum requirements for groundwater investigation and reporting (NSW DPIE, 2021).

This report provides management options and screening values for any incidental water accumulating in any excavations during construction. This report does not include an inflow assessment. Douglas note that an inflow assessment will be required for submission to DEECCW as part of the SSD application.

This report must be read in conjunction with all appendices including the notes provided in Appendix A.

## 2. Proposed development

It is understood that the proposed development comprises the construction of an eight-storey building with single level basement. It is understood the first three levels, and basement, of the proposed SBA complex will connect to the existing Susan Wakil Health Building, to the north. It is also understood that the proposed basement will have a finished floor level in the range of RL 18.0 to 20.8 (AHD). Further excavation will be required for slab and subfloor drainage (where required). Locally deeper excavations will be required for lift cores and footings. It is understood the basement for the SBA will be designed for a drained basement. The SBA complex will also include a physical connection to Gloucester House within the RPAH site. The proposed layout is shown on Drawing 1, in Appendix B.

### 3. Field work

Field work was conducted on 7, 12 and 26 June 2024 in the presence of a geotechnical engineer from Douglas. The investigation included three boreholes (BH501, BH502 and BH503A) drilled to termination depths in the range of 8 m to 14.65 m, below current surface levels, using a track mounted drilling rig. The bores were initially progressed using solid flight augers in the soil and weathered rock profile to a depth of 5.5 m to 8 m. Boreholes BH502 and BH503A were then continued into the underlying rock, to depths in the range of 11.7 m and 14.65 m, using NMLC diamond core drilling techniques to obtain continuous core samples of the rock.

Groundwater monitoring wells were installed in the boreholes, following the completion of drilling. The wells were constructed using 50 mm diameter, machine slotted, Class 18 uPVC. The wells were completed with flush mount "Gatic" covers.

On completion of drilling, the wells were purged of water using a "Twister" pump. A data logger was installed in each well to carry out a rising head test and to continuously measure groundwater levels for one month.

Construction details of the standpipe piezometer within each borehole and an initial water level reading are included in the attached borehole logs in Appendix C.

The boreholes were logged by a geotechnical engineer from Douglas. The locations of the boreholes are shown on Drawing 1 in Appendix B and the geotechnical borehole logs and notes about soil and rock descriptions and symbols and abbreviations are shown in Appendix C. The coordinates and elevation at the test locations were determined using a dGPS and is considered to be accurate to within 0.1 m AHD.

### 4. Water quality results

Water samples were collected from wells within BH501, BH502 and BH503A by means of a low flow sampling pump. Samples were analysed at a NATA accredited laboratory for a suite of CoPC as informed by the potential contamination sources outlined in Report on Supplementary Contamination Investigation (Project 84711.05.R.001.Rev1 dated 3 September 2024).

Based on the summary of water quality results (Appendix D), the following comments on the groundwater quality have been made:

- Copper in BH502 (2 µg/L) which exceeds the ANZG (2018) freshwater guideline (MWG) for the protection of slightly to moderately disturbed freshwater aquatic ecosystems of 1.4 µg/L;
- Zinc in all samples (ranging from 14 to 23 µg/L) which exceeds the MWG of 8 µg/L;
- It is noted that the laboratory's practical quantitation limit (PQL) is higher than the adopted criteria for anthracene, B(a)P, chlorpyrifos, hexachlorobutadiene and bromomethane. These PQL exceedances, however, are not considered to be of concern given:
  - o Concentrations for PAH, OPP, and VOC were generally low, with all concentrations below the laboratory PQL;
  - o No potential sources for OPP were identified for the site;

- o Whilst there is an identified source of VOC (plantroom machinery), all VOC were below the PQL. Additionally, concentrations of TRH and BTEX were also below the PQL. As such, the risk of impacts from plantroom machinery is considered to be negligible; and
- o Whilst PAH was detected in the fill at the site, PAH concentrations in the natural samples were below the PQL. Additionally, TCLP results indicate low leachability of PAH at the site. Notably, no B(a)P was detected in the groundwater results, which was the contaminant of concern in the soil. As such, it is not anticipated that PAH has impacted on the groundwater.

Based on our experience in the area, the concentrations of metals (i.e. typically copper, nickel and zinc) in groundwater are considered likely to be attributed to the background concentrations that would be common in urban environments due to roadway run-off, stormwater and underground services and other diffuse urban impacts, and can be regarded as background levels.

## 5. Recommended management strategy

It is understood a drained basement is being considered for the SBA site. Drainage measures within the basement walls and below the basement slab will be required to collect and store water inflows for periodic discharge.

This section outlines the proposed management strategy based on the preferred methodology of on-site treatment and disposal.

All works are to be undertaken with reference to with *Managing Urban Stormwater: Soils and Construction, Volume 1*, "The Blue Book" (LandCom, 2004).

### 5.1 Potential treatment requirements

Contaminants identified in the well samples potentially represent the typical contaminants that will require treatment prior to disposal. Treatment strategies for these contaminants include:

- **Solids removal**, relevant screening criteria: heavy metals, TSS / TDS, turbidity, pH, conductivity i.e., to remove suspended solids, and excessive dissolved solids occurring from surface water run-off / seepage from soils. This treatment step may also include additional pH adjustment / flocculation (and final pH adjustment) which may assist in treating typical slightly elevated metals concentrations seen in urban water environments. Solids removal may also generally assist in removing any insoluble contaminants associated with fill (e.g. PAH, metals).
- **Metals removal**, relevant screen criteria: heavy metals. Treatment of solids generally may remove the bulk of metals (i.e. where present in undissolved phase); and / or,
- **Minor Petroleum Impact / Oil and Grease**, relevant screening criteria: heavy metals, TRH, BTEX, oil and grease, VOC. Although not present in the recent test results, it may be likely that run-off/infiltration and / or impacts from construction activities may result in minor amounts of petroleum impacts in the accumulating water. Typical treatment steps may include a range of technologies (i.e. phase separation, chemical filters, etc.).

Any treatment system therefore may include, but not be limited to:

- Intermediate holding / buffer tank(s);

- Sediment tank(s);
- Chemical treatment units, with pH adjustment and coagulant / flocculant additives; and
- Filtration systems with media specific for removal of dissolved heavy metals and trace quantities of petroleum / VOCs.

## 5.2 Groundwater inflow control

Water inflows, both in the short and long term, should be readily controllable by pumping from sumps for discharge to the stormwater. Standard subfloor drainage systems should be sufficient to direct the seepage water into the sumps. It should be noted that seepage may temporarily increase following high rainfall events.

Appropriate planning should be in place to monitor and compensate for possible variations in the actual inflow rate. If higher inflows are encountered, grouting may be required to reduce the inflows.

## 5.3 Water quality control

Seepage water quality must be tested prior to discharge to the stormwater to prevent contamination and adverse impacts during and after construction.

The recommended methodology for water quality testing is as follows:

- Collection of water samples and quality control samples from seepage water stored in the sumps;
- Measurement of general groundwater physical parameters (EC, pH and temperature) prior to sampling using a calibrated water quality meter;
- Analysis of the samples by an accredited NATA endorsed laboratory for the analytes presented in 5 below; and
- Review and update of this water quality testing methodology as required.

Water quality sampling should be conducted in accordance with Geoscience Australia’s Groundwater Sampling and Analysis – A Field Guide (Geoscience Australia 2009).

Quality assurance / quality control (QA / QC) procedures should be used to establish accurate, reliable and precise results. QA / QC procedures include: calibration of equipment, analyses of samples within holding times, collection of replicate samples, keeping samples chilled and wearing gloves during sampling.

**Table 1: Proposed suite of analytes for water quality monitoring**

Category	Analytes
Field parameters	Temperature (T), EC, pH, turbidity
Physical properties	TDS, TSS
Major ions	Calcium, magnesium, sodium, potassium, chloride, sulphate and alkalinity (total, carbonate and bicarbonate)

Category	Analytes
Metals (total and dissolved)	Arsenic, aluminium, cadmium, chromium, copper, Iron (ferrous and ferric), mercury, manganese, nickel, lead and zinc
Nutrients	Total nitrogen, total Kjeldahl nitrogen, nitrite, nitrate, ammonia, total phosphorus and reactive phosphorus
Organics	TRH / TPH, BTEX, phenols, PAH, VOC, oil and grease

Notes: T: Temperature  
 EC: electrical conductivity  
 TDS: total dissolved solids  
 TSS: total suspended solids  
 TRH: total recoverable hydrocarbons  
 TPH: total petroleum hydrocarbons  
 BTEX: benzene, toluene, ethylbenzene and xylenes  
 PAH: polycyclic aromatic hydrocarbons  
 VOC: volatile organic compounds

Water quality results should be compared to assessment criteria for each analyte. These assessment criteria would be selected based on baseline groundwater quality results and relevant guidelines and Council requirements.

#### 5.4 Proposed water quality discharge criteria

Based on the site setting and receiving water bodies, the discharge criterion, based on the following rationale is likely to apply (to be confirmed based on Council requirements / conditions):

- The 95% level of protection (LOP) for fresh water (ANZG, 2018); and
- ANZECC (2000) default trigger values for physical parameters (freshwater NSW lowland river systems).

The screening criteria is summarised in Table F1, in Appendix F.

#### 5.5 Monitoring and reporting requirements

The following monitoring program and associated reporting is to be adopted until the end of excavation and construction works on-site. Groundwater level monitoring should be continued one month after construction.

**Table 2: Monitoring and reporting requirements**

Item	Monitoring Required	Monitoring Frequency, Reporting and Notes
Visual Inspection	No visible oil and grease, 'sheen' and / or no significant discolouration or odours	Daily inspections (contractor)  <b>HOLD POINT - If any of the visual inspection signs are noted, then any discharge will be suspended until further analytical testing is completed.</b>

Item	Monitoring Required	Monitoring Frequency, Reporting and Notes
Groundwater level monitoring	Groundwater level recording from the three monitoring wells to assess drawdown in the vicinity of the site.	<p>Continuous groundwater level monitoring using data logger recording at six-hourly intervals in monitoring wells in the vicinity of the site.</p> <p>Groundwater level monitoring is to be undertaken during construction and to be continued one month after cessation of dewatering.</p> <p>Quarterly manual groundwater level measurements in monitoring wells.</p>
Water Quality Sampling and Testing	Samples to be collected from the sumps for analysis of water parameters set out in Table 2.	<p>Sampling undertaken every second day for the first two weeks (i.e. 6 sampling events) to account for any potential drawdown of contaminants, and stabilisation of water quality. Otherwise for batch treatment, disposal sampling will be conducted for each discharge event.</p> <p>Conditional upon results, sampling may then be adjusted to fortnightly or weekly, and sampling of the outlet only once the treatment capacity of the system is confirmed. Sampling is to be conducted for the duration of discharge, till construction is completed.</p> <p>Testing to be done at NATA accredited laboratories. Samples will be transported under industry standard Chain of Custody (COC) documentation, including the date, name and signature of sampler, sample ID, and transportation records to the NATA accredited laboratory.</p> <p><b>HOLD POINT – If water concentrations exceed assessment criteria, then discharge is to be immediately halted. Contingency strategy to be adopted.</b></p> <p>Physical parameters (pH, dissolved oxygen, turbidity and conductivity) may be monitored using suitable on-site probes / testing kits once correlations are established with analytical results.</p> <p>Based on ongoing review of results scope of water testing may be reduced following approval from the Environmental Consultant. Scope of analytical suite may also be reduced following approval from</p>

Item	Monitoring Required	Monitoring Frequency, Reporting and Notes
		<p>the Environmental Consultant, e.g., upon excavations reaching natural soils.</p> <p>Inclusion of results in a final water quality monitoring report.</p>
Quality control sampling	<p>Collection of replicate samples to verify quality of laboratory results. Testing suite to include:</p> <ul style="list-style-type: none"> <li>• Metals (dissolved);</li> <li>• TRH;</li> <li>• BTEX; and</li> <li>• PAH.</li> </ul>	<p>During each sampling event. Samples will be transported under industry standard COC documentation, including the date, sample ID, name and signature of sampler, and transportation records to the NATA accredited laboratory.</p> <p>Inclusion of results in a final water quality monitoring report</p>
Quantity of water disposed off-site	Calibrated Flowmeter connected to any pump-out system.	<p>Weekly monitoring and recording of dewatering volumes.</p> <p><b>HOLD POINT - If dewatering volumes begin exceeding the nominated treatment system capacity discharge will be halted before water quality exceeds the adopted screening criteria.</b></p> <p>Weekly reporting of volumes to the Environmental Consultant.</p> <p>Inclusion of results in a final water monitoring report</p>
Dewatering completion report	<p>To be prepared by a suitably qualified consultant upon completion of all dewatering works. The summary report will incorporate the above information and:</p> <ul style="list-style-type: none"> <li>• Any on-site records kept by the contractor (e.g. visual observations, any unexpected finds records, etc.);</li> <li>• All analytical results (i.e. each batch of water disposed) compared to the adopted assessment criteria;</li> <li>• Quality control testing;</li> <li>• Record of dewatering volumes (i.e. for each discharge event); and</li> </ul> <p>Comment on any unexpected finds or non-conformances, and / or otherwise if the dewatering works have complied with this DMP.</p>	

Note: Testing frequency and analysis requirements may be reviewed in consultation with the Environmental Consultant dependent upon ongoing results.

## 5.6 Personnel and responsibilities

Table 3 below outlines the proposed project personnel and relevant responsibilities as part of the water management plan.

**Table 3: Nominated personnel and responsibilities**

Role	Organisation / Contact Name	Responsibilities
Site Manager / Contractor	Builder (tbc)	Routine visual inspection Monitoring / recording of disposal volumes Maintaining any unexpected / contingency records
Dewatering contractor	Plumber/ Civil contractor (tbc)	Design / specification and ongoing maintenance of the treatment system
Geotechnical and Environmental Consultant / Water Quality Expert	Douglas Partners (9809 0666)	Groundwater level monitoring and review of disposal volumes. Water quality testing (using NATA accredited laboratories) Interim advice for each sampling event to confirm (or otherwise) compliance with discharge requirements. Quality control sampling Preparation of a final water quality report to be submitted to Council.

## 5.7 Contingency plan

As per Table 2 (Section 5.5), at any hold point, if a non-conformance is encountered then dewatering will be suspended. The following general contingency plan will be implemented:

- Should water quality be deemed unsuitable for disposal, suspend dewatering and treat water prior to discharge to the ground;
- Should dewatering volumes be higher than predicted, suspend construction and undertake grouting to reduce groundwater inflows;
- Notify the Site Manager / Contractor and Environmental Consultant;
- Environmental Consultant to inspect the site / unexpected finds and collect additional water quality samples as advised;
- Off-site tankering may be adopted to meet disposal requirements; and
- Written confirmation by the Environmental Consultant that disposal may resume (e.g. upon receipt of laboratory results).

## 6. Conclusion and recommendations

It is considered that correct implementation of the management and monitoring plan outlined within this report will facilitate the off-site disposal of any excess incidental water encountered during bulk excavation and early construction works.

Should significant volumes of water or any signs of contamination be encountered, for example due to any currently unknown variations in geological or hydrogeological conditions, then this plan would need to be re-assessed and amended as necessary. Similarly, if any signs of gross contamination are identified in the extracted water (e.g. odours, discolouration, hydrocarbon sheens) then this plan may need to be reassessed and amended.

It is also noted that groundwater levels will fluctuate with weather, climatic conditions and drainage features and may temporarily rise following rainfall periods.

## 7. References

ANZECC. (2000). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australia New Zealand Environment Conservation Council.

ANZG. (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Canberra, ACT: Australian and New Zealand Governments and Australian state and territory governments.

LandCom. (2004). *Managing Urban Stormwater: Soils and Construction, Volume 1 ("Blue Book")*. 4th Edition, March 2004: LandCom, New South Wales Government.

NHMRC. (2008). *Guidelines for Managing Risks In Recreational Water*.

## 8. Limitations

Douglas Partners Pty Ltd (Douglas) has prepared this report for this project at Western Avenue and Cadigal Lane, Camperdown in accordance with Douglas' proposal 84711.01.P.005.Rev2 dated 9 May 2024 and acceptance received from Michael Baddoui of FDC Construction (NSW) Pty Ltd. The work was carried out under Douglas' Engagement Terms. This report is provided for the exclusive use of FDC Construction (NSW) Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and / or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after Douglas' field testing has been completed.

Douglas' advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by Douglas in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the (geotechnical / environmental / groundwater) components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. Douglas cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

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## **Appendix A**

Notes About this Report

## Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

## Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

## Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

## Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at

the time of construction as are indicated in the report; and

- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

## Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

continued next page

## About this Report

### Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

### Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

### Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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## **Appendix B**

Drawings



SITE LOCATION

LEGEND

- Site Boundary
- Approximate Basement Outline
- ◆ Groundwater well

0 5 10 15 20 25 m

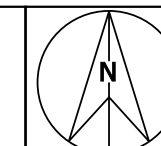


- NOTE:
1. Drawing projection in GDA2020 / MGA zone 56, adapted from aerial imagery from metromap dated July 2024
  2. Test locations are approximate only and were located using differential GPS typically accurate to ± 0.1 m depending on satellite coverage



CLIENT: FDC Construction (NSW) Pty Ltd	
OFFICE: Sydney	DRAWN BY: DS
SCALE: 1:668 @A3	DATE: 04.September.2024

TITLE: <b>Test Location Plan</b> <b>Sydney Biomedical Accelerator (SBA)</b> <b>Western Avenue and Cadigal Lane, Camperdown, NSW</b>
---



PROJECT:	84711.01
DRAWING No:	1
REVISION:	0

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## **Appendix C**

Results of the Investigation

Terminology, Symbols and Abbreviations

Soil Descriptions

Rock Descriptions

Sampling, Testing and Excavation Methodology

# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd

**SURFACE LEVEL:** 23.2 AHD

**LOCATION ID:** BH501

**PROJECT:** Sydney Biomedical Accelerator

**COORDINATE:** E:332114.8, N:6248576.6

**PROJECT No:** 84711.01

**LOCATION:** Western Avenue & Cadigal Lane, Camperdown, NSW

**DATUM/GRID:** MGA2020 Zone 56

**DATE:** 28/06/24

**DIP/AZIMUTH:** 90°/---°

**SHEET:** 1 of 1

CONDITIONS ENCOUNTERED						SAMPLE			TESTING AND REMARKS					
GROUNDWATER RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSIS. (°) DENSITY. (°)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
23	0.00	FILL / Silty SAND: dark brown; medium to coarse; trace clay; with gravel.		FILL		D				0.00 - 1.30				
	1.30	BRICK PAVERS				NA				1.30 - 1.50				
	1.50	CLAY (CH), with gravel: mottled red & pale grey; medium to high plasticity; fine to medium, angular to sub-angular, ironstone gravel.								1.50 - 2.00				
	2.00									2.00 - 3.00				
	3.00									3.00 - 4.00				
	4.00				(ND)					4.00 - 5.00				
	5.00			RS		w=PL				5.00 - 6.00				
	6.00									6.00 - 7.00				
	7.00	6.50m: becoming pale grey.								7.00 - 8.00				
	8.00	7.20m: becoming extremely weathered siltstone.								8.00 - 8.00				
	8.00	Borehole discontinued at 8.00m depth. Target depth reached.								8.00 - 8.00				
	9.00									9.00 - 9.00				

NOTES: #Soil origin is "probable" unless otherwise stated. °Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

**PLANT:** Comacchio 205

**OPERATOR:** Strata Core (SS)

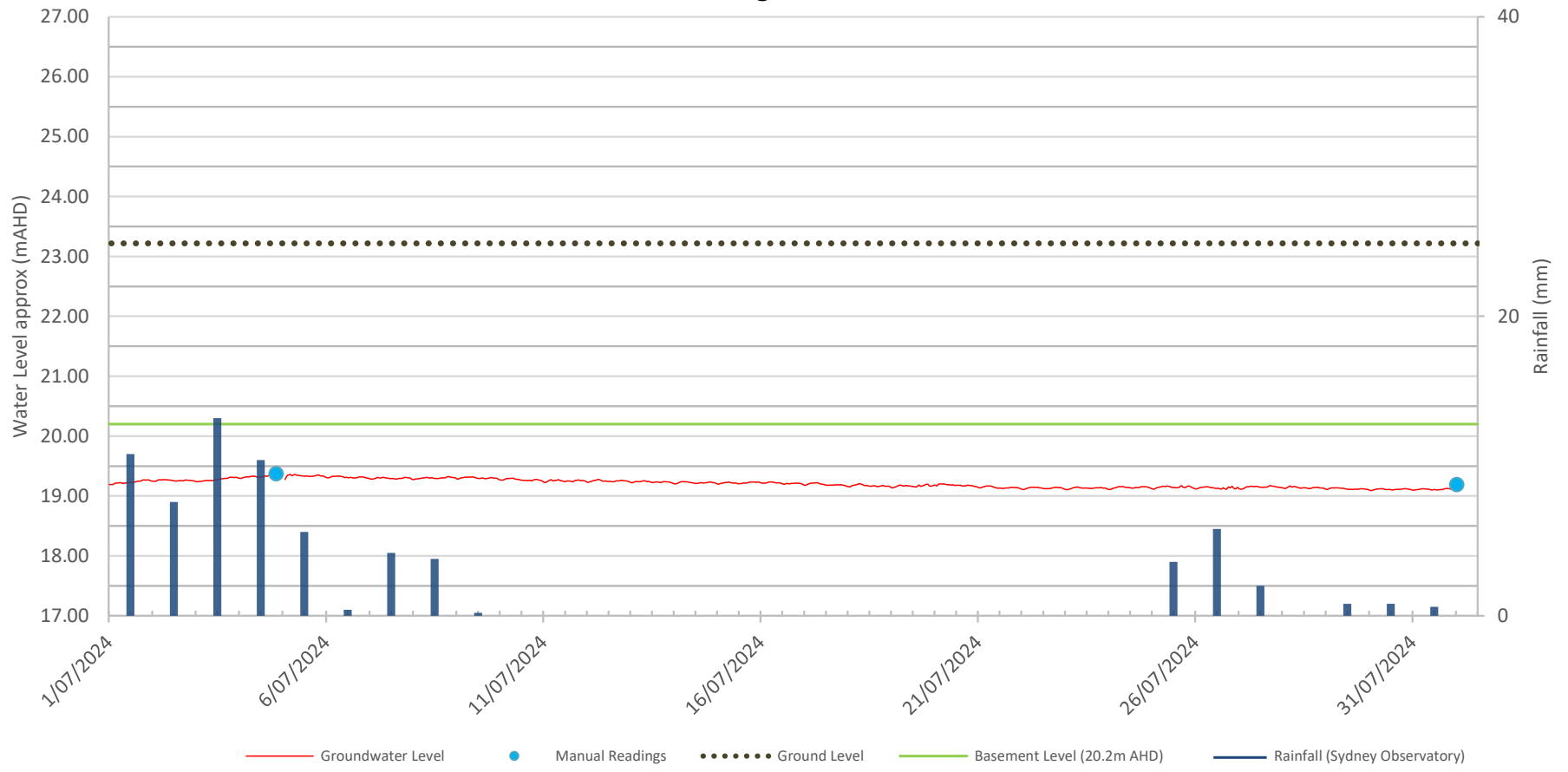
**LOGGED:** IH

**METHOD:** AD/T(100) to 8.0m.

**CASING:** Uncased

**REMARKS:** No free groundwater observed whilst augering.

### Monitoring Well: BH501



Note: Reading Interval = 1 hour



**From**  
1/07/2024  
**To**  
1/08/2024

**Drawn:**  
JM/IH  
**Date:**  
22/08/2024

# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd

**SURFACE LEVEL:** 21.9 AHD

**LOCATION ID:** BH502

**PROJECT:** Sydney Biomedical Accelerator

**COORDINATE:** E:332149.4, N:6248626.8

**PROJECT No:** 84711.01

**LOCATION:** Western Avenue & Cadigal Lane, Camperdown, NSW

**DATUM/GRID:** MGA2020 Zone 56

**DATE:** 07/06/24

**DIP/AZIMUTH:** 90°/---°

**SHEET:** 1 of 2

GROUNDWATER RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	CONDITIONS ENCOUNTERED							SAMPLE				TESTING					
				SOIL			ROCK				DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE	
				ORIGIN (#)	CONSISTENCY DENSITY (%)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)										RQD
0.01	0.30	ASPHALTIC CONCRETE		FILL									A/ES	0.10-0.20						
0.30	0.70	FILL / Gravelly SAND: grey-brown; fine to coarse; medium to coarse, igneous gravel; with building rubble (brick and metal fragments).		FILL	ND	M							A/ES	0.40-0.50						
0.70	2.60	FILL / Sandy CLAY: grey-brown; high plasticity; fine to coarse sand; trace building rubble (concrete, brick and metal fragments)		RS		w<PL							A/ES	0.90-1.00						
2.60	3.60	CLAY (CI-CH), trace gravel: brown; medium plasticity; fine to medium, sub-angular, ironstone gravel.													SPT	10,12,13 N=25				
3.60	5.50	CLAY (CH): pale grey and brown; high plasticity.			VSt										SPT	5,8,12 N=20				
5.50	7.42	3.60m: inferred SILTSTONE; very low strength, extremely weathered, grey.		RS		w=PL														
7.42	7.50	LAMINITE: pale grey and grey; 60% siltstone laminated with 40% fine grained sandstone. Ashfield Shale														PLT	PL(A)=0.60MPa			
7.50	7.72																			
7.72	7.50																			
7.50	8.05																			
8.05	8.05																			
8.05	9.15																			
9.15	9.60																			
9.60	9.60																			
9.60	9.60																			

NOTES: #Soil origin is "probable" unless otherwise stated. #Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

**PLANT:** Massenza M13

**OPERATOR:** Strata Core (SS)

**LOGGED:** SI

**METHOD:** AD/T(100) to 5.5m, NMLC to 14.65m.

**CASING:** HQ to 5.5m

**REMARKS:** No free groundwater observed whilst augering.

Refer to explanatory notes for symbol and abbreviation definitions





# CORE PHOTO LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd

**PROJECT:** Sydney Biomedical Accelerator

**LOCATION:** Western Avenue & Cadigal Lane, Camperdown, NSW

**SURFACE LEVEL:** 21.9 AHD

**COORDINATE:** E:332149.4, N:6248626.8

**DATUM/GRID:** MGA2020 Zone 56

**DIP/AZIMUTH:** 90°/---°

**LOCATION ID:** BH502

**PROJECT No:** 84711.01

**DATE:** 07/06/24

**SHEET:** 1 of 1

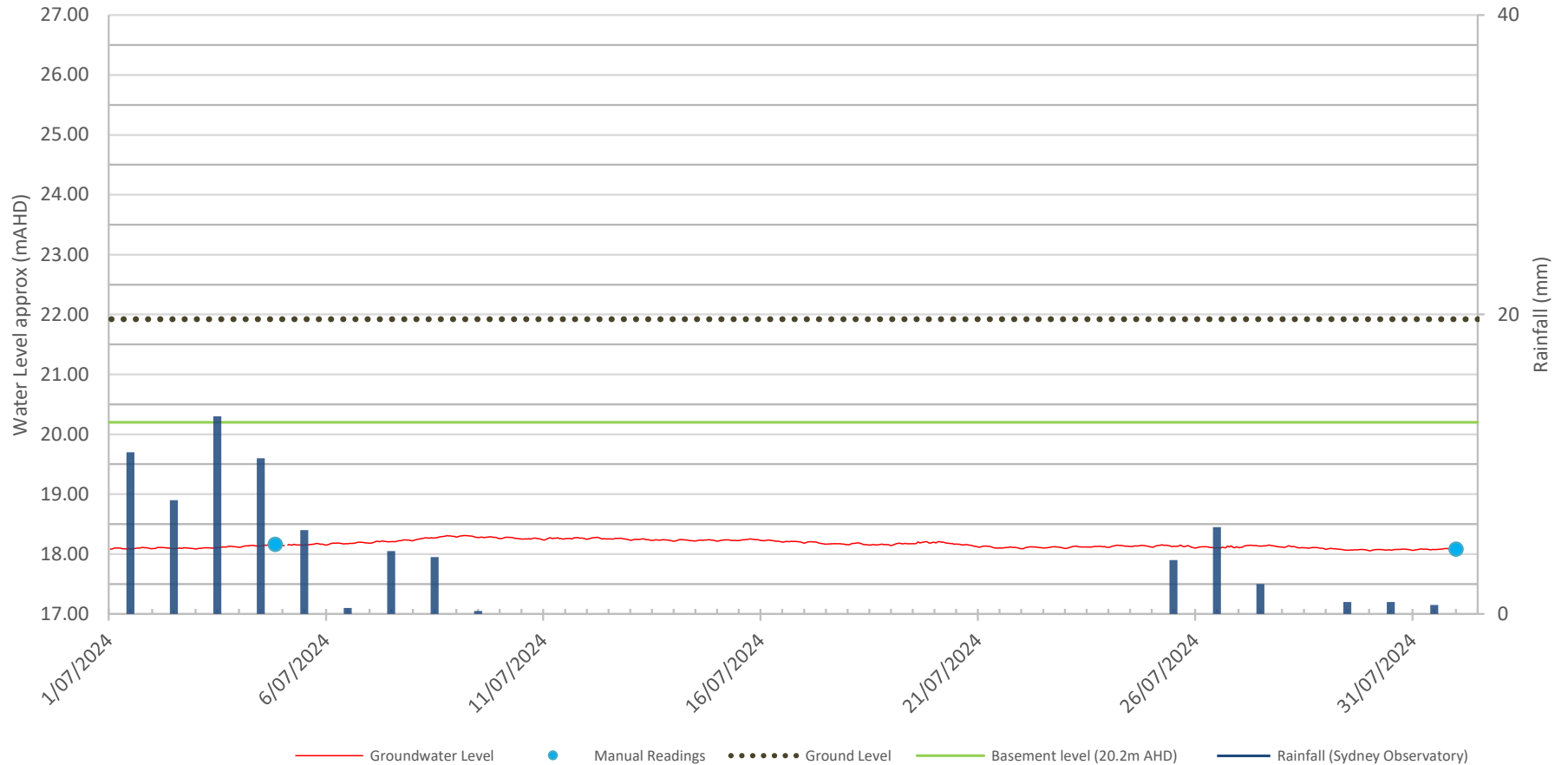


5.50-10.00 m depth



10.00-14.65 m depth

### Monitoring Well: BH502



Note: Reading Interval = 1 hour



**From**  
1/07/2024  
**To**  
1/08/2024

**Drawn:**  
JM/IH  
**Date:**  
22/08/2024

# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue & Cadigal Lane, Camperdown, NSW

**SURFACE LEVEL:** 26.6 AHD  
**COORDINATE:** E:332199.0, N:6248612.4  
**DATUM/GRID:** MGA2020 Zone 56  
**DIP/AZIMUTH:** 90°/---°

**LOCATION ID:** BH503A  
**PROJECT No:** 84711.01  
**DATE:** 12/06/24  
**SHEET:** 1 of 2

GROUNDWATER RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	CONDITIONS ENCOUNTERED						SAMPLE				TESTING				
				SOIL			ROCK			DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
				ORIGIN (#)	CONSIS. DENSITY (%)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH									
26.6	0.10	FILL / Silty CLAY: dark brown, grey; trace fine sand and organic material.		FILL		NA						A/ES	0.10					
	1.00	FILL / Sandy CLAY, with silt: dark grey-brown; low to medium plasticity.		FILL		w>PL						A/ES	0.90-1.00					
	1.20	FILL / Silty CLAY, with sand, trace gravel: orange-brown; fine sand.		FILL		ND						A/ES	1.90-2.00					
	2.10	SHALE: brown-grey; extremely weathered; Ashfield Shale										A/ES	2.90-3.00					
	4.00			XWM		ND	w<PL						4.00					
	5.50	SHALE: grey-brown; 5-10% fine sandstone laminations, with medium strength bands. Ashfield Shale											5.50					
	6.00												6.00					
	6.85												6.85					
	7.15												7.15					
	7.65												7.65					
	8.55	SILTSTONE: pale grey and grey; interlaminated with 30% fine grained sandstone; slightly fractured and unbroken. Hawkesbury Sandstone											8.55					
	8.75												8.75					
	9.60												9.60					

NOTES: <sup>1</sup>Soil origin is "probable" unless otherwise stated. <sup>2</sup>Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

**PLANT:** Massenza M13      **OPERATOR:** Strata Core (SS)      **LOGGED:** IH  
**METHOD:** AD/T(100) to 5.5m, NMLC to 11.75m      **CASING:** HW to 5.5m  
**REMARKS:** No free groundwater observed whilst augering.

Refer to explanatory notes for symbol and abbreviation definitions



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd

**SURFACE LEVEL:** 26.6 AHD

**LOCATION ID:** BH503A

**PROJECT:** Sydney Biomedical Accelerator

**COORDINATE:** E:332199.0, N:6248612.4

**PROJECT No:** 84711.01

**LOCATION:** Western Avenue & Cadigal Lane, Camperdown, NSW

**DATUM/GRID:** MGA2020 Zone 56

**DATE:** 12/06/24

**DIP/AZIMUTH:** 90°/---°

**SHEET:** 2 of 2

CONDITIONS ENCOUNTERED											SAMPLE				TESTING							
GROUNDWATER RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL				ROCK						SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE	
				ORIGIN (#)	CONSIS. (°) DENSITY (°)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS									
15	11	[CONT] SILTSTONE: pale grey and grey; interlaminated with 30% fine grained sandstone; slightly fractured and unbroken. Hawkesbury Sandstone					FR					100	98	10.10m: JT, 45°, PR, CN, SM				11	PLT	PL(A)=0.90MPa		
	12	Borehole discontinued at 11.75m depth. Target depth reached.												11.63m: JT, 30°, PR, CN, SM 11.68m: JT, 45°, PR, CN, SM								
	13																					
	14																					
	15																					
	16																					
	17																					
	18																					
	19																					

NOTES: <sup>(1)</sup>Soil origin is "probable" unless otherwise stated. <sup>(2)</sup>Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

**PLANT:** Massenza M13

**OPERATOR:** Strata Core (SS)

**LOGGED:** IH

**METHOD:** AD/T(100) to 5.5m, NMLC to 11.75m

**CASING:** HW to 5.5m

**REMARKS:** No free groundwater observed whilst augering.

Refer to explanatory notes for symbol and abbreviation definitions



# CORE PHOTO LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue & Cadigal Lane, Camperdown, NSW

**SURFACE LEVEL:** 26.6 AHD  
**COORDINATE:** E:332199.0, N:6248612.4  
**DATUM/GRID:** MGA2020 Zone 56  
**DIP/AZIMUTH:** 90°/---°

**LOCATION ID:** BH503A  
**PROJECT No:** 84711.01  
**DATE:** 12/06/24  
**SHEET:** 1 of 1

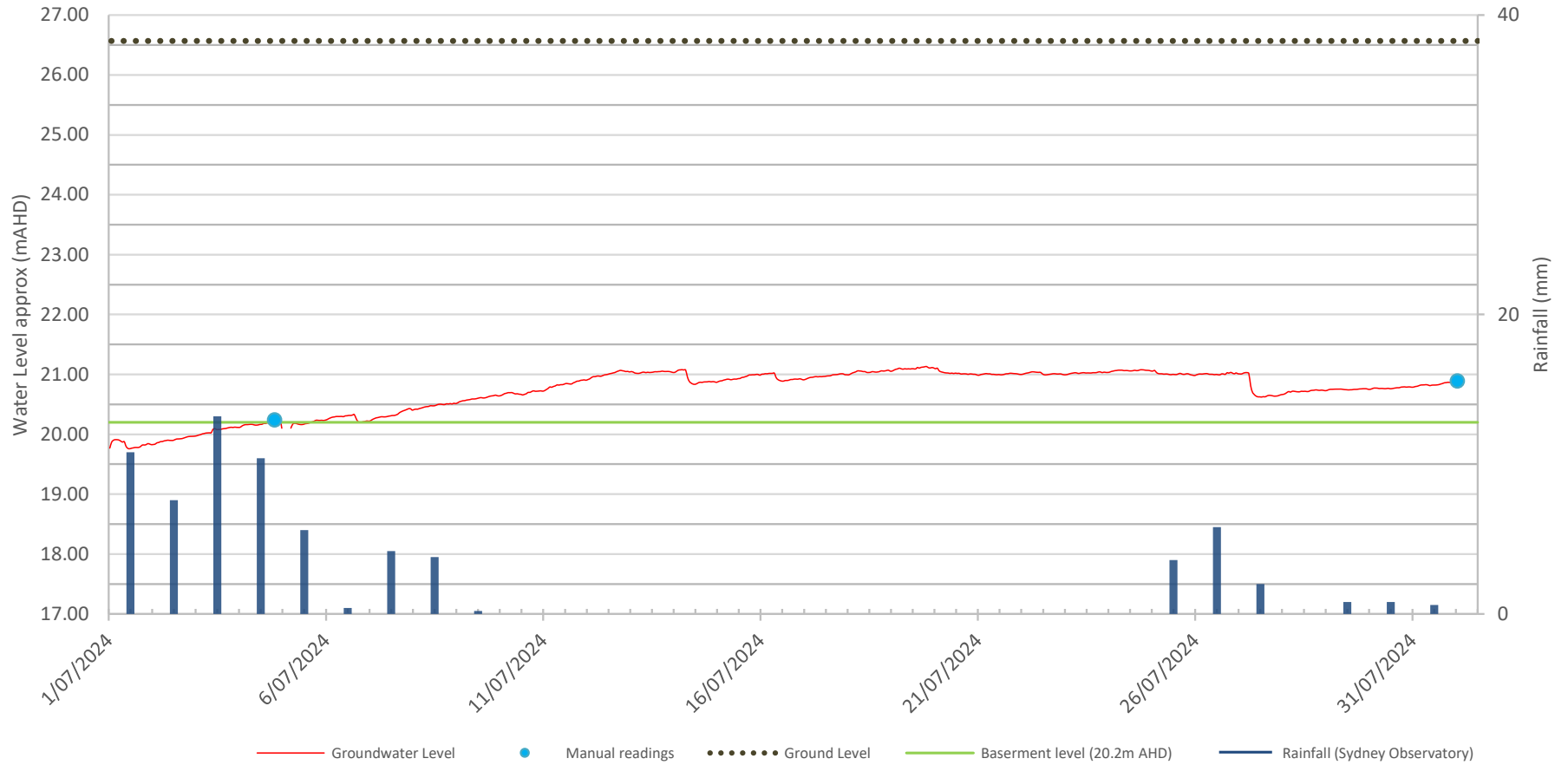


5.50-10.00 m depth



10.00-11.75 m depth

### Monitoring Well: BH503A



Note: Reading Interval = 1 hour



**From**  
1/07/2024  
**To**  
1/08/2024

**Drawn:**  
JM/IH  
**Date:**  
22/08/2024



## Introduction to Terminology, Symbols and Abbreviations

Douglas Partners' reports, investigation logs, and other correspondence may use terminology which has quantitative or qualitative connotations. To remove ambiguity or uncertainty surrounding the use of such terms, the following sets of notes pages may be attached Douglas Partners' reports, depending on the work performed and conditions encountered:

- Soil Descriptions;
- Rock Descriptions; and
- Sampling, insitu testing, and drilling methodologies

In addition to these pages, the following notes generally apply to most documents.

### Abbreviation Codes

Site conditions may also be presented in a number of different formats, such as investigation logs, field mapping, or as a written summary. In some of these formats textual or symbolic terminology may be presented using textual abbreviation codes or graphic symbols, and, where commonly used, these are listed alongside the terminology definition. For ease of identification in these note pages, textual codes are presented in these notes in the following style **XW**. Code usage conforms with the following guidelines:

- Textual codes are case insensitive, although herein they are generally presented in upper case; and
- Textual codes are contextual (i.e. the same or similar combinations of characters may be used in different contexts with different meanings (for example `PL` is used for plastic limit in the context of soil moisture condition, as well as in `PL(A)` for point load test result in the testing results column)).

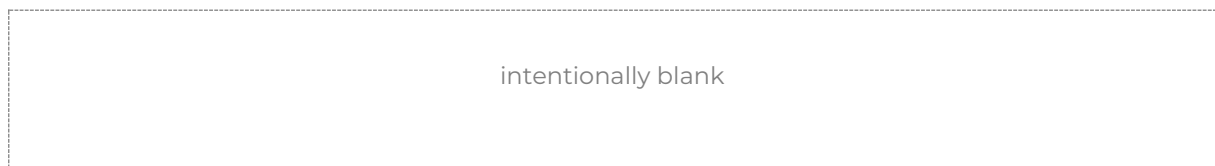
### Data Integrity Codes

Subsurface investigation data recorded by Douglas Partners is generally managed in a highly structured database environment, where records "span" between a top and bottom depth interval. Depth interval "gaps" between records are considered to introduce ambiguity, and, where appropriate, our practice guidelines may require contiguous data sets. Recording meaningful data is not always appropriate (for example assigning a "strength" to a concrete pavement) and the following codes may be used to maintain contiguity in such circumstances.

Term	Description	Abbreviation Code
Core loss	No core recovery	KL
Unknown	Information was not available to allow classification of the property. For example, when auguring in loose, saturated sand auger cuttings may not be returned.	UK
No data	Information required to allow classification of the property was not available. For example if drilling is commenced from the base of a hole predrilled by others	ND
Not Applicable	Derivation of the properties not appropriate or beyond the scope of the investigation. For example providing a description of the strength of a concrete pavement	NA

### Graphic Symbols

Douglas Partners' logs contain a "graphic" column which provides a pictorial representation of the basic composition of the material. The symbols used are directly representing the material name stated in the adjacent "Description of Strata" column, and as such no specific graphic symbology legend has been provided in these notes.





## Introduction

All materials which are not considered to be “in-situ rock” are described in general accordance with the soil description model of AS 1726-2017 Part 6.1.3, and can be broken down into the following description structure:



The “classification” comprises a two character “group symbol” providing a general summary of dominant soil characteristics. The “name” summarises the particle sizes within the soil which most influence its behaviour. The detailed description presents more information about composition, condition, structure, and origin of the soil.

Classification, naming and description of soils require the relative proportion of particles of different sizes within the whole soil mixture to be considered.

### Particle size designation and Behaviour Model

Solid particles within a soil are differentiated on the basis of size.

The engineering behaviour properties of a soil can subsequently be modelled to be either “fine grained” (also known as “cohesive” behaviour) or “coarse grained” (“non cohesive” behaviour), depending on the relative proportion of fine or coarse fractions in the soil mixture.

Particle Size Designation	Particle Size (mm)	Behaviour Model	
		Behaviour	Approximate Dry Mass
Boulder	>200	Excluded from particle behaviour model as “oversize”	
Cobble	63 - 200		
Gravel <sup>1</sup>	2.36 - 63	Coarse	>65%
Sand <sup>1</sup>	0.075 - 2.36		
Silt	0.002 - 0.075	Fine	>35%
Clay	<0.002		

<sup>1</sup> – refer grain size subdivision descriptions below

The behaviour model boundaries defined above are not precise, and the material behaviour should be assumed from the name given to the material (which considers the particle fraction which dominates the behaviour, refer “component proportions” below), rather than strict observance of the proportions of particle sizes. For example, if a material is named a “Sandy CLAY”, this is indicative that the material exhibits fine grained behaviour, even if the dry mass of coarse grained material may exceed 65%.

### Component proportions

The relative proportion of the dry mass of each particle size fraction is assessed to be a “primary”, “secondary”, or “minor” component of the soil mixture, depending on its influence over the soil behaviour.

Component Proportion Designation	Definition <sup>1</sup>	Relative Proportion	
		In Fine Grained Soil	In Coarse Grained Soil
Primary	The component (particle size designation, refer above) which dominates the engineering behaviour of the soil	The clay/silt component with the greater proportion	The sand/gravel component with the greater proportion
Secondary	Any component which is not the primary, but is significant to the engineering properties of the soil	Any component with greater than 30% proportion	Any granular component with greater than 30%; or Any fine component with greater than 12%
Minor <sup>2</sup>	Present in the soil, but not significant to its engineering properties	All other components	All other components

<sup>1</sup> As defined in AS1726-2017 6.1.4.4

<sup>2</sup> In the detailed material description, minor components are split into two further sub-categories. Refer “identification of minor components” below.

### Composite Materials

In certain situations, a lithology description may describe more than one material, for example, collectively describing a layer of interbedded sand and clay. In such a scenario, the two materials would be described independently, with the names preceded or followed by a statement describing the arrangement by which the materials co-exist. For example, “INTERBEDDED Silty CLAY AND SAND”.

## Classification

The soil classification comprises a two character group symbol. The first character identifies the primary component. The second character identifies either the grading or presence of fines in a coarse grained soil, or the plasticity in a fine grained soil. Refer AS1726-2017 6.1.6 for further clarification.

## Soil Name

For most soils, the name is derived with the primary component included as the noun (in upper case), preceded by any secondary components stated in an adjective form. In this way, the soil name also describes the general composition and indicates the dominant behaviour of the material.

Component <sup>1</sup>	Prominence in Soil Name
Primary	Noun (eg "CLAY")
Secondary	Adjective modifier (eg "Sandy")
Minor	No influence

<sup>1</sup> – for determination of component proportions, refer component proportions on previous page

For materials which cannot be disaggregated, or which are not comprised of rock or mineral fragments, the names "ORGANIC MATTER" or "ARTIFICIAL MATERIAL" may be used, in accordance with AS1726-2017 Table 14.

Commercial or colloquial names are not used for the soil name where a component derived name is possible (for example "Gravelly SAND" rather than "CRACKER DUST").

Materials of "fill" or "topsoil" origin are generally assigned a name derived from the primary/secondary component (where appropriate). In log descriptions this is preceded by uppercase "FILL" or "TOPSOIL". Origin uncertainty is indicated in the description by the characters (?), with the degree of uncertainty described (using the terms "probably" or "possibly" in the origin column, or at the end of the description).

## Identification of minor components

Minor components are identified in the soil description immediately following the soil name. The minor component fraction is usually preceded with a term indicating the relative proportion of the component.

Minor Component Proportion Term	Relative Proportion	
	In Fine Grained Soil	In Coarse Grained Soil
With	All fractions: 15-30%	Clay/silt: 5-12% sand/gravel: 15-30%
Trace	All fractions: 0-15%	Clay/silt: 0-5% sand/gravel: 0-15%

The terms "with" and "trace" generally apply only to gravel or fine particle fractions. Where cobbles/boulders are encountered in minor proportions (generally less than about 12%) the term "occasional" may be used. This term describes the sporadic distribution of the material within the confines of the investigation excavation only, and there may be considerable variation in proportion over a wider area which is difficult to factually characterise due to the relative size of the particles and the investigation methods.

## Soil Composition

### Plasticity

Descriptive Term	Laboratory liquid limit range	
	Silt	Clay
Non-plastic materials	Not applicable	Not applicable
Low plasticity	≤50	≤35
Medium plasticity	Not applicable	>35 and ≤50
High plasticity	>50	>50

Note, Plasticity descriptions generally describe the plasticity behaviour of the whole of the fine grained soil, not individual fine grained fractions.

### Grain Size

Type	Particle size (mm)	
	Gravel	Coarse
	Medium	6.7 - 19
	Fine	2.36 - 6.7
Sand	Coarse	0.6 - 2.36
	Medium	0.21 - 0.6
	Fine	0.075 - 0.21

### Grading

Grading Term	Particle size (mm)
Well	A good representation of all particle sizes
Poorly	An excess or deficiency of particular sizes within the specified range
Uniformly	Essentially of one size
Gap	A deficiency of a particular size or size range within the total range

Note, AS1726-2017 provides terminology for additional attributes not listed here.

## Soil Condition

### Moisture

The moisture condition of soils is assessed relative to the plastic limit for fine grained soils, while for coarse grained soils it is assessed based on the appearance and feel of the material. The moisture condition of a material is considered to be independent of stratigraphy (although commonly these are related), and this data is presented in its own column on logs.

Applicability	Term	Tactile Assessment	Abbreviation code
Fine	Dry of plastic limit	Hard and friable or powdery	w<PL
	Near plastic limit	Can be moulded	w=PL
	Wet of plastic limit	Water residue remains on hands when handling	w>PL
	Near liquid limit	"oozes" when agitated	w=LL
	Wet of liquid limit	"oozes"	w>LL
Coarse	Dry	Non-cohesive and free running	D
	Moist	Feels cool, darkened in colour, particles may stick together	M
	Wet	Feels cool, darkened in colour, particles may stick together, free water forms when handling	W

The abbreviation code **NDF**, meaning "not-assessable due to drilling fluid use" may also be used.

Note, observations relating to free ground water or drilling fluids are provided independent of soil moisture condition.

### Consistency/Density/Compaction/Cementation/Extremely Weathered Material

These concepts give an indication of how the material may respond to applied forces (when considered in conjunction with other attributes of the soil). This behaviour can vary independent of the composition of the material, and on logs these are described in an independent column and are generally mutually exclusive (i.e it is inappropriate to describe both consistency and compaction at the same time). The method by which the behaviour is described depends on the behaviour model and other characteristics of the soil as follows:

- In fine grained soils, the "consistency" describes the ease with which the soil can be remoulded, and is generally correlated against the materials undrained shear strength;
- In granular materials, the relative density describes how tightly packed the particles are, and is generally correlated against the density index;
- In anthropogenically modified materials, the compaction of the material is described qualitatively;
- In cemented soils (both natural and anthropogenic), the cemented "strength" is described qualitatively, relative to the difficulty with which the material is disaggregated; and
- In soils of extremely weathered material origin, the engineering behaviour may be governed by relic rock features, and expected behaviour needs to be assessed based the overall material description.

Quantitative engineering performance of these materials may be determined by laboratory testing or estimated by correlated field tests (for example penetration or shear vane testing). In some cases, performance may be assessed by tactile or other subjective methods, in which case investigation logs will show the estimated value enclosed in round brackets, for example **(VS)**.

#### Consistency (fine grained soils)

Consistency Term	Tactile Assessment	Undrained Shear Strength (kPa)	Abbreviation Code
Very soft	Extrudes between fingers when squeezed	<12	VS
Soft	Mouldable with light finger pressure	>12 - ≤25	S
Firm	Mouldable with strong finger pressure	>25 - ≤50	F
Stiff	Cannot be moulded by fingers	>50 - ≤100	St
Very stiff	Indented by thumbnail	>100 - ≤200	VSt
Hard	Indented by thumbnail with difficulty	>200	H
Friable	Easily crumbled or broken into small pieces by hand	-	Fr

#### Relative Density (coarse grained soils)

Relative Density Term	Density Index	Abbreviation Code
Very loose	<15	VL
Loose	>15 - ≤35	L
Medium dense	>35 - ≤65	MD
Dense	>65 - ≤85	D
Very dense	>85	VD

Note, tactile assessment of relative density is difficult, and generally requires penetration testing, hence a tactile assessment guide is not provided.

## Compaction (anthropogenically modified soil)

Compaction Term	Abbreviation Code
Well compacted	WC
Poorly compacted	PC
Moderately compacted	MC
Variably compacted	VC

## Cementation (natural and anthropogenic)

Cementation Term	Abbreviation Code
Moderately cemented	MOD
Weakly cemented	WEK

## Extremely Weathered Material

AS1726-2017 considers weathered material to be soil if the unconfined compressive strength is less than 0.6 MPa (i.e. less than very low strength rock). These materials may be identified as “extremely weathered material” in reports and by the abbreviation code **XWM** on log sheets. This identification is not correlated to any specific qualitative or quantitative behaviour, and the engineering properties of this material must therefore be assessed according to engineering principles with reference to any relic rock structure, fabric, or texture described in the description.

## Soil Origin

Term	Description	Abbreviation Code
Residual	Derived from in-situ weathering of the underlying rock	RS
Extremely weathered material	Formed from in-situ weathering of geological formations. Has strength of less than ‘very low’ as per as1726 but retains the structure or fabric of the parent rock.	XWM
Alluvial	Deposited by streams and rivers	ALV
Fluvial	Deposited by channel fill and overbank (natural levee, crevasse splay or flood basin)	FLV
Estuarine	Deposited in coastal estuaries	EST
Marine	Deposited in a marine environment	MAR
Lacustrine	Deposited in freshwater lakes	LAC
Aeolian	Carried and deposited by wind	AEO
Colluvial	Soil and rock debris transported down slopes by gravity	COL
Slopewash	Thin layers of soil and rock debris gradually and slowly deposited by gravity and possibly water	SW
Topsoil	Mantle of surface soil, often with high levels of organic material	TOP
Fill	Any material which has been moved by man	FILL
Littoral	Deposited on the lake or seashore	LIT
Unidentifiable	Not able to be identified	UID

## Cobbles and Boulders

The presence of particles considered to be “oversize” may be described using one of the following strategies:

- Oversize encountered in a minor proportion (when considered relative to the wider area) are noted in the soil description; or
- Where a significant proportion of oversize is encountered, the cobbles/boulders are described independent of the soil description, in a similar manner to composite soils (described above) but qualified with “MIXTURE OF”.





## Rock Strength

Rock strength is defined by the unconfined compressive strength, and it refers to the strength of the rock substance and not the strength of the overall rock mass, which may be considerably weaker due to defects.

The Point Load Strength Index  $I_{s(50)}$  is commonly used to provide an estimate of the rock strength and site specific correlations should be developed to allow UCS values to be determined. The point load strength test procedure is described by Australian Standard AS4133.4.1-2007. The terms used to describe rock strength are as follows:

Strength Term	Unconfined Compressive Strength (MPa)	Point Load Index <sup>1</sup> $I_{s(50)}$ MPa	Abbreviation Code
Very low	0.6 - 2	0.03 - 0.1	VL
Low	2 - 6	0.1 - 0.3	L
Medium	6 - 20	0.3 - 1.0	M
High	20 - 60	1 - 3	H
Very high	60 - 200	3 - 10	VH
Extremely high	>200	>10	EH

<sup>1</sup> Rock strength classification is based on UCS. The UCS to  $I_{s(50)}$  ratio varies significantly for different rock types and specific ratios may be required for each site. The point load Index ranges shown above are as suggested in AS1726 and should not be relied upon without supporting evidence.

The following abbreviation codes are used for soil layers or seams of material “within rock” but for which the equivalent UCS strength is less than 0.6 MPa.

Scenario	Abbreviation Code
The material encountered has an equivalent UCS strength of less than 0.6 MPa, and therefore is considered to be soil (as per Note 1 of Table 20 of AS 1726-2017). The properties of the material encountered over this interval are described in the “Description of Strata” and soil properties columns.	SOIL
The material encountered has an equivalent UCS strength of less than 0.6 MPa, and therefore is considered to be soil (as per Note 1 of Table 20 of AS 1726-2017). The prominence of the material is such that it can be considered to be a seam (as defined in Table 22 of AS1726-2017) and the properties of the material are described in the defect column.	SEAM

## Degree of Weathering

The degree of weathering of rock is classified as follows:

Weathering Term	Description	Abbreviation Code
Residual Soil <sup>1</sup>	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.	RS
Extremely weathered <sup>1</sup>	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible	XW
Highly weathered	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching or may be decreased due to deposition of weathering products in pores.	HW
Moderately weathered	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable but shows little or no change of strength from fresh rock.	MW
Slightly weathered	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.	SW
Fresh	No signs of decomposition or staining.	FR
Note: If HW and MW cannot be differentiated use DW (see below)		
Distinctly weathered	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching or may be decreased due to deposition of weathered products in pores.	DW

<sup>1</sup> The parent rock type, of which the residual/extremely weathered material is a derivative, will be stated in the description (where discernible).

## Degree of Alteration

The degree of alteration of the rock material (physical or chemical changes caused by hot gasses or liquids at depth) is classified as follows:

Term	Description	Abbreviation Code
Extremely altered	Material is altered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.	XA
Highly altered	The whole of the rock material is discoloured, usually by staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is changed by alteration. Some primary minerals are altered to clay minerals. Porosity may be increased by leaching or may be decreased due to precipitation of secondary materials in pores.	HA
Moderately altered	The whole of the rock material is discoloured, usually by staining or bleaching to the extent that the colour of the original rock is not recognisable but shows little or no change of strength from fresh rock.	MA
Slightly altered	Rock is slightly discoloured but shows little or no change of strength from fresh rock	SA
Note: If HA and MA cannot be differentiated use DA (see below)		
Distinctly altered	Rock strength usually changed by alteration. The rock may be highly discoloured, usually by staining or bleaching. Porosity may be increased by leaching or may be decreased due to precipitation of secondary minerals in pores.	DA

## Degree of Fracturing

The following descriptive classification apply to the spacing of natural occurring fractures in the rock mass. It includes bedding plane partings, joints and other defects, but excludes drilling breaks. These terms are generally not required on investigation logs where fracture spacing is presented as a histogram, and where used are presented in an unabbreviated format.

Term	Description
Fragmented	Fragments of <20 mm
Highly Fractured	Core lengths of 20-40 mm with occasional fragments
Fractured	Core lengths of 30-100 mm with occasional shorter and longer sections
Slightly Fractured	Core lengths of 300 mm or longer with occasional sections of 100-300 mm
Unbroken	Core contains very few fractures

## Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$RQD \% = \frac{\text{cumulative length of 'sound' core sections} > 100 \text{ mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or stronger. The RQD applies only to natural fractures. If the core is broken by drilling or handling (i.e., drilling breaks) then the broken pieces are fitted back together and are not included in the calculation of RQD.

## Stratification Spacing

These terms may be used to describe the spacing of bedding partings in sedimentary rocks. Where used, these terms are generally presented in an unabbreviated format

Term	Separation of Stratification Planes
Thinly laminated	< 6 mm
Laminated	6 mm to 20 mm
Very thinly bedded	20 mm to 60 mm
Thinly bedded	60 mm to 0.2 m
Medium bedded	0.2 m to 0.6 m
Thickly bedded	0.6 m to 2 m
Very thickly bedded	> 2 m

## Defect Descriptions

### Defect Type

Term	Abbreviation Code
Bedding plane	B
Cleavage	CL
Crushed seam	CS
Crushed zone	CZ
Drilling break	DB
Decomposed seam	DS
Drill lift	DL
Extremely Weathered seam	EW
Fault	F
Fracture	FC
Fragmented	FG
Handling break	HB
Infilled seam	IS
Joint	JT
Lamination	LAM
Shear seam	SS
Shear zone	SZ
Vein	VN
Mechanical break	MB
Parting	P
Sheared Surface	S

### Rock Defect Orientation

Term	Abbreviation Code
Horizontal	H
Vertical	V
Sub-horizontal	SH
Sub-vertical	SV

### Rock Defect Coating

Term	Abbreviation Code
Clean	CN
Coating	CT
Healed	HE
Infilled	INF
Stained	SN
Tight	TI
Veneer	VNR

### Rock Defect Infill

Term	Abbreviation Code
Calcite	CA
Carbonaceous	CBS
Clay	CLAY
Iron oxide	FE
Manganese	MN
Pyrite	Py
Secondary material	MS
Silt	M
Quartz	Qz
Unidentified material	MU

### Rock Defect Shape/Planarity

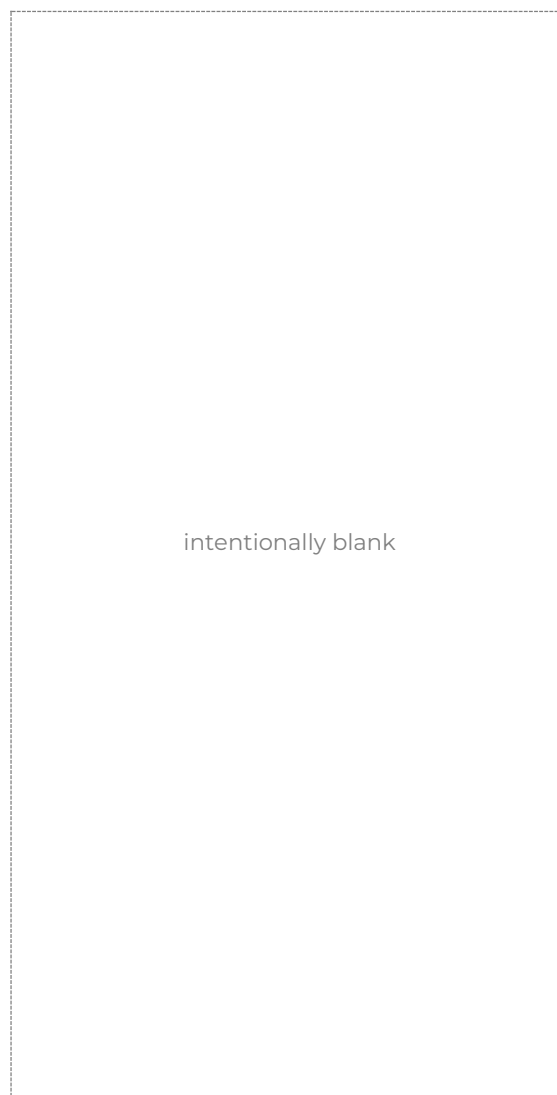
Term	Abbreviation Code
Curved	CU
Discontinuous	DIS
Irregular	IR
Planar	PR
Stepped	ST
Undulating	UN

### Rock Defect Roughness

Term	Abbreviation Code
Polished	PO
Rough	RF
Smooth	SM
Slickensided	SL
Very rough	VR

### Defect Orientation

The inclination of defects is always measured from the perpendicular to the core axis.





## Sampling and Testing

A record of samples retained, and field testing performed is usually shown on a Douglas Partners' log with samples appearing to the left of a depth scale, and selected field and laboratory testing (including results, where relevant) appearing to the right of the scale, as illustrated below:

SAMPLE			DEPTH (m)	TESTING	
SAMPLE REMARKS	TYPE	INTERVAL		TEST TYPE	RESULTS AND REMARKS
	SPT	1.0 - 1.45	1.0	SPT	4,9,11 N=20

### Sampling

The type or intended purpose for which a sample was taken is indicated by the following abbreviation codes.

Sample Type	Code
Auger sample	A
Acid Sulfate sample	ASS
Bulk sample	B
Core sample	C
Disturbed sample	D
Environmental sample	ES
Gas sample	G
Piston sample	P
Sample from SPT test	SPT
Undisturbed tube sample	U <sup>1</sup>
Water sample	W
Material Sample	MT
Core sample for unconfined compressive strength testing	UCS

<sup>1</sup> – numeric suffixes indicate tube diameter/width in mm

The above codes only indicate that a sample was retained, and not that testing was scheduled or performed.

### Field and Laboratory Testing

A record that field and laboratory testing was performed is indicated by the following abbreviation codes.

Test Type	Code
Pocket penetrometer (kPa)	PP
Photo ionisation detector (ppm)	PID
Standard Penetration Test x/y = x blows for y mm penetration HB = hammer bouncing HW = fell under weight of hammer	SPT
Shear vane (kPa)	V
Unconfined compressive strength, (MPa)	UCS

Field and laboratory testing (continued)

Test Type	Code
Point load test, (MPa), axial (A), diametric (D), irregular (I)	PLT(L)
Dynamic cone penetrometer, followed by blow count penetration increment in mm (cone tip, generally in accordance with AS1289.6.3.2)	DCP/150
Perth sand penetrometer, followed by blow count penetration increment in mm (flat tip, generally in accordance with AS1289.6.3.3)	PSP/150

### Groundwater Observations

▷	seepage/inflow
▽	standing or observed water level
NFGWO	no free groundwater observed
OBS	observations obscured by drilling fluids

### Drilling or Excavation Methods/Tools

The drilling/excavation methods used to perform the investigation may be shown either in a dedicated column down the left-hand edge of the log, or stated in the log footer. In some circumstances abbreviation codes may be used.

Method	Abbreviation Code
Direct Push	DP
Solid flight auger. Suffixes: /T = tungsten carbide tip, /V = v-shaped tip	AD <sup>1</sup>
Air Track	AT
Diatube	DT <sup>1</sup>
Hand auger	HA <sup>1</sup>
Hand tools (unspecified)	HAND
Existing exposure	X
Hollow flight auger	HSA <sup>1</sup>
HQ coring	HQ3
HMLC series coring	HMLC
NMLC series coring	NMLC
NQ coring	NQ3
PQ coring	PQ3
Predrilled	PD
Push tube	PT <sup>1</sup>
Ripping tyne/ripper	R
Rock roller	RR <sup>1</sup>
Rock breaker/hydraulic hammer	EH
Sonic drilling	SON <sup>1</sup>
Mud/blade bucket	MB <sup>1</sup>
Toothed bucket	TB <sup>1</sup>
Vibrocure	VC <sup>1</sup>
Vacuum excavation	VE
Wash bore (unspecified bit type)	WB <sup>1</sup>

<sup>1</sup> – numeric suffixes indicate tool diameter/width in mm

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## **Appendix D**

### Summary of Water Quality Results

Table D3: Summary of Laboratory Results – Groundwater

		Metals - Dissolved								TRH				BTEX						PAH					OCP	OPP	PCB	VOC	
		Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	F1 (C6-C10)-BTEX	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene	Total Xylenes	Anthracene	Benzo(a)pyrene (BaP)	Fluoranthene	Phenanthrene	Sum of detected PAH	Sum of detected OCP	Sum of detected OPP	Sum of detected PCB	Sum of detected VOC	
		PQL	1	0.1	1	1	0.05	1	1	10	50	100	100	1	1	1	1	2	1	0.1	0.1	0.1	0.1	0.1	0.001	0.004	0.01	1	
NHMRC (2018) ADWG Health		10	2		2,000	10	1	20					1	800	300				600		0.01								
ANZG (2018) 95% LOP Fresh		13	0.2	1	1.4	3.4	<b>0.06</b>	11	8				950	180	80	350	75			<b>0.01</b>	<b>0.1</b>	<b>1</b>	<b>0.6</b>						
Sample ID	Sample Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
BH501	05/07/24	<1	<0.1	<1	<1	<1	<0.05	<b>2</b>	<b>14</b>	<10	<50	<100	<100	<1	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.001	<0.004	<0.01	<1	
BH502	05/07/24	<1	<0.1	<1	<b>2</b>	<1	<0.05	<b>7</b>	<b>19</b>	<10	<50	<100	<100	<1	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.001	<0.004	<0.01	<1	
BH503	05/07/24	<1	<0.1	<1	<1	<1	<0.05	<b>10</b>	<b>23</b>	<10	<50	<100	<100	<1	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.001	<0.004	<0.01	<1	
BDI/20240705	05/07/24	<1	<0.1	<1	<1	<1	<0.05	<b>3</b>	<b>14</b>	<10	<50	<100	<100	<1	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	

**Notes:**

- No criterion / not defined / not tested / not applicable
  - \* QA/QC replicate of sample listed directly below the primary sample
  - NL Not limiting
  - PQL Practical quantitation limit
- Shaded cell is exceedance of guideline value
- Where one or more guideline value is exceeded, the cell is shaded to the colour of the highest guideline value exceeded
- ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 95% level of protection of species for Fresh aquatic ecosystems [NB: 99% level of protection adopted for bioaccumulative chemicals]
- NHMRC (2018) Australian Drinking Water Guidelines 6 2011, drinking water aesthetic-based criteria
- NHMRC (2008) Guidelines for Managing Risk in Recreational Water
- ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality, orange text is 'unknown' level of protection
- Underlining of ANZG (2018) criteria indicates a criteria with an 'unknown' level of protection.
- ANZG (2018) DGV adopted for most conservative species of following analytes: DGV for xylene (m) adopted for xylene (m+p); DGV for CrVI adopted for total chromium; DGV for AsV adopted for total arsenic
- ANZG (2018) DGV adopted for aluminium in freshwater is for receiving waters with pH >6.5. For receiving waters with pH <6.5 suitability of the more conservative, low reliability DGV of unknown LOP should be considered
- ANZG (2018) Ammonia DGV is pH and temperature dependant. DGV for a pH of 8 provided in table.

