



Health Infrastructure NSW

Remedial Action Plan

The Children's Hospital at Westmead
Stage 2 Redevelopment,
Paediatric Services Building (PSB)
Redbank Road,
Westmead NSW

9 February 2021

56200/133,598 (Rev C)

JBS&G Australia Pty Ltd

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Abbreviations

Term	Definition
ACM	Asbestos Containing Materials
AEC	Areas of Environmental Concern
AF	Asbestos Fibres
AHD	Australian Height Datum
AQA	Asbestos Quantification Assessment
ASS	Acid Sulfate Soils
bgs	Below ground surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CHW	The Children's Hospital at Westmead
CLM Act	Contaminated Land Management Act
CMRI	Children's Medical Research Institute
COC	Chain of Custody
COPC	Contaminants of Potential Concern
DBYD	Dial Before You Dig
DP	Deposited Plan
DQI	Data Quality Indicators
DQO	Data Quality Objectives
DSI	Detailed Site Investigation
EIL	Ecological Investigation Levels
EPA	NSW Environment Protection Authority
ESLs	Ecological Screening Levels
FA	Fibrous Asbestos
HILs	Health Investigation Levels
HSLs	Health Screening Levels
JBS&G	JBS&G Australia Pty Ltd
LOR	Limit of Reporting
NATA	National Accreditation Testing Authority
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
OCP	Organochlorine Pesticides
OPP	Organophosphate Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PASS	Potential Acid Sulfate Soil
PCB	Polychlorinated Biphenyls
PSH	Phase Separated Hydrocarbons
PID	Photo-ionisation Detector
POEO Act	Protection of Environment Operations Act
QA/QC	Quality Assurance/Quality Control
RAP	Remedial Action Plan
RPD	Relative Percentage Difference
SAQP	Sampling Analytical and Quality Plan
SEPP55	State Environmental Planning Policy No 55 – Remediation of Land
TRH	Total Recoverable Hydrocarbons
UCL	Upper Confidence Limit
VOC	Volatile Organic Compounds
WSLHD	Western Sydney Local Health District

1. Introduction

1.1 Background

JBS&G Australia Pty Ltd (JBS&G) was engaged by Health Infrastructure NSW (HI, the Client) to prepare a Remedial Action Plan (RAP) for the proposed Paediatric Services Building (PSB) at The Children's Hospital at Westmead (CHW), part of the overall Westmead Precinct, located on Redbank Road, Westmead, NSW 2145 (the site). The site is formally identified as part Lot 101 in DP 1119583 and covers an area of approximately 2.2 hectares (ha). The site location and layout are shown on **Figures 1** and **2**, respectively.

The State Significant Development Application (SSDA) for the site seeks consent for the construction of a new PSB to be located adjacent to the Central Acute Services Building (CASB), and on the site of the decommissioned P17 car park, including development of the Hawkesbury Road forecourt and access links. This includes works associated with the CHW forecourt on Hawkesbury Road to provide improved community amenity in the form of a new front entry, improved street frontage and enable a more cohesive main entrance connecting existing CHW, adjoining research facilities, and the PSB.

The scope of proposed works includes:

- Construction of the main PSB which may contain the following uses: perioperative and interventional services, neonatal and paediatric intensive care units, cancer centre, acute inpatient beds, back of house and parent facilities;
- Alterations and additions to existing CHW Kids Research (KR) and CASB buildings adjoining the PSB site area to accommodate floor realignment and movement corridors;
- Construction of a new pedestrian canopy link through KR, connecting the main PSB with the CHW forecourt and existing hospital entrance. The canopy link is to be lifted 2 storeys above the CHW forecourt;
- A new ground plane / forecourt landscaped area extending from Hawkesbury Road to the proposed PSB; and
- Tree removal to accommodate the construction of the PSB.

The Stage 2 redevelopment will comprise demolition of existing structures across the site, followed by remedial works, including excavation of site to required levels, excavation of services trenches and the potential installation of pile foundations. The construction works will result in a multi storey hospital building and car park with associated landscaped areas and CHW forecourt on Hawkesbury Road.

The broader Westmead Hospital Precinct, including the site, has been subject to a range of previous investigations that have identified asbestos impacted fill across the Precinct. A Detailed Site Investigation (DSI) (JBS&G 2019¹) was subsequently completed within accessible areas of the north-western portion of the site identified bonded and friable asbestos impacts in fill materials at multiple locations. All fill materials in these areas considered to be impacted by asbestos that will require remediation in order to make the site suitable for the proposed use. An additional DSI (JBS&G 2020²) was recently completed within the eastern portion of the site (current CHW

¹ Detailed Site Investigation – The Children's Hospital at Westmead, Stage 2 Redevelopment, Redbank Road, Westmead NSW, JBS&G Australia Pty Ltd, 3 October 2019 (JBS&G 2019).

² Detailed Site Investigation – The Children's Hospital at Westmead Forecourt, Stage 2 Redevelopment, Redbank Road, Westmead NSW, JBS&G Australia Pty Ltd, 18 March 2020 (JBS&G 2020).

forecourt), in which bonded asbestos was reported in a limited number of sample locations at concentrations below the adopted criteria. The concentrations of other contaminants of potential concern (COPC) were also below the adopted criteria, therefore, there was no identified impacts within this portion of the site that require remediation in order to make the site suitable for the proposed use.

JBS&G (2019) concluded that the site could be made suitable for the proposed land use subject to development and implementation of a site-specific RAP and asbestos management plan (AMP) in accordance with the relevant regulatory requirements made or approved by the NSW Environment Protection Authority (EPA) and relevant Australian Standards.

The RAP conducted for this site and this report meet the requirements of *State Environmental Planning Policy No 55 - Remediation of Land* (SEPP 55). This report documents the procedures and standards to be followed in order to address the identified asbestos impacted soils in such a manner as to make the site suitable for the proposed future uses.

1.2 Objectives

The objective of this RAP is to document the procedures and standards to be followed in order to address the contamination identified at the site, ensuring the protection of human health and the surrounding environment, such that the contamination is remediated / managed in such a manner as to make the site suitable for the proposed future uses.

2. Site Condition & Surrounding Environments

2.1 Site Identification

The location of the site is shown on **Figure 1**. The layout of the site is shown on **Figure 2**. The site details are summarised in **Table 2.1**.

Table 2.1: Summary Site Details

Lot/DP	Part Lot 101 in DP 1119583 – CHW Lot
Address	Redbank Road, Westmead NSW
Local Government Authority	Parramatta City Council
Approximate Area size	2.2 ha
Current Zoning	SP2 (Health Services Facility)
Current Land Use	Multistorey carpark, construction site compound, childcare centres and health services facility (HealthShare NSW)
Previous Land Use	Agricultural land prior to 1970s

2.2 Site Description

North Western Portion

A detailed inspection of the north-western portion of the site was conducted on 15 April 2019 by one of JBS&G's trained and experienced environmental scientists. Observations of the current site configuration and potential areas of concern are discussed below.

The site was located to the south and east of Redbank Road. The site is characterised by its elevation of 3 to 4 metres above Redbank Road and comprised an on-grade carpark, multi-storey staff carpark, Multiplex construction compound associated with the Central Acute Services Building (CASB) Redevelopment, garden/landscaped beds and a pedestrian walkway leading to Redbank Road.

Grass coverage across the site was observed to be generally good, with minor areas of exposed soils present along the eastern side of Redbank Road. Most landscaped/garden bed areas were covered with mulch and/or leaf litter, however, in some areas minimal mulch and/or leaf litter coverage was observed.

A multi-storey carpark with ground floor concrete slab was present in the central portion of the site. The open parking bays in the northern portion of the site typically had accessible soils in the form of landscape or garden bed areas running between parking rows.

The ground surface at the site comprises two general categories; permanent hard cover or accessible soils. Permanent hard cover includes materials such as bituminous concrete (asphalt), concrete or other hard materials in applications such as roads, carparks, footpaths, building slabs, loading docks etc., and are widespread across the site.

Eastern Portion

A detailed inspection of the site was conducted on 26 February 2020 by one of JBS&G's trained and experienced environmental scientists. Observations of the current site configuration and potential areas of concern are discussed below.

The site was observed to mainly consist of publicly accessible open space associated with the entrance to CHW and other health facilities, including:

- A grassed area in the central portion of the site and bordering the Children's Medical Research Institute (CMRI) in the southern portion of the site, with grass coverage observed to be in good condition;

- An unsealed gravel surface open space in the southern portion of the site, vegetated by trees and associated benches for public use;
- Brick and concrete paved pedestrian walkways from bus stops bordering Hawkesbury Road to the CHW entrance;
- An asphalt sealed access road to facilitate on-grade CHW personnel and ambulance vehicle parking off Hawkesbury Road in the western portion of the site; and
- A brick paved vehicle access road and associated on-grade parking for ambulance and accessible access to the CHW entrance in the northern portion of the site.

Landscaped garden beds were observed adjacent or within to both on-grade car parking locations and were covered with mulch and/or leaf litter.

Multiple underground services were identified at the site including communications, electricity, stormwater, irrigation/water and sewer lines, identified from publicly available dial before you dig plans and during underground service location across the site. No evidence of above ground or underground waste storage was observed at the site, with the exception of general waste bins. No visual indicators of gross or widespread contamination (including the presence of asbestos containing material (ACM), discolouration of soils, distressed vegetation or other aesthetic concerns) were observed on the site surfaces.

2.3 Surrounding Land-use

The surrounding land-uses of the site are detailed as follows.

- North – Westmead Hospital Careflight Helipad and recently constructed on-grade carpark. Further beyond is Toongabbie Creek;
- East – Hawkesbury Road, with residential properties further afield;
- South – CHW with some open spaced area and Hawkesbury Road. Further afield are medium residential properties; and
- West – New hospital buildings (Acute Services Building) currently under construction and other hospital buildings.

2.4 Topography

The northern portion of the site was observed to be raised approximately 4 m from the ground level of Redbank Road.

The eastern portion of the site was observed to gently slope in a southern and western direction, with the grassed area in the central portion of the site significantly raised and retained above the general site levels in the southern portion and sloped downwards to meet adjacent site levels to the north and east.

2.5 Geology and Soil

The site is underlain by two geological formations. The southern portion of site is underlain by Ashfield Shale of the Wianamatta Group, which comprises black to dark grey shale and laminite. The northern portion of the site, towards Toongabbie Creek, is underlain by Hawkesbury Sandstone, which comprises medium to coarse-grained quartz sandstone with very minor shale and laminite lenses.

Review of eSPADE indicated that the natural site soils comprise the Blacktown soil landscape which comprises residual soils that are shallow to moderately deep hardsetting mottled texture contrast soils, red and brown podzolic soils on crests grading to yellow podzolic soils on lower slopes in drainage lines.

Fill material generally consisted of brown heterogeneous gravelly / silty clay and was observed to a maximum depth of 6.2 m bgs within the site. Natural silty clay / shale bedrock was encountered at all locations (except those with refusal on concrete slab).

2.6 Acid Sulfate Soils

Review of the Prospect / Parramatta River 1:25 000 Acid Sulfate Soil Risk Map indicates there is no known occurrence of acid sulfate soils being present at the site.

During site investigation works, no indicators of ASS or potential ASS (PASS) were observed in any sample locations.

2.7 Salinity Potential

The *Salinity Potential in Western Sydney* map (DIPNR 2002³) indicates that the assessment area exists within an area of both 'very low salinity potential' and 'moderate salinity potential', coinciding with areas of the site in Hawkesbury Sandstone and Ashfield Shale geological settings respectively. Areas with the 'very low salinity potential' classification exhibit soils that are rapidly drained and underlying Hawkesbury Sandstone strata are highly permeable, resulting in continual flushing and removal of salts in the landscape. No salinity has been observed in these areas and is not expected to occur. Areas with 'moderate salinity potential' occur on Wianamatta Group Shales (Ashfield Shale) and exhibit scattered scalding and indicator vegetation, but soil concentrations have not been mapped. Saline areas are identified as potentially existing within these zones.

A review of eSPADE⁴ indicated that the site exists within the Prospect Hydrogeological Landscape (HGL). Relevant information from this landscape is summarised following:

- This HGL is characterised by deep storage of salts in relatively thick shale soil layers, forming gently undulating low hills and comprises predominantly sedimentary rocks from the Triassic Wianamatta Group (laminar, black and grey shales, lithic sandstone and rare coal).
- Minor to severe salt sites occur within this landscape. They are most common within the foot slopes of the low hills and at the contact between the colluvial and alluvial plains however the severe salt damage also occurs on the upper slopes or crests of hills around the contact of picrite caps with underlying shales. Moderate levels of salt are exported from the deep shales, which means some of the creeks within the unit contain brackish water;
- The landscape has high levels of salinity occurrence with small salt sites commonly occurring along drainage depressions, on hill tops and within urban structures at both upper and mid slope positions within this HGL; and
- Landscape limitations and hazards on this HGL include salt store, with moderate depths of Ashfield Shale storing moderate quantities of mobile salt, picrite/basalt cap weathers to produce relatively impermeable clay layers high in landscape and lateral flow discharging high in landscape, and an undulating landscape where changes of slope predisposes landform to salinity discharge.

It is understood that the proposed works will be excavating through fill material, with no proposed disturbance/exposure to natural materials, therefore eliminating the potential for mobilisation of salt via erosion during rainfall events or groundwater seepage.

³ *Salinity Potential in Western Sydney*. Department of Infrastructure, Planning and Natural Resources, March 2003, DIPNR 2002

⁴ *ESPADE 2.0*. NSW Office of Environment and Heritage accessed 25 October 2020, (OEHS 2020)

2.8 Hydrology

The nearest water body is Toongabbie Creek, a major tributary of Parramatta River, located approximately 160 m north of the site.

Surface water is anticipated to primarily enter the stormwater system with infiltration through unsealed soils, grassed areas and garden beds. Overland flow paths are present onsite with drainage to Toongabbie Creek.

2.9 Hydrogeology

Review of the registered bore information identified several registered groundwater bores within 1.5 km radius of the site. Relevant information is summarised in **Table 2.2** below.

Table 2.2: Registered Groundwater Bore Search Summary

Bore ID	Use	Standing Water Level (m bgs)	Well Depth (m bgs)	Distance from site	Lithology
GW062300	Industrial	Unknown	100.0	1.1 km to the northeast	Topsoil to 0.4 m, Sandstone and shale to 100.0 m
GW108247	Industrial	10	102.0	1.3 km to the northeast	Sandy Clay to 3.0 m, Sandstone and shale to 102.0 m
GW108378	Industrial	Unknown	282.0	0.5 km to the northwest	Topsoil to 0.2 m, Clay to 2.0 m, Sandstone and shale to 282.0 m
GW108611	Domestic	6.2	60.5	1.4 km to the southeast	Fill to 1.0 m, Clay to 3.0 m, Shale to 5.5 m, Sandstone to 60.5 m
GW110303	Monitoring	3.2	10	750 m to the north	Fill to 0.7 m, Sandy Clay to 2.5 m, Gravelly Clay to 3.5 m, Sandstone to 10 m
GW110304		3.6	10		Fill to 1.0 m, Clayey Sand to 4.5 m, Sandstone to 10 m
GW110305		4.8	10		Fill to 1.3 m, Sandy Clay to 2.5 m, Sandstone to 10 m
GW110306		4.3	10		Fill to 1.2 m, Sandy Clay to 5.5 m, Sandstone to 10 m
GW114747	Monitoring	7.0	10	600 m to the north	Gravelly Clay to 5.7 m, Sandstone to 10 m
GW114748	Monitoring	7.0	14.5	700 m to the north	Fill to 1.5 m, Sandy Clay to 2.8 m, Gravelly Clay to 3.7 m, Sand Clay to 5.7 m, Sandstone to 14.5 m
GW114751	Monitoring	6.9	9	1.5 km to the northeast	Fill to 0.5 m, Sandstone to 9 m
GW114752		9.4	12		Fill to 0.4 m, Sandstone to 12 m
GW114753		8.2	12		Fill to 0.55 m, Sandstone to 7 m, Shale to 8 m, Sandstone to 12 m
GW114754		9.9	12		Fill to 0.5 m, Sandstone to 7 m, Shale to 8 m, Sandstone to 12 m

Based on the reported geology, topography and site observations of the site, groundwater is expected to be encountered at depths ranging between 3 m bgs to 6 m bgs. Groundwater is expected to flow north towards Toongabbie Creek, in line with regional topography.

2.10 Meteorology

A review of average climatic data for the nearest Bureau of Meteorology (BOM) monitoring location at Parramatta North (Masons Drive) Meteorological Station indicates the site is located within the following meteorological setting:

- Average minimum temperatures vary from 6.2 °C in July to 17.7 °C in January;
- Average maximum temperatures vary from 17.5 °C in July to 28.6 °C in January;
- The average annual rainfall is approximately 967.1 mm with rainfall greater than 1 mm occurring on an average of 89.8 days per year; and
- Monthly rainfall varies from 44.5 mm in July to 120.7 mm in February with the wettest periods occurring on average between January and March.

3. Previous Site Investigations

3.1 Westmead Oval Asbestos Quantification (JBS&G 2014⁵)

JBS&G was engaged by Western Sydney Local Health District (WSLHD) to undertake an asbestos quantification assessment (AQA) of 'the Oval' and surrounds, Westmead Hospital, Westmead NSW, located to the immediate northwest of the subject site. A total of 69 locations to a vertical extent of 0.5 m bgs were assessed across the oval and surrounds.

Soils in the Oval exceeded visible surface ACM site investigation levels in 1 of 26 locations, exceeded bonded asbestos containing materials (ACM) site investigation levels in 1 of 26 locations and exceeded asbestos fibres (AF) / fibrous asbestos (FA) site investigation levels in 11 of 26 locations.

Soils in the surrounds exceeded visible surface ACM site investigation levels in 31 of 43 locations, exceeded bonded ACM site investigation levels in 25 of 43 locations and exceeded AF / FA site investigation levels in 34 of 43 locations.

The following recommendations were made:

- The preparation and implementation of an interim site management plan immediately to address the identified asbestos in soil and aesthetic concerns identified at the site in the short term.
- The preparation of a site specific Human Health Risk Assessment (HHRA) to derive appropriate site specific response levels for asbestos in soils.
- The preparation of a Remedial Action Plan (RAP) using the site specific response levels derived in the HHRA, to detail the actions required to address the management of asbestos in soils at the site.
- The updating of the current WSLHD asbestos register for Westmead Hospital, to take into account the findings from the investigation.
- The updating of the WSLHD AMP Version 2.1 to provide specific details to staff / contractors / personnel undertaking activities on the site, including, but not limited to, ground disturbance and surface maintenance.