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## **Appendix E**

Water Laboratory Reports

## CERTIFICATE OF ANALYSIS 355865

### Client Details

<b>Client</b>	Douglas Partners Pty Ltd
<b>Attention</b>	Joel James-Hall
<b>Address</b>	96 Hermitage Rd, West Ryde, NSW, 2114

### Sample Details

<b>Your Reference</b>	<b>84711.05 Sydney</b>
<b>Number of Samples</b>	4 Water
<b>Date samples received</b>	05/07/2024
<b>Date completed instructions received</b>	05/07/2024

### Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.  
 Samples were analysed as received from the client. Results relate specifically to the samples as received.  
 Results are reported on a dry weight basis for solids and on an as received basis for other matrices.  
**Please refer to the last page of this report for any comments relating to the results.**

### Report Details

<b>Date results requested by</b>	12/07/2024
<b>Date of Issue</b>	12/07/2024
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. <b>Tests not covered by NATA are denoted with *</b>	

#### **Results Approved By**

Diego Bigolin, Inorganics Supervisor  
 Giovanni Agosti, Group Technical Manager  
 Jack Wallis, Chemist (FAS)  
 Timothy Toll, Senior Chemist

#### **Authorised By**

Nancy Zhang, Laboratory Manager

VOCs in water				
Our Reference		355865-1	355865-2	355865-3
Your Reference	UNITS	BH501	BH502	BH503
Date Sampled		05/07/2024	05/07/2024	05/07/2024
Type of sample		Water	Water	Water
Date Extracted	-	09/07/2024	09/07/2024	09/07/2024
Date Analysed	-	10/07/2024	10/07/2024	10/07/2024
Dichlorodifluoromethane	µg/L	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1
Chloroform	µg/L	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1
Benzene	µg/L	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1
Toluene	µg/L	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1

VOCs in water				
Our Reference		355865-1	355865-2	355865-3
Your Reference	UNITS	BH501	BH502	BH503
Date Sampled		05/07/2024	05/07/2024	05/07/2024
Type of sample		Water	Water	Water
Bromoform	µg/L	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2
Styrene	µg/L	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1
o-xylene	µg/L	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1
Surrogate Dibromofluoromethane	%	110	115	118
Surrogate Toluene-d8	%	104	105	106
Surrogate 4-Bromofluorobenzene	%	88	89	87

vTRH(C6-C10)/BTEXN in Water					
Our Reference		355865-1	355865-2	355865-3	355865-4
Your Reference	UNITS	BH501	BH502	BH503	BD1/20240705
Date Sampled		05/07/2024	05/07/2024	05/07/2024	05/07/2024
Type of sample		Water	Water	Water	Water
Date extracted	-	09/07/2024	09/07/2024	09/07/2024	09/07/2024
Date analysed	-	10/07/2024	10/07/2024	10/07/2024	10/07/2024
TRH C <sub>6</sub> - C <sub>9</sub>	µg/L	<10	<10	<10	<10
TRH C <sub>6</sub> - C <sub>10</sub>	µg/L	<10	<10	<10	<10
TRH C <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	µg/L	<10	<10	<10	<10
Benzene	µg/L	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	110	115	118	113
Surrogate Toluene-d8	%	104	105	106	104
Surrogate 4-Bromofluorobenzene	%	88	89	87	87

svTRH (C10-C40) in Water					
Our Reference		355865-1	355865-2	355865-3	355865-4
Your Reference	UNITS	BH501	BH502	BH503	BD1/20240705
Date Sampled		05/07/2024	05/07/2024	05/07/2024	05/07/2024
Type of sample		Water	Water	Water	Water
Date extracted	-	09/07/2024	09/07/2024	09/07/2024	09/07/2024
Date analysed	-	10/07/2024	10/07/2024	10/07/2024	10/07/2024
TRH C <sub>10</sub> - C <sub>14</sub>	µg/L	<50	<50	<50	<50
TRH C <sub>15</sub> - C <sub>28</sub>	µg/L	<100	<100	<100	<100
TRH C <sub>29</sub> - C <sub>36</sub>	µg/L	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	<50
TRH >C <sub>10</sub> - C <sub>16</sub>	µg/L	<50	<50	<50	<50
TRH >C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	µg/L	<50	<50	<50	<50
TRH >C <sub>16</sub> - C <sub>34</sub>	µg/L	<100	<100	<100	<100
TRH >C <sub>34</sub> - C <sub>40</sub>	µg/L	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50	<50
Surrogate o-Terphenyl	%	110	104	72	95

PAHs in Water					
Our Reference		355865-1	355865-2	355865-3	355865-4
Your Reference	UNITS	BH501	BH502	BH503	BD1/20240705
Date Sampled		05/07/2024	05/07/2024	05/07/2024	05/07/2024
Type of sample		Water	Water	Water	Water
Date extracted	-	09/07/2024	09/07/2024	09/07/2024	09/07/2024
Date analysed	-	11/07/2024	11/07/2024	11/07/2024	12/07/2024
Naphthalene	µg/L	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1	<0.1
Surrogate <i>p</i> -Terphenyl-d14	%	134	126	78	79

OCPs in Water - Trace Level				
Our Reference		355865-1	355865-2	355865-3
Your Reference	UNITS	BH501	BH502	BH503
Date Sampled		05/07/2024	05/07/2024	05/07/2024
Type of sample		Water	Water	Water
Date extracted	-	09/07/2024	09/07/2024	09/07/2024
Date analysed	-	11/07/2024	11/07/2024	11/07/2024
alpha-BHC	µg/L	<0.001	<0.001	<0.001
HCB	µg/L	<0.001	<0.001	<0.001
beta-BHC	µg/L	<0.001	<0.001	<0.001
gamma-BHC	µg/L	<0.001	<0.001	<0.001
Heptachlor	µg/L	<0.001	<0.001	<0.001
delta-BHC	µg/L	<0.001	<0.001	<0.001
Aldrin	µg/L	<0.001	<0.001	<0.001
Heptachlor Epoxide	µg/L	<0.001	<0.001	<0.001
gamma-Chlordane	µg/L	<0.001	<0.001	<0.001
alpha-Chlordane	µg/L	<0.001	<0.001	<0.001
Endosulfan I	µg/L	<0.002	<0.002	<0.002
pp-DDE	µg/L	<0.001	<0.001	<0.001
Dieldrin	µg/L	<0.001	<0.001	<0.001
Endrin	µg/L	<0.001	<0.001	<0.001
Endosulfan II	µg/L	<0.002	<0.002	<0.002
pp-DDD	µg/L	<0.001	<0.001	<0.001
Endrin Aldehyde	µg/L	<0.001	<0.001	<0.001
pp-DDT	µg/L	<0.001	<0.001	<0.001
Endosulfan Sulphate	µg/L	<0.001	<0.001	<0.001
Methoxychlor	µg/L	<0.001	<0.001	<0.001
Surrogate 4-Chloro-3-NBTF	%	137	110	68

OP in water LL ANZECCF/ADWG				
Our Reference		355865-1	355865-2	355865-3
Your Reference	UNITS	BH501	BH502	BH503
Date Sampled		05/07/2024	05/07/2024	05/07/2024
Type of sample		Water	Water	Water
Date extracted	-	09/07/2024	09/07/2024	09/07/2024
Date analysed	-	11/07/2024	11/07/2024	11/07/2024
Dichlorvos	µg/L	<0.05	<0.05	<0.05
Mevinphos	µg/L	<0.05	<0.05	<0.05
Phorate	µg/L	<0.05	<0.05	<0.05
Dimethoate	µg/L	<0.1	<0.1	<0.1
Diazinon	µg/L	<0.01	<0.01	<0.01
Disulfoton	µg/L	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	µg/L	<0.05	<0.05	<0.05
Parathion-Methyl	µg/L	<0.05	<0.05	<0.05
Ronnel	µg/L	<0.05	<0.05	<0.05
Fenitrothion	µg/L	<0.05	<0.05	<0.05
Malathion	µg/L	<0.05	<0.05	<0.05
Chlorpyrifos	µg/L	<0.009	<0.009	<0.009
Fenthion	µg/L	<0.05	<0.05	<0.05
Parathion	µg/L	<0.004	<0.004	<0.004
Bromophos ethyl	µg/L	<0.05	<0.05	<0.05
Methidathion	µg/L	<0.05	<0.05	<0.05
Fenamiphos	µg/L	<0.05	<0.05	<0.05
Ethion	µg/L	<0.05	<0.05	<0.05
Phosalone	µg/L	<0.05	<0.05	<0.05
Azinphos-methyl (Guthion)	µg/L	<0.02	<0.02	<0.02
Coumaphos	µg/L	<0.05	<0.05	<0.05
Surrogate 4-Chloro-3-NBTF	%	137	110	68

PCBs in Water - Trace Level				
Our Reference		355865-1	355865-2	355865-3
Your Reference	UNITS	BH501	BH502	BH503
Date Sampled		05/07/2024	05/07/2024	05/07/2024
Type of sample		Water	Water	Water
Date extracted	-	09/07/2024	09/07/2024	09/07/2024
Date analysed	-	11/07/2024	11/07/2024	11/07/2024
Aroclor 1016	µg/L	<0.01	<0.01	<0.01
Aroclor 1221	µg/L	<0.01	<0.01	<0.01
Aroclor 1232	µg/L	<0.01	<0.01	<0.01
Aroclor 1242	µg/L	<0.01	<0.01	<0.01
Aroclor 1248	µg/L	<0.01	<0.01	<0.01
Aroclor 1254	µg/L	<0.01	<0.01	<0.01
Aroclor 1260	µg/L	<0.01	<0.01	<0.01
Surrogate 2-Fluorobiphenyl	%	139	126	74

Client Reference: 84711.05 Sydney

Total Phenolics in Water				
Our Reference		355865-1	355865-2	355865-3
Your Reference	UNITS	BH501	BH502	BH503
Date Sampled		05/07/2024	05/07/2024	05/07/2024
Type of sample		Water	Water	Water
Date extracted	-	10/07/2024	10/07/2024	10/07/2024
Date analysed	-	10/07/2024	10/07/2024	10/07/2024
Total Phenolics (as Phenol)	mg/L	<0.05	<0.05	<0.05

HM in water - dissolved					
Our Reference		355865-1	355865-2	355865-3	355865-4
Your Reference	UNITS	BH501	BH502	BH503	BD1/20240705
Date Sampled		05/07/2024	05/07/2024	05/07/2024	05/07/2024
Type of sample		Water	Water	Water	Water
Date prepared	-	11/07/2024	11/07/2024	11/07/2024	11/07/2024
Date analysed	-	11/07/2024	11/07/2024	11/07/2024	11/07/2024
Arsenic-Dissolved	µg/L	<1	<1	<1	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1
Copper-Dissolved	µg/L	<1	2	<1	<1
Lead-Dissolved	µg/L	<1	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	2	7	10	3
Zinc-Dissolved	µg/L	14	19	23	14

Method ID	Methodology Summary
<b>Inorg-031</b>	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
<b>Metals-021</b>	Determination of Mercury by Cold Vapour AAS.
<b>Metals-022</b>	Determination of various metals by ICP-MS.  Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements.  Salt forms (e.g. FeO, PbO, ZnO) are determined stoichiometrically from the base metal concentration.
<b>Org-020</b>	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
<b>Org-021/022/025</b>	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS.
<b>Org-021/022/025</b>	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
<b>Org-022/025</b>	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
<b>Org-022/025</b>	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
<b>Org-023</b>	Water samples are analysed directly by purge and trap GC-MS.
<b>Org-023</b>	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Client Reference: 84711.05 Sydney

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date Extracted	-			09/07/2024	1	09/07/2024	10/07/2024		09/07/2024	[NT]
Date Analysed	-			10/07/2024	1	10/07/2024	11/07/2024		10/07/2024	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	85	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	1	<1	<1	0	93	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	94	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	94	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	85	[NT]
Dibromomethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	87	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	89	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	87	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	103	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	96	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	90	[NT]
Bromoform	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	89	[NT]
Styrene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]

Client Reference: 84711.05 Sydney

QUALITY CONTROL: VOCs in water						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	90	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
<i>Surrogate</i> Dibromofluoromethane	%		Org-023	107	1	110	108	2	102	[NT]
<i>Surrogate</i> Toluene-d8	%		Org-023	104	1	104	101	3	103	[NT]
<i>Surrogate</i> 4-Bromofluorobenzene	%		Org-023	88	1	88	85	3	110	[NT]

Client Reference: 84711.05 Sydney

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water							Duplicate		Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			09/07/2024	1	09/07/2024	10/07/2024		09/07/2024	[NT]
Date analysed	-			10/07/2024	1	10/07/2024	11/07/2024		10/07/2024	[NT]
TRH C <sub>6</sub> - C <sub>9</sub>	µg/L	10	Org-023	<10	1	<10	<10	0	88	[NT]
TRH C <sub>6</sub> - C <sub>10</sub>	µg/L	10	Org-023	<10	1	<10	<10	0	88	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	85	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	87	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	90	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	89	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	90	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	107	1	110	108	2	102	[NT]
Surrogate Toluene-d8	%		Org-023	104	1	104	101	3	103	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	88	1	88	85	3	110	[NT]

Client Reference: 84711.05 Sydney

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			09/07/2024	[NT]	[NT]	[NT]	[NT]	09/07/2024	[NT]
Date analysed	-			10/07/2024	[NT]	[NT]	[NT]	[NT]	10/07/2024	[NT]
TRH C <sub>10</sub> - C <sub>14</sub>	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	79	[NT]
TRH C <sub>15</sub> - C <sub>28</sub>	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	80	[NT]
TRH C <sub>29</sub> - C <sub>36</sub>	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	85	[NT]
TRH >C <sub>10</sub> - C <sub>16</sub>	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	79	[NT]
TRH >C <sub>16</sub> - C <sub>34</sub>	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	80	[NT]
TRH >C <sub>34</sub> - C <sub>40</sub>	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	85	[NT]
Surrogate o-Terphenyl	%		Org-020	97	[NT]	[NT]	[NT]	[NT]	114	[NT]

Client Reference: 84711.05 Sydney

QUALITY CONTROL: PAHs in Water				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			09/07/2024	[NT]	[NT]	[NT]	[NT]	09/07/2024	[NT]
Date analysed	-			11/07/2024	[NT]	[NT]	[NT]	[NT]	11/07/2024	[NT]
Naphthalene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	68	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	129	[NT]	[NT]	[NT]	[NT]	91	[NT]

Client Reference: 84711.05 Sydney

QUALITY CONTROL: OCPs in Water - Trace Level				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			09/07/2024	[NT]	[NT]	[NT]	[NT]	09/07/2024	[NT]
Date analysed	-			11/07/2024	[NT]	[NT]	[NT]	[NT]	11/07/2024	[NT]
alpha-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	86	[NT]
HCB	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	102	[NT]
gamma-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	104	[NT]
delta-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	108	[NT]
Aldrin	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	108	[NT]
Heptachlor Epoxide	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	112	[NT]
gamma-Chlordane	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-Chlordane	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	µg/L	0.002	Org-022/025	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	102	[NT]
Dieldrin	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	104	[NT]
Endrin	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	78	[NT]
Endosulfan II	µg/L	0.002	Org-022/025	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	110	[NT]
Endrin Aldehyde	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	104	[NT]
Methoxychlor	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	100	[NT]	[NT]	[NT]	[NT]	67	[NT]

Client Reference: 84711.05 Sydney

QUALITY CONTROL: OP in water LL ANZECCF/ADWG					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			09/07/2024	[NT]	[NT]	[NT]	[NT]	09/07/2024	[NT]
Date analysed	-			11/07/2024	[NT]	[NT]	[NT]	[NT]	11/07/2024	[NT]
Dichlorvos	µg/L	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	110	[NT]
Mevinphos	µg/L	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phorate	µg/L	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dimethoate	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	µg/L	0.01	Org-022/025	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Disulfoton	µg/L	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos-methyl	µg/L	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion-Methyl	µg/L	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	µg/L	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	94	[NT]
Fenitrothion	µg/L	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	88	[NT]
Malathion	µg/L	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	98	[NT]
Chlorpyrifos	µg/L	0.009	Org-022/025	<0.009	[NT]	[NT]	[NT]	[NT]	100	[NT]
Fenthion	µg/L	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion	µg/L	0.004	Org-022/025	<0.004	[NT]	[NT]	[NT]	[NT]	88	[NT]
Bromophos ethyl	µg/L	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methidathion	µg/L	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fenamiphos	µg/L	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	µg/L	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	96	[NT]
Phosalone	µg/L	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Azinphos-methyl (Guthion)	µg/L	0.02	Org-022/025	<0.02	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Coumaphos	µg/L	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	100	[NT]	[NT]	[NT]	[NT]	67	[NT]

Client Reference: 84711.05 Sydney

QUALITY CONTROL: PCBs in Water - Trace Level					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			09/07/2024	[NT]	[NT]	[NT]	[NT]	09/07/2024	[NT]
Date analysed	-			11/07/2024	[NT]	[NT]	[NT]	[NT]	11/07/2024	[NT]
Aroclor 1016	µg/L	0.01	Org-021/022/025	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	µg/L	0.01	Org-021/022/025	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	µg/L	0.01	Org-021/022/025	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	µg/L	0.01	Org-021/022/025	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	µg/L	0.01	Org-021/022/025	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	µg/L	0.01	Org-021/022/025	<0.01	[NT]	[NT]	[NT]	[NT]	121	[NT]
Aroclor 1260	µg/L	0.01	Org-021/022/025	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	88	[NT]	[NT]	[NT]	[NT]	109	[NT]

Client Reference: 84711.05 Sydney

QUALITY CONTROL: Total Phenolics in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			10/07/2024	1	10/07/2024	10/07/2024		10/07/2024	[NT]
Date analysed	-			10/07/2024	1	10/07/2024	10/07/2024		10/07/2024	[NT]
Total Phenolics (as Phenol)	mg/L	0.05	Inorg-031	<0.05	1	<0.05	<0.05	0	108	[NT]

Client Reference: 84711.05 Sydney

QUALITY CONTROL: HM in water - dissolved				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W5	355865-2
Date prepared	-			11/07/2024	1	11/07/2024	11/07/2024		11/07/2024	11/07/2024
Date analysed	-			11/07/2024	1	11/07/2024	11/07/2024		11/07/2024	11/07/2024
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	96	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	<0.1	<0.1	0	98	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	100	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	104	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	101	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	[NT]	82
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	2	2	0	104	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	14	13	7	110	[NT]

QUALITY CONTROL: HM in water - dissolved				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date prepared	-			[NT]	[NT]	[NT]	[NT]	[NT]	11/07/2024	[NT]
Date analysed	-			[NT]	[NT]	[NT]	[NT]	[NT]	11/07/2024	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	[NT]	[NT]	[NT]	[NT]	[NT]	118	[NT]

## Result Definitions

<b>NT</b>	Not tested
<b>NA</b>	Test not required
<b>INS</b>	Insufficient sample for this test
<b>PQL</b>	Practical Quantitation Limit
<b>&lt;</b>	Less than
<b>&gt;</b>	Greater than
<b>RPD</b>	Relative Percent Difference
<b>LCS</b>	Laboratory Control Sample
<b>NS</b>	Not specified
<b>NEPM</b>	National Environmental Protection Measure
<b>NR</b>	Not Reported

## Quality Control Definitions

<b>Blank</b>	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
<b>Duplicate</b>	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
<b>Matrix Spike</b>	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
<b>LCS (Laboratory Control Sample)</b>	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
<b>Surrogate Spike</b>	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	

## Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

## Report Comments

Dissolved Metals: no filtered, preserved sample was received, therefore the unpreserved sample was filtered through 0.45µm filter at the lab.

Note: there is a possibility some elements may be underestimated.

355865 LOC 5/7/24

# CHAIN OF CUSTODY DESPATCH SHEET

<b>Project No:</b> 84711.05		<b>Suburb:</b> Sydney		<b>To:</b> Envirolab Services	
<b>Project Manager:</b> Joel James-Hall		<b>Order Number:</b>		<b>Sampler:</b> JC	
<b>Email:</b> joel.james-hall@douglaspartners.com.au				<b>Attn:</b> Sample Receipt	
<b>Turnaround time</b> <input checked="" type="checkbox"/> Standard <input type="checkbox"/> 72 hour <input type="checkbox"/> 48 hour <input type="checkbox"/> 24 hour <input type="checkbox"/> Same day				(02) 9910 6200 <a href="mailto:samplerreceipt@envirolab.com">samplerreceipt@envirolab.com</a>	

**Prior Storage**  Fridge  Freezer  Esky  Shelf **Do samples contain 'potential' HBM?**  No  YES, handle, transport, store in accordance with FPM HAZID

Lab ID	Sample ID			Date Sampled	Sample Type		Container Type		Analytes										Notes/ Preservation/ Additional Requirements			
	Location / Other ID	Depth From	Depth To		S - soil W - water M - Material	G - glass P - plastic	Combo 8L	VOC	Combo 3L													
1	BH501			5/07/24	W	G/P	x	x														Trace OCP, OPP, PCB. Lab filter metals
✓	BH502			5/07/24	W	G/P	x	x														
3	BH503			5/07/24	W	G/P	x	x														
4	BD1/20240705			5/07/24	W	G/P			x													Lab filter metals

<b>Metals to analyse:</b>			<b>LAB RECEIPT</b>		
<b>Number of samples in container:</b>			<b>Transported to laboratory by:</b>		
<b>Send results to:</b> Douglas Partners Pty Ltd			<b>Lab Ref. No:</b>		
<b>Address:</b> 96 Hermitage Road, West Ryde NSW 211			<b>Received by:</b>		
<b>Relinquished by:</b>			<b>Date &amp; Time:</b>		
<b>Phone:</b> (02) 9809 0666			<b>Signed:</b>		
<b>Date:</b>			<b>Signed:</b>		



---

## **Appendix F**

### Summary of Screening Criteria

**Table F1: Summary screening criteria (units given in µg/L unless otherwise stated)**

	Analyte	Freshwater (95% LOP)	Physical parameters
Metals	Arsenic (III / V)	24 / 13	-
	Cadmium	0.2	-
	Chromium (III / VI)	1	-
	Copper	1.4	-
	Mercury (inorganic)	0.06	-
	Lead	3.4	-
	Nickel	11	-
	Zinc	8	-
TRH	C <sub>6</sub> -C <sub>10</sub>	10 (< PQL) <sup>d</sup>	-
	C <sub>10</sub> -C <sub>16</sub>	50 (< PQL) <sup>d</sup>	-
	C <sub>16</sub> -C <sub>34</sub>	100 (< PQL) <sup>d</sup>	-
	C <sub>34</sub> -C <sub>40</sub>	100 (< PQL) <sup>d</sup>	-
Oil and Grease		5000 (< PQL) <sup>d</sup>	No visible
BTEX	Benzene	950 <sup>a</sup>	-
	Toluene	180	-
	Ethylbenzene	80	-
	Xylenes (m-, o- & p-)	75 / 350 / 200	-
PAH	Anthracene	0.01 <sup>a</sup>	-
	Benzo(a)pyrene	0.1 <sup>a</sup>	-
	Fluoranthene	1 <sup>a</sup>	-
	Naphthalene	50	-
	Phenanthrene	0.6 <sup>a</sup>	-
PCB	Aroclor 1254 (as a preliminary screen)	0.01	-
OCP	Aldrin <sup>a</sup> (as a preliminary screen)	0.001	-
OPP	Chlopyrifos <sup>a</sup> (as a preliminary screen)	0.01	-

Analyte		Freshwater (95% LOP)	Physical parameters
Phenols	Pentachlorophenol <sup>a</sup> (as a preliminary screen)	11	-
PFAS	PFOS	0.00023 <sup>a</sup>	-
	PFOA	19 <sup>a</sup>	-
VOC	All VOC	< PQL <sup>e</sup>	-
Nutrients	Ammonia as N	900	-
	Nitrate as N	-	-
	Nitrite as N	-	-
Physical Parameters	Conductivity	-	125 - 2200 $\mu\text{s}/\text{cm}$ <sup>f</sup>
	pH	-	6-8 <sup>f</sup> (6.5-8.5) <sup>h</sup>
	Dissolved Oxygen	-	85-120 % saturation <sup>f</sup>
	Turbidity	-	6-50 NTU <sup>f</sup>
	Total Suspended Solids	-	< 50 mg/L <sup>g</sup>

## Notes to Table:

PQL – laboratory practical quantification limit

a – 99% LOP adopted due to bioaccumulating nature of the contaminant or as otherwise recommended as per ANZG (2018)

b – unknown LOP

c – aesthetic criteria only

d – set at the laboratory PQL, example limits given

e- as an initial screen given the exhaustive list of VOC

f – given as comparative levels for lowland rivers. Typical conductivity values for coastal rivers in NSW are cited as 200-300  $\mu\text{s}/\text{cm}$  (ANZECC, 2000).

g – typical levels based on experience with previous council disposal requirements

h – range of typical neutral pH conditions.

## 6.2 CONSTRUCTION TRAFFIC AND PEDESTRIAN MANAGEMENT PLAN

## 6.3 CONSTRUCTION NOISE AND VIBRATION MANAGEMENT PLAN

## 6.4 CONSTRUCTION WASTE MANAGEMENT PLAN

## 6.6 REMEDIATION ACTION PLAN



**Douglas Partners**  
Geotechnics | Environment | Groundwater

Integrated Practical Solutions

## Remediation Action Plan

Sydney Biomedical Accelerator (SBA)  
Corner of Western Avenue and Cadigal Lane, The  
University of Sydney and Gloucester House Drive and  
Lambie Dew Drive, Royal Prince Alfred Hospital.

Prepared for  
FDC Construction (NSW) Pty Ltd

Project 84711.02  
July 2023



## Document History

### Document details

<b>Project No.</b>	84711.02	<b>Document No.</b>	R.002.Rev2
<b>Document title</b>	Remediation Action Plan Sydney Biomedical Accelerator (SBA) Corner of Western Avenue and Cadigal Lane, The University of Sydney and Gloucester House Drive and Lambie Dew Drive, Royal Prince Alfred Hospital.		
<b>Site address</b>	SBA Site (former Bosch), Western Av and Cadigal L, Camperdown		
<b>Report prepared for</b>	FDC Construction (NSW) Pty Ltd		
<b>File name</b>	84711.02.R.002.RAP.Rev2		



### Document status and review

Status	Prepared by	Reviewed by	Date issued
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Revision 0	Paula Maurici	Paul Gorman	05 July 2023
Revision 1	Joel James-Hall	Paul Gorman	31 July 2023

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Status	Electronic	Paper	Issued to
Draft A	1	-	David Greig, FDC Construction (NSW) Pty Ltd
Revision 0	1	-	David Greig, FDC Construction (NSW) Pty Ltd
Revision 1	1	-	David Greig, FDC Construction (NSW) Pty Ltd

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

	Signature	Date
<b>Author</b>		31 July 2023
<b>Reviewer</b>	p.p. 	31 July 2023

*Douglas Partners acknowledges Australia's First Peoples as the Traditional Owners of the Land and Sea on which we operate. We pay our respects to Elders past and present and to all Aboriginal and Torres Strait Islander peoples across the many communities in which we live, visit and work. We recognise and respect their ongoing cultural and spiritual connection to Country.*



FS 604853

Douglas Partners Pty Ltd  
 ABN 75 053 980 117  
[www.douglaspartners.com.au](http://www.douglaspartners.com.au)  
 96 Hermitage Road  
 West Ryde NSW 2114  
 PO Box 472  
 West Ryde NSW 1685  
 Phone (02) 9809 0666

## Executive Summary

Douglas Partners Pty Ltd (DP) has prepared this remediation action plan (RAP) in relation to the Sydney Biomedical Accelerator Complex at the corner of Western Ave and Cadigal Lane, The University of Sydney and Gloucester House Drive and Lambie Dew Drive, Royal Prince Alfred Hospital. The RAP was commissioned by David Greig of FDC Construction (NSW) Pty Ltd and was undertaken in accordance with DP's proposal 84711.01.P.004.Rev0 dated 26 May 2023.

The remediation objectives, devised in accordance with CRC (2019a), are to:

- Address potentially unacceptable risks to relevant environmental values from contamination; and
- Render the site suitable, from a contamination perspective, for the proposed development.

This RAP provides details of the work that will be required at the site to meet the remediation objectives. It is noted that additional post demolition investigations are required to further inform the remediation at the site. Those investigations may necessitate a revision to this RAP to capture any additional identified contamination requiring remediation or management.

It is understood that the proposed development comprises the construction of an eight-storey building with single level basement. Demolition of the existing structures is understood to have been subject to a separate development approval D/2022/997.

Previous desktop investigations at the site have identified contamination risks to include the presence of uncontrolled fill, age of the buildings, plant rooms (gas boilers, air circulation systems etc), generator and an electrical substation. Based on the intrusive previous investigations, the following preliminary extent of remediation has been defined:

- Remediation Area 1 - Asbestos-impacted fill in the garden beds / embankment surrounding the glasshouse and south of Bosch 1A in the vicinity of previous sampling locations BH307 and BH310. Preliminarily the extent of the area may be anticipated to extend towards the nearest test locations which did not identify asbestos, and therefore may include the area bound by BH01, BH1, BH306, BH308, BH312 and BH311.
- Remediation Area 2 – Ecological Investigation Level (EIL) exceedances of metals and polycyclic aromatic hydrocarbons (PAH) in the vicinity of previous sampling locations BH1, BH314 and BH316.

In addition, the following potential areas for remediation have been identified:

- Potential Remediation Area 3 - Potential contamination beneath building footprints or other previously inaccessible areas of the site, to be assessed following demolition of the existing buildings; and
- Potential Remediation Area 4 - Potential asbestos, SMF, lead (in paint) and PCB to be addressed through a hazardous building material survey, subsequent removal, and clearances.

The test locations identified as above the Tier 1 screening criteria are shown on Drawing 2, Appendix A. The actual extent (the final remediation extent) will be established following demolition and completion of the data gap investigation outlined in Section 10.3), prior to commencement of excavation and remediation works. Particularly for Remediation Area 1, given the previous investigation methods and the typical nature of asbestos in soil contamination, consideration should be given for the risk of additional finds as a result of the data gap investigation.

The general sequence of remediation shall be determined by the Contractor with the aim of minimising the potential for cross contamination of 'clean' areas / soils with contaminated soils. This should include avoiding, wherever possible, transporting or placing contaminated soil over 'clean' areas separating stockpiles of different origin / contamination profile, and validating the complete removal of any contaminated material placed / potentially impacting 'clean' areas.

Prior to the commencement of demolition works a Hazardous Building Materials Survey (HBMS) must be undertaken to identify the type, condition, and location of hazardous building materials in the structures to be demolished (such as asbestos).

The general sequence of remediation recommended in the RAP includes:

- Task 1: Supplementary (data gap) investigation following demolition and clearance:
  - Delineation and further characterisation of Remediation Area 1 - area of known asbestos in fill in the garden beds / embankment surrounding the glasshouse and south of Bosch 1A building.
  - Conduct further general characterisation in currently inaccessible and un-tested parts of the site following demolition. This testing should include assessment of general potential contaminants identified in the CSM and more detailed assessment for asbestos in soils;
  - This testing should comprise use of test pits, on-site field screening of bulk samples and AF / FA analysis; and
  - Groundwater Investigation is required as part of the supplementary testing as this also represents a data gap.
- Task 2: Amendment of the RAP to capture any additional required remediation as a result of the data gap investigation. The amendment will document the preferred remediation option(s) for each remediation area;
- Task 3: In the case of fill soils to be removed from site either due to contamination issues or being surplus to the project:
  - Identify and delineate fill planned for excavation and landfill disposal;
  - Undertake additional sampling and testing (if required) and prepare a waste classification report;
  - Dispose the target soils off site in accordance with the waste classification; and
  - In the case of contaminated soils validate the removal of the impacted soils.
- Task 4: In the case of contaminated fill to be capped on site:
  - Identify and delineate the fill planned for retention on site under a cap;
  - If not being retained in situ, excavate, and stockpile the fill for later relocation to the area of containment;
  - Prepare and survey the depths and extents of the area of containment;
  - Place the soils in the containment area to the design underside of the cap, and survey the level of the top of contained soils; and
  - Cover the contained soils with a marker layer and validated capping soils (or similar) to the design thickness.
- Task 5: In the case of fill to be relocated within the site (e.g., fill with EIL exceedances):
  - Identify and delineate the fill planned for relocation;
  - If not being retained in situ, excavate, and stockpile the fill for later relocation to the proposed relocation area;

- Prepare and survey the extents of the area of proposed relocation; and
- Place the soils in the relocation area to the design underside of the hardstand.

Subject to proper implementation of the RAP and validation reporting confirming compliance with the RAP, DP considers that the site can be made suitable for the proposed University facility redevelopment. The short-term exposure during remediation and construction works should not pose an unacceptable risk to workers, provided the specific health and safety procedures as detailed in this document are adhered to.

On completion of remediation works, where contaminated soils are retained under a capping system, a long term environmental management plan (EMP) prepared in accordance with NSW EPA guidelines will be required to outline management procedures for future works to maintain the integrity of the cap. The obligations within the EMP must be legally enforceable.

It should be noted that this RAP does not form a detailed specification for the proposed site remediation works, but rather represents a planning document which outlines the means by which site remediation can be achieved.

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## Remediation Action Plan

### **Sydney Biomedical Accelerator (SBA) Corner of Western Avenue and Cadigal Lane, The University of Sydney and Gloucester House Drive and Lambie Dew Drive, Royal Prince Alfred Hospital.**

---

## 1. Introduction

Douglas Partners Pty Ltd (DP) has prepared this remediation action plan (RAP) in relation to the Camperdown – Sydney Biomedical Accelerator Complex – Sydney University at SBA Site (former Bosch), Western Avenue and Cadigal Lane, Camperdown. The RAP was commissioned by David Greig of FDC Construction (NSW) Pty Ltd and was undertaken in accordance with DP's proposal 84711.01.P.004.Rev0 dated 26 May 2023.

The following key guidelines were consulted in the preparation of this report:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013);
- NSW EPA *Guidelines for Consultants Reporting on Contaminated Land* (NSW EPA, 2020); and
- CRC CARE *Remediation Action Plan: Development - Guideline on Establishing Remediation Objectives* (CRC CARE, 2019a).

The remediation objectives, devised in accordance with CRC (2019a), are to:

- Address potentially unacceptable risks to relevant environmental values from contamination; and
- Render the site suitable, from a contamination perspective, for the proposed development.

This RAP provides details of the work that will be required at the site to meet the remediation objectives. It is noted that additional post demolition investigations are required to further inform the remediation at the site. Those investigations are likely to necessitate a revision to this RAP to capture any additional identified contamination requiring remediation or management.

It is understood that the proposed development comprises demolition of the existing structures and the construction of an eight-storey building with single level basement.

Based on available information, it is considered that the remediation works outlined in this report constitute Category 2 Remediation under Clause 4.13 of *SEPP (Resilience and Hazards) 2021*. The University of Sydney or the Department of Planning should be notified of the proposed commencement of the remediation work at least 30 days before commencement.

DP understands that FDC Construction (NSW) Pty Ltd (FDC) intend to engage an NSW EPA accredited site auditor to complete a site audit under the *Contaminated Land Management Act 1997* (NSW), which will involve their review of this RAP and associated reports.

It should be noted that this RAP does not form a detailed specification for the proposed site remediation works, but rather represents a planning document which outlines the means by which site remediation can be achieved.

The site layout is shown on Drawing 2, Appendix A. This report must be read in conjunction with all appendices including the notes provided in Appendix A.

## 2. Proposed Development

It is understood that the proposed development comprises the construction of an eight-storey building with single level basement. A separate development application approval is understood to have been lodged and proved with the City of Sydney (D/2022/997) for the demolition of existing structures on the site. Whilst demolition is therefore noted to be outside of the scope of the current application it is nonetheless referred to within this report as pertaining to the potential contamination risks, and limits to the previous investigations.

It is understood the first four levels, and basement, of the proposed SBA complex will connect to the existing Susan Wakil Health Building, to the north. With reference to provided design drawings (revision S2, attached in Appendix B) the proposed basement will have a finished floor level in the range of RL 18 to 20.8 m, relative to the Australian Height Datum (AHD). Further excavation will be required for slab and subfloor drainage (where required). Locally deeper excavations will be required for footings. It is understood the existing basements at Bosch 1A and 1B buildings will be demolished and progressively backfilled, where required. The extent of the proposed basements are shown on Drawing 2 in Appendix B. Drawing 2 in Appendix B shows the approximate basement outline of the proposed development.

Within the University of Sydney campus, the proposed development comprises the following:

- Isaac Wakil Biomedical Building (IWBB): approximately 28,200 m<sup>2</sup> gross floor area (GFA) over eight floors for physical containment level 2 (PC2) wet lab research, mortuary and advanced anatomy teaching, clinical research facilities, and core research facilities.

Within RPAH the proposed development comprises:

- Building B: approximately 8,000 m<sup>2</sup> GFA over eight floors of primarily PC2 laboratories with a specialist PC3 laboratory and biobank facility.

The SBA complex will also include a physical connection to an existing structure (Gloucester House) within the Royal Prince Alfred Hospital (RPAH) and internal refurbishment of this building for dry research support space and clinics. However, all the internal works to this building are understood to be undertaken via a separate planning approval pathway and are not being assessed as part of this SSD.

The proposed development includes public domain upgrades and landscaping surrounding the new building to integrate the SBA complex with its setting.

The range of RLs provided in the borehole logs in Appendix D range from RL 21 to 28.4 m AHD (with the exception of BH304 which was in a basement at RL 16.8 m AHD. In the locations of the majority of the bore hole logs excavation of fill to excavation depth suitable for construction of pavements to finished floor levels of RL 19.5 to 20.8 m will require bulk excavation.

Provided proposed development drawings are attached in Appendix B.

### 3. Scope of Work

The scope of works to achieve the objective of this RAP is as follows:

- Summarise the findings of previous investigations used to inform the status of contamination and currently assessed contamination risk at the site;
- Present a conceptual site model (CSM) to list potential and likely contamination source, pathway, and receptor linkages to address potentially unacceptable risks to human health and relevant environmental values from contamination;
- Outline requirements of a supplementary (data gap) investigation including an associated sampling and analysis quality plan (SAQP);
- Define the anticipated extent of remediation based on current data;
- Assess, select and justify a preferred approach to management and/or remediation of contamination to render the site suitable for its proposed use, and which will minimise potentially unacceptable risk to human health and/or the environment and which includes the consideration of the principles of ecologically sustainable development;
- Select an appropriate remediation strategy to render the site suitable, from a contamination perspective, for the proposed development;
- Establish the remediation acceptance criteria (RAC) to be adopted for validation of remediation;
- Identify how successful implementation of the RAP will be demonstrated / validated;
- Outline waste classification, handling and tracking requirements;
- Outline imported materials approval and tracking processes;
- Outline environmental safeguards required to complete the remediation works;
- Include contingency plans and an unexpected finds protocol; and
- Identify the need for, and nature of, any long-term management and / or monitoring following the completion of management / remediation and, if required, provide an outline of an environmental management plan.

#### 4. Site Description

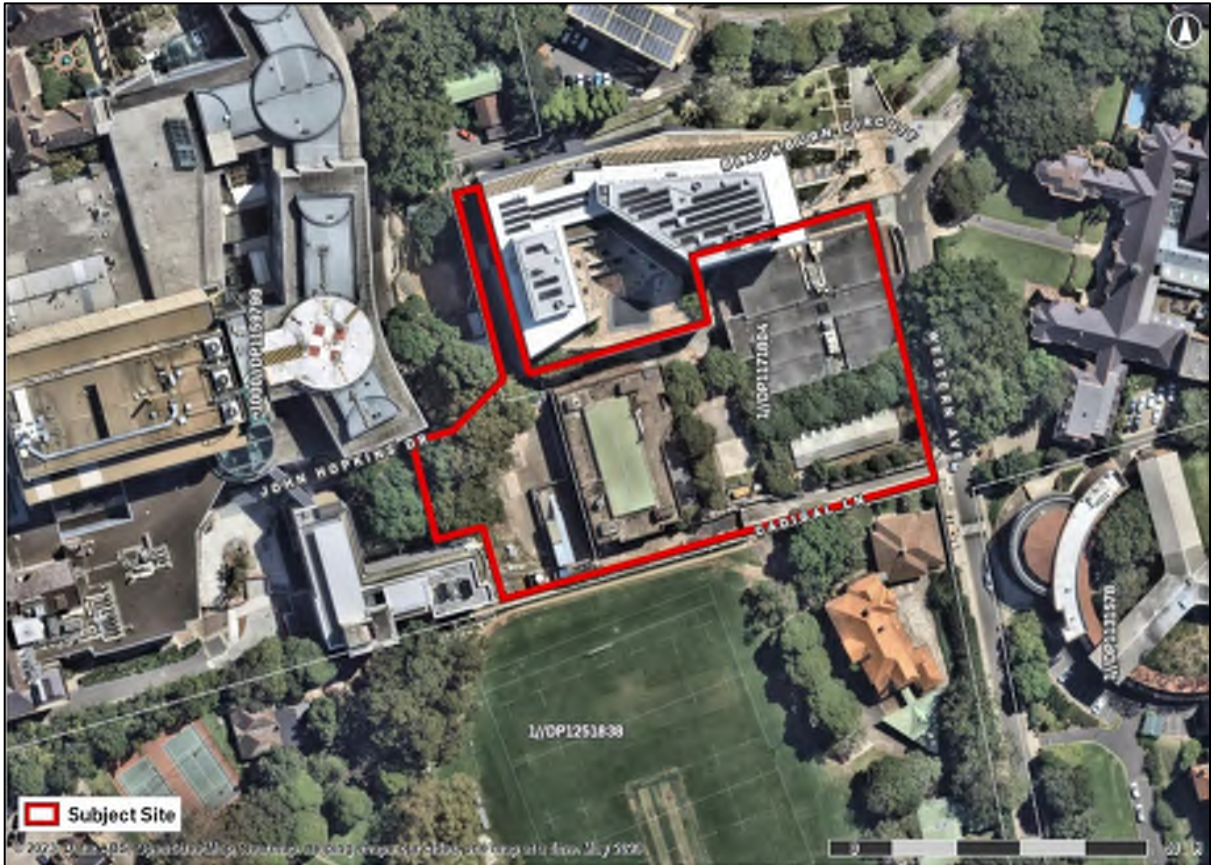
Site Address	SBA Site (former Bosch), Western Av and Cadigal L, Camperdown  For brevity the address is referred to as Western Avenue and Cadigal Lane, Camperdown throughout the remainder of the report and the attached appendices.
Legal Description	Part Lot 1, Deposited Plan 1171804 Part Lot 1000, Deposited Plan 1159799
Area	8,600 m <sup>2</sup>
Zoning	Zone SP2 Health Services Facilities / Educational
Local Council Area	City of Sydney
Current Use	Tertiary Education / Hospital
Surrounding Uses	North – Tertiary education / recreational East – Tertiary education (College accommodation) South – Tertiary education / recreational West – Hospital

The site is located west of Western Avenue, Camperdown, within The University of Sydney campus. It is bounded by the Susan Wakil Health Building to the north, Cadigal Lane to the south, Western Avenue to the east and Royal Prince Alfred Hospital to the west. The site boundaries, together with the proposed building layout are shown on Drawing 1, in Appendix B.

The site was occupied by three university buildings - (Bosch 1, Bosch 1B, and the Bosch Greenhouse). The demolition of the three existing buildings on the site, the associated perimeter retaining walls and trees was approved by the City of Sydney in February 2023 (D/2022/997) and is understood to be underway in accordance with this separate approval.

At the time of the previous investigations, buildings on site were observed to be separated mostly by asphalt pavements, notably Blackburn Circuit which loops around the northern half of the site, and Cadigal Lane along the southern boundary of the site. There were also grassed areas with trees, as well as a courtyard with undercover seating to the east of the Bosch 1B building.

The site boundary is shown on Figure 1.



**Figure 1: Site Location**

## 5. Environmental Setting

Regional Topography	Regional topography generally slopes to the north towards Parramatta Road, and the now canalised Orphans School Creek Lane.
Site Topography	The ground surface across the site gently slopes down to the north-west, with levels typically ranging between about RL 29 m and RL 21 m Australian Height Datum (AHD).
Soil Landscape	Reference to the Sydney 1:100,000 Soils Landscape Sheet indicates that bedrock at the site is overlain by residual soils of the Blacktown group. These typically comprise shallow to moderately deep, moderately reactive clay soils.
Geology	The Geological Survey of NSW Sydney 1:100,000 Geology Sheet 9130 for Sydney indicates that the site is underlain by Ashfield Shale, part of the Wianamatta Group of rocks comprising four siltstone and laminite subgroups.

Acid Sulfate Soils	Data supplied by the NSW Department of Environment and Climate Change based on published 1:25,000 Acid Sulfate Soil Risk Mapping, 1994 - 1998, identifies the site as being located in an area with no known occurrence of acid sulfate soils (ASS).
Surface Water	Surface water flows are anticipated to be intercepted by local stormwater systems.
Groundwater	Groundwater is anticipated to follow regional topography and flow toward the north, likely towards Orphans School Creek, which in turn discharges into Blackwattle Bay. A search of the publicly available registered WaterNSW groundwater bore database did not identify any wells in close proximity to the site. A monitoring well was previously installed at BH201 where standing water levels were recorded in the range of 2.3-4.2 m bgl. Standing water levels were also recorded at 1 m depth in BH01 (also within the site) (Construction Sciences, 2019). These readings are likely to represent perched water, which is commonly present at the soil/rock interface after periods of prolonged wet weather, with a deeper regional aquifer present.

## 6. Previous Reports and Site History

### 6.1 Previous Reports

Background information for the site includes the following reports:

- Douglas Partners: “*Report on Preliminary Contamination Assessment Cadigal Lane, Sydney University, Camperdown*”, report reference 35807B dated August 2003 (DP, 2003);
- Douglas Partners: “*Report on Geotechnical and Contamination Desktop Study, Proposed Health Precinct Development, Western Avenue, University of Sydney*”, report reference 84711.00 dated March 2015 (DP, 2015);
- Construction Sciences: “*Geotechnical – Preliminary Site Investigation (PSI) Report. University of Sydney (Camperdown) Susan Wakil Health Building, Stage 2 and 3*”, report reference 5017190132 dated 30 April 2019 (Construction Sciences, 2019);
- Douglas Partners: “*Report on Geotechnical Investigation, Royal Prince Alfred Hospital Redevelopment, Missenden Road, Camperdown*”, report reference 99709.00 dated August 2020 (DP, 2020a);
- Douglas Partners: “*Report on Preliminary Contamination Investigation for Contamination, Royal Prince Alfred Hospital Redevelopment, Missenden Road, Camperdown*”, report reference 99709.00 dated August 2020 (DP, 2020b);
- Douglas Partners: “*Report on Geotechnical Investigation, Sydney Biomedical Accelerator Complex, Western Avenue and Cadigal Lane, Camperdown*,” report reference 84711.01.003.Rev1 dated March 2023 (DP, 2023); and

- Douglas Partners “*Report on Detailed Site Investigation (Contamination), Sydney Biomedical Accelerator Complex, Western Avenue and Cadigal Lane, Camperdown,*” report reference 84711.02.001.Rev0 dated March 2023 (DP, 2023a).

## 6.2 Below Ground Conditions

A preliminary geotechnical and contamination desktop study was undertaken by DP on the site in March 2015 (DP, 2015), which included a review of results from previous investigations carried out on nearby sites by DP (DP, 2003) and by other consultants. In the vicinity of the site, 2-3 m of fill over clay / shaly clay and underlying shale were encountered. Groundwater was encountered at depths of approximately 6-8 m during investigations within the vicinity of the site.

The geotechnical investigation by Construction Sciences (2019) was carried out around the footprint of the existing Bosch 1A and east of 1B building. It noted the site slopes down towards the west. Typically, the boreholes encountered thin layers of fill and residual materials and shale bedrock was encountered at about 1.3 m to 5.8 m depth below the surface level. Notably, fill depths ranged from 0.3 m to 1.5 m within all boreholes. The shale encountered was considered very low to low strength, then becoming medium to high strength with depth. Groundwater, likely perched water, was noted in BH01 at 1 m depth, below ground level (bgl).

A monitoring well was installed at BH201 (DP, 2020a; DP, 2020b), where standing water levels were recorded in the range of 2.3-4.2 m bgl. Previous soil test results for BH201 (DP, 2020b) indicated slightly elevated concentrations of PAH above commercial / industrial Tier 1 screening criteria, and minor detection of metals, but below the commercial / industrial Tier 1 investigation levels.

In 2022 a geotechnical investigation was undertaken by DP on the site (DP, 2023). The investigation included four boreholes to depths of 1 m to 7.15 m bgl (BH1 to BH4, shown on Drawing 1, Appendix B). The investigations encountered fill to depths of up to 0.55 to 2.4 m bgl, which was considered to be uncontrolled fill of variable compaction, over stiff to hard, high plasticity residual clay and extremely weathered rock, very low and low strength Ashfield Shale grading to medium and high strength rock at depth.

## 6.3 Site History and Potential Contaminating Activities

DP (2015) included a site walkover and review of readily available desktop information sources and review of additional information relating to site usage and storage of dangerous goods within the University.

Key information presented in the report included:

- An above ground backup generator (diesel) was observed between Bosch 1B and the greenhouse buildings;
- A substation was noted in Bosch 1A building;
- The basement of Bosch 1B included a plant room with various compressors, boilers, chillers, motors, and switchboards;

- University records identified that no dangerous goods stores were present on the site (i.e., Bosch Building D04);
- No significant NSW EPA records were previously noted for the site in 2015;
- Based on historical titles, the site forms part of the original grant to the University of Sydney dated 1855;
- Bosch 1A (constructed circa 1965) has been used for lectures purposes, and Bosch 1B (constructed circa 1968) initially a library and animal houses;
- Adjoining Royal Prince Alfred Hospital (RPA) was developed starting circa 1880;
- The site was likely used as a farm / grazing (i.e., as part of the Grose Farm Estate) prior to the grant and development by the University; and
- Orphans School Creek previously had tributaries starting near St Andrews (200 m south-west of the site) and St Johns College (300 m north-west of the site).

Further site history review undertaken during the DSI investigation (DP, March 2023a) included a review of historical aerial imagery from 1930 to present using NSW Spatial Services and Metromap, review of EPA public registers, and a review of City of Sydney archives (May 2023) with respect to potential storage of dangerous goods.'

Based on a review of previous reports and additional site history information the site is understood to have formed part of the original grant to the University of Sydney in 1855, (with prior agricultural / grazing land-use) with some limited redevelopment of the land for education purposes, until construction of the current Bosch buildings in the 1960s. Of interest, in the 1943 aerial image, the site appears to have been redeveloped with a small building to the west of the site near RPA. Eastern parts of the site include 'zig zag' trenches, typically seen in 1940s imagery as part of WWII training / defences. No significant evidence of military (army) usage is otherwise visible and may just suggest civilian defences.

No EPA notices are listed for the site or sites on or adjacent to the site notified to the EPA under Section 60 of the CLMA however a previous licence is recorded for RPA hospital relating the storage of hazardous wastes, but this notice is noted as no longer in force since 2005. This licence is considered likely to have been associated with medical waste for hospital operations.

Based on reviewed archive documentation no underground tank structures were identified on the plans, and the plant room boilers for both structures appear to have been designed for gas. Limited sub-level areas are noted in Bosch 1A for fan / air-recirculation systems. Key plant room drawings and details extracted from the drawing packages are attached in Appendix C for reference. It is also noted that the dates of the drawings correspond to the construction dates of the Bosch 1A and 1B buildings noted in Section 6.2. The previously observed back-up diesel generator may also be potentially a source of localised leaks / spills.

Identified contamination risks included the presence of uncontrolled fill, age of the buildings, plant rooms (gas boilers, air circulation systems etc), generator and an electrical substation.

## 6.4 Detailed Site Investigation (DP, 2023a)

A walkover of the site was conducted by DP on 7 February 2023 and again during fieldwork in April 2023. The following general site observations were noted:

- The site was occupied by two existing structures (Bosch 1A and Bosch 1B) which were unoccupied/disused at the time of inspection;
- The western end of the site included site sheds and a carpark which was accessible from within RPA to the west;
- Bosch 1B included a basement level with various plant and switchboards, likely used for ventilation and heating purposes;
- A middle podium level (between Bosch 1B and the glasshouse) was observed and appeared to have been cleared of previous fittings (likely tables / shade areas). A substation (green 'kiosk') and backup generator was observed at the southern end of this area;
- The greenhouse was surrounded by elevated garden beds behind a retaining wall. A steep embankment was observed between the greenhouse and Bosch 1A, miscellaneous fly tipped waste was observed in this area in surficial soils. The fill in the embankment also had visible inclusions of brick fragments and gravel;
- An above ground rainwater tank was observed near the loading dock at the west of Bosch 1A; and
- Bosch 1A building included lower plant rooms.

The DSI fieldwork involved sampling from three geotechnical boreholes, and drilling / sampling from nineteen environmental and geotechnical boreholes. Boreholes were drilled using a mixture of hand tools, and portable drilling techniques based on available site access, and extended into natural soils or prior refusal. Samples were analysed for a range of potential contaminants and assessed against site assessment criteria.

The borehole logs for this assessment are included in Appendix D. The logs recorded the following general sub-surface profile:

- Fill
  - sandy clay, gravel and sand fill, with inclusions of ripped sandstone and pavement materials (i.e., asphalt and concrete), and other anthropogenic inclusions such as wood, terracotta, plastic, glass, and brick, to depths of up to 0.4 m to 2.4 m bgl. Limited fill was noted in areas of existing basements; underlain by,
- Residual Soils
  - pale grey and red-brown, high plasticity, residual clays, with some gravel inclusions to depths in the range of 1.0 to 6.5 m bgl; overlying,
- Bedrock (Ashfield Shale)
  - laminite (interlaminated siltstone and sandstone). Some extremely weathered rock (i.e., with soil like properties) was noted overlying bedrock.

DP reported that no visual or olfactory evidence (e.g., staining, odours) which may indicate other potential sources / signs of contamination were observed during fieldwork.

DP also reported that no free groundwater was encountered during auger drilling through the soil profile of the boreholes. The use of water for rotary drilling and coring prevented observation of groundwater within the rock at BH302, BH305 and BH317. DP suggested that it was expected that the regional groundwater table is relatively deep in the underlying rock. Seepage from perched groundwater was expected to occur along the soil and rock interface and may also occur through fractured zones and joints in the rock. Seepage is likely to increase following periods of extended wet weather. DP noted that groundwater levels are affected by climatic conditions and soil permeability and will therefore vary with time.

The DSI Summary Tables are provided in Appendix C. DP reported that the analytical results were below the SAC with the exception of the following:

#### **Health-based criteria - Asbestos**

- BH310/0-0.1 m, exceeding the HSL (0.001%) for AF / FA; and
- BH307/0.4-0.5 m, detected at the reporting limit of 0.1 g/kg.

It was noted that for BH307 further assessment would be required to determine the significance against the HSL, including assessment of potential asbestos in soil concentrations and presence of any AF / FA. DP recommended require further delineation / management around the detection AF / FA in shallow soils (within top 10 cm) and exceedance of the HSL the location at BH310. Based on the test location within a raised garden bed surrounding the glass house, and the visible presence of anthropogenic materials in an exposed embankment to the south of Bosch 1A it was considered likely that further unidentified asbestos is present in soils within this area.

#### **Ecological-based criteria - Metals**

- BH1/1.5-1.6 m, 830 mg/kg Zinc exceeding the EIL of 320 mg/kg; and
- BH314/0.2-0.3 m, 120 mg/kg Copper exceeding the EIL of 110 mg/kg.

Based on additional statistical assessment using ProUCL software the calculated 95% upper confidence limits (UCL) of the mean concentrations were calculated to be 35 mg/kg (copper) and 84 mg/kg (zinc) which were within the respective EIL. Therefore, the limited ecological exceedances were considered likely to be localised to the test locations and not to indicate widespread further potential exceedances that may require management.

#### **Ecological based criteria – PAH**

- BH316/0.4-0.5 m, exceeding the ESL of 1.4 mg/kg.

It was noted that the B(a)P ESL is a low reliability value. Higher reliability screening levels have been published in CRC CARE *Risk-based Management and Remediation Guidance for Benzo(a)pyrene* (CRC CARE, 2017). DP concluded that the high reliability value of 33 mg/kg (or ranging from 21 mg/kg to 135 mg/kg) for fresh B(a)P suggested that the concentrations of B(a)P detected at the site were unlikely to pose an unacceptable risk to terrestrial ecosystems and therefore the exceedance was not considered to be of concern.

A preliminary waste classification was undertaken for the material sampled at the site with the following preliminary classifications:

**Table 1. Schedule of Preliminary *In Situ* Waste Classification Per Test Location**

<b>Test Location</b>	<b>Preliminary Waste Classification (note comment below this table)</b>
BH310	Restricted Solid Waste (non-putrescible) – Special Waste (asbestos)
BH1	Restricted Solid Waste (non-putrescible)
BH301	
BH303	
BH311	
BH312	
BH316	
BH307	
BH2	General Solid Waste (non-putrescible)
BH3	
BH4	
BH302	
BH304	
BH305	
BH306	
BH308	
BH309	
BH313	
BH314	
BH315	
BH317	
BH318	
BH319	

*[DP reiterates that the above classifications are only preliminary and should not be relied upon for planning or budgeting. It is likely that further testing, including TCLP testing, will reduce the restricted solid waste classifications to general solid waste. Also, given the presence of asbestos in the buildings to be demolished, and the noted anthropogenics in the fill, it is likely that the special waste (asbestos) classification will extend beyond the locations of BH307 And BH310 (extent to be confirmed through a data gap investigation)].*

The conclusions of the DSI were as follows:

*Based on the results of the DSI it is considered that the site can be made suitable for the proposed development subject to the following recommendations:*

- *Conduct further general characterisation in currently inaccessible and un-tested parts of the site following demolition. This testing should include assessment of general potential contaminants identified in the CSM and more detailed assessment for asbestos in soils; and*
- *Development of a remediation action plan (RAP) to manage the current identified and any additional identified contamination risks. The RAP should include inter alia:*
  - *Procedures for the delineation and further characterisation of known asbestos in fill in the garden beds / embankment surrounding the glasshouse and south of Bosch 1A building. This testing should comprise use of test pits, on-site field screening of bulk samples and AF / FA analysis (this may be reported prior to the RAP if the post demolition assessment in dot point one is undertaken initially);*
  - *Contingency strategies for management of further identified contamination;*
  - *An additional / unexpected finds protocol;*
  - *Management requirements for waste and imported materials; and*
  - *Reporting / validation requirements.*

## 7. Conceptual Site Model

The data collected during previous investigations generally confirmed that for certain potential contaminant sources outlined in the preliminary CSM in DP (2023a), potentially complete pathways to the identified receptors exist, whereas for others, they do not. No other sources of contamination have been identified as a result of the testing results to date. The source (and associated contaminants of potential concern (CoPC)), pathway and receptor linkages are summarised in Table 2.

### Sources

Based on the current investigation, the following sources of CoPC have been identified.

- S1: Remediation Area 1 - Asbestos-impacted fill west of Bosch Building 1B and south of Bosch Building 1A in the vicinity of BH307 and BH310;
  - CoPC: asbestos (i.e., as bonded asbestos containing material (ACM) and / or fibrous asbestos and asbestos fines (FA and AF)).
- S2: Remediation Area 2 - EIL exceedances of metals and PAH (BH1/1.5-1.6, BH314/0.2-0.2 and BH316/0.4-0.5);
  - CoPC: copper, zinc, and PAH.
- S3: Potential Remediation Area 3 - Potential contamination beneath building footprints and previous inaccessible areas of the site – data gap; and
  - CoPC: metals, TRH, BTEX, PAH, PCB, OPP, OCP, phenols and asbestos.

- S4: Potential Remediation Area 4 - Potential asbestos, SMF, lead (in paint) and PCB to be addressed in Hazardous Building Material survey and clearances.
  - o CoPC: asbestos, synthetic mineral fibres (SMF), lead (in paint) and PCB.

### Receptors

The following human receptors have been identified:

- R1: Current users [educational];
- R2: Construction and maintenance workers;
- R3: End users [educational]; and
- R4: Adjacent site users [educational, recreational, hospital].

The following potential environmental receptors have been identified:

- R5: Surface water [Orphans School Creek / Blackwattle Bay];
- R6: Groundwater; and
- R7: Terrestrial ecosystems.

### Pathways

The following pathways have been identified:

- P1: Ingestion and dermal contact;
- P2: Inhalation of dust and / or vapours;
- P3: Surface water run-off;
- P4: Leaching of contaminants and vertical migration into groundwater;
- P5: Lateral migration of groundwater providing base flow to water bodies; and
- P6: Inhalation, ingestion, and absorption.

A summary of the potentially complete exposure pathways for the proposed land use is shown in the table below.

**Table 2: Summary of Potentially Complete Exposure Pathways (Proposed Land Use)**

Source and CoPC	Transport Pathway	Receptor
Remediation Area 1: Asbestos impacted fill, unknown extent	P2: Inhalation of dust and/or vapours	R1: Current site users. R2: Construction and maintenance workers. R3: End users (if exposed). R4: Adjacent site users (if exposed).
Remediation Area 2: metal and PAH impacted fill, exceedance of EIL	P6: Inhalation, ingestion, and absorption.	R7: Terrestrial ecosystems.

Source and CoPC	Transport Pathway	Receptor
Data gap - Area beneath building footprints and previously inaccessible areas	P1: Ingestion and dermal contact P2: Inhalation of dust and/or vapours	R1: Current users [educational] R2: Construction and maintenance workers R3: End users [educational]
	P2: Inhalation of dust and/or vapours	R4: Adjacent site users [educational, recreational and hospital]
	P3: Surface water run-off P4: Leaching of contaminants and vertical migration into groundwater	R5: Surface water
	P5: Lateral migration of groundwater providing base flow to water bodies	R6: Groundwater
	P6: Inhalation, ingestion and absorption	R7: Terrestrial ecosystems
	P1: Ingestion and dermal contact P2: Inhalation of dust and/or vapours	R1: Current users [educational] R2: Construction and maintenance workers R3: End users [educational]
Hazardous Building Materials	P1: Ingestion and dermal contact P2: Inhalation of dust and/or vapours	R1: Current users [educational] R2: Construction and maintenance workers R3: End users [educational]

## 8. Remediation Extent

The extent of remediation for the purpose of this RAP comprises:

- Remediation Area 1 - Asbestos-impacted fill in the garden beds / embankment surrounding the glasshouse and south of Bosch 1A in the vicinity of BH307 and BH310 (refer DP, 2023a). Preliminarily the extent of the area may be anticipated to extend towards the nearest test locations which did not identify asbestos and therefore may include the area bound by BH01, BH1, BH306, BH308, BH312 and BH311.
- Remediation Area 2 - EIL exceedances of metals and PAH in the vicinity of BH1, BH314 and BH316 (refer DP, 2023a).

Areas of potential remediation, subject to the results of the data gap investigation (refer Section 10.3):

- Potential Remediation Area 3 - Potential contamination beneath building footprints or other previously inaccessible areas of the site, to be assessed following demolition of the existing buildings; and

- Potential Remediation Area 4 - Potential asbestos, SMF, lead (in paint) and PCB to be addressed through a hazardous building material survey, subsequent removal, and clearances.

The test locations identified as above the Tier 1 screening criteria are shown on Drawing 2, Appendix A. The actual extent (the final remediation extent) will be established following demolition and completion of the data gap investigation outlined in Section 10.3), prior to commencement of excavation and remediation works. Particularly for Remediation Area 1, given the previous investigation methods and the typical nature of asbestos in soil contamination, consideration should be given for the risk of additional finds as a result of the data gap investigation.

## 9. Remediation Options Assessment

The objective of the remediation options assessment and evaluation is to establish a preferred remediation strategy. The process involves canvassing various remedial options which may be viable and then ranking each option based on a number of evaluation criteria. The remediation options assessment was undertaken with reference to CRC CARE *Remediation Action Plan: Development - Guideline on Performing Remediation Options Assessment* (CRC CARE, 2019b).

The remediation options assessment is included in Appendix E.

## 10. Preferred Remediation Strategy

### 10.1 Rationale

The rationale for the selection of the preferred remediation strategy is outlined in Appendix E. The preferred remediation strategy is for:

- Remediation Area 1: Excavation and off-site disposal or "cap and contain" for the asbestos impacted fill, depending on the eventual volume and available space for capping on site.
- Remediation Area 2: Excavation and off-site disposal or placement of material at depth or below hardstand (i.e., not in the accessible landscaping area).

Potential Remediation Areas 3 and 4 will be investigated as part of the delineation and data gap investigations outlined in Section 10.3 and 10.4 below. The remediation approach to those areas will be discussed in an amendment to this RAP.

### 10.2 Sequence of Remediation

The general sequence of remediation shall be determined by the Contractor with the aim of minimising the potential for cross contamination of 'clean' areas / soils with contaminated soils. This should include avoiding, wherever possible transporting or placing contaminated soil over 'clean' areas, separating stockpiles of different origin / contamination profile, and validating the complete removal of any contaminated material placed / potentially impacting 'clean' areas.

Prior to the commencement of demolition works a HBMS must be undertaken to identify the type, condition, and location of hazardous building materials in the structures to be demolished (such as asbestos).

Following the completion of the HBMS a demolition plan must be prepared to detail the process to safely remove hazardous materials in a manner to prevent risk to human and environmental health. Following the removal of the hazardous materials a clearance inspection and report must be completed by an Occupational Hygienist before general demolition works commences.

Following the completion of the demolition works a surface clearance inspection and certificate must be prepared by an Occupational Hygienist to confirm that no hazardous building materials from the demolition works remain at the surface of the site. This is to be undertaken prior to the commencement of the supplementary (data gap) investigation (Task 1).

The remediation should consider the following recommended sequence:

- Task 1: Supplementary (data gap) investigation following demolition and clearance:
  - Delineation and further characterisation of Remediation Area 1 - area of known asbestos in fill in the garden beds / embankment surrounding the glasshouse and south of Bosch 1A building;
  - Conduct further general characterisation in currently inaccessible and un-tested parts of the site following demolition. This testing should include assessment of general potential contaminants identified in the CSM and more detailed assessment for asbestos in soils;
  - This testing should comprise use of test pits, on-site field screening of bulk samples and AF / FA analysis; and
  - Groundwater Investigation is required as part of the supplementary testing as this also represents a data gap.
- Task 2: Amendment of the RAP to capture any additional required remediation as a result of the data gap investigation. The amendment will document the preferred remediation option(s) for each remediation area;
- Task 3: In the case of fill soils to be removed from site either due to contamination issues or being surplus to the project:
  - Identify and delineate fill planned for excavation and landfill disposal;
  - Undertake additional sampling and testing (if required) and prepare a waste classification report;
  - Dispose the target soils off site in accordance with the waste classification; and
  - In the case of contaminated soils validate the removal of the impacted soils.
- Task 4: In the case of contaminated fill to be capped on site:
  - Identify and delineate the fill planned for retention on site under a cap;
  - If not being retained in situ, excavate, and stockpile the fill for later relocation to the area of containment;
  - Prepare and survey the depths and extents of the area of containment;
  - Place the soils in the containment area to the design underside of the cap, and survey the level of the top of contained soils; and
  - Cover the contained soils with a marker layer and validated capping soils (or similar) to the design thickness.

- Task 5: In the case of fill to be relocated within the site (e.g., fill with EIL exceedances):
  - Identify and delineate the fill planned for relocation;
  - If not being retained *in situ*, excavate, and stockpile the fill for later relocation to the proposed relocation area;
  - Prepare and survey the extents of the area of proposed relocation; and
  - Place the soils in the relocation area to the design underside of the hardstand.

Roles and responsibilities are outlined in the site management plan (Appendix H).

### **10.3 Tasks 1 and 2: Supplementary Investigation Following Demolition and RAP Amendment**

The supplementary investigation will be undertaken post demolition and clearance at which point the potential risk associated with asbestos (and other potential hazardous building materials) in building demolition waste can most effectively be assessed.

NSW EPA's *Sampling Design Guidelines* (1995) recommends a minimum of 16 systematic grid-based sampling locations for a site of 0.65 hectares (ha) (SBA site). For sites where there is a high risk of asbestos, test pits are the preferred method, and additional sampling locations may be required to sufficiently characterise the risk from asbestos (for higher risks sites a sampling density of double the EPA (1995) guidelines is commonly adopted in accordance with guidance from Western Australia). It is anticipated that test locations will include a mixture of systematic and targeted locations, with targeted locations being, inter alia, in the areas of chemical storage such as dangerous goods stores, Building D15, generators, previous training areas (zig zag trenches, World War II), and the filled area of former Orphans Creek.

DP recommends an additional 20 test pits be excavated targeting areas as follows:

- Five test pits targeting delineation and further characterisation of Remediation Area 1 - area of known asbestos in fill in the garden beds / embankment surrounding the glasshouse and south of Bosch 1A building. This testing will comprise use of test pits, on-site field screening of bulk samples and AF / FA analysis;
- 12 test pits targeting further general characterisation in currently inaccessible and un-tested parts of the site following demolition. The test pits are to be extended to a maximum depth of 3 m below ground level, 0.5 m into natural soil or prior refusal (whichever is the lesser); This testing should include assessment of general potential contaminants identified in the CSM and more detailed assessment for asbestos in soils; This testing should comprise use of test pits, on-site field screening of bulk samples and AF / FA analysis; and
- Drill three boreholes and construct combined groundwater and soil vapour monitoring wells to allow for groundwater sampling and soil vapour testing. If possible, at least 1-2 of the wells will be located outside the proposed basement area, so they can be used in the long-term to monitor the groundwater drawdown during the excavation works; In addition, at least one of the wells need to target potential sources of contamination (such as the dangerous good store); Note if existing wells are suitable for groundwater sampling these should also be sampled as part of the supplementary investigation.

The actual scope of the supplementary investigation may change pending a review of site conditions following demolition. For instance, additional test pits may be nominated for areas where there is a high concentration of general building rubble or suspected ACM.

A Supplementary Investigation report will be prepared and will include the following:

- Additional assessment of site suitability. Results from the additional testing will be compared against the assessment criteria outlined in Appendix F;
- Identification (and delineation where possible) of contamination requiring remediation or management;
- Additional characterisation of currently inaccessible and un-tested parts of the site following demolition;
- Additional waste classification assessment including leachability assessment;
- Delineation of known asbestos in fill in the garden beds / embankment surrounding the glasshouse and south of Bosch 1A building;
- Discussion of groundwater and soil vapour results and potential risks identified;
- Assessment of general potential contaminants identified in the CSM and more detailed assessment for asbestos in soils; and
- Advice on requirements for an update to the RAP as required.

If considered necessary based on the findings of the Supplementary Investigation, an updated RAP will be prepared (note that this is likely). This updated report is likely to include remediation areas in addition to those listed in Section 7. The remediation preferences will be further defined in the updated RAP.

#### **10.4 Task 3: Excavation and Off-site Disposal of Fill**

For identified contaminated soils requiring off-site disposal:

- Mark out the area(s) in which fill is to be removed due to contamination. Conduct additional delineation sampling and testing as required;
- The Environmental Consultant will prepare a waste classification report(s) to inform the off-site disposal options;
- Excavate the fill in accordance with the amended RAP and instruction provided by the Environmental Consultant and dispose to landfill (or alternative location) as is permissible under the waste classification report;
- If required, stockpiling according to the requirements of the SMP in Appendix H (Section H4.0) prior to off-site disposal;
- Validation sampling and testing of soils exposed at the base and side walls of the excavation as a means of validating complete removal of the impacted soils as outlined in Section 12 of this RAP. The test results will be used as part of the bulk soil waste classification process described below;

- If required (i.e., if contamination is found at the base or side walls of the excavation), further vertical and / or lateral delineation should be undertaken with excavation, sampling, testing and validation of soil being undertaken at the instruction of the Environmental Consultant; and
- Inclusion of the process and material tracking documentation and docketts from the receiving site in the validation report for the site.

For surplus soils (not identified as contaminated) requiring disposal, the following process applies:

- The Environmental Consultant will prepare a waste classification report(s) to inform the off-site disposal options;
- Excavate the fill in accordance with instruction provided by the Environmental Consultant and dispose to landfill (or alternative location) as is permissible under the waste classification report;
- If required, stockpiling according to the requirements of the SMP in Appendix H (Section H4.0) prior to off-site disposal; and
- Inclusion of the process and material tracking documentation and docketts from the receiving site in the validation report for the site.

#### **10.5 Task 4: Capping of Contaminated Fill to be Retained**

This task is in relation to fill soils found to be contaminated with respect to the proposed land use, and for which a decision has been made by the relevant stakeholders to retain the soils on site under a suitable capping mechanism. This option will generally only apply to contaminants that are not likely to leach of site or into groundwater (e.g., asbestos and low-level metals).

Depending on the volume of impacted soils, the available space for retaining such soils, the depths of proposed excavation and the soil and rock profile, this process may involve retaining contaminated soils *in situ* and forming the cap on top or excavating and relocating the contaminated soils to a designated area to be capped.

The detail of this option (i.e., volumes, depths, locations, capping thicknesses etc) will be provided in the updated RAP, as those details are contingent on this being a preferred option and the volume of contaminated soils to be retained under this option.

The general steps under this task are as follows:

- Mark out the area(s) in which fill is to be retained or excavated for relocation;
- Where soils are to be relocated, excavate and stockpile under strict management protocols depending on the contamination identified (i.e., stockpile on hardstand or plastic, cover the stockpile, monitor asbestos in air as needed);
- If soils are being relocated, prepare the designated area by removing any identified contaminated fill and levelling the area to support placement and compaction of the contaminated fill;
- Survey all locations where contaminated fill is being capped, including levels at the base, and coordinates and levels at the lateral extents;
- Place and compact the contaminated fill (or retain the fill where that is being adopted) to the design underside of the capping layer;

- Survey the top of the contaminated fill (levels and coordinates);
- Place the marker layer and construct the designed cap (likely to be a minimum thickness of approved VENM or ENM classified materials, hardstand, or a combination);
- Prepare a drawing showing the locations of capped soils for inclusion in the validation report and LTEMP; and
- The Environmental Consultant will prepare the LTEMP.

## 10.6 Task 5: Relocation of Fill (EIL Exceedances)

This task is in relation to fill soils found to have low level contamination exceeding the adopted EILs, which potentially present a risk to ecology on site, but not to human health. The objective of the option is to remove contact of the impacted soils from areas proposed to establish lawns or gardens. To do this, such soils can either be relocated to areas of proposed hardstand or be positioned at depth (generally greater than 2 m).

The detail of this option (i.e., volumes, development design) will be provided in the updated RAP, as those details are contingent on this being a preferred option and the volume of contaminated soils to be relocated under this option.

The general steps under this task are as follows:

- Mark out the area(s) in which fill is to be relocated;
- Excavate and stockpile for later relocation as needed;
- Prepare the designated relocation area by removing any identified contaminated fill and levelling the area to support placement and compaction of the relocated fill;
- Place and compact the contaminated fill (or retain the fill where that is being adopted) to the design underside of the hardstand or 2 m soil cover; and
- Track the soil movements for inclusion in the validation report.

## 11. Assessment Criteria

### 11.1 Remediation Acceptance Criteria

The overarching remediation acceptance criterion (RAC) to be adopted for the project is for 'no unacceptable risks posed by the relevant media (i.e., soils, groundwater or soil vapour) to human health or the environment'.

The remediation works are to be validated as meeting the RAC by the Environmental Consultant (EC) by means of visual inspection, field screening, recovery and analysis of samples and review of any available plans as set out in this report.

In the absence of derivation of Tier 2 site specific target levels (SSTL), the (RAC) for contaminants in soil are the same as the Tier 1 site assessment criteria (SAC) adopted for DP (2023a), protective of human health and ecology. The following table provides a summary of the RAC.

**Table 3: Remediation Acceptance Criteria**

Item	Remediation Acceptance Criteria
Supplementary investigation results; validation of contaminated soil excavations, assessment of imported fill	Testing on investigation, assessment and validation samples to show analyte concentrations meeting the SAC (refer Section 11.2).  Note, however, that site specific criteria may be developed for some analytes should the EC consider that a beneficial approach to minimising required remediation.
Cap and contain remediation option	The area(s) for containment and capping are appropriately surveyed; The capping thickness is to meet the design of the RAP (as updated); Placement of the marker layer to be visually confirmed by the EC; Where soils are used for the capping layer, the soils are to classify as VENM or ENM and meet the SAC.
Relocation of low level contaminated soils under hardstand or at depth below landscaping areas	Impacted soils to be removed and visually verifies by the EC; The placement of the relocated soils to be verified by survey (if placed at depth) and visually by the EC (confirming proposed hardstand areas).