3.2 Westmead Hospital Campus Asbestos Quantification Assessment (2016a⁶)

JBS&G was engaged by WSLHD to conduct an AQA of accessible soils in previously unassessed areas across the Westmead Hospital Campus (including the north-western portion of subject site). The objectives of the AQA were to undertake a quantitative assessment of asbestos in accessible soils at the site that have not previously been assessed and, if required, make recommendations for the remediation and management of asbestos impacted soils at the site.

The scope of work comprised test pitting at sample locations in currently accessible soils across the broader site and quantification of asbestos by the methods advised in WA DoH (2009⁷) and NEPC (2013) including recovery and collection of bonded asbestos containing ACM and FA within

⁵ *Westmead Oval Asbestos Quantification, Westmead Hospital, Westmead NSW.* Prepared for Western Sydney Local Health District by JBS&G Australia Pty Ltd. Dated 10 December 2014. Reference 50391/60178 Rev 0 (JBS&G 2014)

⁶ *Westmead Hospital Campus Asbestos Quantification Assessment. Westmead Hospital, Westmead NSW.* Prepared for Western Sydney Local Health District. Dated 22 February 2016. Reference 50391/102983 Revision A (JBS&G 2016a)

⁷ *Guidelines for the Assessment Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, Western Australian Department of Health, May 2009 WA DOH (2009)

test pit fill material spoil. Representative soil samples were analysed to assess for the presence of bonded ACM, FA, AF and free asbestos fibres; and

Based on the findings of JBS&G (2016a) and in accordance with the limitations provided, the following conclusions were provided:

- Visible asbestos within surface soils (0.0 to 0.1 m bgs) was observed at 81 out of 422 surface soil sample locations across the site.
- The primary fill material identified across approximately 85% of the site comprises brown heterogeneous gravelly clay with shale gravels, igneous gravels, some anthropogenic inclusions and frequently identified bonded ACM and/or fibrous asbestos.
- Bonded ACM and FA/AF exceeded the site assessment criteria at a number of sample locations across the lateral and vertical extent of the gravelly clay fill material at the site.
- Bonded ACM and FA/AF exceeded the site assessment criteria or were detected below the site assessment criteria but above the laboratory limit of reporting (LOR) at a limited number of sample locations within the silty sand imported topsoil at Westmead Oval and Redbank House Oval.
- Bonded ACM and FA/AF exceeded the site assessment criteria or were detected below the site assessment criteria but above the LOR at a limited number of sample locations within sandy clay fill material present in the southern most portion of the site adjacent Hawkesbury Road.
- All results for airborne asbestos fibre monitoring conducted during this AQA and all previous AQAs were less than 0.01 fibres/mL.

The following recommendations were provided:

- Areas of the site in which asbestos has been identified at the ground surface should be managed via the current program of interim control measures if these areas have not previously had interim control measures implemented.
- A RAP should be prepared and implemented in accordance with the relevant regulatory requirements that documents the procedures and standards to be followed in order to address the identified asbestos impacted soils in areas of the site that will not be remediated during the Westmead Redevelopment project.
- The asbestos in soils register for the site is updated to reflect the results of this assessment.
- The WSLHD AMP should be updated to reflect the results of this assessment.

3.3 Child Care Centres Asbestos Quantification Assessment (2016b⁸)

JBS&G was engaged by WSLHD to conduct an AQA of accessible soils within the external areas of the Westmead Hospital Child Care Centre and The Children's Hospital at Westmead Child Care Centre (north of the site). The objectives of this AQA were to undertake a quantitative assessment of asbestos in accessible soils at the site and, if required, make recommendations for the site specific management of asbestos in soils at the site.

The scope of work comprised test pitting via hand tools at 17 sample locations in currently accessible soils across the site and quantification of asbestos in soil by the methods advised in WA

⁸ *Child Care Centres Asbestos Quantification Assessment. Westmead Hospital, Westmead NSW. Prepared for Western Sydney Local Health District. Dated 11 March 2016. Reference 50391/103246 Revision A (JBS&G 2016b)*

DoH (2009) and NEPC (2013) including recovery and collection of bonded ACM and FA, where observed, within test pit fill material spoil to the extent practicable. Representative soils samples were analysed to assess for the presence of bonded ACM, FA, Asbestos Fines (AF) and free asbestos fibres.

During the intrusive investigation, four daily events of air monitoring in accordance with the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003(2005)]* by Matthew O'Brien, (LAA001093) with NATA certification applying to all sample collection, handling and analytical procedures.

Based on the findings of JBS&G (2016b) and in accordance with the limitations provided, the following conclusions were provided:

- Access should be restricted to the parts of the site where asbestos was reported above the assessment criteria until such a time that the management controls have been implemented in these areas and an asbestos clearance certificate is obtained stating that these parts of the site are suitable to be re-occupied. In restricting access to these three particular parts of the site, it is considered that the identified soil exceedances do not preclude the ongoing use and occupation of the childcare facility building and the remaining outdoor areas where the soils meet the relevant childcare criteria.
- Airborne asbestos fibre monitoring should continue until such a time that the asbestos clearance certificate has been obtained for the areas of the site where asbestos was reported above the assessment criteria.
- In the areas of the identified exceedances:
 - A marker layer consisting of a durable, brightly coloured non-woven geotextile should be installed across accessible soils to the extent practicable.
 - Mulch of a minimum thickness of 100mm should be placed over the marker layer within all landscaped / garden bed areas at the site.
 - Grass should be repaired or replaced in area of poor grass coverage where exposed soils are observable.
- In other areas of the site, the marker layer (where practicable), mulch and grass management measures should be implemented as a precautionary measure.
- A site specific long term environmental management plan (LTEMP) should be prepared that documents the required inspections and control measures required to maintain the integrity of the ground surface covering to ensure no exposed soils are present at the ground surface. The WSLHD Asbestos Management Plan (AMP) should be revised to make reference to the site specific LTEMP and the "Asbestos in soils register" for the site should be revised to reflect the findings of this assessment.

3.4 Central Acute Services Building Data Gap Assessment (JBS&G 2016c⁹)

JBS&G was engaged by HI to conduct a Data Gap Assessment (DGA) for part of the proposed footprint of the new CASB as part of the Westmead Redevelopment, located southwest to the subject site. The objective of the DGA is to address the identified data gaps and to draw conclusions regarding the suitability of the site to be redeveloped for continued use as a health

⁹ Westmead Redevelopment. Acute Services Building Data Gap Assessment. Prepared for Health Infrastructure NSW by JBS&G Australia Pty Ltd. Dated 17 March 2016. Reference 50369/102871 Rev 0 (JBS&G 2016c)

services facility or to make recommendations, such that identified contamination is remediated /managed in such a manner as to enable such conclusions.

Based on the findings of JBS&G (2016c) and in accordance with the limitations provided, the following conclusions were provided:

- the site can be made suitable for the proposed health services facility (hospital) land use, subject to the implementation of a RAP for the proposed CASB Redevelopment to address the known asbestos impact, aboveground storage tank (AST) and UST infrastructure and data gaps.
- The concentrations of non-asbestos contaminants in soil were all less than the adopted site assessment criteria. The concentrations of contaminants in groundwater were generally less than the adopted site criteria, with the exception of four heavy metals, which are typically associated with built up urban environments.
- To this extent, non-asbestos soil and groundwater contaminants are considered not to represent a potential risk to future onsite receptors or the environment. No background soil concentrations, chemical mixtures, aesthetic issues or offsite migrations risks were identified in this assessment.

It was also recommended that a RAP for the proposed CASB Redevelopment considering all historical and current assessments be developed in accordance with the relevant regulatory requirements and implemented during the redevelopment works. The RAP, as a minimum, should include remedial /management procedures for the following contamination issues:

- Asbestos impacted fill materials;
- Removal of AST and UST Infrastructure;
- Data gap assessment of inaccessible areas (under buildings and structures);
- Off-site disposal of waste; and
- Importation of environmentally suitable backfill material.

3.5 Central Acute Services Building Asbestos Quantification Assessment (JBS&G 2016d¹⁰)

JBS&G was engaged by HI to conduct an AQA for part of the proposed footprint of the new CASB as part of the Westmead Redevelopment, located southwest to the subject site. The objective of the AQA is to undertake a quantitative assessment of asbestos in soils at the site and to draw conclusions regarding the suitability of the site to be redeveloped for continued use as a health services facility or to make recommendations, such that identified contamination is remediated /managed in such a manner as to enable such conclusions.

Based on the findings of JBS&G (2016d) and in accordance with the limitations provided, the following conclusions were provided:

- The site can be made suitable for the proposed health services facility (hospital) land use, subject to the implementation of a RAP to address the identified asbestos impact, and the implementation of a LTEMP to address long term site maintenance of the remedial strategy;
- Gravelly clay fill materials in the northern portion of the site area considered to be impacted with bonded and friable asbestos;

¹⁰ Westmead Redevelopment. Acute Services Building Asbestos Quantification Assessment. Prepared for Health Infrastructure NSW by JBS&G Australia Pty Ltd. Dated 17 March 2016. Reference 50369/102846 Rev 0 (JBS&G 2016d)

- Detections of asbestos above the adopted site criteria in two sample locations within the southern portion of the site, RAQ189 (clayey sand) and RAQ204 (gravelly sand), are considered not to be representative of widespread asbestos impact within their respective material types;
- It is recommended that a RAP be developed in accordance with the relevant regulatory requirements that documents the procedures and standards to be followed in order to address the identified asbestos impact, ensuring the protection of human health and the surrounding environment, such that the asbestos impact is remediated / managed in such a manner as to make the site suitable for the proposed future uses.
- A LTEMP should be prepared if the management strategy for the identified asbestos impact includes on-site containment, such as the placement of a marker and capping layer to address the long term site maintenance of the remedial strategy.
- A Construction Environmental Management Plan (CEMP) should be prepared prior to redevelopment works, which documents the environmental monitoring and management measures required to be implemented during the remediation and construction related activities associated with the construction of the site.

3.6 Area 6 Sampling within Multiplex Site (JBS&G 2017a)

JBS&G was engaged by Multiplex Constructions Pty Ltd (MPX) to provide environmental consultancy and occupational hygienist services associated with the supervision and validation of remediation works of the Acute Services Building (ASB, immediate southwest to the subject site) project as part of the Westmead Hospital Redevelopment.

During JBS&G full time supervision of the remedial work on ASB site, asbestos data gap sampling as per the requirements of the Remedial Action Plan (RAP, JBS&G 2017b¹¹) prepared for the ASB site were undertaken within Area 6 (west corner of the subject site, see **Figure 3**). Fill materials comprising grey brown heterogeneous gravelly sand with inclusions of concrete, metal, roadbase and igneous gravels were observed to the depth ranging from 4 m bgs to 6 m bgs at all five sample locations (AQ_01 to AQ_05). Bonded ACM fragments were observed in AQ_01 during field AQ and laboratory results have reported presence of either bonded ACM or AF/FA in 24 out of 30 analysed samples.

To this extent, fill materials below Area 6 are considered to be impacted by asbestos, as consistent with surrounding soils at the site.

3.7 Detailed Site Investigation (JBS&G 2019¹²) – PSB Development Area

JBS&G was engaged by HI to conduct a DSI for the main portion of the site (north-western extent) in order to delineate the extent of asbestos impacted fill and characterisation of non-asbestos contaminants across this area of the site, and also to facilitate the planning of proposed PSB redevelopment works.

The scope of works for the investigation comprised a review of available site history, previous investigation reports and publicly available information to identify potential AECs and associated COPCs, soil and groundwater sampling, analysis of selected samples for identified COPCs, comparison of collected data against relevant EPA endorsed criteria, preparation of a DSI report in general accordance with relevant EPA endorsed guidelines, from a site contamination

¹¹ Westmead Redevelopment Remedial Action Plan. Acute Services Building Stage 1, Westmead NSW. Prepared for Health Infrastructure NSW by JBS&G Australia Pty Ltd. Dated 2 February 2017. Reference 50369/102443 Rev 5 (JBS&G 2017b)

¹² Detailed Site Investigation – The Children’s Hospital at Westmead, Stage 2 Redevelopment, Redbank Road, Westmead NSW, JBS&G Australia Pty Ltd, 3 October 2019 (JBS&G 2019).

perspective, for the proposed redevelopment equivalent to a land use scenario of high-density residential land use.

The site investigation works comprised a detailed site inspection of advancement of 42 locations across the north-western portion of the site and converted 3 locations into monitoring wells, from which selected samples were submitted for laboratory analysis to sufficiently characterise site conditions.

Based on the scope of work undertaken, the following conclusions were made:

- The review of historical site use information and inspection of site conditions identified potential AECs and associated COPCs, which were associated with potential importation of fill materials from unknown origins and former use of the site for agricultural purposes.
- Several types of fill materials were encountered across the site, however the dominant fill consisted of brown to dark brown heterogenous sandy clay / silty sandy clay to depths ranging from 1.5 m bgs to 6.2 m bgs, with anthropogenic inclusions of asbestos, plastic, metal fragments, bricks, concrete fragments, igneous gravels, trace bitumen and glass. The vertical extent of fill was not determined at some locations due to refusal on concrete slab.
- Slight hydrocarbon odour and staining was noted in sample location BH19 between 3.7 m bgs to 4.3 mgs. However, concentrations of TRH and PAHs in this location reported less than the adopted site criteria, therefore it was considered that this location does not pose an unacceptable risk requiring remediation.
- Bonded ACM and FA/AF exceeded the site assessment criteria at a number of sample locations across the lateral and vertical extent of the gravelly clay fill material at the site. All fill materials at the site were considered to be impacted by asbestos in soils.
- Concentrations of lead and zinc in several samples exceeded the adopted EIL site criterion. The 95% UCL for each analyte did not exceed adopted criteria therefore the exceedances were not statistically significant and do not represent an unacceptable risk requiring remediation or management.
- Concentrations of copper exceeded the adopted EIL criterion at sample location BH20_2.9-3.0. However, it is noted in NEPC (2013) that EIL criterion only applies to soil down to a depth 2 m below the current soil surface, therefore the exceedance does not represent an unacceptable risk.
- Concentrations of TRH-F2 ($>C_{10} - C_{16}$) exceeded the adopted EIL in sample BH19_3.7-3.9. The 95% UCL for each analyte did not exceed adopted criteria therefore the exceedances are not statistically significant and do not represent an unacceptable risk requiring remediation or management.
- Elevated concentrations of B(a)P, with concentrations of 1.6 mg/kg and 1.4 mg/kg, were reported in samples BH23_1.0-1.1 and BH24_1.0-1.1 respectively, exceeding the ESL criterion of 0.7 mg/kg. NEPC (2013) notes that plant uptake of anthropogenic PAHs is limited and therefore it is considered that B(a)P ecological exceedances do not represent an unacceptable risk requiring remediation or management.
- No groundwater, chemical mixtures or significant offsite migration risks were identified.
- Fill material at the site has a preliminary waste classification as special waste (asbestos) mixed with general solid waste (non-putrescible).

- On this basis, it was considered that subject to development and implementation of site-specific Remedial Action Plan and Asbestos Management Plan during future redevelopment works, the site can be made suitable for the proposed hospital land use.

3.8 Detailed Site Investigation (JBS&G 2020¹³) – PSB Development Area

JBS&G was engaged by HI to conduct a DSI for the eastern portion of the site within the existing CHW forecourt area in order to delineate the extent of asbestos impacted fill and characterisation of non-asbestos contaminants across this area of the site, and also to facilitate the planning of proposed redevelopment works. This report along with the DSI detailed in **Section 3.7** above (JBS&G 2019) are the subject of this report and supports the PSB Development SSDA.

The scope of works for the investigation comprised a review of available site history, previous investigation reports and publicly available information to identify potential AECs and associated COPCs, soil and groundwater sampling, analysis of selected samples for identified COPCs, comparison of collected data against relevant EPA endorsed criteria, preparation of a DSI report in general accordance with relevant EPA endorsed guidelines, from a site contamination perspective, for the proposed redevelopment equivalent to a land use scenario of high-density residential land use.

The site investigation works comprised a detailed site inspection and advancement of boreholes at 15 locations across the site from which selected soil samples were submitted for laboratory analysis of COPCs to sufficiently characterise site conditions.

Based on the scope of work completed, the following conclusions were made:

- The review of historical site use information and inspection of site conditions identified potential AECs and associated COPCs, which were associated with potential importation of fill materials from unknown origins and former use of the site for agricultural purposes.
- Several types of fill materials were encountered across the site, however the dominant fill consisted of red-brown heterogeneous sandy/silty/gravelly clay with depths ranging from 0.4-3.5 m bgs with anthropogenic inclusions of brick fragments, road base gravels, sandstone and shale gravels, asphalt, slag, concrete and metal at trace levels. This fill type differed from previous investigations across the CHW Stage 2 redevelopment and the broader Westmead Hospital campus, with an increased clay content and red-brown colour difference. The vertical extent of fill was not determined at three locations due to refusal on concrete slab.
- A total of 44 samples from 15 sampling locations were field quantified and analysed by the laboratory for asbestos. Bonded ACM was detected during field quantification at two locations and from laboratory analysis at one location. Concentrations of ACM at these three locations were all below the site assessment criterion for bonded ACM. Friable asbestos was reported below the site assessment criterion and LOR within all 44 samples. To this extent, asbestos in soil was not considered to pose a potentially unacceptable risk to future site receptors and was not considered to require remediation or management from a contaminated land perspective. The bonded ACM was noted to require management from a WHS perspective during future activities that may result in ground disturbance in this area of the site.

¹³ *Detailed Site Investigation* – The Children's Hospital at Westmead Forecourt, Stage 2 Redevelopment, Redbank Road, Westmead NSW, JBS&G Australia Pty Ltd, 18 March 2020 (JBS&G 2020).

- Concentrations of other COPCs in soil samples analysed were reported below the site health and ecological assessment criteria and therefore do not pose a potentially unacceptable human health or ecological risk.
- On this basis, it was considered that the site is suitable for the proposed hospital land use.

4. Summary Site History

A summary of the site history as it relates to the site is presented below.