## 11.2 Site Assessment Criteria

The SAC are the same as the Tier 1 SAC adopted for DP (2023a). This is on the provision that other considerations such as risks to groundwater are also taken into account. The broader list of contaminants and their SAC are included in Appendix F.

The SAC should also be used as part of the assessment framework for imported soils (i.e., contaminant concentrations in imported soils must comply with the SAC).

The adopted investigation and screening levels comprise levels for a generic tertiary educational land use scenario. The derivation of the SAC is included in Appendix F and the adopted SAC are listed on the summary analytical results tables in Appendix C.

The SAC are not RAC, and an exceedance of the SAC does not automatically trigger the need for remediation. Exceedances of the SAC will trigger the need for further assessment of risk by the Environmental Consultant to determine the need for remediation in accordance with NEPC (2013) and Appendix H.

## 12. Validation Plan

### 12.1 Data Quality Objectives

The data quality objectives (DQO) for the validation plan are included in Appendix G.

### 12.2 Validation Assessment Requirements

The following site validation work will be required:

- Field assessment by the Environmental Consultant comprising:
  - o Visual inspection, including taking photographs for record purposes;
  - o Collecting validation samples from excavations resulting from the removal of contaminated soils, including contaminated soil stockpile footprints (if relevant); and
  - o Collecting validation / characterisation samples for materials to be re-used on site.
- Surveying by the surveyor comprising:
  - o Survey of the extent and levels of the base of the excavations;
  - o Survey of the extent and levels of the top of the marker layer; and
  - o Survey of the extent and levels of the top of the capping layer.
- Laboratory analysis of validation samples at a NATA accredited laboratory for:
  - o The CoPC relevant to the remediation area; and
  - o Quality control (QC) samples in accordance with Section 15.
- Comparison by the Environmental Consultant of the laboratory results with the SAC and / or RAC as appropriate (refer to Section 11); and
- Preparation by the Environmental Consultant of a validation report detailing the methods and results of the remediation works and validation assessment.

### 12.3 Visual Inspections

All areas to be assessed and validated will first be subject to a visual inspection by the Environmental Consultant. Any areas of fill / ACM / staining (as appropriate for the remediation) must be removed prior to validation sampling.

### 12.4 Validation Sampling

The sampling frequency will depend on the volume or area to be assessed and the previous results. The following approximate sampling frequencies will be adopted but may be modified by the Environmental Consultant to take into account previous results, where applicable, and findings from the visual inspections.

Small to medium excavations (base <500 m<sup>2</sup>):

- Base of excavation: one sample per 25 m<sup>2</sup> or part thereof, with a minimum of three samples where the base of the excavation is fill rather than natural soils; and
- Sides of excavation: one sample per 10 m to 20 m length or part thereof with a minimum of one sample per wall. Additional samples will be collected at depths of concern where there is more than one depth of concern, with a minimum of one sample per 1.5 m depth in fill.

Large excavations (base ≥500 m<sup>2</sup>):

- Base of excavation: sampling on a grid at a density in accordance with Table 2 in NSW EPA (2022) or a minimum of eight samples. In sub-areas with any specific signs of concern, a higher sampling density may be required; and
- Sides of excavation: one sample per 20 m length or part thereof with a minimum of one sample per wall. Additional samples will be collected at depths of concern where there is more than one depth of concern, with a minimum of one sample per 1.5 m depth in filling.

Where contaminated soils are stored or treated on bare soils, the footprint of the stockpile will require validation following removal of the contaminated soils.

Validation samples will be analysed by a NATA accredited laboratory for the relevant CoPC relevant to the remediation area.

Validation sample test results will be compared to the RAC, as per the DQO (Appendix G). Where the RAC are considered to have not been met, the remediation excavation(s) will be expanded to 'chase-out' impacted material, as instructed by the Environmental Consultant, with the validation sampling then continuing into the extended excavation. This process will continue until the impacted material has been fully chased out.

In the event that contamination extends beyond site boundaries or in areas that can't be practically chased out (e.g., under buildings), validation samples will be taken at the limit of excavation. Notwithstanding that there may be residual contamination present.

Advice may need to be obtained from a qualified geotechnical or structural engineer regarding excavation and/or structure stability if excavations approach site boundaries and/or existing structures.

### 13. Waste Disposal

Disposal of waste must be to an appropriately licensed waste facility, as per *Protection of the Environment Operations Act 1997* NSW (POEO Act) and the *Protection of the Environment (Waste) Regulation 2014* NSW.

Any waste disposed off-site must be initially classified by the Environmental Consultant in accordance with:

- NSW EPA *Waste Classification Guidelines, Part 1: Classifying Waste* (NSW EPA, 2014a);

- NSW EPA *Waste Classification Guidelines, Part 2: Immobilisation of Waste* (NSW EPA, 2014b);
- NSW EPA *Waste Classification Guidelines, Part 4: Acid Sulfate Soils* (NSW EPA, 2014c); and
- NSW EPA *Addendum to the Waste Classification Guidelines (2014) - Part 1: Classifying Waste* (NSW EPA, 2016) [addendum for per- and poly-fluoroalkyl substances (PFAS)].

Samples will be collected from stockpiles / *in situ* fill at various depths to characterise the full depth of the material. The frequency is to be determined by the Environmental Consultant based on the risk of contamination and heterogeneity of the material.

For stockpiles comprising similar materials, the following general frequency should be adopted:

- Volume up to 200 m<sup>3</sup>: a recommended minimum frequency of one sample per 25-50 m<sup>3</sup>, with a minimum of three per stockpile (NSW EPA, 2022); or
- Volume greater than 200 m<sup>3</sup>: a recommended minimum frequency of one sample per 50-100 m<sup>3</sup>, with a minimum of six samples and calculation of the 95% upper confidence limit of the arithmetic mean for all applicable analytes (NSW EPA, 2022). Note that this does not apply to stockpiles impacted, or potentially impacted, by asbestos. For stockpiles greater than 200 m<sup>3</sup> which are impacted, or potentially impacted, by asbestos the Environmental Consultant shall provide guidance in accordance with NSW EPA (2022).

It may be possible to classify excavated soil / fill for reuse on another site under a relevant NSW EPA resource recovery order (RRO) so that it can be used on other sites under the requirements of the corresponding NSW EPA resource recovery exemption (RRE). For this option, the frequency of sampling should be in accordance with the relevant RRO and the contaminants to be analysed will be determined by the Environmental Consultant. The Environmental Consultant will provide a report confirming the suitability of the spoil for reuse under a RRO, or otherwise.

All waste must be tracked by the Remediation Contractor from 'cradle to grave'. Copies of all consignment notes / disposal dockets (or similar) and Environment Protection Licences for receipt and disposal of the materials must be maintained by the Remediation Contractor as part of the site log and must be provided to the Environmental Consultant for inclusion in the validation report.

## 14. Imported Material

Any soil, aggregate etc imported for the remediation works must have contaminant concentrations that meet the relevant criteria outlined in Section 11. Imported materials will only be accepted for use at the site if:

- It can legally be accepted onto the site (e.g., classified as virgin excavated natural material (VENM), accompanied by a report / certificate prepared by a qualified environmental consultant);
- Visual inspection of the imported soil confirms that the soil has no signs of concern and is consistent with those described in the supporting classification documentation; and
- Have no aesthetic issues of concern, and

- The materials are validated (by inspection / sampling) by the Environmental Consultant as being suitable for use at the site.

The classification report / certificate for all material proposed for import must be reviewed and approved in writing by the Environmental Consultant prior to import. Materials to be imported may need to meet geotechnical requirements which are to be assessed by others, as required.

If permitted by the development consent and approved by the site owner, Remediation Contractor and Environmental Consultant and Site Auditor (to be appointed), material classified under a NSW EPA RRO may also be accepted, provided the material can be used on site in accordance with the corresponding RRE. This could include excavated natural material (ENM), classified under NSW EPA *Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014, The excavated natural material order 2014* (NSW EPA, 2014d).

The need for check-sampling of RRO material is to be determined by the Environmental Consultant depending on the source of the material, adequacy of the supporting documentation provided and inspection(s) of material. Quarried material / VENM may need little or no check sampling.

Any imported recycled aggregates must be sampled at a frequency of sampling of one sample per 25 m<sup>3</sup>, with a minimum of three samples per load. The recycled aggregate will not be permitted to be used on site until the results of the inspection and laboratory analysis have been approved in writing by the Environmental Consultant.

## 15. Quality Assurance and Quality Control

Field quality assurance and quality control (QA/QC) testing will include the following:

- 10% sample intra-laboratory analysis, analysed for the same suite as primary sample;
- 5% sample inter-laboratory analysis, analysed for the same suite as primary sample;
- 5% sample intra-laboratory analysis, analysed for the same suite as primary sample;
- Rinsate samples (where re-useable sampling equipment is used), analysed for the suite of analytes analysed by the majority of the primary samples; and
- Trip spike and trip blank samples (analysed for BTEX) (approximately one per batch of samples where volatile contaminants are CoPC).

The laboratory will undertake analysis in accordance with its NATA accreditation, including in-house QA / QC procedures.

The QC analytical results will be assessed using the following criteria:

- Sampling location rationale met the sampling objective;
- Standard operating procedures (SOP) are followed;
- Appropriate QA / QC samples are collected / prepared and analysed;
- Samples are stored under secure, temperature-controlled conditions;

- Chain of custody documentation is employed for the handling, transport, and delivery of samples to the selected laboratory;
- Conformance with specified holding times;
- Accuracy of spiked samples within the laboratory's acceptable range (typically 70-130% for inorganic contaminants and greater for some organic contaminants);
- Field and laboratory duplicate and replicate samples will have a precision average of +/- 30% relative percentage difference (RPD); and
- Rinsate samples will show that the sampling equipment (if used) is free of introduced contaminants, i.e., the analytes show that the rinsate sample is within the normal range for deionised water.

## **16. Management and Responsibilities**

### **16.1 Site Management Plan**

A general site management plan for the operational phase of site remediation is included in Appendix H. The management plan includes soil, noise, dust, work health safety (WHS), remediation schedule, hours of operation and incident response. The Remediation Contractor is to implement the general site management plan for the duration of remedial works by incorporating the plan into their over-arching construction environmental management plan (CEMP).

### **16.2 Site Responsibilities**

The site management plan (Appendix H) provides a summary of the general program management and associated responsibilities. Contact details for key utilities are also included in the event of needing to respond to any incidents.

### **16.3 Contingency Plan and Unexpected Finds Protocol**

Plans for contingency situations (e.g., encountering asbestos in fill), along with an unexpected finds protocol for dealing with unexpected finds during remediation work / earthworks, are included in Appendix I.

## **17. Validation Reporting**

### **17.1 Documentation**

The following documents will need to be collated and reviewed by the Environmental Consultant as part of the validation assessment (including those items that are prepared by the Environmental Consultant):

- Any licences and approvals required for the remediation works (Remediation Contractor);

- Waste classification report(s) (Environmental Consultant);
- Transportation Record: comprising a record of all truck-loads of soil (including aggregate) entering the site, including truck identification (e.g., registration number), date, time, source site, load characteristics (e.g., type of material, i.e., quarried aggregate, etc.), approximate volume, use (e.g., general site raising, service trenches, etc.) (Remediation Contractor);
- Disposal docket(s): for any soil disposed off-site including transportation records, spoil source, spoil disposal location, receipt provided by the receiving waste facility / site (Remediation Contractor). Note: A record of the building materials disposed off-site is also to be kept and provided to the Principal, on request;
- Imported materials records: records for any soil imported onto the site, including source site, classification reports, inspection records of soil upon receipt at site and transportation records (Remediation Contractor);
- Records relating to any unexpected finds and contingency plans implemented (Remediation Contractor);
- Laboratory certificates and chain-of-custody documentation;
- Inspections records from the Environmental Consultant;
- Photographic records by all contractors and consultants of the works undertaken within their purview of responsibilities (Remediation Contractor);
- Surveys pre- and post-installation of geotextile marker layer and clean fill cap (Remediation Contractor);
- Airborne asbestos monitoring records (in the event that asbestos works are undertaken) (Remediation Contractor); and
- Interim / final visual and sampling clearances for any asbestos related works (in the event that asbestos works are undertaken) (Remediation Contractor).

## 17.2 Reporting

A validation assessment report will be prepared by the Environmental Consultant in accordance with NSW EPA (2020).

The validation report shall describe the remediation approach adopted, methodology, results and conclusion of the assessment and make a statement regarding the suitability of the site for the proposed development (educational facility).

In the event that the cap and contain option is adopted, a LTEMP will be prepared by the Environmental consultant in accordance with NSW EPA (2020).

## 18. Conclusions

Subject to proper implementation of this RAP (and the updated version following the data gap investigation) and validation reporting, DP considers that the site can be made suitable for the proposed University facility redevelopment. The short-term exposure during remediation and construction works should not pose an unacceptable risk to workers, provided the specific health and safety procedures as detailed in this document are adhered to.

On completion of remediation works, if any known contamination is to be retained under a cap and contain strategy, a LTEMP prepared in accordance with NSW EPA guidelines will be required to outline management procedures for future works to maintain the integrity of the cap. The obligations within the LTEMP must be legally enforceable.

It should be noted that this RAP (nor the updated version) does not form a detailed specification for the proposed site remediation works, but rather represents a planning document which outlines the means by which site remediation can be achieved.

## 19. References

- Construction Sciences. (2019). *Geotechnical – Preliminary Site Investigation (PSI) Report. University of Sydney (Camperdown) Susan Wakil Health Building, Stage 2 and 3. Reference 5017190132 dated 30 April 2019.*
- CRC CARE. (2017). *Risk-based Management and Remediation Guidance for Benzo(a)pyrene.* Technical Report no. 39: Cooperative Research Centre for Contamination Assessment and Remediation of the Environment.
- CRC CARE. (2019a). *Remediation Action Plan: Development - Guideline on Establishing Remediation Objectives.* National Remediation Framework: CRC for Contamination Assessment and Remediation of the Environment.
- CRC CARE. (2019b). *Remediation Action Plan: Development - Guideline on Performing Remediation Options Assessment.* National Remediation Framework: CRC for Contamination Assessment and Remediation of the Environment.
- DP. (2003). *Report on Preliminary Contamination Assessment, Cadigal Lane, Sydney University, Camperdown. DP reference 35807B dated August 2003.*
- DP. (2015). *Report on Geotechnical and Contamination Desktop Study, Proposed Health Precinct Development, Western Avenue, University of Sydney. DP reference 84711.00 dated March 2015.*
- DP. (2020a). *Report on Geotechnical Investigation, Royal Prince Alfred Hospital Redevelopment, Missenden Road, Camperdown. DP reference 99709.00 dated August 2020.*
- DP. (2020b). *Report on Preliminary Contamination Investigation, Royal Prince Alfred Hospital Redevelopment, Missenden Road, Camperdown. DP reference 99709.00 dated August 2020.*
- DP. (2023). *Report on Geotechnical Investigation, Sydney Biomedical Accelerator Complex, Western Avenue and Cadigal Lane, Camperdown. DP reference 84711.01.003.Rev1 dated March 2023.*

DP. (March 2023a). *Report on Detailed Site Investigation (Contamination), Sydney Biomedical Accelerator Complex, Western Avenue and Cadigal Lane, Camperdown, report reference 84711.02.001.Rev0 dated March 2023.*

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

NSW EPA. (2014a). *Waste Classification Guidelines, Part 1: Classifying Waste*. NSW Environment Protection Authority.

NSW EPA. (2014b). *Waste Classification Guidelines, Part 2: Immobilisation of Waste*. NSW Environment Protection Authority.

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NSW EPA. (2014d). *Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014, The excavated natural material order 2014*. NSW Environment Protection Authority.

NSW EPA. (2016). *Addendum to the Waste Classification Guidelines (2014) - Part 1: Classifying Waste*. NSW Environment Protection Authority.

NSW EPA. (2020). *Guidelines for Consultants Reporting on Contaminated Land*. Contaminated Land Guidelines: NSW Environment Protection Authority.

NSW EPA. (2022). *Sampling Design, Part 1: Application; Part 2: Interpretation*. NSW Environment Protection Authority.

## 20. Limitations

Douglas Partners (DP) has prepared this report for this project at Western Avenue and Cadigal Lane, Camperdown in accordance with DP's proposal dated 84711.01.P.004.Rev0 dated 26 May 2023 and acceptance received from Michael Badaoui of FDC Construction (NSW) Pty Ltd dated 29 May 2023. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of FDC Construction (NSW) Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and / or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and / or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the environmental components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome, or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Asbestos has been detected by laboratory analysis in fill materials at the test locations sampled and analysed. Building demolition materials, such as brick and terracotta tiles were also identified in below-ground fill, and these are considered as indicative of the possible presence of further hazardous building materials (HBM), including asbestos.

Although the sampling plan adopted for this investigation is considered appropriate to achieve the stated project objectives, there are necessarily parts of the site that have not been sampled and analysed. This is either due to undetected variations in ground conditions or to parts of the site being inaccessible and not available for inspection. It is therefore considered possible that additional HBM, including asbestos, may be present in unobserved or untested parts of the site, between and beyond sampling locations, and hence no warranty can be given that further asbestos is not present.

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**Douglas Partners Pty Ltd**

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## **Appendix A**

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Drawings

About This Report

# About this Report

# Douglas Partners



## Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

## Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

## Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

## Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;

- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

## Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

## *About this Report*

### **Site Anomalies**

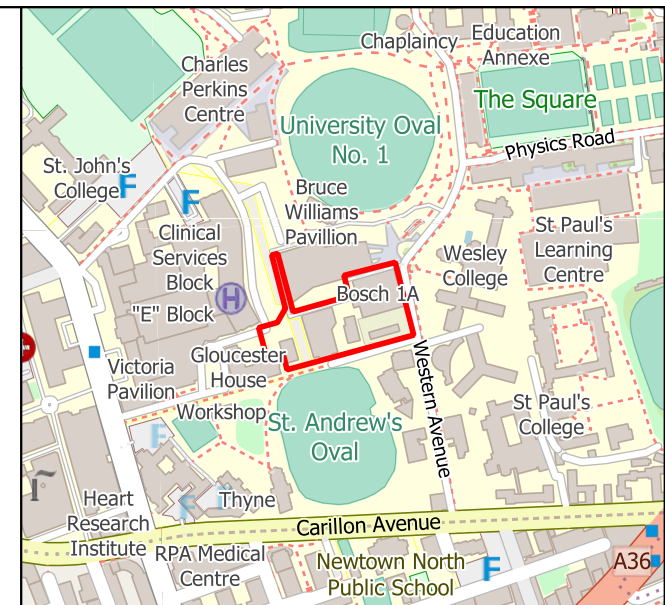
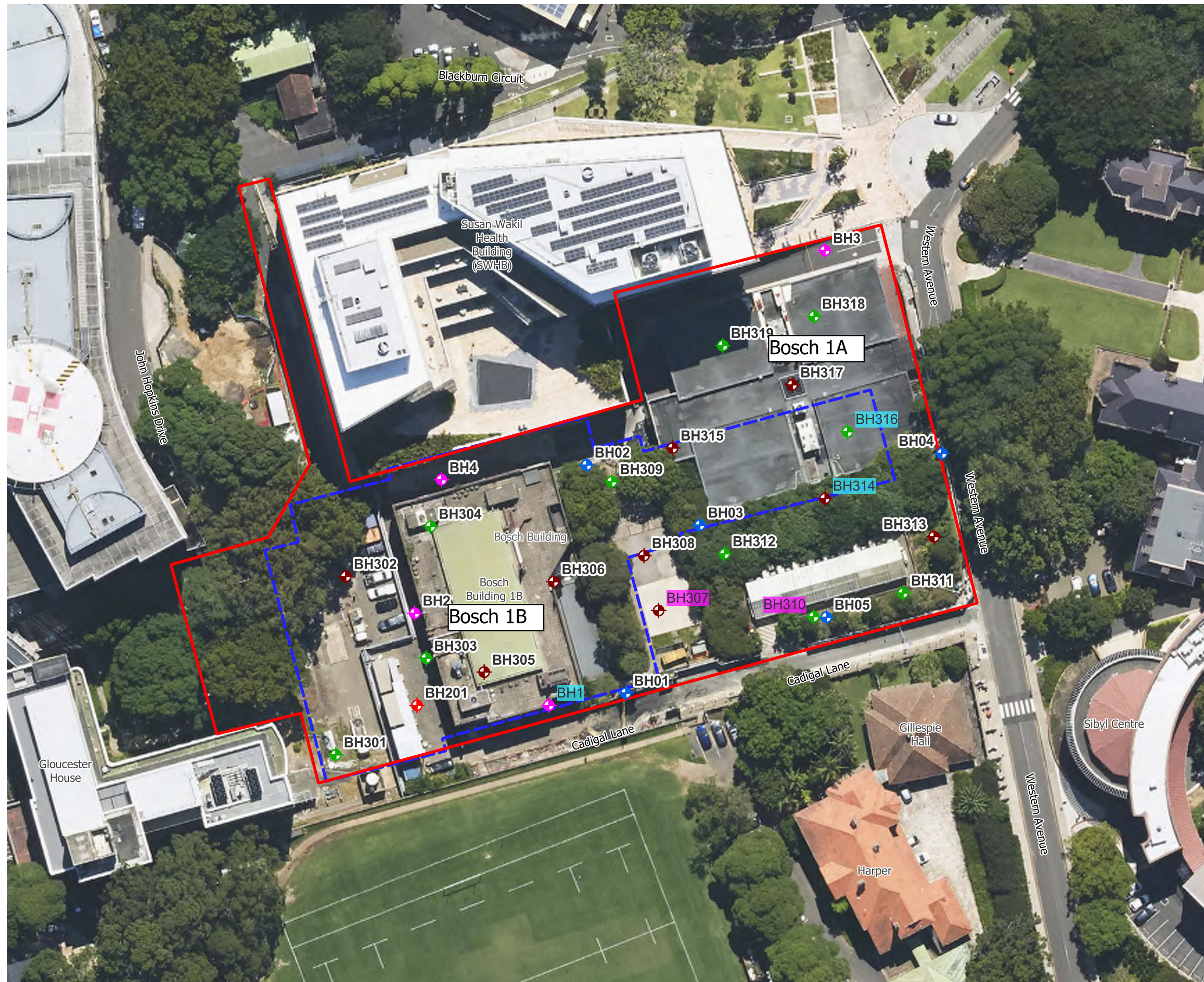
In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

### **Information for Contractual Purposes**

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

### **Site Inspection**

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.



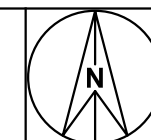
LOCALITY MAP

Notes:  
 1. Drawing projection GDA94 / MGA zone 56  
 2. Latest available aerial imagery sourced from metromap.com accessed 28/04/2023

Legend

- Site Boundary
- Approximate Basement Outline
- Current Test Locations
  - ◆ Environmental Borehole
  - ◆ Geotechnical and Environmental Borehole
- Previous Test Locations
  - ◆ Geotechnical Borehole (CS 2019)
  - ◆ Geotechnical and Environmental Borehole (DP 2020)
  - ◆ Geotechnical Borehole (DP 2022)
- Ecological Exceedance (metals / PAH)
- Asbestos Detection

0 5 10 15 20 25 m

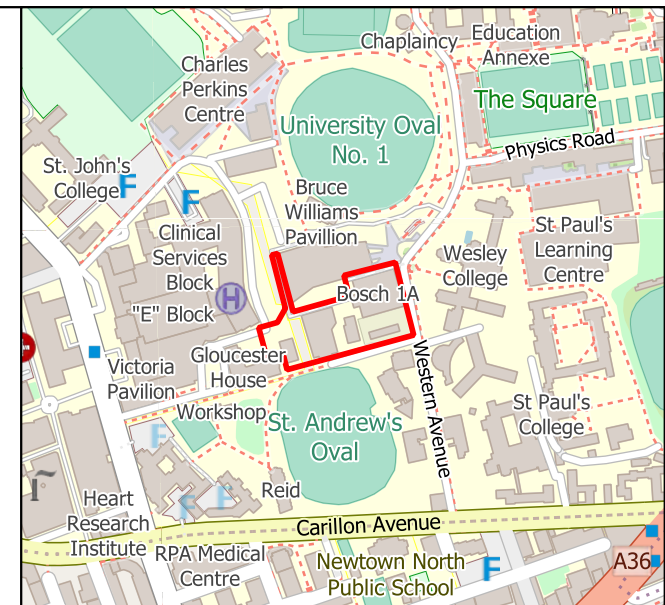
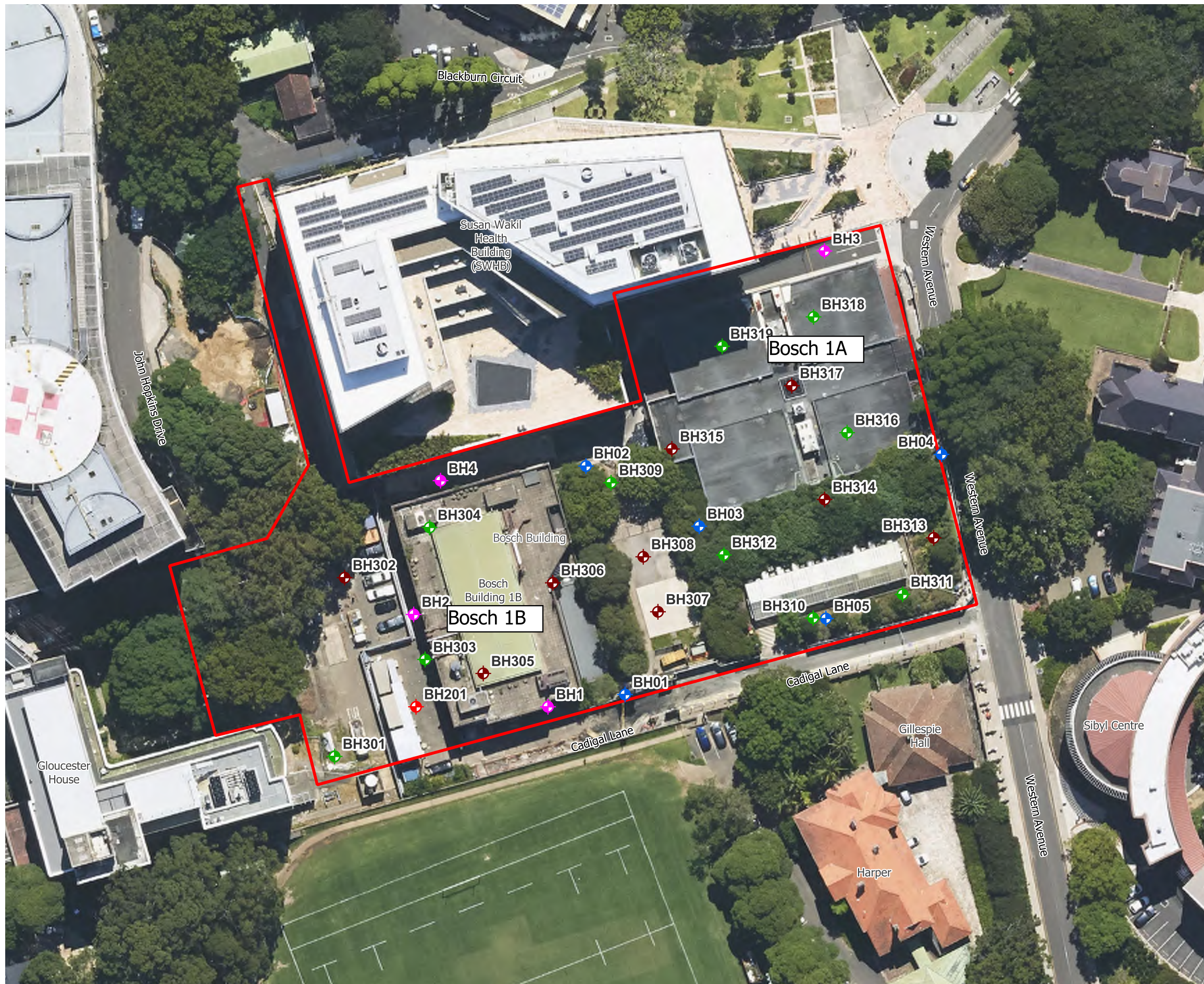


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## **Appendix B**

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Selected Drawings from Previous Report(s)



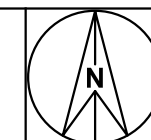
LOCALITY MAP

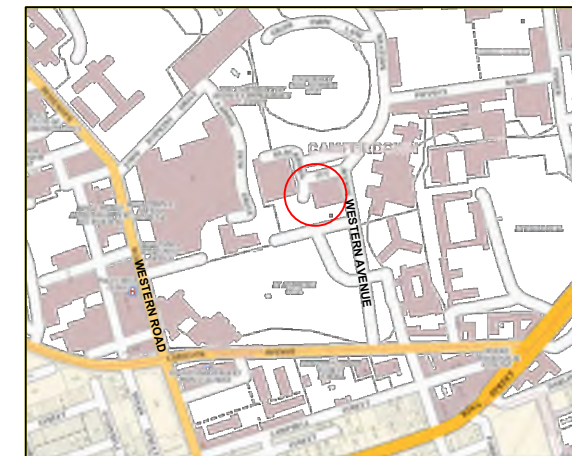
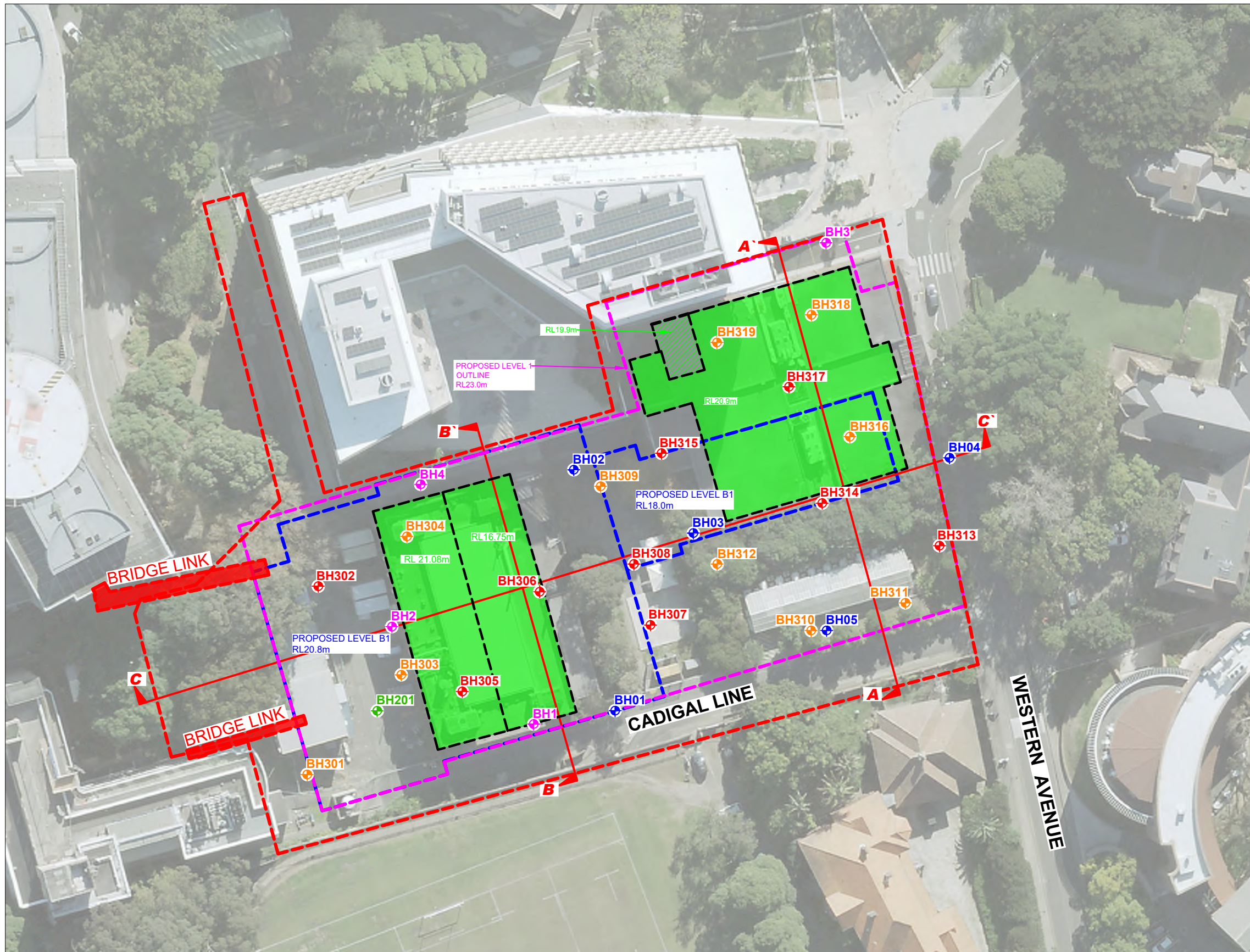
- Notes:
1. Drawing projection GDA94 / MGA zone 56
  2. Latest available aerial imagery sourced from metromap.com accessed 28/04/2023

Legend

- Site Boundary
- Current Test Locations**
- ◆ Environmental Borehole
- ◆ Geotechnical and Environmental Borehole
- Previous Test Locations**
- ◆ Geotechnical Borehole (CS 2019)
- ◆ Geotechnical and Environmental Borehole (DP 2020)
- ◆ Geotechnical Borehole (DP 2022)

0 5 10 15 20 25 m





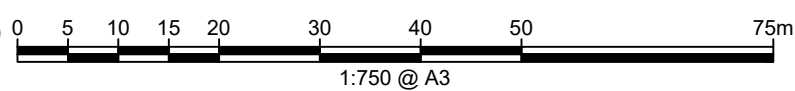
Locality Plan

**LEGEND**

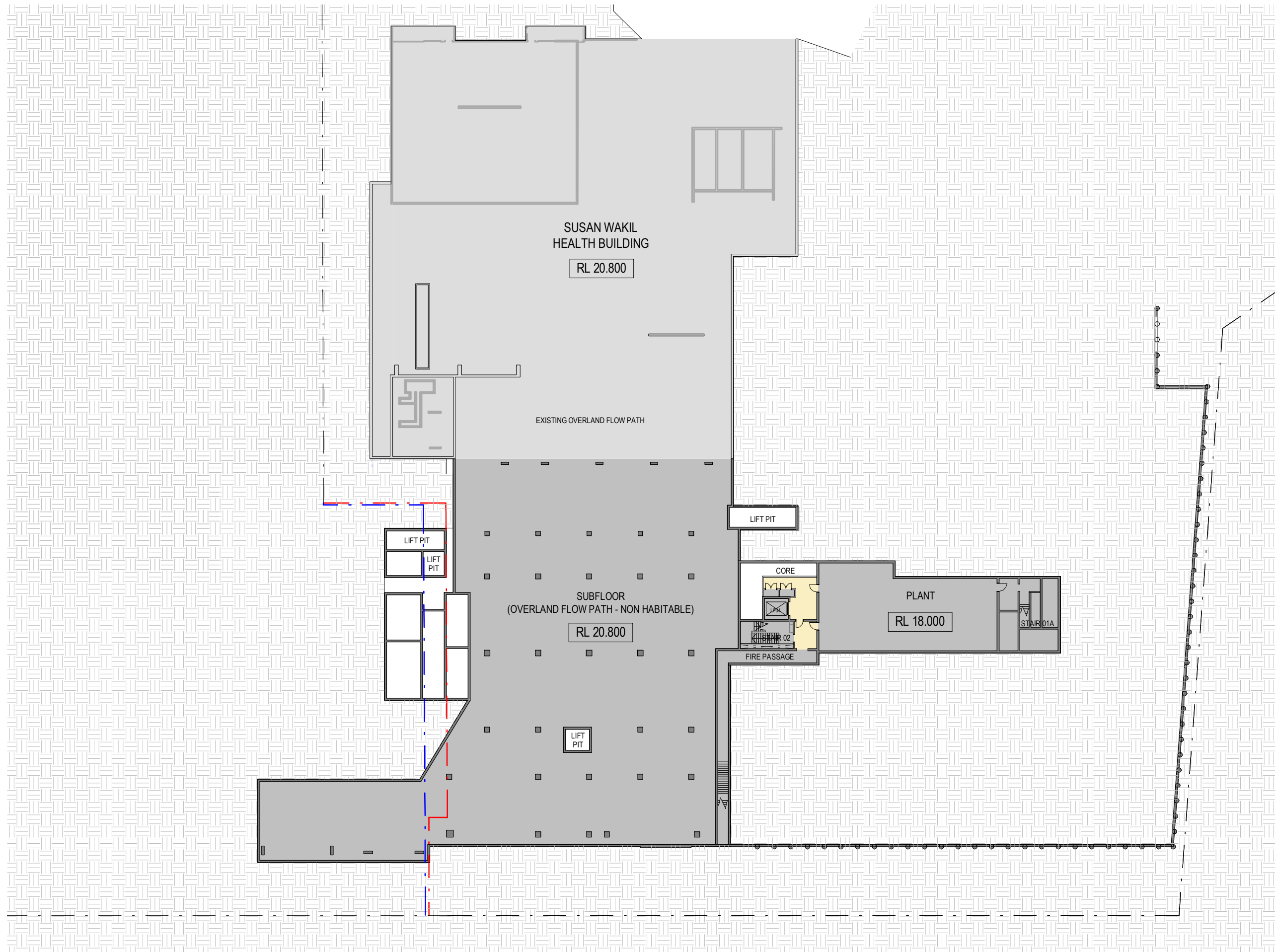
- ◆ **CURRENT TEST LOCATIONS**  
◆ Environmental Borehole  
◆ Geotechnical and Environmental Borehole
- ◆ **PREVIOUS INVESTIGATIONS (2019 TO 2020)**  
◆ DP Borehole (Proj. 99709.00, Aug 2020)  
◆ CS Borehole (Proj. 5017190132, Apr 2019)
- ◆ **2022 DP investigation (Proj. 84711.01)**  
◆ Borehole (2022)
- Proposed Level B1
- Proposed Level 01
- Site Boundary
- Existing Basement
- Geological Cross Section

**NOTE:**

1. Base image from MetroMap (Dated 13.06.2022)
2. Proposed Level Outlines are from HDR Pty Ltd, Project No. D0353, Drawing No. A10\_0001& 0011, Revision S5& S7 (Dated 17/04/2023)
3. Existing Level Outlines are from TTW, Job No. 221176, Drawing No. S0010, Revision 01 (Dated 23/09/2022)
4. Bridge Link Outlines are from HDR Pty Ltd, Project No. D0353, Drawing No. A01\_0100, Revision S5 (Dated 28.04.2023)



<p><b>Douglas Partners</b> Geotechnics   Environment   Groundwater</p>	CLIENT: FDC Construction (NSW) Pty Ltd	<b>TITLE: Test Location Plan</b> <b>Sydney Biomedical Accelerator Complex</b> <b>Western Avenue and Cadigal Lane, Camperdown</b>		PROJECT No: 84711.01	
	OFFICE: Sydney			DRAWN BY: MN	DRAWING No: 2
	SCALE: 1:750 @ A3			DATE: 31.05.2023	REVISION: 2



**LEGEND**

- · — EXISTING PROPERTY BOUNDARY
- · — PROPOSED PROPERTY BOUNDARY

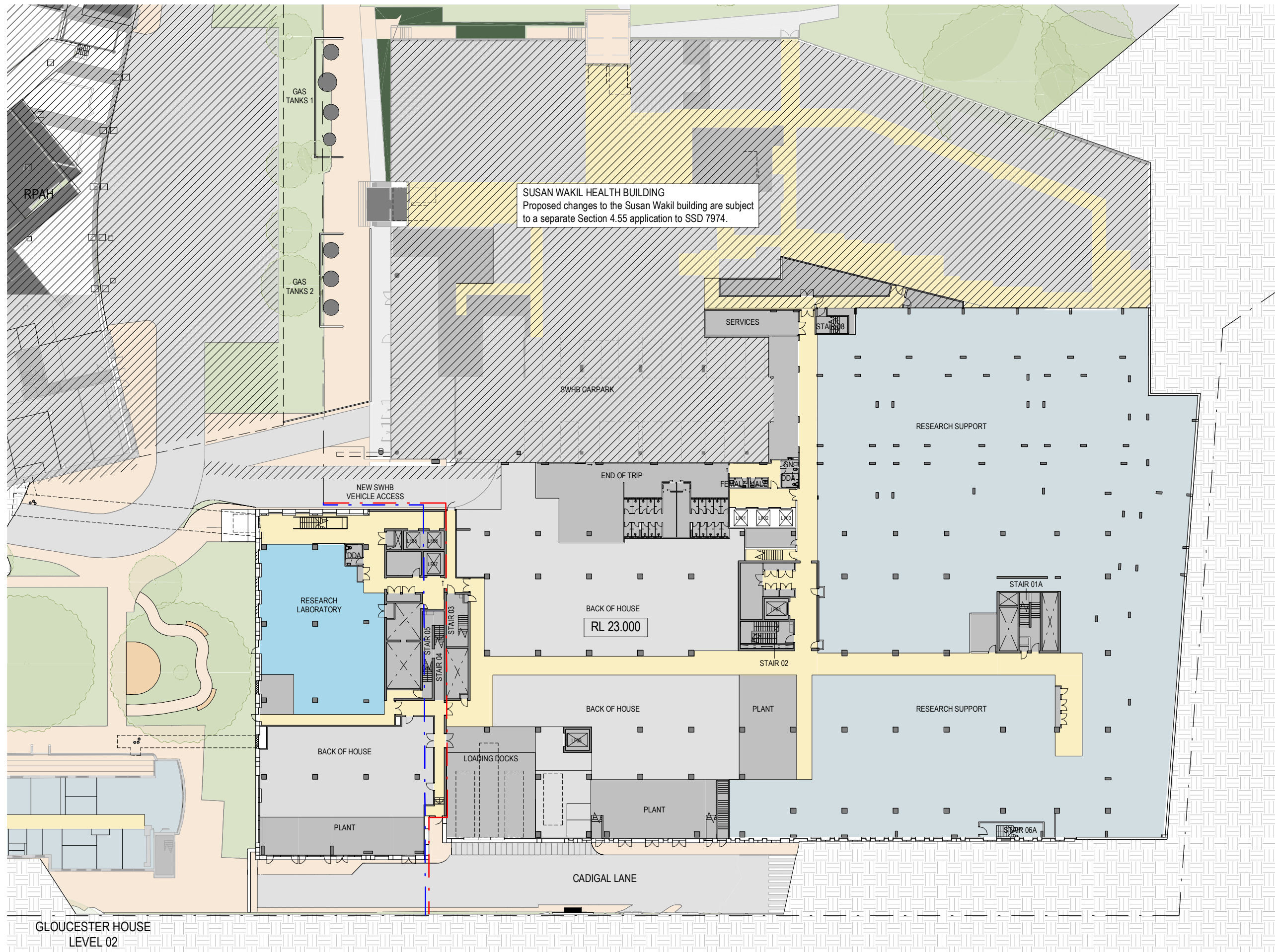
D0353 A05\_0001 REV DA1  
28/07/2023  
1:500 @ A3  
0 5 10 15M



**DENTON  
CORKER  
MARSHALL**

**SYDNEY BIOMEDICAL  
ACCELERATOR**

**FOR PLANNING  
28/07/2023  
SSDA - GENERAL ARRANGMENT PLAN  
LEVEL B1**



**LEGEND**

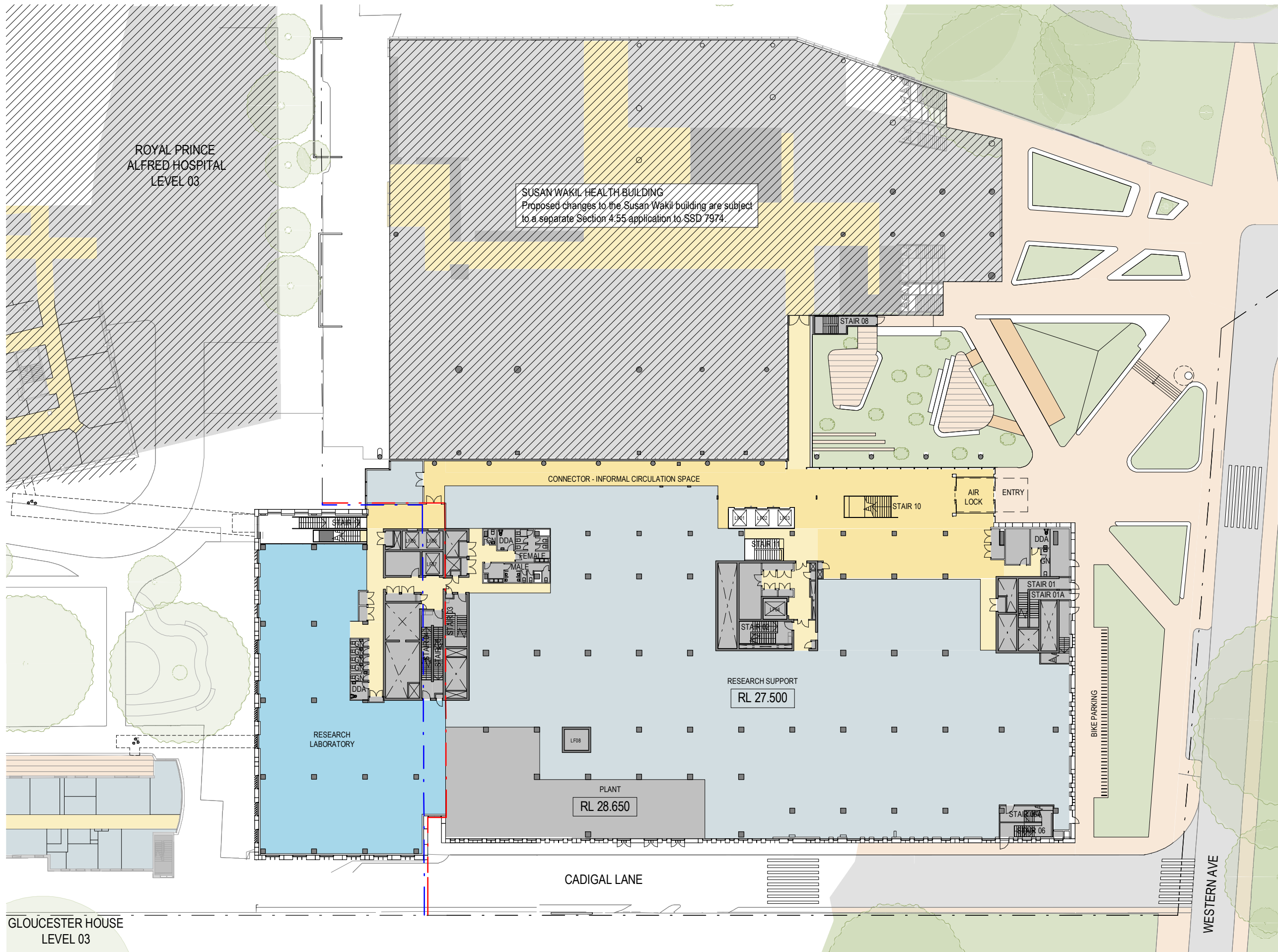
- — — EXISTING PROPERTY BOUNDARY
- — — PROPOSED PROPERTY BOUNDARY

D0353 A05\_0011 REV DA1 28/07/2023  
 1:500 @ A3  
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**DENTON  
CORKER  
MARSHALL**

**SYDNEY BIOMEDICAL  
ACCELERATOR**

**FOR PLANNING  
28/07/2023  
SSDA - GENERAL ARRANGEMENT PLAN -  
LEVEL 01**



ROYAL PRINCE  
ALFRED HOSPITAL  
LEVEL 03

SUSAN WAKIL HEALTH BUILDING  
Proposed changes to the Susan Wakil building are subject  
to a separate Section 4.55 application to SSD 7974.

CONNECTOR - INFORMAL CIRCULATION SPACE

RESEARCH  
LABORATORY

RESEARCH SUPPORT  
RL 27.500

PLANT  
RL 28.650

CADIGAL LANE

WESTERN AVE

GLOUCESTER HOUSE  
LEVEL 03

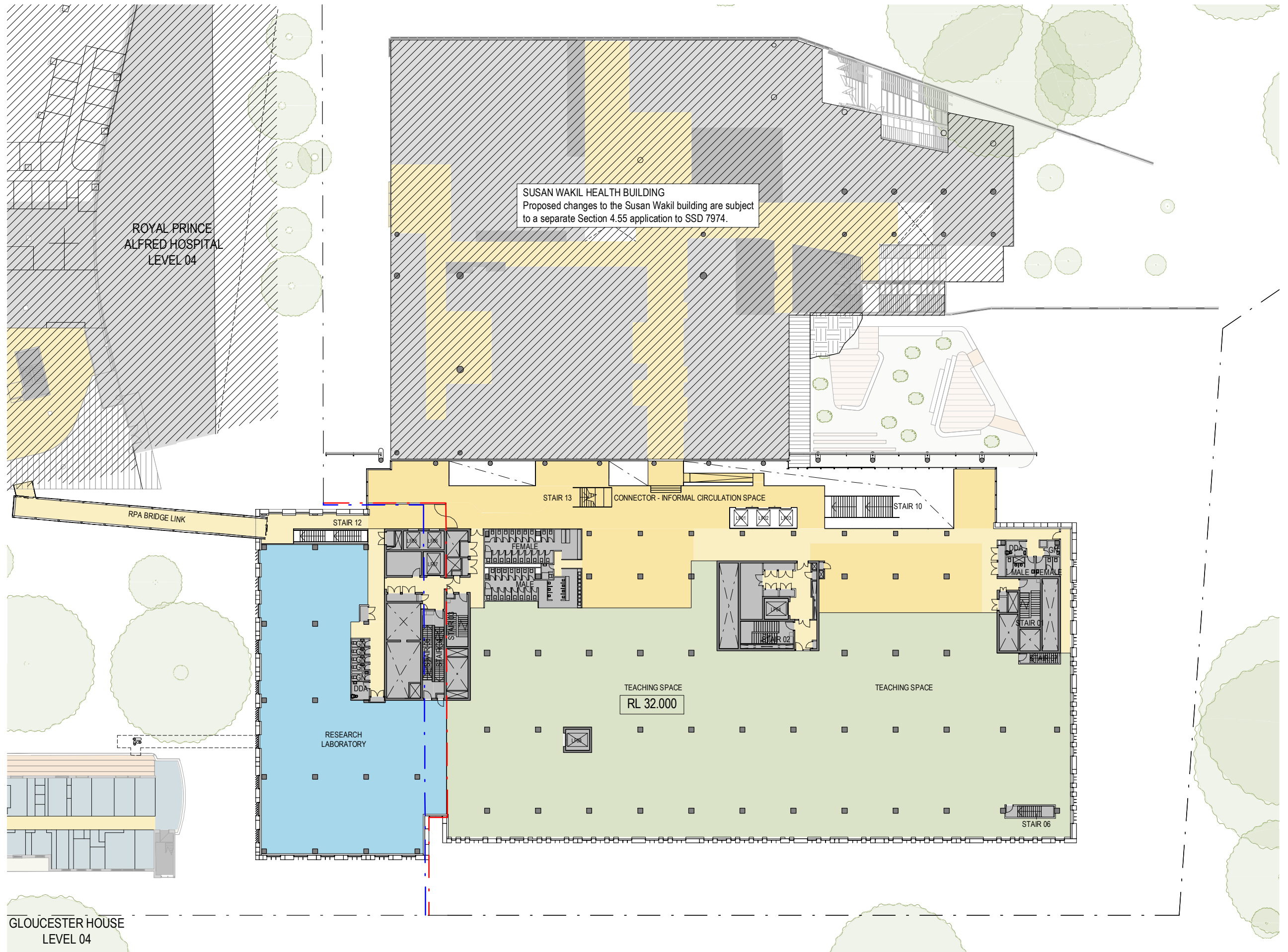
- LEGEND**
- - - EXISTING PROPERTY BOUNDARY
  - - - PROPOSED PROPERTY BOUNDARY

D0353 A05\_0021 REV DA1 28/07/2023  
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0 5 10 15M

**DENTON  
CORKER  
MARSHALL**

**SYDNEY BIOMEDICAL  
ACCELERATOR**

**FOR PLANNING  
28/07/2023  
SSDA - GENERAL ARRANGEMENT PLAN -  
LEVEL 02**



SUSAN WAKIL HEALTH BUILDING  
 Proposed changes to the Susan Wakil building are subject to a separate Section 4.55 application to SSD 7974.

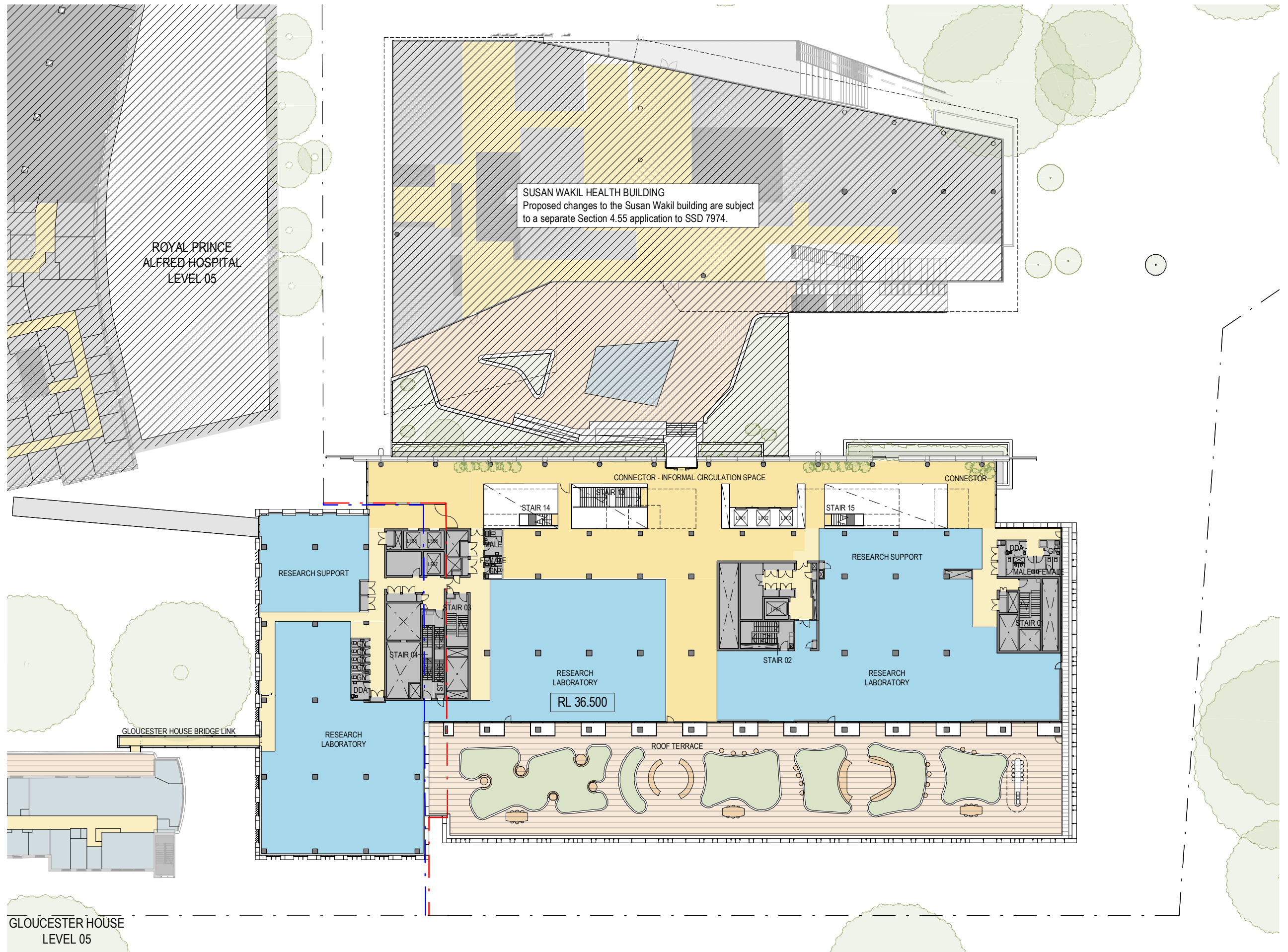
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 - - - PROPOSED PROPERTY BOUNDARY

D0353 A05\_0031 REV DA1 28/07/2023  
 1:500 @ A3  
 0 5 10 15M

**DENTON  
 CORKER  
 MARSHALL**

**SYDNEY BIOMEDICAL  
 ACCELERATOR**

**FOR PLANNING  
 28/07/2023  
 SSDA - GENERAL ARRANGEMENT PLAN -  
 LEVEL 03**



SUSAN WAKIL HEALTH BUILDING  
 Proposed changes to the Susan Wakil building are subject to a separate Section 4.55 application to SSD 7974.

ROYAL PRINCE ALFRED HOSPITAL  
 LEVEL 05

GLoucester House  
 LEVEL 05

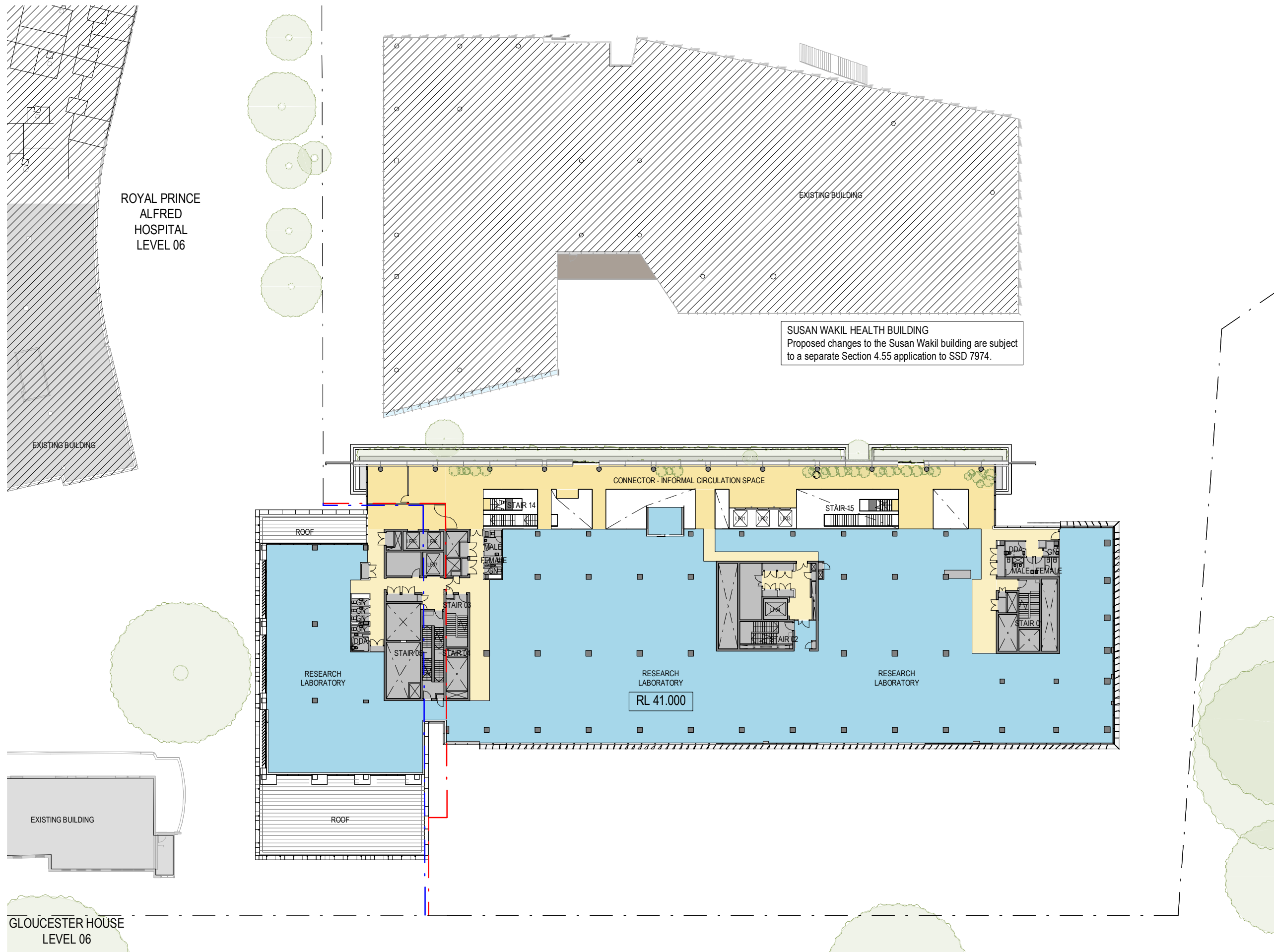
**LEGEND**  
 - - - - - EXISTING PROPERTY BOUNDARY  
 - - - - - PROPOSED PROPERTY BOUNDARY

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 1:500 @ A3  
 0 5 10 15M

**DENTON  
 CORKER  
 MARSHALL**

**SYDNEY BIOMEDICAL  
 ACCELERATOR**

**FOR PLANNING  
 28/07/2023  
 SSSA - GENERAL ARRANGEMENT PLAN -  
 LEVEL 04**



**LEGEND**

— — — — — EXISTING PROPERTY BOUNDARY

— — — — — PROPOSED PROPERTY BOUNDARY

D0353 A05\_0051 REV DA1 28/07/2023

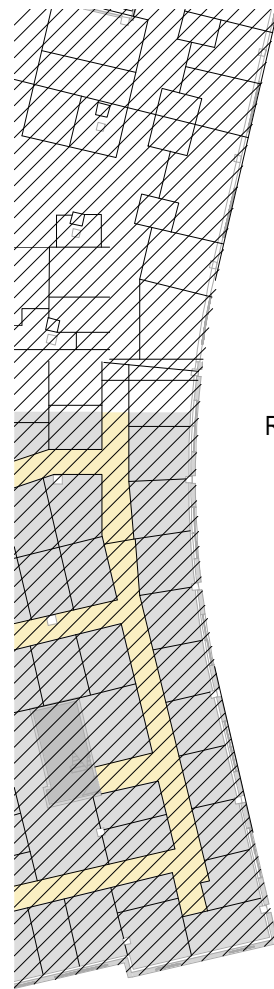
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0 5 10 15M

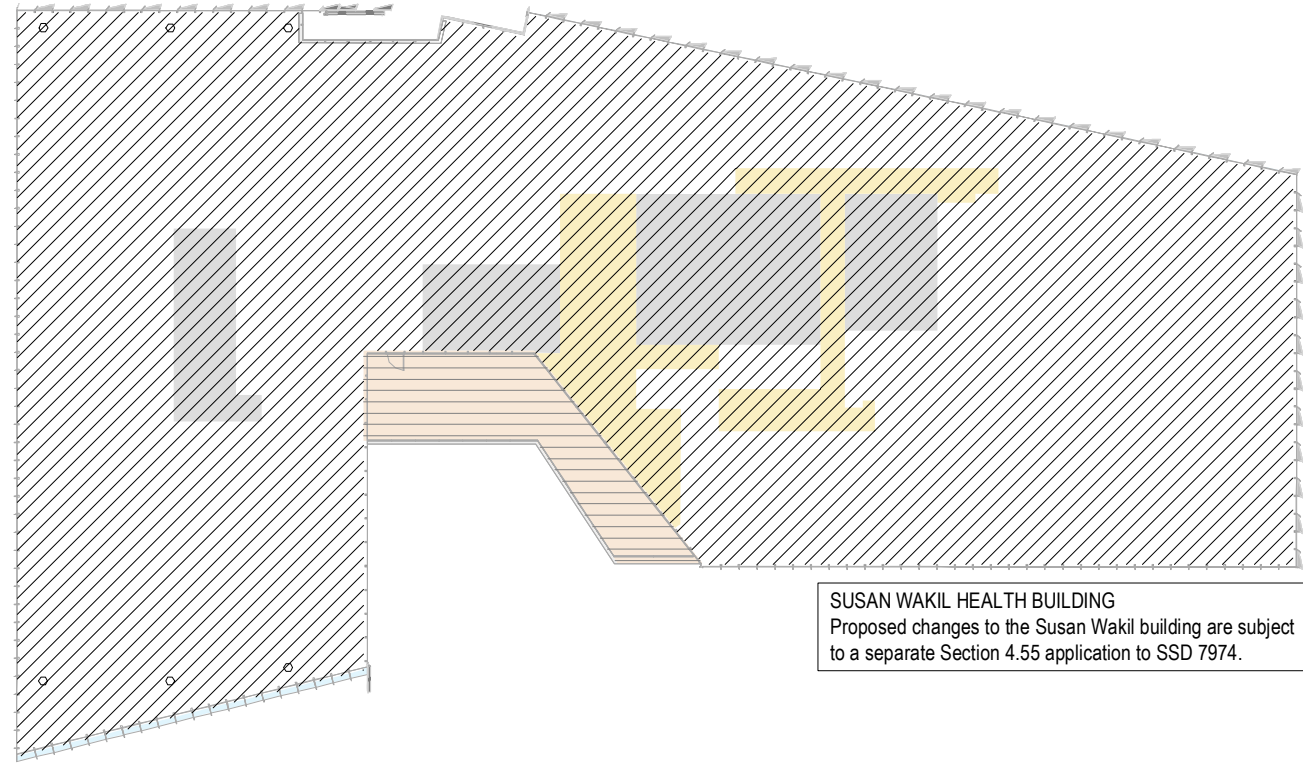
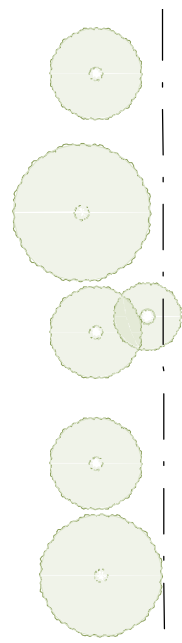
**DENTON  
CORKER  
MARSHALL**

**SYDNEY BIOMEDICAL  
ACCELERATOR**

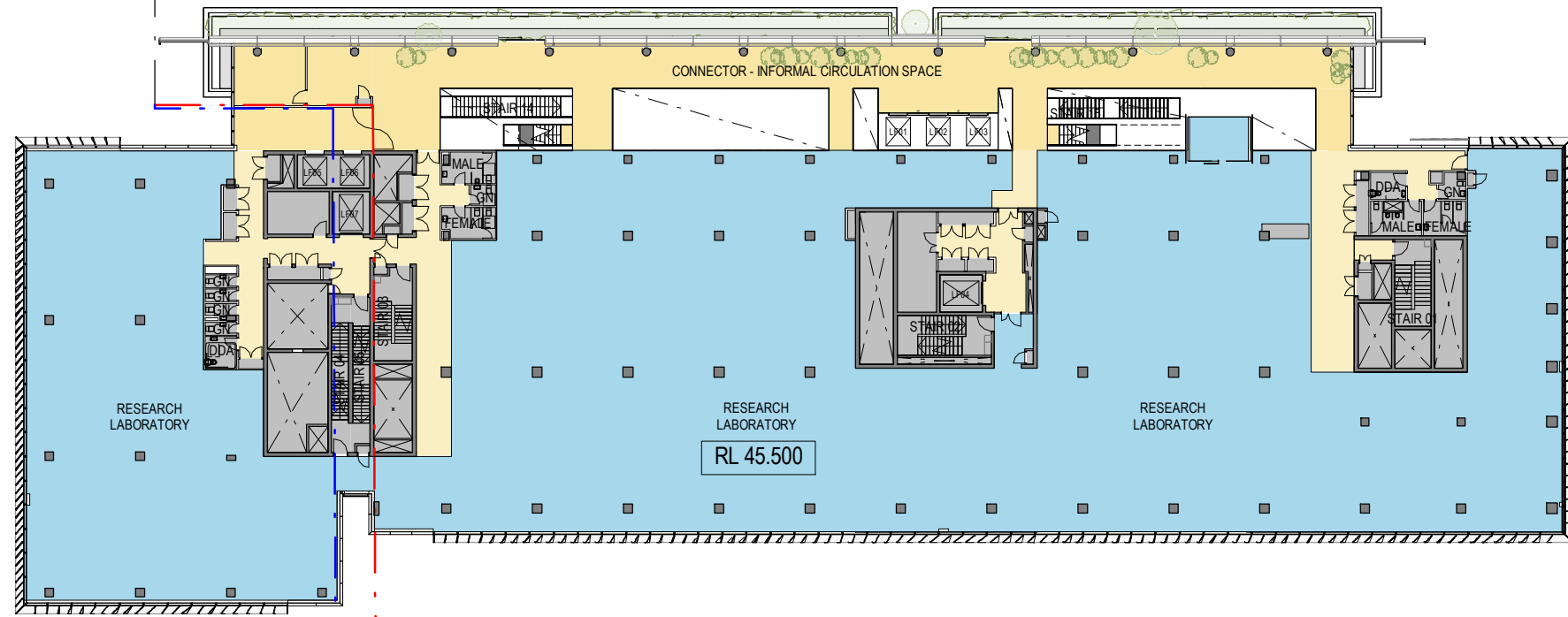
**FOR PLANNING  
28/07/2023  
SSDA - GENERAL ARRANGEMENT PLAN -  
LEVEL 05**



ROYAL PRINCE  
ALFRED  
HOSPITAL  
LEVEL 07



SUSAN WAKIL HEALTH BUILDING  
Proposed changes to the Susan Wakil building are subject to a separate Section 4.55 application to SSD 7974.