Table 3.1: Summary of Historical Aerial Imagery Review for North-Western Portion

Year	Observations
1943	<ul style="list-style-type: none"> The site and the surrounding lands appeared to be used for agricultural purposes. No residential or industrial development were apparent on site. Earthen track was observed to intersect the southern portion of the site. A dam was also observed within the northwest corner of the site.
1951	<ul style="list-style-type: none"> The site and the surrounding lands remained unchanged from the 1941 aerial.
1972	<ul style="list-style-type: none"> The site still appeared to be vacant except the most southern portion of the site appeared to be part of the old hospital buildings. Land to the east of the site were also noted to be developed as part of the hospital precinct. The dam observed in 1943/1951 aerial was no longer apparent.
1976	<ul style="list-style-type: none"> Significant earthworks are apparent within the north and north-eastern portion of the site and immediate broader site, across both lots. Site sheds, plants and earthen tracks were apparent. A large stockpile of material was apparent to the northwest of the site (in the location of the current Westmead Hospital Oval). Extensive filling of southwestern portion of the site (current staff carpark) is apparent. No earthworks are apparent in the southern part of site near the clustered buildings. New buildings were observed to the northeast of the site, being the current deliverables warehouses.
1978	<ul style="list-style-type: none"> There are no major changes to the site as seen in the 1976 aerial except more earthworks/disturbed land were apparent within the southern portion of the site (current staff carpark). Stockpiles were evident in the southern portion of the site. Eastern portion of the site was observed to be utilised as a temporary carpark.
1980	<ul style="list-style-type: none"> There are no significant change to the site as seen in the 1978 aerial except levelling works of the site and the immediate surrounding lands were observed to be completed. The current Redbank Road was also observed. In the area to the north of the site the stockpile is completely gone, with current day Westmead Oval in its place.
1986	<ul style="list-style-type: none"> The image is of poor quality, however it appeared that there were no major changes to the site and surrounding areas as seen in the 1980 aerial.
1998	<ul style="list-style-type: none"> Parking bays, open space and hospital buildings were observed within the northern portion of site, whereas an open carpark and a multi-storey covered carpark were built within the southern portion of the site, similar to the current layout. The surrounding lands were also been largely developed, becoming the Westmead Hospital Campus.
2005	<ul style="list-style-type: none"> The site generally remained unchanged from the 1998 aerial.
2009	<ul style="list-style-type: none"> The site generally remained unchanged from the 2009 aerial.
2018	<ul style="list-style-type: none"> The site generally remained unchanged from the 2009 aerial, except new buildings are being constructed within the northwest corner of the site and to the northwest of the site. A new on-grade carpark was also constructed in the existing oval location.

Table 3.2: Summary of Historical Aerial Imagery Review for Eastern Portion

Year	Observations
1943	<ul style="list-style-type: none"> The site and the surrounding lands appeared to be used for agricultural purposes. No residential or industrial developments were apparent on site. Access roads were observed to the east of the site (now Hawkesbury Road) and in the northern portion of the site. Residential properties were observed to the east of the site.
1951	<ul style="list-style-type: none"> The site and the surrounding lands remained unchanged from the 1943 aerial, with increased residential development to the east of the site.
1972	<ul style="list-style-type: none"> The site appeared to be developed, with a set of buildings observed on the site. To the south, similar structures were erected in a semi-circle formation, with an access road to these properties from Hawkesbury Road. To the north, smaller structures were observed, with increased development of residential properties observed to the east.
1976	<ul style="list-style-type: none"> Significant earthworks are apparent to the north, east and south of the site. Site sheds, plants and earthen tracks were apparent. The site and surrounding properties within the semi circle formation appeared relatively unchanged from the previous 1972 aerial, with no earthworks observed.
1978	<ul style="list-style-type: none"> There are no major changes to the site from the 1976 aerial, with the earthworks continuing to the north, east and south of the site.
1980	<ul style="list-style-type: none"> There are no significant changes to the site from the 1978 aerial. The earthworks observed adjacent to the site appeared to be less extensive near completion with significant levelling and the formation of Redbank Road.
1986	<ul style="list-style-type: none"> The image is of poor quality, however it appeared that there were no major changes to the site and surrounding areas as seen in the 1980 aerial.
1991	<ul style="list-style-type: none"> The previous buildings identified on the site had been demolished, with significant earthworks observed across the broader CHW campus area to the north and east. Smaller stockpiles and haul roads were observed across the site. The CMRI building was formed to the south of the site, with increased development as part of the broader hospital site.
1998	<ul style="list-style-type: none"> The site appeared to be developed as the existing CHW forecourt similar to the current layout, with the surrounding CHW and other broader Westmead hospital buildings and carparks developed to the north, east and south as the Westmead Hospital Campus.
2005	<ul style="list-style-type: none"> The site remained relatively unchanged from the 1998 aerial, with the exception of increased tree growth.
2009	<ul style="list-style-type: none"> The site remained relatively unchanged from the 2005 aerial.
2020	<ul style="list-style-type: none"> The site remained relatively unchanged from the 2009 aerial.

5. Contamination Status

5.1 Summary of Known Contamination

Contamination of land is defined by the CLM Act¹⁴ as “the presence in, on or under the land of a substance at a concentration above the concentration at which the substance is normally present in, on or under (respectively) land in the same locality, being a presence that presents a risk of harm to human health or any other aspect of the environment”.

5.1.1 Asbestos Contaminated Fill

North-Western Portion

JBS&G (2019) reported that visible ACM fragments were observed and/or detected above the adopted site criterion at 2 sample locations (out of 26) in the fill profile ranging from ground surface level to 4.3 m bgs during field quantification.

No FA was observed during field quantification sampling. However, AF/FA were reported in 23 samples limited to nine sampling locations, with a maximum concentration of 0.1077%w/w. Twenty-three samples were reported to exceed the adopted site criteria of 0.001%w/w.

Given the confirmation of bonded and friable asbestos within fill materials in this portion of the site, as consistent with surrounding broader Westmead Hospital redevelopment areas, asbestos represents a potentially unacceptable risk to future receptors based on the proposed residential land use as a hospital care facility. All fill materials within this portion of the site are considered to be impacted with asbestos to varying extents and all fill materials will require remediation/management for asbestos in soils.

The proposed remediation works in this portion of the site comprise an area of approximately 1.56 ha and will therefore disturb an aggregate area of contaminated soil of less than 3 ha.

Eastern Portion

The dominant fill type identified in this portion of the site was observed to comprise of a higher clay content and was a lighter reddish-brown colour than the fill materials observed in the north-western portion of the site.

Visible ACM fragments were observed and/or detected at two locations in this area of the site, during field asbestos quantification at concentrations below the adopted site criterion for bonded ACM. Laboratory analysis reported ACM at one additional location at a concentration below the adopted criterion. No FA was observed during field quantification sampling and AF/FA was reported in analysed samples.

Given that asbestos (in bonded or friable form) was not detected at concentrations above site criteria in 44 samples field quantified and analysed by the laboratory, it is considered that fill materials identified in this portion of the site is not consistent with asbestos contaminated fill materials identified across the broader Westmead Hospital redevelopment areas. The identified ACM fragments are considered to be present from potential demolition of hazardous buildings materials from the historical buildings during the CHW development in the 1990s.

Although there is potential for cross contamination of asbestos contaminated fill from the broader Westmead Hospital precinct into the CHW development during the late 1980s and early 1990s, the findings of JBS&G (2020) did not identify asbestos in concentrations that would indicate the fill is consistent with adjacent portions of Westmead Hospital. To this extent, it is

¹⁴ Contaminated Land Management Act 1997 (CLM Act).

considered that the identified bonded ACM is relatively isolated in nature and do not require management or remediation in order to make the site suitable for the proposed use.

Isolated fragments of bonded ACM, whilst not a concern from a long-term health exposure (contaminated land) assessment perspective, will require on-going management from a WHS perspective during future activities that may result in ground disturbance in this area of the site.

5.2 Summary of Potential Contamination Data Gaps

Soils underlying the multi-level car park area and adjacent areas in the southern portion of the site have not been assessed due to access limitations. It is presumed that the asbestos impacted fill will extend beneath these areas, with soils requiring further assessment as per the sampling regime in **Table 9.2**. Proposed sampling locations will be completed on a 20 m grid, consistent with the sampling density in JBS&G 2019, across these areas prior to the implementation of remediation works proposed herein, with approximate locations detailed on **Figure 5**.

6. Remediation Options

6.1 Remediation Objectives

The remediation objectives are outlined as follows:

- Removal of unacceptable risks to human health and the environment from the identified asbestos contaminated fill such that the site is suitable for the proposed uses;
- Validate the remedial works in accordance with the relevant NSW EPA Guidelines and with reference to the adopted site criteria; and
- Document the validation process.

This RAP has been prepared with reference to the following guidelines and legislation:

- Managing Land Contamination, Planning Guidelines, SEPP 55 – Remediation of Land; (DUAP 1998).
- Contaminated Sites: Sampling Design Guidelines, September 1995 (EPA 1995).
- Contaminated Land Guidelines: Consultants Reporting on Contaminated Land, NSW EPA, May 2020 (EPA 2020).
- Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme, 3rd Edition, NSW EPA, October 2017 (EPA 2017).
- National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013, National Environment Protection Council (NEPC 2013).
- Work Health and Safety Act 2011 (WHS Act).
- Work Health and Safety Regulation 2017.
- How to safely remove asbestos - Code of Practice, Safe Work Australia, 2020 (SWA 2020a).
- How to manage and control asbestos in the workplace - Code of Practice, Safe Work Australia, 2020 (SWA 2020b).
- Management of asbestos in the non-occupational environment, enHealth Council, 2005 (enHealth 2005).
- Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, WA Department of Health, 2009 (WA DoH 2009).

6.2 Extent of Remediation

6.2.1 Asbestos Impacted Fill

The lateral extent of potential asbestos contamination is detailed in **Figure 6**, comprising locations of brown gravelly clay fill observed across the central and north-western extent of the site. Fill material beneath the car park footprint and adjacent areas in the southern portion has been assumed to be impacted with asbestos for the purposes of this RAP and will be further defined during the data gap assessment.

The vertical extent of remediation will be to the vertical depth of asbestos contaminated fill, with consideration to the specific design options for the site which may form permanent capping layers (such as permanent slabs underlying the proposed building footprint, car park access roadways etc.).

6.2.2 Data Gaps

The data gap of the assessment of soils underlying the car park and adjacent areas in the southern portion has been incorporated within the RAP and are to be addressed during the validation works and are shown on **Figure 5**.

6.3 Consideration of Possible Remediation Options

6.3.1 EPA (2017) Guidance

The approach adopted in this RAP is consistent with the preferred hierarchy of options for site clean-up and/or management provided in NEPC (2013) and referred to by EPA (2017), which are listed as follows:

- on-site treatment so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level;
- off-site treatment of excavated soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the site; or

if the above are not practicable,

- consolidation and isolation of the soil on-site by containment within a properly designed barrier; and
- removal of contaminated soil 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.

In addition, it is also a requirement that remediation should not proceed in the event that it is likely to cause a greater adverse effect than leaving the site undisturbed. In addition, where there are large quantities of soil with low levels of contamination, alternative strategies are required to be considered or developed (EPA 2017). In addition, sustainability should be considered by the consultant when deciding which remediation option to choose, in terms of achieving an appropriate balance between the benefits and effects of undertaking the option. For example, where there are large quantities of soil with low levels of contamination, alternative strategies are required to be considered or developed (EPA 2017).

Consideration of each of the available options is presented in **Table 6.1**, taking into account the proposed development works at the site.

6.3.2 WA DoH 2009 Guidance

WA DoH 2009 provides specific guidance in the remediation and management of asbestos.

WA DoH 2009 note the following considerations as important when assessing the acceptability of any remediation:

- Minimisation of public risk;
- Minimisation of contaminated soil disturbance; and
- Minimisation of contaminated material/soil moved to landfill.

Consideration of each of the WA DOH 2009 guidance is presented in **Table 6.1**, taking into account the proposed development works at the site.

6.4 Possible Remedial Options

Table 6.1: Remedial Options Matrix

Option of Treatment	Discussion	Conclusion
Option 1: On-site treatment of the soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level.	<u>FA / AF impacted soils</u> FA / AF are typically heterogeneously distributed throughout impacted soils and are not readily visible to the naked eye. On this basis, there is no option considered appropriate to remove asbestos fibres from impacted soils on site. Furthermore, attempted removal of FA / AF from impacted soil would result in increased disturbance of FA / AF impacted soils.	Not a suitable Option.
	<u>ACM only impacted soils</u> Bound ACM can be removed from impacted soils by hand-picking. Hand picking of ACM within fill material is labour intensive and can be costly and time consuming. The success of the remediation method is highly dependent upon the soil type and the amount of other building rubble present within the fill, and also on the adopted validation criterion. The more clayey the soil, or the more building rubble present, the harder it is to remove all ACM.	The preferred option if areas of exclusively bonded ACM are identified and need to be segregated from friable impacted soils for beneficial re-use above the marker layer.
Option 2: Off-site treatment of excavated soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the site.	<u>FA / AF impacted soils</u> As with Option 1, treatment of these materials is not a viable option.	Not a suitable Option.
	<u>ACM only impacted soils</u> As above (Option 1), however, there are reductions in noise and dust emissions on site in comparison to on-site treatment (Option 1), but these are offset by increased truck movements. Typically, the costs associated with returning the treated materials to site may be equivalent to the costs associated with disposal to landfill. Furthermore, there are currently no facilities licensed to accept asbestos impacted material for offsite treatment.	Not a suitable option.
Option 3: Consolidation and isolation of the soil on-site by containment within a properly designed barrier.	<u>FA / AF impacted soils</u> Given the extent of FA / AF impacted soils across the hospital campus portion of the site, a remediation objective was to minimise disturbance of FA / AF impacted soils where possible, which is in accordance with guidance provided by WA DoH 2009. It is considered that extensive remediation, removal and disposal of FA / AF heavily impacted soils would cause a greater adverse effect than if the impacted soils remain in-situ where possible and are contained and managed in the long term. It is noted that containment of contaminated soil would require the potential exposure to contamination to be managed by the implementation of a Long Term Asbestos Management Plan (LTAMP). There must be acceptance by the ultimate custodian of the land that future controls will be implemented, and that a notation will be made on the Title of the land. Implementation of a LTAMP is considered feasible for the site given the proposed long term uses as a health services facility.	The preferred option.

Option of Treatment	Discussion	Conclusion
	<p><u>ACM only impacted soils</u></p> <p>Onsite containment is a suitable remedial option for areas where ACM impact is present above a threshold that renders it commercially unviable to remediate for onsite reuse. This may be due to an inability to effectively remove non-friable ACM due to soil type and building rubble concentration.</p> <p>The amount of material able to be contained onsite will be dependent upon final design levels and the total volumes of fill materials required.</p>	A suitable option if unable to remediate onsite.
<p><u>Option 4:</u> Removal of contaminated soil to an approved site or facility, followed where necessary by replacement with clean fill.</p>	<p><u>FA / AF impacted soils</u></p> <p>There are currently suitably licensed waste facilities in the Sydney Metropolitan region capable of accepting asbestos contaminated soils.</p> <p>Offsite disposal of FA / AF impacted soils is likely the fastest method of remediation, but also involves significant disturbance of the FA / AF impacted materials and should be limited to excess material that cannot remain contained onsite.</p> <p>This option generates the highest quantity of waste, since the materials are disposed to landfill rather than treated and reused (i.e. Options 1 & 2) or retained on site (Option 3). This option also generates additional truck movements and associated fuel/emissions over Option 1 and Option 3, but less than Option 2, since materials are not returned to site</p>	A suitable option if unable to contain onsite.
	<p><u>ACM only impacted soils</u></p> <p>Offsite disposal is a suitable remedial option for areas where ACM impact is present above a threshold that renders it commercially unviable to remediate for onsite reuse. This may be due to an inability to effectively remove bound ACM due to soil type and building rubble concentration.</p>	A suitable option if unable to remediate or contain onsite.

6.5 Preferred Remedial Strategy

A number of potential remedial options have been outlined in **Table 6.1**. The preferred remedial strategy for the site is:

- Containment of asbestos impacted soils, with the installation of a marker layer, capping layer, implementation of a LTAMP and notation on the land Title.

Offsite disposal of asbestos impacted soils, if asbestos impacted soils are surplus to the development and cannot be contained on site due to space constraints, is also considered to be a suitable option if considered to be feasible as part of the development works.

6.6 Containment of Asbestos Impacted Soils Across the Westmead Precinct

The site (i.e., the PSB SSDA footprint) is part of the overall Westmead Precinct and includes a number of redevelopment stages. Stages of the CHW Stage 2 Redevelopment currently include the Early Works program, PSB Redevelopment and the Multi-Storey Carpark (MSCP) Redevelopment including various refurbishment projects.

It is understood that Health Administration Corporation (HAC) owns or is in control of the CHW Lot (Lot 101 DP1119583), Westmead Hospital Lot (Lot 1 DP1194390), and Cumberland West Hospital Lot (Lot 1 in DP 808447). Future stages of the CHW Stage 2 Redevelopment proposed to occur across these lots would be considered to be part of the overall Westmead Precinct.

On this basis, it is considered that asbestos contaminated materials can be re-located across specific stages of the CHW Stage 2 redevelopment on the basis this is occurring within the overall Westmead Precinct site. To this extent, there is no requirement for an Environment Protection Licence (EPL) to be held to accept the material or to assign a waste classification to the materials, because the material is not considered to be surplus to site requirements and not leaving the Westmead Precinct site.

Materials destined for re-use across the Westmead Precinct as part of the overall remedial and design strategy are not considered to be waste materials. These materials may be temporarily stored within designated locations prior to permanent containment across the Precinct as part of the overall CHW Stage 2 redevelopment remedial strategy. Transportation of these materials via internal roads or directly adjacent public roads is considered appropriate if conducted with appropriate controls including wetted materials, leakproof trucks and covered loads.

6.7 Remediation Principles

The following remedial principles must be implemented during remedial works:

- Minimise the area and extent of disturbance of asbestos impacted fill; and
- Minimise off-site disposal of asbestos impacted fill.

7. Remediation Plan

7.1 Approvals, licences and notifications

Based on the findings of previous investigations, the total volume of known contaminated material is anticipated to be less than 30 000 m³. The total area of the site subject to remediation is approximately 1.56 ha, therefore less than 3 aggregate hectares of contaminated material will be disturbed during the remedial process, with disturbances restricted to the extent of design requirements, as shown in **Appendix B**.

To this extent, the works are considered to be Category 2 remediation works in accordance with SEPP 55. SEPP 55 requires the consent authority to be notified 30 days before the commencement of Category 2 remediation works.

An appropriately experienced and licensed Remediation Contractor is required to undertake the works, under the supervision of an appropriately qualified and experienced Remediation Consultant. Large quantities of identified asbestos impacted soils are friable, as per the definitions in relevant regulatory guidance. As such, the works must be conducted by a Class A (friable) licensed contractor who has obtained a site specific permit approving the asbestos works from SafeWork NSW (SWNSW). This permit application must be made at least seven working days before removal work is commenced.

Remediation works shall not commence until all required approvals, licences and notifications have been granted and/or received.

Furthermore, all required environmental and health and safety documentations must be completed prior to the commencement of remedial works, and should as a minimum include the Construction Environmental Management Plan (CEMP), and Work Health and Safety Plan (WHSP) detailed in **Section 11**.

7.2 Site Establishment

The boundary of the extent of remediation will be defined by the Remediation Consultant. The Contractor shall secure these areas to ensure that all safety and environmental controls are implemented. These controls will include, but not be limited to:

- Locate and isolate all required utilities in the proximity of the works;
- Assess need for and implement any necessary traffic controls;
- Work area security fencing;
- Site signage and contact numbers;
- Stabilised site entry gate;
- Appropriate decontamination areas for personnel and plant;
- Sediment fencing (attached to security fencing) where necessary; and
- Stormwater runoff and sediment controls (e.g. silt fences and hay bales) where necessary.

7.3 Buildings and Structures Demolition

Existing structures (including the car park in the southern portion) on the site have recently been demolished or are currently in the process of being demolished. The key processes remaining are briefly summarised below:

- Removal and disposal of hazardous materials in accordance with relevant regulatory guidance and Waste Classification Guidelines 2014 (EPA 2014);

- Conduct hazardous materials clearance inspection (where required);
- Demolish remainder of structures;
- Beneficial reuse of environmentally validated material onsite where possible (i.e., reuse of crushed recycled concrete) or lawfully remove all materials off-site; and
- Expose underlying soils for validation sampling by Remediation Consultant.

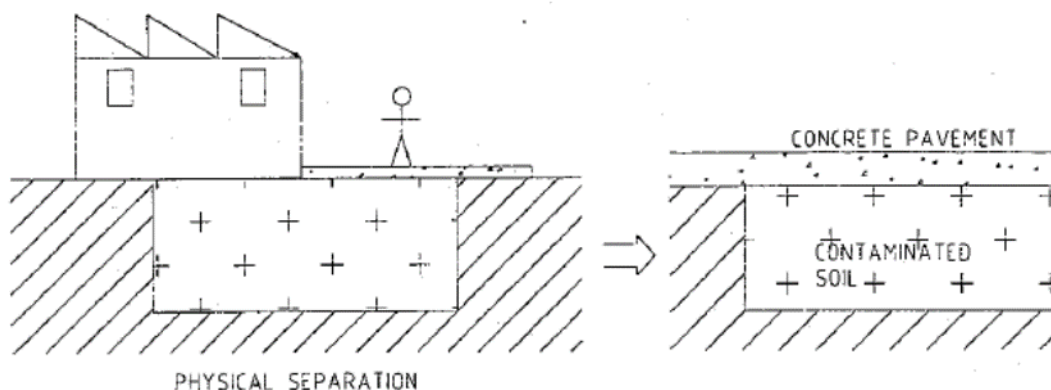
It is noted that there is a potential beneficial reuse of environmentally validated crushed recycled concrete from the southern car park as a capping layer across the asbestos impacted areas of the site.

7.4 Containment of Impacted Fill Option

Asbestos impacted fill can be managed via containment and the implementation of physical separation or within a “Containment Cell”, which eliminates the inhalation exposure pathway for airborne asbestos fibres. The minimum requirements for the physical separation to be adopted in the remediation of the site include:

- A minimum soil cover thickness of 0.3 m in turfed areas, 0.5 m in mass planting/shallow landscaped areas and 0.6 m in tree pit zones which is underlain by a “marker layer” in unpaved areas, i.e., parks, gardens and green open spaces etc.; or
- Permanent concrete floor/ground/wall slabs or asphaltic concrete surfaced pavements and underlain by a “marker layer”, i.e., underlying buildings, roads, pathways; or
- Top (concrete) of pile foundations (no marker layer required for below pile foundations).

A conceptual sketch, sourced from ANZECC 1999¹⁵, is shown following:



The marker layer shall consist of a bright orange coloured non-woven polyester continuous filament or PET (such as nonwoven geotextiles) or similar with a minimum density of approximately 150 grams per square metre (or equivalent). The marker layer must:

- Be easily recognisable within soils (i.e., bright orange in colour);
- Be durable as a long term marker layer (i.e., > 150 grams per square metre); and
- Maintain integrity during remedial/civil works such as capping layer insulation and road/building construction.

Additionally, the marker layer must meet geotechnical and civil specifications where required, i.e., underlying roads.

¹⁵ *Guidelines for the Assessment of On-site Containment of Contaminated Soil*, Australian and New Zealand Environment and Conservation Council, September 1999. (ANZECC 1999).

The marker layer should be installed flush with the exterior of all pile foundations. A marker layer is not required below pile foundations.

Typically, at least 0.5 m depth capping layer in vegetated areas is required for containment of asbestos impacted soils (ANZECC 1999). However, Westmead Hospital Campus, which is currently managed by Western Sydney Local Health District (WSLHD) is considered to have effective institutional management controls in place such as contractor inductions, an Asbestos Management Plan and a Ground Disturbance Procedure which minimise the risk of containment failure. Therefore, a reduced cover of 0.3 m depth capping in turfed areas is considered appropriate. Deeper capping layers have been specified in mass planting and tree pit zones to accommodate for the increased root depths of native tall grasses, shrubs and trees, and to minimise potential containment failure during future landscaping works in these areas. Furthermore, this enables the proposed finished ground surface levels of the redevelopment to be commensurate with the current ground surface levels of the hospital campus, thus eliminating additional unnecessary disturbance of asbestos impacted materials.

The specific details of the marker layer are required to be included in the site validation report and LTAMP documents in addition to surveyed plans showing the extent of capped area within the site.

7.4.1 Interim Capping Arrangements During Construction Works

To manage the potential contamination exposure risks to site construction workers, including but not limited to airborne asbestos fibres, an interim impermeable capping profile installed at the completion of the excavation works within areas of the site where asbestos impacted fill is present, may be preferred. This capping layer will comprise either a minimum 150 mm robust material capping layer or concrete blinding slab (or similar subject to Site Auditor endorsement) and includes the concreted surface of pile foundations, that will extend across the ground, to the boundary of the impacted area. The material must be able to withstand construction based activities, such as moving excavators and other plant. Example of suitable materials include validated crushed recycled concrete, crushed rock or similar hard materials.

It may be beneficial to undertake any piling works (if required) as part of the remediation works as the top of pile foundations will form part of the capping layer on the site. Furthermore, completion of piling works during remediation will avoid unnecessary duplicated disturbance of asbestos impacted material on the site if piling works were to be completed subsequent to the installation of the marker and capping layer. In addition, completing the piling works whilst Class A Licensed Asbestos removalists, Licensed Asbestos Assessor(s) and a full suite of appropriate asbestos related controls (as per **Section 10**) are being implemented on the site will enhance the safety of the work environment during piling works.

The interim capping approach is considered appropriate to complete (in the interim) the requirements of the RAP as the material or pavement will form a durable physical barrier such that there is/are:

- No complete exposure pathways (inhalation of asbestos fibres) between the asbestos impacted fill material and future site workers; and
- No significant potential risk of contaminant migration via airborne movement and dust generation etc. into surrounding areas of the site (occupational receptors) or offsite (sensitive receptors).

Where a marker layer is required to be placed underlying the capping as indicated above, this marker layer will be installed prior to construction of the interim capping layer so as to meet the requirements of the RAP.

Once the interim capping arrangements have been installed, the CEMP will address interim management requirements for all site works that may result in penetration of and/or removal of the

interim cap. The CEMP will remain applicable until such time as the final capping arrangements are completed at the site, following which the LTAMP, in conjunction with the existing Western Sydney Local Health District Asbestos Management Plan (at handover of the site) will replace the interim requirements. It is envisaged that this will occur in conjunction with the completion of construction works such that the CEMP will address primarily construction related activities under the direction of the Contractor, whilst the LTAMP will address primarily site maintenance related activities to be completed under the direction of the future land operators (i.e. WSLHD).

Validation of the interim and permanent capping arrangements will be required as outlined in **Section 9**, including inspections by the Remediation Consultant, a survey plan prepared by a registered surveyor showing the level and lateral extent of the marker layer, interim capping and permanent capping in relation to the site boundaries.

7.4.2 Permanent Capping Arrangements

The following general capping procedures will be applied to appropriate scenarios across the site, prior to completion of construction works:

- Beneath permanent parking ground floor/basement structures – installation of a marker layer over contaminated fill material and permanent concrete slab as the physical barrier.
- Permanent hardstand structures (i.e., concrete slabs, pile caps or asphaltic concrete or similar, but not bricks or pavers) – installation of a marker layer overlying potentially contaminated material followed by sub-grade material validated as environmentally suitable materials for human exposure and then the permanent structure (e.g., exterior concrete footpaths, asphaltic roads, etc.).
- Turfed areas – installation of the marker layer at a minimum depth of 300 mm below final finished site levels, with a capping layer consisting of environmentally suitable materials for potential human and/or ecological exposure.
- Mass planting / shallow landscaping areas – installation of the marker layer at a minimum depth of 500 mm below the final finished site levels, with a capping layer consisting of environmentally suitable materials for potential human and/or ecological exposure.
- New tree pit zones – installation of the marker layer at a minimum depth of 600 mm below the final finished site levels, with a capping layer consisting of environmentally suitable materials for potential human and/or ecological exposure.
- Existing tree zones – installation of the marker layer consistent with immediately adjacent marker layer depths (e.g., 300 mm in turfed areas and 500 mm in mass planting areas) to the extent practicable, with a capping layer consisting of environmentally suitable materials for potential human and/or ecological exposure.
- Within underground services trenches / services – service infrastructure will require remediation to 150 mm below the depth of services, with a marker layer and capping layer installed consisting of environmentally suitable materials for potential human and/or ecological exposure.
- Within road reserves – the entire width of newly constructed road reserves, in conjunction with service infrastructure will be required to a depth 150 mm below the depth of the services, with a marker layer and capping layer installed consisting of environmentally suitable materials for potential human and/or ecological exposure.

Preliminary locations and extents of finished site surfaces, i.e., permanent hardstand structures and landscaped areas are detailed in the draft Development Plans, provided in **Appendix B**.

Where a marker layer has been installed and validated as part of the interim capping arrangements, a new marker layer is not required beneath the final capping layer, subject to all capping materials placed over the marker layer having been validated as environmentally suitable.

Material above the marker layer extending to the final finished ground level will be required to be environmentally suitable material for human and/or ecological exposure (as appropriate). This may include: virgin excavated natural material (VENM) sourced from on-site, imported VENM, excavated natural material (ENM) or similar material certified in accordance with an exemption issued by the NSW EPA that also meets site suitability criteria; or imported road making materials comprising fresh quarried material or material covered by a beneficial reuse exemption issued by the NSW EPA.

Additionally, material underlying load bearing structures such as roads, should be geo-technically suitable, in accordance previously prepared geo-technical reports.

In the interface of remediated and non-remediated areas, the extent of the marker and capping layer should be extended a minimum of 300 mm laterally outside the extent of remediated area, where practicable. This may include battering of the marker/capping layer to tie-in with existing site levels within the 300mm outside of the remediated area, where practicable.

Validation of the interim and permanent capping arrangements will be required as outlined in **Section 9**, including inspections by the Remediation Consultant, a survey plan prepared by a registered surveyor showing the level and lateral extent of the marker layer, interim capping and permanent capping in relation to the site boundaries.

7.5 Off-Site Disposal Option

Where management of impacted soils will be completed via excavation and off-site disposal, procedures as documented following will require to be implemented to ensure all environmental/health objectives are addressed.

7.5.1 Excavation of Impacted Soils

Impacted soils (assessed as unsuitable for containment) shall be 'chased out' under the direction and supervision of the Remediation Consultant. The procedure for undertaking this excavation activity will be:

- Excavation of impacted soils to nominated lateral and vertical extent until the soils meet the adopted validation criteria (**Section 9.5**);
- Excavated soils shall be stockpiled on a hardstand or plastic liner pending offsite disposal or loaded directly into the back of a truck for disposal; and
- Any unexpected finds will be managed as per **Section 8.1**.

7.5.2 Offsite Disposal of Material

Any material requiring disposal shall be classified prior to removal by the Remediation Consultant in accordance with *Waste Classification Guidelines Part 1: Classifying Waste*, NSW EPA (2014) and relevant waste regulations. Disposal of waste to licensed waste facilities in accordance with relevant waste regulations will be undertaken by the Contractor. All waste tracking documentation including disposal dockets must be maintained by the Contractor and must be provided to the Principal and the Remediation Consultant for inclusion in the validation report.

Any asbestos waste exceeding 100 kilograms or more than 10 m² of bonded ACM in one load disposed off-site must be tracked using the NSW EPA online system WasteLocate.

7.6 Validation

Validation of the remedial works will be conducted by the Remediation Consultant to demonstrate the remediation objectives have been achieved. Details of the validation program are provided in **Section 9**.

7.7 Backfilling of Excavations and Imported Fill Materials

Upon confirmation of soil validation by the Remediation Consultant, or application of marker layer, excavations that require reinstating, will be backfilled using on-site validated material and/or validated imported material where required.

7.8 Waste Classification and Offsite Disposal of Material

Classification of ACM and other waste materials/soil will be completed in accordance with *Waste Classification Guidelines Part 1: Classifying Waste*, NSW EPA (2014) and relevant waste regulations by the Remediation Consultant. Disposal of waste to licensed waste facilities in accordance with relevant waste regulations will be undertaken by the Contractor. All waste tracking documentation including disposal dockets must be maintained by the Contractor and must be provided to the Principal and the Remediation Consultant (JBS&G) for inclusion in the validation report.

Unless specified above, soils requiring off-site disposal will be sampled by the Remediation Consultant as per the sampling density for stockpiled materials in NEPC (2013) for chemicals of concern.

It is a requirement under the *Protection of the Environment Operations (Waste) Regulations 2014* (POEO Waste Regulation) to record the movement of all loads of more than 100 kg of asbestos waste or more than 10 m² of asbestos sheeting. Each load will be assigned a unique consignment code to allow NSW EPA to monitor their movement from site of generation to disposal.

In addition, the *proximity principle*, under the POEO Waste Regulation, makes it an offence to transport waste generated in NSW by motor vehicle for disposal more than 150 kilometres from the place of generation, unless the waste is transported to one of the two nearest lawful disposal facilities to the place of generation.

The Contractor must be aware of and conduct all waste disposal in accordance all relevant regulations.

7.9 Site Disestablishment

On completion of the remediation works all plant / equipment and safety / environmental controls shall be removed from the site by the Contractor. All equipment used during asbestos remediation works will need to be appropriately decontaminated or disposed of as asbestos waste by the Contractor, in accordance with SWA and SWNSW guidance, EPA 2014 and relevant waste regulations.

8. Contingency Plan

A review of remediation works has been undertaken to identify potential risks to meeting the specified site validation criteria. A number of potential risks have been identified. These are listed following with contingencies that will be implemented to ensure that validation criteria are met.

Additionally, the associated remedial works health and environmental risks/hazards and their minimisation/mitigation are further discussed in **Sections 10** and **11**.

8.1 Unexpected Finds Protocol

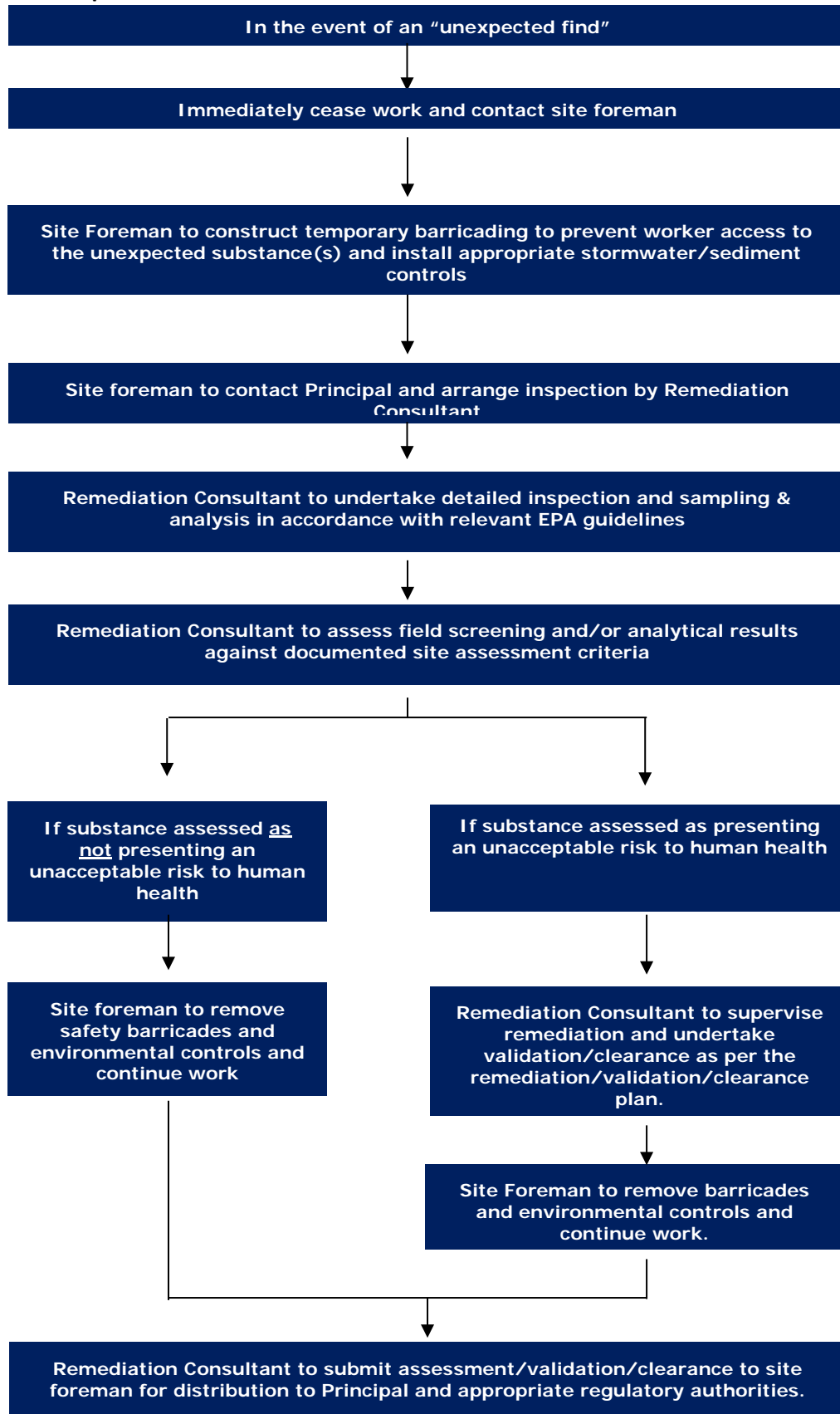
It is acknowledged that previous investigations of the site have been undertaken to assess the identified contaminants of potential concern in selected parts of the site. However, ground conditions between sampling points may vary, and further hazards may arise from unexpected sources and/or in unexpected locations during remediation. The nature of any residual hazards which may be present at the site are generally detectable through visual or olfactory means, for example (presented in **Appendix C** for use on-site):

- bottles / containers of chemicals (visible);
- construction / demolition waste (visible);
- ash and/or slag contaminated soils / fill materials (visible);
- petroleum contaminated soils (odorous, staining / discolouration visible) beyond the identified impact, or at levels that prevent off-site disposal without treatment; and
- volatile organic compound contaminated soils (odorous).