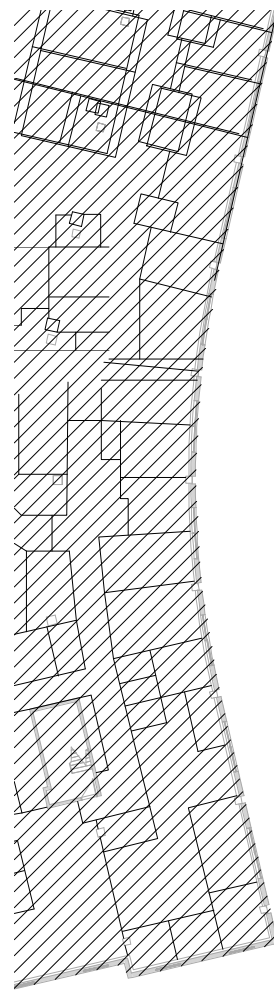
**LEGEND**  
 - - - EXISTING PROPERTY BOUNDARY  
 - - - PROPOSED PROPERTY BOUNDARY

D0353 A05\_0061 REV DA1 28/07/2023  
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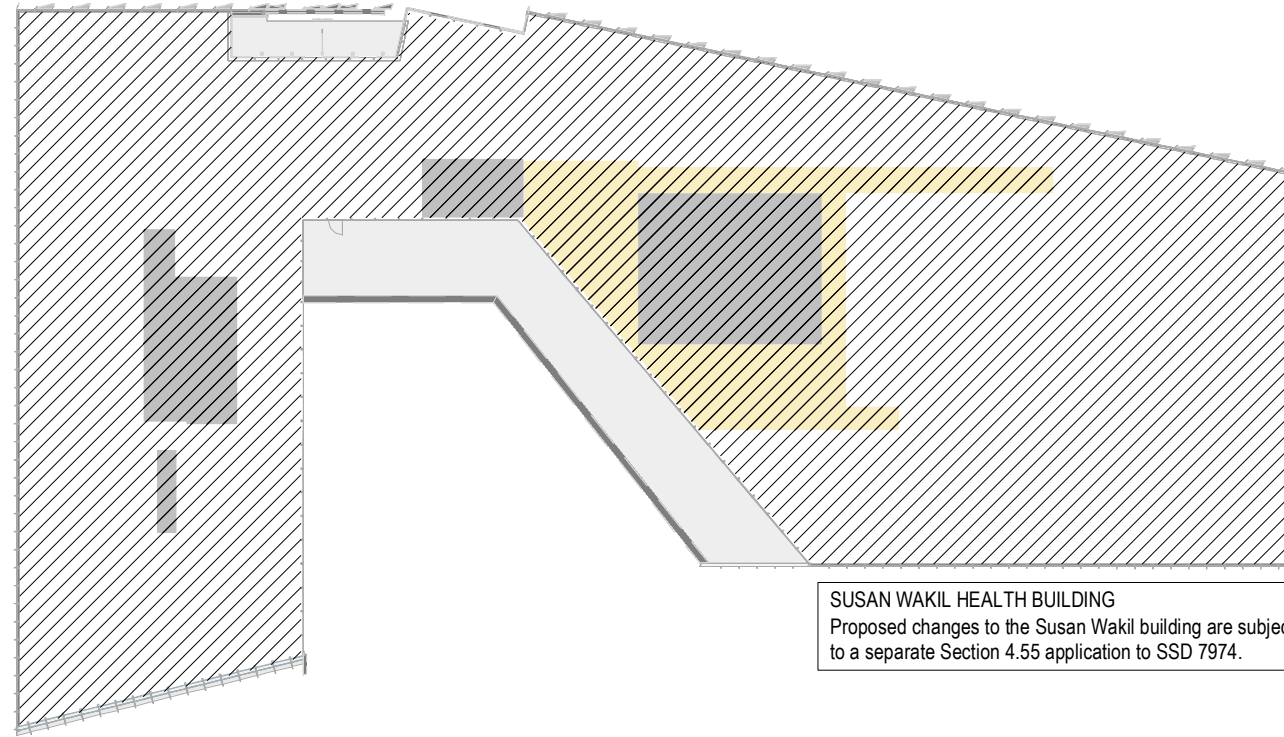
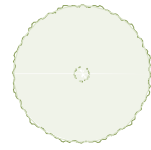
**DENTON  
CORKER  
MARSHALL**

**SYDNEY BIOMEDICAL  
ACCELERATOR**

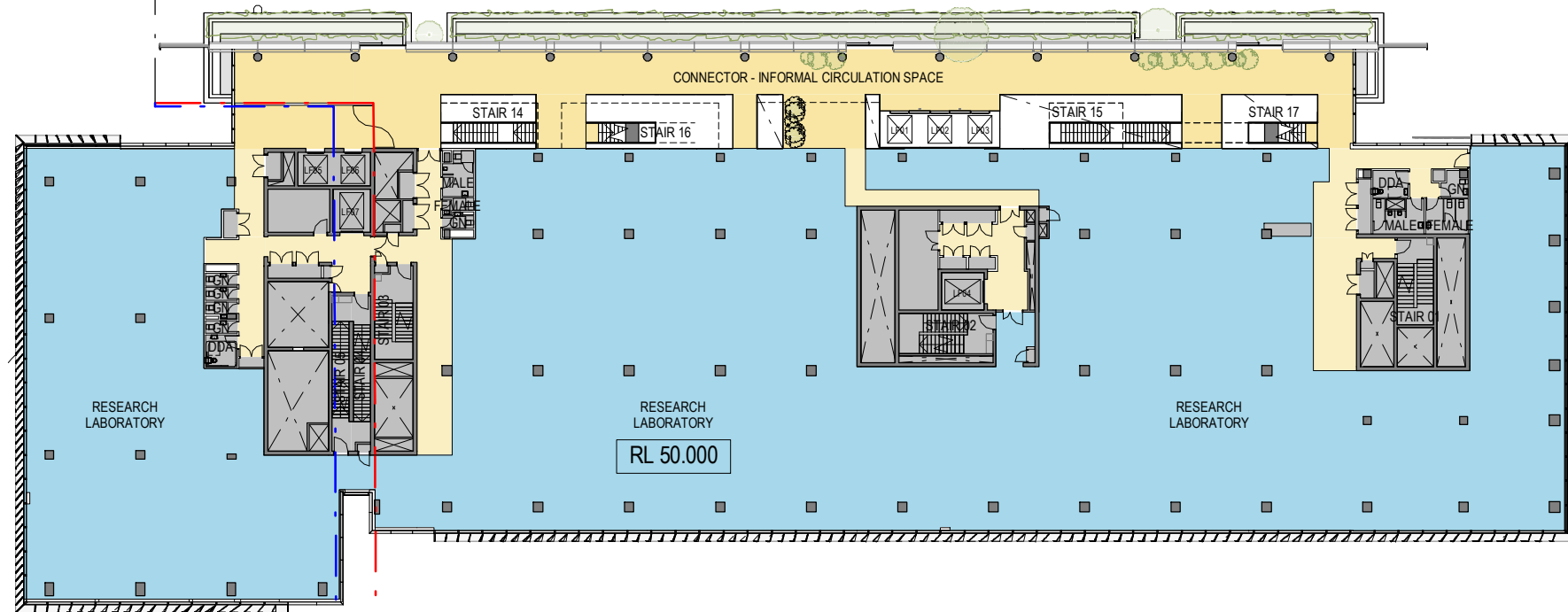
**FOR PLANNING  
28/07/2023  
SSDA - GENERAL ARRANGEMENT PLAN -  
LEVEL 06**



ROYAL PRINCE  
ALFRED  
HOSPITAL  
LEVEL 08



SUSAN WAKIL HEALTH BUILDING  
Proposed changes to the Susan Wakil building are subject to a separate Section 4.55 application to SSD 7974.



**LEGEND**

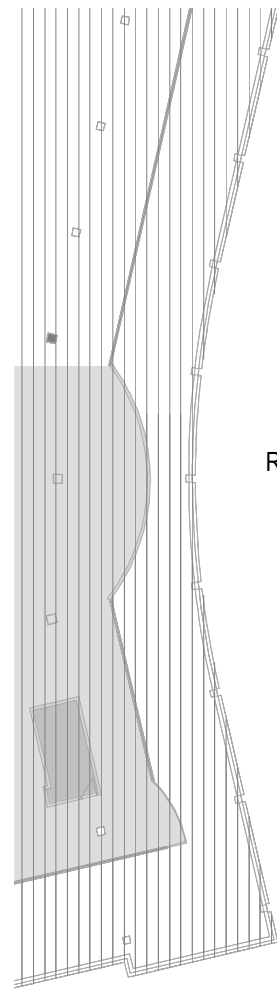
- - EXISTING PROPERTY BOUNDARY
- - PROPOSED PROPERTY BOUNDARY

D0353 A05\_0071 REV DA1 28/07/2023  
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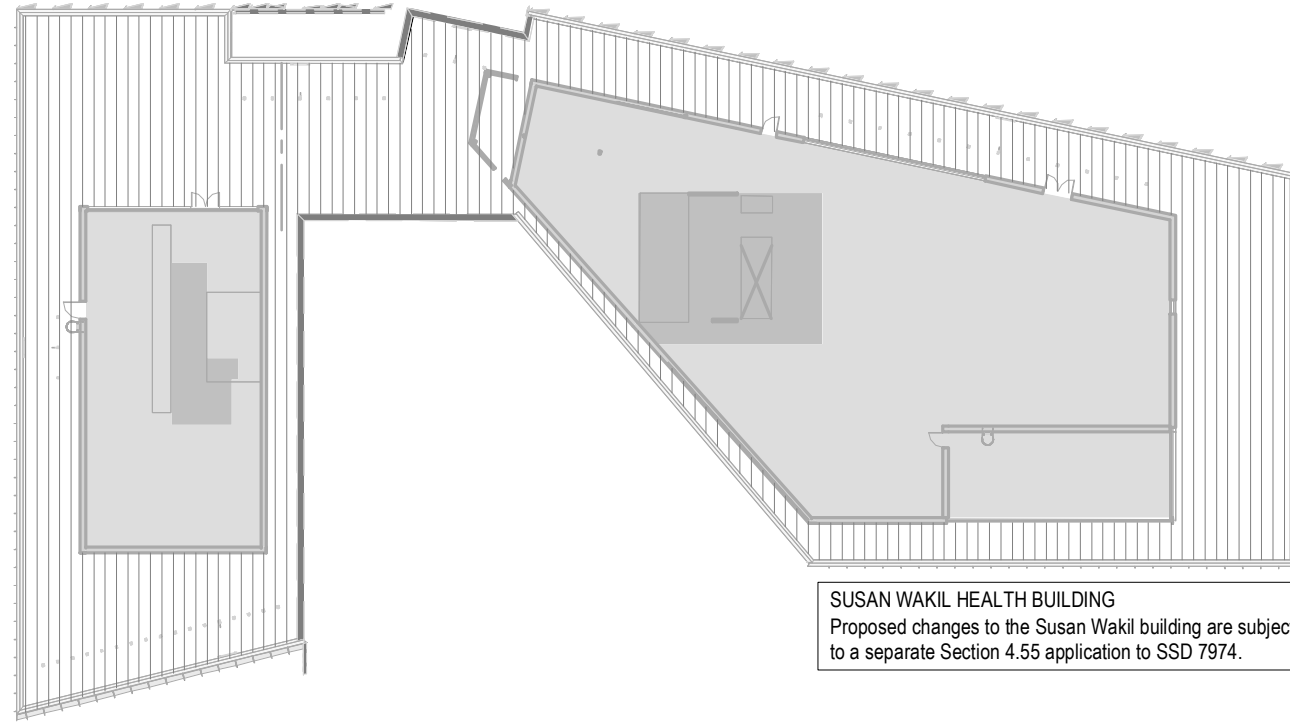
**DENTON  
CORKER  
MARSHALL**

**SYDNEY BIOMEDICAL  
ACCELERATOR**

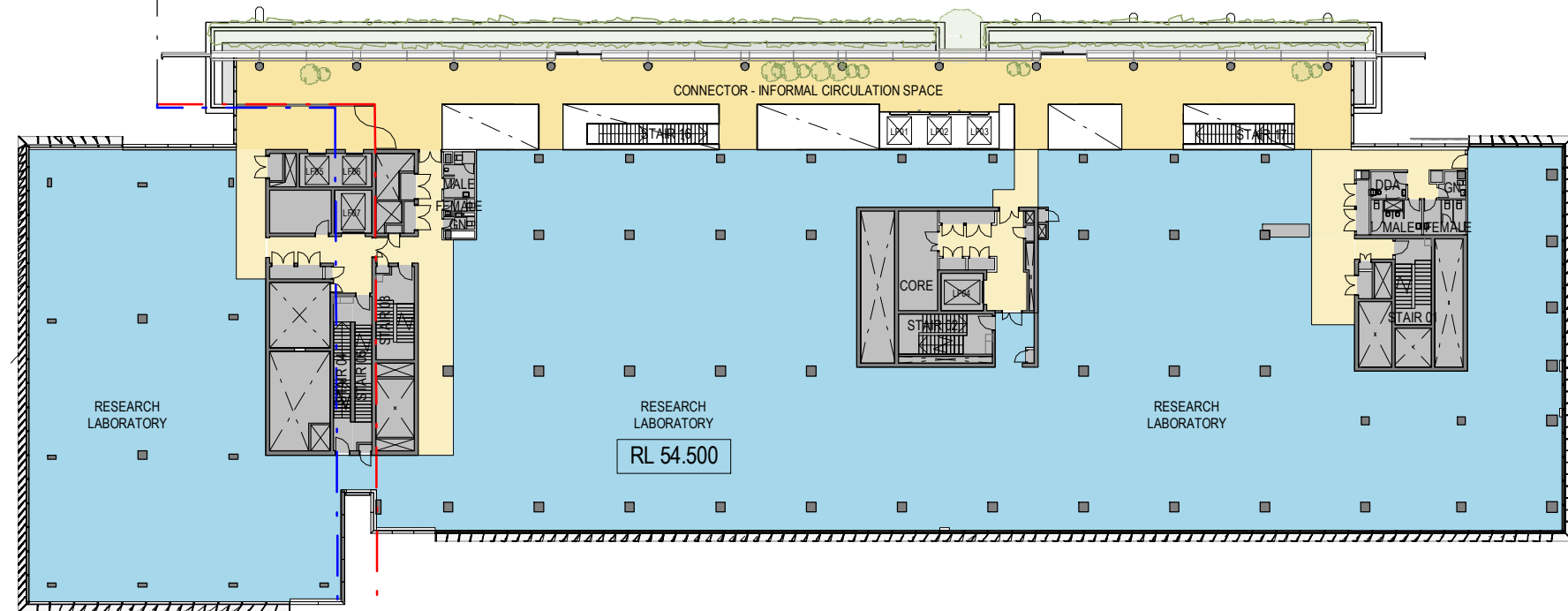
**FOR PLANNING  
28/07/2023  
SSDA - GENERAL ARRANGEMENT PLAN -  
LEVEL 07**



ROYAL PRINCE  
ALFRED  
HOSPITAL  
LEVEL 09



SUSAN WAKIL HEALTH BUILDING  
Proposed changes to the Susan Wakil building are subject to a separate Section 4.55 application to SSD 7974.



**LEGEND**

- — — EXISTING PROPERTY BOUNDARY
- — — PROPOSED PROPERTY BOUNDARY

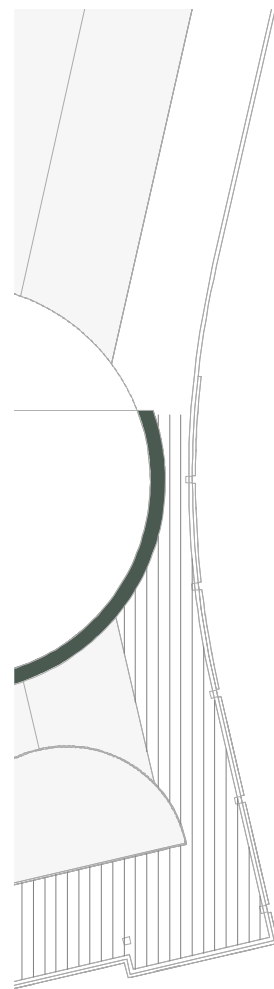
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**DENTON  
CORKER  
MARSHALL**

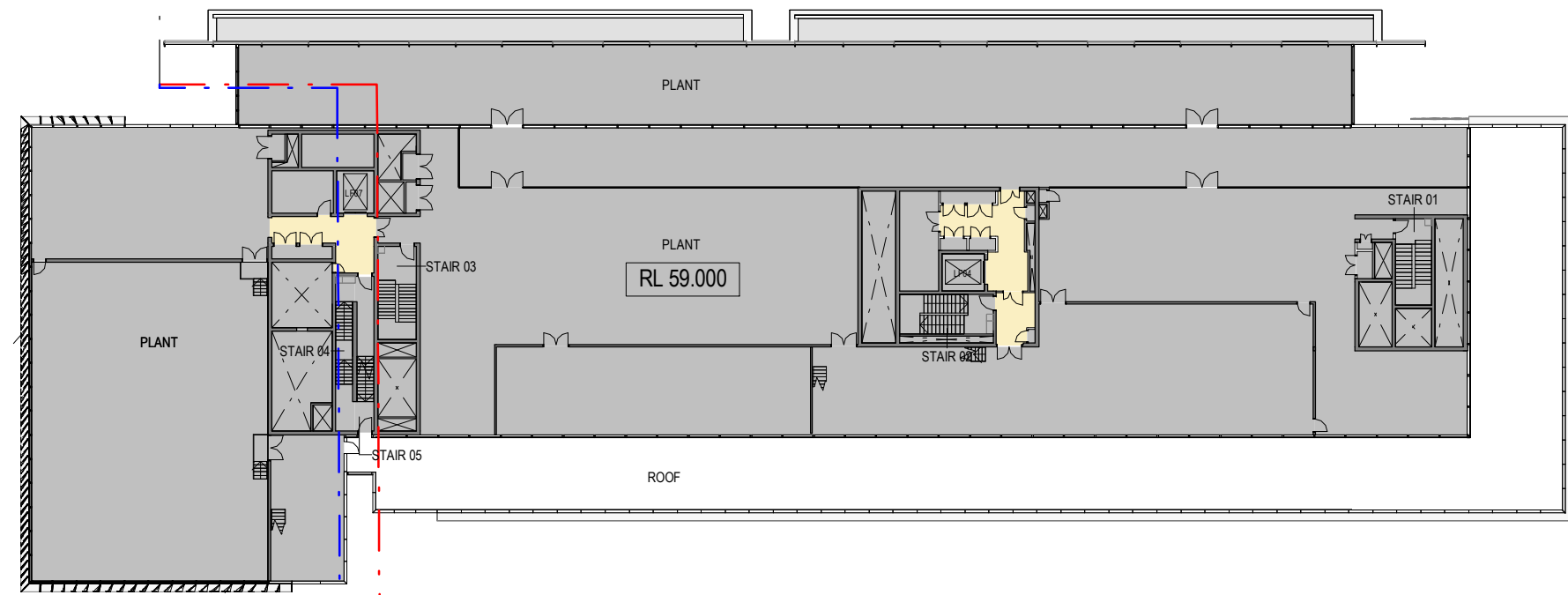
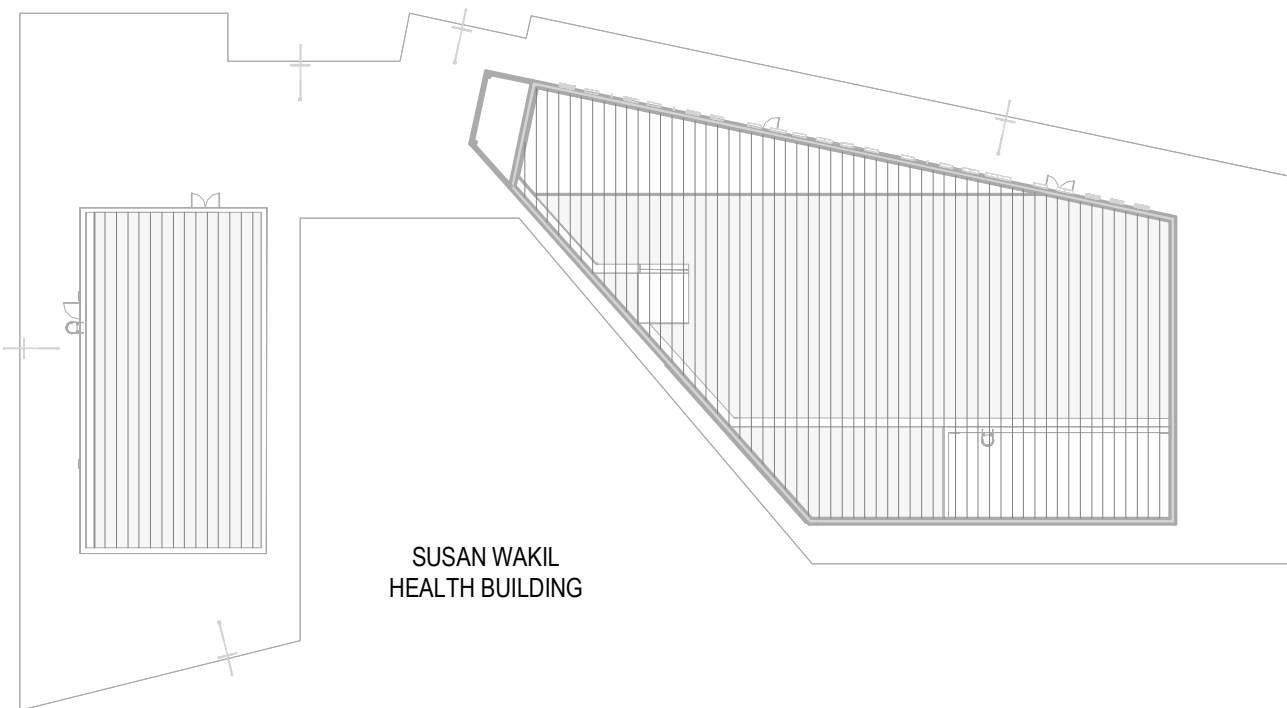
**SYDNEY BIOMEDICAL  
ACCELERATOR**

**FOR PLANNING  
28/07/2023  
SSDA - GENERAL ARRANGEMENT PLAN -  
LEVEL 08**

ROYAL PRINCE  
ALFRED  
HOSPITAL



SUSAN WAKIL  
HEALTH BUILDING



**LEGEND**

- - EXISTING PROPERTY BOUNDARY
- - PROPOSED PROPERTY BOUNDARY

D0353    A05\_0091    REV DA1  
28/07/2023

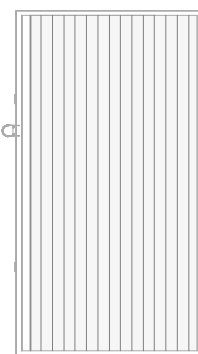
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**DENTON  
CORKER  
MARSHALL**

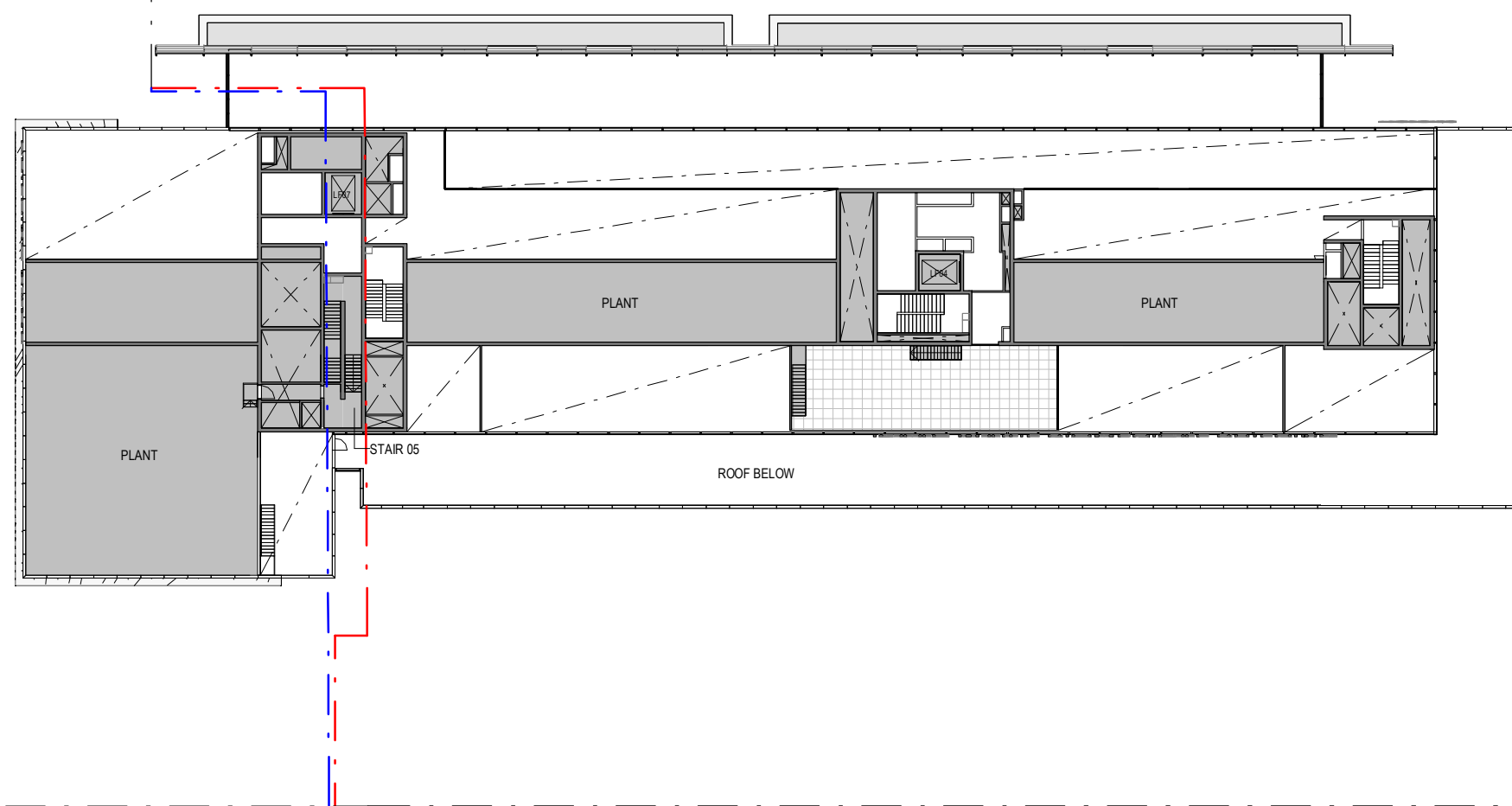
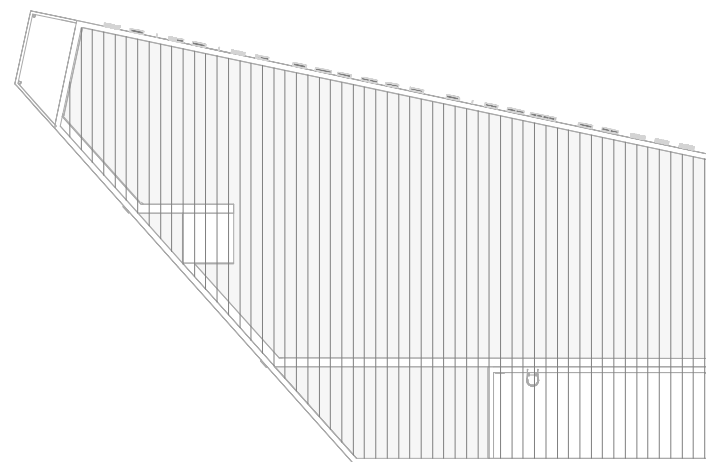
**SYDNEY BIOMEDICAL  
ACCELERATOR**

**FOR PLANNING  
28/07/2023  
SSDA - GENERAL ARRANGEMENT PLAN -  
LEVEL 09**

ROYAL PRINCE  
ALFRED  
HOSPITAL



SUSAN WAKIL  
HEALTH BUILDING

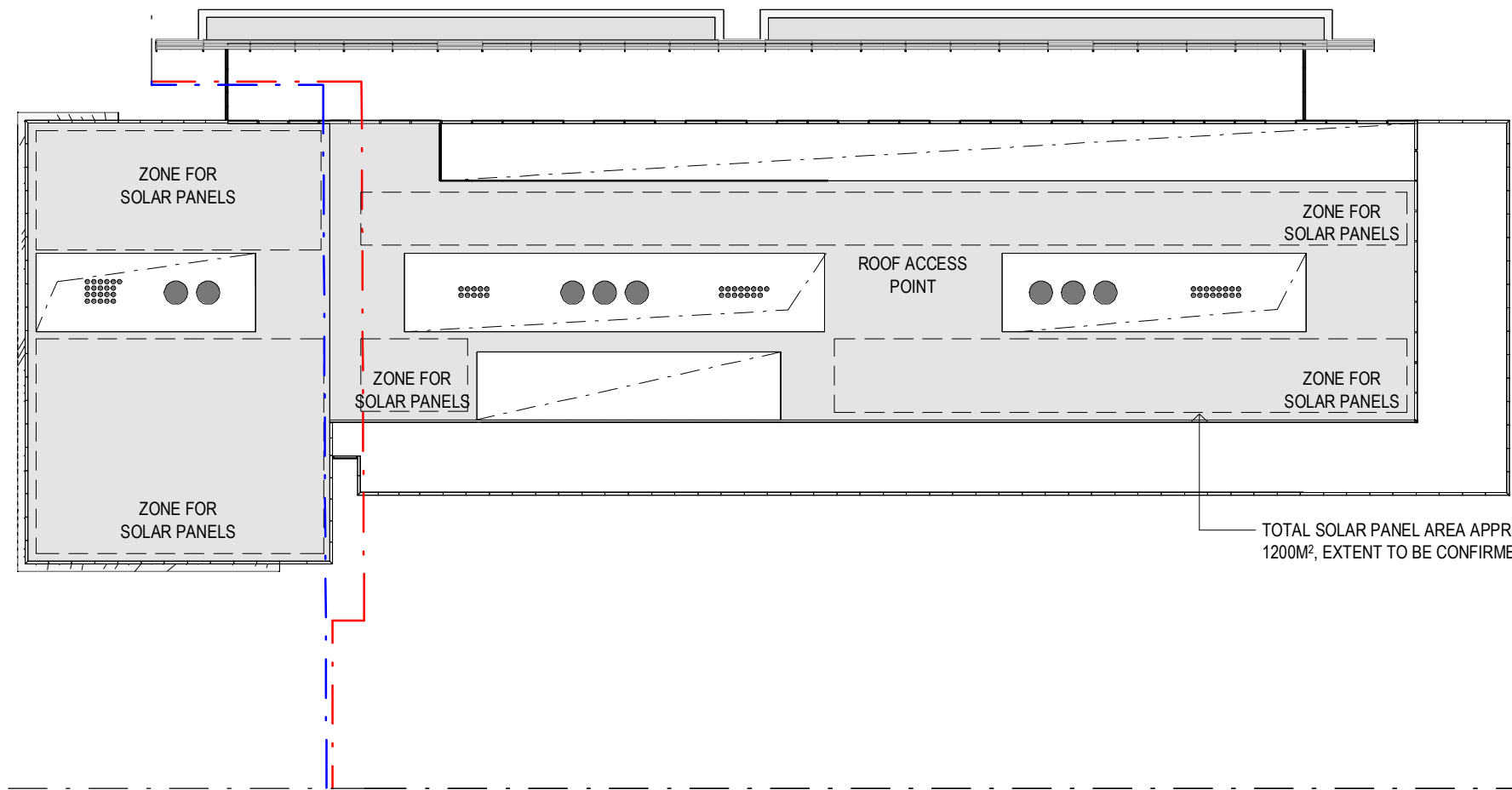
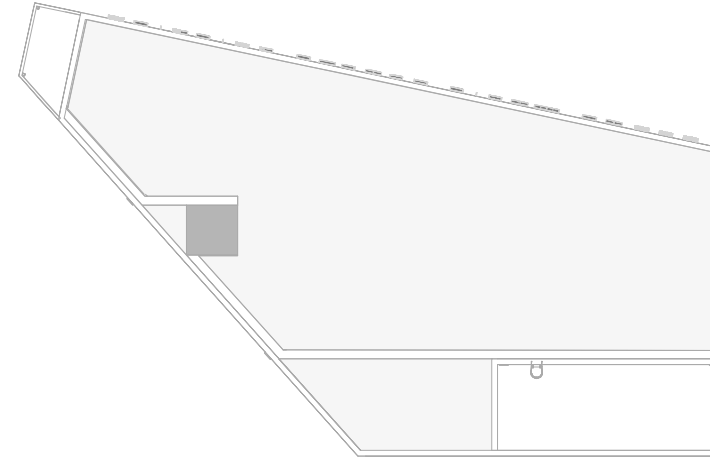
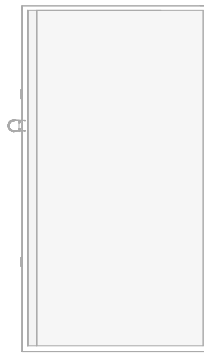


D0353 A05\_0092 REV DA1 28/07/2023  
1:500 @ A3  
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DENTON  
CORKER  
MARSHALL

SYDNEY BIOMEDICAL  
ACCELERATOR

FOR INFORMATION  
28/07/2023  
SSDA - GENERAL ARRANGEMENT PLAN -  
LEVEL 09 MEZZANINE



**LEGEND**

- - EXISTING PROPERTY BOUNDARY
- - PROPOSED PROPERTY BOUNDARY

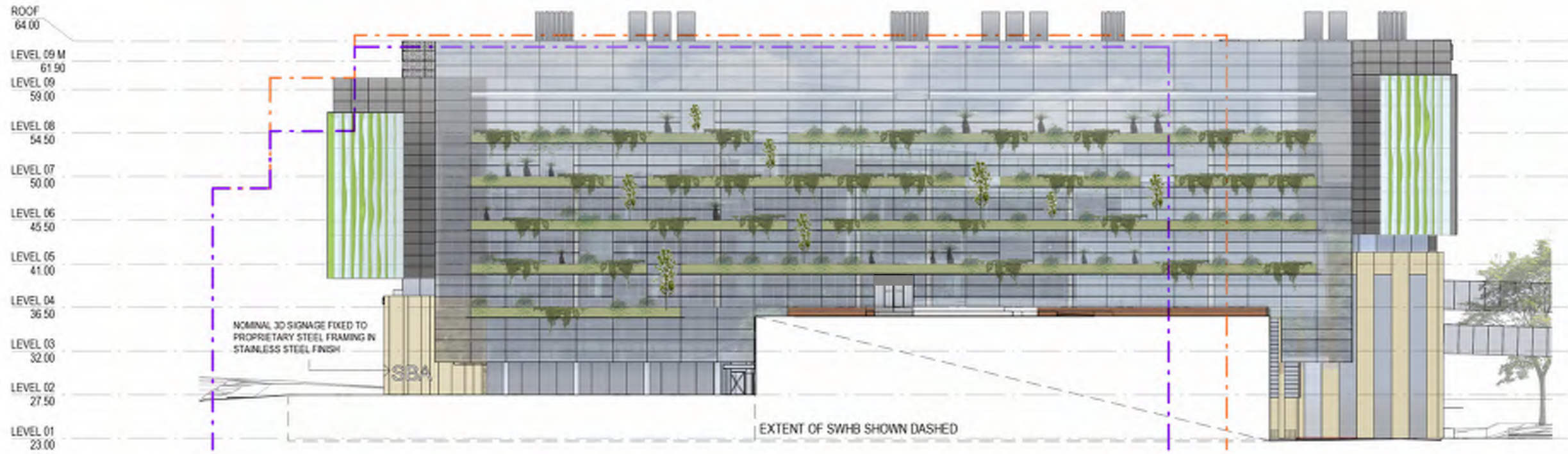
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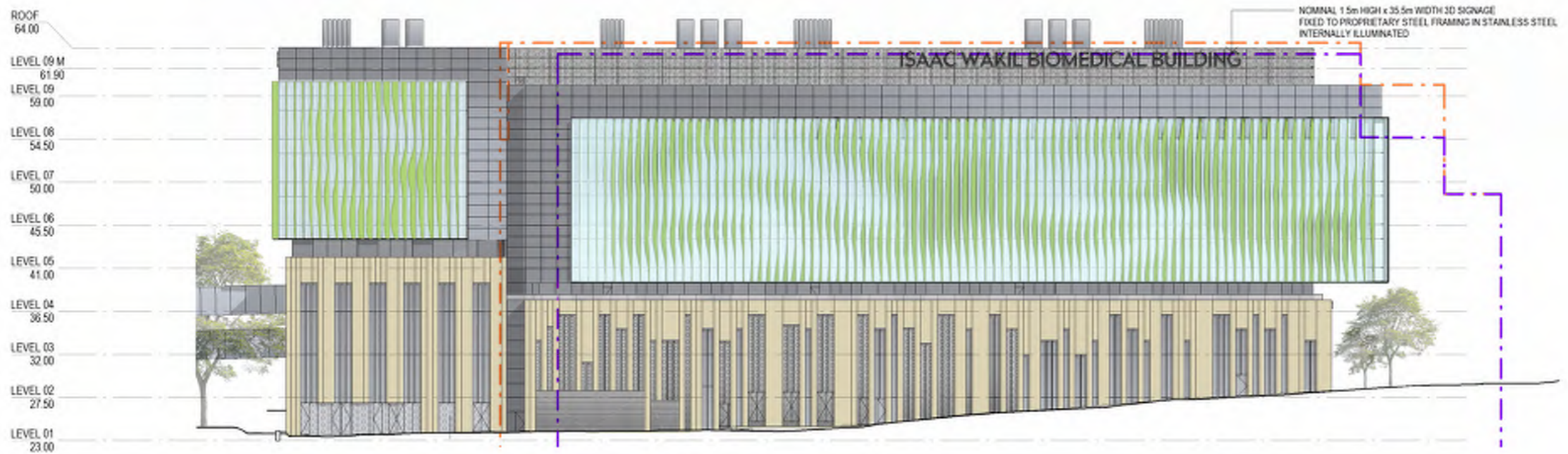
**DENTON  
 CORKER  
 MARSHALL**

**SYDNEY BIOMEDICAL  
 ACCELERATOR**

**FOR PLANNING  
 28/07/2023  
 SSSA - GENERAL ARRANGEMENT PLAN  
 ROOF**




1 NORTH ELEVATION  
SCALE 1:500



2 SOUTH ELEVATION  
SCALE 1:500

**LEGEND**

- EXISTING CIP ENVELOPE
- PROPOSED CIP ENVELOPE
-  PERFORATED METAL

D0353 A06\_1101 REV DA1  
28/07/2023  
1:500 @ A3  


**DENTON  
CORKER  
MARSHALL**

**SYDNEY BIOMEDICAL  
ACCELERATOR**

**FOR PLANNING  
28/07/2023  
SSDA - NORTH AND SOUTH ELEVATIONS**



1 EAST ELEVATION  
SCALE 1:500



2 WEST ELEVATION  
SCALE 1:500

LEGEND

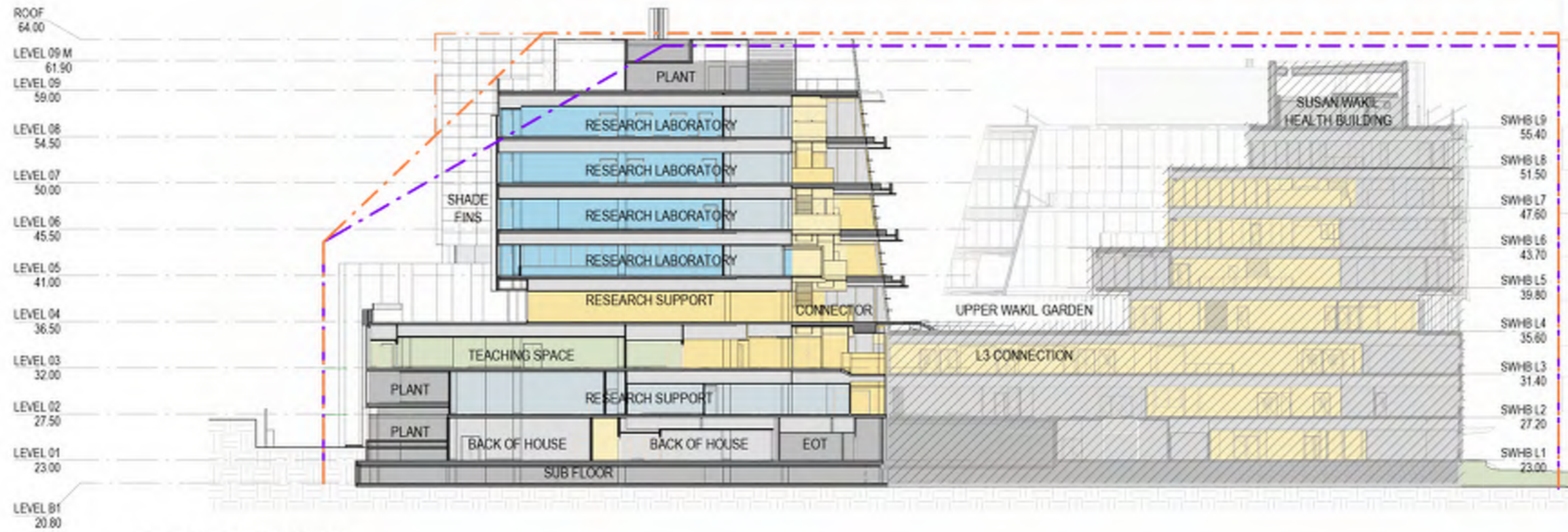
- EXISTING CIP ENVELOPE
- PROPOSED CIP ENVELOPE
- PERFORATED METAL

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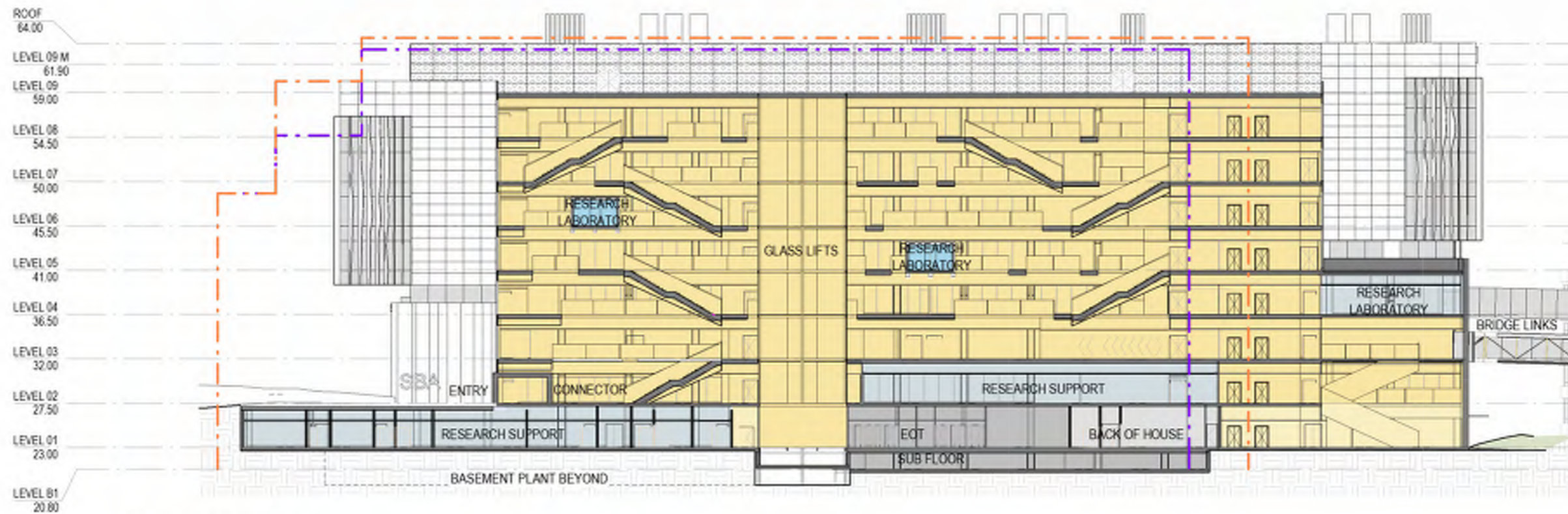
DENTON  
CORKER  
MARSHALL

SYDNEY BIOMEDICAL  
ACCELERATOR

FOR PLANNING  
28/07/2023  
SSDA - EAST AND WEST ELEVATIONS



1 NORTH-SOUTH SECTION  
SCALE 1:500



2 EAST-WEST SECTION  
SCALE 1:500

LEGEND

- EXISTING CIP ENVELOPE
- PROPOSED CIP ENVELOPE
- PERFORATED METAL

D0353 A05\_1201 REV DA1  
1:500 @ A3 28/07/2023

DENTON  
CORKER  
MARSHALL

SYDNEY BIOMEDICAL  
ACCELERATOR

FOR PLANNING  
28/07/2023  
SSDA - SECTIONS

---

## **Appendix C**

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Tabulated Summary Results from Previous Report(s)

Table D1: Summary of Laboratory Results; Soils

Sample ID	Depth	Sample Date	Metals							TRH					BTEX				PAH				Phenol	OCP	OPP	PCB	Asbestos														
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH >C10-C16	F1 (C8-C9)-BTEX	F2 (C10-C16) (as Naphthalene)	F3 (C17-C24)	F4 (C25-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene <sup>b</sup>	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ					Total PAHs	Asbestos ID in soil >0.1µg	FA and AF Estimation												
		PQL	4	0.4	1	1	1	0.1	1	1	50	25	50	100	100	0.2	0.5	1	1	0.1	0.05	0.5	0.05	5	0.1	0.1	0.1	-	<0.001												
BH2	0.4 - 0.6 m	13/10/2022	<4	<0.4	8	44	16	<0.1	11	74	<50	<25	<50	<100	120	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	-	-												
			3000	160	900	3600	1100	240000	110	1500	1800	730	290	400000	320	<170	310	215	NL	<50	<2500	<6600	4	95	NL	135	NL	185	NL	95	NL	370	<1.4	40	<4000	<0.05	<660	<45	<2000	<7	-
BH2	0.9 - 1.1 m	13/10/2022	<4	<0.4	7	6	15	<0.1	3	15	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	-	-												
			3000	160	900	3600	1100	240000	110	1500	1800	730	290	400000	320	<170	310	215	NL	<50	<2500	<6600	4	95	NL	135	NL	185	NL	95	NL	370	<1.4	40	<4000	<0.05	<660	<45	<2000	<7	-
BD01	0.9 - 1.1 m	13/10/2022	<4	<0.4	8	7	15	<0.1	4	17	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	-	-												
			3000	160	900	3600	1100	240000	110	1500	1800	730	290	400000	320	<170	310	215	NL	<50	<2500	<6600	4	95	NL	135	NL	185	NL	95	NL	370	<1.4	40	<4000	<0.05	<660	<45	<2000	<7	-
BH2	1.4 - 1.5 m	13/10/2022	<4	<0.4	15	14	16	0.1	4	13	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	-	-	-	-	-	-												
			3000	160	900	3600	1100	240000	110	1500	1800	730	290	400000	320	<170	480	215	NL	<50	<2500	<6600	6	95	NL	135	NL	185	NL	95	NL	370	<1.4	40	<4000	<0.05	<660	<45	<2000	<7	-
BH1	0.4 - 0.5 m	20/10/2022	<4	<0.4	8	24	86	0.1	10	110	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.1	0.73	1	10	<5	<0.1	<0.1	<0.1	-	-												
			3000	160	900	3600	1100	240000	110	1500	1800	730	290	400000	320	<170	310	215	NL	<50	<2500	<6600	4	95	NL	135	NL	185	NL	95	NL	370	<1.4	40	<4000	<0.05	<660	<45	<2000	<7	-
BH1	0.9 - 1 m	20/10/2022	<4	<0.4	3	11	120	<0.1	1	110	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	0.2	1.2	10	<5	<0.1	<0.1	<0.1	-	-												
			3000	160	900	3600	1100	240000	110	1500	1800	730	290	400000	320	<170	310	215	NL	<50	<2500	<6600	4	95	NL	135	NL	185	NL	95	NL	370	<1.4	40	<4000	<0.05	<660	<45	<2000	<7	-
BH1	1.5 - 1.6 m	20/10/2022	<4	<0.4	7	38	390	<0.1	2	830	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	0.2	1.8	10	<5	<0.1	<0.1	<0.1	-	-												
			3000	160	900	3600	1100	240000	110	1500	1800	730	290	400000	320	<170	480	215	NL	<50	<2500	<6600	6	95	NL	135	NL	185	NL	95	NL	370	<1.4	40	<4000	<0.05	<660	<45	<2000	<7	-
BH3	0.9 - 1 m	20/10/2022	<4	<0.4	14	41	15	<0.1	13	32	<50	<25	<50	100	<100	<0.2	<0.5	<1	<1	<0.1	0.54	0.7	5.4	<5	<0.1	<0.1	<0.1	-	-												
			3000	160	900	3600	1100	240000	110	1500	1800	730	290	400000	320	<170	310	215	NL	<50	<2500	<6600	4	95	NL	135	NL	185	NL	95	NL	370	<1.4	40	<4000	<0.05	<660	<45	<2000	<7	-
BH3	1.5 - 1.6 m	20/10/2022	<4	<0.4	12	10	17	<0.1	2	8	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	-	-	-	-	-													
			3000	160	900	3600	1100	240000	110	1500	1800	730	290	400000	320	<170	480	215	NL	<50	<2500	<6600	6	95	NL	135	NL	185	NL	95	NL	370	<1.4	40	<4000	<0.05	<660	<45	<2000	<7	-
BH301	0.05 - 0.15 m	24/03/2023	5	<0.4	22	41	25	<0.1	49	36	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	-	-												
			3000	160	900	3600	1100	240000	110	1500	1800	730	290	400000	320	<170	310	215	NL	<50	<2500	<6600	4	95	NL	135	NL	185	NL	95	NL	370	<1.4	40	<4000	<0.05	<660	<45	<2000	<7	-
BH301 - (TRIPPLICATE)	0.05 - 0.15 m	24/03/2023	4	<0.4	23	19	21	<0.1	26	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
			3000	160	900	3600	1100	240000	110	1500	1800	730	290	400000	320	<170	310	215	NL	<50	<2500	<6600	4	95	NL	135	NL	185	NL	95	NL	370	<1.4	40	<4000	<0.05	<660	<45	<2000	<7	-
BH301	0.6 - 0.7 m	24/03/2023	4	<0.4	23	1	16	<0.1	6	11	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	-	-												
			3000	160	900	3600	1100	240000	110	1500	1800	730	290	400000	320	<170	310	215	NL	<50	<2500	<6600	4	95	NL	135	NL	185	NL	95	NL	370	<1.4	40	<4000	<0.05	<660	<45	<2000	<7	-
BH301	1.5 - 1.6 m	24/03/2023	4	<0.4	29	3	14	<0.1	8	19	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	-	-	-	-	-													
			3000	160	900	3600	1100	240000	110	1500	1800	730	290	400000	320	<170	480	215	NL	<50	<2500	<6600	6	95	NL	135	NL	185	NL	95	NL	370	<1.4	40	<4000	<0.05	<660	<45	<2000	<7	-
BH303	0.1 - 0.2 m	24/03/2023	<4	<0.4	8	74	2	<0.1	43	40	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	0.05	0.3	5	<5	<0.1	<0.1	<0.1	-	-												
			3000	160	900	3600	1100	240000	110	1500	1800	730	290	400000	320	<170	310	215	NL	<50	<2500	<6600	4	95	NL	135	NL	185	NL	95	NL	370	<1.4	40	<4000	<0.05	<660	<45	<2000	<7	-
BH303	0.6 - 0.7 m	24/03/2023	<4	<0.4	4	20	71	<0.1	4	100	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	0.4	0.6	5	<5	<0.1	<0.1	<0.1	-	-												
			3000	160	900	3600	1100	240000	110	1500	1800	730	290	400000	320	<170	310	215	NL	<50	<2500	<6600	4	95	NL	135	NL	185	NL	95	NL	370	<1.4	40	<4000	<0.05	<660	<45	<2000	<7	-
BH303	1.5 - 1.6 m	24/03/2023	4	<0.4	17	8	25	<0.1	5	17	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	-	-	-	-	-													
			3000	160	900	3600	1100	240000	110	1500	1800	730	290	400000	320	<170	480	215	NL	<50	<2500	<6600	6	95	NL	135	NL	185	NL	95	NL	370	<1.4	40	<4000	<0.05	<660	<45	<2000	<7	-
BH303	1.9 - 2.1 m	24/03/2023	6	<0.4	19	5	37	<0.1	1	5	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	-	-	-	-	-													
			3000	160	900	3600	1100	240000	110	1500	1800	730	290	400000	320	<170	480	215	NL	<50	<2500	<6600	6	95	NL	135	NL	185	NL	95	NL	370	<1.4	40	<4000	<0.05	<660				



Table D2 - Preliminary Waste Classification Assessment

Sample ID	Depth	Sample Date	Metals						TRH		BTEX				PAH		Phenol	OCP		OPP	PCB	Asbestos		
			Arsenic	Cadmium	Total Chromium	Lead	Mercury (inorganic)	Nickel	TRH C6 - C9	C10-C16 recoverable hydrocarbons	Benzene	Toluene	Ethylbenzene	Xylenes (total)	Benzo(a)pyrene (BaP)	Total PAHs	Phenol	Total Endosulfane	Total Analyzed OCP	Total Analyzed OPP	Total PCB	Asbestos ID in soil >0.1µg/g	FA and AF Estimation	
		PQL	4	0.4	1	1	0.1	1	25	50	0.2	0.5	1	1	0.05	0.05	5	0.1	0.1	0.1	0.1		<0.001	
BH2	0.4 - 0.6 m	13/10/2022	<4	<0.4	8	16	<0.1	11	<25	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	-
BH2	0.9 - 1.1 m	13/10/2022	<4	<0.4	7	15	<0.1	3	<25	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NAD	-
BD01	0.9 - 1.1 m	13/10/2022	<4	<0.4	8	15	<0.1	4	<25	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	-	-
BH2	1.4 - 1.5 m	13/10/2022	<4	<0.4	15	16	0.1	4	<25	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	-	-	-	-	-	-	AD	-
BH1	0.4 - 0.5 m	20/10/2022	<4	<0.4	8	86	0.1	10	<25	<50	<0.2	<0.5	<1	<1	0.73	10	<5	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	-
BH1	0.9 - 1 m	20/10/2022	<4	<0.4	3	120	<0.1	1	<25	<50	<0.2	<0.5	<1	<1	0.2	1.2	-	-	-	-	-	-	NAD	-
BH1	1.5 - 1.6 m	20/10/2022	<4	<0.4	7	390	<0.1	2	<25	<50	<0.2	<0.5	<1	<1	0.2	1.8	-	-	-	-	-	-	NAD	-
BH3	0.9 - 1 m	20/10/2022	<4	<0.4	14	15	<0.1	13	<25	<50	<0.2	<0.5	<1	<1	0.54	5.4	<5	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	-
BH3	1.5 - 1.6 m	20/10/2022	<4	<0.4	12	17	<0.1	2	<25	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	-	-	-	-	-	-	NAD	-
BH301	0.05 - 0.15 m	24/03/2023	5	<0.4	22	25	<0.1	49	<25	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	<0.001
BH301	0.6 - 0.7 m	24/03/2023	4	<0.4	23	16	<0.1	6	<25	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	-
BH301	1.5 - 1.6 m	24/03/2023	4	<0.4	29	14	<0.1	8	<25	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	-	-	-	-	-	-	NAD	-
BH303	0.1 - 0.2 m	24/03/2023	<4	<0.4	8	2	<0.1	43	<25	<50	<0.2	<0.5	<1	<1	0.05	0.3	<5	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	<0.001
BH303	0.6 - 0.7 m	24/03/2023	<4	<0.4	4	71	<0.1	4	<25	<50	<0.2	<0.5	<1	<1	0.4	5	<5	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	-
BH303	1.5 - 1.6 m	24/03/2023	4	<0.4	17	25	<0.1	5	<25	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	-	-	-	-	-	-	NAD	-
BH303	1.9 - 2.1 m	24/03/2023	6	<0.4	19	37	<0.1	1	<25	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	-	-	-	-	-	-	NAD	-
BH304	0.25 - 0.35 m	24/03/2023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	<0.001
BH306	0.5 - 0.6 m	27/03/2023	<4	<0.4	4	14	<0.1	<1	<25	<50	<0.2	<0.5	<1	17	<0.05	<0.05	-	-	-	-	-	-	-	-
BH307	0.25 - 0.3 m	27/03/2023	<4	<0.4	9	23	<0.1	3	<25	<50	<0.2	<0.5	<1	<1	0.2	3.2	<5	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	<0.001
BH307	0.4 - 0.5 m	27/03/2023	5	<0.4	31	43	0.1	16	<25	<50	<0.2	<0.5	<1	<1	0.69	5.6	<5	<0.1	<0.1	<0.1	<0.1	<0.1	AD	-
BH307	0.9 - 1 m	27/03/2023	<4	<0.4	12	19	<0.1	<1	<25	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	-	-	-	-	-	-	NAD	-
BH308	0.15 - 0.2 m	27/03/2023	<4	<0.4	4	3	<0.1	2	<25	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	-
BD2/20230327	0.15 - 0.2 m	27/03/2023	<4	<0.4	3	1	<0.1	2	<25	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	-	-
BH308	0.4 - 0.5 m	27/03/2023	5	<0.4	17	20	<0.1	5	<25	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	AD	-
BH308	0.9 - 1 m	27/03/2023	<4	<0.4	9	19	<0.1	<1	<25	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	-	-	-	-	-	-	NAD	-
BH309	0 - 0.1 m	24/03/2023	6	<0.4	15	44	<0.1	6	<25	<50	<0.2	<0.5	<1	<1	0.3	4	<5	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	<0.001
BH309	0.4 - 0.5 m	24/03/2023	<4	<0.4	11	9	<0.1	100	<25	<50	<0.2	<0.5	<1	<1	<0.05	0.2	<5	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	-
BH309	0.9 - 1 m	24/03/2023	<4	<0.4	8	17	<0.1	17	<25	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	-
BH309	1.4 - 1.5 m	24/03/2023	<4	<0.4	4	24	<0.1	2	<25	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	-	-	-	-	-	-	NAD	-
BH310	0 - 0.1 m	24/03/2023	7	<0.4	14	110	0.2	8	<25	210	<0.2	<0.5	<1	<1	0.8	8	<5	<0.1	<0.1	<0.1	<0.1	<0.1	AD	<0.001
BH310	0.5 - 0.6 m	24/03/2023	5	<0.4	15	70	0.1	7	<25	110	<0.2	<0.5	<1	<1	1.2	10	<5	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	-
BH311	0 - 0.1 m	24/03/2023	<4	<0.4	3	110	0.2	6	<25	230	<0.2	<0.5	<1	<1	0.98	9.4	<5	<0.1	0.2	<0.1	<0.1	<0.1	NAD	-
BD1/20230324	0 - 0.1 m	24/03/2023	7	<0.4	13	160	0.4	9	<25	120	<0.2	<0.5	<1	<1	1.1	11	NT	NT	NT	NT	NT	NT	-	-
BH311	0.6 - 0.7 m	24/03/2023	7	<0.4	19	84	0.2	25	<25	<50	<0.2	<0.5	<1	<1	0.59	5.9	-	-	-	-	-	-	NAD	-
BH312	0 - 0.1 m	24/03/2023	7	<0.4	14	200	0.3	8	<25	240	<0.2	<0.5	<1	<1	0.71	6.8	<5	<0.1	0.2	<0.1	<0.1	<0.1	NAD	<0.001
BH312	0.9 - 1 m	24/03/2023	34	<0.4	17	31	0.1	3	<25	<50	<0.2	<0.5	<1	<1	0.06	0.06	-	-	-	-	-	-	NAD	-
BH313	0.1 - 0.2 m	27/03/2023	<4	<0.4	11	100	0.2	9	<25	220	<0.2	<0.5	<1	<1	0.65	6.5	<5	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	<0.001
BH313	0.7 - 0.8 m	27/03/2023	4	<0.4	16	44	<0.1	3	<25	<50	<0.2	<0.5	<1	<1	0.2	1.7	<5	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	-
BH313	1.2 - 1.3 m	27/03/2023	<4	<0.4	11	26	<0.1	1	<25	<50	<0.2	<0.5	<1	<1	0.07	0.3	-	-	-	-	-	-	NAD	-
BH314	0.2 - 0.3 m	27/03/2023	8	<0.4	4	16	<0.1	4	<25	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	-
BH314	0.5 - 0.6 m	27/03/2023	<4	<0.4	5	15	<0.1	5	<25	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	-
BH314	0.9 - 1 m	27/03/2023	<4	<0.4	3	15	<0.1	3	<25	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	-	-	-	-	-	-	NAD	-
BH315	0.1 - 0.2 m	27/03/2023	18	<0.4	10	25	<0.1	10	<25	<50	<0.2	<0.5	<1	<1	0.1	1.6	<5	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	<0.001
BH315	0.5 - 0.6 m	27/03/2023	4	<0.4	8	28	<0.1	8	<25	<50	<0.2	<0.5	<1	<1	0.06	0.4	<5	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	-
BH315	1.2 - 1.3 m	27/03/2023	<4	<0.4	5	15	<0.1	2	<25	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	-	-	-	-	-	-	NAD	-
BH316	0.4 - 0.5 m	27/03/2023	<4	<0.4	6	23	<0.1	7	<25	230	<0.2	<0.5	<1	<1	2.8	50	<5	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	-
BH316	0.7 - 0.8 m	27/03/2023	<4	<0.4	3	36	0.3	3	<25	<50	<0.2	<0.5	<1	<1	<0.05	0.5	-	-	-	-	-	-	NAD	-
BH317	0.4 - 0.5 m	27/03/2023	<4	<0.4	5	21	<0.1	3	<25	<50	<0.2	<0.5	<											

A	B	C	D	E	F	G	H	I	J	K	L
1	<b>UCL Statistics for Uncensored Full Data Sets</b>										
2											
3	User Selected Options										
4	Date/Time of Computation		ProUCL 5.15/05/2023 3:04:00 PM								
5	From File		WorkSheet.xls								
6	Full Precision		OFF								
7	Confidence Coefficient		95%								
8	Number of Bootstrap Operations		2000								
9											
10											
11	<b>Copper</b>										
12											
13	<b>General Statistics</b>										
14	Total Number of Observations			54		Number of Distinct Observations			41		
15						Number of Missing Observations			0		
16	Minimum			1		Mean			29.67		
17	Maximum			120		Median			24.5		
18	SD			21.79		Std. Error of Mean			2.966		
19	Coefficient of Variation			0.735		Skewness			1.598		
20											
21	<b>Normal GOF Test</b>										
22	Shapiro Wilk Test Statistic			0.889		<b>Shapiro Wilk GOF Test</b>					
23	5% Shapiro Wilk P Value			3.3732E-5		Data Not Normal at 5% Significance Level					
24	Lilliefors Test Statistic			0.119		<b>Lilliefors GOF Test</b>					
25	5% Lilliefors Critical Value			0.12		Data appear Normal at 5% Significance Level					
26	<b>Data appear Approximate Normal at 5% Significance Level</b>										
27											
28	<b>Assuming Normal Distribution</b>										
29	<b>95% Normal UCL</b>					<b>95% UCLs (Adjusted for Skewness)</b>					
30	95% Student's-t UCL			34.63		95% Adjusted-CLT UCL (Chen-1995)			35.23		
31						95% Modified-t UCL (Johnson-1978)			34.74		
32											
33	<b>Gamma GOF Test</b>										
34	A-D Test Statistic			0.124		<b>Anderson-Darling Gamma GOF Test</b>					
35	5% A-D Critical Value			0.764		Detected data appear Gamma Distributed at 5% Significance Level					
36	K-S Test Statistic			0.0531		<b>Kolmogorov-Smirnov Gamma GOF Test</b>					
37	5% K-S Critical Value			0.123		Detected data appear Gamma Distributed at 5% Significance Level					
38	<b>Detected data appear Gamma Distributed at 5% Significance Level</b>										
39											
40	<b>Gamma Statistics</b>										
41	k hat (MLE)			1.856		k star (bias corrected MLE)			1.765		
42	Theta hat (MLE)			15.98		Theta star (bias corrected MLE)			16.81		
43	nu hat (MLE)			200.5		nu star (bias corrected)			190.7		
44	MLE Mean (bias corrected)			29.67		MLE Sd (bias corrected)			22.33		
45						Approximate Chi Square Value (0.05)			159.7		
46	Adjusted Level of Significance			0.0456		Adjusted Chi Square Value			158.9		
47											
48	<b>Assuming Gamma Distribution</b>										
49	95% Approximate Gamma UCL (use when n>=50)			35.41		95% Adjusted Gamma UCL (use when n<50)			35.59		
50											
51	<b>Lognormal GOF Test</b>										
52	Shapiro Wilk Test Statistic			0.953		<b>Shapiro Wilk Lognormal GOF Test</b>					

A	B	C	D	E	F	G	H	I	J	K	L
53	5% Shapiro Wilk P Value			0.0651	Data appear Lognormal at 5% Significance Level						
54	Lilliefors Test Statistic			0.0829	<b>Lilliefors Lognormal GOF Test</b>						
55	5% Lilliefors Critical Value			0.12	Data appear Lognormal at 5% Significance Level						
56	<b>Data appear Lognormal at 5% Significance Level</b>										
57											
58	<b>Lognormal Statistics</b>										
59	Minimum of Logged Data			0	Mean of logged Data			3.097			
60	Maximum of Logged Data			4.787	SD of logged Data			0.864			
61											
62	<b>Assuming Lognormal Distribution</b>										
63	95% H-UCL			41.64	90% Chebyshev (MVUE) UCL			44.65			
64	95% Chebyshev (MVUE) UCL			50.45	97.5% Chebyshev (MVUE) UCL			58.5			
65	99% Chebyshev (MVUE) UCL			74.31							
66											
67	<b>Nonparametric Distribution Free UCL Statistics</b>										
68	<b>Data appear to follow a Discernible Distribution at 5% Significance Level</b>										
69											
70	<b>Nonparametric Distribution Free UCLs</b>										
71	95% CLT UCL			34.54	95% Jackknife UCL			34.63			
72	95% Standard Bootstrap UCL			34.49	95% Bootstrap-t UCL			35.28			
73	95% Hall's Bootstrap UCL			35.94	95% Percentile Bootstrap UCL			34.63			
74	95% BCA Bootstrap UCL			34.81							
75	90% Chebyshev(Mean, Sd) UCL			38.56	95% Chebyshev(Mean, Sd) UCL			42.59			
76	97.5% Chebyshev(Mean, Sd) UCL			48.19	99% Chebyshev(Mean, Sd) UCL			59.17			
77											
78	<b>Suggested UCL to Use</b>										
79	95% Student's-t UCL			34.63							
80											
81	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test										
82	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL										
83											
84	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.										
85	Recommendations are based upon data size, data distribution, and skewness.										
86	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).										
87	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.										
88											
89											
90	<b>Zinc</b>										
91											
92	<b>General Statistics</b>										
93	Total Number of Observations			54	Number of Distinct Observations			36			
94					Number of Missing Observations			0			
95	Minimum			4	Mean			59.48			
96	Maximum			830	Median			26			
97	SD			116.3	Std. Error of Mean			15.82			
98	Coefficient of Variation			1.955	Skewness			5.729			
99											
100	<b>Normal GOF Test</b>										
101	Shapiro Wilk Test Statistic			0.434	<b>Shapiro Wilk GOF Test</b>						
102	5% Shapiro Wilk P Value			0	Data Not Normal at 5% Significance Level						
103	Lilliefors Test Statistic			0.317	<b>Lilliefors GOF Test</b>						
104	5% Lilliefors Critical Value			0.12	Data Not Normal at 5% Significance Level						

A	B	C	D	E	F	G	H	I	J	K	L	
105	<b>Data Not Normal at 5% Significance Level</b>											
106												
107	<b>Assuming Normal Distribution</b>											
108	<b>95% Normal UCL</b>				<b>95% UCLs (Adjusted for Skewness)</b>							
109	95% Student's-t UCL			85.97	95% Adjusted-CLT UCL (Chen-1995)					98.69		
110					95% Modified-t UCL (Johnson-1978)					88.02		
111												
112	<b>Gamma GOF Test</b>											
113	A-D Test Statistic			1.629	<b>Anderson-Darling Gamma GOF Test</b>							
114	5% A-D Critical Value			0.79	Data Not Gamma Distributed at 5% Significance Level							
115	K-S Test Statistic			0.15	<b>Kolmogorov-Smirnov Gamma GOF Test</b>							
116	5% K-S Critical Value			0.126	Data Not Gamma Distributed at 5% Significance Level							
117	<b>Data Not Gamma Distributed at 5% Significance Level</b>											
118												
119	<b>Gamma Statistics</b>											
120	k hat (MLE)		0.796	k star (bias corrected MLE)			0.764					
121	Theta hat (MLE)		74.71	Theta star (bias corrected MLE)			77.83					
122	nu hat (MLE)		85.98	nu star (bias corrected)			82.54					
123	MLE Mean (bias corrected)		59.48	MLE Sd (bias corrected)			68.04					
124					Approximate Chi Square Value (0.05)			62.6				
125	Adjusted Level of Significance		0.0456	Adjusted Chi Square Value			62.13					
126												
127	<b>Assuming Gamma Distribution</b>											
128	95% Approximate Gamma UCL (use when n>=50)			78.42	95% Adjusted Gamma UCL (use when n<50)					79.03		
129												
130	<b>Lognormal GOF Test</b>											
131	Shapiro Wilk Test Statistic			0.964	<b>Shapiro Wilk Lognormal GOF Test</b>							
132	5% Shapiro Wilk P Value			0.193	Data appear Lognormal at 5% Significance Level							
133	Lilliefors Test Statistic			0.0953	<b>Lilliefors Lognormal GOF Test</b>							
134	5% Lilliefors Critical Value			0.12	Data appear Lognormal at 5% Significance Level							
135	<b>Data appear Lognormal at 5% Significance Level</b>											
136												
137	<b>Lognormal Statistics</b>											
138	Minimum of Logged Data			1.386	Mean of logged Data			3.34				
139	Maximum of Logged Data			6.721	SD of logged Data			1.169				
140												
141	<b>Assuming Lognormal Distribution</b>											
142	95% H-UCL		84.07	90% Chebyshev (MVUE) UCL			86.89					
143	95% Chebyshev (MVUE) UCL			101.5	97.5% Chebyshev (MVUE) UCL			121.7				
144	99% Chebyshev (MVUE) UCL			161.4								
145												
146	<b>Nonparametric Distribution Free UCL Statistics</b>											
147	<b>Data appear to follow a Discernible Distribution at 5% Significance Level</b>											
148												
149	<b>Nonparametric Distribution Free UCLs</b>											
150	95% CLT UCL		85.5	95% Jackknife UCL			85.97					
151	95% Standard Bootstrap UCL			85.04	95% Bootstrap-t UCL			122.9				
152	95% Hall's Bootstrap UCL			187.1	95% Percentile Bootstrap UCL			87.11				
153	95% BCA Bootstrap UCL			104.7								
154	90% Chebyshev(Mean, Sd) UCL			106.9	95% Chebyshev(Mean, Sd) UCL			128.4				
155	97.5% Chebyshev(Mean, Sd) UCL			158.3	99% Chebyshev(Mean, Sd) UCL			216.9				
156												

	A	B	C	D	E	F	G	H	I	J	K	L	
157	<b>Suggested UCL to Use</b>												
158						95% H-UCL	84.07						
159													
160	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.												
161	Recommendations are based upon data size, data distribution, and skewness.												
162	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).												
163	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.												
164													
165	<b>ProUCL computes and outputs H-statistic based UCLs for historical reasons only.</b>												
166	<b>H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.</b>												
167	<b>It is therefore recommended to avoid the use of H-statistic based 95% UCLs.</b>												
168	<b>Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.</b>												
169													

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## **Appendix D**

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Borehole and Test Pit Logs from Previous Report(s)

# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue and Cadigal Lane,  
 Camperdown

**SURFACE LEVEL:** 23.0 AHD  
**EASTING:** 332095  
**NORTHING:** 6248567  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH301  
**PROJECT No:** 84711.01  
**DATE:** 24/3/2023  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details		
				Type	Depth	Sample	Results & Comments				
23 22 21 20 19	0.05	ASPHALTIC CONCRETE (50mm)	█		0.05						
		FILL/CLAY: low to medium plasticity, dark brown and dark grey, with angular to sub-angular gravel, trace fine to coarse sand and terracotta, w~PL, apparently very stiff	█	E	0.15						
		FILL/CLAY: low to medium plasticity, brown, trace angular to sub-angular gravel, wood chipping, rootlets, w~PL	█	E	0.4						
		From 0.6m: becoming pale brown, trace sand	█	E	0.5						
			█	E	0.6						
		From 0.9m: becoming brown and orange-brown	█	E	0.7						
			█	E	1.1						
			█	E	1.2						
			█	E	1.5						
			█	E	1.6						
		1.4	CLAY: low to medium plasticity, red brown and grey, w~PL	█	E	1.5					
		1.9	Bore discontinued at 1.9m Target depth reached	█							

**RIG:** Hand Tools

**DRILLER:** SR/JBC

**LOGGED:** SR/JBC

**CASING:** Uncased

**TYPE OF BORING:** Diacore to 0.05m, Hand auger to 1.9m

**WATER OBSERVATIONS:** No free groundwater observed whilst augering

**REMARKS:** Location coordinates are in MGA94 Zone 56. Levels taken from dGPS

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 23.3 AHD  
**EASTING:** 332112  
**NORTHING:** 6248585  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH303  
**PROJECT No:** 84711.01  
**DATE:** 24/3/2023  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details		
				Type	Depth	Sample	Results & Comments				
23	0.1	CONCRETE (100mm)	△-△-△								
	0.2	FILL/Gravelly SAND: fine to coarse, dark grey, angular to sub-angular gravel, fine to coarse sand, moist, apparently dense	⊗	E	0.1						
	0.3			E	0.2						
	0.4	FILL/Gravelly SAND: fine to coarse, dark brown, fine to coarse sandstone gravel, trace clay, moist (crushed sandstone)	⊗	E	0.3						
	0.6			E	0.4						
	0.7	FILL/SAND: fine to coarse, dark brown, trace angular to sub-angular sandstone gravel, moist	⊗	E	0.6						
	1.0			E	0.7						
	1	1.0	FILL/CLAY: medium to high plasticity, dark brown, trace sand, ash inclusions, w~PL  Below 1.6m: becoming pale brown	⊗	E	1.0					
	1.1	E			1.1						
	1.5	E			1.5						
1.6	E	1.6									
1.7	E	1.7									
1.8				E	1.8						
1.9	1.9	CLAY: low to medium plasticity, brown and red-brown, w~PL, residual	⊗	E	1.9						
2	E			2.1							
2.1	2.3	Bore discontinued at 2.3m Target depth reached									
3											
20											
4											
19											