As a precautionary measure to ensure the protection of the workforce and surrounding community, should any of the abovementioned substances be identified (or any other unexpected potentially hazardous substance), the procedure summarised in **Flowchart 8.1** is to be followed.

An enlarged version of the unexpected finds protocol, suitable for use on-site, should be posted in the Site Office and referred to during the site specific induction by the Contractor.

Flowchart 8.1: Unexpected Finds Protocol



8.1.1 Remedial Strategy Constraints

In the event that the proposed remedial works do not meet the validation criteria, or if the selected remedial strategy is not able to proceed, the following actions will be considered to ensure, firstly, the safety and health of people and the environment and, secondly, that the overall project objectives are achieved:

- Reassessment of remedial and validation options for ACM/AF/FA contaminated soils; and
- Continued controlled excavation of potential impacted soils.

8.1.2 Material Storage Breach

In the event any stockpiled or capped materials escape (or have the potential to escape), then the management controls shall be rectified and investigations undertaken to review the adequacy of the controls and any improvements implemented.

8.1.3 Complaints

Due to the nature of the activities and type of contaminants identified at the site there is a potential for complaints to be received from members of the public, patients and staff members relating to environmental emissions including:

- Dust emissions arising from asbestos contaminated soil excavation, material handling, transport, placement and capping; and
- Noise and vibration from excavation.

Monitoring of all environmental emissions shall be undertaken as detailed in **Section 10** and appropriate actions taken to further control emissions following receipt of a complaint. Such additional controls may include the following actions:

- Disturbance of soils during meteorologically favourable periods only; and/or
- Increasing environmental controls including covering and/or wetting down soils which are generating dust.

8.1.4 Lack of Available Space

Works will be scheduled so that new remedial areas will not be opened up until previously excavated areas are capped. This has the benefit of separating asbestos earth works and regular earth works, thus minimising the extent of asbestos earth works occurring at any one stage. Should room availability for unexpected finds become a concern, laboratory-turn-around times for validation samples will be decreased in an attempt to clear open areas. If room onsite does become an issue remedial works will stop until areas can be validated.

8.1.5 Severe Weather

Weather will be monitored on a daily basis via checking an internet based weather service provider. Should severe weather be forecast, especially strong winds, works will stop until safe to re-commence. All site management controls will be implemented to the extent practicable as outlined in **Section 10** prior to any severe weather events.

8.1.6 Odours from Works

Based on the nature of the identified contaminants, off-site odour complaints are considered unlikely. Where complaints occur the following will be undertaken:

- Installation of an odour screening / masking system at the remediation area boundaries; and/or
- Disturbance of soils during meteorologically favourable periods only; and/or

- The use of odour suppressant additives to water used to keep impact soils/ stockpiles moist; and or
- Covering of impacted soils.

9. Validation Plan

9.1 Overview

Validation data are required to be collected to verify the effectiveness of the remediation works and document the condition of the site as being suitable for the proposed future uses.

Validation activities will be required for the following areas:

- Documentation of installation of containment measures if chosen as the remedial option (both interim and final);
- Validation of imported fill material to demonstrate its suitability for use as a capping layer or in trenching works;
- Validation of soils underlying current structures on the site;
- Movement of all soil and fill material onsite; and
- Waste materials requiring offsite disposal.

9.2 Data Quality Objectives

Data Quality Objectives (DQOs) were developed for the validation program, as discussed in the following sections.

9.2.1 State the Problem

The site is proposed to be redeveloped for use as a PSB which may include perioperative and interventional services, neonatal and paediatric intensive care units, cancer centre, acute inpatient beds, back of house and parent facilities, and associated accessways and landscaping. A number of previous investigations, as detailed in **Section 3**, have identified areas requiring remediation in order to make the site suitable for the proposed redevelopment. Specifically, asbestos in soil have been observed and detected above the adopted criteria within the north-western portion of the site.

9.2.2 Identify the Decision

The following decisions are required to be made during the validation works:

- Are fill material or natural soils underlying the existing structures (existing P17 car park in southern portion) environmentally suitable?
- Is there potential for fill materials that are not impacted by asbestos above the site criteria to be separated and re-used on site?
- Have marker and capping layers (where required) been installed appropriately and in accordance with RAP requirements?
- Are imported materials environmentally suitable for their proposed use?
- Have waste materials been suitability classified and lawfully disposed?
- Have the works been completed in accordance with the RAP, or where variations to the works were required, have these met the objectives of the RAP?
- Are analytical data generated by the validation works reliable?
- Is the site suitable for the proposed use?

9.2.3 Identify Inputs to the Decision

The inputs to the decision are:

- Detailed development plans to be provided by HI;

- Previous investigation data;
- Observation and photographic log of marker and capping layer installation (if required);
- Survey of marker and capping layer vertical and lateral extents (if required);
- Field observations and analytical data for soils beneath structures;
- Field observations, sampling and analytical data for imported materials;
- Field observations, sampling and analytical data for reused materials;
- Field observations, sampling and analytical data for off-site disposal of waste materials;
- Field observations, sampling and analytical data of any unexpected finds;
- Physical observations, including visual, olfactory and photoionisation detector (PID), where appropriate, screening results;
- Documentation of appropriate classification of imported materials;
- Environmental monitoring data to demonstrate that potential airborne pollutants as generated by the handling of environmentally impacted materials on the site has not impacted off-site locations;
- Assessment criteria for soils; and
- Data quality indicators as assessed by quality assurance/quality control (QA/QC).

9.2.4 Define the Study Boundaries

The study boundaries of the site are defined as follows:

- The lateral extent of the works relevant to this RAP are defined by the extent of the site, as shown on **Figure 2**;
- The vertical extent of the works is defined as:
 - 0.5 m into natural materials; or
 - the maximum depth of where potentially impacted fill materials are to be retained.

9.2.5 Decision Rules

The decision rules adopted to answer the decisions identified in **Section 9.2.2** are discussed below.

Are fill materials or natural soils underlying structures environmentally suitable?

To successfully validate fill material or natural soils underlying the car park in the southern portion, analytical validation data will be required to meet the assessment criteria and environmental quality goals for asbestos in soils established in **Sections 9.3.3** and **9.4** below.

Where a valid data set can be generated as based on assessment of the soils underlying structures, the following statistical criteria may be applied:

- The 95% UCL average concentrations shall be below the soil criteria;
- The standard deviation of the generated data set shall be below 50% of the soil criteria; and
- The maximum concentration shall be below 250% of the soil criteria.

Existing data, as summarised in **Table A**, for chemical constituents (not asbestos) from materials remaining at the site shall be included in analytical data sets created for the soils.

Is there potential for fill materials to be assessed for on-site re-use?

To successfully assess the suitability of fill materials to be re-used or retained on site, additional asbestos assessment is required to obtain analytical validation data to meet the assessment criteria and environmental quality goals for asbestos in soils established in **Sections 9.3.3** and **9.4** below.

Existing asbestos data, as summarised in **Table B**, for asbestos from materials remaining at the site shall be included in analytical data sets created for the soils.

Have marking and capping layers, where required, been installed appropriately and in accordance with RAP requirements?

The marker and capping layers must be installed across the extent of the remedial area, as shown in **Figure 6**. The marker layer must be installed to the RAP requirements, as well as the manufacturer's installation requirements. The vertical and lateral extents of the marker layer and position of piles should be surveyed, along with consistent and comprehensive photographic evidence.

Where soil based material is to be used as a capping layer, placed above the marker layer and readily accessible to human users, this material is required to be validated as meeting the health and ecological validation requirements for the site in addition to aesthetic requirements.

All imported materials to be used as the capping layer must be environmentally suitable, as defined below.

Are imported soils environmentally suitable for their proposed use?

Material required to be imported onto the site as capping, trench backfill or road building purposes (or any other purpose) are required to be demonstrated to be VENM, ENM or material considered suitable for beneficial reuse in accordance with a resource recovery exemption issued by NSW EPA under clauses 51 and 51A of the POEO Waste Regulation.

All imported material must not be classified as containing asbestos as per the definition of SWA (2020a).

All imported materials will be assessed to ensure the entirety of the capping layer from surface to the marker layer is validated upon conclusion of remedial works.

VENM

Laboratory analysis results will be compared to published background levels (metals) and nominated laboratory LORs (for all man-made chemical constituents) for VENM. The Remediation Consultant will conduct a site inspection of all VENM source sites and approve any VENM Certificates prior to importation of material. If either the source site or supporting documentation is unsatisfactory in regards to certainty of the material comprising VENM, the Remediation Consultant will undertake additional sampling to confirm chemical characterisation of VENM material and prepare any required documentation.

ENM

ENM will be assessed in accordance with the "Excavated Natural Material Exemption 2014". The Remediation Consultant will conduct a site inspection of all ENM source sites and approve any ENM material characterisations prior to importation of material. If either the source site or supporting documentation is unsatisfactory in regards to certainty of the material comprising ENM, the Remediation Consultant will undertake additional sampling to confirm chemical characterisation of ENM material and prepare any required documentation.

Resource Recovery Exemptions

Any materials falling under this category will be assessed in accordance with the relevant resource recovery exemption. The Remediation Consultant will undertake additional assessment and reporting if required to ensure compliance with the relevant resource recovery exemption.

Have waste materials been suitability classified and lawfully disposed?

All waste requiring off-site disposal must be suitability characterised and classified in accordance with *Waste Classification Guidelines* (EPA 2014) or relevant exemptions (such as VENM and ENM).

Fill materials present across the extent of the site are considered to be Special Waste – Asbestos, unless assessment proves otherwise. Additional chemical analysis is required for off-site disposal unless sufficient historical data can be used for waste classification purposes.

Natural soils underlying fill materials across the site may be encountered during excavations and may be suitable for characterisation as VENM, if appropriate care should be taken to not mix waste streams, no visual or olfactory signs of contamination are present and the material meets VENM chemical criteria (if required).

Is the data generated by the validation works reliable?

If the analytical data meets the Data Quality Indicators established in **Section 9.2.11**, then the analytical data are considered to be reliable.

All other data, such as visual observations, photographic logs and surveys will be qualitatively assessed to ensure they contain sufficient information to inform the validation report.

Is a Long Term Asbestos Management Plan Required?

A suitable LTAMP is required at the site if the containment management strategy of asbestos impacted fill materials is conducted. The LTAMP will detail the management strategies required to ensure the long term integrity of the marker and capping layers, such as inspection timetables, accidental penetrations of the marker layer and required controls for scheduled works below the marker layer.

Is the site suitable for the proposed use?

The site will be considered suitable for the proposed use if the following conditions are met:

- Fill materials or natural soils across the site meet the adopted site criteria;
- Marker and capping layers have been appropriately installed and documented;
- Imported soils are considered to be environmentally suitable;
- Waste materials have been suitably characterised and lawfully disposed;
- Analytical data generated is considered reliable; and
- A suitable LTAMP will be implemented at the site.

9.2.6 Specify Limits of Decision Error

A qualitative assessment shall be undertaken of potential decision errors associated with the data, in accordance with the provisions in NEPC 2013.

9.2.7 Optimise the Design for Obtaining Data

The validation sampling design for each specific type of validation works anticipated is discussed in detail in **Section 9.3**. The general sampling methodologies are discussed below.

9.2.8 Soil Sampling Methodology

Soil sampling will be conducted by the Remediation Consultant. The soil sampling method shall be determined by the Remediation Consultant as consistent with the observations of the site sub-surface and appropriate to generate representative samples. The soil sampling method shall be consistent with the data quality indicators in **Section 9.2.11**.

Where sample locations are placed by boreholes, undisturbed samples, as collected by push tube or SPT sampler, are preferred where able to be effectively implemented. Otherwise samples may be recovered from solid flight augers or via test pitting. All asbestos quantifications will be recovered from a solid flight auger with a diameter of at least 150 mm or via test pitting. Re-usable equipment shall require to be decontaminated between sampling locations.

9.2.9 Soil Sample Containers

During the collection of soil samples, features such as seepage, discolouration, staining, odours and other indications of contamination shall be noted on field reporting sheets / field logs.

Collected soil samples shall be immediately transferred to sample containers of appropriate composition (glass jars) fitted with Teflon sealed lids. 500 mL samples shall be additionally collected and placed in new zip lock bags where asbestos analysis is required. Sample labels shall record sample identification number and date and time of sampling. Sample containers shall be transferred to a chilled ice box for sample preservation prior to and during shipment to the testing laboratory. A chain-of-custody form shall be completed and forwarded with the samples to the testing laboratory, containing the following information:

- Sample identification;
- Signature of sampler;
- Date of collection;
- Type of sample;
- Number and type of container;
- Inclusive dates of possession; and
- Signature of receiver.

9.2.10 PID Screening

Soil samples will be screened during field works using a photo-ionisation detector (PID) to assess the potential presence of VOCs including petroleum hydrocarbons. Samples obtained for PID screening will be placed in a sealed plastic bag for approximately 5 minutes to equilibrate, prior to a PID being attached to the bag. Readings will then be monitored for a period of approximately 30 seconds or until values stabilise and the stabilise/highest reading will be recorded on the field sample forms. The PID will be calibrated prior to the commencement of field works and then check readings will be completed on a daily basis during the field program using suitable calibration gas. If required, the PID will be re-calibrated during the field program in accordance with manufacturer's instructions.

9.2.11 Quality Assurance/Quality Control

The objective of the project is to remediate the site to a standard suitable for the proposed uses. To demonstrate the effectiveness of the remedial works, validation sampling, inspections and analysis will be conducted. The quality of the validation data must be sufficient to draw conclusions regarding the suitability of the site. Hence, the quality assurance / quality control (QA/QC) program employed as part of the remediation works will involve pre-determined data quality indicators (DQIs).

The DQIs are summarised following and in **Table 9.1:**

- **Precision** - measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is normally assessed by

calculating the Relative Percent Difference (RPD)¹⁶ of duplicate samples. However, this calculation is not applicable due to the presence / absence nature of asbestos, and as such, the agreement between the sample pairs will be assessed instead.

- **Accuracy** - measures the bias in a measurement system. The accuracy of the laboratory data that are generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards.
- **Representativeness** - expresses the degree which sample data accurately and precisely represent a characteristic of a population or an environmental condition. Representativeness is achieved by using an adequate number of sample locations to characterise the site to the required accuracy.
- **Comparability** - expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples, ensuring analysing laboratories use consistent analysis techniques and reporting methods.
- **Completeness** - is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study.
- **Sensitivity** - expresses the appropriateness of the chosen field and laboratory methods, including the limits of reporting, in producing reliable data in relation to the adopted site assessment criteria.

Table 9.1: Summary of QA/QC Control Program

Data Quality Indicator	Frequency	Data Quality Acceptance Criteria
Precision		
Blind duplicates (intra laboratory)	1 / 20 samples	<50% RPD or agreement between asbestos presence/absence
Blind duplicates (inter laboratory)	1 / 20 samples	<50% RPD or agreement between asbestos presence/absence
Accuracy		
Surrogate spikes	All organic samples	70-130%
Matrix spikes	NA for asbestos analysis. Otherwise 1 per lab batch.	70-130%
Laboratory control samples	1 per lab batch	70-130%
Representativeness		
Sampling appropriate for media and analytes	All samples	All samples
Samples extracted and analysed within holding times.	-	NA for asbestos, organics (14 days), inorganics (6 months)
Laboratory Blanks	1 per lab batch	<LOR
Trip spike	1 per sampling event targeting volatiles	70-130% recovery
Trip blank	1 per sampling event targeting volatiles	<LOR
Comparability		

$$^{16} RPD(\%) = \frac{|C_o - C_d|}{C_o + C_d} \times 200$$

Where C_o is the analyte concentration of the original sample
 C_d is the analyte concentration of the duplicate sample

Data Quality Indicator	Frequency	Data Quality Acceptance Criteria
Standard operating procedures for sample collection & handling	All samples	All samples
Standard analytical methods used for all analyses	All samples	All samples
Consistent field conditions, sampling staff and laboratory analysis	All samples	All samples
Limits of reporting appropriate and consistent	All samples	All samples
Completeness		
Soil description and COCs completed and appropriate	All samples	All samples
Appropriate documentation	All samples	All samples
Satisfactory frequency and result for QC samples	All QA/QC samples	-
Data from critical samples is considered valid	-	Critical samples valid
Sensitivity		
Field and analytical methods and limits of recovery appropriate for media and adopted site assessment criteria	All samples	At least 10L per field AQ sample. LOR < Site assessment criteria (where possible)

If the RPD between duplicates is greater than the pre-determined DQI, a judgement will be made as to whether the excess is critical in relation to the validation of the data set or unacceptable sampling error is occurring in the field. For asbestos agreement, the highest concentration of the primary, duplicate or triplicate samples will be recorded as the result for that sample location, thus eliminating any non-conformance between primary, duplicate and triplicate samples.

9.3 Validation Inspections, Sampling and Analyses

9.3.1 Overview of Validation Sampling

The proposed soil validation sampling, quantification and analytical program is outlined in **Table 9.2**.

Table 9.2: Validation Sampling and Analytical Plan

Validation Area	Sampling Frequency	Analytes
Data Gaps including under the car park footprint in the southern portion	1 sample location per 20 m grid	Heavy metals TRH/BTEX PAHs OCPs/PCBs Asbestos (500mL) Minimum of 10L Asbestos Quantification per metre interval of fill
Further assessment of differing fill material types that may be encountered during civil earthworks (if segregation and on-site re-use above the marker layer is required)	1 per 70m ³ (historical samples able to be included), as per WA DoH 2009 stockpile materials sampling density	Asbestos (500mL) Minimum of 10L Asbestos Quantification per 70m ³
Excavations formed by removal of localised asbestos impact (if required to segregate impacted fill from non-impacted soils)	Floor: 1 per 25m ² . Wall: 1 sample per 5 linear metre. 1 sample per vertical metre.	Asbestos (500mL) 10L Asbestos Quantification per metre interval of fill (where appropriate)
Residual soils underneath stockpiles where contaminated material has been stored	1 sample per 10 m grid	Asbestos (500mL) or relevant contaminants
Excavations formed by Unexpected Finds	Base: 1 sample / 10 m grid, minimum of 2 per base Walls: 1 sample per 10 lineal metres per 1 m depth	Relevant contaminants of concern

Imported Materials of VENM, if required	Minimum of 5 samples per source site	<u>As a minimum:</u> Heavy metals TPH/BTEX PAHs OCPs/PCBs Asbestos (500mL)
Quarry VENM Materials (e.g. blue metal, sandstone, shale)	Confirmation that the material is quarried rock (VENM) prior to importation, and visual confirmation.	Site Inspection required.
Imported Materials of ENM, if required	As per ENM exemption 2014	Heavy metals TPH/BTEX PAHs pH EC RTA 276 (foreign materials) Asbestos (500mL)
Waste Classification, stockpiles	1 per 25m ³ up to 100 m ³ , minimum of 3. Reduced sampling density for volumes >100 m ³ .	Heavy metals TPH/BTEX OCPs/PCBs PAHs Phenols Asbestos TCLP Metals and PAHs (if required)
Recycled/Recovered Products	As per relevant exemption	As per exemption Plus Asbestos (500mL)

9.3.2 Validation Sampling Under Car Park

Soil validation sampling for asbestos and chemical constituents will be conducted by the Remediation Consultant under the car park footprint and adjacent areas in the southern portion. An approximate 20 m grid sampling density will be applied (refer **Figure 5**), with sample locations targeting identified areas of concern. The sample locations will comprise both chemical constituent sampling and asbestos quantification sampling. If gross soil contamination observed following the removal of the slab or during boreholes, consideration to additional sample locations will be given. All results will be compared to the adopted site soil validation criteria as presented in **Table 9.3**.

9.3.3 Marker Layer Inspection (if required)

Visual inspection will be undertaken by the Remediation Consultant to verify the installation of the marker layer across all required areas of the site, (i.e., across all areas of gravelly clay fill observed, detected or assumed to contain asbestos, as per **Figure 6**). Photographic records and a survey of the marker layer installation, including vertical and lateral extents by the Contractor will be retained for inclusion in the validation report. The marker layer will be inspected where present adjacent to pile foundations to ensure the marker layer has been placed flush with the exterior of the pile.

9.3.4 Capping Layer Validation (if required)

Material to be used as a capping layer must be validated by the Remediation Consultant to be environmentally suitable, consisting of VENM, ENM, suitable on-site materials (i.e. VENM from on-site) or material considered suitable for beneficial reuse via a resource recovery exemption issued by NSW EPA. Additionally, any capping layer material must not exceed the adopted site validation criteria for soils.

The capping layer must be placed at the thicknesses specified for each capping scenario as detailed in **Section 7.4**. Photographic records and a survey of the capping layer installation, which details the final thicknesses of the capping layer, including the vertical and lateral extents by the Contractor will be retained for inclusion in the validation report.

9.3.5 Imported Material Validation

Imported material source sites will be visited by the Remediation Consultant. Supporting documentation must be provided by the Contractor for imported materials to be assessed against the validation plan, relevant guidelines/exemptions and adopted site criteria. The Remediation Consultant will collect additional samples and prepare appropriate documentation for imported materials in lieu of adequate information provided by the Contractor to ensure all material imported to site is validated.

Sampling requirements are detailed in **Table 9.2**.

An electronic database (Imported Material Spreadsheet) will be maintained by the Remediation Consultant and Contractor to keep a record of imported materials.

9.3.6 Waste Disposal Off-Site

All wastes requiring off-site disposal from the Westmead Precinct must be classified in accordance with *Waste Classification Guidelines* (EPA 2014). The Contractor is responsible for the lawful disposal of the classified waste to a licensed waste disposal facility lawfully able to accept the waste.

Disposal dockets for each individual off-site waste disposal load must be provided to the Principal and to the Remediation Consultant by the Contractor to demonstrate appropriate off-site disposal of waste occurred for site validation purposes.

As detailed in **Section 6.6** above, if asbestos contaminated materials are to be re-located across other stages of the CHW Stage 2 redevelopment, the materials will be relocated within the overall Westmead Precinct site and the material is not considered to be surplus to site requirements (as it is not leaving the Westmead Precinct). Materials destined for re-use across the Westmead Precinct as part of the overall remedial and design strategy are not considered to be waste materials. Thus, there is no need to assign a waste classification to these materials.

9.4 Environmental Quality Goals for Asbestos in Soils

Environmental Quality Goals (EQGs) for asbestos in soils establish the minimum criteria for the remediation of asbestos via the preferred cap and contain strategy at the site.

The EQGs for the site are discussed below:

- **Capping Depth** - Capping depths must be commensurate with the proposed environmental controls for each of the capping scenarios established in **Section 7.4.2**. A minimum of 95% of surveyed depths must comply with the proposed capping depths for each capping scenario in each distinct capping area (i.e., 95% of surveyed depths complying with a single mass planting area).
- **Lateral Extent of Capping** - The lateral extent of capping must be consistent with the conceptual model of the distribution of asbestos in fill at the site. That is, capping must extend laterally across the extent of identified asbestos impacted gravely clay fill or other asbestos impacted fill on the site.
- **Long Term Integrity of Marker/Capping System** – the marker layer must be a bright orange coloured non-woven polyester continuous filament or PET (such as nonwoven geotextiles) or similar with a minimum density of approximately 150 grams per square metre (or equivalent). The marker layer must also be easily recognisable within soils (i.e., bright orange in colour), durable as a long term marker layer (i.e., > 150 grams per square metre) and maintain integrity during remedial/civil works such as capping layer installation and road/building construction. The depths proposed for each capping scenario in **Section 7.4.2** allow for root growth, as consistent with the Preliminary Development Plans presented in **Appendix B**, namely, 0.3 m for turf, 0.5 m for mass planting areas and 0.6 m for trees. Site management controls, such as inductions, ground disturbance procedures and the asbestos

register will make future contractors/workers aware of the presence and meaning of the marker layer. The LTEMP, which will form part on-going site management will include the procedures for future workers conducting works below the marker layer including the safe removal and re-instatement of the marker layer.

- **Capping material** - Material above the marker layer extending to the final finished ground level will be required to be environmentally suitable material for human and/or ecological exposure (as appropriate). This may include: VENM sourced from on-site, imported VENM, ENM or similar material certified in accordance with an exemption issued by the NSW EPA that also meets site suitability criteria; or imported road making materials comprising fresh quarried material or material covered by a beneficial reuse exemption issued by the NSW EPA.

9.5 Validation Criteria Selection

The hospital land use represents a scenario that does not fall under the standard health investigation land use scenarios presented in NEPM (2013). Schedule B7 of NEPM (2013) states “the HILs developed for the commercial/industrial land use scenario are not applicable to a site used frequently by more sensitive groups such as children (within childcare centres, hospitals and hotels) and the elderly (within hospitals, aged care facilities and hospices).” Given that children, elderly and other sensitive sub-populations (such as patients with immunosuppression and pre-existing illness) are frequent users of the site, a more sensitive land use scenario is required to be adopted. To this extent, the HIL B – standard residential land use scenario with minimal opportunities for soil access has been adopted as one of the validation criteria for all COPCs except asbestos for the site. In addition, given the potential for landscaped spaces in portions of the site, consideration has also been given to HIL C – Recreational and Public Open Space.

9.5.1 Soil Validation Criteria

The site is proposed to be redeveloped for ongoing use as a health services facility. As such, based on the proposed land use and in accordance with the decision process for assessment of urban redevelopment sites (EPA 2017), concentrations in the soil will be compared against published levels as presented in **Tables 9.3**, sourced from the following:

- Health Investigation Levels (HILs) for residential with minimum opportunities for soil access – NEPC 2013, HIL-B;
- Health Investigation Levels (HILs) for public open space / recreational areas – NEPC 2013, HIL-C;
- Health Screening Levels (HSLs) for petroleum hydrocarbons considering potential for vapour intrusion, clay for low – high density residential (NEPC 2013);
- HSLs for asbestos contamination in soil for high density residential and recreational open space land use (HSL B and HSL C) – NEPC (2013);
- Management limits for hydrocarbons for urban residential and public open space land use – fine soil (NEPC 2013);
- Generic and derived ecological investigation levels (EILs) based on NEPC (2013) for urban residential and public open space; and
- Ecological Screening Levels (ESLs) for TPH fractions, BTEX and benzo(a)pyrene in fine soil for urban residential and public open space land use (NEPC 2013).

Given the typically clay based fill materials / soils, fine soil criteria will be used in the HSLs/ESLs and the Management Limits.

Where there are no NSW EPA endorsed thresholds the laboratory limit of reporting (LOR) has been adopted as an initial screening value for the purposes of this assessment.

Where required, results will be statistically assessed in accordance with the method summarised in **Section 9.5.2**.

Table 9.3: Adopted Soil Validation Criteria

Constituent	Limit of Reporting (mg/kg)	Laboratory Method	Health Investigation / Screening Levels: HIL B (mg/kg, %w/w for asbestos)	Health Investigation / Screening Levels: HIL C (mg/kg, %w/w for asbestos)	Ecological Investigation / Screening Levels: (mg/kg)	Management Limits TRH (mg/kg)
Asbestos						
Bonded ACM	0.01	AS4964-2004	0.04	0.02	-	-
AF/FA	0.001	AS4964-2004	0.001	0.001	-	-
Heavy Metals						
Arsenic	2	ICP-AES (USEPA 200.7)	500	300	100	-
Cadmium	0.4	ICP-AES (USEPA 200.7)	150	90	-	-
Chromium	5	ICP-AES (USEPA 200.7)	500 (Cr VI)	300 (Cr VI)	410 (Cr III)	-
Copper	5	ICP-AES (USEPA 200.7)	30 000	17 000	110	-
Lead	5	ICP-AES (USEPA 200.7)	1200	600	1,480	-
Mercury (inorganic)	0.05	ICP-AES (USEPA 200.7)	120	80	-	-
Nickel	5	ICP-AES (USEPA 200.7)	1200	1200	200	-
Zinc	5	ICP-AES (USEPA 200.7)	60 000	30 000	310	-
Polycyclic Aromatic Hydrocarbons (PAHs)						
Carcinogenic PAHs (as B(a)P TEQ)	-	-	4	3	-	-
Total PAHs	0.5	-	400	300	-	-
B(a)P	0.5	GCMS (USEPA8270)	-	-	0.7	-
BTEX						
Benzene	0.1	Purge Trap-GCMS (USEPA8260)	0.7 (<1 m) 1 (1 to < 2 m) 2 (2 to < 4 m) 3 (4 m +)	Not Limiting (NL)	65	-
Toluene	0.1	Purge Trap-GCMS (USEPA8260)	480 (<1 m)	NL	105	-
Ethyl benzene	0.1	Purge Trap-GCMS (USEPA8260)	-	NL	125	-
Xylenes (Total)	0.3	Purge Trap-GCMS (USEPA8260)	110 (<1 m) 310 (1 to < 2 m)	NL	45	-
Naphthalene	0.5	Purge Trap-GCMS (USEPA8260)	5 (<1 m)	NL	170	-
Total Recoverable Hydrocarbons (TRH)						
F1 C ₆ -C ₁₀	20	Purge Trap-GCMS (USEPA8260)	50 (<1 m) 90 (1 to < 2 m) 150 (2 to < 4 m) 290 (4 m +)	NL	180	800
F2 >C ₁₀ -C ₁₆	50	Purge Trap-GCMS (USEPA8260)	280 (<1 m)	NL	120	1000
F3 >C ₁₆ -C ₃₄	100	Purge Trap-GCMS (USEPA8260)	-	-	1300	3500
F4 >C ₃₄ -C ₄₀	100	Purge Trap-GCMS (USEPA8260)	-	-	5600	10 000
Organochlorine Pesticides (OCPs)						
DDT+DDE+DDD	0.015	GCECD (USEPA8140,8080)	600	400	180	-

Constituent	Limit of Reporting (mg/kg)	Laboratory Method	Health Investigation / Screening Levels: HIL B (mg/kg, %w/w for asbestos)	Health Investigation / Screening Levels: HIL C (mg/kg, %w/w for asbestos)	Ecological Investigation / Screening Levels: (mg/kg)	Management Limits TRH (mg/kg)
Aldrin and dieldrin	0.01	GCECD (USEPA8140,8080)	10	10	-	-
Chlordanes – Total	0.1	GCECD (USEPA8140,8080)	90	70	-	-
Endosulfan I + II	0.01	GCECD (USEPA8140,8080)	400	340	-	-
Endrin	0.05	GCECD (USEPA8140,8080)	20	20	-	-
Heptachlor	0.05	GCECD (USEPA8140,8080)	10	10	-	-
HCB	0.05	GCECD (USEPA8140,8080)	15	10	-	-
Methoxychlor	0.2	GCECD (USEPA8140,8080)	500	400	-	-
Mirex		GCECD (USEPA8140,8080)	20	20	-	-
Toxaphene	1	GCECD (USEPA8140,8080)	30	30	-	-
PCBs						
Total PCBs	0.5	GCECD (USEPA8140,8080)	1	1	-	-

Notes: EILs derived from the Ambient Background Concentrations (ABCs) for an Old Suburb with High Traffic from Olszowy et al 1995¹⁷ plus Added Contaminant Limits (ACLs) based on JBS&G 2015e soil characteristic data for the gravelly clay fill material present on the Westmead Hospital Campus.

9.5.2 Application of Soil Criteria

For soil to be considered as validated (i.e., not posing an unacceptable risk) all reported concentrations should ideally be below the site validation criteria. For chemical analysis the following statistical criteria shall be adopted with respect to the health based criteria:

- The upper 95% confidence limit on the average concentration for each analyte (calculated for samples collected from consistent soil horizons, stratigraphy or material types) must be below the adopted criterion;
- No single analyte concentration shall exceed 250% of the adopted criterion; and
- The standard deviation of the results must be less than 50% of the criterion.
- Where the soil validation criteria are exceeded, further remediation and validation, or evaluation of risk, will be required.

In addition to the numerical criteria, consideration shall be given to the presence of soils that are odorous or discoloured as a result of contamination.

9.6 Material Tracking Plan

The movement of all earth based materials on the site, to the site and from the site is required to be subject to a Material Tracking Plan (MTP). The MTP shall be administered by the Remediation Consultant with the provision of all required information by the Contractor.

¹⁷ Olszowy, H, Torr, H & Imray, P 1995, *Trace element concentrations in soils from rural and urban areas of Australia*, Contaminated sites monograph series no. 4, South Australian Health Commission, Adelaide Australia (Olszowy et al 1995).

Material tracking shall be required for all materials that are moved / excavated from a location on the site and not wholly replaced in the same locations within 12 hours of material movement (i.e., soils excavated for testpitting / assessment do not require material tracking, however all other material will require tracking).

9.6.1 Material Tracking Data

To this extent, all excavation and filling works as undertaken for the purposes of site remediation require the following information to be recorded by the Contractor on Material Tracking Forms (MTFs) and in an electronic Material Tracking Spreadsheet (MTS) and verified by the Remediation Consultant, with respect to material placement activities:

- Date (yyyy/mm/dd);
- Unique MTF identification (starting at 001);
- Site figure showing source (cut) and placement (fill);
- Estimated volume (cubic metres);
- Type of material (refer to classification scheme in **Section 9.6.2**);
- Depth of source (RL)
- Depth of placement (RL);
- Source (from) information in terms of MGA56 co-ordinates as established by site GPS and/or survey;
- Placement (to) information in terms of MGA56 co-ordinates as established by site GPS and/or survey;
- Source (from) information in terms of site feature (i.e., The Lodge footprint);
- Placement (to) information in terms of site feature;
- Source (from) information from off-site source site (e.g. Quarry A);
- Placement (to) information for off-site disposal (e.g., tip, EPA tracking number, docket reference);
- Reference document (where necessary, i.e. virgin excavated natural material / excavated natural material classification);
- Purpose of placement (i.e. containment, surplus to site requirements etc); and
- Comments (when required).

For material which has been removed for the purposes of environmental remediation, and is proposed to be moved again subsequent to the completion / validation of environmental remediation works, MTFs for the replacement of the material shall make reference to the initial MTFs generated by the excavation of the materials for remediation. As part of the validation of the material tracking forms, mass / material balances shall be assessed at each stage where additional material tracking forms are generated for particular site material.

It is the responsibility of the Contractor to ensure the MTF(s) are completed and submitted to the Remediation Consultant at the end of each day's work. The Remediation Consultant has ownership of the MTFs on receipt of all the necessary information from the Contractor.

The Remediation Consultant is required to review the submitted MTFs and to investigate/resolve any discrepancies. Following this review, a copy of the MTFs will be forwarded to the Principal.

Ideally this would occur within two days of the Remediation Consultant verifying the MTFs from the Contractor.

The MTP is considered an active process and revisions of the MTP will be undertaken to improve the MTFs and MTS to ensure comprehensive and efficient material tracking.

9.6.2 Material Tracking Classifications

Material to be moved on the site shall generally be tracked as per one of the following classifications:

- Asbestos impacted fill moved on-site (i.e., below site criteria) that may be temporarily stockpiled with a unique stockpile identifier prior to final placement under the marker layer;
- Asbestos impacted fill moved on-site (i.e., below site criteria) from excavations or temporary stockpiles and placed under the marker layer;
- Validated soils moved on-site;
- Relocation of fill/natural materials across the Westmead Precinct to temporary stockpiles or direct placement under the marker layer;
- Off-site disposal of waste material (with classification);
- Surplus soils as ENM;
- Surplus soils as VENM;
- Imported soils as VENM;
- Imported soils as ENM; and
- Imported soils under exemption.

Review of these general classification will be undertaken throughout the remedial works to ensure the classification remain appropriate.

9.7 Validation Reporting

9.7.1 Validation Report

The validation report shall be prepared by the Remediation Consultant written in general accordance with *Contaminated Land Guidelines: Consultants Reporting on Contaminated Land*, NSW EPA (EPA 2020).