**RIG:** Hand Tools                      **DRILLER:** SR/JBC                      **LOGGED:** SR/JBC                      **CASING:** Uncased  
**TYPE OF BORING:** Diacore to 0.1m, Hand auger to 2.3m  
**WATER OBSERVATIONS:** No free groundwater observed whilst augering  
**REMARKS:** Location coordinates are in MGA94 Zone 56. Levels taken from dGPS

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	∇	Water seep
E	Environmental sample	☼	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 16.8 AHD  
**EASTING:** 332113  
**NORTHING:** 6248610  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH304  
**PROJECT No:** 84711.01  
**DATE:** 24/3/2023  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
	0.25	CONCRETE (250mm)	△△△△							
	0.35	FILL/GRAVEL: dark grey, fine to coarse, moist	⊠	F	0.25 0.35					
	0.45	Bore discontinued at 0.45m Refusal on inferred shale bedrock								
	1.0									
	2.0									
	3.0									
	4.0									

**RIG:** Hand Tools      **DRILLER:** SR/JBC      **LOGGED:** SR/JBC      **CASING:** Uncased  
**TYPE OF BORING:** Diacore to 0.25m, Hand auger to 0.45m  
**WATER OBSERVATIONS:** No free groundwater observed whilst augering  
**REMARKS:** Location coordinates are in MGA94 Zone 56. Borehole elevation estimated from survey plan

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 21.2 AHD  
**EASTING:** 332137  
**NORTHING:** 6248600  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH306  
**PROJECT No:** 84711.01  
**DATE:** 27/3/2023  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)					
				Type	Depth	Sample	Results & Comments		5	10	15	20		
21		CONCRETE (450mm)	△△△△△ △△△△△ △△△△△ △△△△△ △△△△△											
	0.45	CLAY: low to medium plasticity, orange-brown and pale grey, residual, w<PL (possibly fill)  Below 0.7m: becoming red-brown, trace sandstone gravel	/ / / / / / / / / / / / / / / / / / / /	E	0.5 0.6				5	10	15	20		
1	1.0	Bore discontinued at 1.0m Target depth reached		E	0.8 0.9									
20														
2														
19														
3														
18														
4														
17														

**RIG:** Hand Tools      **DRILLER:** SR/JBC      **LOGGED:** SR/JBC      **CASING:** Uncased  
**TYPE OF BORING:** Diacore to 0.45m, Hand auger to 1.0m  
**WATER OBSERVATIONS:** No free groundwater observed whilst augering  
**REMARKS:** Location coordinates are in MGA94 Zone 56. Borehole elevation estimated from survey plan

Sand Penetrometer AS1289.6.3.3  
 Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND		
A	Auger sample	PID Photo ionisation detector (ppm)
B	Bulk sample	PL(A) Point load axial test Is(50) (MPa)
BLK	Block sample	PL(D) Point load diametral test Is(50) (MPa)
C	Core drilling	pp Pocket penetrometer (kPa)
D	Disturbed sample	S Standard penetration test
E	Environmental sample	V Shear vane (kPa)
G	Gas sample	
P	Piston sample	
U	Tube sample (x mm dia.)	
W	Water sample	
>	Water seep	
≡	Water level	



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 24.2 AHD  
**EASTING:** 332157  
**NORTHING:** 6248594  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH307  
**PROJECT No:** 84711.01  
**DATE:** 27/3/2023  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)				
				Type	Depth	Sample	Results & Comments		5	10	15	20	
24	0.24	CONCRETE (240mm)	△△△△										
	0.3	FILL/Gravelly SAND: fine to coarse, pale brown, with angular to sub-angular gravel, rootlets, moist, apparently medium dense	⊗	E	0.25								
				E	0.3								
				E	0.4								
		FILL/CLAY: low to medium plasticity, dark grey and dark brown, trace angular to sub-angular gravel, rootlets, moist, apparently stiff	⊗		0.5								
	0.7	CLAY: low to medium plasticity, orange-brown and pale grey, trace rootlets, w<PL, stiff, residual	⊗		0.9								
	1.0			E	1.0								
23	1.3	Bore discontinued at 1.3m Target depth reached											
2													
22													
3													
21													
4													
20													

**RIG:** Hand Tools      **DRILLER:** SR/JBC      **LOGGED:** SR/JBC      **CASING:** Uncased  
**TYPE OF BORING:** Diacore to 0.24m, Hand auger to 1.3m  
**WATER OBSERVATIONS:** No free groundwater observed whilst augering  
**REMARKS:** Location coordinates are in MGA94 Zone 56. Levels taken from dGPS

Sand Penetrometer AS1289.6.3.3  
 Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	∇	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 23.8 AHD  
**EASTING:** 332154  
**NORTHING:** 6248605  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH308  
**PROJECT No:** 84711.01  
**DATE:** 27/3/2023  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing			Water	Dynamic Penetrometer Test (blows per 150mm)						
				Type	Depth	Sample		Results & Comments	5	10	15	20		
	0.12	CONCRETE (120mm)	△											
	0.2	FILL/SAND: fine to coarse, yellow-brown, moist, apparently medium dense	E		0.15									
	0.3	FILL/Gravelly SAND: fine to coarse, dark grey, with angular to sub-angular gravel, trace clay, moist	E		0.2									
	0.6	FILL/CLAY: low to medium plasticity, dark grey and dark brown, trace angular to sub-angular ironstone gravel, rootlets, w<PL	E		0.3									
	0.9	CLAY: low to medium plasticity, orange-brown and pale grey, trace rootlets, w<PL, firm to stiff, residual	E		0.4									
	1.0		E		0.5									
	1.2	Bore discontinued at 1.2m Target depth reached			0.9									
	1.2				1.0									

**RIG:** Hand Tools      **DRILLER:** SR/JBC      **LOGGED:** SR/JBC      **CASING:** Uncased  
**TYPE OF BORING:** Diacore to 0.12m, Hand auger to 1.2m

**WATER OBSERVATIONS:** No free groundwater observed whilst augering

**REMARKS:** Location coordinates are in MGA94 Zone 56. \*Field Replicate BD2/20230327 taken at 0.15-0.2m depth. Levels taken from dGPS

Sand Penetrometer AS1289.6.3.3  
 Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 23.0 AHD  
**EASTING:** 332148  
**NORTHING:** 6248619  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH309  
**PROJECT No:** 84711.01  
**DATE:** 24/3/2023  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details						
				Type	Depth	Sample	Results & Comments								
23 22 21 20 19	0.2	FILL/Silty CLAY: low to medium, dark brown, trace sand, rootlets, w<PL		E	0.0										
		FILL/SAND: fine to coarse, pale brown, with sandstone gravel, gravel (~30mm), trace rootlets, dry		E	0.1										
	0.8	FILL/CLAY: low to medium plasticity, yellow-brown and grey, trace rootlets, w<PL, apparently very stiff		E	0.4										
				E	0.5										
	1.3	CLAY: low to medium plasticity, yellow-brown and grey, trace rootlets, w<PL, apparently very stiff, residual		E	0.9										
				E	1.0										
	1.8	Bore discontinued at 1.8m Target depth reached		E	1.4										
				E	1.5										
	2														
	3														
4															

**RIG:** Hand Tools      **DRILLER:** SR/JBC      **LOGGED:** SR/JBC      **CASING:** Uncased  
**TYPE OF BORING:** Hand auger to 1.8m  
**WATER OBSERVATIONS:** No free groundwater observed whilst augering  
**REMARKS:** Location coordinates are in MGA94 Zone 56. Levels taken from dGPS

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 26.6 AHD  
**EASTING:** 332186  
**NORTHING:** 6248593  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH310  
**PROJECT No:** 84711.01  
**DATE:** 24/3/2023  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
26	0.0	FILL/SAND: very fine to medium, brown, trace clay, gravel, siltstone gravel, rootlets, wood chipping, dry, apparently dense	[Cross-hatch pattern]	E	0.0			5 10 15 20	
				0.1					
	0.4	FILL/Sandy CLAY: medium to high plasticity, brown and pale grey, very fine to medium sand, trace angular to sub-angular gravel, terracotta fragment, rootlets, w<PL	E	0.5					
	0.6	At 0.7m: trace slag inclusions							
1	0.9	Bore discontinued at 0.9m Practical refusal in apparently dense, gravelly fill							
26									
2									
24									
3									
23									
4									
22									

**RIG:** Hand Tools      **DRILLER:** SR/JBC      **LOGGED:** SR/JBC      **CASING:** Uncased

**TYPE OF BORING:** Hand auger to 0.9m

**WATER OBSERVATIONS:** No free groundwater observed whilst augering

**REMARKS:** Location coordinates are in MGA94 Zone 56. Levels taken from dGPS

- Sand Penetrometer AS1289.6.3.3
- Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	≧	Water seep
E	Environmental sample	≧	Water level
		PLD	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 27.6 AHD  
**EASTING:** 332203  
**NORTHING:** 6248598  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH311  
**PROJECT No:** 84711.01  
**DATE:** 24/3/2023  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
	0.5	FILL/SAND: very fine to fine, brown, with angular to sub-angular gravel, trace clay, plastic, glass fragments, terracotta fragments, rootlets, dry	[Cross-hatch pattern]	E*	0.0					
					0.1					
27	0.9	FILL/Clayey SAND: fine to coarse, brown and red-brown, low to medium plasticity clay, with fine to coarse gravel, trace rootlets, concrete fragments, dry, apparently dense	[Cross-hatch pattern]	E	0.6					
					0.7					
1	1	Bore discontinued at 0.9m Practical refusal in apparently dense, gravelly fill								
26	2									
25	3									
24	4									
23										

**RIG:** Hand Tools      **DRILLER:** SR/JBC      **LOGGED:** SR/JBC      **CASING:** Uncased

**TYPE OF BORING:** Hand auger to 0.9m

**WATER OBSERVATIONS:** No free groundwater observed whilst augering

**REMARKS:** Location coordinates are in MGA94 Zone 56. \*Field Replicate BD1/20230327 taken at 0-0.1m depth. Levels taken from dGPS

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PLD	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 25.4 AHD  
**EASTING:** 332169  
**NORTHING:** 6248605  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH312  
**PROJECT No:** 84711.01  
**DATE:** 24/3/2023  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
25	0.8	FILL/SAND: very fine to fine, dark brown, trace gravel, plastic, rootlets, dry  At 0.5m: trace clay	[Cross-hatched pattern]	E	0.0					
					0.1					
				E	0.5					
					0.6					
				E	0.9					
1	1.0	FILL/CLAY: medium to high plasticity, dark brown, trace sand, ironstone gravel, rootlets, w<PL, apparently very stiff	[Cross-hatched pattern]	E				1		
24	1.2	Bore discontinued at 1.2m Practical refusal in apparently very stiff fill								
2										
23										
3										
22										
4										
21										

**RIG:** Hand Tools      **DRILLER:** SR/JBC      **LOGGED:** SR/JBC      **CASING:** Uncased  
**TYPE OF BORING:** Hand auger to 1.2m  
**WATER OBSERVATIONS:** No free groundwater observed whilst augering  
**REMARKS:** Location coordinates are in MGA94 Zone 56. Levels taken from dGPS

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 28.4 AHD  
**EASTING:** 332209  
**NORTHING:** 6248608  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH313  
**PROJECT No:** 84711.01  
**DATE:** 27/3/2023  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
28 27	0.1	FILL/Silty SAND: fine to medium, dark brown, with angular to sub-angular gravel, rootlets, trace glass, moist	[Cross-hatched pattern]	E	0.1			1	[Penetrometer graph showing blow counts vs depth]
	E			0.2					
	0.5	FILL/CLAY: low to medium plasticity, dark brown, trace sand, angular to sub-angular gravel, w<PL		E	0.7				
	0.8			E	0.8				
	0.9	FILL/CLAY: medium to high plasticity, pale grey and orange-brown, trace rootlets, w<PL		E	1.2				
1.5	Bore discontinued at 1.5m Practical refusal in apparently very stiff fill								
2 26 3 25 4 24									

**RIG:** Hand Tools      **DRILLER:** SR/JBC      **LOGGED:** SR/JBC      **CASING:** Uncased

**TYPE OF BORING:** Hand auger to 1.5m

**WATER OBSERVATIONS:** No free groundwater observed whilst augering

**REMARKS:** Location coordinates are in MGA94 Zone 56. Levels taken from dGPS

- Sand Penetrometer AS1289.6.3.3
- Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PLD	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)





# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 21.0 AHD  
**EASTING:** 332159  
**NORTHING:** 6248625  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH315  
**PROJECT No:** 84711.01  
**DATE:** 27/3/2023  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
21		FILL/SAND: fine to coarse, pale brown, with angular to sub-angular gravel, sandstone gravel, trace glass, plastic, brick, wood, rootlets	[Cross-hatched pattern]	E	0.1			[Graph showing blow counts vs depth]	
					0.2				
		Below 0.4m: increasing inclusions of angular to sub-angular gravel and wood		E/D	0.5				
					0.6				
20	0.9	FILL/CLAY: low to medium plasticity, pale grey and orange-brown, trace sand, w<PL	[Cross-hatched pattern]						
				E	1.2				
	1.3	Bore discontinued at 1.3m Practical refusal in apparently very stiff fill			1.3				
19	2								
18	3								
17	4								

**RIG:** Hand Tools      **DRILLER:** SR/JBC      **LOGGED:** SR/JBC      **CASING:** Uncased

**TYPE OF BORING:** Hand auger to 1.3m

**WATER OBSERVATIONS:** No free groundwater observed whilst augering

**REMARKS:** Location coordinates are in MGA94 Zone 56. Levels taken from dGPS

- Sand Penetrometer AS1289.6.3.3
- Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PLD	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 21.2 AHD  
**EASTING:** 332193  
**NORTHING:** 6248628  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH316  
**PROJECT No:** 84711.01  
**DATE:** 27/3/2023  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)				
				Type	Depth	Sample	Results & Comments		5	10	15	20	
21	0.18	CONCRETE (180mm)	[Concrete Symbol]										
	0.3	GRAVEL (120 mm)	[Gravel Symbol]										
	0.6	FILL/CLAY: low to medium plasticity, pale brown and dark grey, with angular to sub-angular gravel, trace sand, slag, asphalt, w<PL	[Fill/Clay Symbol]	E/D	0.4 0.5								
	0.8	CLAY: low to medium plasticity, pale grey and orange-brown, w<PL, firm to stiff, residual	[Clay Symbol]	E	0.7 0.8								
	1	Bore discontinued at 0.8m Refusal on inferred shale bedrock											
20													
2													
19													
3													
18													
4													
17													

**RIG:** Hand Tools      **DRILLER:** SR/JBC      **LOGGED:** SR/JBC      **CASING:** Uncased  
**TYPE OF BORING:** Diacore to 0.18m, Hand auger to 0.8m  
**WATER OBSERVATIONS:** No free groundwater observed whilst augering  
**REMARKS:** Location coordinates are in MGA94 Zone 56. Borehole elevation estimated from survey plan

Sand Penetrometer AS1289.6.3.3  
 Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue and Cadigal Lane,  
 Camperdown

**SURFACE LEVEL:** 21.2 AHD  
**EASTING:** 332186  
**NORTHING:** 6248650  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH318  
**PROJECT No:** 84711.01  
**DATE:** 27/3/2023  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)				
				Type	Depth	Sample	Results & Comments		5	10	15	20	
21	0.19	CONCRETE (190mm)	[Concrete Symbol]										
	0.25	GRAVEL (60mm)	[Gravel Symbol]										
	0.4	FILL/CLAY: low to medium plasticity, dark brown and dark grey, trace angular to sub-angular gravel, sand, asphalt	[Fill/Clay Symbol]	E	0.3								
				E	0.4								
	0.55	Silty CLAY: pale grey, with extremely weathered shale, moist, residual Bore discontinued at 0.55m Refusal on inferred shale bedrock	[Silty Clay Symbol]	E	0.5								
1													
20													
2													
19													
3													
18													
4													
17													

**RIG:** Hand Tools      **DRILLER:** SR/JBC      **LOGGED:** SR/JBC      **CASING:** Uncased  
**TYPE OF BORING:** Diacore to 0.19m, Hand auger to 0.55m  
**WATER OBSERVATIONS:** No free groundwater observed whilst augering  
**REMARKS:** Location coordinates are in MGA94 Zone 56. Borehole elevation estimated from survey plan

Sand Penetrometer AS1289.6.3.3  
 Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	⊢	Water seep
E	Environmental sample	☞	Water level
		PLD	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 21.2 AHD  
**EASTING:** 332169  
**NORTHING:** 6248645  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH319  
**PROJECT No:** 84711.01  
**DATE:** 31/3/2023  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
21	0.15	CONCRETE (150mm)	[Concrete Symbol]							
	0.2	GRAVEL (50mm)	[Gravel Symbol]	E*	0.2					
		FILL/CLAY: low to medium plasticity, brown and pale grey, trace angular to sub-angular gravel, w<PL	[Fill/Clay Symbol]		0.3					
	0.45	CLAY: low to medium plasticity, pale grey and orange-brown, w<PL, residual	[Clay Symbol]							
	0.55	Bore discontinued at 0.55m Refusal on inferred shale bedrock								
1										
20										
2										
19										
3										
18										
4										
17										

**RIG:** Hand Tools      **DRILLER:** SR/JBC      **LOGGED:** SR/JBC      **CASING:** Uncased

**TYPE OF BORING:** Diacore to 0.15m, Hand auger to 0.55m

**WATER OBSERVATIONS:** No free groundwater observed whilst augering

**REMARKS:** Location coordinates are in MGA94 Zone 56. Borehole elevation estimated from survey plan. \*Field Replicate BD1/20230331 taken at 0.2-0.3m depth.

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 23.0 AHD  
**EASTING:** 332097  
**NORTHING:** 6248601  
**DIP/AZIMUTH:** 90°/-

**BORE No:** BH302  
**PROJECT No:** 84711.01  
**DATE:** 17/3/2023  
**SHEET 1 OF 3**

RL	Depth (m)	Description of Strata	Degree of Weathering					Graphic Log	Rock Strength					Water	Fracture Spacing (m)	Discontinuities		Sampling & In Situ Testing					
			EW	HW	MW	SW	FS		FR	Ex Low	Very Low	Low	Medium			High	Very High	Ex High	B - Bedding	J - Joint	S - Shear	F - Fault	Type
26	0.1	ASPHALTIC CONCRETE: fine to medium laterite aggregate, grey, 5-10% voids																					
	0.2	FILL/Sandy GRAVEL: fine to medium gravel, brown, fine to coarse sand, trace rootlets, moist																					
	0.3		CONCRETE: 100mm slab, fine to medium laterite aggregate, <2% voids																				
	1.0	FILL/Sandy GRAVEL: fine to coarse gravel, dark grey and brown, fine to coarse sand, with poorly graded ripped sandstone and clay, moist																					
	1.7	CLAY Cl: medium plasticity, dark grey mottled brown, with fine sand, trace ironstone gravel, w<PL, stiff, residual																					1.5,6 N = 11
	2.0	Silty CLAY Cl: medium plasticity, dark grey mottled red-brown, w<PL, stiff to very stiff, residual																					
	2.7		Below 2.7m: with ironstone gravel																				
	3.0																						
	4.0																						8.7,7 N = 14

**RIG:** Geo 205      **DRILLER:** Ground Test      **LOGGED:** AM      **CASING:** HWT to 5.5m  
**TYPE OF BORING:** Diacore to 0.3m, Solid Flight Auger (TC-bit) to 5.5m, Rotary (water) to 7.15m, NMLC Coring to 12.05m  
**WATER OBSERVATIONS:** No free groundwater observed whilst augering. Obscured by drilling fluid when rotary or core drilling.  
**REMARKS:** Location coordinates are in MGA94 Zone 56. \*Field Replicate BD1 taken at 0.5-0.6m depth. Levels taken from dGPS

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PL(D)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)





# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 23.0 AHD  
**EASTING:** 332097  
**NORTHING:** 6248601  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH302  
**PROJECT No:** 84711.01  
**DATE:** 17/3/2023  
**SHEET 3 OF 3**

RL	Depth (m)	Description of Strata	Degree of Weathering					Graphic Log	Rock Strength					Water	Fracture Spacing (m)	Discontinuities		Sampling & In Situ Testing													
			EW	HW	MW	SW	FS		FR	Ex Low	Very Low	Low	Medium			High	Very High	Ex High	0.01	0.05	0.10	0.50	1.00	B - Bedding	J - Joint	S - Shear	F - Fault	Type	Core Rec. %	RQD %	Test Results & Comments
11		LAMINITE: 10-15% fine grained sandstone, dark grey, medium to high strength, fresh, slightly fractured, Ashfield Shale (continued)																													PL(A) = 1.3
	11																							C	100	80					
	12																														PL(A) = 1.4
	12.05	Bore discontinued at 12.05m Target depth reached																													
	13																														
	14																														

**RIG:** Geo 205      **DRILLER:** Ground Test      **LOGGED:** AM      **CASING:** HWT to 5.5m  
**TYPE OF BORING:** Diacore to 0.3m, Solid Flight Auger (TC-bit) to 5.5m, Rotary (water) to 7.15m, NMLC Coring to 12.05m  
**WATER OBSERVATIONS:** No free groundwater observed whilst augering. Obscured by drilling fluid when rotary or core drilling.  
**REMARKS:** Location coordinates are in MGA94 Zone 56. \*Field Replicate BD1 taken at 0.5-0.6m depth. Levels taken from dGPS

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	≻	Water seep
E	Environmental sample	≻	Water level
		PLD	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 16.8 AHD  
**EASTING:** 332123  
**NORTHING:** 6248582  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH305  
**PROJECT No:** 84711.01  
**DATE:** 27/3/2023  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Degree of Weathering					Graphic Log	Rock Strength					Water	Fracture Spacing (m)	Discontinuities		Sampling & In Situ Testing																	
			EW	HW	MW	SW	FS		FR	Ex Low	Very Low	Low	Medium			High	Very High	Ex High	0.01	0.05	0.10	0.50	1.00	B - Bedding	J - Joint	S - Shear	F - Fault	Type	Core Rec. %	RQD %	Test Results & Comments				
	0.25	CONCRETE (250mm)																																	
	0.4	FILL/GRAVEL: dark grey, fine to coarse, moist																																	
	0.57	Silty CLAY: pale grey, low to medium plasticity, extremely weathered Ashfield Shale																																	
	1.0	LAMINITE: pale grey, with 0-20% fine sandstone laminations, dipping 0-10°, low strength, slightly weathered, highly fractured, Ashfield Shale																																	
	1.36	below 1.36m: medium strength																																	
	2.0																																		
	2.98	Bore discontinued at 2.98m Target depth reached																																	
	3.0																																		
	4.0																																		
	12.0																																		

**RIG:** Hand tools and Proline      **DRILLER:** Tightsite      **LOGGED:** AN / SR / JBC      **CASING:** Uncased  
**TYPE OF BORING:** Diacore to 0.25m, Hand auger to 0.57m, NMLC Coring to 2.98m  
**WATER OBSERVATIONS:** No free groundwater observed whilst augering. Obscured due to drilling fluid.  
**REMARKS:** Location coordinates are in MGA94 Zone 56. Borehole elevation estimated from survey plan

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PLD	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 21.2 AHD  
**EASTING:** 332182  
**NORTHING:** 6248637  
**DIP/AZIMUTH:** 90°/-

**BORE No:** BH317  
**PROJECT No:** 84711.01  
**DATE:** 27/3/2023  
**SHEET 1 OF 2**

RL	Depth (m)	Description of Strata	Degree of Weathering EW HW MW SW FS FR	Graphic Log	Rock Strength						Water	Fracture Spacing (m) 0.01 0.05 0.10 0.50 1.00	Discontinuities B - Bedding J - Joint S - Shear F - Fault		Sampling & In Situ Testing					
					Ex Low	Very Low	Low	Medium	High	Very High			Ex High	Type	Core Rec. %	RQD %	Test Results & Comments			
	0.25	CONCRETE (250mm)																		
	0.35	GRAVEL: fine to coarse, dark grey, with fine to coarse sand																		
	0.55	FILL/CLAY: medium to high plasticity, pale grey, with extremely weathered shale, w<PL CONCRETE: aggregate 5-15mm thick, no reinforcement																		
	1.29	CLAY, CH: high plasticity, pale grey, w>PL, hard, residual																		0.55 - 1.16m: core loss
	1.64	LAMINITE: red and orange, laminations dipping 0-10°, very low strength, extremely weathered, Ashfield Shale  Below 2.00m: dark grey, slightly weathered, fragmented																		PL(A) = 0.07
	3.04	Below 2.78m: red and orange, moderately weathered, low strength, highly fractured  LAMINITE: pale grey-fine, laminated, 0-20% grained sandstone laminations, laminations dipping 0-10°, fresh, medium to high strength, fractured, Ashfield Shale																		PL(A) = 0.18
																				PL(A) = 0.38
																				PL(A) = 0.59

**RIG:** Hand tools and Proline      **DRILLER:** Tightsite      **LOGGED:** AN / SR / JBC      **CASING:** Uncased  
**TYPE OF BORING:** Diacore to 0.25m, Hand auger to 0.55m, NMLC Coring to 6.22m  
**WATER OBSERVATIONS:** No free groundwater observed whilst augering. Obscured by drilling fluid when rotary or core drilling.  
**REMARKS:** Location coordinates are in MGA94 Zone 56. Hand auger refusal on possible concrete footing at 0.55m. Borehole elevation estimated from survey plan

A Auger sample	G Gas sample	PLD Photo ionisation detector (ppm)
B Bulk sample	P Piston sample	PL(A) Point load axial test Is(50) (MPa)
BLK Block sample	U Tube sample (x mm dia.)	PL(D) Point load diametral test Is(50) (MPa)
C Core drilling	W Water sample	pp Pocket penetrometer (kPa)
D Disturbed sample	W Water seep	S Standard penetration test
E Environmental sample	W Water level	V Shear vane (kPa)



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerator  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 21.2 AHD  
**EASTING:** 332182  
**NORTHING:** 6248637  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH317  
**PROJECT No:** 84711.01  
**DATE:** 27/3/2023  
**SHEET 2 OF 2**

RL	Depth (m)	Description of Strata	Degree of Weathering				Graphic Log	Rock Strength					Water	Fracture Spacing (m)	Discontinuities		Sampling & In Situ Testing					
			EW	HW	MW	SW		FS	FR	Ex Low	Very Low	Low			Medium	High	Very High	Ex High	B - Bedding	J - Joint	S - Shear	F - Fault
	5.6	LAMINITE: pale grey-fine, laminated, 0-20% grained sandstone laminations, laminations dipping 0-10°, fresh, medium to high strength, fractured, Ashfield Shale (continued) Below 5.06m: highly fractured												0.01 0.05 0.10 0.50 1.00					C	100	61	
	6.22	Bore discontinued at 6.22m Target depth reached													5.81m: J30°, cln, st, sm 5.82m: J40°, cln, pl, sm 5.83m: J70°, cln, pl, sm 6.03m: B5°(x3), cln, st, sm (6.03-6.15m) 6.19m: J25°, cln, cu, sm			C	100	0	PL(A) = 0.98 PL(A) = 1.6 PL(A) = 1.1	
	6																					
	7																					
	8																					
	9																					
	12																					

**RIG:** Hand tools and Proline      **DRILLER:** Tightsite      **LOGGED:** AN / SR / JBC      **CASING:** Uncased  
**TYPE OF BORING:** Diacore to 0.25m, Hand auger to 0.55m, NMLC Coring to 6.22m  
**WATER OBSERVATIONS:** No free groundwater observed whilst augering. Obscured by drilling fluid when rotary or core drilling.  
**REMARKS:** Location coordinates are in MGA94 Zone 56. Hand auger refusal on possible concrete footing at 0.55m. Borehole elevation estimated from survey plan

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	▷	Water seep
E	Environmental sample	≡	Water level
		PLD	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerated Complex  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 24.0 AHD  
**EASTING:** 332135.9  
**NORTHING:** 6248576.1  
**DIP/AZIMUTH:** 90°/-

**BORE No:** BH1  
**PROJECT No:** 84711.01  
**DATE:** 20/10/2022  
**SHEET 1 OF 2**

RL	Depth (m)	Description of Strata	Degree of Weathering				Graphic Log	Rock Strength					Water	Fracture Spacing (m)	Discontinuities		Sampling & In Situ Testing																	
			EW	HW	SW	FR		Ex Low	Very Low	Low	Medium	High			Very High	Ex High	B - Bedding	J - Joint	S - Shear	F - Fault	Type	Core Rec. %	RQD %	Test Results & Comments										
24	0.1	FILL/ORGANIC MATTER: grey, decomposed organic matter with wood chips, garden bed																																
	0.5	FILL/Sandy CLAY: low plasticity, grey-brown, trace ripped sandstone gravel, moist, apparently firm																																
	1	FILL/SAND: fine to medium, pale grey/brown, moist, apparently very loose to loose																																0.0,1 N = 1
	2.4	CLAY CH: high plasticity, pale grey, trace iron indurated sandstone gravel, w>PL, firm to stiff then very stiff, residual																																1.3,6 N = 9
	4.8	CLAY CI: medium plasticity, pale grey and red brown, w>PL. very stiff then hard, residual																																9.11,16 N = 27
	6.5	LAMINITE: grey, very low strength, Ashfield Shale																																3.12,19 N = 31
	7.15	LAMINITE: pale grey and grey, laminated, 40% fine grained sandstone laminations, medium then high strength, slightly weathered then fresh, slightly fractured and unbroken, Ashfield Shale																																25/100 refusal PL(A) = 0.4
	8																																	7.68m: J30°, pl, sm, cln 7.75m: J45°, pl, ro, fe 8.08m: B0°, sm, fe, cly
	9																																	8.96m: B0°, sm, cly

**RIG:** Comacchio Geo 305      **DRILLER:** Matrix Drilling      **LOGGED:** SI      **CASING:** HW to 7.1m  
**TYPE OF BORING:** Solid Flight Auger (TC-bit) to 7.1m, NMLC coring to 12.0m  
**WATER OBSERVATIONS:** No free groundwater observed whilst augering. Obscured by drilling fluid when coring  
**REMARKS:** Location coordinates are in MGA94 Zone 56. BD120221020

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	≡	Water level
		PLD	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerated Complex  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 24.0 AHD  
**EASTING:** 332135.9  
**NORTHING:** 6248576.1  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH1  
**PROJECT No:** 84711.01  
**DATE:** 20/10/2022  
**SHEET 2 OF 2**

RL	Depth (m)	Description of Strata	Degree of Weathering				Graphic Log	Rock Strength					Water	Fracture Spacing (m)	Discontinuities		Sampling & In Situ Testing							
			EW	HW	MW	SW		FS	FR	Ex Low	Very Low	Low			Medium	High	Very High	Ex High	B - Bedding	J - Joint	S - Shear	F - Fault	Type	Core Rec. %
11.5	11	LAMINITE: pale grey and grey, laminated, 40% fine grained sandstone laminations, medium then high strength, slightly weathered then fresh, slightly fractured and unbroken, Ashfield Shale (continued)													10.0-10.12m: J85-90°, pl, ro, cln					C	100	100	PL(A) = 1.5  PL(A) = 1.8	
12.0	12.0	Bore discontinued at 12.0m																						
13.0	13																							
14.0	14																							
15.0	15																							
16.0	16																							
17.0	17																							
18.0	18																							
19.0	19																							

**RIG:** Comacchio Geo 305      **DRILLER:** Matrix Drilling      **LOGGED:** SI      **CASING:** HW to 7.1m  
**TYPE OF BORING:** Solid Flight Auger (TC-bit) to 7.1m , NMLC coring to 12.0m  
**WATER OBSERVATIONS:** No free groundwater observed whilst augering. Obscured by drilling fluid when coring  
**REMARKS:** Location coordinates are in MGA94 Zone 56. BD120221020

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	▷	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerated Complex  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 24.0 AHD  
**EASTING:** 332188.7  
**NORTHING:** 6248663  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH3  
**PROJECT No:** 84711.01  
**DATE:** 20/10/2022  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Degree of Weathering					Graphic Log	Rock Strength					Water	Fracture Spacing (m)	Discontinuities				Sampling & In Situ Testing								
			EW	HW	MW	SW	FS		Ex Low	Very Low	Low	Medium	High			Very High	Ex High	0.01	0.05	0.10	0.50	1.00	B - Bedding	J - Joint	S - Shear	F - Fault	Type	Core Rec. %
24	0.03	ASPHALTIC CONCRETE																										
		FILL/Gravelly SAND: medium to coarse, pale grey-brown, trace roadbase and ripped sandstone gravel, moist, apparently medium dense																						A				
	1.1	CLAY CH: high plasticity, pale grey and brown, trace iron indurated sandstone, moist, firm to stiff, residual																						A			2,3,4 N = 7	
	2.4	CLAY CI: medium plasticity, pale grey and red-brown, trace ironstone gravel, moist, very stiff then hard, residual																						A				
	2.4	CLAY CI: medium plasticity, pale grey and red-brown, trace ironstone gravel, moist, very stiff then hard, residual																						S			4,9,14 N = 23	
	5.8	SHALE: pale grey-brown, very low strength, extremely to highly weathered, Ashfield Shale																						S			6,15,21 N = 36	
	6.6	LAMINITE: grey and brown, laminated, 10% fine sandstone laminations, low then medium to high strength, slightly weathered, slightly fractured, Ashfield Shale																		6.16m: B0°, fe, fg 10mm 6.3m: Cs 50mm 6.38m: B0°, fg 15mm 6.5m: J20°, pl, ro, fe					C	100	40	PL(A) = 0.2
	7.0	LAMINITE: grey and brown, laminated, 10% fine sandstone laminations, low then medium to high strength, slightly weathered, slightly fractured, Ashfield Shale																		6.8m: B0°, cly, Ds 50mm 7.02m: B0°, fe 7.15m: B10°, fe 7.23m: B0°, sm, fe, cly 7.33m: J70°, un, ro, cln 7.45m: J45°, un, ro, fe 7.75m: B0°, fe, cly 7.9m: J45°, pl, sm, cln					C	96	92	PL(A) = 0.4
	8.4																			8.32m: CORE LOSS: 80mm								PL(A) = 1.6
	9.0	Bore discontinued at 9.0m																										

**RIG:** Comacchio Geo 305      **DRILLER:** Matrix Drilling      **LOGGED:** SI      **CASING:** HW to 6.0m  
**TYPE OF BORING:** SFA (TC-bit) to 6.0m, NMLC coring to 9.0m  
**WATER OBSERVATIONS:** No free groundwater observed whilst augering. Obscured by drilling fluid when coring  
**REMARKS:** Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PLD	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerated Complex  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 23.3 AHD  
**EASTING:** 332110.3  
**NORTHING:** 6248593.7  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH2  
**PROJECT No:** 84711.01  
**DATE:** 13/10/2022  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
23 22 21 20 19 18 17 16 15 14	0.1	FILL/ASPHALTIC CONCRETE		D	0.1					
		FILL/Sandy GRAVEL: medium to coarse, pale grey, fine to coarse sand, dry		D	0.2					
				D	0.5					
		Between 1.0-1.13m: with concrete fragments		D*	1.0					
				S	1.45		1,1,2 N = 3			
				D	1.5					
	1.9	Silty CLAY CI-CH: medium to high plasticity, red mottled brown, w<PL, stiff to very stiff, residual		D	2.0					
		Below 2.5m: becoming dark red mottled grey		D	2.5					
				S	2.95		3,4,6 N = 10			
				S	4.0		4,6,14 N = 20			
	Below 4.0m: w<PL to w~PL	S	4.45							
	Below 4.4m: becoming very stiff to hard, with extremely weathered shale	S	5.5		7,18,24 N = 42					
	Below 5.5m: hard	S	5.95							
	5.95	Bore discontinued at 5.95m Limit of investigation								

**RIG:** Scout 4      **DRILLER:** Ground Test      **LOGGED:** JOR      **CASING:** Uncased  
**TYPE OF BORING:** Solid Flight Auger to 5.95m  
**WATER OBSERVATIONS:** No free groundwater observed  
**REMARKS:** Location coordinates are in MGA94 Zone 56. \*Field Replicate taken at 1.0m depth

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PLD	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# BOREHOLE LOG

**CLIENT:** FDC Construction (NSW) Pty Ltd  
**PROJECT:** Sydney Biomedical Accelerated Complex  
**LOCATION:** Western Avenue and Cadigal Lane, Camperdown

**SURFACE LEVEL:** 20.2 AHD  
**EASTING:** 332115.5  
**NORTHING:** 6248619.4  
**DIP/AZIMUTH:** 90°/--

**BORE No:** BH4  
**PROJECT No:** 84711.01  
**DATE:** 27/10/2022  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing			Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample		
20	0.13	CONCRETE SLAB: 5-20mm thick aggregate	△△△△					
	0.25	FILL/Sandy GRAVEL: pale brown, fine to medium sand, igneous	XXXX	A	0.15			
		FILL/GRAVEL and COBBLES: coarse, dark grey, sub-angular, igneous	XXXX		0.25			
	0.55	CLAY CH: high plasticity, pale grey mottled red, trace igneous gravel, w>PL, firm (can be moulded by finger pressure), residual	XXXX	A	0.55			
1	0.65				0.65			
	1.0	Below 0.9m: red, hard Bore discontinued at 1.0m Auger Refusal on hard, residual clay	XXXX	A	0.9			
19					1.0			
2								
18								
3								
17								
4								
16								

**RIG:** Hand Tools      **DRILLER:** AN      **LOGGED:** AN      **CASING:** Uncased  
**TYPE OF BORING:** Saw cut to 0.13m, Hand Auger and Non-Destructive Digging to 1.0m  
**WATER OBSERVATIONS:** No free ground water observed during drilling.  
**REMARKS:** Location coordinates are in MGA94 Zone 56.

Sand Penetrometer AS1289.6.3.3  
 Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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## **Appendix E**

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### Remediation Options Assessment and Evaluation

## Appendix E

### Remediation Options and Evaluation

#### SBA Site (former Bosch), Western Av and Cadigal L, Camperdown

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#### E1.0 Introduction

The following key guidelines and technical reports were consulted in the preparation of this remediation options assessment:

- NEPC National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM] (NEPC, 2013); and
- CRC CARE Remediation Action Plan: Development - Guideline on Performing Remediation Options Assessment (CRC CARE, 2019a).

The first stage of developing a remediation strategy is to establish clear and measurable remediation objectives and remediation criteria (clean-up levels). These will form the requirements against which remediation options are assessed.

The next stage of the remediation options assessment is to select technology and management options, or combinations of options, that have the potential to reduce contaminant concentrations and / or apply management controls as necessary so that the remediation objectives are achieved and no unacceptable risk is posed by the contamination in the context of the current and proposed site use. Where several viable options have been identified, an assessment of each of the options will be required to determine which option will most adequately and sustainably meet the remediation objectives (CRC CARE, 2019a).

The remediation objectives are to:

- Address potentially unacceptable risks to relevant environmental values from contamination (refer to the CSM in Section 7); and
- Render the site suitable, from a contamination perspective, for the proposed development (refer to Section 2).

#### E2.0 Hierarchy of Remediation Options

NEPC (2013) stipulates the preferred hierarchy of options for site clean-up (remediation) and/or management which is outlined as follows:

- On-site treatment of the contamination so that it is destroyed, or the associated risk is reduced to an acceptable level; and
- Off-site treatment of excavated soil, so that the contamination is destroyed, or the associated risk is reduced to an acceptable level, after which soil is returned to the site;

or, if these two options are not practicable;

- Consolidation and isolation of the soil on site by containment with a properly designed barrier; and
- Removal of contaminated material to an approved site or facility, followed, where necessary, by replacement with appropriate material;

or,

- Where the assessment indicates remediation would have no net environmental benefit or would have a net adverse environmental effect, implementation of an appropriate management strategy.

When deciding which option to choose, the sustainability (environmental, economic and social) of each option should be considered, in terms of achieving an appropriate balance between the benefits and effects of undertaking the option. In cases where no readily available or economically feasible method is available for remediation, it may be possible to adopt appropriate regulatory controls or develop other forms of remediation (NEPC, 2013).

## **E3.0 Remediation Options Assessment**

### **E3.1 Introduction**

The following issues have been identified at the site which require remediation:

- Asbestos-impacted fill; and
- Fill impacted by metal and PAH exceeding site environmental investigation levels (EILs).

DP notes that the delineation of asbestos contaminated fill and the data gap due to material yet to be investigated below building footprints and previously inaccessible areas may impact the remediation strategy if large quantities of material are encountered and which require remediation. The options assessment will therefore be revisited as part of the update of the RAP following the data gap investigation.

### **E3.2 Remediation Options**

Given the straightforward nature of the contamination issues at the site and the necessary earthworks (final landform) as part of the proposed development, only four options for the soil contamination have been considered, as follows:

- Do nothing;
- Excavation and offsite disposal;
- On-site management (cap and contain); and
- Relocation of material at depth or below hardstand (for material exceeding site EILs).

The following key guidelines have therefore been consulted:

- CRC CARE Technology Guide: Soil - Excavation (CRC CARE, 2019b);
- CRC CARE Technology Guide: Soil - Containment (CRC CARE, 2019c);
- WA DoH Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (WA DoH, 2021); and
- WorkCover NSW Managing Asbestos in or on Soil (WorkCover NSW, 2014).

### **E3.3 Do Nothing**

No action means that no response is considered necessary to remediate the site as there is not considered to be a risk to the environment or the community from the contamination identified.

### **E3.4 Off-Site Disposal**

Off-site disposal is technically a straightforward option for impacted soil and could be completed in a relatively short time scale prior to development of the site. The option would remove from the site maintenance and risk legacy associated with impacted soils. However, soil removed from site may need to be replaced with imported soils / aggregates resulting in increased vehicle movements.

This option is viable for all contaminated and surplus soils at the site, particularly where there is a surplus of soils requiring to be removed from the site.

If the contaminated material is found to be extensive and high volumes of material require off-site disposal, this option may become expensive and less beneficial for the client.

### **E3.5 Consolidation and Isolation**

Consolidation and isolation (capping and containment) involves the capping of material with contaminant concentrations above the adopted RAC, either *in-situ* or in a specific location following excavation. Capping comprises covering with a geotextile fabric, an engineered capping layer and/or burial at a specified depth.

Benefits of this remediation option include:

- Potentially minimal disturbance of soil;
- No movement of contaminated soils on public roads;
- A more sustainable solution; and
- Potentially lower cost and time delays, and greater confidence of outcomes.

Constraints associated with the option include:

- Requires available space (vertically and laterally) within the site to accommodate the impacted soils;

- On-going management responsibility of the long-term environmental management plan (LTEMP);
- Recording of the LTEMP on the S10.7 certificate (or similar recording means) will be necessary which may have implications for property value; and
- Contaminants which leach would require a base liner or other method to managing the leaching.

It is noted that this approach may be preferable to avoid excavation and disposal of large quantities of waste which otherwise may not be able to be effectively treated on site due to site constraints and the type of contamination. This option is also more generally suited to non-volatile or non-mobile contaminants.

### **E3.6 Relocation and Placement at Depth or Below Hardstand**

Relocation of material with EIL exceedances to an area of the site below hardstand or at depth below the landscaping areas of the site is recommended. Given the high proportion of the site, which is covered by hardstand, this strategy will be relatively straightforward.

### **E4.0 Summary of Preferred Remediation Strategy**

Based on the outcome of the options assessment, and on the currently available data, the following preferred remediation strategy is proposed, noting again that the preference may change subject to the outcomes of the data gap investigation:

- Off-site disposal of contaminated material where surplus to the project needs, and where the volume is manageable;
- For contaminated soils outside of the proposed basement footprint, and / or where the impacted volume makes off-site disposal financially unviable, and where there is available space within the site, the cap and contain option will be utilised; and
- Soils with contaminants only exceeding the EILs, and outside of the basement footprint, will be relocated to below hardstand or at depth.

Only the soils outside the basement footprint and on-site boundaries will potentially remain and, if the soils contain elevated concentrations of contaminants, a risk assessment may be recommended (following the data gap investigation) to evaluate whether the soils will require remediation or whether the associated risks are acceptable.

The details of each preferred remediation strategy will be included in the update to the RAP, following completion of the data gap investigation.

## E5.0 References

CRC CARE. (2019a). *Remediation Action Plan: Development - Guideline on Performing Remediation Options Assessment*. National Remediation Framework: CRC for Contamination Assessment and Remediation of the Environment.

CRC CARE. (2019b). *Technology Guide: Soil - Excavation*. National Remediation Framework: CRC for Contamination Assessment and Remediation of the Environment.

CRC CARE. (2019c). *Technology Guide: Soil - Containment*. National Remediation Framework: CRC for Contamination Assessment and Remediation of the Environment.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

WA DoH. (2021). *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*. WA Department of Health.

WorkCover NSW. (2014). *Managing Asbestos in or on Soil*. March 2014: WorkCover NSW, NSW Government.

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## **Appendix F**

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Site Assessment Criteria

## Appendix F

### Site Assessment Criteria (RAP)

#### SBA Site (former Bosch), Western Av and Cadigal L, Camperdown

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## F1.0 Introduction

### F1.1 Guidelines

The following key guidelines were consulted for deriving the site assessment criteria (SAC):

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013)* [NEPM] (NEPC, 2013).
- CRC CARE *Health screening levels for petroleum hydrocarbons in soil and groundwater* (CRC CARE, 2011).

### F1.2 General

The SAC applied to any contingency or unexpected finds scenarios during site remediation are informed by the CSM which identified human and environmental receptors to potential contamination at the site. Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising primarily the investigation and screening levels of Schedule B1 of NEPC (2013).

The following inputs are relevant to the selection and/or derivation of the SAC:

- Land use: tertiary education.
- Soil type: clay (based on predominate soil type encountered).

It is noted that a university does not directly correspond to any of the generic land-uses outlined in NEPC (2013), and is otherwise considered distinct to that of a secondary school, i.e., length of attendance, ages of the site users. It is considered that the longest exposure duration for a site user would reasonably be for an employee of the university (i.e., up to the assumed 30 year duration for other generic land uses). Therefore, it is considered that a commercial worker land-use can be adopted for initial Tier 1 criteria. This corresponds to land use category 'D', commercial / industrial in NEPC (2013).

## F2.0 Soils

### F2.1 Health Investigation and Screening Levels

The generic health investigation levels (HIL) and health screening levels (HSL) are considered to be appropriate for the assessment of human health risk via all relevant pathways of exposure associated with contamination at the site. The adopted soil HIL and HSL for the contaminants of concern are in Table 1 and Table 2.

**Table 1: Health Investigation Levels (mg/kg)**

<b>Contaminant</b>	<b>HIL-D</b>
<b>Metals</b>	
Arsenic	3000
Cadmium	900
Chromium (VI)	3600
Copper	240 000
Lead	1500
Mercury (inorganic)	730
Nickel	6000
Zinc	400 000
<b>PAH</b>	
B(a)P TEQ	40
Total PAH	4000
<b>Phenols</b>	
Phenol	240 000
Pentachlorophenol	660
<b>OCP</b>	
DDT+DDE+DDD	3600
Aldrin and dieldrin	45
Chlordane	530
Endosulfan	2000
Endrin	100
Heptachlor	50
HCB	80
Methoxychlor	2500
<b>OPP</b>	
Chlorpyrifos	2000
<b>PCB</b>	
PCB	7

**Table 2: Health Screening Levels (mg/kg)**

Contaminant	HSL-D
<b>CLAY</b>	<b>0 m to &lt;1 m</b>
Benzene	4
Toluene	NL
Ethylbenzene	NL
Xylenes	NL
Naphthalene	NL
TRH F1	310
TRH F2	NL

Notes: TRH F1 is TRH C<sub>6</sub>-C<sub>10</sub> minus BTEX

TRH F2 is TRH >C<sub>10</sub>-C<sub>16</sub> minus naphthalene

The soil saturation concentration (Csat) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds Csat, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'

**Table 3: Health Screening Levels (mg/kg)**

Contaminant	DC HSL-D	DC HSL-IMW
Benzene	430	1100
Toluene	99 000	120 000
Ethylbenzene	27 000	85 000
Xylenes	81 000	130 000
Naphthalene	11 000	29 000
TRH F1	26 000	82 000
TRH F2	20 000	62 000
TRH F3	27 000	85 000
TRH F4	38 000	120 000

Notes: TRH F1 is TRH C<sub>6</sub>-C<sub>10</sub> minus BTEX

TRH F2 is TRH >C<sub>10</sub>-C<sub>16</sub> minus naphthalene

The soil saturation concentration (Csat) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds Csat, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'

## F2.2 Asbestos in Soil

The SAC applied to any contingency or unexpected finds scenarios during site remediation for asbestos in soil are based on likely exposure levels for different scenarios published in NEPC (2013) for the following forms of asbestos:

- Bonded asbestos containing material (ACM); and
- Fibrous asbestos and asbestos fines (FA and AF).

The HSL are in Table 4.

**Table 4: Health Screening Levels for Asbestos**

Form of Asbestos	HSL-D
ACM	0.05%
FA and AF	0.001%
FA and AF and ACM	No visible asbestos for surface soil *

Notes: Surface soils defined as top 10 cm.

\* Based on site observations at the sampling points and the analytical results of surface samples.

## F2.3 Ecological Investigation Levels

The SAC applied to any contingency or unexpected finds scenarios during site remediation will use ecological investigation levels (EIL) and added contaminant limits (ACL), where appropriate, as per NEPC (2013) for arsenic, copper, chromium (III), nickel, lead, zinc, DDT and naphthalene. The adopted EIL, derived using the interactive (excel) calculation spreadsheet on the NEPM toolbox website are shown in Table 6, with inputs into their derivation shown in Table 5.

**Table 5: Inputs to the Derivation of the Ecological Investigation Levels**

Variable	Input	Rationale
Age of contaminants	"Aged" (>2 years)	Site history assessment
pH	4.5	ASRIS CSIRO mapping information <sup>1</sup> (local average values for 5-15cm depth)
CEC	10 cmol <sub>e</sub> /kg	
Clay content	50 %	Predominately clayey soils identified during field investigations, 50% adopted to account for range of clay mixtures and clayey soils e.g., sandy clays / clayey sand
Traffic volumes	high	Site locality
State / Territory	NSW	

<sup>1</sup> Australian Soil Resource Information System mapping accessible via <https://www.asris.csiro.au>

**Table 6: Ecological Investigation Levels (mg/kg)**

<b>Contaminant</b>	<b>EIL-D</b>
<b>Metals</b>	
Arsenic	160
Copper	110
Nickel	290
Chromium III	1100
Lead	1800
Zinc	320
<b>PAH</b>	
Naphthalene	370
<b>OCP</b>	
DDT	640

Notes: EIL-AES area of ecological significance  
 EIL-A-B-C urban residential and public open space

## F2.4 Ecological Screening Levels

The SAC applied to any contingency or unexpected finds scenarios during site remediation will use ecological screening levels (ESL) to assess the risk of selected petroleum hydrocarbon compounds, BTEX and benzo(a)pyrene to terrestrial ecosystems. The adopted ESL are shown in Table 7.

**Table 7: Ecological Screening Levels (mg/kg)**

<b>Contaminant</b>	<b>Soil Type</b>	<b>ESL-D</b>
Benzene	Fine	95
Toluene	Fine	135
Ethylbenzene	Fine	185
Xylenes	Fine	95
TRH F1	Coarse/ Fine	215*
TRH F2	Coarse/ Fine	170*
TRH F3	Fine	2500
TRH F4	Fine	6600
B(a)P	Fine	1.4

Notes: ESL are of low reliability except where indicated by \* which indicates that the ESL is of moderate reliability  
 TRH F1 is TRH C<sub>6</sub>-C<sub>10</sub> minus BTEX  
 TRH F2 is TRH >C<sub>10</sub>-C<sub>16</sub> including naphthalene

## F2.5 Management Limits

The SAC applied to any contingency or unexpected finds scenarios during site remediation for TRH, in addition to appropriate consideration and application of the HSL and ESL, there are additional considerations which reflect the nature and properties of petroleum hydrocarbons, including:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosion hazards;
- Effects on buried infrastructure e.g. penetration of, or damage to, in-ground services.

These management limits are in Table 8.

**Table 8: Management Limits (mg/kg)**

Contaminant	Soil Type	ML-D
TRH F1	Fine	800
TRH F2	Fine	1000
TRH F3	Fine	5000
TRH F4	Fine	10 000

Notes: TRH F1 is TRH C<sub>6</sub>-C<sub>10</sub> including BTEX  
 TRH F2 is TRH >C<sub>10</sub>-C<sub>16</sub> including naphthalene  
 ML-A-B-C residential, parkland and public open space

## F3.0 References

CRC CARE. (2011). *Health screening levels for petroleum hydrocarbons in soil and groundwater*. Parts 1 to 3, Technical Report No. 10: Cooperative Research Centre for Contamination Assessment and Remediation of the Environment.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

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## **Appendix G**

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Data Quality Objectives

## Appendix G

### Data Quality Objectives

#### SBA Site (former Bosch), Western Av and Cadigal L, Camperdown

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#### G1.0 Introduction

The objective of the validation plan is to assess the results of validation testing against the remediation acceptance criteria (RAC) stated within Section 12.1, assess the resultant suitability of the site for the intended land use, and to provide information on any environmental impacts which may have resulted from the works.

The validation assessment will be conducted with reference to the seven step data quality objectives process (DQO) as outlined in NEPC (2013), described below. The DQO in NEPC (2013) is in turn, based on the DQO process outlined in USEPA (2006), and associated guidelines.

#### G2.0 Data Quality Objectives

**Table 1: Data Quality Objectives**

Step	Summary
1: State the problem	<p>The site requires remediation and validation of remediation in order to render it suitable for tertiary educational land use. The objective of the validation plan is to confirm the successful implementation of this remediation action plan.</p> <p>A conceptual site model (CSM) for the proposed development has been prepared (Section 7).</p>
2: Identify the decisions / goal of the study	<p>The CSM identifies the contaminants of potential concern (CoPC) and the likely impacted media. The key CoPC impacting the site are:</p> <ul style="list-style-type: none"> <li>• Asbestos;</li> <li>• Metals; and</li> <li>• PAH</li> </ul> <p>The validation sampling results will be compared against the RAC.</p> <p>The preferred remediation strategy as outlined in the RAP is the excavation and disposal of contaminated soils. An option for the capping and containment of asbestos impacted material is also provided as a contingency. Excavation and relocation of material with EIL exceedances of metals and PAH is also presented. Refer Appendix E.</p> <p>The success of the remediation and subsequent validation will be based on a comparison of the analytical results for all CoPC to the adopted RAC and, if necessary, compared to the 95% UCL of the mean concentrations.</p>

Step	Summary
3: Identify the information inputs	<p>Relevant inputs to the decision include:</p> <ul style="list-style-type: none"> <li>• The CSM, identifying the CoPC and affected media;</li> <li>• Analysis for the relevant CoPC using NATA accredited laboratories and methods, where possible;</li> <li>• Field and laboratory QA/QC data to assess the suitability of the environmental data for the validation assessment;</li> <li>• Results compared with the RAC; and</li> <li>• Assessments of aggregates, soil, etc imported as part of the permanent remediation works.</li> </ul> <p>A photoionisation detector (PID) will be used on-site to screen soils for VOC. PID readings will be used to inform sample selection for laboratory analysis.</p>
4: Define the study boundaries	<p>The lateral boundaries of the site are shown on Drawing 1, Appendix A. The vertical boundaries are to the extent of contamination impact as determined from the site history assessment, site observations and previous investigations used to inform the RAP.</p>
5: Develop the analytical approach (or decision rule)	<p>The decision rule is to compare all analytical results with RAC. Initial comparisons will be with individual results then, where required, summary statistics (including mean, standard deviation and 95% upper confidence limit (UCL) of the arithmetic mean (95% UCL) to assess potential risks posed by the site contamination.</p> <p>Quality control results are to be assessed according to their relative percent difference (RPD) values. For field and laboratory duplicate results, RPDs should generally be below 30%; for field blanks, results should be at or less than the limits of reporting (NEPC, 2013). The field and laboratory quality assurance assessment is included in Section 13.3.</p>
6: Specify the performance or acceptance criteria	<p>Baseline condition: Contaminants at the site and/or statistical analysis of data exceed the RAC and pose a potentially unacceptable risk to receptors (null hypothesis).</p> <p>Alternative condition: Contaminants at the site and statistical analysis of data complies with the RAC and as such, do not pose a potentially unacceptable risk to receptors (alternative hypothesis).</p> <p>Unless conclusive information from the collected data is sufficient to reject the null hypothesis, it is assumed that the baseline condition is true.</p>
7: Optimise the design for obtaining data	<p>Sampling design and procedures to be implemented to optimise data collection for achieving the DQO include the following:</p> <ul style="list-style-type: none"> <li>• Sampling frequencies in accordance with Section 13.2;</li> <li>• Analysis for the CoPC at NATA accredited laboratories using NATA endorsed methods will be used to perform laboratory analysis whenever possible; and</li> <li>• Adequately experienced environmental scientists/engineers will conduct field work and sample analysis interpretation.</li> </ul>

### G3.0 References

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

USEPA. (2006). *Guidance on systematic planning using the data quality objectives process, EPA QA/G-4*. Washington DC.: United States Environmental Protection Agency, Office of Environmental Information.

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## **Appendix H**

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Site Management Plan

## Appendix H

### Site Management Plan

#### SBA Site (former Bosch), Western Av and Cadigal L, Camperdown

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### H1.0 Introduction

This general site management plan (SMP) has been developed to minimise potentially adverse impacts on the environment, and worker and public health as a result of the proposed remediation works.

The Remediation Contractor must have in place a construction environmental management plan (CEMP) (or similar) which is specific to the equipment used for the remediation and the proposed methods to be adopted by the Remediation Contractor. This SMP has been prepared to augment the Remediation Contractor's CEMP and contains general details for aspects of the work, as per reporting requirements for a remediation action plan (RAP) under NSW EPA *Guidelines for Consultants Reporting on Contaminated Land* (NSW EPA, 2020).

Apart from the management principles outlined in this SMP, the Remediation Contractor must also ensure compliance with all relevant environmental legislation and regulations, including (but not limited to) the following:

- *Contaminated Land Management Act 1997* NSW (CLM Act);
- *Protection of the Environment Operations Act 1997* NSW (POEO Act);
- *Protection of the Environment Legislation Amendment Act 2011* NSW;
- *Protection of the Environment Operations Amendment (Scheduled Activities and Waste) Regulation 2008* NSW.
- *Environmentally Hazardous Chemicals Act 1985* NSW;
- *Environmental Offences and Penalties Act 1989* NSW;
- *Pesticide Act 1999* NSW and *Pesticides Regulation 2017*; and
- *Work Health and Safety Act 2017* NSW (WHS Act) and *Work Health and Safety Regulations 2017* NSW.

### H2.0 Roles and Responsibilities

#### H2.1 Principal

The Principal is responsible for the environmental performance of the proposed remediation works, including implementation of acceptable environmental controls during remediation works. The Principal will retain the overall responsibility for ensuring this RAP is appropriately implemented. The Principal is to nominate a representative (the Principal's Representative), who is responsible for overseeing the implementation of this RAP. The actual implementation of the RAP will, however, be conducted by the Principal Contractor on behalf of the Principal.

The Principal is responsible for providing appropriate information to the Contractor to allow them to safely plan the required works. This includes the asbestos register for the site and this RAP.

The Principal is also responsible for implementing an appropriate communications plan.

## H2.2 Remediation Contractor

The Remediation Contractor ('the Contractor') will be the party responsible for daily implementation of this RAP and shall fulfil the responsibilities of the Contractor as defined by SafeWork NSW. It is noted that the Contractor may appoint appropriately qualified sub-contractors or sub-consultants to assist in fulfilling the requirements of the procedures. The Contractor will appoint a Site Manager.

In addition to the implementation of the RAP it will be the Contractors responsibility to:

- Obtain / ensure relevant sub-contractors obtain specific related approvals as necessary to implement the earthworks including permits for removal of asbestos-containing material, SafeWork NSW notification etc.;
- Develop or request and review any site plans to manage the works to be conducted;
- Ensure that all remediation works and other related activities are undertaken in accordance with this RAP;
- Maintain all site records related to the implementation of this RAP including but not limited to;
  - Tracking of all movement of soil within the site and off-site from cradle to grave;
  - Transportation Record: comprising a record of all truck-loads of soil (including aggregate) entering the site, including truck identification (e.g., registration number), date, time, source site, load characteristics (e.g., type of material, i.e., quarried aggregate, etc.), approximate volume, use (e.g., general site raising, service trenches, etc.);
  - Disposal dockets: for any soil disposed off-site including transportation records, spoil source, spoil disposal location, receipt provided by the receiving waste facility / site;
  - Imported materials records: records for any soil imported onto the site, including source site, classification reports, inspection records of soil upon receipt at site and transportation records;
  - Records relating to any unexpected finds and contingency plans implemented;
  - Photographic records by all contractors and consultants of the works undertaken within their purview of responsibilities;
  - Surveys pre- and post-installation of geotextile marker layer and clean fill cap;
  - Airborne asbestos monitoring records (in the event that asbestos works are undertaken); and
  - Interim / final visual and sampling clearances for any asbestos related works (in the event that asbestos works are undertaken).
- Ensure sufficient information is provided to engage or direct all required parties, including sub-contractors, to implement the requirements of the RAP other than those that are the direct responsibility of the Contractor;
- Manage the implementation of any recommendation made by those parties in relation to work undertaken in accordance with the RAP;

- Inform, if appropriate, the relevant regulatory authorities of any non-conformances with the procedures and requirements of the RAP in accordance with the procedures outlined in this document;
- Retain records of any contingency actions;
- On completion of the project, to review the RAP records for completeness and update as necessary; and
- Recommend any modification to general documentation which would further improve the environmental outcomes of this RAP.

### **H2.3 Surveyor**

The project surveyor will be a registered surveyor engaged by the Contractor to undertake surveying works as required by this RAP.

### **H2.4 Asbestos Contractor**

The Asbestos Contractor will be responsible for undertaking all asbestos work involving any asbestos impacted filling and will hold a Class A licence for the removal of asbestos (issued by SafeWork NSW), on the basis that the asbestos identified at the site to date has included both friable and bonded asbestos.

The Asbestos Contractor can be the same entity as the Remediation Contractor.

### **H2.5 Sub-contractors**

All sub-contractors will be inducted onto the site, informed of their responsibilities in relation to this RAP and sign their agreement to abide by the RAP requirements. Where necessary, sub-contractors will also be trained in accordance with the requirements of this document. All sub-contractors must conduct their operations in accordance with the RAP as well as all applicable regulatory requirements.

### **H2.6 Environmental Consultant**

The Environmental Consultant will provide advice on implementing the RAP. The Environmental Consultant will be responsible for:

- Undertake any required assessments where applicable (e.g., waste classification, validation);
- Provide advice and recommendations arising from monitoring and/or inspections, including unexpected finds; and
- Notify the Client with any results of assessments, and any observed non-conformances.

## H2.7 Licenced Asbestos Assessor

A Licenced Asbestos Assessor will be required to be engaged independently of the Asbestos Contractor to undertake the following:

- Review and approve documentation prepared by the Asbestos Contractor;
- Prepare any WHS plans and advice required by the Contractor;
- Undertake airborne asbestos monitoring;
- Undertake clearance inspections;
- Provide advice and recommendations arising from monitoring and/or inspections; and
- Notify the client with the results of any assessments and any observed non-conformances.

## H2.8 Site Workers

All workers on the site are responsible for observing the requirements of this RAP and other management plans. These responsibilities include the following:

- Being inducted on the site and advised of the general nature of the remediation/environmental issues at the site;
- Being aware of the requirements of this plan;
- Wearing appropriate personal protective equipment (PPE) as required by this plan;
- Only entering restricted areas when permitted; and
- Requesting clarification when unclear of requirements of this or any other plans (e.g. safe work method statements (SWMS)).

## H3.0 Water Management

### H3.1 Stormwater

Stormwater must be managed during the remediation works such that potential adverse impacts from surface runoff (e.g., cross contamination, mobilisation of contaminants in soil particles, etc.) are appropriately mitigated. Accordingly, the Remediation Contractor will take appropriate measures which may include:

- Construction, where necessary, of stormwater diversion channels, bunding and linear drainage sumps with catch pits in and around the remediation areas to divert stormwater from the contaminated areas;
- Provision of appropriately located sediment traps including geotextiles; and
- Discharge of excess water in excavations / low points on a regular basis to limit the potential for flooding.

### H3.2 Dewatering of Excavations

Any runoff or seepage water accumulated in site excavations that requires removal must initially be sampled and tested for suspended solids, pH and any contaminants of potential concern (CoPC) as identified by the Environmental Consultant. The options for management of excavation pump-out water, dependent upon the test results, are for disposal of the water as follows:

- Discharge to stormwater with prior approval from Council. Provided the test results comply with relevant ANZG *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, 2018), or any other compliance requirements stipulated by Council. The Environmental Consultant must consider the most appropriate criteria to be used; or
- Discharge to sewer, as industrial trade wastewater, with prior approval from Sydney Water. This option would require the analysis of a larger list of analytes, and compliance with the Sydney Water acceptance standards; or
- Pumping by a liquid waste contractor for removal of the water off-site, in accordance with regulatory requirements.

Note that, depending on the type and scale of the dewatering required, a permit (water use approval) may need to be obtained through NSW Water.

### H4.0 Soil Management Plan

The Contractor will develop a plan to mitigate cross contamination as part of the CEMP to be implemented throughout the works.

#### H4.1 Excavation and Stockpiling of Contaminated Material

Contaminated material shall be excavated and stockpiled at a suitably segregated location(s) away from sensitive areas (e.g. water bodies, drainage lines, stormwater pits, etc.) and ongoing excavations, and in a manner that will not cause nuisance to the neighbouring properties. Soil stockpiles are to be managed as follows:

- An impermeable membrane such as plastic sheeting should be provided at the surface by the Remediation Contractor prior to stockpiling. Plastic sheeting should be taped at joins, as necessary;
- All stockpiles of contaminated material shall be surrounded by star pickets and marking tape or other suitable material to clearly delineate their boundaries;
- Stockpiles shall be lightly conditioned by sprinkler or covered by geotextile or similar cover to prevent dust generation;
- Stockpiles impacted, or potentially impacted, with asbestos must be covered by geotextile;
- Any stockpile to remain on-site overnight should be adequately secured in order to reduce the risk of sediment runoff;
- Measures should be taken by the remediation contractor to prevent the migration of stockpile materials (i.e., perimeter bunds, hay bales, silt fences, etc.);

- Should the stockpile remain on-site for over 24 hours, geotextile silt fences must be erected to prevent losses by surface erosion; and
- A record of stockpile locations (stockpile register), dimensions, descriptions, environmental controls, etc. should be maintained by the Remediation Contractor.

All movement of soil within the site and off-site is to be tracked by the Remediation Contractor, from cradle to grave. Copies of tracking records must be provided to the Environmental Consultant.

#### **H4.2 Loading and Transport of Contaminated Material**

Transport of contaminated material from the site shall be via a clearly delineated haul route and this route shall be used exclusively for entry and egress of vehicles used to transport contaminated materials within and away from the site. The proposed waste transport route (to be determined by the Remediation Contractor) will be notified to Council and truck dispatch shall be logged and recorded by the Remediation Contractor for each load leaving the site. A record of the truck dispatch will be provided to the Environmental Consultant.

All haulage routes for trucks transporting soil, materials, equipment or machinery to and from the site should be selected to meet the following objectives:

- Comply with all road traffic rules;
- Minimise noise, vibration and dust to adjacent premises; and
- Utilise State roads and minimise use of local roads as far as practicable.

The remediation work will be conducted such that all vehicles:

- Conduct deliveries of soil, materials, equipment or machinery only during the specified hours of remediation;
- Have securely covered loads to prevent any dust or odour emissions during transportation; and
- Exit the site in a forward direction.

In addition, measures will be implemented to ensure no contaminated material is spilled onto public roadways or tracked off-site on vehicle wheels. Roadways will be kept clean throughout the remediation works and will be broomed, if necessary, to achieve a clean environment.

All loads will be securely covered and may be lightly wetted, if required, to ensure that no materials or dust are dropped or deposited outside or within the site. Prior to exiting the site each truck should be inspected by Remediation Contractor personnel and either noted as clean (wheels and chassis) or broomed prior to leaving the site. Any soil spilled onto surrounding streets will be cleaned by mechanical or hand methods, on a daily basis.

Removal of waste materials from the site shall only be carried out by contractors holding the appropriate license(s), consent or approvals to dispose the waste materials according to the waste classification and with the appropriate approvals obtained from the EPA, where required.

## H5.0 Noise and Vibration Control Plan

All equipment and machinery should be operated in an efficient manner to minimise the emission of noise. The use of any plant and/or machinery should not cause unacceptable vibrations to nearby properties and should meet Council requirements.

## H6.0 Dust Control Plan

Dust emissions must be confined within the site boundary as far as is practicable. The following example dust control procedures could be employed to comply with this requirement, as necessary:

- Erection of dust screens around the perimeter of the site (as applicable);
- Securely covering all loads entering or exiting the site;
- Use of water sprays across the site to suppress dust;
- Covering of all stockpiles of contaminated soil remaining on site more than 24 hours;
- Include wheel wash (if applicable); and
- Keeping excavation and stockpile surfaces moist.

Regular checking of the fugitive dust issues is to be undertaken. Remedial measures are to be undertaken to rectify any cases of excessive dust.

## H7.0 Odour Control Plan

No odours should be detected at any boundary of the site during remediation works by an authorised Council Officer relying solely on sense of smell. The following example procedures could be employed to comply with this requirement as necessary:

- Use of appropriate covering techniques such as plastic sheeting, polythene or geotextile membranes to cover excavation faces or stockpiles;
- Fine spray of water and / or hydrocarbon mitigating agent on impacted areas/stockpiles or loads to lightly condition the material;
- If required, restrict uncovered stockpiles to appropriate sizes to minimise odour generation;
- Ceasing works during periods of inclement weather such as high winds or heavy rain;
- Regular checking of the fugitive dust and odour issues to ensure compliance. Undertake immediate remediation measures to rectify any cases of excessive dust or odour (e.g., use of misting sprays or odour masking agent); and
- Adequate maintenance of equipment and machinery to minimise exhaust emissions.

## H8.0 Work Health and Safety Plan

### H8.1 General

It is the Remediation Contractor's responsibility to devise a SWMS<sup>1</sup> (or series thereof, for various respective tasks) and to implement proper controls that enable the personnel undertaking the remediation to work in a safe environment. This RAP and SMP does not relieve the Remediation Contractor or other contractors of their ultimate responsibility for occupational health and safety of their workforce and to prevent contamination of areas outside the 'remediation' workspace. This RAP and SMP sets out general procedures and the minimum standards and guidelines for remediation that will need to be used in preparing the safe work method statement.

This work health safety plan (WHSP) has been prepared with reference to CRC CARE *Remediation Action Plan: Implementation - Guideline on Health and Safety* (CRC CARE, 2019). The requirements of this WHSP must be incorporated into the Remediation Contractor's SWMS.

All site work must be undertaken in a controlled and safe manner with due regard to potential hazards, training and safe work practices. To attain this the SWMS developed by the Remediation Contractor must comply with policies specified in the Work Health and Safety Regulation 2011.

All appropriate permits, licences and notifications required for the remediation activities must be obtained prior to the commencement of remediation works.

### H8.2 Site Access

Appropriate fencing and signage must be installed around and within the site to prevent unauthorised access and restrict access to remediation areas and/or deep excavations. Access restrictions and administrative arrangements for management of entry of workers or related personnel on site is the responsibility of the Remediation Contractor.

Any existing pits or unstable areas on site that may generate potential safety, or operational risk should be demarcated and taped off, with appropriate rectification action undertaken (e.g., backfilling of pits).

### H8.3 Personnel and Responsibilities

Before undertaking works on site, all personnel will be made aware of the officer responsible for implementing WHS procedures. All personnel must read and understand this WHSP and over-arching SWMS prior to commencing site works and sign a statement to that effect. Contractors employed at the site will be responsible for ensuring that their employees are aware of, and comply with, the requirements of this WHSP and Remediation Contractor's SWMS.

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<sup>1</sup> Either a SWMS or construction environmental management plan (CEMP), or other equivalent document incorporating health and safety aspects of the proposed remedial works.