The validation report should contain information including:

- Results of previous investigations conducted at the site;
- Details of the remediation works conducted;
- Information demonstrating that the objectives of the RAP have been achieved, in particular the validation sample results and assessment of the data against both the pre-defined data quality objectives and the remediation acceptance (validation) criteria;
- Information demonstrating compliance with appropriate regulations and guidelines;
- All material tracking data;
- Any variations to the strategy undertaken during the implementation of the remedial works;
- Details of any environmental incidents occurring during the course of the remedial works and the actions undertaken in response to these incidents; and

- Other information as appropriate, including any requirements for ongoing monitoring / management.

9.7.2 Long Term Asbestos Management Plan – Onsite Containment Option

In addition to the requirements of the validation plan, if the proposed remediation strategy is for on-site containment, this will require long term management following completion of the redevelopment.

To this end, a LTAMP will be prepared by the Remediation Consultant to detail the ongoing management and monitoring requirements for the site, however, the precise nature and extent of management requirements will not be known until remediation/management works are conducted and validation data obtained. The LTAMP will be prepared following the completion of the Validation Report for the site such that the requirements may be reviewed by the appointed site auditor in preparation of the Site Audit Report and Site Audit Statement.

The LTAMP is required to document the following elements:

- A statement of the objectives of the LTAMP – i.e., to ensure continued suitability of the site following remediation;
- Identification of residual environmental contamination issues at the site that require ongoing management/monitoring to meet the LTAMP objectives, including the type of contamination and location within the site (including a survey plan prepared by a registered surveyor);
- Documentation of environmental management measures which have been implemented to address the identified environmental issues at the site;
- Description of management controls to limit the exposure of site users to known areas of contamination to acceptable levels;
- Description of responsibilities for implementing various elements of the provisions contained in the LTAMP;
- Timeframes for implementing the various control/monitoring, etc. elements outlined in the LTAMP;
- Environmental monitoring and reporting requirements (if required) for the future management of environmental impact underlying the site including:
 - Appropriate monitoring locations and depth within and down-gradient of any residual contamination;
 - Relevant assessment criteria to be used in evaluating monitoring results;
 - Frequency of monitoring and reporting;
 - Process for reviewing monitoring data and how decisions will be made regarding the ongoing management strategy;
 - The length of time for which monitoring is expected to continue; and
 - The regulatory authorities involved and the management inputs required from each;
 - the integration of environmental management and monitoring measures for soil and groundwater;
 - Health and safety requirements for particular activities;
 - A program of review and audits;

- The provisions in the LTAMP are feasible (i.e., able to be implemented) and able to be legally enforceable (i.e., a mechanism exists, such as development consent conditions, to give the plan a basis in law);
 - The relevant consent authority is satisfied that the inclusion of a development consent condition relating to the implementation of the LTAMP is acceptable; and
- Corrective action procedures to be implemented where LTAMP assessment criteria are breached.

10. Site Management Plan

The site management plan is largely based on the Parramatta City Council (PCC) *Contaminated Land Policy, Version 1* (PCC 2017). This section contains procedures and requirements that are to be implemented as a minimum requirement during the remedial works at the site.

10.1 Hours of Operation

It is understood that the hours of operation for remedial work may vary from PCC 2017 typical hours of operation and is subject to approval.

PCC 2017 typical hours of operation for remedial works are:

- Monday to Saturday: 7am to 6pm.
- Sunday and public holidays: No work permitted.

10.2 Soil and Water Management

All works shall be conducted in general accordance with the NSW Department of Housing Blue Book – *Managing Urban Stormwater – Landcom*, 2004, which outlines the general requirements for the preparation of a soil and water management plan.

All remedial works shall be conducted in accordance with a soil and water management plan, which is to be kept onsite and made available to Council Officers on request. All erosion and sediment measures must be maintained in a functional condition through the remediation works by the Contractor.

To prevent the migration of impacted soil off site, silt fences shall be constructed at the down-gradient site boundaries by the Contractor. Any material which is collected behind the sediment control structures shall be treated by one of the following options:

- Placement under the capping layer if appropriate; or
- Removal off site to a licensed waste facility subsequent to waste classification.

In storm or extended rainfall event, the structures located on site for sediment control shall be monitored and replaced or altered if necessary by the contractor. Collected material shall be managed in accordance with remediation works by the contractor.

10.3 Stockpile Management

All materials stockpiled onsite will be managed by the Contractor. Unique numbers will be provided for each stockpile, the source of the stockpile, its estimated volume, material characterisation and its location onsite (via GPS) will also be recorded consistent with the Material Tracking Plan provided as **Section 9.6**.

The following procedures will be implemented by the Contractor:

- No stockpiles of soil or other materials shall be placed on footpaths or nature strips unless prior Council approval has been obtained;
- All stockpiles of soil or other materials shall be placed away from drainage lines gutters or stormwater pits or inlets;
- All stockpiles of soil or other materials likely to generate dust or odours shall be covered (where practical);
- All stockpiles of chemically contaminated soil shall be stored in a secure area and be covered if remaining more than 24 hours (where practical); and

- All stockpiles of asbestos contaminated soils shall be kept damp and covered to minimise potential fibre release, and if left for more than 24 hours, be stored in a secure area (where practical).

10.4 Site Access

All vehicle access to the site shall be stabilised to prevent the tracking of sediment onto the roads and footpaths. All materials must be removed from the roadway on a daily or as required basis. Soil washings from wheels shall be collected and disposed of in a manner that does not pollute waters. Any personnel, equipment, plant or vehicles that enter an asbestos works zone must be appropriately decontaminated prior to exiting.

10.5 Excavation Pump-out

Any excavation pump out water shall be sampled by the consultant for analysis for total suspended solid concentrations, turbidity, pH and the identified contaminants of concern prior to release to stormwater with permission from Council, sewer (only if trade waste permit obtained) or licensed liquid waste Contractor.

Excavation pump out from trenches is not anticipated with the general remediation works given the general remedial plan of minimising ground disturbance and groundwater being at a depth of approximately 5 m bgs. Pump out following accumulation of surface water is the most likely scenario for water disposal.

10.6 Landscaping / Rehabilitation

All exposed soils shall be progressively stabilised and revegetated or resealed on the completion of remedial works.

10.7 Noise

Remediation work shall not give rise to 'offensive noise' as defined in the *Protection of the Environment Operations* (POEO) Act 1997. All equipment and machinery associated with the remediation work shall be operated by the Contractor in accordance with the POEO Act 1997 and its *Noise Control Regulations 2000*.

The remediation works shall comply with the NSW EPA's *Environmental Noise Control Manual* for the control of noise from construction sites which specifies that:

- For a cumulative period of up to 4 weeks, the noise level as measured by the LA10 (15 minute) emitted by the works to specific residences should not exceed the background noise level, LA 90 (15 minute), by more than 20dB(A).

All machinery and equipment used on site will be in good working order and with the fitted with appropriate silencers when necessary.

10.8 Vibration

The use of plant and machinery by the Contractor shall not cause vibrations to be felt or capable to be measured at any premises.

10.9 Air Quality

During remedial works, dust emissions and any odours will be confined within the site boundary. This will be assessed by a program of air monitoring undertaken by the consultant for all remediation works and implemented by air emission controls as required by the Contractor. Air monitoring requirements are summarised in this section.

10.9.1 Air Monitoring

Real-time Exposure Monitoring

Preference is given for all environmental monitoring to be undertaken using real time methods. To this extent, the Remediation Consultant shall monitor works on the site by the use of a Dusttrak real-time aerosol monitors. A minimum of five locations will be monitored continuously throughout the remediation works.

The consultant will advise the Principal and Contractor when the time averaged Dusttrak particulate measurement (PM10) exceeds 0.05 mg/m³. WA DoH (2009) reports that this level is protective of potential asbestos fibre exposures. Further, this level is well below the inspirable dust inhalation standard, and is further protective of potential respirable dust impacts at the site boundary. The remediation works shall not comprise excavation / handling of silica rich materials, and maintenance of particulates at this level is considered to be similarly protective of potential silica exposures.

If dust levels exceed the adopted criteria of 0.05 mg/m³, the Principal and Contractor will be notified, and works will require to be modified to reduce dust emissions to below the adopted criteria. All exceedances will be required to be “closed-out” by re-sampling at the exceedance location subsequent to implementation of modified work routines (such as increased dust controls).

Occupational Asbestos Monitoring

Airborne asbestos fibre monitoring will be conducted by the Certified Occupational Hygienist (COH) whom also must be a Licensed Asbestos Assessor (LAA, as per SafeWork NSW requirements) in accordance with the requirements of the National Occupational Health and Safety Commission (NOHSC) *Asbestos Code of Practice and Guidance Notes*, in particular the Guidance note for the estimation of airborne asbestos dust [NOHSC 3002:2005]. The COH shall undertake airborne asbestos fibres monitoring at a minimum of five static locations daily during remediation works that will disturb asbestos impacted or contaminated materials. Monitoring locations will include site perimeter locations and downwind locations. Wind information available from the Bureau of Meteorology (BOM) for the nearest weather stations will be used to determine common prevailing winds in the area. Additionally, personal monitoring of up to three potentially impacted workers as nominated by the Contactor must be undertaken by the COH.

Air filters shall be analysed by a NATA accredited laboratory and results shall be required to be below 0.01 fibres/mL. All detections of fibres shall be further analysed by scanning electron microscope (SEM) to confirm the fibres are asbestos.

If respirable asbestos fibres are confirmed and present between 0.01 and 0.02 fibres/mL, the following controls must be implemented by the licensed asbestos removalist, in accordance with *Code of Practice: How to Safely Remove Asbestos*, SafeWork NSW (SWNSW 2020a);

- Review control measures;
- Investigate the cause; and
- Implement controls to eliminate or minimise exposure and prevent further release.

If respirable asbestos fibres are confirmed and present above 0.02 fibres/mL, the following controls must be implemented by the licensed asbestos removalist, in accordance with SWNSW 2020a;

- Stop removal work;
- Notify SafeWork NSW by phone, then by fax or written statement that work has ceased;
- Investigate the cause;
- Implement controls to eliminate or minimise exposure and prevent further release; and
- Do not recommence removal work until further air monitoring is conducted and fibre levels are detected below 0.01 fibres/mL.

A daily report air monitoring report will be prepared documenting the previous/same days airborne asbestos fibre air monitoring results. This report will be made available to all relevant stakeholders, including but not limited to:

- Site workers;
- Hospital staff;
- Neighbouring facilities; and
- Unions.

10.10 Dust Control

During the remedial works, as necessary, excavation areas will be wetted down using a water spray to minimise the potential for dust to be generated by the Contractor. A wetting or bonding agent may be used to further bind the soil to minimise asbestos fibre release.

All asbestos impacted soils must be wetted (but not flooded) prior to and during excavation and movement of the soils. To control dust in significant areas of exposed asbestos contaminated fill, industrial misting fans, placed at the outer extents of remedial/excavation areas, must be utilised by the Contractor.

Dust shall also be controlled by ensuring vehicles leave via the designated (stabilised) site access and all equipment have dust suppressors fitted by the Contractor.

During all remedial works, dust screens will be erected around the perimeter of the site by the Contractor. Where significant fugitive emissions are observed from asbestos inspection / treatment pads, or bioremediation areas, these areas shall be wetted and/or covered by the Contractor.

Meteorological conditions will be monitored by the Remediation Consultant and Contractor. Remedial work will be stopped or modified where meteorological conditions are adverse (i.e., dry conditions and strong winds towards sensitive receptors).

Plant and vehicles should limit their speed when working within asbestos exclusion zones and only traverse wetted haul roads. Only essential vehicles are permitted to traverse the asbestos exclusion zone.

10.11 Staging of Asbestos Disturbance Works

Where practicable, asbestos disturbance works will be conducted exclusively (i.e., with no other dust generating earthworks occurring simultaneously) with the application of a marker layer and interim capping layers as soon as practicable subsequent to site levels being achieved.

The objective of this is to separate all potential asbestos and non-asbestos dust generating activities so appropriate levels of control can implemented for each type of activity.

10.12 Odour / Volatile Emissions Control

No odours should be detectable at the site boundary and volatile emissions of other potentially volatile substances shall be controlled. Appropriate actions will be taken by the Contractor to reduce the odours, which may include: increasing the amount of covering of excavations / stockpiles; mist sprays; odour suppressants; and maintenance of equipment.

Records of volatile emissions and odours shall be kept by the Contractor. Equipment and machinery will be adequately maintained to minimise exhaust emissions. No materials shall be burnt on the site.

10.13 Transport of Material Offsite/Across the Westmead Precinct

Trucks will be loaded in a designated areas. The Contractor shall ensure that there is no material tracked out onto the street and that the load is securely covered. In addition, all site vehicles must leave the site in a forward direction.

The Contractor shall also log truck movements and approximate volume, via registration number and consignment number (where applicable), into and out of the site including material relocated across the Westmead Precinct.

All appropriate road rules shall be observed and state roads will be selected as far as practicable over local roads when deciding on the transport route to the off-site material disposal location.

Plant and vehicles should limit their speed when working within asbestos exclusion zones and only traverse wetted haul roads.

10.14 Hazardous Materials

Hazardous and / or intractable wastes arising from the remediation work shall be removed and disposed of in accordance with the requirements of NSW EPA, SafeWork NSW and the relevant regulations by the Contractor.

In particular, any hazardous wastes will be transported by a NSW EPA licensed transporter.

10.15 Offsite Disposal of Contaminated Soil

All soils to be removed from the Westmead Precinct for disposal will be classified, managed and disposed in accordance with the *Waste Classification Guidelines* (EPA 2014). Documentary evidence for all soil disposal shall be kept for inclusion in the Validation Report/s.

It is a requirement under the *Protection of the Environment Operations (Waste) Regulations 2014* (POEO Waste Regulation) to record the movement of all loads of more than 100 kg of asbestos waste or more than 10 m² of asbestos sheeting. Each load will be assigned a unique consignment code to allow NSW EPA to monitor their movement from site of generation to disposal.

In addition, the *proximity principle*, under the POEO Regulation, makes it an offence to transport waste generated in NSW by motor vehicle for disposal more than 150 kilometres from the place of generation, unless the waste is transported to one of the two nearest lawfully disposal facilities to the place of generation.

10.16 Imported Fill

Any materials imported on site by the Contractor to re-establish ground levels or to be applied as a capping layer must be validated, environmentally suitable material (i.e. VENM, ENM or other, as described in **Section 9.2.5**). Additionally, the imported fill should also be compatible with required geotechnical constraints and the existing soils characteristic for site drainage purposes.

10.17 Groundwater

It is anticipated no dewatering will be required for the remediation works. If dewatering is required as part of the remediation works, a licence shall be applied for from Water NSW for approval to extract groundwater. Details on the analyses and disposal of dewatering water is provided in **Section 10.5**.

10.18 Site Signage and Contact Numbers

A sign/s shall be displayed adjacent to the site access point/s throughout the duration of the works with the contact details of the Contractor and project manager as provided and maintained by the Contractor.

10.19 Site Security

The remedial areas shall be secured against unauthorised access by means of an appropriate fence or barricade by the Contractor. All persons working in asbestos remedial areas must be inducted, have undertaken required training and don appropriate PPE. The access gates will be locked at all times when remedial works are not occurring.

10.20 Community Consultation

Owners and / or occupants of adjacent premises and will be notified at least seven days prior to the commencement of preparation for the remediation works. As a minimum the notification shall include the details of an appropriate contact person.

Hospital staff and contractors will be notified at least seven days prior to the commencement of preparation for the remediation works via communications notices by Westmead Hospital.

11. Environmental and Health and Safety Management

11.1 Environmental Management

11.1.1 Construction Environmental Management Plan

Prior to commencement of remediation works on the site, a Construction Environmental Management Plan (CEMP) shall be prepared by the Contractor, which documents the environmental monitoring and management measures required to be implemented during the remediation and construction related activities associated with the construction of the site.

The CEMP shall address each of the nominated items in **Section 11.1.2** and shall include the contingency plan, referred to in **Section 8** above.

11.1.2 Required Elements / Procedures

An assessment of the proposed activities and the associated elements required to be incorporated into the CEMP is provided in **Table 11.1**. The CEMP is required to address each of the required elements and procedures in full detail and to include detailed monitoring processes and procedures, corrective actions and reporting requirements.

Table 11.1: Required Elements of the CEMP

Element	Specific Minimum Requirements to be included in CEMP
1. Dust and Airborne Hazard Control	Real time airborne dust analyser monitoring. Asbestos air monitoring. Provisions for dust control based on monitoring results. Staging of asbestos works. Notification of surrounding buildings and implementation of control measures (e.g., closure of air vents or additional monitoring for asbestos fibres).
2. Flora and Fauna	As appropriate and advised by flora and fauna consultant.
3. Heritage/Archaeological	In accordance with relevant heritage/archaeological studies.
4. Visual Impacts	Visual monitoring at site boundary Specific colour requirements for various controls/measures, including PPE (e.g., navy coveralls may be a suitable option in cooler conditions)
5. Emergency Response	As appropriate. Procedures required for spill incident response including material storage breach.
6. Noise Control	Hours of operation, consistent with the consent conditions. Boundary monitoring at commencement of work site activities with potential for environmental noise emissions. Potential noise monitoring at nearest receptors. Procedures for control and management of noise emissions, as appropriate (e.g., restricted hours).
7. Traffic	Controls on vehicle movements on public roads/internal Westmead Precinct roads Controls on transport in asbestos exclusion zones
8. Protection of Adjoining Structures	As appropriate and advised by structural engineer.
9. Odour Control	Procedures for management of potentially odorous works.
10. Handling of Contaminated Soil and Groundwater	Soil and water management (stockpiling, site access, excavation pump out, reinstatement).
11. Soil Storage/Placement Areas	Soil and water management (stockpiling, site access, excavation pump out, reinstatement). Bunding. Heavy vehicle/personnel decontamination. Interim storage requirements for materials requiring later treatment. Site drainage requirements, incorporating clean/dirty areas and modifications to existing surface water and drainage controls beneath retained pavements. Monitoring as required.

Element	Specific Minimum Requirements to be included in CEMP
12. Sediment Control	Bunding. Collection/treatment/handling impacted sediments.
13. Operation of Site Office	As appropriate.
14. Asbestos Works	Required notifications, permits, signage and exclusion zones. Required personal (e.g. Class A removalist, licences asbestos assessor). PPE and decontamination. Staging of asbestos and non-asbestos works.
15. Environmental Monitoring	Monitoring of dusts, noise, odour and fibres. Monitoring as required for vibration and water releases. Inspection checklists and field forms.
16. Environmental Criteria	Soil and water criteria as sourced from RAP.
17. Material Classification	As detailed in this RAP. Materials tracking, including QA/QC inspection and sampling.
18. Community Relations Plan	Refer to CHW Stage 2 project specific communication protocols, incorporating nomination of specific contact persons & details and requirements for communications/response register.
19. Incident Reporting	As appropriate, including standard form/checklist.
20. Security and Signage	Secure site perimeter. Site boundary signage. Asbestos exclusion zone signage.
21. EMP Review	As appropriate.
22. Training	As appropriate. Asbestos awareness training for all workers.
23. Contact Details	Company/personnel details, including names/phone numbers for: - Principal Contractor - Site Auditor - Remediation Consultant - Remediation Contractor - OH&S Compliance - Environmental Compliance

11.2 Health and Safety Management

A Work Health & Safety Management Plan (WHSP) shall be prepared by the Contractor prior to commencement of remediation works on the site. The Plan shall contain procedures and requirements that are to be implemented as a minimum during the works.