## H8.4 Chemical Contamination Hazards

Chemical compounds or substances that may be present in the soils at the site include the key CoPC TRH, BTEX, TCE and, given the presence of fill, asbestos. There is also a lower probability of other contaminants being present.

The risks associated with the identified contaminants to site personnel and workers involved in the remediation are considered to be low due to the concentrations within groundwater and soil vapour and limited exposure durations. These risks are associated with:

- Ingestion of contaminated soil and / or water;
- Dermal contact with contaminated soil and / or water; and
- Inhalation of dusts or vapours of the CoPC.

If asbestos is encountered in fill, this risk evaluation should be revised.

Personnel will endeavour, wherever possible, to avoid direct contact with potentially contaminated material. Workers must avoid the potential exposures listed above as far as is practicable. Appropriate personal protective equipment (PPE) must be used to mitigate potential risks.

## H8.5 Physical Hazards

The following physical hazards are associated with conditions that may be created during remediation works:

- Heat exposure;
- Excavations;
- Buried services;
- Noise;
- Dust;
- Electrical equipment;
- Heavy equipment and truck operation; and
- Asbestos.

Safe work practices must be employed to manage the physical risks identified above. For the most part these risks can be managed through appropriate demarcation, access controls and the use of appropriate PPE.

## H8.6 Safe Work Practices

The appropriate safe work practices should be clearly defined by the Remediation Contractor in their SWMS. As a minimum, all personnel on site will be required to wear the following PPE:

- Steel-capped boots (mandatory);

- High visibility clothing / vest (mandatory);
- Safety glasses or safety goggles with side shields requirements (as necessary);
- Hard hat (as necessary);
- Appropriate respiratory and protective equipment for any works involving asbestos (as necessary); and
- Hearing protection when working in the vicinity of machinery or plant equipment if noise levels exceed exposure standards (as necessary).

Each item of PPE should meet the corresponding relevant Australian Standard(s).

Specific safe work practices will be adopted when working with asbestos, in accordance with (but not limited to) the following codes of practice:

- SafeWork NSW *Code of Practice, How to Manage and Control Asbestos in the Workplace* (SafeWork NSW, 2019a)
- SafeWork NSW *Code of Practice, How to Safely Remove Asbestos* (SafeWork NSW, 2019b);
- WorkCover NSW *Managing Asbestos in or on Soil* (WorkCover NSW, 2014); and
- NOHSC *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Ed* (NOHSC, 2005).

## H9.0 Remediation Schedule and Hours of Operation

The remediation works will be conducted within the days and hours specified in the development consent.

## H10.0 Response to Incidents

The key to effective management of incidents is the timely action taken before any situation reaches a reportable or critical level. Therefore, surveillance activities are extremely important, and should be conducted for the measures prescribed herein and any other measures prescribed in any additional environmental management plan developed subsequently. During construction activities on the site, the following inspection or preventative actions should be performed by the Remediation Contractor:

- Regular inspection of works;
- Completion of routine environmental checklists and follow-up of non-compliance situations;
- Maintenance and supervision on-site; and
- An induction process for site personnel involved in the remediation works that includes relevant information on the contamination status of the site, the remediation works being undertaken, worker health and environmental protection requirements and ensures that all site personnel are familiar with the site emergency procedures.

An emergency response plan will be in place for all aspects of site works. Any emergency will be reported immediately to the site office and / or the Site Manager (and Safety Officer), and the appropriate emergency assistance should be sought. The Site Manager should be responsible for initiating an immediate emergency response using the resources available on the site. Where external assistance is required, the relevant emergency services should be contacted. A table such as that below, containing contact details for key personnel who may be involved in an environmental emergency response should be completed and be readily available to personnel at all times. The table should be completed, and thereafter amended, as required.

The Remediation Contractor will be responsible for ensuring that site personnel are aware of the emergency services available and the appropriate contact details. A site Safety Officer should be contactable, or available, on-site during remediation and development works.

Contact details for key utilities are included in the event of needing to respond to incidents. Blank cells are 'to be confirmed' and should be completed prior to works commencing when all entities are confirmed.

**Table 1: Summary of Roles and Contact Details**

<b>Role</b>	<b>Personnel / Contact</b>	<b>Phone Contact Details</b>
Principal	Sydney University, Nikki Short	0413586039
Principal's Representative	Chris Gagliardi	0410668064
Site Manager	FDC – Michael Badaoui	0424891332
Remediation Contractor and Builder	FDC – Michael Badaoui	0424891332
Site Office	TBC	TBC
Environmental Consultant	Douglas Partners	
Consent Authority	NSW Government SEARS SSD 55388456	
Regulator	NSW EPA (pollution line and general enquiries)	131 555
Utility Provider	Water (Sydney Water Corporation)	13 20 92
Utility Provider	Power (Ausgrid)	13 13 88
Utility Provider	Gas (Jemena Limited)	131 909
Utility Provider	Telecommunications (Telstra Corporation Limited)	13 22 03
Utility Provider	Telecommunications (Optus)	1800 505 777
Utility Provider	Telecommunications (NBN Co Limited)	1800 687 626

## H11.0 References

ANZG. (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Canberra, ACT: Australian and New Zealand Governments and Australian state and territory governments.

CRC CARE. (2019). *Remediation Action Plan: Implementation - Guideline on Health and Safety*. National Remediation Framework: CRC for Contamination Assessment and Remediation of the Environment.

NOHSC. (2005). *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Ed*. Canberra, April 2005, NOHSC:3003: National Occupational Health and Safety Commission, Commonwealth of Australia.

NSW EPA. (2020). *Guidelines for Consultants Reporting on Contaminated Land*. Contaminated Land Guidelines: NSW Environment Protection Authority.

SafeWork NSW. (2019a). *Code of Practice, How to Manage and Control Asbestos in the Workplace*. August 2019.

SafeWork NSW. (2019b). *Code of Practice, How to Safely Remove Asbestos*. August 2019: SafeWork NSW, NSW Government.

WorkCover NSW. (2014). *Managing Asbestos in or on Soil*. March 2014: WorkCover NSW, NSW Government.

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**Douglas Partners Pty Ltd**

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## **Appendix I**

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### Contingency Plan and Unexpected Finds Protocol

## Appendix I

### Contingency Plan and Unexpected Finds Plan

#### SBA Site (former Bosch), Western Av and Cadigal L, Camperdown

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##### 11.0 General

Where the site conditions are found to be different than that anticipated during the remediation works, the proposed remediation approach may not be appropriate for the contamination encountered. In such cases the Environmental Consultant is to re-assess the contamination and remediation approach and inform the Site Auditor (to be appointed). Where necessary the Environmental Consultant will prepare an addendum to, or revision of, this RAP. Any addendum or revision is to be reviewed and agreed by the Site Auditor before its implementation.

##### 12.0 Contingency Plan

This contingency plan has been developed to provide guidance on processes to follow if contamination (or indicators of contamination), other than that included in the remediation strategy, (Section 10) is encountered during the remediation works. Any such finds shall be surveyed and the location documented.

Although the site has been subject to previous investigation(s), there remains a potential for soil contamination to be present between sampled locations. In the event that signs of soil contamination, other than that included in the remediation strategy, are encountered during remediation e.g. evidence of asbestos containing material (ACM), petroleum, or other chemical odours which weren't previously identified the following protocols will apply:

- The Site Manager is to be notified and the affected area closed off by the use of barrier tape and warning signs;
- The Environmental Consultant is to be notified to inspect the area and assess the significance of the potential contamination and determine extent of remediation works (if deemed necessary) to be undertaken. An assessment report and management plan detailing this information will be compiled by the Environmental Consultant and provided to the Principal's Representative;
- The assessment results together with a suitable management plan shall be provided by the Principal's Representative to the Consent Authority (if required by the development consent) and Site Auditor;
- The agreed management / remedial strategy, based on the RAP and relevant guidelines (e.g., WA DoH (2021), for asbestos issues), shall be implemented; and
- All details of the assessment and remedial works are to be included in the site validation report.

### 13.0 Unexpected Finds Protocol

This unexpected finds protocol (UFP) has been developed to provide guidance on processes to follow if any unexpected find is encountered during the remediation or future civil and construction works. Any unexpected finds should be surveyed and the location documented.

All site personnel are to be inducted into their responsibilities under this (UFP), which should be included or referenced in the Contractors Environmental Management Plan.

All site personnel are required to report unexpected signs of environmental concern to the Site Manager if observed during the course of their works e.g. presence of potential unexploded ordinance, unnatural staining, potential contamination sources (such as buried drums or tanks) or chemical spills.

Should signs of concern be observed, the Site Manager, as soon as practical, will:

- Stop work in the affected area and ensure the area is barricaded to prevent unauthorised access;
- Notify authorities needed to obtain emergency response for any health or environmental concerns (e.g., fire brigade);
- Notify the Principal's Representative of the occurrence;
- Notify any of the authorities that the Contractor is legally/ contractually required to notify (e.g., EPA, Council); and
- Notify the Environmental Consultant.

The Principal's Representative is to notify any of the authorities which the Principal is legally / contractually required to notify (e.g., EPA, Council). Where appropriate the Principals Representative will also implement appropriate community consultation in accordance with the Communications Plan (refer to Section 7).

The Environmental Consultant will assess the extent and significance of the find and develop an investigation, remediation or management approach using (where possible) the principles and procedures already outlined in the RAP. Where a Site Auditor is involved, the proposed approach will be discussed and agreed with the Site Auditor prior to implementation.

### 14.0 References

WA DoH. (2021). *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*. WA Department of Health.

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**Douglas Partners Pty Ltd**

## 6.7 ASBESTOS MANAGEMENT PLAN

RICHARD CROOKES  
  
CONSTRUCTIONS

SYDNEY BIOMEDICAL ACCELERATOR  
1330

# ASBESTOS MANAGEMENT PLAN

26 March 2025



This plan has been approved for use by the following:

Approved by / Date

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Joe Amodeo, Project Manager

Approved by / Date

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Craig Richmond, Business Systems, QA/Env Manager

Approved by / Date

---

Simon Dayball, Group WHS Manager

Approved by / Date

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Ian West, General Manager – Commercial & Risk

**REVISION REGISTER**

REVISION DATE	REVISION DESCRIPTION	PMS INITIALS (ACCEPTANCE OF CHANGES)
R0	Original issue	JA

PROJECT POSITION	NAME	SIGNATURE	REVISIONS
			/ / / /
Construction Manager	Peter Furlong		
Project Director			
Senior Project Manager	Joe Amodeo		
Senior Site Manager	Dane Lalic		
Safety Manager	Matt Dymond		
Senior Project Engineer	Cameron Smith		
Senior Contracts Manager	Keith Tai		
Contracts Manager	Michael Laverty		
Senior Design Manager	Michael Bradburn		
Senior Design Manager	JP Castaner		
Senior Services Manager	Zoran Stepanovski		

PROJECT POSITION	NAME	SIGNATURE	REVISIONS
Senior Contract Administrator	Monique Martino		
Project Engineer			
Site Engineer	Madison Barrie		
Site Engineer			
Contract Administrator			
Site Supervisor			
Sustainability Manager	Samantha Jones		
WHS Environmental Co-ordinator			

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# 1 INTRODUCTION

## 1.1 PURPOSE

The management of asbestos containing materials is important to ensure the Asbestos Containing Material (ACM) are not damaged nor deteriorate to such an extent that site workers, public, external contractors or visitors are unnecessarily exposed to airborne asbestos fibres.

The requirements of the contractor site induction and permit to work system will aid in the management of ACM's throughout the site. Any other unexpected finds that are or could be potentially hazardous will follow the same protocol as ACM.

## 1.2 GENERAL PRINCIPLES

The RCC's principles of asbestos management have been adapted from general principles published in the Code of Practice for the Management and Control of Asbestos in Workplaces [NOHSC: 2018 (2005)]. These principles are summarised below:

- Consideration should be given to the removal of ACM during any renovations, refurbishments or maintenance work in preference to other control measures such as encapsulation, enclosure and sealing.
- The WHS Regulation requires all ACM within the construction area to be labelled. (Refer 6.3 Labelling)
- Where ACM is identified or presumed, the locations and type of ACM are to be recorded in the ACM Register located within the Asbestos management plan folder.
- A risk assessment must be performed on all identified or presumed ACM.
- Control measures must be established to prevent exposure to airborne asbestos fibres and should take into account the results of risk assessments conducted for the identified or presumed ACM.
- All workers and contractors on site etc. must be advised of the ACM Register at time of induction, and as requested, permitted access to the register for their review
- Only competent persons should undertake the identification of ACM.
- All workers and contractors on site where ACM are present or presumed to be present, and all other persons who may be exposed to ACM as a result of being on the premises, must be provided with full information on the occupational health and safety consequences of exposure to asbestos and appropriate control measures. The provision of this information should be recorded.
- Reasonable steps must be taken to identify all possible locations of ACM within the site.
- Once a risk assessment has been completed and controls established, a SWMS is to be developed and submitted to RCC'S site management team for approval

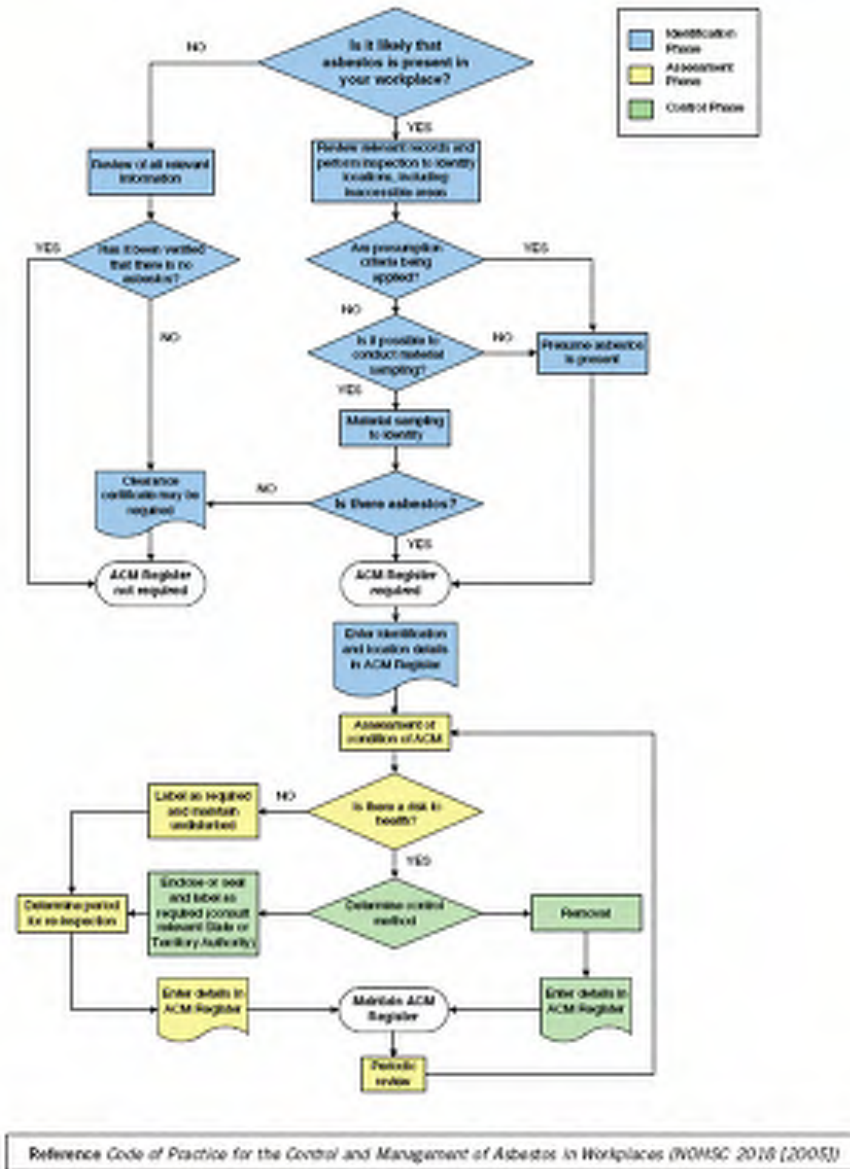


Figure 1: General principles of an asbestos management plan

Source: Code of Practice for the Management and Control of Asbestos in Workplaces [NOHSC: 2018 (2005)]

## 2 OBJECTIVES

- Remove all high-risk asbestos items where possible.
- Deliver effective asbestos management work programs.
- Ensure that no one is exposed to airborne asbestos fibres.
- Ensure compliance with this Asbestos Management Plan.
- Ensure the asbestos database and register is accurate.
- Comply with State and Commonwealth legislation.
- Remove asbestos containing items when and where possible

## 3 REGULATORY REQUIREMENTS

This asbestos management plan is consistent with removal, encapsulation, transport, and disposal or otherwise potential disturbance of asbestos containing materials. All these activities shall be performed in accordance with relevant Commonwealth and State Acts, Regulations, Codes of Practice, Advisory Standards and Industry Standards.

### 3.1 STATE LEGISLATIVE REQUIREMENTS – NEW SOUTH WALES/ACT/QUEENSLAND

Relevant State legislation includes:

- Work Health and Safety Act 2011
- Work Health and Safety Regulation 2017

### 3.2 CODE OF PRACTICE/GUIDES

Key Codes of Practice and Guidance Notes include:

- Code of Practice for the Management and Control of Asbestos in the Workplaces [NOHSC: 2018 (2005)].
- COP- How to Manage and Control Asbestos in the workplace - Oct 2018
- COP- How to safely remove asbestos - Oct 2018

### 3.3 RCC REQUIREMENTS

- Project Managers (PM) /Site Managers (SM) must be notified before asbestos removal work commences.
- Any new asbestos identified must be explicitly notified to the PM/SM.
- All Staff and Contractors must comply with this Plan.
- Tenants and other interested parties must be notified of the asbestos removal work in advance and asbestos awareness training shall be made available to those persons affected by the asbestos work.

## 4 ORGANISATIONAL RESPONSIBILITIES

Person / Party	Responsibility
Construction Manager (CM), Project Manager (PM)	<ul style="list-style-type: none"> <li>▪ Ensure all staff and contractors are aware of and comply with the plan.</li> <li>▪ Project management</li> <li>▪ Identification and bringing to the attention of appropriate staff, any suspect material</li> <li>▪ Ensure all contractors working on asbestos are aware of and meet the requirement of the plan.</li> <li>▪ Notify Adjacent neighbours, property owners work type and time frame</li> </ul>
Site Manager (SM) Health Safety and Environmental Coordinator (HSE)	<ul style="list-style-type: none"> <li>▪ Obtain from Subcontractor, copy of Safework Notification (Requirement of RCC Asbestos removal permit)</li> <li>▪ Ensure project personnel (including contractors) are inducted</li> <li>▪ Surveying, identification and arranging for sampling of suspected asbestos containing materials by competent persons.</li> <li>▪ Training and awareness RCC relevant staff</li> <li>▪ Manage the asbestos works program and removal program</li> <li>▪ Respond to incidents</li> <li>▪ Document preparation, recording and filing</li> <li>▪ Manage asbestos inspection contractor</li> </ul>
Contractors (C) and Trades Staff (TS)	<ul style="list-style-type: none"> <li>▪ Not to impact on an ACM without complying with the plan</li> <li>▪ To bring to the attention of the SM/HSE any suspect material</li> <li>▪ Refer to the plan for guidance to identify, manage, and remove asbestos</li> <li>▪ Apply for Asbestos Permit to Work when performing asbestos removal work that requires notification.</li> <li>▪ Undergo RCC Contractor Induction</li> <li>▪ Develop a site specific asbestos removal control plan, SWMS and Risk Assessment prior to performing the asbestos removal work</li> </ul>

## 5 CONTROL OF ASBESTOS HAZARDS

As part of the asbestos survey or subsequent resurvey, a 'Competent Person' is required to assess the risk posed by the ACM by completing a Risk Assessment; this will determine what, if any, control measures may be required. Generally, there are four control options available to select:

- Leave in-situ and manage
- Seal / encapsulate
- Enclose / isolate
- Remove

The controls are to be appropriate to the risk of the ACM in question. The following information should be used as a guideline when determining the correct control measure for management of the ACM risks.

If the ACM is friable, and there is a risk to health from exposure, it should be removed.

If the ACM is bonded and in a stable condition, encapsulation may be appropriate if the ACM is unsealed. Encapsulation is not necessarily required if the ACM is unsealed but it does provide another "barrier" to the potential release of asbestos fibre as well as prolonging the lifespan of the material by providing protection against UV and environmental elements etc.

ACM that are bonded, stable and sealed, which are unlikely to be disturbed during normal activities, can be left in-situ and managed, but need to be recorded in the ACM Register.

ACM within the works zone must be removed prior to the commencement of demolition, partial demolition, renovation or refurbishment if they are likely to be disturbed by those works. This is in accordance with the NOHSC Code of Practice for the Safe Removal of Asbestos [NOHSC: October 2018]

### 5.1 REMOVAL OF ACM

#### 5.1.1 LICENSED CONTRACTORS

ACM falls into two broad categories (bonded and friable) and the category the ACM falls under will determine how the ACM is removed. If the ACM is classified as friable (e.g. sprayed limpet, pipe lagging, millboard insulation, vinyl sheet floor coverings with asbestos backing material, etc.) it is necessary to engage a contractor who holds a current AS-A class license for friable asbestos removal. The holder of an AS-A licence is also permitted to removed Bonded ACM

If the ACM is classified as bonded ACM (e.g. asbestos cement wall linings, Super Six roof sheeting, vinyl floor tiles, Zelemite electrical boards, etc.) the ACM may be removed by the contractor who holds a current AS-B licence for bonded asbestos removal. The holder of an AS-B licence is not permitted to remove friable ACM.

#### 5.1.2 SAFEWORk - NOTIFICATION

For Bonded ACM, in quantities greater than 10m<sup>2</sup>, requiring a licensed contractor (AS-B) to complete the removal works, a Safework (Regulator) Notification is required to be lodged by the Licensed Contractor.

The Notification is required to be lodged a minimum of seven (7) working days prior to starting the removal works. Safework (Regulator) will review the application and return the first two

pages, stamped with an official Safework (Regulator) approval. No works are to proceed prior to the receipt of the Notification.

RCC will require a copy of the Safework (Regulator) stamped 'Notification' prior to issuing an RCC Asbestos removal permit.

### 5.1.3 SAFework – PERMIT

For all Friable removal works, regardless of quantity, a suitably licensed contractor (AS-A) must apply to Safework (Regulator) for a Permit prior to removal works progressing.

The Permit application is required to be lodged a minimum of seven (7) working days prior to starting the removal works. Safework (Regulator) will review the application and return the first two pages stamped with an official Safework (Regulator) approval and, issue a separate numbered Permit. No works are to proceed prior to the receipt of the permit.

RCC will require a copy of the Safework (Regulator) 'Permit' and the application form prior to issuing an RCC Asbestos removal permit.

### 5.1.4 AIRBORNE FIBRE MONITORING

Airborne fibre monitoring must be conducted during and after the removal of all friable ACM by an independent competent person. For Bonded ACM, air monitoring is conducted as part of the clearance certificate (where required) or as requested by RCC, client or Hygienist. Air monitoring is conducted during the removal works to check the effectiveness of control measures implemented by the contractor (e.g. isolating the removal work area with a sealed, airtight enclosure fitted with negative air generating units, etc.).

Air monitoring is also conducted after the ACM has been completely removed and the work area has passed a satisfactory visual inspection to determine whether the area is safe to reoccupy by unprotected persons.

### 5.1.5 CLEARANCE CERTIFICATES

For all Friable ACM removal works or, as requested by the client or RCC for Bonded works, before an area can be re-occupied post asbestos removal, a clearance inspection must be carried out. The clearance inspection must be undertaken by an independent competent person only and a clearance certificate must be obtained from that competent person. Clearance monitoring is a mandatory requirement for all friable asbestos removal works and is recommended for bonded ACM removal works particularly when the bonded ACM is located internally or near sensitive receptors.

The complete removal of all ACM must be verified with a written clearance certificate which must include details of a satisfactory clearance inspection conducted by the independent competent person. If clearance air monitoring has been conducted, the results of the clearance monitoring must be included as part of the clearance certificate as well.

### 5.1.6 WASTE

All asbestos waste shall be disposed of at an approved landfill disposal site by licensed contractors, and in accordance with the requirements of The Legislation. Transport and disposal of asbestos waste shall be carried out only in a manner that will prevent the liberation of asbestos fibres into the atmosphere.

To achieve "final completion" of an asbestos removal activity, RCC require verification that the asbestos waste has been transported and disposed of in accordance with State/Territory legislative requirements. A copy of the EPA Waste Tracking document is the required

documentation for disposal, and a copy of the necessary License for carrying out this removal and disposal is the required documentation for transportation.

## 5.2 RECORD KEEPING

RCC shall maintain detailed records of all activities relating to asbestos works which have been undertaken on site. The records kept should include:

- Copies of all asbestos survey/audit reports, including updates and amendments. (RCC ACM Registers)
- Copies of all Safework (Regulator) notifications and permits
- Risk Assessments and SWMS documents.
- RCC Asbestos removal permits
- RCC Air Monitoring and Clearance certificate records
- Records pertaining to the informing of employees/contractors about the presence of asbestos on site, and those employees have been appropriately trained in safe work procedures and practices.
- Clearance certificates indicating areas are safe to reoccupy after asbestos abatement works; and
- Airborne fibre monitoring results
- Previous versions of the asbestos register

All documentation is to be retained in the one file structure under the heading of Asbestos Management. All asbestos related records and documents are to be retained for a period of 30 years.

## 5.3 LABELLING

Current State and Territory legislation specify the requirements for some form of labelling in buildings. [NOHSC: 2018 (2005)] states all in-situ ACM's should be labelled where practicable. The words 'should' and 'practicable' in the Code of Practice allow some flexibility in the approach to labelling. Similar flexibility is allowed under State and Territory workplace health and safety legislation.

RCC has advised that individual labelling of ACM is to be determined by a Competent Person usually nominated by the client however may not be necessary in every instance.

All friable and high risk asbestos situations, as well as any location containing ACM's where regular maintenance or repair work is likely to be carried must be labelled.

In locations where ACM has been identified within close proximity to the work area, but not required to be removed or disturbed, should be labelled or sign posted warning of 'Asbestos containing material, do not disturb' or in wording similar.

Ref: WHS Regulation, Chapter 8, Asbestos- Clause 469

An asbestos removalist must ensure that:

- a) Signs alerting persons to the presence of asbestos are placed to indicate where the asbestos removal work is being carried out, and
- b) Barricades are erected to delineate the asbestos removal area.

## 5.4 WARNING SIGNS

All site areas which are known or suspected to contain ACM's shall have a warning sign at every main entry and around the perimeter of the isolated ACM area. An asbestos register exists for the site and a point of contact must be contacted before undertaking any works.

The warning sign must be clearly visible from all directions leading onto the area.

## 5.5 SAFE WORK PRACTICES

Prior to commencing any works on RCC sites, such as demolition, refurbishment, maintenance or installation of new equipment, the asbestos register must be consulted to determine if any ACM are present which may be disturbed. This ACM must be removed before commencement of the work. If unknown materials, or undocumented materials suspected of containing asbestos are encountered during building works, stop work and follow the Incident response procedures shown in figure 7.0.

If a project is likely to impinge upon ACM, the principal contractor (RCC) must assess the requirement for a licensed asbestos removalist to perform the asbestos removal work. A Safework permit / Notification may be required as part of an RCC, Asbestos Permit to work, prior to the asbestos removal work commencing.

### 5.5.1 MAINTENANCE PROCEDURES

Maintenance tasks that may impact on ACM are to be performed under controlled conditions to prevent the distribution of airborne asbestos fibres. [NOHSC: 2018 (2005)] has procedures for certain maintenance tasks and these must be followed. These maintenance tasks include:

- The drilling of asbestos containing materials
- Sealing, painting, coating of asbestos cement products
- Cleaning leaf litter from the gutters of asbestos cement roofs
- Replacing cabling in asbestos cement conduits or boxes
- Working on electrical mounting boards (switchboards) containing asbestos

### 5.5.2 TOOLS AND EQUIPMENT

Tools and equipment to be used for asbestos removal jobs are required to minimise the generation of airborne asbestos fibres. High-speed abrasive power or pneumatic tools such as angle grinders, sander, saws and high speed drills must never be used. Hand tools are preferred over power tools.

At the end of the removal work, all tools should be:

Decontaminated (i.e. fully dismantled and cleaned under controlled conditions as described in the Code, or

Disposed of in sealed containers similar to that for disposal of the ACM waste product.

Vacuum cleaners used for asbestos cleaning must comply with:

- AS 3544-1988 (Industrial Vacuum Cleaners for Particulates Hazardous to Health) and
- AS4260-1997 High Efficiency Particulate Air Filters (HEPA) - Classification, construction and performance.

### 5.5.3 RCC ASBESTOS REMOVAL PERMIT

An RCC Asbestos Removal Permit form must be completed for any work on ACM.

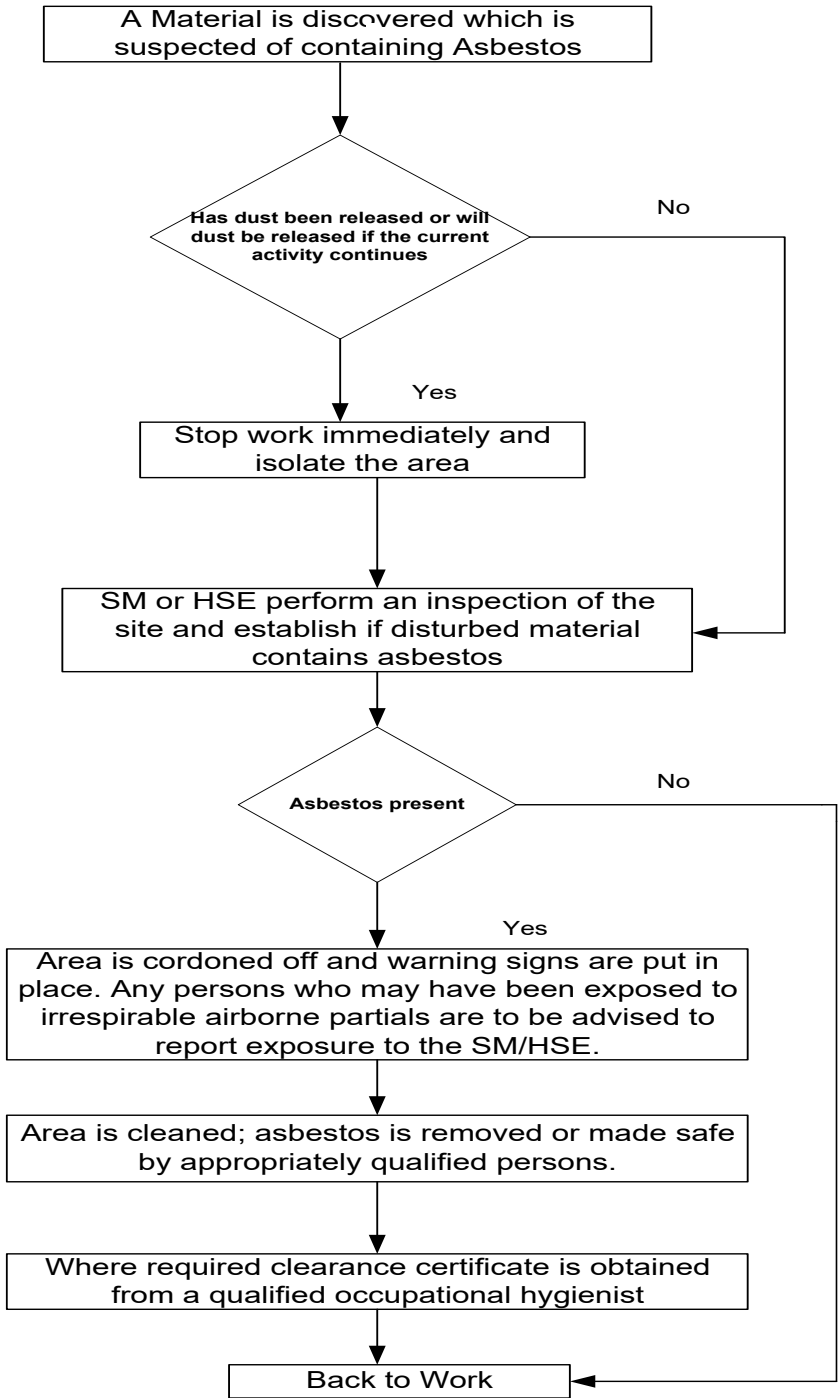
Before being issued with an Asbestos Removal Permit, individuals will be required to peruse the RCC Asbestos Management Plan and the Asbestos Register. Where practicable, contractors should be made aware of the requirements of the plan prior to tendering to ensure they allow for such requirements when quoting.

The Asbestos Removal Permit is designed to ensure appropriate work practices are employed when working with ACM. The Asbestos Removal Permit will document what ACM's are to be removed, encapsulated or otherwise protected, prior to the contracted works proceeding. The Asbestos Removal Permit will also check other requirements such as the need for barricading and airborne fibre monitoring.

The Demolisher or asbestos removal contractor will be responsible to ensure that their workers are aware of their responsibilities and abide by the requirements of the permit.

RCC's Site Manager or HSE Coordinator shall be advised immediately of any incidents of non-compliance with the RCC Asbestos Management plan or the Code.

# 6 INCIDENT RESPONSE FLOW CHART



## 7 DOCUMENTATION REQUIREMENTS

### 7.1 ASBESTOS CONTAINING MATERIAL (ACM) REGISTER FORM 21.1A

The RCC ACM register will be generated where no report has been received from the client or when additional ACM items have been identified but not listed in previous reports.

The RCC ACM register and the clients ACM report will be monitored and signed off where required, when ACM works are completed.

Supporting information that should be included in the register is:

- Register of ACM items
- Register of items which were samples but found to contain no asbestos
- Certificates of analysis
- Photos
- Floor plans with asbestos containing items marked up

### 7.2 ASBESTOS REMOVAL PERMIT FORM 21.1B

The RCC Asbestos removal permit is required to be completed prior to any ACM removal / remedial works.

The requirements for supporting documentation are listed within the permit.

### 7.3 ASBESTOS CONTAINING MATERIAL (ACM) AIR MONITORING & CLEARANCE CERTIFICATE RECORD FORM 21.1C (NOTE: 1 FORM PER ACTIVITY / ITEM)

Asbestos Containing Material (ACM) Air Monitoring & Clearance Certificate Record is used to collate all associated documentation involved in the identification, removal, remediation, transport and disposal of logged ACM.

## 8 TRAINING

### 8.1 ASBESTOS AWARENESS TRAINING

Asbestos awareness training provides participants with a general overview of asbestos including history and background; asbestos types and properties; common asbestos situations; health effects; risk in perspective and management of asbestos. Conducted by RCC person, or RTO. ACT region training conducted by MBA or other ATO accredited company mandatory for Act Workers.

### 8.2 ASBESTOS REMOVAL TRAINING

This course is typically provided by an external registered training organisation (RTO) to personnel who intend to remove bonded ACM, pre-requisite for obtaining a Safework recognised licence



## APPENDIX 2 – 21.11A ASBESTOS REMOVAL PERMIT

Project Name:		Company Performing Work:		
Contractors Contact:		Position:		
Location of works:				
Description of Work:				
RCC Asbestos Register – Item Identification number:				
<b>Asbestos Type</b>				
Bonded Less than 10m <sup>2</sup> <input type="checkbox"/>		No License or Permit / Application required		
Bonded Greater than 10m <sup>2</sup> <input type="checkbox"/>		Copy of WorkCover Stamped, Notification to be obtained from contractor prior to start.		
AS-B Lic. No: _____				
Friable <input type="checkbox"/>		Copy of WorkCover stamped, Permit application to be obtained from contractor prior to start.		
AS-A Lic. No: _____		WorkCover Permit No: _____		
<b>Permit begins</b>		<b>Permit expires</b>		
Date: / /	Time: am/pm	Date: / /	Time: am/pm	
Date: / /	Time: am/pm	Date: / /	Time: am/pm	
Date: / /	Time: am/pm	Date: / /	Time: am/pm	
Date: / /	Time: am/pm	Date: / /	Time: am/pm	
<b>RCC Emergency Contact information</b>				
Name of RCC Contact:		Tel: ( )		
<b>Authorisation by company representative</b>				
The above work is authorised to proceed subject to the following action being taken prior to work starting and procedures being maintained for the duration of the work.				
RCC Representative Name:		Position:	Signature:	
	Yes	N/A	Yes	N/A
Work area has been inspected prior to works proceeding			Contractor has read the requirements of the RCC, ACM Management plan	
Risk Assessment completed			Disposal method established	
Will the area be occupied during the works			Air conditioning / Mechanical ventilation isolated:	
Is it necessary to vacate the building during the works			Electrical isolated (Written confirmation from Electrician required)	
SWMS reviewed by RCC			Signage / Barricades in place	
Air monitoring required			Clearance certificate required	
<b>Weekly Review of Permit</b>				
	Week 1	Week 2	Week 3	Week 4
Signature and position of person issuing the permit:				
Signature of the person conducting the Work:				

## APPENDIX 3 – 21.11B ASBESTOS CONTAINING MATERIAL (ACM) AIR MONITORING AND CLEARANCE CERTIFICATE RECORD

<p>In all Friable removal works and in other cases where requested by RCC or the client, a clearance certificate may be required post completion of ACM removal works. Clearance certificates may require air monitoring to be conducted during the removal process. All monitoring records are to be maintained and kept for a period of 30 years post completion. Separate form required for each location.</p>							
Project Name:		SYDNEY BIOMEDICAL ACCELERATOR			Project Number :		1330
Clearance Certificate location / item details							
RCC ACM Register No: (Refer to ACM register)	Item description, type & Location (Wall sheeting, Bonded)				Removed		Date removed
					Yes	No	
Air Monitoring Results							
Monitoring Unit ID;	Sample location	Start time (24hour)	Finish time (24 Hour)	Average flow rate (mL)	Fibres / Fields	Result Fibres/mL	
Completion sign off by competent person							
Copy of final clearance certificate attached <input type="checkbox"/>				Copy of waste transport receipt attached <input type="checkbox"/>			
Copy of waste disposal dockets attached <input type="checkbox"/>				Copy of ACM work permit attached <input type="checkbox"/>			
Name:		Position:		Signature:		Date:	

## APPENDIX 4 – 40.3 SAFE WORK METHOD STATEMENT: REMOVAL OF BONDED ASBESTOS SCATTERED AT RANDOM

<b>[PCBU Contractor Name, contact details]</b>		<b>Principal Contractor (PC) [Name, contact details]</b>	
<b>Works Manager: Contact Phone:</b>		<b>Date SWMS provided to PC:</b>	<b>Revision No:</b>
<b>Work activity/trade:</b>		<b>Project Name:</b>	
<b>HIGH RISK CONSTRUCTION WORK: HRCW</b>	Risk of a person falling more than 2 metres ( <i>Note: in some jurisdictions this is 3 metres</i> )	Work on a telecommunication tower	Demolition of load-bearing structure
	Likely to involve disturbing asbestos	Temporary load-bearing support for structural alterations or	Work in or near a confined space
	Work in or near a shaft or trench deeper than 1.5 m or a tunnel	Use of explosives	Work on or near pressurised gas mains or piping
	<input type="checkbox"/> Work on or near chemical, fuel or refrigerant lines	Work on or near energised electrical installations or services	<input type="checkbox"/> Work in an area that may have a contaminated or flammable atmosphere
	<input type="checkbox"/> Tilt-up or precast concrete elements	<input type="checkbox"/> Work on, in or adjacent to a road, railway, shipping lane or other traffic corridor in use by traffic other than	<input type="checkbox"/> Work in an area with movement of powered mobile plant
	<input type="checkbox"/> Work in areas with artificial extremes of temperature	<input type="checkbox"/> Work in or near water or other liquid that involves a risk of drowning	<input type="checkbox"/> Diving work
<b>Person responsible for ensuring compliance with</b>		<b>Date SWMS received:</b>	
<b>What measures are in place to ensure compliance with the SWMS?</b>			
<b>Person responsible for reviewing SWMS control measures:</b>		<b>Date SWMS received by reviewer:</b>	

<b>How will the SWMS control measures be</b>			
<b>Review date:</b>		<b>Reviewer's signature:</b>	
<b>Procedure (in steps):</b>	<b>Possible Hazards</b>	<b>Control Measures</b>	
Break the job down into steps should accomplish and be	Situation with no illness, damage, any injury Eg loss of car	What actions are necessary to eliminate, substitution, isolation or	
Isolation / protection of Asbestos containing material (ACM)	Disturbance of ACM Incorrect removal	Isolate identified material by removing workers from the area and barricading off minimum radius of 5 metres - Danger tape. Warning signage to be placed at the barrier to area warning of ACM Restrict access to one entry point ONLY Asbestos register to be updated in accordance with ACM Register. Initiate RCC ACM works permit process	
Establish works area / removal area	Unauthorised entry to areas	Identify the boundary for the works area i.e the location where ACM is to be removed from and identify with danger tape and signage advising ACM removal in progress. Identify area for removal site i.e. the isolated region around the works, identify with danger tape & signage warning of restricted access ACM removal works in progress.	
Protection of surrounding areas / adjoining structures	Adjoining areas contaminated by removal process	Prior to any removal: Protection in the form of 200 micron plastic to be secured to protect adjoining finishes (Floors / walls) Isolation / lock out of mechanical ventilation required prior to starting	
Sealing of ACM prior to removal	Disturbance of ACM Water run off Electrical outlets i.e. switches, lights, outlets, alarms etc.	Ensure all electrical items are isolated from supply. Ensure all Any drains within the area to be protected. PPE as identified above. Low pressure coarse spray to be applied to all faces / edges. A mixture of water & PVA solution or detergent or paint can be used as a wetting agent. Ensure surface is saturated but minimise run off	

		<p>Ensure ACM is saturated through it's full depth prior to removal / disturbing.</p> <p>Spray all accessible voids where dust may exist</p>
Removal process	<p>Damage to sheets</p> <p>General disturbance</p> <p>Manual handling</p>	<p>Determine methodology for removal Remove any loose sections prior to removing fixed sheets.</p> <p>Ensure all disturbed areas remain saturated, re-apply dampening method as required.</p> <p>Avoid breaking sheets where possible. Should sheets continually break, reassess method of removal.</p> <p>Support sheets prior to removing fixings</p> <p>Where possible, remove nails / fixings or punch nail heads through sheeting.</p> <p>2 person lifts for heavy or awkward materials.</p> <p>PPE as specified above.</p>
Packaging waste	<p>Packages become loose and tear</p> <p>Materials spill onto ground</p> <p>Manual handling</p>	<p><b>For small pieces</b>, ACM to be packaged into man-handleable packages, enclosed in heavy duty 200 micron plastic. (Bag or wrap) Where possibility of tearing is identified 2 layers may be required.</p> <p>Bags to be labelled with appropriate warnings similar to ' Caution Asbestos' or Asbestos within, do not open bag.</p> <p>Where bags are used, opening to be twisted and folded over and fixed with tape or other means.</p> <p><b>For larger sections</b>, skips may be used but must be in good condition.</p> <p>Skip is to be lined in 2 layers of 200 micron plastic. ACM must be kept wet.</p> <p>Once skip is full, it's contents must be sealed with the plastic sheeting.</p>
Clean up	<p>Adjoining areas contaminated by removal process</p> <p>Manual handling</p>	<p>Ensure all disturbed areas remain saturated, re-apply dampening method as required.</p> <p>Start from the top and work down cleaning ledges, sills &amp; high flat areas that ACM can settle. Remove any loose items.</p> <p>Start cleaning and removing plastic from furthest workpoint from exit working towards the exit point.</p> <p>The use of an Asbestos vacuum is permitted for dry decontamination cleaning.</p> <p>All waste to be disposed of in Same way to ACM. (Lined bin,</p>

		<p>plastic bag 200 micron)          All PPE to remain on till area is decontaminated.          Scrape / clean off excess materials from boots, tools etc with damp rag, into Asbestos waste bag.          All disposable PPE to be placed in Asbestos waste bag and not re-used.</p>
Disposal of waste	Incorrect disposal of waste	<p>Materials to be disposed of at registered waste management facility, capable of receiving Hazardous waste.          Receipts of waste disposal to be collected and recorded in Asbestos register.</p>
Other items as identified		



<b>Project: (List Project Name)</b>	<b>Signed by Senior Management Company Rep.</b>
<b>Contractor:</b> Richard Crookes Constructions. Lvl 3. 4 Broadcast Wav. Artarmon NSW 2064	<b>Signature: (Who has reviewed the SWMS)</b>
<b>Description of Work: SWMS - Removal of BONDED Asbestos containing material ONLY (ACM) quantity less than 10 square metres (Non licensed - Minor works)</b>	<b>Title: (Your title)</b>
	<b>Date: (Date reviewed prior to release)</b>

Potential Environmental Impacts:	
Air (odour, dust, fumes)	<input checked="" type="checkbox"/> Spills to ground <input checked="" type="checkbox"/>
Noise	<input type="checkbox"/> Soil Erosion <input type="checkbox"/>
Vibration	<input type="checkbox"/> Contamination/Haz materials <input checked="" type="checkbox"/>
Spills to drains/waterways	<input checked="" type="checkbox"/> Traffic / community <input type="checkbox"/>
Flora	<input type="checkbox"/> Fauna <input type="checkbox"/>
Waste:	<input checked="" type="checkbox"/> Other: <input type="checkbox"/>

Safety Equipment	
Fire extinguishers	<input type="checkbox"/>
Barricades	<input checked="" type="checkbox"/>
Ventilation	<input type="checkbox"/>
Lighting	<input type="checkbox"/>
Ladders/mobile scaffold	<input type="checkbox"/>
Traffic control	<input type="checkbox"/>
Welding screens	<input type="checkbox"/>
Dust extraction	<input type="checkbox"/>
Emergency response	<input type="checkbox"/>

Permits	
Hot Work	<input type="checkbox"/>
Excavation	<input type="checkbox"/>
Confined Space	<input type="checkbox"/>
Tag out / Lock out	<input type="checkbox"/>
Formwork stripping	<input type="checkbox"/>
Fall Arrest Systems	<input type="checkbox"/>
Scaffold	<input type="checkbox"/>
Other: RCC Asbestos Permit to Work	

Personal Protective Equipment (PPE)	
Hard Hat	<input checked="" type="checkbox"/>
High Vis. Clothing	<input type="checkbox"/>
Steep capped boots	<input checked="" type="checkbox"/>
Face Shield/Welding Shield	<input type="checkbox"/>
Safety Glasses	<input checked="" type="checkbox"/>
Gloves	<input checked="" type="checkbox"/>
Hearing Protection	<input type="checkbox"/>
Fall Protection/Harness	<input type="checkbox"/>
Other Task Specific: Face mask - Type 2 Cartridge, Disposable over-alls (Non - Velcro type).	

Procedure (in steps):	Possible Hazards	Risks	Inherent Risk Score (risk with no controls)	Control Measures	Residual Risk Score (risk after controls in place)	Resp. Person
Break the job down into steps. Each of the steps should accomplish some major tasks and be logical	Situation with potential to harm – injury, illness, damage, environmental impact Eg.loss of control of plant	List Eg. Damage to plant, buildings etc.injury or death, spills	Refer to RCC Risk Assessment Calculator F 21.5 Score 1, 2, 3	What actions are necessary to eliminate or minimise the hazards – elimination, substitution, isolation, engineers solutions and lastly PPE	Refer to RCC Risk Assessment Calculator F 21.5 Score 1, 2, 3	
Isolation / protection of Asbestos	Disturbance of ACM	Dust inhalation	1	Isolate identified material by removing	3	HSE

Risk Scores: 1= Immediately Stop work until controls in place, 2 =High priority controls in place as soon as practicable, 3= Low risk, planned re assessment of risk

Procedure (in steps):	Possible Hazards	Risks	Inherent Risk Score (risk with no controls)	Control Measures	Residual Risk Score (risk after controls in place)	Resp. Person
containing material (ACM)	Incorrect removal	Long term health effects Cross contamination Whole of site closure		workers form the area and barricading off minimum radius of 5 metres – Danger tape. Warning signage to be placed at the barrier to area warning of ACM Restrict access to one entry point ONLY Asbestos register to be updated in accordance with ACM Register. Initiate RCC ACM works permit process		SM
Establish works area / removal area	Unauthorised entry to areas	Workers exposed to ACM	2	Identify the boundary for the works area i.e the location where ACM is to be removed from and identify with danger tape and signage advising ACM removal in progress. Identify area for removal site i.e. the isolated region around the works, identify with danger tape & signage warning of restricted access ACM removal works in progress.	3	SM, HSE Competent Person
Protection of surrounding areas / adjoining structures	Adjoining areas contaminated by removal process	Workers exposed to ACM	1	Prior to any removal: Protection in the form of 200 micron plastic to be secured to protect adjoining finishes (Floors / walls) Isolation / lock out of mechanical ventilation required prior to starting	3	Competent Person
Sealing of ACM prior to removal	Disturbance of ACM	Cross contamination	2	Ensure all electrical items are isolated	3	Competent

Risk Scores: 1= Immediately Stop work until controls in place, 2 =High priority controls in place as soon as practicable, 3= Low risk, planned re assessment of risk

Procedure (in steps):	Possible Hazards	Risks	Inherent Risk Score (risk with no controls)	Control Measures	Residual Risk Score (risk after controls in place)	Resp. Person
	Water run off Electrical outlets i.e. switches, lights, outlets, alarms etc.	to other areas Electrocution Explosion Slips / falls		from supply. Ensure any drains within the area are protected. PPE as identified above. Low pressure coarse spray to be applied to all faces / edges. A mixture of water & PVA solution or detergent or paint can be used as a wetting agent. Ensure all exposed surfaces (where exposed) are saturated but minimise run off, prior to removal / disturbing. Ensure ACM is saturated (where exposed), prior to removal / disturbing. Spray all accessible voids where dust may exist		Person
Removal process	Damage to sheets General disturbance Manual handling	Workers exposed to ACM Dust generation Cross contamination to other areas Strains / cuts	1	Determine methodology for removal Remove any loose sections prior to removing fixed sheets. Ensure all disturbed areas remain saturated, re-apply dampening method as required. Avoid breaking sheets where possible. Should sheets continually break, reassess method of removal. Support sheets prior to removing fixings Where possible, remove nails / fixings or punch nail heads through sheeting. 2 person lifts for heavy or awkward	3	Competent Person

Risk Scores: 1= Immediately Stop work until controls in place, 2 =High priority controls in place as soon as practicable, 3= Low risk, planned re assessment of risk

Procedure (in steps):	Possible Hazards	Risks	Inherent Risk Score (risk with no controls)	Control Measures	Residual Risk Score (risk after controls in place)	Resp. Person
				materials. PPE as specified above.		
Packaging waste	Packages become loose and tear Materials spill onto ground Manual handling	Workers exposed to ACM Dust generation Whole of site closure Environmental damage  Strains / cuts	1	<b>For small pieces</b> , ACM to be packaged into man handle-able packages, enclosed in heavy duty 200 micron plastic. All asbestos waste must be double bagged or wrapped in 2 layers of 0.2mm plastic Bags to be labelled with appropriate warnings similar to 'Caution Asbestos' or Asbestos within, do not open bag. Where bags are used, opening to be twisted and folded over and fixed with tape or other means.	3	Competent Person
Clean up	Adjoining areas contaminated by removal process Manual handling	Workers exposed to ACM Dust generation Environmental damage Strains	1	Ensure all disturbed areas remain saturated, re-apply dampening method as required. Start from the top and work down cleaning ledges, sills & high flat areas that ACM can settle. Remove any loose items. Start cleaning and removing plastic from furthest work point from exit working towards the exit point. The use of an Asbestos vacuum is permitted for dry decontamination cleaning. All waste to be disposed of in Same	3	SM HSE Competant Person

Risk Scores: 1= Immediately Stop work until controls in place, 2 =High priority controls in place as soon as practicable, 3= Low risk, planned re assessment of risk

Procedure (in steps):	Possible Hazards	Risks	Inherent Risk Score (risk with no controls)	Control Measures	Residual Risk Score (risk after controls in place)	Resp. Person
				way to ACM. (Lined bin, plastic bag 200 micron) All PPE to remain on till area is decontaminated. Scrape / clean off excess materials from boots, tools etc with damp rag, into Asbestos waste bag. All disposable PPE to be placed in Asbestos waste bag and not re-used.		
Disposal of waste	Incorrect disposal of waste	Environmental contamination Environmental fines imposed People exposed Commercial disgrace	1	Materials to be disposed of at registered waste management facility, capable of receiving Hazardous waste. Receipts of waste disposal to be collected and recorded in Asbestos register.	3	SM
Other items as identified						

Details of Site Supervisory staff		
Name:	Qualification:	Certificates of Competence / Safework Approvals required:

Training Required to Complete Work
General WHS Induction Training
Work activity training - (Asbestos awareness training)
SWMS Training
Manual Handling training
Personal protective equipment
Other: RCC Asbestos Management Plan

Plant & Equipment: (Log books to be supplied)	

Codes of Practice, Legislation, etc. applicable :
Act: Work Health & Safety Act 2011 Protection of the Environment Operations Act 1997
Regulation: Work Health & Safety Regulation 2017
Codes of Practice: COP For the safe removal of Asbestos [NOHSC:2018 (2005)] COP- How do manage and control asbestos in the workplace- Oct 2018 COP- How to safely remove asbestos- Oct 2018
Hygienists report, if submitted.





## SYDNEY

LEVEL 3, 4 BROADCAST WAY  
ARTARMON NSW 2064

PO BOX 1024  
CROWS NEST NSW 1585

PHONE: +61 2 9902 4700  
FAX: +61 2 9439 1114

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## NEWCASTLE

LEVEL 1, 118A BELFORD ST  
BROADMEADOW NSW 2292

PO BOX 835  
HAMILTON NSW 2303

PHONE: +61 2 9902 4700  
FAX: +61 2 6766 3022

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## TAMWORTH

SUITE 1, 493 PEEL ST  
TAMWORTH NSW 2340

PO BOX 576  
TAMWORTH NSW 2340

PHONE: +61 2 6766 5225  
FAX: +61 2 6766 3022

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## ACT

UNIT 1, 155 NEWCASTLE ST  
FYSHWICK ACT 2609

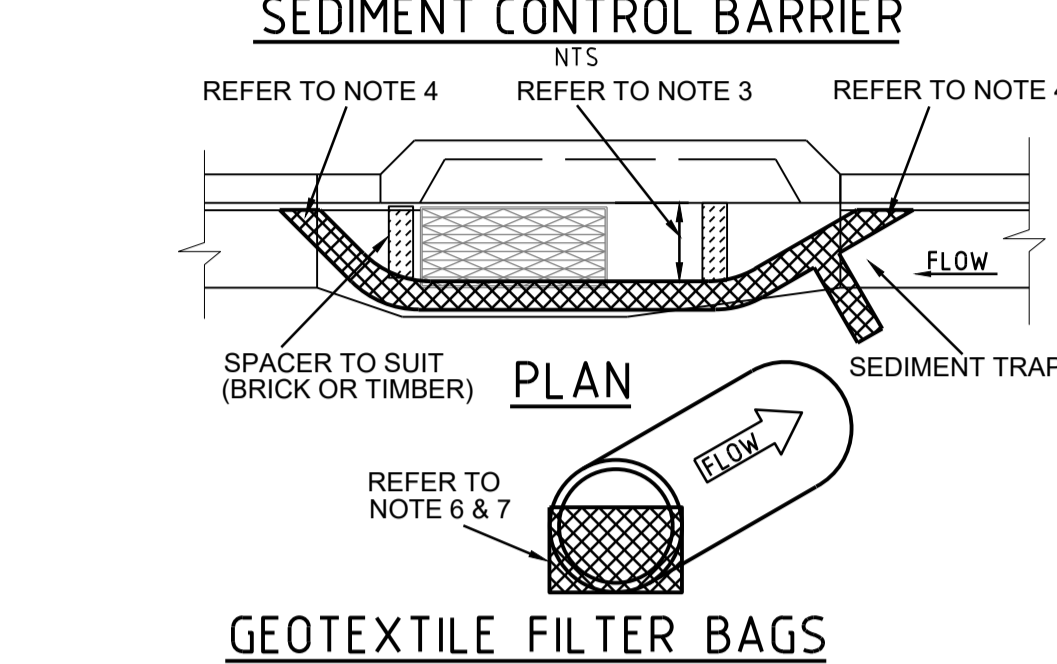
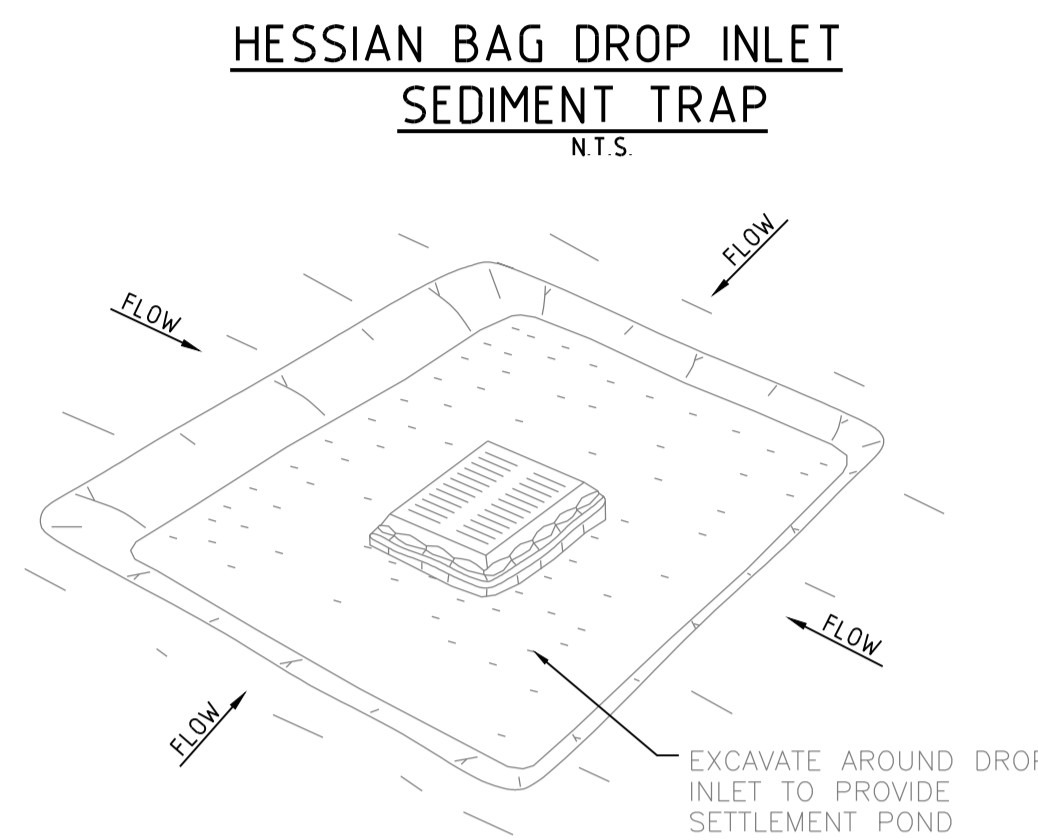
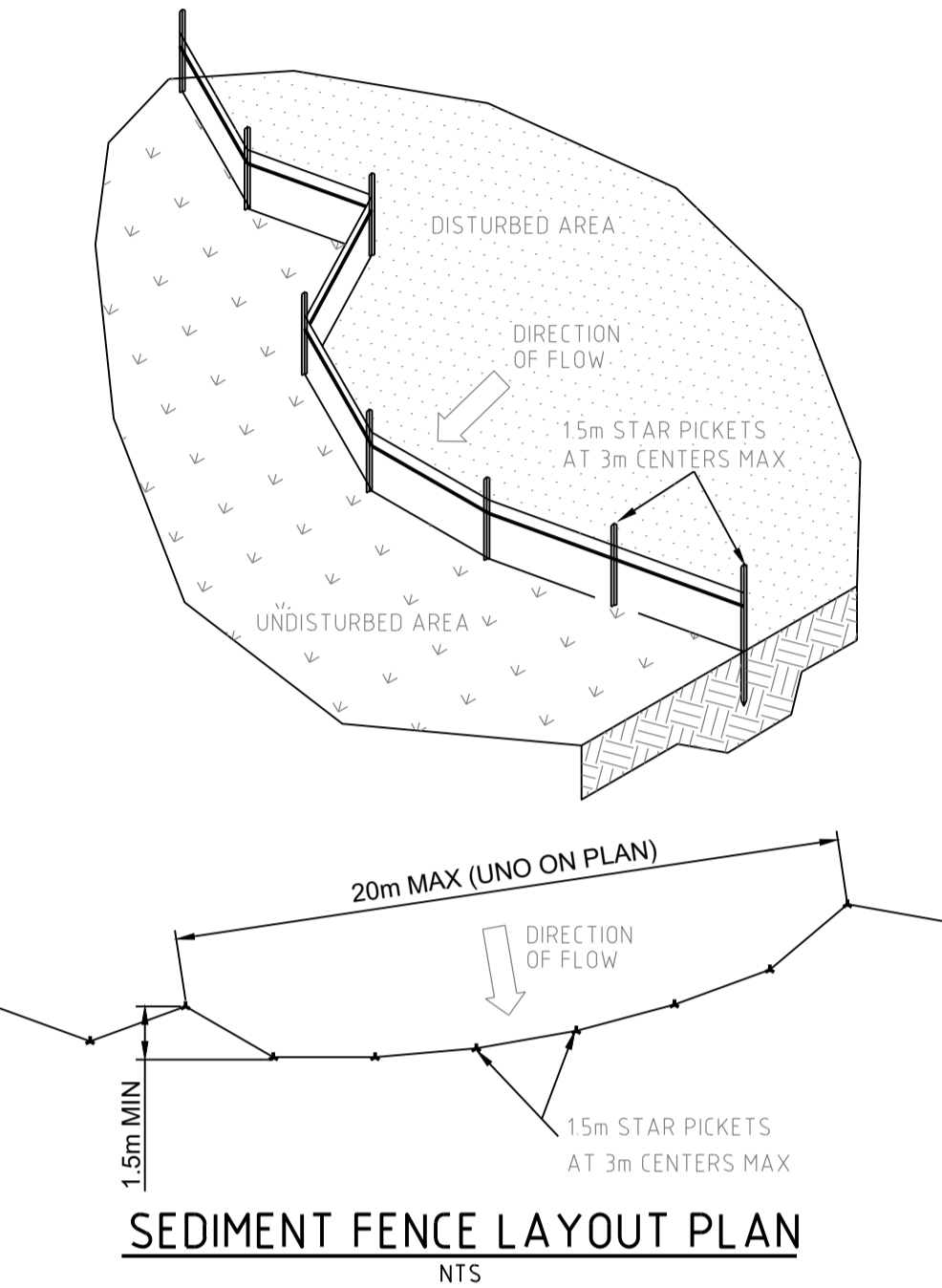
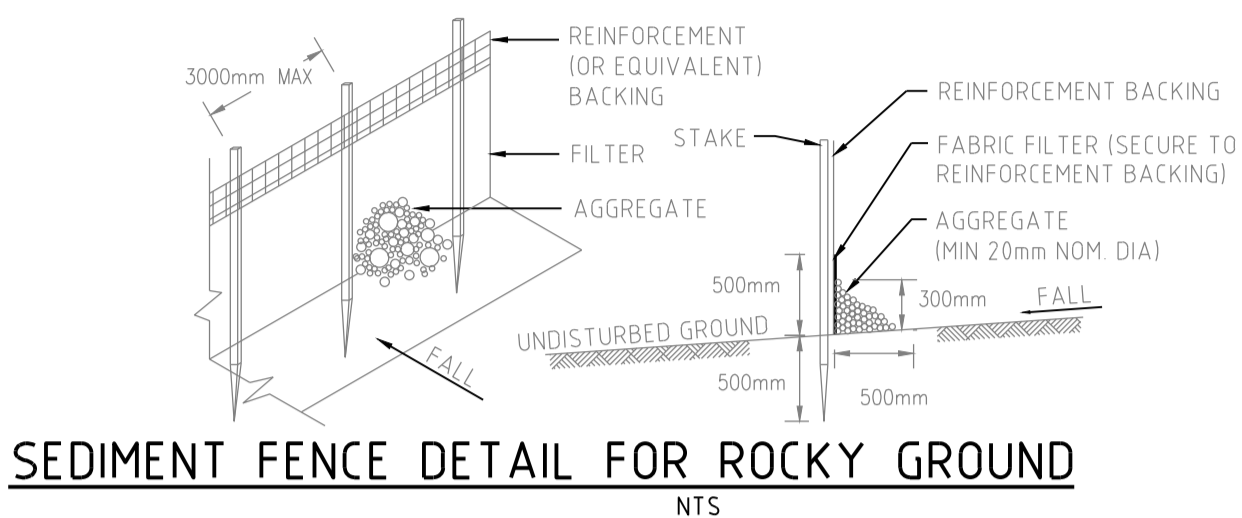
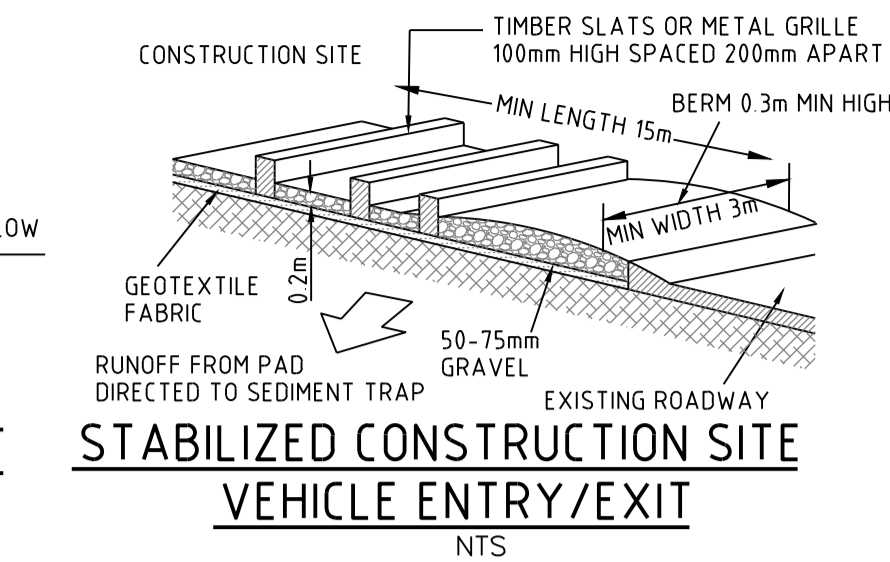
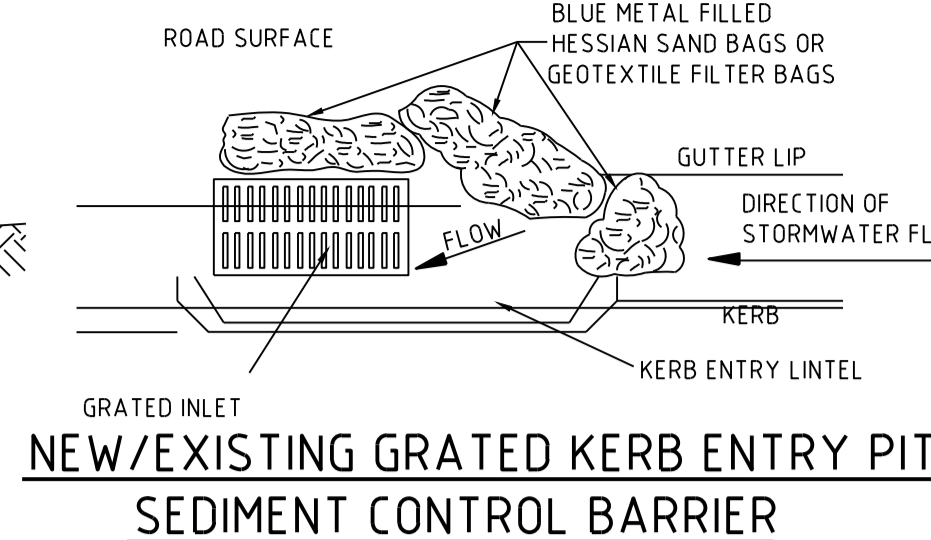
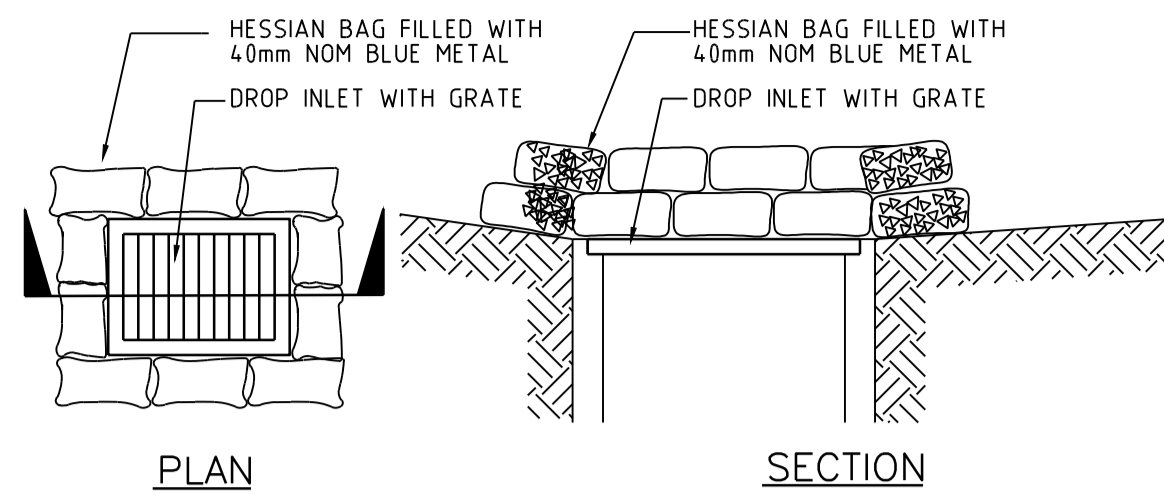
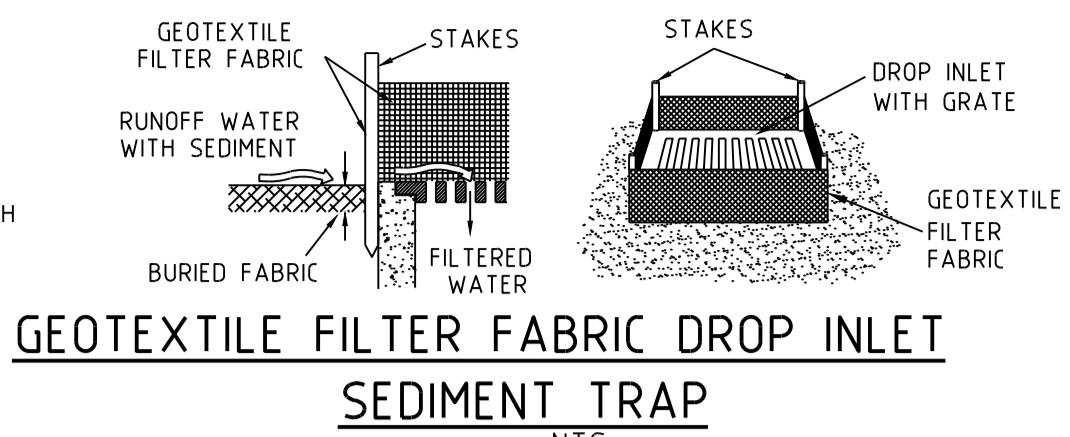
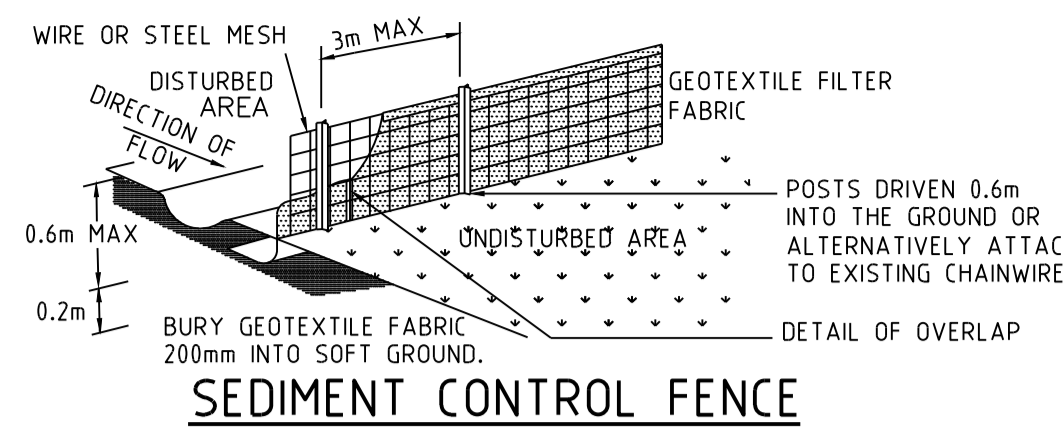
PO BOX 771  
FYSHWICK ACT 2609

PHONE: +61 2 6143 2900  
FAX: +61 2 6280 8774

## 6.8 EROSION AND SEDIMENT CONTROL PLAN



## 6.9 EROSION AND SEDIMENT CONTROL DETAILS

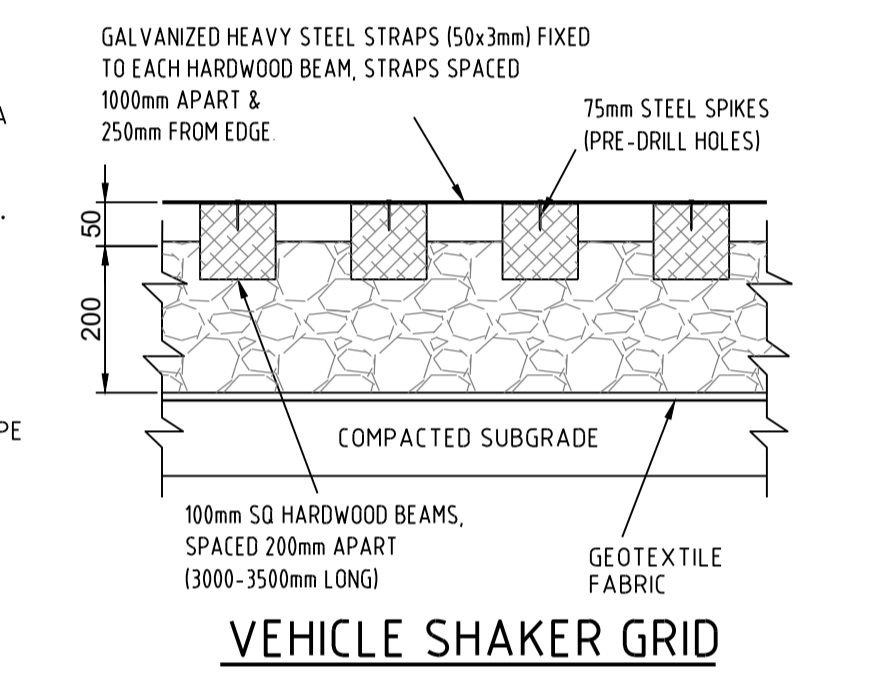


- SITE ENTRY/EXIT NOTES:-**
- ALL VEHICLE ENTRANCES & EXITS TO THE CONSTRUCTION SITE MUST BE STABILIZED TO PREVENT THEM BECOMING A SOURCE OF SEDIMENT. BY PROVIDING A VEHICLE SHAKE AREA, THIS MAY CONSIST OF A TIMBER, CONCRETE OR STEEL SHAKER GRID OR RUBBLE AREA.
  - THE VEHICLE EXIT AREA IS TO BE MAINTAINED IN A CLEAN & SERVICEABLE CONDITION DURING THE TOTAL TIME OF USAGE.
  - ANY UNSEALED ROAD BETWEEN THE DEVICE AND COUNCIL'S ROADWAY IS TO BE TOPPED WITH 100mm THICK, 40mm NOMINAL SIZE AGGREGATE.
  - PUBLIC ROADS MUST BE KEPT FREE OF DIRT AND MUD. SEDIMENT TRACKED ONTO THE PUBLIC ROADWAY BY VEHICLES LEAVING THE CONSTRUCTION SITE IS TO BE SWEEPED UP IMMEDIATELY.
  - FENCES SHOULD BE ERECTED TO ENSURE VEHICLES CAN NOT BYPASS THE STABILIZED ACCESS POINTS, UNLESS COMING FROM A STABILIZED AREA.

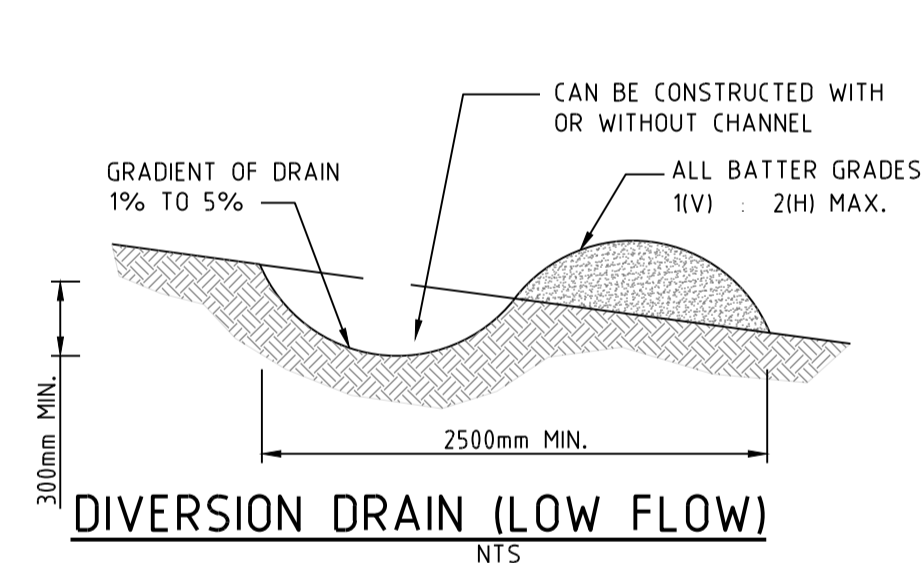
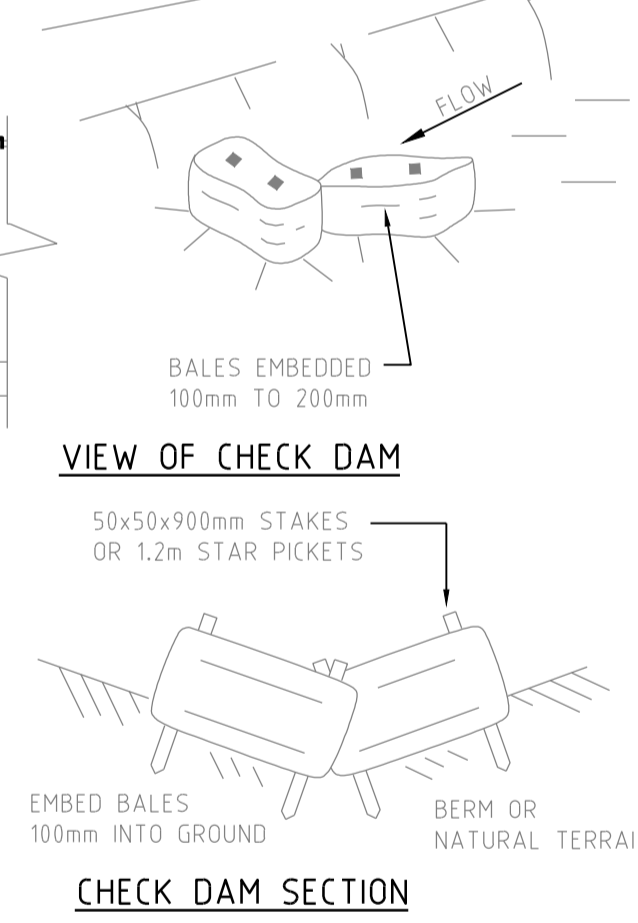
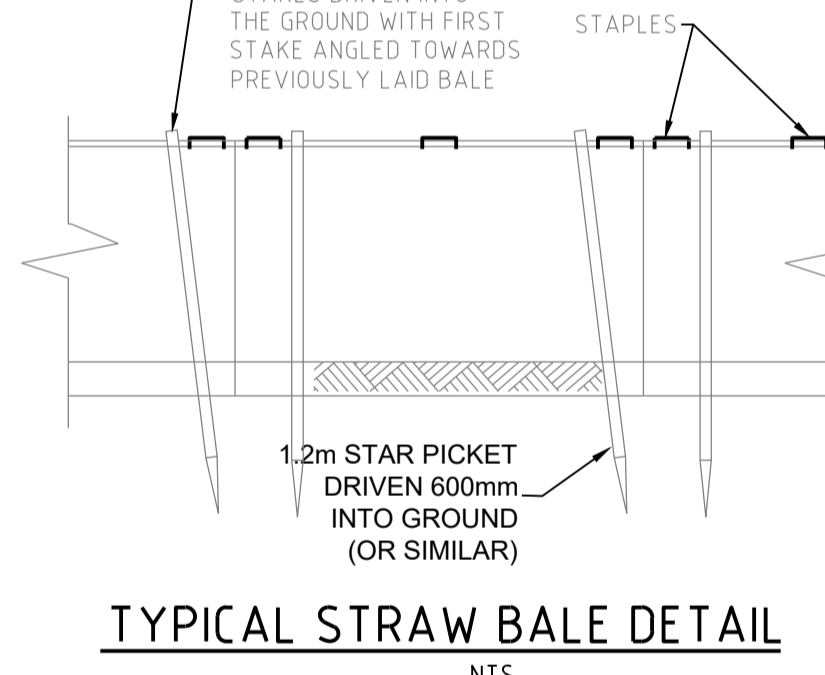
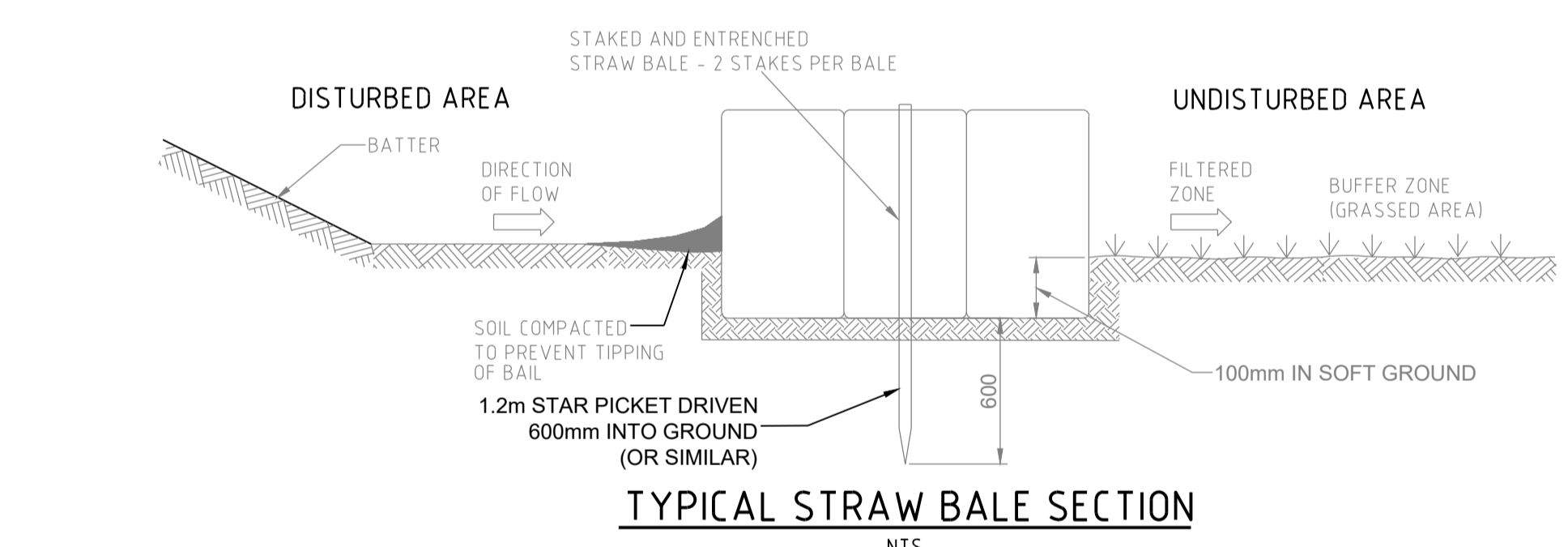
- SEDIMENT FENCE NOTES:-**
- CONSTRUCT SEDIMENT FENCE AS CLOSE AS POSSIBLE TO PARALLEL TO THE CONTOURS OF THE SITE OR AT THE TOE OF A SLOPE.
  - DRIVE 1.5 METRE LONG STAR PICKETS INTO GROUND SUFFICIENT TO PROVIDE RIGID SUPPORT, 3 METERS APART. WHERE THERE IS INSUFFICIENT SOIL DEPTH OVER ROCK, HOLES ARE TO BE DRILLED INTO ROCK TO ACCEPT THE STAR PICKETS.
  - ON SOFT GROUND MATERIALS, DIG A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
  - BACKFILL TRENCH OVER BASE OF FABRIC & COMPACT.
  - FIX SELF-SUPPORTING GEOTEXTILE TO UPSLOPE SIDE OF POSTS WITH WIRE TIES OR AS RECOMMENDED BY THE GEOTEXTILE MANUFACTURER. USE A REINFORCEMENT BACKING WITH NON SELF-SUPPORTING GEOTEXTILE FABRIC.
  - JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
  - ON HARD OR ROCKY GROUND, SMOOTH A 500mm WIDE STRIP UPSLOPE OF THE FENCE LINE. TURN THE BOTTOM 500mm OF THE FABRIC UPSLOPE AND ANCHOR IN PLACE WITH SUITABLE AGGREGATE.
  - WHERE A SEDIMENT FENCE IS CONSTRUCTED DOWN SLOPE FROM A DISTURBED BATTER THE FENCE SHOULD BE LOCATED 1.5 TO 2.0 METERS DOWN SLOPE FROM THE TOE OF THE BATTER.

- EXCAVATED SEDIMENT TRAP NOTES:-**
- REMOVE THE SEDIMENT WHEN IT HAS ACCUMULATED TO HALF THE DESIGN DEPTH OF THE TRAP AND RESTORE THE TRAP TO ITS ORIGINAL DIMENSIONS.
  - PROVIDE 50 cu.m/Ha OF SEDIMENT STORAGE VOLUME.
  - REFER TO THE MAINTENANCE REQUIREMENTS.

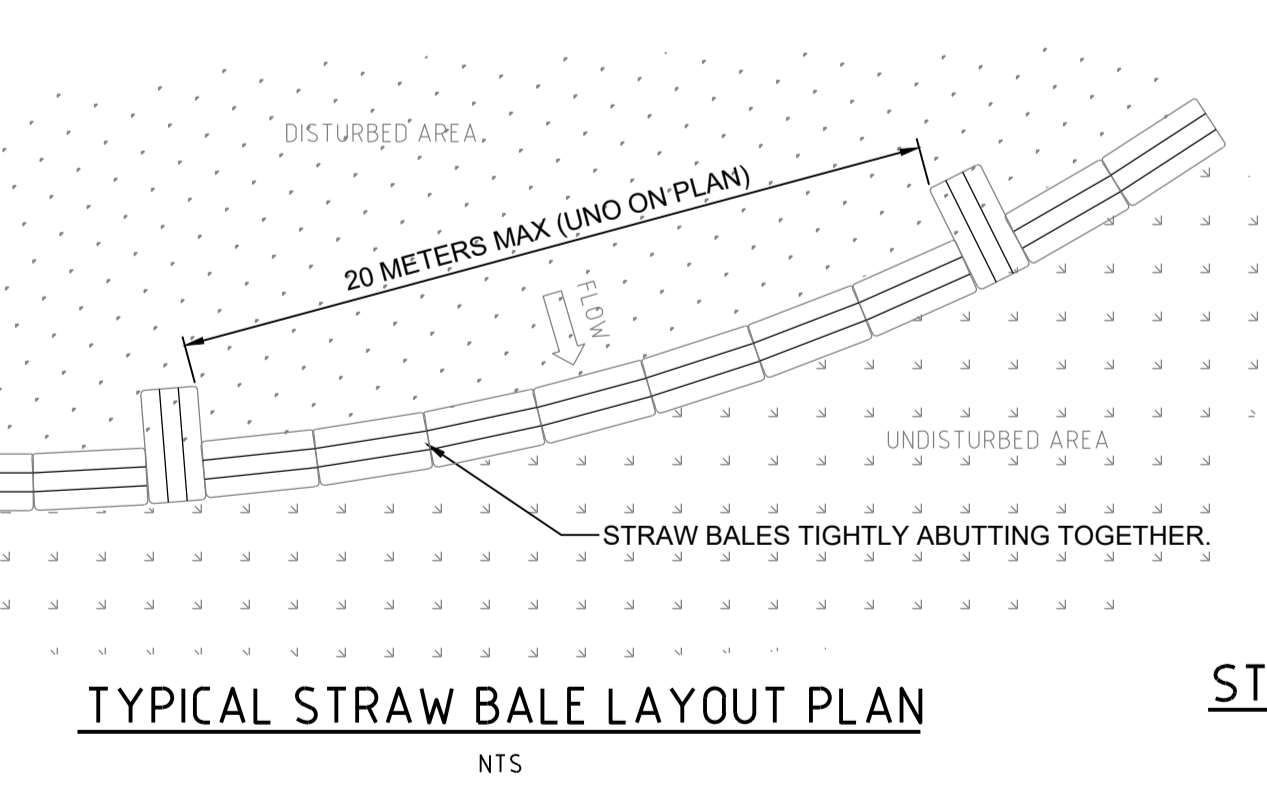
- SEDIMENT BARRIER FOR PITS & PIPES, NOTES:-**
- SLEEVES ARE TO BE MADE FROM GEOTEXTILE FABRIC LONGER THEN THE LENGTH OF THE INLET PIT.
  - FILL SLEEVE WITH 5 OR 10mm CLEAN GRAVEL.
  - PLACE THE SLEEVE AT THE OPENING OF THE KERB INLET LEAVING A 100mm GAP TO ACT AS AN EMERGENCY OVERFLOW.
  - SLEEVE MUST BE PLACED AGAINST THE KERB TO PREVENT BYPASS.
  - FIT SLEEVE TO ALL INLETS DOWNSTREAM OF THE WORKS.
  - FOR DRAINAGE WORKS FIT GEOTEXTILE FABRIC OR GEO BAGS TO UPSLOPE FACE OF ALL OPEN PIPES.
  - MAINTAIN AN OPENING AT THE TOP OF THE PIPE OF 1/3 OF THE PIPE DIAMETER.
  - THE FILTERS ARE TO BE CLEANED AND MAINTAINED DAILY.
  - ALL CARE SHOULD BE TAKEN TO MINIMIZE SEDIMENT REACHING THE STORMWATER SYSTEM BY MINIMIZING EXCAVATION WORKS AND PREVENTING EXCESS WATER FLOW THROUGH WORKS.



- SITE ENTRY/EXIT CONSTRUCTION NOTES:-**
- STRIP TOP SOIL & LEVEL SITE. PROVIDE CATCH DRAIN AT SIDES TO DIRECT RUNOFF WATER TO SEDIMENT TRAPS.
  - COMPACT SUBGRADE AND REMOVE ANY HIGH POINTS.
  - COVER AREA WITH GEOTEXTILE FABRIC. THIS MAY BE WOVEN OR NEEDLE PUNCHED PRODUCT WITH A MINIMUM CBR BURST STRENGTH (AS3706.4-90) OF 2500 N.
  - CONSTRUCT 200mm THICK RUBBLE PAD OVER GEOTEXTILE USING ROAD BASE OR 30-40mm AGGREGATE. MINIMUM LENGTH 15 METRES OR TO BUILDING ALIGNMENT. MINIMUM WIDTH 3 METRES. CONSTRUCT 300mm HIGH HUMP IMMEDIATELY WITHIN BOUNDARY TO DIVERT WATER TO A SEDIMENT TRAP.
  - WHERE GRIDS ARE USED FIRST CONSTRUCT A 150 THICK PAD OVER GEOTEXTILE FABRIC. LEVEL THIS IN BOTH DIRECTIONS. LOWER GRID ON TO THE PREPARED BASE AND ENSURE THAT NO PART IS SITTING ON ANY HIGH POINTS. BACKFILL THE SPACES BETWEEN THE GRIDS TO WITHIN 50mm OF THE TOP.
  - PROVIDE RAMPS AT ENDS AND SIDE OF GRIDS. IF DEPRESSIONS OCCUR IN THE RAMPS DURING USE. ADD ADDITIONAL MATERIAL.



- STRAW BALE NOTES:-**
- CONSTRUCT STRAW BALE FILTER AS CLOSE AS POSSIBLE TO PARALLEL TO THE CONTOURS OF THE SITE OR AT THE TOE OF A SLOPE.
  - PLACE BALES LENGTHWISE IN A ROW WITH ENDS TIGHTLY ABUTTING. USE STRAW TO FILL ANY GAPS BETWEEN BALES. STRAWS TO BE PLACED PARALLEL TO GROUND.
  - MAXIMUM HEIGHT OF FILTER IS ONE BALE.
  - ON SOFT MATERIALS, EMBE EACH BALE IN THE GROUND 75mm TO 100mm AND ANCHOR WITH TWO 1.2 METRE STAR PICKETS. ANGLE THE FIRST STAKE IN EACH BALE TOWARDS THE PREVIOUSLY LAID BALE. DRIVE STAKES 600mm INTO THE GROUND AND FLUSH WITH THE TOP OF THE BALES.
  - WHERE A STRAW BALE FILTER IS CONSTRUCTED DOWN SLOPE FROM A DISTURBED BATTER THE BALES SHOULD BE LOCATED 1.5 TO 2.0 METERS DOWN SLOPE FROM THE TOE OF THE BATTER.
  - WHERE REQUIRED WRAP GEOTEXTILE FILTER FABRIC AROUND BALES AND STAPLE IN POSITION.



**STRAW BALE CHECK DAM DETAILS**  
NTS

LONGITUDINAL GRADE (%)	SPACING (METERS)
0 - 5	4.0
5 - 10	3.0
10 - 15	2.0
GREATER THAN 15	1.0

- DIVERSION DRAIN NOTES:-**
- CONSTRUCT WITH GRADIENT OF 1 PER CENT TO 5 PER CENT.
  - AVOID REMOVING TREES AND SHRUBS IF POSSIBLE.
  - DRAINS TO BE OF CIRCULAR, PARABOLIC OR TRAPEZOIDAL CROSS SECTION NOT V-SHAPED.
  - EARTH BANKS TO BE ADEQUATELY COMPACTED IN ORDER TO PREVENT FAILURE.
  - PERMANENT OR TEMPORARY STABILIZATION OF THE EARTH BANK TO BE COMPLETED WITHIN 10 DAYS OF CONSTRUCTION.
  - ALL OUTLETS FROM DISTURBED LANDS ARE TO FEED INTO A SEDIMENT BASIN OR SIMILAR.
  - DISCHARGE RUN OFF COLLECTED FROM UNDISTURBED LANDS ONTO EITHER A STABILIZED OR AN UNDISTURBED DISPOSAL SITE WITHIN THE SAME SUBCATCHMENT AREA FROM WHICH THE WATER ORIGINATED.
  - COMPACT BANK WITH A SUITABLE IMPLEMENT IN SITUATIONS WHERE THEY ARE REQUIRED TO FUNCTION FOR MORE THAN FIVE DAYS.
  - EARTH BANKS TO BE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT WILL IMPEDE NORMAL FLOW.

- MAINTENANCE REQUIREMENTS:-**
- ACCUMULATED SILT & SEDIMENT MUST BE REMOVED AT REGULAR INTERVALS AND AFTER EACH MAJOR STORM.
  - SILT & SEDIMENT MUST BE REMOVED FROM OFF THE SITE OR TO A COUNCIL APPROVED LOCATION WITHIN THE SITE, WHERE IT WILL NOT ERODE.
  - THE SEDIMENT FENCES, BALES & TRAPS SHALL BE REGULARLY INSPECTED, ESPECIALLY AFTER RAIN AND KEPT IN GOOD REPAIR AND FUNCTIONING CONDITION AT ALL TIMES.
  - CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT SEDIMENT, EROSION & WATER POLLUTION SHALL BE MINIMIZED.
  - THE SEDIMENT TRAPS SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE CONSTRUCTION AREA HAS BEEN PROPERLY STABILIZED.

No. 13/2023/18 A.H. REC  
 Plan Date: 13/05/2023/15411  
 Logon Name: you  
 Call File: 13883002-Drawing/Asst/CD/Design/01/2023/02\_Sediment and Erosion Control Details.dwg

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**DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR**

REVISION	AMENDMENT	DATE	REVISION	AMENDMENT	DATE
1	ISSUE FOR 70% DETAILED DESIGN	15/12/23			
2	ISSUE FOR TENDER	23/04/24			
A	ISSUE FOR CONSTRUCTION	13/05/25			

CLIENT  
**RICHARD CROOKES CONSTRUCTIONS**

PROJECT  
**SYDNEY BIOMEDICAL ACCELERATOR**

PREPARED BY

WSce Pty Ltd  
ACN 648 655 141  
ABN 75 648 655 141  
info@wsce.com.au  
www.wsce.com.au

Driven by excellence, built on experience.

TITLE  
**SEDIMENT AND EROSION CONTROL DETAILS**

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	R.X.	J.G.	
JOB No.	DRAWING No.		ISSUE	
	5835002		C2.02 A	
DATE	STATUS			
APRIL 2024	ISSUE FOR CONSTRUCTION			

**NOT FOR CONSTRUCTION**

## 6.10 COMMUNITY CONSULTATION AND ENGAGEMENT PLAN

RICHARD CROOKES  
  
CONSTRUCTIONS

SYDNEY BIOMEDICAL ACCELERATOR (SBA)  
JOB NO. 1330

# COMMUNITY CONSULTATION & ENGAGEMENT STRATEGY

16 June 2025



This plan has been approved for use by the following:

Approved by / Date

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Project Manager

Approved by / Date

---

Stakeholder & Workforce Development Manager

Approved by / Date

---

Approved by / Date

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	COMPANY NAME	NO. OF COPIES
<Client / Superintendent>	Sydney University, Sydney Local Health District & NSW Health	1 copy
<Project Manager>	Richard Crookes Constructions	1 copy
<Site Manager>	Richard Crookes Constructions	1 copy

**REVISION REGISTER**

REVISION DATE	REVISION DESCRIPTION	PMS INITIALS (ACCEPTANCE OF CHANGES)
14/04/2025	Original issue	JA
03/06/2025	Updated Incident Management and Escalation Procedure, and Incident Categories (Severity of Impact)	JA

PROJECT POSITION	NAME	SIGNATURE	REVISIONS
Construction Manager	Peter Furlong		
Project Director			
Senior Project Manager	Joe Amodeo		
Senior Site Manager	Dane Lalic		
Safety Manager	Matt Dymond		
Senior Project Engineer	Cameron Smith		
Senior Contracts Manager	Keith Tai		
Contracts Manager	Michael Laverty		
Senior Design Manager	Michael Bradburn		
Senior Design Manager	JP Castaner		
Senior Design Manager			
Senior Services Manager	Zoran Stepanovski		
Services Manager	Mike Emerson		

PROJECT POSITION	NAME	SIGNATURE	REVISIONS
Senior Contract Administrator	Monique Martino		
Project Engineer			
Site Engineer	Madison Barrie		
Site Engineer			
Contract Administrator			
Site Supervisor			
Sustainability Manager	Samantha Jones		
Stakeholder & Workforce Development Manager	Sarah Uff		
Doc Controller	Jessica Way		
WHS Environmental Co-ordinator			
Quality Co-ordinator			
Leading Hand			
Building Cadet	Luke Chapman		

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# 1 INTRODUCTION

This Community Consultation & Engagement Plan (CCEP) forms part of the RCC Project Management Plan (PMP) for the Sydney Biomedical Accelerator (SBA) and has been prepared to outline the procedures and mechanisms to facilitate communication between Richard Crookes Construction (RCC) and interested and engaged stakeholders and community members.

This plan also acts as a sub-plan to support the existing Community Engagement and Consultation Plan (CECP) created by The University of Sydney and Sydney Local Health District.

## 1.1 OBJECTIVE OF THIS PLAN

RCC recognises the importance of trust in relationship building with stakeholders involved with the project and is committed to actively communicating and engaging with the community and stakeholders throughout the construction of the project.

Further, in line with our company commitment to continual improvement, we constantly aim for a greater level of engagement and interaction with stakeholders, particularly when our project activities may impact on the communities in which we operate.

The communications and engagement approach for the SBA focuses on early, proactive, transparent, and regular communications and engagement throughout all stages of the project.

The objectives of this plan (CCEP) are to;

- Provide stakeholders (defined as staff, students, community) with the opportunity to contribute feedback to the project
- Understand any current community issues and ensure these are given appropriate consideration
- Provide confidence that there are significant community benefits associated with the completion of the project
- Meet the NSW department of planning and environment statutory requirements for community participation to support the SSA.
- Leave a positive legacy in the community.

## 1.2 RESPONSIBILITY FOR IMPLEMENTING THE PLAN

It is recognised that The University of Sydney's Campus University Infrastructure (UI) is managing the planning and delivery of the SBA building and associated communications in partnership with the NSW Government SLHD, as outlined in the Community Engagement and Consultation Plan created by The University of Sydney and Sydney Local Health District.

University Infrastructure (UI) has a dedicated team managing the SBA Project. Their primary responsibility regarding communications relating to the project is to ensure that stakeholders, students, staff and the wider community are informed and kept engaged about:

- The plans and processes involved for the construction of the building,
- The staging and execution of the works (program and impacts),
- Where we are now,
- Next steps, and
- Milestone achievements.

RCC will be responsible for:

- Preparation and providing design and construction related collateral for the review and distribution by the SBA Project Communications Team.
- Issue information direct to stakeholder groups, where requested.
- Working with the SBA Delivery and Communications Teams to develop the collateral to ensure clear, coordinated and timely communications are being delivered to ensure all stakeholders have been duly consulted prior to implementation of the plan/s.
- In the event of unplanned programs of construction works RCC will notify the University and the appropriate authority as soon as possible
- Complying with the University’s and SLHD disruption notice requirements including the submission of all applications and/or permits prior to the commencement of relative disruptive works
- Leading the Construction User Interface Group meetings (CUIG) meetings with key stakeholders on a monthly basis, or as advised by the Principal.
- Proactive measures in relation to residents within close proximity to the site and University entrances will be undertaken in conjunction with UI.
- Providing a weekly two-week look ahead construction update to the CUIG to inform the stakeholder group on high-level construction activities forecast in advance, focusing on activities which may have any impact to operations outside the site.
- The design, supply and installation of temporary signage to communicate relevant stakeholders any impacts to University and SLHD BAU (in addition to mandatory compliance signage). Signage to our site perimeter may include but not limited to:
  - Wayfinding.
  - Traffic and Pedestrian Signage and road markings.
  - Fire egress and evacuation routes.
- Adhering to SBA project branding guidelines for all materials including rendered images, shade cloth, signage. All co-branded materials must be approved and this will be managed through the UI Project Team.
- Responding to construction-specific queries from stakeholders, including those referred to by the client.

### 1.2.1 KEY ROLES AND RESPONSIBILITY

ROLE	RESPONSIBILITY
<b>Construction Manager &amp; Project Director</b>	Peter Furlong
<b>Senior Project Manager</b>	Joe Amodeo
<b>Senior Site Manager</b>	Dane Lalic
<b>Stakeholder &amp; Workforce Development Manager</b>	Sarah Uff

## 1.2.2 INTERFACE GROUPS

<b>University Infrastructure Project Team (UI)</b>	UI has a dedicated team managing the SBA Project
<b>Central Operations Services (COS)</b>	UI and COS are located on the University of Sydney Darlington Campus (Building G12, 22 Codrington Street, Darlington.). UI/COS are responsible for the University long and short-range campus planning, capital resource planning, project delivery, property management, assets and services management and operations.
<b>Construction User Interface Group (CUIG)</b>	<p>Made up of general stakeholders who may be impacted by construction works including traffic and pedestrian movements in the vicinity of the site</p> <ul style="list-style-type: none"> <li>• Sydney Local Health District representatives.</li> <li>• University Infrastructure – Project Team representative</li> <li>• University Infrastructure – Communications</li> <li>• Susan Wakil Building (SWHB) Representative</li> <li>• Adjacent colleges – Wesley College, Women’s College, St Andrews &amp; St Pauls.</li> <li>• Central Operational Services (COS) – Security</li> <li>• COS – Management</li> <li>• Health Infrastructure – RPAH Redevelopment Communications representative.</li> <li>• SUSF – Sydney University Sports and Fitness</li> </ul>
<b>The Communications and Engagement Working Group (CEWG)</b>	Representatives from both the Sydney Local Health District and the University of Sydney
<b>Head Contractor (RCC)</b>	The Contractor shall work with the SBA Delivery and Communications Teams to develop the collateral to ensure clear, coordinated and timely communications are being delivered to ensure all stakeholders have been duly consulted prior to implementation of the plan/s.

## 1.3 PROJECT OVERVIEW

The Sydney Biomedical Accelerator (SBA) is a co-funded partnership project between the NSW Government (NSW Health), Sydney Local Health District (SLHD) and the University of Sydney (the University), comprising a state-of-the-art biomedical research complex spanning SLHD’s Royal Prince Alfred (RPA) Hospital campus and University of Sydney’s Camperdown Campus Health Precinct.

The SBA complex will be a collaborative world-class biomedical research and innovation precinct that will integrate world-leading fundamental biomedical science with clinical research and innovation.

Within the University of Sydney campus, the proposed development comprises the following:

- Isaac Wakil Biomedical Building (IWBB): approximately 28,200sqm gross floor area (GFA) over 8 floors for physical containment level 2 (PC2) wet lab research, mortuary and advanced anatomy teaching, clinical research facilities, and core research facilities.

On the RPAH site the proposed development comprises:

- Building B: approximately 8,000sqm GFA over 8 floors consisting of PC2 laboratories, specialist PC3 laboratory, and biobank facility.

The SBA complex will also include a physical connection to Gloucester House within the RPAH site and internal refurbishment of this building for dry research support space and clinics. However, all the internal works to this building are being undertaken via a separate planning approval pathway and are not being assessed as part of this SSD.

The proposed development includes public domain upgrades and landscaping surrounding the new building to integrate the SBA complex with its setting.

### 1.3.1 CONSTRUCTION HOURS:

Monday – Friday 7am to 6pm

Saturday - 8am to 1pm

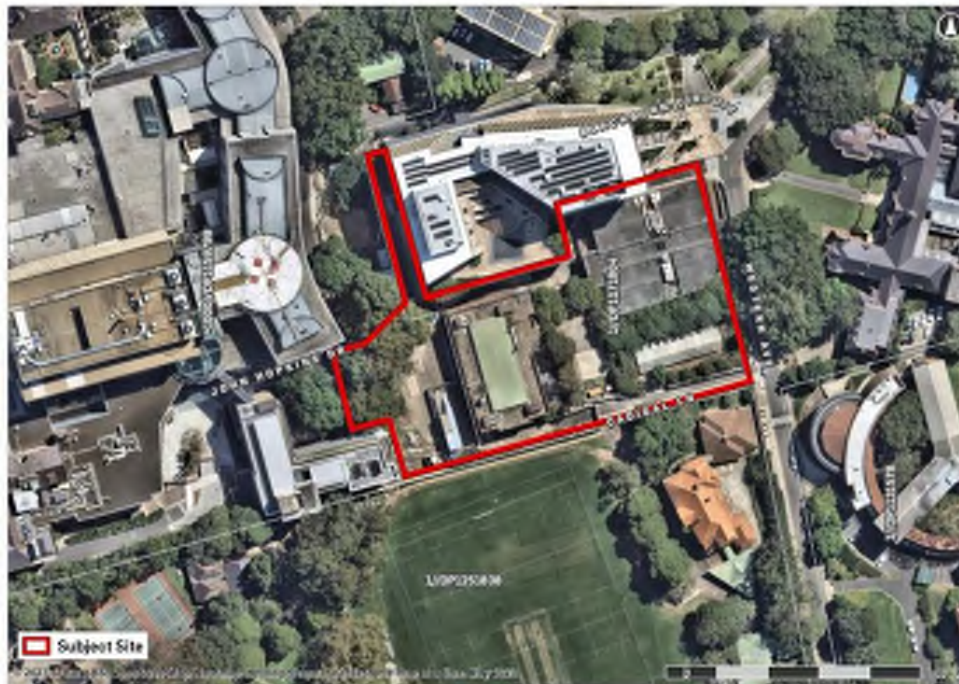
Sunday & public holidays - no work

## 1.4 PROJECT LOCATION

The site is located on the corner of Western Avenue and Cadigal Lane in Camperdown. The University of Sydney (Lot DP1171804) and Royal Prince Alfred Hospital (Lot 1000 DP1159799).

The overall site has an area of 8,600sqm and is bound by existing Royal Prince Alfred Hospital and Susan Wakil Health Building to the North, Western Avenue & Wesley College to the East, Cadigal Lane and St. Andrews College to the South and Gloucester House to the West.

An aerial photograph of the site is provided below.



Source: Urbis 2023

An aerial photograph outlining key neighbouring properties is provided below:



## 1.5 PROJECT BENEFITS / KEY MESSAGES

RCC will support the SBA project team to deliver key messages on the following:

- The SBA Project is committed to minimizing construction impacts through implementation of appropriate mitigation measures.
- The SBA Project has an ongoing long-term relationship with the stakeholders and will continue to respect their role through the process.
- The SBA Project is committed to providing stakeholders with an opportunity to be informed through regular updates using various communication tools.
- The SBA Project will deliver the project with the stakeholder's needs in mind.

## 2 COMMUNICATIONS STRATEGY

RCC is committed to open and transparent communications with our stakeholders and the community. We also recognise the diverse information needs of the community and commit to a robust plan of engagement. The level of consultation required is determined by the potential level of impact and degree of complexity of the issue to be communicated or consulted on.

### 2.1 STAKEHOLDER ANALYSIS

Key stakeholders are generally identified as people or groups who are impacted by our operations and those who have an interest in / influence on what we do.

The stakeholder list below summarises who will be consulted with during the construction of the project and the communication tools applicable.

COMMUNICATIONS APPROACH			
STAKEHOLDER	INTEREST / CONCERN	INTEREST LEVEL – UPDATE BELOW	COMMUNICATION TOOL
<b>Client</b> <ul style="list-style-type: none"> <li>The University of Sydney</li> <li>NSW Health</li> <li>Sydney Local Health District</li> </ul>	Construction program Potential construction delays Business continuity for tenancies Parking impacts Amenity impacts to customers	High	<ul style="list-style-type: none"> <li>Meetings / briefings</li> <li>Communications &amp; Engagement Working Group</li> <li>Reporting</li> <li>Phone / email</li> <li>Launches / milestone events</li> </ul>
<b>Donors</b> <ul style="list-style-type: none"> <li>Susan and Isaac Wakil Foundation for The Isaac Wakil Biomedical Building</li> <li>Centenary Institute</li> <li>The University of Sydney</li> <li>Sydney Local Health District</li> <li>NSW Government</li> </ul>	Construction program Potential construction delays Amenity impacts to customers Timely notifications / need to feel well informed Activation and community engagement Legacy	High	<ul style="list-style-type: none"> <li>Project updates and notifications</li> <li>Reporting</li> <li>Launches / milestone events</li> <li>Meetings as required</li> <li>Phone / email</li> </ul>
<b>Internal Stakeholders</b> <b>University Staff:</b> <ul style="list-style-type: none"> <li>Faculty of Medicine &amp; Health</li> <li>Faculty of Engineering</li> <li>Faculty of Science</li> <li>Professional Service Units</li> <li>Faculty General Managers and Heads of School</li> <li>Media and PR</li> <li>Advancement</li> </ul>	Construction impacts: noise, dust, vibration Construction program Potential construction delays Business continuity for tenancies Traffic and parking impacts Amenity impacts to end users	High	<ul style="list-style-type: none"> <li>Meetings as required</li> <li>Project updates and notifications</li> <li>Phone / email</li> <li>Website</li> </ul>

<ul style="list-style-type: none"> <li>Marketing and Communications</li> </ul> <p><b>University Students</b></p> <p><b>Colleges:</b></p> <ul style="list-style-type: none"> <li>St Andrews</li> <li>The Women's College</li> <li>Wesley College</li> <li>St Andrews</li> <li>St Paul's</li> <li>Sancta Sophia</li> <li>St Johns</li> </ul> <p><b>RPAH:</b></p> <ul style="list-style-type: none"> <li>RPAH Staff</li> <li>Sydney Local Health District</li> <li>RPA Hospital Redevelopment (delivery partners)</li> </ul>	<p>Conflicting / competing construction delivery of RPAH Redevelopment</p> <p>Pedestrian impacts</p> <p>General amenity impacts</p> <p>Service/ utility impacts</p> <p>Timely notifications / need to feel well informed</p> <p>Benefits of the redevelopment</p>		
<p><b>Government agencies / authorities</b></p> <ul style="list-style-type: none"> <li>Dept. Planning, Industry &amp; Environment Government Architect NSW</li> <li>Heritage NSW</li> <li>Transport NSW</li> <li>City of Sydney Council</li> </ul>	<p>Compliance with DA conditions</p> <p>Construction impacts: noise, dust, vibration</p> <p>Traffic and parking impacts</p> <p>Impacts to bus services: 664, 715, 735</p>	High	<ul style="list-style-type: none"> <li>Meetings as required</li> <li>Project updates and notifications</li> <li>Phone / email</li> <li>Website</li> </ul>
<p><b>Aboriginal and Torres Strait Islander community</b></p> <ul style="list-style-type: none"> <li>Sydney University Aboriginal &amp; Torres Strait Advisory Panel</li> <li>Aileen Sage consultancy firm (c/o project Architect)</li> <li>Metropolitan Local Aboriginal Land Council</li> </ul>	<p>Aboriginal culture and heritage of the site</p> <p>Significant finds of aboriginal objects</p>	Medium	<ul style="list-style-type: none"> <li>Meetings / briefings</li> <li>Project updates and notifications</li> <li>Phone / email</li> </ul>
<p><b>Adjoining properties</b></p> <ul style="list-style-type: none"> <li>Newtown North Public School</li> <li>KU Carillon Avenue Childcare</li> <li>See internal stakeholders &amp; RPAH for additional adjoining properties</li> </ul>	<p>Traffic and parking impacts</p> <p>Pedestrian impacts</p> <p>General amenity impacts</p> <p>Service/ utility impacts</p> <p>Timely notifications / need to feel well informed</p> <p>Benefits of the redevelopment</p>	High	<ul style="list-style-type: none"> <li>Project updates and notifications</li> <li>Meetings / briefings as required</li> <li>Phone / email</li> <li>Site signage</li> <li>Website</li> </ul>
<p><b>Other authorities</b></p> <ul style="list-style-type: none"> <li>Utility Providers: Sydney Water, Ausgrid, Fire &amp; Rescue NSW</li> </ul>	<p>General project progress</p> <p>Traffic impacts</p> <p>Service / utility impacts</p>	Low	<ul style="list-style-type: none"> <li>Project updates and notifications</li> <li>Meetings / briefings as required</li> <li>Phone / email</li> <li>Site signage</li> <li>Website</li> </ul>

<b>Residents</b> <ul style="list-style-type: none"> <li>• Broader Community</li> </ul>	Construction impacts: noise, dust, vibration Traffic and parking impacts Pedestrian and cycling impacts Service/ utility impacts General amenity impacts Construction fatigue due to continual development in the area	Medium	<ul style="list-style-type: none"> <li>• Project updates and notifications</li> <li>• Meetings and briefings as required</li> <li>• Phone / email</li> <li>• Site signage</li> <li>• Website</li> </ul>
<b>Other stakeholders</b> <ul style="list-style-type: none"> <li>• RED Watch Community group</li> </ul>	Major disruption to bicycle routes Construction coordination	Low	<ul style="list-style-type: none"> <li>• Project updates / notifications via email</li> <li>• Phone / email</li> </ul>
<b>User groups</b> <ul style="list-style-type: none"> <li>• Incoming tenants, owners</li> </ul>	Operational issues Defects	High	<ul style="list-style-type: none"> <li>• Meetings / briefings</li> <li>• Phone / email</li> <li>• Info sessions</li> </ul>
<b>Media</b> <ul style="list-style-type: none"> <li>• Local / metro / social</li> </ul>	General project progress Milestones / events Programs / partnerships / community engagement	High	<ul style="list-style-type: none"> <li>• Phone / email</li> <li>• Launches / milestone events</li> <li>• Website</li> </ul>

## 2.2 COMMUNICATION AND ENGAGEMENT TOOLS

A range of communication tools have been identified (and implemented by the SBA Project Communications Team to date) to assist in the delivery of effective community and stakeholder engagement for the project. The project team should choose the appropriate engagement tools based on the stakeholder analysis, consent requirements and Client requests. RCC will support the implementation of all the following initiatives.

A database of interested individuals and organisations will be established to ensure that these stakeholders are given timely information, advice and adequate notice of any consultation/engagement events.

<b>‘Become a friend of Sydney Biomedical Accelerator’ website mailing list</b>	A <a href="#">voluntary mailing list</a> set up by The University of Sydney and Sydney Local Health District to receive updates and announcements about the Sydney Biomedical Accelerator project. Mailing list information to be used to share news and events regarding the project on a regular basis.
<b>Dedicated email address</b>	A dedicated project email address <a href="mailto:sydneybiomedicalaccelerator@richardcrookes.com.au">sydneybiomedicalaccelerator@richardcrookes.com.au</a> has been created to answer any questions and to receive feedback throughout the project.
<b>Display materials &amp; information sessions</b>	Development of display boards outlining the planning and approvals process to enable the SBA and the design of the proposed building and its surrounds. Ad hoc information sessions may also be beneficial for certain key stakeholder groups.

<b>Hoarding</b>	Hoarding can be used as a strategic communication tool or as a community engagement initiative (e.g. Indigenous or community art) pending client approval & consultation.
<b>Information Pack</b>	Creation of an Information Pack overview of the project clearly stating the aims and objectives of the SBA, how the SBA was developed, the consultation process to date and how to make comment on the SBA. The Information Pack will appear on the website and emailed to the data base.
<b>Intranet/update on key milestones</b>	Provide a program of upcoming works on a fortnightly basis, to ensure that key milestones are updated on SLHD & UIs respective internal communication channels. UI meet with the Staff Communications Specialist fortnightly to discuss what should be included on the University's intranet page.
<b>Key stakeholder briefings</b>	One on one briefings for key stakeholders and Government agencies. On-site meetings with the key stakeholders can be organised to determine site set-up, traffic management etc. and to address any emerging issues.
<b>Media</b>	<p>All media requests or any media issued by the Head Contractor in relation to the University must be approved by the Director of Media and PR and the CUIO. The Contractor shall follow the media protocol detailed in Appendix A of the Sydney Biomedical Accelerator Construction Communications Plan.</p> <p>All media enquiries should follow an internally agreed process. Subcontractors engaged on the project are subject to media clauses within the subcontract stipulating issuing of information concerning the Project, Works, Head Contract, Subcontractor or the Subcontract Works.</p>
<b>Personalised correspondence</b>	Letters to State Local Members and any other key stakeholders identified, advising them of the SBA and providing updates as required.
<b>Photographs/Images/Time Lapse/Videos</b>	<p>Photographic evidence of works in progress and the finished product need to be recorded. The Contractor must provide images regularly, or as requested by the Principal.</p> <p>These images will be used for the Internet/Intranet, in regular updates, Staff and Student news and awards submissions. The images need to meet Principal's Work Requirements.</p> <p>Flying drones/remotely piloted aircraft/unmanned aerial systems are not authorised over any campuses unless formal authorisation is obtained from COS, Airservices Australia and the Civil Aviation Safety Authority where relevant.</p>
<b>Project email updates / work notifications</b>	Project update emails will be sent to the database on a regular basis during project to share information including a construction lookahead, progress, potential impacts and any other significant milestones.
<b>Project Induction</b>	A forum to set expectations for behaviour and engagement deliverable. Educate staff and workers on expected protocols and procedures when dealing with the community and stakeholders.

<p><b>Public website</b></p>	<p>Two websites have been set up:</p> <p>A web page <a href="#">Transforming our campuses</a> has been setup to provide updates and relevant documentation to the public.</p> <p>A secondary web page shared by SLHD and the University of Sydney <a href="#">Sydney Biomedical Accelerator</a> has also been created to provide news and updates on the joint partnership project.</p> <p>Community organisations such as RED Watch will also be invited to upload the SBA documents on their websites.</p>
<p><b>SBA Project Branding Guidelines</b></p>	<p>All materials including rendered images, shade cloth, signage must adhere to the SBA projects interim branding guidelines. All co-branded materials must be approved and this will be managed through the UI Project Team.</p>
<p><b>SSD public exhibition program</b></p>	<p>Implemented by the NSW Department of Planning and Environment</p>
<p><b>Site Signage</b></p>	<p>Clear and visible signage to ensure the local community are aware of the project, including relevant project contact details (number, email) from site establishment and throughout the project</p>
<p><b>Site tours</b></p>	<p>Site tours are often a positive stakeholder and community engagement tool and should be carefully planned. Visitors will need to abide by the site safety requirements.</p>
<p><b>Social Media</b></p>	<p>From time to time, RCC may request to promote the project via social media channels (Facebook, Instagram and LinkedIn). All content will be developed by RCC and sent to the client for approval prior to posting. Mentions of SBA on social media will be monitored and escalated to the client where necessary. Specific Social Media Policies and media clauses will be in place for RCC employees and associated subcontractors.</p>
<p><b>Stakeholder Database</b></p>	<p>A key stakeholder database is to be established for the project, to ensure that all stakeholders who need to be advised of construction works have been identified.</p>
<p><b>UI Weekly Construction Notification (SharePoint)</b></p>	<p>The Contractor shall complete the Construction Notification template as required and issue to the UI Project Team for approval. UI is responsible for uploads to SharePoint. A works notification is to be uploaded to SharePoint a week prior to works commencing.</p> <p>If an emergency notification is required, please contact the Project Team for distribution of appropriate advice.</p>
<p><b>University Staff/Student News</b></p>	<p>Updates and invitation to comment in University's Staff / Student News.</p>

## 2.3 COMMUNICATION ACTION PLAN

The below table gives a high-level overview of the project’s construction phase / milestone, audience and proposed communication tools. (Indicative phasing)

Timing	Stakeholder	Communication tool	Purpose	Responsible
<b>CONTRACT AWARD &amp; SITE ESTABLISHMENT [Q2 2025 - Q4 2025]</b>				
<b>Q2 2025</b>	All stakeholders	Media release	<ul style="list-style-type: none"> <li>Notifying appointment of RCC as contractor and expected start of works</li> </ul>	The University
		Social media Website	<ul style="list-style-type: none"> <li>Contract award and expected start of works</li> </ul>	RCC
<b>Ongoing</b>	RCC project workforce	Contractor Induction i.e. Contractor Online Induction, and Contractor location-specific inductions	<ul style="list-style-type: none"> <li>Communicate expectations of workforce during project delivery</li> </ul>	RCC
<b>Q2 2025</b>	University stakeholders	Notification	<ul style="list-style-type: none"> <li>Notify impacted stakeholders about investigation works and how to contact the nominated representative</li> </ul>	RCC / The University
<b>Q2 2025</b>	University stakeholders in zone of influence	Letter	<ul style="list-style-type: none"> <li>Initial contact to offer the survey Dilapidation / property condition report prior to start of construction works by the University</li> </ul>	The University
			<ul style="list-style-type: none"> <li>Coordination and carry out of the survey the Contractor responsibility</li> </ul>	RCC
<b>Q3 2025</b>	University stakeholders	Project update Email communication	<ul style="list-style-type: none"> <li>Start of works – expected impacts and mitigations</li> <li>How to contact the nominated representative</li> </ul>	RCC / The University
	Wider interested parties			
<b>CIVIL WORKS I.E. STORMWATER RELOCATION / DIVERSION / BULK EARTHWORKS [Q3 2025 - Q1 2026]</b>				
<b>Q3 2025</b>	Directly impacted stakeholders / local community	Notification/ Project update	<ul style="list-style-type: none"> <li>Notify of expected activities, duration, impacts, mitigations, traffic impacts</li> </ul>	RCC / The University
	Wider interested parties		<ul style="list-style-type: none"> <li>How to contact the nominated representative</li> </ul>	
<b>MAIN CONSTRUCTION [Q4 2025 - Q1 2028]</b>				
<b>Ongoing</b>	Directly impacted stakeholders / local community	Notification/ Project update Meetings / briefings	<ul style="list-style-type: none"> <li>Notify of expected activities, duration, impacts, mitigations</li> <li>Addressing traffic &amp; construction fatigue key issues</li> <li>Provide project contact details</li> </ul>	RCC / The University

<b>Ongoing</b>	Wider interested parties	Project update / email communication	<ul style="list-style-type: none"> <li>Notify of expected activities, duration, impacts, mitigations, traffic impacts</li> <li>Provide project contact details</li> </ul>	RCC / The University
<b>Ongoing</b>	University key stakeholders	Site visits	<ul style="list-style-type: none"> <li>Build excitement, bring stakeholders on the journey, build RCC reputation</li> </ul>	RCC / The University
<b>PROJECT COMPLETION / HANDOVER [Q4 2027 - Q2 2028]</b>				
<b>Q2 2028</b>	University stakeholders in zone of influence Incoming tenants	Letters Info session Meetings / briefings	<ul style="list-style-type: none"> <li>Close out dilapidation / property condition reports</li> <li>Familiarise with new facilities prior to handover</li> </ul>	The University

## 2.4 KEY ISSUES AND MITIGATION MEASURES

<b>Issue</b>	<b>Mitigation</b>
<b>Noise and vibration</b>	
Effects on sensitive receivers Construction traffic noise (deliveries and spoil movements) Vibration generated by construction activities	<ul style="list-style-type: none"> <li>Continue ongoing open dialogue which has been established with residents, agencies, relevant local groups and other stakeholders as the planning process continues.</li> <li>Compliance with various management plans. Refer to site specific Environmental Management Plan and Construction Noise &amp; Vibration Monitoring Plan</li> <li>Implementation of mitigation measures in the Construction Noise &amp; Vibration Management Plan and other documents and plans where relevant</li> <li>Noise minimised through use of appropriate plant, tools and techniques and adaptive programming, where possible.</li> <li>High impact noise works staged with respite periods as required by any applicable Environment Protection Licence or planning approval</li> <li>Temporary noise screens used around equipment, where appropriate.</li> <li>Localised acoustic barricades around plant and equipment (for example concrete pumping and cranes) when in close proximity to particularly sensitive areas</li> <li>Staff induction and toolbox meetings prior to noisy activities to highlight acceptable work force behaviour</li> <li>Noise and or vibration monitoring to ensure limits comply with CoS planning conditions and act immediately on stakeholder concern and/or if monitoring exceeds the permissible limits.</li> <li>Implement disciplined project management practices, including a rigorous meeting and reporting regime.</li> <li>Incorporate knowledge and lessons learned from previous Projects.</li> </ul>

Dust & Air Quality	
<p>Dust generated by construction activities</p> <p>Concern about health impacts of dust (silica during excavation)</p> <p>Control of Asbestos Containing Material (ACM)</p>	<ul style="list-style-type: none"> <li>• Compliance with various management plans. Refer to site specific Environmental Management Plan, Construction Waste Management Plan and Construction Noise &amp; Vibration Monitoring Plan</li> <li>• Dust minimised by using water carts, water sprayers, street sweepers, hard stands and limiting activities on windy days where necessary</li> <li>• Establishment of dust seal hoardings where works are being undertaken in existing buildings</li> <li>• Implement disciplined Project management practices, including a rigorous meeting and reporting regime.</li> <li>• Appropriate Silica Training (and controls) for workforce imbedded into project induction in line with <b>SafeWork Training Requirements</b></li> <li>• Implementation of mitigation and control measures in the Asbestos Management Plan and other documents and plans where relevant</li> <li>• All site areas which are known or suspected to contain ACMs shall have a warning sign at every main entrance and around the perimeter of the isolated ACM area. The warning sign must be clearly visible from all directions leading onto the area.</li> <li>• An asbestos register exists for the site and a point of contact must be contacted before undertaking any works. This register must be consulted prior to commencing any works.</li> <li>• ACM within the works zone must be removed prior to the commencement of demolition, partial demolition, renovation or refurbishment if they are likely to be disturbed by those works.</li> <li>• Appropriate Asbestos awareness and Asbestos remove training for workforce imbedded into the project.</li> </ul>
Access & Security	
<p>Access for deliveries and customers</p> <p>Traffic changes to roads</p> <p>Impacts to parking</p> <p>Traffic modifications including changes to footpaths</p> <p>Utility works affecting footpath or road access</p> <p>Additional traffic on an identified bicycle route</p> <p>Safeguard construction zones and prevent unauthorised access / incidents</p>	<ul style="list-style-type: none"> <li>• Maintaining the A Class hoarding and pedestrian management in accordance with our Traffic Management Plan.</li> <li>• Coordination of works with deliveries and business priorities, where possible</li> <li>• Provision of easy to read “way finding signage” to redirect all vehicles and pedestrian movements to direct pedestrians, delivery drivers and customers where appropriate, particularly when disrupted by planned works.</li> <li>• Traffic control plan coordination with COS, TFNSW and the University.</li> <li>• Traffic and pedestrian management will be always in place. Construction site to be well contained within secure construction fencing. Regular communication with relevant stakeholders to monitor performance and manage expectations.</li> <li>• Compliance with WHS Safety Management Plan</li> <li>• Security measures / appropriate controls in place to prevent unauthorized access; these include physical barriers and danger warning signage.</li> </ul>

<b>Construction traffic</b>	
<p>Heavy vehicle movements on local roads</p> <p>Additional construction traffic to an already busy city thoroughfare</p>	<ul style="list-style-type: none"> <li>• Implement Traffic Management Plan as approved by COS</li> <li>• Construction traffic movements minimised in peak times, where possible</li> <li>• Heavy vehicle specific access and egress locations and routes to minimise local congestion</li> <li>• Out of hours deliveries to minimise impacts of oversized vehicles on local roads</li> <li>• All access roads to be regularly monitored to ensure they are maintained</li> </ul>
<b>Parking</b>	
<p>Parking changes</p> <p>Construction workforce parking</p>	<ul style="list-style-type: none"> <li>• Workforce parking strategy – workers will be encouraged to use public transport to avoid congestion of the RPA / USYD road networks and local parking</li> </ul>
<b>Property impacts</b>	
<p>Concerns about potential damage to property</p>	<ul style="list-style-type: none"> <li>• Dilapidation reports carried out to surrounding roads and identified properties.</li> <li>• Vibration monitoring</li> </ul>
<b>Visual / amenity impacts</b>	
<p>Impacts to visual amenity</p> <p>Vandalism of site hoarding</p>	<ul style="list-style-type: none"> <li>• Hoarding design / use of artwork</li> <li>• Prompt graffiti removal from hoarding, buildings, plant and surroundings kept well maintained and clean</li> <li>• Explore opportunities for signage and wayfinding to maintain accessibility around site boundary</li> </ul>
<b>Heritage</b>	
<p>Impacts to areas of heritage significance</p> <p>Impacts to heritage buildings in close proximity to project</p> <p>Protection of structures and existing services</p>	<ul style="list-style-type: none"> <li>• Dilapidation survey reports completed prior to any works and complete post completion to ensure no damage to nearby buildings and infrastructure</li> <li>• Comply with any heritage requirements as outlined by the consultant engaged by the University</li> <li>• Specialist demolition contractor</li> <li>• Structural Engineer to review existing structure and advise on propping requirements prior to installation of link bridge and breakthrough</li> </ul>
<b>Construction fatigue</b>	
<p>Ongoing construction in the area leading to fatigue and reduced resilience for businesses and residents</p>	<ul style="list-style-type: none"> <li>• Regular communications and engagement with stakeholders</li> <li>• Implementation of PMP and subplans to mitigate construction impacts</li> </ul>

<b>Environmental</b>	
<p>Proper disposal of construction waste and debris to minimize environmental impact and maintain campus aesthetics</p> <p>Impacts to biodiversity on campus</p>	<ul style="list-style-type: none"> <li>• Implementation of mitigation measures in the Construction Waste Management Procedure and other documents and plans where relevant</li> <li>• Partnership with supply chain on ensuring waste material on site is taken to accredited off site facilities with monthly reporting provided to RCC monitoring against ESD objectives</li> <li>• Community consultation address safety &amp; environmental hazards in and around the site, community interactions &amp; feedback</li> <li>• Project environmental site rules will be included in the induction session.</li> </ul>
<b>University &amp; Hospital Operations</b>	
<p>Maintaining University &amp; Hospital operations and minimising disruption to services</p>	<ul style="list-style-type: none"> <li>• Experienced project team, technical resources and experts incorporated into the design and delivery team to assist in the planning and processes around the operations and integration of these matters into the Works.</li> <li>• Early and comprehensive identification of enabling works interfaces, connection points, changeover and integration between the campus and the works through the regular precinct Interface Meetings.</li> <li>• Incorporating this information into the design completion process to minimise shutdowns and interactions, introducing measures to allow operations to continue whilst disruptive works are completed (temp cutovers / diversions, re-routing services, etc.) this will be managed by the Services Manager and Design Management team.</li> <li>• Detailed consultation at project start-up with all stakeholders to ensure all issues, priorities, concerns, and needs are identified, well understood, and planned for. This will be managed by the Project Director.</li> <li>• Detailed consultation regarding the Integration and Disruptive Works with stakeholders to commence the planning and programming of the works. this information will be fed into the design completion process.</li> </ul>

## 2.5 DEVELOPMENT CONSENT CONDITIONS

RCC will conduct engagement and communications activities to meet relevant requirements as specified in the Development Consent Conditions (SSD-55388456). Relevant conditions and response are outlined below.

<b>Development Consent Condition</b>	<b>Response</b>
<p><b>A26.</b> At least 48 hours before the commencement of construction until the completion of all works under this consent, or such other time as agreed by the Planning Secretary, the Applicant must:</p> <p>(a) make the following information and documents (as they are obtained or approved) publicly available on its website:</p> <p>(vii) contact details to enquire about the development or to make a complaint;</p> <p>(viii) a complaints register, updated monthly;</p>	<ul style="list-style-type: none"> <li>• Dedicated community contact points are available for local residents, community members and stakeholders to raise issues, ask questions and speak directly to the nominated representative</li> <li>• Dedicated community contact details will be displayed on site signage, communication material, project websites and all communication collateral including emails.</li> <li>• All community contact will be recorded in Complaints Management System as provided by UI. This will be used to manage, track, and maintain a communications activities and contacts register, capturing the relevant</li> </ul>

	<p>Project stakeholders, key personnel, contact details and escalation contacts.</p> <ul style="list-style-type: none"> <li>• A summary of complaints will be documented in complaints register uploaded to the project website. This register will be updated monthly.</li> </ul>
<p><b>C1. Site Notices.</b> A site notice(s) must be prominently displayed at the boundaries of the site during construction for the purpose of informing the public of project details and must satisfy the following requirements:</p> <p>a) "minimum dimensions of the site notice(s) must measure 841 mm x 594 mm (A1) with any text on the site notice(s) to be a minimum of 30-point type size;"</p> <p>b) "the site notice(s) must be durable and weatherproof and must be displayed throughout the works period;"</p> <p>c) "the approved hours of work, the name of the builder, Certifier, structural engineer, site/ project manager, the responsible managing company (if any), its address and 24-hour contact phone number for any inquiries, including construction/ noise complaint must be displayed on the site notice(s); and"</p> <p>d) the site notice(s) must be mounted at eye level on the perimeter hoardings/fencing and must state that unauthorised entry to the site is not permitted.</p>	<ul style="list-style-type: none"> <li>• Site signage will be displayed during construction to inform the local community, residents, and stakeholders about who is responsible for construction activities and the contact details for further information.</li> <li>• Site signage will be maintained to ensure it remains visible and clear at all times.</li> <li>• Site signage will comply with the University's Signage Guidelines.</li> </ul>
<p><b>C4. Construction Hours</b></p> <p>Construction, including the delivery of materials to and from the site, may only be carried out between the following hours:</p> <p>(a) between 7am and 6pm, Mondays to Fridays inclusive; and</p> <p>(b) between 8am and 1pm, Saturdays.</p> <p>No work may be carried out on Sundays or public holidays.</p>	<p>Construction hours are as outlined in this plan:</p> <p>Monday – Friday 7am to 6pm</p> <p>Saturday – 8am to 1pm</p> <p>Sunday &amp; public holiday – no work</p>
<p><b>C6. (outside of hours construction hours in C4)</b></p> <p>Notification of such construction activities as referenced in condition C5 must be given to affected residents before undertaking the activities or as soon as is practical afterwards.</p>	<p>Approved SBA branded Project Notifications will be used to inform of current and upcoming work, with the potential to impact on stakeholders and the community.</p> <p>Out of hours activity will be communicated in advance, where available, or as soon as practical afterwards. Notification will be provided to the University and COS.</p>
<p><b>C10. Hoarding Requirements</b></p> <p>The following hoarding requirements must be complied with:</p> <p>a) "no third-party advertising is permitted to be displayed on the subject hoarding/ fencing; and"</p> <p>b) "the construction site manager must be responsible for the removal of all graffiti from any construction hoardings or the like within the construction area within 48 hours of its application."</p>	<p>As outlined in this Plan mitigation strategies are in place for hoarding design / use of artwork:</p> <ul style="list-style-type: none"> <li>• Prompt graffiti removal from hoarding, buildings, plant and surroundings kept well maintained and clean</li> <li>• Hoarding designed to maximise visibility of neighbouring signage (where applicable)</li> </ul>

## 2.6 INDIGENOUS COMMUNITY

The University has convened a separate Aboriginal and Torres Strait Islander advisory panel that has met several times to inform the design of the building to ensure it embeds Aboriginal and Torres Strait Island culture and values in the development.

The architect for the project has also contracted a specialist firm Aileen Sage to continue to consult with the local Aboriginal and Torres Strait Islander community throughout the development stage of the project.

Aboriginal Participation Plans will be developed for a project in accordance with the Contract requirements or where there is a significant potential to benefit the local community in line with the NSW Government's policies (see Appendix 1 of the Project Management Plan).

RCC has established an Indigenous Participation Plan that forms a subsection of the broader Skills, Training and Diversity Plan and aims to outline the importance of indigenous participation in all aspects of the project, as well as our commitment and strategies to create and extend opportunities for First Nations people and enterprises.

## 2.7 KEY RCC ENGAGEMENT ACTIVITIES

### INDIGENOUS ENGAGEMENT

Progress towards these nominated targets will be reported throughout the project duration.

Annual engagement events will be implemented twice yearly to acknowledge and celebrate culturally significant dates (National Reconciliation Week and NAIDOC Week). Protocols for use of language and Acknowledgement of Country on site signage will be observed.

### INDUSTRY INFORMATION SESSIONS I.E. MEET THE BUYER, MEET THE EMPLOYER

The Meet the Buyer engagement events for the SBA Project will connect key stakeholders, including potential suppliers, contractors, and service providers, with the project's procurement team. It will facilitate direct interaction, enabling participants to understand the project's needs, timelines, and procurement processes.

The Meet the Employer engagement events for the SBA Project are multifaceted, serving both employers and potential employees by facilitating direct interactions and providing valuable opportunities for networking and information exchange. It will be an avenue the project can utilise to connect the project supply chain with jobseekers looking to explore opportunities in the construction industry.

### SITE ESTABLISHMENT EVENT

The establishment of site marks a significant project milestone. RCC will work alongside the University project team to plan and host an on-site event, which would include an acknowledgment of country / smoking ceremony.

### SCHOOLS OUTREACH PROGRAMS

Schools outreach is an opportunity for the SBA Project to play a significant role in enhancing education, fostering career development and showcasing the exciting work and variety of opportunities available within the industry. Students from identified local schools will be invited to participate in site tours, school-to-work programs and targeted initiatives such as:

- Name the Crane,
- STEM Career Discovery and
- Safety Awareness Program.

## **SITE TOURS**

Aligned to the Schools Outreach Programs, RCC recognises the importance of bringing our stakeholders on the journey throughout construction. Site tours will play a key role in showcasing the project and building excitement.

Local identified schools and Universities and other nearby educational institutions will also be invited to participate in targeted site tours.

## **RCC USYD FUTURE TALENT PARTNERSHIP**

In our ongoing effort to provide future generations with opportunities for growth and positive change, the project seeks to establish a strong partnership with the University of Sydney (USYD), committing to at least two hires from the USYD Cadets program upon the successful award of the tender.

Our commitment extends beyond financial support, offering alumni unique opportunities such as site tours with our leadership team, fostering connections and professional growth. We strongly believe in creating a supportive and enjoyable workplace, maintaining genuine connections with our scholarship recipients, and nurturing the next generation of female leaders in the industry.

## **COMMUNITY LEGACY PROJECT**

We will create a continuing legacy and positive impact to go beyond the built environment for First Nations people. In respect to already established priorities and plans for the University of Sydney campus and Health Infrastructure, RCC will work together with the SBA Indigenous Advisory Group to establish a community-based project during the build that will deliver a long-term legacy to First Nations people in the region and beyond. We recognise the existing commitments that University of Sydney already has in place through *One Sydney, Many People* and we are committed to enabling these commitments and local implementation Through co-design discussions as our resources will allow.

## **UNIVERSITY RESEARCH COLLABORATION PROJECT**

The SBA Project presents a unique opportunity to address the historical gender imbalance in the construction industry. Centred around a significant construction initiative on the University of Sydney campus, a potential research collaboration with the project aims to leverage the project's extensive, predominantly male workforce to explore and implement programs, initiatives, and strategies designed to increase the representation of women in construction.

By partnering with The Australian Centre for Gender Equality and Inclusion @ Work, this project will not only address diversity issues on-site but also contribute to industry-wide change through rigorous research and evidence-based interventions.

## **TOPPING OUT CEREMONY**

A celebratory milestone in the construction process, whereby the completion of the structural phase is celebrated. This event is usually celebrated with RCC leadership, clients and other key stakeholders.

# 3 PROTOCOL FOR MANAGING ENQUIRIES, FEEDBACK AND COMPLAINTS

## 3.1 CONTACTS PROTOCOL

The nominated representative will have primary responsibility for maintaining a record and actioning all project related contacts (complaints or enquiries). Input from the wider project team will also be sought to help respond to complaints and enquiries as required. Where possible, enquiries and complaints will be responded to and closed out at the time the contact is made.

If an issue (enquiry or complaint) is seen to be contentious, the project team should consult with the Client and RCC Stakeholder Manager for guidance on how to respond.

All complaints will be recorded in the project’s complaints register.

### 3.1.1 CONTACT POINTS

The main points of public contact will be displayed on project signage and on public facing project information:

1. Project email address: [sydneybiomedicalaccelerator@richardcrookes.com.au](mailto:sydneybiomedicalaccelerator@richardcrookes.com.au)
2. Site Contact Information: Dane Lalic (0411 406 559)
3. University Website: <https://www.sydney.edu.au/about-us/campuses/transforming-our-campus.html>
4. SLHD Website: <https://sydneybiomedicalaccelerator.org/>

### 3.1.2 MEDIA ESCALATION PROTOCOL

As per Appendix A: Media Escalation Protocol all media enquiries will follow the below workflow:

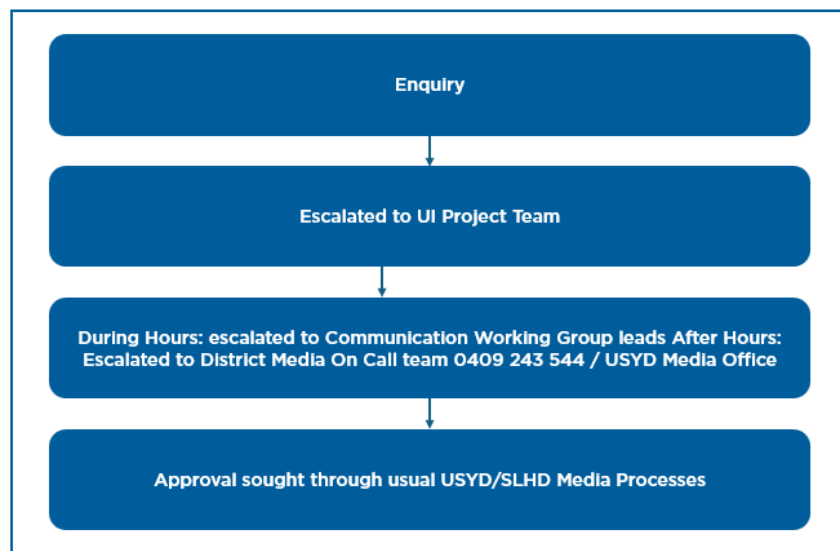


Figure 2 – SBA Media Escalation Protocol

## 3.2 FEEDBACK & COMPLAINTS MANAGEMENT

Feedback may include any interaction with a stakeholder, student or staff member who expresses satisfaction / dissatisfaction with the project, services or staff member’s action during the project or highlights an issue regarding the project that requires management. Complaints received by the nominated representative via email or phone will be referred directly to the project team for investigation and response.

### 3.2.1 RESPONDING TO AND RECORDING ENQUIRIES / COMPLAINTS

To ensure that any negative feedback is managed consistently the following information is required to help resolve the complaint quickly and effectively:

- Complainants contact details
- Description of complaint
- Requested remedy or action
- Due date for response
- Immediate action

Where RCC receives a request or complaint in respect to the WUC from an owner or occupier of an Adjacent Site, the public or any other source, RCC will:

- Respond courteously, and with regard to any previous directions by UI
- Record all such requests and complaints received, and
- Notify the Principal immediately.

Project sites are required to maintain a register of concerns and complaints and referred to UI Community Engagement Manager for entry into the Complaints Management Database for management and record of outcomes. RCC will align with UI’s issues management procedures.

### 3.2.2 COMMUNITY COMPLAINTS DIRECT TO WORKFORCE

Where a complaint is made directly to workers onsite, they are to immediately advise the nominated representative of the complaint. The nominated representative will maintain ongoing contact with the stakeholder until the issue is resolved satisfactorily.

The complaints register will be maintained and updated with any new complaint without delay.

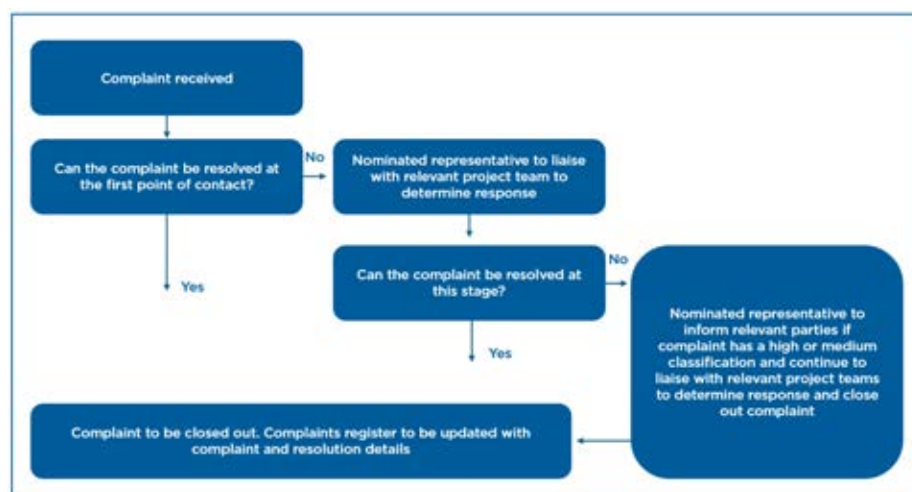


Figure 1 – Complaints escalation procedure is to be followed to the point when the stakeholder is satisfied the complaint has been adequately addressed or as considered by UI.

### 3.2.3 COMMUNITY NOTIFICATIONS

A key stakeholder database is to be established for the project, to ensure that all stakeholders who need to be advised of construction works have been identified. RCC shall give notice in writing to the owners and occupiers of Adjacent Sites before the commencement of any work that may cause nuisance or disruption to the owners or occupiers in line with the SLHD and UI permits, and disruption notice timeframes. The notice shall include a general description of the work, times and anticipated nuisance or disruption.

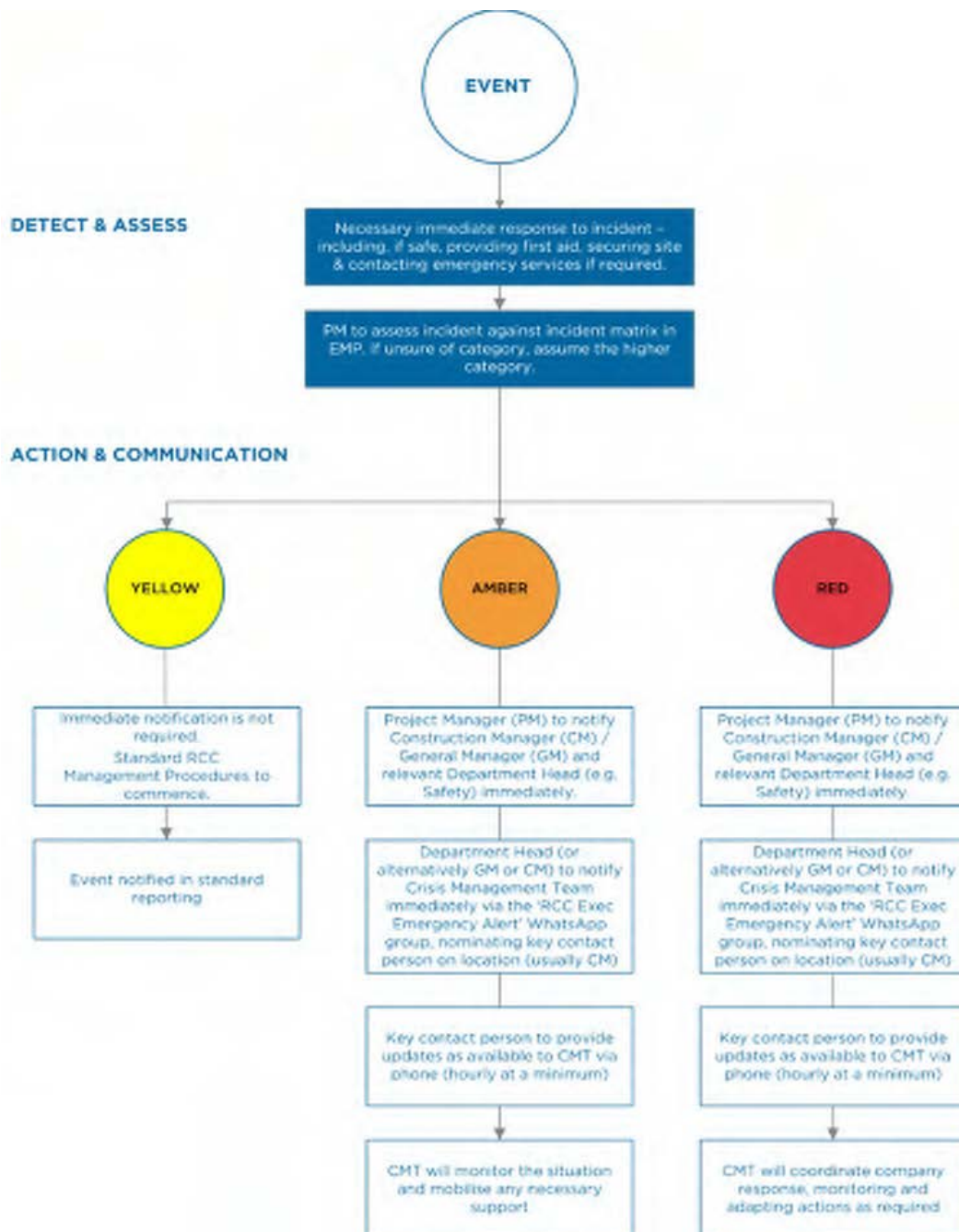
As part of this proactive approach the Contractor is required to provide a weekly two-week look ahead construction update to the CUIG to inform the stakeholder group on high-level construction activities forecast in advance, focusing on activities which may have any impact to operations outside the site. These have been successfully implemented throughout the enabling works and the Contractor is required to continue throughout the main building works.

# 4 CRISIS COMMUNICATION

RCC has a number of plans to ensure the business and projects are able to quickly and effectively respond and manage a crisis or serious incident.

Refer to The Emergency Management Plan that will be implemented prior to the commencement of on-site works.

## 4.1 PROJECT TEAM INCIDENT MANAGEMENT AND ESCALATION PROCEDURE



### INCIDENT CATEGORIES (SEVERITY OF IMPACT)

	SAFETY / HUMAN RISK	ENVIRONMENTAL / NATURAL DISASTER	INDUSTRIAL RELATIONS	PROPERTY OR PROJECT	CORPORATE REPUTATION / MEDIA	HEALTH
Crisis Management Team notified, action will be taken by the team	<ul style="list-style-type: none"> <li>Attack with weapon</li> <li>Fatality/ multiple fatalities of worker/ RCC employee/ member of public</li> <li>Permanent disability</li> <li>Kidnapping</li> <li>Specific threat to business/ project from terrorist group</li> </ul>	<ul style="list-style-type: none"> <li>Significant impact on environment</li> <li>Natural disaster</li> <li>Significant environment clean-up required</li> <li>Major impact to local community / community outrage</li> </ul>		<ul style="list-style-type: none"> <li>Significant damage, temporary or permanent relocation required</li> <li>Rebuilding required</li> <li>Major building loss, collapse</li> </ul>	<ul style="list-style-type: none"> <li>Media allegations regarding RCC's financial status that require immediate correction (eg allegations re voluntary or involuntary administration or other insolvency event)</li> </ul>	<ul style="list-style-type: none"> <li>Significant outbreak which results in widespread lockdown, project shutdowns and work from home orders</li> </ul>
Crisis Management Team notified only	<ul style="list-style-type: none"> <li>Hospitalisation required</li> <li>Multiple injuries from single event</li> <li>Injury to member of the public</li> <li>Major HPI occurs involving serious injury (non-life threatening)</li> </ul>	<ul style="list-style-type: none"> <li>Moderate environment clean-up required as below</li> <li>Likely EPA/ Government involvement/ fine</li> <li>Impacts local community</li> <li>Nearby flood or fire that causes project to be evacuated / stop work</li> </ul>	<ul style="list-style-type: none"> <li>Project shut down</li> <li>Strike action causing work to stop for multiple days</li> <li>Uninvited regulator attendance resulting in violence</li> <li>Infringement notice issued</li> <li>Uninvited regulator attendance which severely impacts team/ project operations</li> <li>Strike action causing work to stop for less than a day</li> </ul>	<ul style="list-style-type: none"> <li>Moderate damage, partial relocation possible</li> <li>Substantial repairs required</li> <li>Significant loss of services caused by RCC operations</li> </ul>	<ul style="list-style-type: none"> <li>Government / regulatory intervention likely / or investigation</li> <li>Significant/ major public / stakeholder concern</li> <li>Local/ significant reputation / media interest</li> </ul>	<ul style="list-style-type: none"> <li>Outbreak or moderate health concern which results in short term impacts to project operations</li> <li>Key members / subcontractors unable to work for extended period, affecting project or team</li> </ul>
Managed by site team in line with RCC Management Procedures	<ul style="list-style-type: none"> <li>HPI occurs, no medical attention required / minor injury medical attention is required</li> <li>Injury to worker requiring first aid</li> <li>Minor uncontained safety, welfare concern</li> <li>Notifiable incident (non-life threatening or major building loss/damage)</li> </ul>	<ul style="list-style-type: none"> <li>Minor impact on environment as below</li> <li>Immediate clean-up / contained on site</li> <li>No regulatory involvement</li> <li>No impact on local community</li> <li>Localised flooding/ contained fire that prevents work for short duration of time</li> </ul>	<ul style="list-style-type: none"> <li>Uninvited regulator or union attendance/ no infringement</li> </ul>	<ul style="list-style-type: none"> <li>Minor damage, minor repairs required, project continues to operate</li> <li>Moderate security breach</li> <li>Temporary loss of essential services caused by RCC operations</li> </ul>	<ul style="list-style-type: none"> <li>No Government or regulatory involvement</li> <li>Minor local public / stakeholder concern</li> <li>No media interest</li> </ul>	<ul style="list-style-type: none"> <li>Isolated and managed cases / health concern</li> <li>Project operations can continue as normal</li> </ul>

## 5 REPORTING, MONITORING AND EVALUATION

The plan will need to be reviewed and updated regularly.

Tools can be used for regular monthly monitoring, evaluation and reporting. For example:

- Reporting to client (fortnightly or monthly)
- Evaluation of response times to external enquiries
- Meetings with client to track progress
- Complaints reporting through agreed process.

## SYDNEY

LEVEL 3, 4 BROADCAST WAY  
ARTARMON NSW 2064

PO BOX 1024  
CROWS NEST NSW 1585

PHONE: 02 9902 4700  
FAX: 02 9439 1114

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## NEWCASTLE

LEVEL 1, 118A BELFORD STREET  
BROADMEADOW NSW 2292

PHONE: 02 9902 4700

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## TAMWORTH

SUITE 1, 493 PEEL STREET  
TAMWORTH NSW 2340

PHONE: 02 6766 5225

---

## CANBERRA

UNIT 1, 155 NEWCASTLE STREET  
FYSHWICK ACT 2609

PO BOX 771  
FYSHWICK ACT 2609

PHONE: 02 6143 2900

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## BRISBANE

LEVEL 6, 25 KING STREET  
BOWEN HILLS QLD 4006

PHONE: 07 3099 0899

## 6.11 HERITAGE INDUCTION



# **Sydney Biomedical Accelerator Project: Aboriginal Heritage Management Plan**

Prepared by AMBS Ecology & Heritage  
for Richard Crookes Constructions

Final

June 2025

AMBS Reference: 25593

## Document Information

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<b>Recipient:</b>	Madison Barrie, Site Engineer, Richard Crookes Constructions
<b>Authors:</b>	Christopher Langeluddecke, Director Heritage, and Madi Rodwell, Heritage Project Manager, AMBS Ecology & Heritage
<b>Approved by:</b>	Christopher Langeluddecke, Director Heritage, AMBS Ecology & Heritage

## Compliance

ID	Requirement	Reference
B19	<p><b>Construction Environmental Management Plan</b></p> <p>Prior to the commencement of construction, the Applicant must submit a Construction Environmental Management Plan (CEMP) to the Certifier and publish a copy of the CEMP on the Applicant’s website in accordance with condition A26 (Access to Information). The CEMP must include, but not be limited to, the following:</p> <ul style="list-style-type: none"> <li>(a) Details of:</li> <li>(iii) heritage induction for staff</li> </ul>	Project CEMP, Appendix C of this plan
B33	<p><b>Aboriginal Heritage</b></p> <p>Prior to the commencement of construction, the Applicant must consult with Registered Aboriginal Parties to determine specific requirements and management measures to be used on site during construction, including protection of any objects or items in perpetuity.</p>	This plan
B34	<p>Prior to commencement of construction, workers must receive information on Aboriginal cultural heritage management requirements as part of the induction process. Records of these inductions must be documented and provided to the Certifier.</p>	Project CEMP, Appendix C of this plan
C26	<p><b>Aboriginal Cultural Heritage</b></p> <p>Construction must be undertaken in accordance with the recommendations of the Aboriginal Cultural Heritage Assessment prepared by Biosis dated 1 July 2024, including the unexpected finds procedure and procedure for the discovery of human remains in the Aboriginal Cultural Heritage Management Plan (ACHMP) developed by Extent Heritage Pty Ltd (2018) for the Campus Improvement Program (CIP) (Extent Heritage Pty Ltd 2018).</p>	Project CEMP, Appendix A of this plan
C28	<p><b>Unexpected Finds Protocol – Historic Heritage</b></p> <p>If any unexpected archaeological relics are uncovered during the work, then:</p> <ul style="list-style-type: none"> <li>a) all works must cease immediately in that area and notice is to be given to Heritage NSW and the Planning Secretary;</li> <li>b) depending on the possible significance of the relics, an archaeological assessment and management strategy may be required before further works can continue in that area as determined in consultation with Heritage NSW; and</li> <li>c) works may only recommence with the written approval of the Planning Secretary.</li> </ul>	Appendix A of this plan

## Glossary/Abbreviations

Acronym	Definition
Aboriginal objects	Aboriginal objects include any deposit, object or material evidence (not being a handicraft made for sale), including Aboriginal remains, relating to the Aboriginal habitation of NSW, before or concurrent with occupation by non-Aboriginal people, as defined in Section 5 of the <i>National Parks and Wildlife Act 1974</i>
ACHA	Aboriginal Cultural Heritage Assessment Report
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
AHMP	Aboriginal Heritage Management Plan
AMBS	AMBS Ecology and Heritage
CEMP	Construction Environmental Management Plan
CoA	Condition of approval
DECCW	Department of Environment Climate Change and Water (now Heritage NSW)
EIS	Environmental Impact Statement
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
GFA	Gross Floor Area
Heritage NSW	Heritage NSW, Department of Premier and Cabinet (formerly OEH and DECCW)
HTH	Health Translation Hub
LALC	Local Aboriginal Land Council
NPW Act	<i>National Parks and Wildlife Act 1974</i>
OEH	Office of Environment and Heritage (now Heritage NSW)
Project, the	Sydney Biomedical Accelerator Project
RAP	Registered Aboriginal Party
RCC	Richard Crookes Constructions
RPAH	Royal Prince Alfred Hospital
SBA	Sydney Biomedical Accelerator Project
Secretary	Secretary of the NSW Department of Planning and Environment (or delegate)
SLHD	Sydney Local Health District
USYD	University of Sydney

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# 1 Introduction

## 1.1 Context

This Aboriginal Heritage Management Plan (AHMP or Plan) forms part of the construction management planning for the University of Sydney (USYD) and Sydney Local Health District (SLHD) Sydney Biomedical Accelerator Project (SBA, the Project). This Plan has been prepared to address the requirements of the State Significant Development Consent (SSD-55388456) dated 19 November 2024, the *Sydney Biomedical Accelerator Aboriginal Cultural Heritage Assessment* (Biosis 2023), and all applicable legislation (NSW and Commonwealth).

## 1.2 Project overview

The SBA is a co-funded partnership project between NSW Government (NSW Health), SLHD and USYD. Located within the Camperdown neighbourhood of the health precinct, the SBA will be a state-of-the-art health, education and biomedical research complex.

The SBA is a complex of two interconnected buildings that bring together the brightest academic, scientific and clinical minds with entrepreneurs, industry and government to accelerate biomedical research development, innovation and commercialisation. The SBA development will comprise of two functional integrated buildings and will straddle the University of Sydney's Camperdown Campus Health Precinct, and the adjoining RPAH site.

Within the University of Sydney Camperdown campus, the development comprises:

- The Isaac Wakil Biomedical Building (IWBB): approximately 29,050sqm gross floor area (GFA) over 8 floors for physical containment level 2 (PC2) wet lab research, mortuary and advanced anatomy teaching, clinical research facilities, core research facilities and plant space. The IWBB scope also includes all landscaping and in-ground services works to the Eastern side of the adjusted property boundary.

On the RPAH site, the development comprises:

- Building B: approximately 8,000sqm GFA over 8 floors of primarily PC2 laboratories with a specialist PC3 laboratory, biobank facility and plant space. The Building B scope also includes all landscaping and in-ground services works to the Western side of the adjusted property boundary.

In addition, the development facilitates a publicly accessible pedestrian connection from Missenden Road, through RPAH land, to the Camperdown campus, as well as public domain upgrades and landscaping surrounding the new building to integrate the SBA complex with its setting.

The project is classified as State Significant Development (SSD) under section 4.36 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), as it is a subsequent stage of the approved concept development application for the University's Campus Improvement Program (CIP) concept proposal (SSD-6123), is for the purposes of a health, medical or related research Facility, and has a capital investment value greater than \$30 million. This Plan has been prepared in accordance with the

- *Environmental Planning and Assessment Act 1979* (EP&A Act)
- *National Parks and Wildlife Act 1974* (NPW Act)

The SBA Project area spans the USYD Camperdown campus and the Sydney Health District's Royal Prince Alfred Hospital (RPAH) campus, and is located the corner of Western Avenue and Cadigal Lane, Camperdown in the Sydney Local Government Area (LGA) (Figure 1.1 and Figure 1.2).

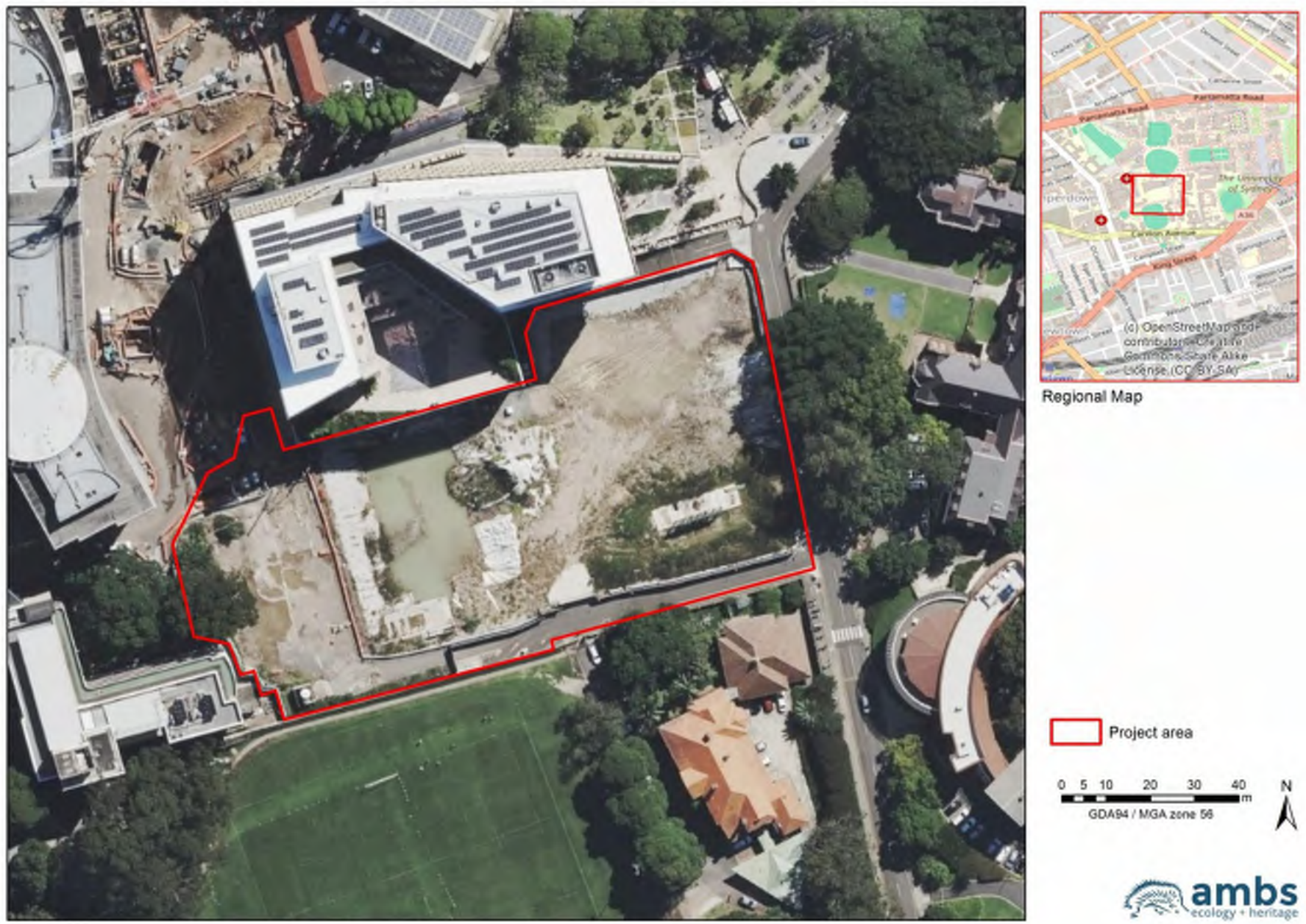


Figure 1.1 SBA project area.



Figure 1.2 SBA project area location indicated in red within USYD and RPAH campuses.

### 1.3 Project compliance requirements and targets

Key planning requirements from the Project Planning Approval addressing Aboriginal heritage are summarised in the Compliance Matrix included at the beginning of this Plan. As the Project is an SSD, the approval and permit requirements of the NPW Act have been assessed under Part 5.1 of the EP&A Act. This is addressed in the Project Planning Approval and no separate permits are required for the works.

The following targets have been established for the management of Aboriginal heritage impacts during the Project:

- Compliance with the Project's Conditions of Approval (CoA) and mitigation measures, and relevant legislative requirements,
- Adherence to the Unexpected Finds Procedure attached as Appendix A, including notification of any heritage objects/places uncovered during construction,
- Provision of a heritage induction addressing Aboriginal and historic heritage to all personnel including sub-contractors as part of project inductions training before they start work onsite.

### 1.4 Guidelines and other environmental documents

The main guidelines and policy documents of relevance to this plan include:

- *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010)
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010)
- *Guide to Investigation, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011)

Other environmental documents relevant to management of Aboriginal heritage for the project include:

- *Sydney Biomedical Accelerator Aboriginal Cultural Heritage Assessment* (Biosis, July 2023)
- *Environmental Impact Statement: Sydney Biomedical Accelerator - University of Sydney SSD-55388456* (Urbis, October 2023)
- *University of Sydney – Campus Improvement Program – Aboriginal Cultural Heritage Management Plan* (Extent, September 2018)

## 2 Aboriginal community consultation

Consultation and engagement with the project's Registered Aboriginal Parties (RAPs) was initiated during the EIS assessment process in accordance with the Heritage NSW *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010).

The following 14 RAPs registered their interest in being consulted with for the project, and were engaged with throughout the Aboriginal Cultural Heritage Assessment (ACHA) and EIS assessment process:

- Metropolitan Local Aboriginal Land Council (LALC)
- Didge Ngunawal Clan
- Koori Digs Services
- A1 Indigenous Services
- Kamilaroi Yankuntjatjura Working Group (KYWG)
- Gunjee Wong Cultural Heritage Aboriginal Corporation
- RAW Cultural Healing
- Ginninderra Aboriginal Corporation
- Confidential Party 1
- Confidential Party 2
- Sydney Local Health District (SLHD) party 1
- Sydney Local Health District (SLHD) party 2
- Aboriginal Medical Service Redfern
- Amanda Hickey Cultural Services

Details of the consultation with the RAPs throughout the EIS assessment process are outlined in Chapter 4 of the ACHA report (included as appendix Z of the Project EIS). Detailed consultation records are included in Appendix A of that report (Biosis 2023:1-15, Appendix A).

### 2.1 Ongoing consultation

As per Condition B33 of the Project approval, the draft of this AHMP was provided to all project RAPs for their review by email by USYD on 16 May 2025, requesting that any feedback or comment be provided within 14 days. A single response was received from Didge Ngunawal Clan on 16 May 2025 indicating that the organisation had reviewed and supported the AHMP. No additional feedback or input was received from the remaining RAPs. Copies of all correspondence with the RAPs regarding the AHMP are attached as Appendix B, along with a complete record of all communications.

As per the ACHA, no Aboriginal heritage sites or areas of Aboriginal archaeological potential were identified within the SBA project area, and no further Aboriginal heritage investigations are required. As such, no further Aboriginal community consultation for the Project site is required during construction unless an unexpected Aboriginal heritage object is identified during works.

In the event that an Aboriginal object or suspected human remains are unexpectedly identified during construction, RAPs will be notified and engaged with in accordance with the Unexpected Finds Procedure or Procedure for the Discover of Possible Human Skeletal Remains (Appendix A). RAP representatives will be given the opportunity to participate in the event that additional archaeological works are required in order to manage Unexpected Aboriginal heritage finds, including site and artefact recording, archaeological excavation, or monitoring. All Aboriginal heritage reports produced as a result of the unexpected finds being identified will be given to the RAPs for their review, comment, and input prior to finalisation.

### **3 Existing environment**

The ACHA included as Appendix Z of the Project EIS describes the environmental and Aboriginal heritage context for the SBA project site. The assessment included a review of the site's history of development and disturbance, archaeological survey, and consultation with the local Aboriginal community in accordance with Heritage NSW requirements.

The ACHA identified that there were no previously recorded Aboriginal heritage sites in or near the project area, and that the area had been previously disturbed and modified by past agricultural activities, and construction of buildings and infrastructure through the 20<sup>th</sup> century and onwards, particularly from educational and healthcare buildings. Archaeological survey conducted with representatives of the RAPs identified no Aboriginal sites, objects or areas of archaeological potential, and confirmed significant disturbances across the area, with terracing and flat areas established through cutting into the natural landform for the construction of buildings.

The assessment concluded that there were no Aboriginal sites, objects or areas of archaeological potential in the project area, that no further Aboriginal heritage investigations were required for the proposed development, and that the works may proceed with caution.

#### **3.1 Potential impacts**

Given the results and conclusions of the ACHA, it is unlikely that Aboriginal heritage sites or objects remain which could be impacted by the Project works.

If suspected Aboriginal heritage objects are identified during Project works they should be managed in accordance with the Unexpected Finds Procedure discussed in Section 4 and attached as Appendix A.

## 4 Aboriginal heritage impact mitigation and management measures

Previous Aboriginal heritage assessment and archaeological investigation undertaken for the Project EIS have identified that there is a low likelihood that any additional sites or objects remain present in the Project area of works.

In the unlikely event that potential heritage finds are identified during works, all works should immediately cease, and the Unexpected Finds Procedure should be followed (Appendix A).

Unexpected heritage finds are categorised as either:

- a) Aboriginal heritage objects;
- b) Historic (non-Aboriginal) heritage items; or
- c) Human skeletal remains.

The Unexpected Heritage Finds Procedure details the process that should be followed in the event that potential heritage items are identified, including hold points requiring written approval from regulatory authorities and heritage specialists before works can proceed. Also included is a separate Procedure addressing the process to be followed in the event that bones which may be human skeletal remains are identified. The Unexpected Human Skeletal Remains Procedure details hold points which would be under the control of the NSW Police.

In the event that Aboriginal heritage objects are identified during works and recovered as per the Unidentified Heritage Finds Procedure, engagement with the Project RAPs and Heritage NSW would need to be undertaken by an AMBS archaeologist and Richard Crookes Constructions (RCC) to identify the Aboriginal stakeholder's preferred option for long term management following archaeological recovery and analysis. With RAP and Heritage NSW approval, initial temporary storage of artefacts would be at the AMBS office immediately following recovery, to allow for detailed archaeological recording and analysis.

An Aboriginal heritage induction must be provided to all on-site personnel, including sub-contractors, as part of project inductions. The training should address the following:

- Existence and requirements of this AHMP
- Relevant legislation and approvals
- Roles and responsibilities for Aboriginal heritage management
- Existence and process detailed in the Unexpected Heritage Finds Procedure in the event of an unexpected heritage find or suspected human skeletal remains during construction works (as per Appendix A).

## **Bibliography**

Biosis (2023) *Sydney Biomedical Accelerator Aboriginal Cultural Heritage Assessment*, Report to the University of Sydney on behalf of University of Sydney, Sydney Local Health District and NSW Government.

Department of Environment, Climate Change and Water NSW (DECCW) (2010) *Aboriginal cultural heritage consultation requirements for proponents 2010*.

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Extent (2018) *University of Sydney – Campus Improvement Program – Aboriginal Cultural Heritage Management Plan*, Report to University of Sydney.

Transport for NSW (2022) *Unexpected Heritage Items procedure*.

Urbis (2023) *Environmental Impact Statement Sydney Biomedical Accelerator - University of Sydney SSD-55388456*, Report to University of Sydney.

## Appendix A: Unexpected Finds Procedure

As per Condition C26 of the project approval, if possible Aboriginal or non-Aboriginal (historic) heritage objects or suspected skeletal human remains are identified during project works, they should be managed in accordance with the Unexpected Finds Procedure and Procedure for the Discovery of Possible Human Skeletal Remains as presented in the *University of Sydney – Campus Improvement Program Aboriginal Cultural Heritage Management Plan* (Extent 2018).

Condition C28 of the project approval requires that additional processes be followed if a potentially significant historic relic is identified. The additional processes have been added to the Unexpected Finds Procedure to ensure compliance with both C28 and C26.

The procedures presented in this Appendix have been updated to reflect that the current regulatory body to be consulted with for the processes is Heritage NSW, and to present the correct roles and contact information for the current RCC SBA project scope of works.

## Unexpected Find Procedure – Aboriginal and Historic Heritage

### **Purpose**

This procedure details the actions to be taken when a previously unidentified and/or potential Aboriginal and/or historical heritage item/object/site is found during construction activities.

### **Scope**

This procedure is applicable to all activities conducted by project personnel that have the potential to uncover an Aboriginal and/or historical heritage artefact/item/object/site.

### **Procedure – Aboriginal and Historic Heritage**

In the event that a potential heritage artefact/item/object/site is encountered during construction the following steps shall be taken.

- **STOP ALL WORK** in the vicinity of the find and immediately notify the relevant Site Supervisor. The Supervisor will then notify the Richard Crookes Constructions (RCC) Workplace Health, Safety and Environment (WHS&E) advisor and/or the Project Manager, and demark the area to protect the artefact/item/object/site.
- The RCC WHS&E advisor is to record the details, take photos of the find and ensure that the area is adequately protected from additional disturbance.
- The RCC WHS&E advisor contacts the AMBS project archaeologist on (02) 9518 4489 to notify them of the location of the find.
- If the AMBS project archaeologist advises that the find **is not** a potential Aboriginal object or significant historical relic, work will recommence in consultation with the Project Manager and/or Richard Crookes Constructions (RCC) Workplace Health, Safety and Environment (WHS&E) advisor.
- If the AMBS project archaeologist advises that the find **is** a potential Aboriginal object or significant historical relic, the Project Manager and RCC WHS&E advisor should undertake the following procedure:
  - If the find is a significant historic relic, notice should be given to Heritage NSW and the Planning Secretary;
  - Liaise with the AMBS project archaeologist to determine the significance of the potential Aboriginal object or significant historical relic. Note this may require liaison with Relevant Aboriginal Parties;
  - Implement the appropriate heritage mitigations dependent on the significance of the site as outlined in the University of Sydney – Campus Improvement Program – Aboriginal Cultural Heritage Management Plan (Extent 2019) or Sydney Biomedical Accelerator Aboriginal Cultural Heritage Assessment (Biosis 2023) as appropriate; and
  - If the find is a significant historic relic, depending on the possible significance, an archaeological assessment and management strategy prepared by the AMBS project archaeologist may be required before further works can continue in that area as determined in consultation with Heritage NSW.
- If the find is a significant historic relic, works may only recommence with the written approval of the Planning Secretary.

## Procedure for Discovery of Possible Human Skeletal Remains

### **Purpose**

This procedure details the actions to be taken when possible human skeletal material (remains) is found during construction activities.

### **Scope**

This procedure is applicable to all activities conducted by project personnel that have the potential to uncover possible human skeletal material (remains).

This section outlines the procedure for handling human remains in accordance with the *Skeletal Remains – Guidelines for the Management of Human Skeletal Remains* under the *Heritage Act 1977* (NSW Heritage Office 1998) and the *Aboriginal Cultural Heritage Standards and Guidelines Kit* (NPWS 1997).

### **Procedure – Discovery of possible human skeletal material (remains)**

In the event that possible human skeletal material (remains) is encountered during construction the following steps shall be taken.

- **STOP ALL WORK** in the vicinity of the find and immediately notify the relevant Site Supervisor. The Supervisor will then notify the *Richard Crookes Constructions (RCC) Workplace Health, Safety and Environment (WHS&E) advisor* and/or the Project Manager, and demark the area to protect the possible human skeletal material (remains).
- The *RCC WHS&E advisor/Project Manager* is to record the details, take photos of the find and ensure that the area is adequately protected from additional disturbance.
- (Please note: each step of the procedure will advise if the following step is required to be implemented)
- The *RCC WHS&E advisor/Project Manager* on site must notify the NSW Police by calling '000' and the Office of the NSW State Coroner by calling '(02) 8584 7777'.
- The *RCC WHS&E advisor/Project Manager* on site must notify the *AMBS project archaeologist* on (02) 9518 4489.
- Should the NSW Police determine the remains to not be of a criminal nature, the *RCC WHS&E advisor/Project Manager* should notify *Heritage NSW (formerly OEH)* through the Environment hotline on 131 555.
- Should Heritage NSW determine the remains to be of Aboriginal ancestry, Heritage NSW and/or the *AMBS project archaeologist* in liaison with the Registered Aboriginal Parties would determine the most appropriate course of action, which may include deviation of the construction works, or the careful removal of the remains and reburial elsewhere.
- Should Heritage NSW determine the remains to be of historic ancestry, the *RCC WHS&E advisor* in liaison with the *AMBS project archaeologist* should contact the NSW Heritage Branch and determine the most appropriate course of action, which may include deviation of the construction works, or the careful removal of the remains and reburial elsewhere.
- Should Heritage NSW determine the remains to be of non-human origin, construction works may proceed.

## **Appendix B: Aboriginal Community Consultation**

**Aboriginal Community Consultation Log**

Date	Sender	Organisation	Recipient	Organisation	Method	Comment
16/05/2025	Janani Suseelar	USYD	Rowena Welsh-Jarrett	Metropolitan Local Aboriginal Land Council	email	Admin responded on 16/5/25 saying Rowena no longer works for the company. Cultural Heritage Team will review & respond. No response received by 2/6/25
16/05/2025	Janani Suseelar	USYD	Lilly Carroll	Didge Ngunawal Clan	Email	Responded 16/5/25. No comments.
16/05/2025	Janani Suseelar	USYD	Korri Currell	Koori Digs Services	Email	No response received
16/05/2025	Janani Suseelar	USYD	Carolyn Hickey	A1 Indigenous Services	Email	No response received
16/05/2025	Janani Suseelar	USYD	Phil Khan	Kamilaroi Yankuntjatara Working Group	Email	No response received
16/05/2025	Janani Suseelar	USYD	Shayne Dickson	Gunjeewong Cultural Heritage Aboriginal Corporation	Email	No response received
16/05/2025	Janani Suseelar	USYD	Raymond Weatherall	RAW Cultural Healing	Email	No response received
16/05/2025	Janani Suseelar	USYD	Krystle Carroll-Elliott	Ginninderra Aboriginal Corporation	Email	No response received
16/05/2025	Janani Suseelar	USYD	CONFIDENTIAL 1		Email	No response received
16/05/2025	Janani Suseelar	USYD	CONFIDENTIAL 2		Email	No response received
16/05/2025	Janani Suseelar	USYD	George Long	Sydney Local Health District	Email	No response received
16/05/2025	Janani Suseelar	USYD	Kristina Zarkos	Sydney Local Health District	Email	No response received
16/05/2025	Janani Suseelar	USYD	LaVerne Bellear	Aboriginal Medical Service Redfern	Email	No response received
16/05/2025	Janani Suseelar	USYD	Amanda Hickey	Amanda Hickey Cultural Services	Email	No response received
16/05/2025	Janani Suseelar	USYD	Rowena Welsh-Jarrett	Metropolitan Local Aboriginal Land Council	Email	Admin responded on 16/5/25 saying Rowena no longer works for the company. Cultural Heritage Team will review & respond. No response received by 2/6/25

## Aboriginal Community Consultation Correspondence

### Janani Suseelar

---

**From:** Janani Suseelar  
**Sent:** Friday, 16 May 2025 2:56 PM  
**To:** culturalheritage@metroalc.org.au  
**Cc:** Nikki Short  
**Subject:** University of Sydney, Sydney Local Health District and NSW Government: Sydney Biomedical Accelerator Project- Aboriginal Heritage Management Plan  
**Attachments:** 25593 v4 Sydney Biomedical Accelerator AHMP.pdf

Hi Rowena,

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If you have any questions or require further information, please don't hesitate to contact me using the details below.

Regards

Janani Suseelar | Senior Project Manager  
University Infrastructure

THE UNIVERSITY OF SYDNEY  
Services Building G12 | 22 Cockington St | Darlington | NSW | 2008  
M +61 400 898 187  
E [janani.suseelar@sydney.edu.au](mailto:janani.suseelar@sydney.edu.au) | <https://sydney.edu.au>

## Janani Suseelar

---

**From:** Janani Suseelar  
**Sent:** Friday, 16 May 2025 2:57 PM  
**To:** didgengunawalklan@yahoo.com.au  
**Cc:** Nikki Short  
**Subject:** University of Sydney, Sydney Local Health District and NSW Government: Sydney Biomedical Accelerator Project- Aboriginal Heritage Management Plan  
**Attachments:** 25593 v4 Sydney Biomedical Accelerator AHMP.pdf

Hi Lilly,

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Regards

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THE UNIVERSITY OF SYDNEY  
Services Building G12 | 22 Cockington St | Darlinghurst | NSW | 2008  
M +61 400 998 187  
E [janani.suseelar@sydney.edu.au](mailto:janani.suseelar@sydney.edu.au) W <http://sydney.edu.au>

**Janani Suseelar**

---

**From:** Janani Suseelar  
**Sent:** Friday, 16 May 2025 2:59 PM  
**To:** kooridigs@gmail.com  
**Cc:** Nikki Short  
**Subject:** University of Sydney, Sydney Local Health District and NSW Government: Sydney Biomedical Accelerator Project- Aboriginal Heritage Management Plan  
**Attachments:** 25593 v4 Sydney Biomedical Accelerator AHMP.pdf

Hi Koori,

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University Infrastructure

THE UNIVERSITY OF SYDNEY  
Services Building G12 | 22 Cockington St | Darlinghurst | NSW | 2008  
M +61 400 888 187  
E [janani.suseelar@sydney.edu.au](mailto:janani.suseelar@sydney.edu.au) | <https://sydney.edu.au>

**Janani Suseelar**

---

**From:** Janani Suseelar  
**Sent:** Friday, 16 May 2025 3:00 PM  
**To:** cazadirect@live.com  
**Cc:** Nikki Short  
**Subject:** University of Sydney, Sydney Local Health District and NSW Government: Sydney Biomedical Accelerator Project- Aboriginal Heritage Management Plan  
**Attachments:** 25593 v4 Sydney Biomedical Accelerator AHMP.pdf

Hi Carolyn,

In March 2023, Biosis Pty Ltd (Biosis) conducted an Aboriginal Cultural Heritage Assessment (ACHA) on behalf of the University of Sydney, Sydney Local Health District, and the NSW Government. This work was undertaken to support the development of a new educational precinct for the proposed Sydney Biomedical Accelerator (SBA) project.

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THE UNIVERSITY OF SYDNEY  
Services Building G12 | 22 Cockington St | Darlinghurst | NSW | 2008  
M +61 400 998 187  
E [janani.suseelar@sydney.edu.au](mailto:janani.suseelar@sydney.edu.au) W <http://sydney.edu.au>

## Janani Suseelar

---

**From:** Janani Suseelar  
**Sent:** Friday, 16 May 2025 3:02 PM  
**To:** [gunjeewongculturalheritage21@hotmail.com](mailto:gunjeewongculturalheritage21@hotmail.com)  
**Cc:** Nikki Short  
**Subject:** University of Sydney, Sydney Local Health District and NSW Government: Sydney Biomedical Accelerator Project- Aboriginal Heritage Management Plan  
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Hi Shayne,

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University Infrastructure

THE UNIVERSITY OF SYDNEY  
Services Building G12 | 22 Cockington St | Darlinghurst | NSW | 2008  
M +61 400 888 187  
E [janani.suseelar@sydney.edu.au](mailto:janani.suseelar@sydney.edu.au) W <http://sydney.edu.au>

## Janani Suseelar

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**From:** Janani Suseelar  
**Sent:** Friday, 16 May 2025 3:01 PM  
**To:** philipkhan.acn@live.com.au  
**Cc:** Nikki Short  
**Subject:** University of Sydney, Sydney Local Health District and NSW Government: Sydney Biomedical Accelerator Project- Aboriginal Heritage Management Plan  
**Attachments:** 25593 v4 Sydney Biomedical Accelerator AHMP.pdf

Hi Phil,

In March 2023, Biosis Pty Ltd (Biosis) conducted an Aboriginal Cultural Heritage Assessment (ACHA) on behalf of the University of Sydney, Sydney Local Health District, and the NSW Government. This work was undertaken to support the development of a new educational precinct for the proposed Sydney Biomedical Accelerator (SBA) project.

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THE UNIVERSITY OF SYDNEY  
Services Building G12 | 22 Cockington St | Darlinghurst | NSW | 2008  
M +61 400 998 187  
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**Janani Suseelar**

---

**From:** Janani Suseelar  
**Sent:** Friday, 16 May 2025 3:03 PM  
**To:** Ginninderra.corp@gmail.com  
**Cc:** Nikki Short  
**Subject:** University of Sydney, Sydney Local Health District and NSW Government: Sydney Biomedical Accelerator Project- Aboriginal Heritage Management Plan  
**Attachments:** 25593 v4 Sydney Biomedical Accelerator AHMP.pdf

Hi Krystle,

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E [janani.suseelar@sydney.edu.au](mailto:janani.suseelar@sydney.edu.au) W [Ntp://sydney.edu.au](http://Ntp://sydney.edu.au)

## Janani Suseelar

---

**From:** Janani Suseelar  
**Sent:** Friday, 16 May 2025 3:02 PM  
**To:** RAW.CulturalHealing@hotmail.com  
**Cc:** Nikki Short  
**Subject:** University of Sydney, Sydney Local Health District and NSW Government: Sydney Biomedical Accelerator Project- Aboriginal Heritage Management Plan  
**Attachments:** 25593 v4 Sydney Biomedical Accelerator AHMP.pdf

Hi Raymond,

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University Infrastructure

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**Janani Suseelar**

---

**From:** Janani Suseelar  
**Sent:** Friday, 16 May 2025 3:08 PM  
**To:** [REDACTED]  
**Subject:** University of Sydney, Sydney Local Health District and NSW Government: Sydney Biomedical Accelerator Project- Aboriginal Heritage Management Plan  
**Attachments:** 25593 v4 Sydney Biomedical Accelerator AHMP.pdf

Hi [REDACTED],

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University Infrastructure

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M +61 405 998 187  
E [janani.suseelar@sydney.edu.au](mailto:janani.suseelar@sydney.edu.au) | [MBA/sydney.edu.au](http://MBA/sydney.edu.au)

**Janani Suseelar**

---

**From:** Janani Suseelar  
**Sent:** Friday, 16 May 2025 3:09 PM  
**To:** [REDACTED]  
**Subject:** University of Sydney, Sydney Local Health District and NSW Government: Sydney Biomedical Accelerator Project- Aboriginal Heritage Management Plan  
**Attachments:** 25593 v4 Sydney Biomedical Accelerator AHMP.pdf

Hi [REDACTED],

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University Infrastructure

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M +61 405 999 187  
E [janani.suseelar@sydney.edu.au](mailto:janani.suseelar@sydney.edu.au) | [MBA/sydney.edu.au](http://MBA/sydney.edu.au)

## Janani Suseelar

---

**From:** Janani Suseelar  
**Sent:** Friday, 16 May 2025 3:04 PM  
**To:** George.Iong@health.nsw.gov.au  
**Cc:** Nikki Short  
**Subject:** University of Sydney, Sydney Local Health District and NSW Government: Sydney Biomedical Accelerator Project- Aboriginal Heritage Management Plan  
**Attachments:** 25593 v4 Sydney Biomedical Accelerator AHMP.pdf

Hi George,

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M +61 400 998 187  
E [janani.suseelar@sydney.edu.au](mailto:janani.suseelar@sydney.edu.au) W <http://sydney.edu.au>

## Janani Suseelar

---

**From:** Janani Suseelar  
**Sent:** Friday, 16 May 2025 3:05 PM  
**To:** Kristina.zarkos@health.nsw.gov.au  
**Cc:** Nikki Short  
**Subject:** University of Sydney, Sydney Local Health District and NSW Government: Sydney Biomedical Accelerator Project- Aboriginal Heritage Management Plan  
**Attachments:** 25593 v4 Sydney Biomedical Accelerator AHMP.pdf

Hi Kristina,

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Regards

Janani Suseelar | Senior Project Manager  
University Infrastructure

THE UNIVERSITY OF SYDNEY  
Services Building G12 | 22 Cockington St | Darlinghurst | NSW | 2008  
M +61 400 998 187  
E [janani.suseelar@sydney.edu.au](mailto:janani.suseelar@sydney.edu.au) W [Ntp://sydney.edu.au](http://Ntp://sydney.edu.au)

## Janani Suseelar

---

**From:** Janani Suseelar  
**Sent:** Friday, 16 May 2025 3:06 PM  
**To:** [ibellean@amsredfern.org.au](mailto:ibellean@amsredfern.org.au)  
**Cc:** Nikki Short  
**Subject:** University of Sydney, Sydney Local Health District and NSW Government: Sydney Biomedical Accelerator Project- Aboriginal Heritage Management Plan  
**Attachments:** 25593 v4 Sydney Biomedical Accelerator AHMP.pdf

Hi LaVerne,

In March 2023, Biosis Pty Ltd (Biosis) conducted an Aboriginal Cultural Heritage Assessment (ACHA) on behalf of the University of Sydney, Sydney Local Health District, and the NSW Government. This work was undertaken to support the development of a new educational precinct for the proposed Sydney Biomedical Accelerator (SBA) project.

As you have previously registered your interest in the SBA project and are recognised as holding valuable cultural knowledge of the area, I am writing to share the **draft Aboriginal Heritage Management Plan (AHMP)** for the project's construction phase in Camperdown.

The SBA, approved as State Significant Development (SSD-55388456) under the *Environmental Planning and Assessment Act 1979*, is a collaborative initiative between NSW Health, Sydney Local Health District, and the University of Sydney. Situated within the Camperdown neighbourhood of the Tech Central precinct, the SBA will be a world-class health, education, and biomedical research facility, comprising three interconnected buildings.

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Regards

Janani Suseelar | Senior Project Manager  
University Infrastructure

THE UNIVERSITY OF SYDNEY  
Services Building G12 | 22 Cockington St | Darlinghurst | NSW | 2008  
M +61 400 998 187  
E [janani.suseelar@sydney.edu.au](mailto:janani.suseelar@sydney.edu.au) W <http://sydney.edu.au>

**Janani Suseelar**

---

**From:** Janani Suseelar  
**Sent:** Friday, 16 May 2025 3:06 PM  
**To:** amandahickey@live.com.au  
**Cc:** Nikki Short  
**Subject:** University of Sydney, Sydney Local Health District and NSW Government: Sydney Biomedical Accelerator Project- Aboriginal Heritage Management Plan  
**Attachments:** 25593 v4 Sydney Biomedical Accelerator AHMP.pdf

Hi Amanda,

In March 2023, Biosis Pty Ltd (Biosis) conducted an Aboriginal Cultural Heritage Assessment (ACHA) on behalf of the University of Sydney, Sydney Local Health District, and the NSW Government. This work was undertaken to support the development of a new educational precinct for the proposed Sydney Biomedical Accelerator (SBA) project.

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Regards

Janani Suseelar | Senior Project Manager  
University Infrastructure

THE UNIVERSITY OF SYDNEY  
Services Building G12 | 22 Cockington St | Darlinghurst | NSW | 2008  
M +61 400 998 187  
E [janani.suseelar@sydney.edu.au](mailto:janani.suseelar@sydney.edu.au) W <http://sydney.edu.au>

## Janani Suseelar

---

**From:** Elly carroll <didgengunawaiclan@yahoo.com.au>  
**Sent:** Friday, 16 May 2025 5:02 PM  
**To:** Janani Suseelar  
**Subject:** Re: University of Sydney, Sydney Local Health District and NSW Government: Sydney Biomedical Accelerator Project- Aboriginal Heritage Management Plan

Hi guys, we've reviewed it and we're happy with everything cheers Paul

[Sent from Yahoo Mail for iPhone](#)

On Friday, May 16, 2025, 2:57 pm, Janani Suseelar <janani.suseelar@sydney.edu.au> wrote:

Hi Lilly,

In March 2023, Biosis Pty Ltd (Biosis) conducted an Aboriginal Cultural Heritage Assessment (ACHA) on behalf of the University of Sydney, Sydney Local Health District, and the NSW Government. This work was undertaken to support the development of a new educational precinct for the proposed Sydney Biomedical Accelerator (SBA) project.

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If you have any questions or require further information, please don't hesitate to contact me using the details below.

Regards

Janani Suseelar | Senior Project Manager  
University Infrastructure

THE UNIVERSITY OF SYDNEY  
Services Building G12 | 22 Cadrigton St | Darlington | NSW | 2008

M +61 499 998 187

E [janani.suseelar@sydney.edu.au](mailto:janani.suseelar@sydney.edu.au) | W <http://sydney.edu.au>

## **Appendix C: Heritage Inductions**

## **Aboriginal Heritage Induction**

### ***Aboriginal Heritage and Archaeology at the SBA site***

Aboriginal heritage was assessed for the Sydney Biomedical Accelerator Project (SBA) Environmental Impact Statement in 2023, in consultation with the local Aboriginal community. The assessment confirmed that the area may once have been used by Aboriginal people in the past for short or long periods of time, and could once have retained Aboriginal heritage objects.

Due to the amount of past development and disturbance, there is a low likelihood that Aboriginal artefacts or areas of archaeological potential remain in the project area, and the development is able to proceed with caution.

All management responsibilities for Aboriginal heritage for the SBA are detailed in the project's Aboriginal Heritage Management Plan (AHMP). The AHMP summarises the site's Aboriginal heritage and approval, and outlines the responsibilities for management of Unexpected Heritage Finds.

### ***SBA Project Approval***

The SBA has been approved as a State Significant Development (SSD-55388456), which permits the project to proceed without any additional Aboriginal heritage assessment or permits. The approval does not allow any impacts to Aboriginal heritage outside of the SBA Project area.

The approval requires Aboriginal heritage to be managed under an *Unexpected Finds Procedure* and *Procedure for Discovery of Possible Human Skeletal remains*, which are included as Appendix A in the Project's AHMP

### ***What to do if suspected Aboriginal artefacts or possible human skeletal remains are found***

It is unlikely that that Aboriginal artefacts or burials are present within the SBA Project area.

However, if any suspected Aboriginal artefacts or human remains are identified during works, all works in the vicinity of the find must stop immediately and the relevant Site Supervisor must be notified straight away.

The Supervisor will then notify the Richard Crookes Constructions Workplace Health, Safety and Environment (WHS&E) advisor and/or the Project Manager and demark the area to protect the possible heritage find, and the steps outlined in the *Unexpected Find Procedure – Aboriginal and Historic Heritage* or *Procedure for Discovery of Possible Human Skeletal Remains* will be followed. Work will only re-commence once the requirements of that procedure have been satisfied.

### ***Aboriginal Stone Artefacts***

Aboriginal stone artefacts were generally made by hitting a piece of modified stone (a core), with a hammerstone (a cobble or pebble) held in the hand, to remove a sharp fragment of stone called a flake. If there is any suspicion that an object may be an Aboriginal artefact, it should be recovered in line with the protocol so that a specialist can make the final determination.

Examples of the types of Aboriginal artefacts which could be found in the local area are presented in Figure A.1, below.



Figure A.1 Examples of the types of Aboriginal stone artefacts which could be found in the local area (Transport for NSW 2022:26).

## Historic Heritage Induction

The SBA project is subject to State Significant Development (SSD-55388456) with the SSD Development Consent issued 19 November 2024. This Heritage Induction has been prepared to address the following conditions:

- *B19. Prior to the commencement of construction, the Applicant must submit a Construction Environmental Management Plans (CEMP) to the Certifier and publish a copy of the CEMP on the Applicant's website in accordance with condition A26 (Access to Information). The CEMP must include, but not be limited to, the following:*

*a) Details of:*

*(iii) Heritage induction for staff*

- *B34. Prior to commencement of construction, workers must receive information on Aboriginal cultural heritage management requirements as part of the induction process. Records of these inductions must be documented and provided to the Certifier.*

### **Responsibilities under the Heritage Act 1977**

All site personnel are to be made aware of the heritage significance of the site and unexpected heritage finds management measures for the site which is included as Appendix X of the ACHMP. It is a breach under the *Heritage Act 1977* for a person to disturb or excavate any land knowing or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed unless the disturbance or excavation is carried out in accordance with the excavation permit. Any person found in breach of the act are liable and may face penalties as outlined in Part 7 Division 3 of the *Heritage Act 1977*:

- (1) A person guilty of an offence against this Act shall be liable to a penalty not exceeding 10,000 penalty units or imprisonment for a period not exceeding 6 months, or both.*
- (2) A person guilty of an offence against the regulations shall be liable to a penalty not exceeding 50 penalty units.*

This is the responsibility of both the individual and the company undertaking the works.

### **Previous archaeological investigations**

AMBS undertook archaeological investigations within the RPA Hospital portion of the site under a S140 permit (S140-5303) with the final excavation report submitted in February 2025. Submission of the final excavation report satisfies Condition 8 of the S140 permit and Condition B14 of the SSD approval. As such, it is unlikely for any historic archaeological resources to be present on site which has not been previously recorded.

The archaeological remains identified at the SBA site are representative of the late nineteenth and twentieth century ancillary industries of the hospital. The remains have historical, rarity and representative significance at a local level. The majority of the identified archaeological resources consisted of structural remains of the laundry with limited evidence of the former boiler house (Figure A.2). No archaeological resources were identified which predate the construction of the laundry in 1882.

Historic documentation identified that the study area formed part of Grose Farm and was later included as part of the land grant given to the University of Sydney. However, the study area was unlikely to be intensely developed until the land transferred to Royal Prince Alfred Hospital and the hospital laundry was constructed in 1882. The land was then also used for the second boiler house

constructed in 1902. Both structures provided ancillary industries to the hospital until they were demolished in 1961, after which, the site was used as a carpark and demountable building.

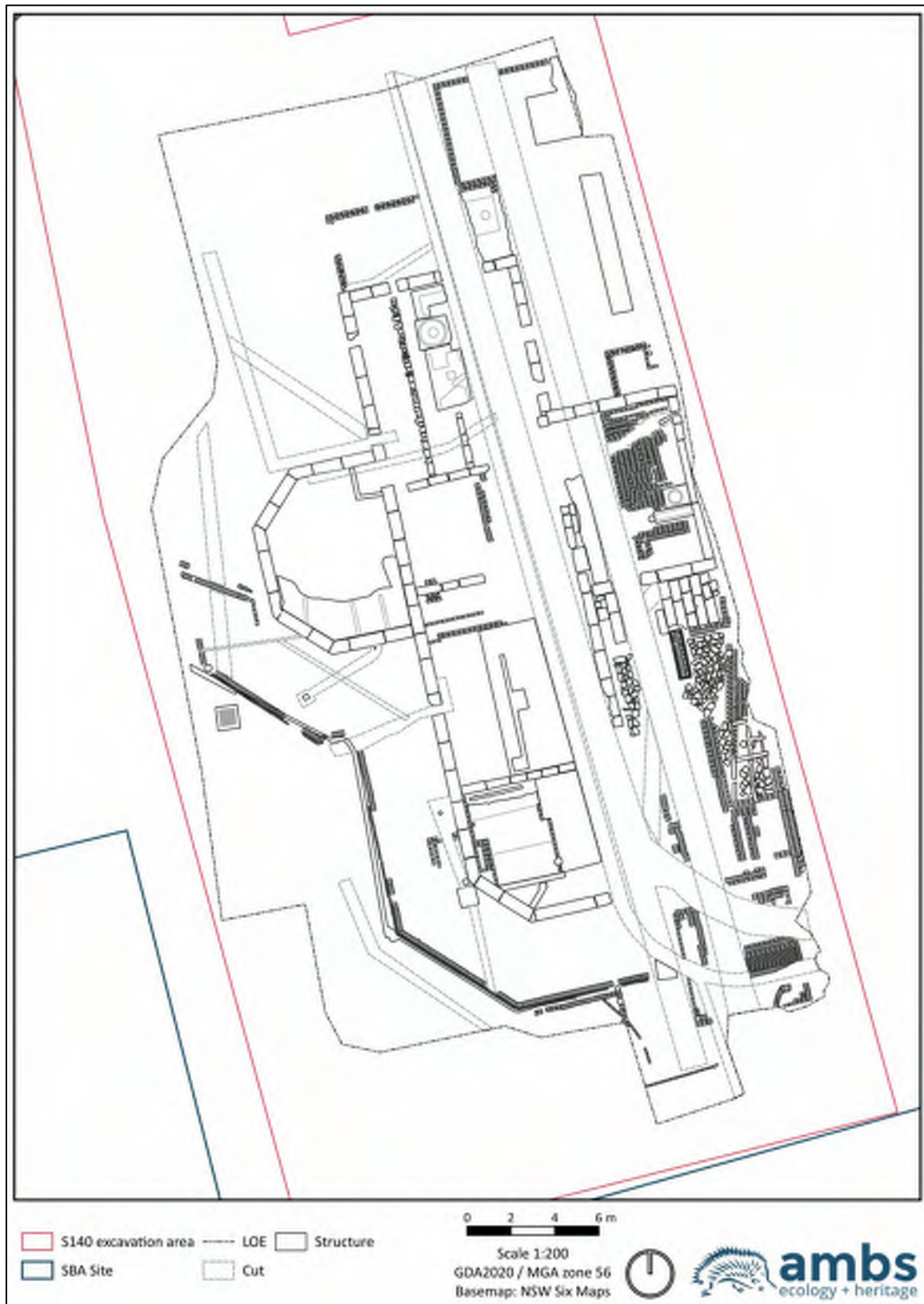


Figure A.2 Overview of archaeological features excavated and recorded during the archaeological investigations.

### **Examples of Unexpected Finds**

Unexpected historic (non-Aboriginal) heritage finds would most likely consist of footings of earlier buildings, rubbish pits and wells or cisterns associated with the early nineteenth century pre-university land use of Grose Farm, the late nineteenth century laundry and boiler house, the suburban development of the area and the early development of the university itself which may have existed outside of the archaeological excavation area. Examples of unexpected finds are provided below.



**Figure A.2 Sandstone pavers uncovered during the SBA archaeological excavations, 2024.**



**Figure A.3 Example of drainage feature identified during the SBA archaeological excavations, 2024.**



Figure A.4 Example of Telford style road base identified during the SBA archaeological excavations, 2024.



Figure A.5 Examples of artefacts collected during the SBA archaeological excavations, 2024.

## 6.12 ASSOCIATED FORMS

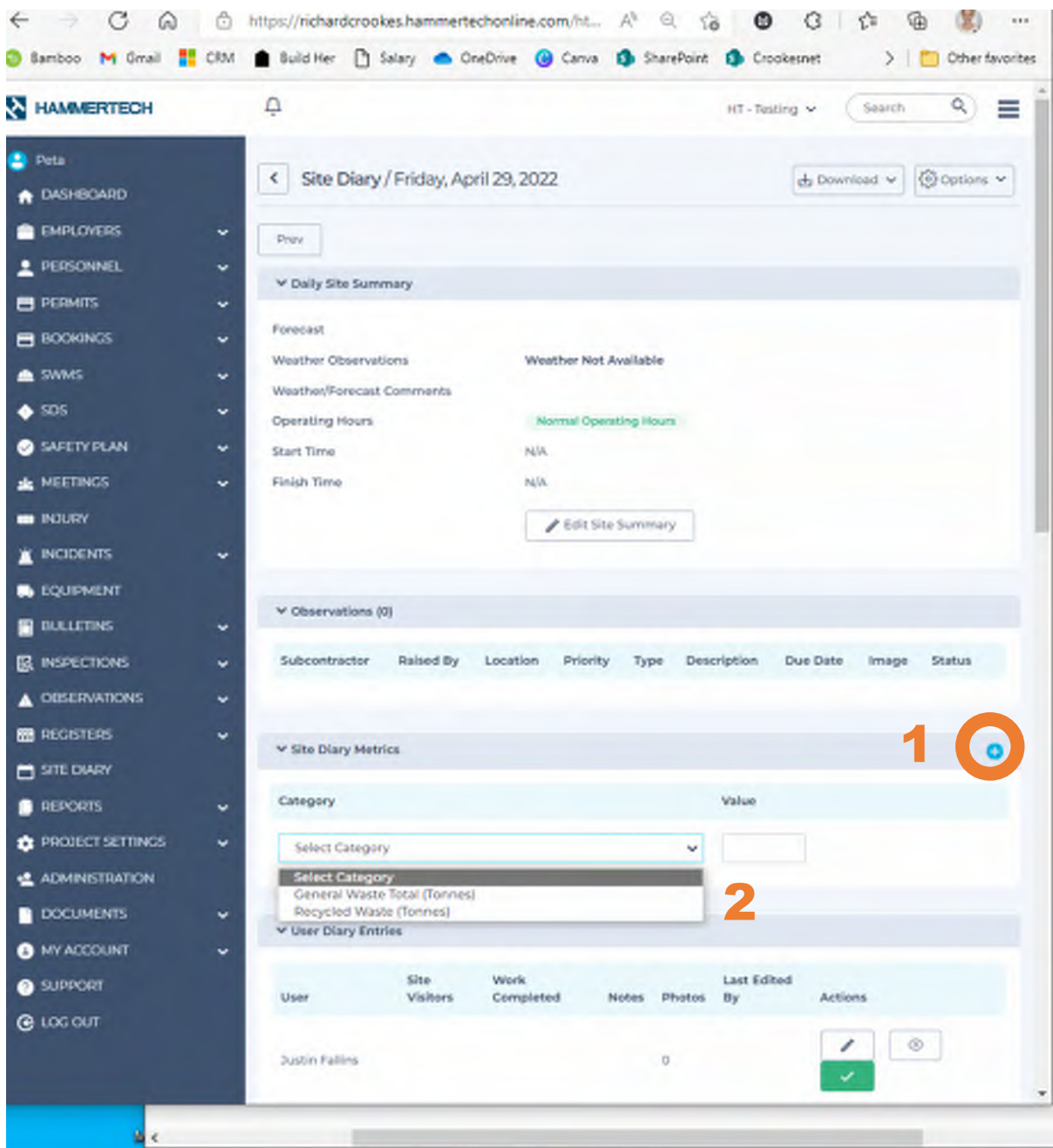
### 18.1 Waste Records

Richard Crookes Constructions (RCC) recognises the importance of promoting building design and construction techniques which minimise waste and provides an efficient recycle procedure for all waste materials.

The ultimate disposal location for wastes taken off-site is monitored and recorded to ensure legal compliance. Waste generated by the project is monitored and recorded; with the aim of meeting RCC environmental target of 85% for projects, and whole of business.

General & Greenstar Waste Reporting:

1. Nominated member of the project team will be responsible for collecting monthly waste reports in HammerTech
2. These reports will measure the weight of waste generated of material by classification, total weight of waste, percentage by weight recycled and percentage by weight to landfill which must be recorded in HammerTech per instructions below.
3. Tonnage measured to two (0.00) decimal points.
4. Upload records of relevant documentation received from subcontractor into HammerTech for future reference.



Site Diary / Friday, April 29, 2022 Download Options

Prev

▼ Daily Site Summary

Forecast

Weather Observations: **Weather Not Available**

Weather/Forecast Comments

Operating Hours: **Normal Operating Hours**

Start Time: N/A









Finish Time: N/A

[Edit Site Summary](#)

▼ Observations (0)

Subcontractor	Raised By	Location	Priority	Type	Description	Due Date	Image	Status
---------------	-----------	----------	----------	------	-------------	----------	-------	--------

▼ Site Diary Metrics **3** +

Category	Value	
Disposal Cost	111	 
Doc No/Reference	132	 
General Waste Total (Tonnes)	.01	 
Recycled Waste (Tonnes)	.01	 

**4**

▼ Progress / Site Photos

[Choose Photos](#) Or drop files here

**Instructions:**

- 1** In your daily site diary record go to the Site Diary Metrics and click on the + sign to add details
- 2** Select the appropriate category to capture all relevant details.
- 3** Enter the value for each category. The % recycled waste will be calculated in reports/dashboards.
- 4** Upload tip receipts/logs/monthly waste summary to the site record in the "User Diary Entries" under your username.

# 18.3 Environmental Inspection

**Project:** Sydney Biomedical Accelerator

**Project No.** 1330

Inspection Date

Weather Conditions: \_\_\_\_\_ After Rain

RCC Inspection Team: Include attendees Name and Signature:  
PM to attend 1 per month


Environmental Safeguard	Comments	Actioned (Date/Initial)
Have RCC staff been briefed in the requirements and responsibility of ENV of the PMP (EMP)?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Have key subcontractors been briefed on project environmental issues and their responsibilities?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Have you held/distributed any environmental based tool box talks?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Have you received complaints, have they been recorded ( <b>F 18.5</b> ) and a response provided to complainant?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Are retained trees fenced, and the drip zone free of stored materials, parked cars etc	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Are stockpiles battered and contained by a silt fence, away from waterways?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Have you checked the silt fences, other sediment control measures?	<input type="checkbox"/> Yes Do they require maintenance? <input type="checkbox"/> No	
Have silt fences been installed around constructed drainage pits / or are they covered with geofabric?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Has refuelling been undertaken by mobile refuelling providers?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Has there been any dust management issues? How were they rectified?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Has work been undertaken within approved operating hours?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Excessive noise or vibration levels from equipment?	<input type="checkbox"/> Yes Consider heritage structures, residents <input type="checkbox"/> No	
Have trucks leaving site carting spoil, demolition wastes, general wastes etc been tarped?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Project entries/exits adequate ballast or grid in working order	<input type="checkbox"/> Yes <input type="checkbox"/> No	

## 18.3 Environmental Inspection

Environmental Safeguard	Comments	Actioned (Date/Initial)
Roads /Gutters clean socks in good order	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Are chemicals / fuels stored in a bunded, roofed and secure area? – not a shipping container	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Are concrete wastes/washouts contained?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Is a paint wash up system established?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Are there enough bins onsite? Does litter require tidying up inside/outside the site	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Have you or the subcontractor tracked waste off site (F 18.4)?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Do you have all the waste docket, completed the waste register (F 18.1) and the monthly waste reports from the contractor?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Do you have records for any imported fill?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Do weeds need spraying grass cutting? Do you need a licenced contractor?	<input type="checkbox"/> Yes What type of herbicide did you use? <input type="checkbox"/> No	
Spill kit onsite and fully stocked?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Have heritage requirements been complied with?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Did you have to stop any works due to rain, high winds, noise or vibration, traffic issues?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Note site specific items		

Comments:

Inspection Completed By:

Attach any photo evidence as required to this report







<b>Project Name:</b>	<b>Incident Number:</b>
<b>Attendees:</b>	
<b>Apologies:</b>	
<b>Date:</b>	
Purpose of debrief meeting:	
What is the status of any injured person/persons?	
Is there a requirement for assistance with the RTW process?	
Briefly describe the background of the Incident	

Briefly describe the key Investigation Findings

Status of any Notices/Investigations/Safety Regulator?

What are three (3) Key Lessons learned as a result of the Incident?

What actions have been taken to prevent reoccurrence by RCC?

What actions have been taken to prevent reoccurrence by relevant Contractors?

Have any training requirements been identified to prevent reoccurrence?

Is there a system deficiency or opportunity for improvement?

Has there been consideration to issue a Safety Alert as a result of the incident?

Have any non-conformances been issued by RCC? And are they closed out?

## SYDNEY

LEVEL 14, 558 PACIFIC HIGHWAY  
ST LEONARDS NSW 2065

PO BOX 1024  
CROWS NEST NSW 1585

PHONE: 02 9902 4700

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## NEWCASTLE

SUITE 18, 50 GLEBE ROAD  
THE JUNCTION NSW 2291

PHONE: 02 4952 6777

---

## TAMWORTH

SUITE 1, 493 PEEL STREET  
TAMWORTH NSW 2340

PHONE: 02 6766 5225

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## CANBERRA

SUITE 4A, 73 NORTHBOURNE AVENUE  
CANBERRA ACT 2601

PO BOX 771  
FYSHWICK ACT 2609

PHONE: 02 6143 2900

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## BRISBANE

84 LATROBE TERRACE  
PADDINGTON QLD 4064

PHONE: 07 3099 0899