The objectives of the WHSP are:

- Ensure all regulatory requirements for the proposed works are satisfied;
- To apply standard procedures that minimises risks resulting from the works;
- To ensure all employees are provided with appropriate training, equipment and support to consistently perform their duties in a safe manner; and
- To have procedures to protect other site workers and the general public.

These objectives will be achieved by:

- Assignment of responsibilities;
- An evaluation of hazards;
- Establishment of personal protection standards, mandatory safety practices and procedures;
- Monitoring of potential hazards and implementation of corrective measures; and
- Provision for contingencies that may arise while operations are being conducted at the site.

12. Regulatory Approvals / Licensing

12.1 State Environment Planning Policy Number 55 (SEPP55) Remediation of Land

The proposed remediation works are considered to be classified as 'Category 2' Remediation Works – i.e., not requiring consent. The notification requirements of SEPP 55 require the consent authority to be notified 30 days before Category 2 remediation works commence, providing the consent authority with the information needed to verify the work is not Category 1 by reference to the following criteria:

- The work is not designated development under schedule 3 of the *Environmental Planning and Assessment Regulation 2000* (EPA&A Regulation) or under a planning instrument;
- The work proposed is not on land identified as critical habitat under the *Biodiversity Conservation Act 2016*;
- The remediation work is not likely to have a significant effect on threatened species, populations, ecological communities or their habitats;
- The work is not proposed in an area or zone identified in a planning instrument as being an area of environmental significance such as scenic areas or wetlands; and/or
- The work does not require consent under another SEPP or regional environmental plan.

In addition, the notification will also include relevant contact details and a proposed remediation schedule. Notice is also required to be given to the consent authority within 30 days of remediation works completion.

12.2 Protection of the Environment Operations Act 1997

The proposed remediation/validation activities are not required to be licensed under the POEO Act since the works do not involve:

- treatment otherwise than by incineration and storage of more than 30 000 cubic metres of contaminated soil originating exclusively from the site, or
- disturbance of more than an aggregate area of 3 hectares of contaminated soil originating exclusively from the site.

12.3 Protection of The Environment Operations (Waste) Regulation 2014

The regulations make requirements relating to non-licensed waste activities and waste transporting. The proposed works on the site will not require to be licensed.

Section 42 of the Regulation stipulates special transportation, reporting, re-use and recycling requirements relating to asbestos waste and must be complied with regardless whether the activity is licensed.

The requirements for the transportation of asbestos waste include:

- bonded asbestos material must be securely packaged at all times;
- friable asbestos material must be kept in a sealed container;
- asbestos-contaminated soils must be wetted down; and
- all asbestos waste must be transported in a covered, leak-proof vehicle.

The transporter of asbestos waste must cause the following information to be given to the EPA prior to the transportation of asbestos waste loads:

- source site details including address, name and contact details;

- date of proposed transportation commencement;
- name, address and contact details of disposal site; and
- approximate weight of each class of asbestos in each load.

The transporter of asbestos waste must ensure the following information is given to the disposal site before or at delivery:

- unique consignment code issued by EPA in relation to that load; and
- any other information specified in the Asbestos and Waste Tyres Guidelines.

The requirements relating to the off-site disposal of asbestos waste are as follows:

- asbestos waste in any form must be disposed of only at a landfill site that may lawfully receive the waste;
- when asbestos waste is delivered to a landfill site, the occupier of the landfill site must be informed by the person delivering the waste that the waste contains asbestos;
- when unloading and disposing of asbestos waste at a landfill site, the waste must be unloaded and disposed of in such a manner as to prevent the generation of dust or the stirring up of dust; and
- asbestos waste disposed of at a landfill site must be covered with virgin excavated natural material or other material as approved in the facility's environment protection licence.

Section 48 of the Regulation requires that wastes are stored in an environmentally safe manner. It also stipulates that vehicles used to transport waste must be covered when loaded.

It is noted that the above requirements of the waste regulatory framework apply when waste materials leave a site. As detailed in **Section 6.6**, material movement across the Westmead Precinct are not considered to be waste materials because the material is not considered to be surplus to site requirements and is not leaving the Westmead Precinct site. Thus, there is no need to assign a waste classification to the materials.

12.4 Waste Classification Guidelines (EPA 2014)

All wastes generated and proposed to be disposed from the Westmead Precinct site shall be assessed, classified and managed in accordance with this guideline. Where wastes require immobilisation prior to off-site disposal (to reduce waste classifications) an immobilisation approval shall be sought in accordance with Part 2 of this guideline. Immobilisations are only anticipated to be required with unexpected finds that cannot be retained on site and cannot be disposed directly offsite to a licensed facility.

12.5 Parramatta City Council Contaminated Land Policy (PCC 2017)

The Parramatta City Council Contaminated Land Policy details the requirements of the council in regards to contaminated lands. The requirements provided in **Section 10** are largely based on the guidance provided in PCC 2017.

12.6 Asbestos Removal Regulations and Codes of Practice

The remediation of fill containing asbestos will be managed in accordance with the Work Health and Safety Act (2011), WHS Regulation, SafeWork NSW guidelines, '*Code of Practice: How to Safely Remove Asbestos*, (SWA 2020a), '*Code of Practice: How to Manage and Control Asbestos in the Workplace*', (SWA 2020b) and the NSW EPA (2014) Waste Classification Guidelines.

Excavation, onsite remediation and removal of friable asbestos contaminated soils are required to be conducted by a Class A Asbestos Removal licensed contractor.

All airborne asbestos fibre monitoring works must be undertaken by a COH / LAA, in accordance with SafeWork NSW requirements.

Before starting the affected works, the Contractor is required to obtain a site-specific permit approving the asbestos works from SafeWork NSW. A permit will not be granted without a current licence and the permit application must be made at least seven days before the work is due to commence.

12.7 Guidelines of the Duty to Report Contamination under the Contaminated Land Management Act 1997 (EPA 2015)

The EPA 2015 guidelines now present notification triggers specific to asbestos in, or on, soil. The site is considered to have friable asbestos present in or on soil on the land and to have a level of asbestos (% w/w) above the HSL for FA/AF in NEPC 2013 in a number of samples across the site. However, it is understood that there have been no detections of airborne asbestos fibres above 0.01 fibres/mL during airborne asbestos fibre monitoring conducted by or known to, the remediation consultant. Based on the current data, it is considered that there is not a requirement for notification of the site to the EPA for asbestos contamination.

13. Communications with Stakeholders

Communication will be maintained in accordance with Health Infrastructure and the Children's Hospital Redevelopment Stage 2 related communication plans throughout the work with key stakeholders of the project.

Communication will also be maintained throughout the work via:

- Daily pre-starts;
- Weekly toolbox talks;
- Information and training awareness sessions as required;
- Daily airborne asbestos fibre monitoring reports; and
- Community consultation.

14. Conclusions and Recommendations

With reference to the limitations in **Section 15**, the following conclusions and recommendations are provided.

14.1 Conclusions

Overall, it is considered that the proposed actions outlined in this RAP conform to the requirements of the *Contaminated Sites Guidelines for the NSW Site Auditor Scheme (3rd Edition)* (EPA 2017) because they are: technically feasible; environmentally justifiable; and consistent with relevant laws, policies and guidelines endorsed by NSW EPA.

Subject to the successful implementation of the measures described in this RAP and the recommendations below, it is concluded that the risks posed by contamination can be managed in such a way as to be adequately protective of human health and the environment, such that the site can be made suitable for the proposed hospital use.

14.2 Recommendations

It is recommended that the processes outlined in this RAP be implemented and that the following documentation be developed and implemented to ensure the risks and impacts during remediation works are controlled in an appropriate manner:

- A Construction Environmental Management Plan (CEMP), to document the monitoring and management measures required to control the environmental impacts of the works and ensure the validation protocols are being addressed; and
- A Work Health and Safety Management Plan (WHSP) to document the procedures to be followed to manage the risks posed to the health of the remediation workforce.

The CEMP and WHSP will require to be cognisant of the potential occurrence and storage / handling of asbestos contaminated soils on the site.

Upon completion of the remediation works, if containment is considered the most suitable option, the Validation Report and LTAMP for materials retained beneath the marker and capping layer are required to be submitted by the Remediation Consultant to the Site Auditor for certification that the site is suitable for the proposed uses, subject to implementation of the LTAMP. If offsite disposal is considered the most suitable option, the Validation Report will document the remediation and validation of the site, with no requirement for an LTAMP.

15. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquiries.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.


Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

Figures



Legend:

 Approximate Site Boundary



Job No: 56200

Client: Health Infrastructure

Version: R08 RAP SB Date 6/11/2020

Drawn By: AS/RH Checked By: CB

Scale 1:8,500



0 110 220
metres

Coord. Sys. GDA 1994 MGA Zone 56

**Westmead Hospital RAP PSB,
Westmead, NSW**

SITE LOCATION

FIGURE 1



Legend:

- Approximate Site Boundary
- NSW LPI Road Labels



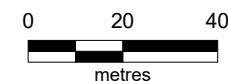
Job No: 56200

Client: Health Infrastructure

Version: R08 RAP SB Date 6/11/2020

Drawn By: AS/RH Checked By: CB

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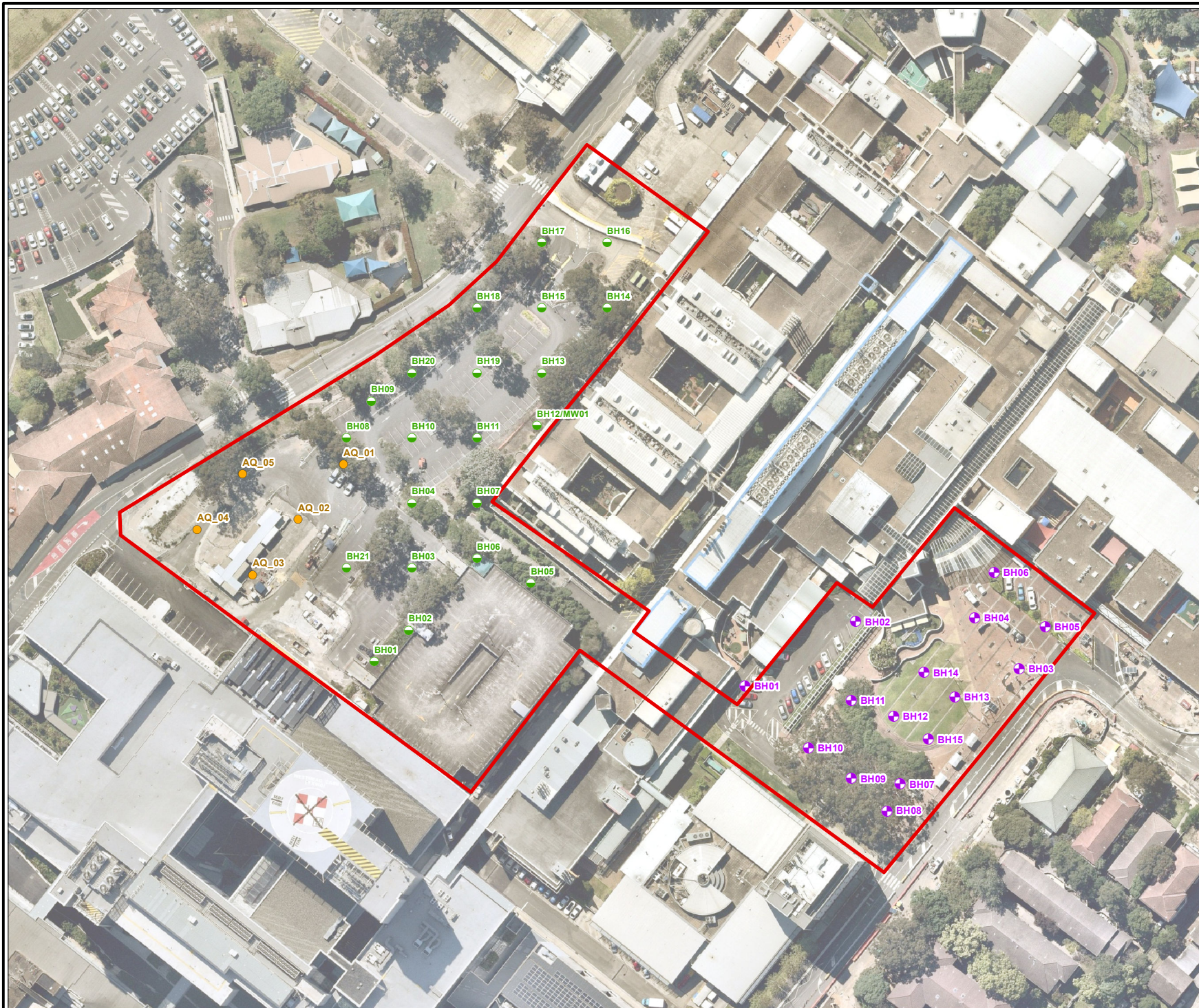


Coord. Sys. GDA 1994 MGA Zone 56

**Westmead Hospital RAP PSB,
Westmead, NSW**

SITE LAYOUT

FIGURE 2



Legend:

- Approximate Site Boundary
- Historical Area 6 Sample Locations (JBS&G 2017a)
- Historical Sample Location (JBS&G 2019)
- Historical Sample Location (JBS&G 2020)



Job No: 56200

Client: Health Infrastructure

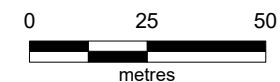
Version: R08 RAP

Date 6/11/2020

Drawn By: AV

Checked By: JS

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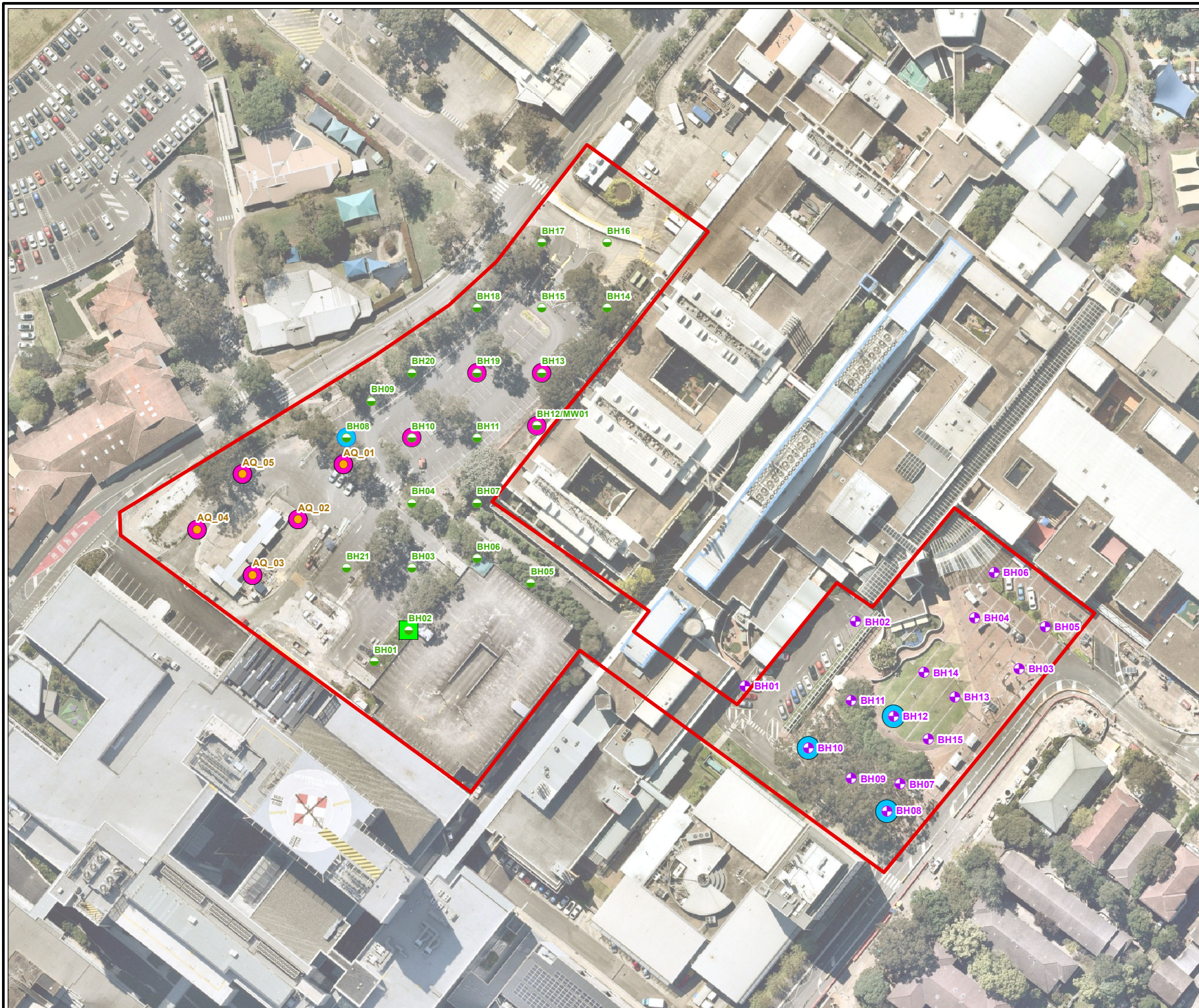


Coord. Sys. GDA 1994 MGA Zone 56

**Westmead Hospital RAP PSB,
Westmead, NSW**

HISTORICAL SAMPLE LOCATIONS

FIGURE 3



Legend:

- Approximate Site Boundary
- Historical Area 6 Sample Locations (JBS&G 2017a)
- Historical Sample Location (JBS&G 2019)
- Historical Sample Location (JBS&G 2020)

Asbestos Detected

- ACM & FA/AF
- FA/AF
- ACM



Job No: 56200

Client: Health Infrastructure

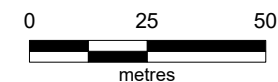
Version: R08 RAP

Date 6/11/2020

Drawn By: AV

Checked By: JS

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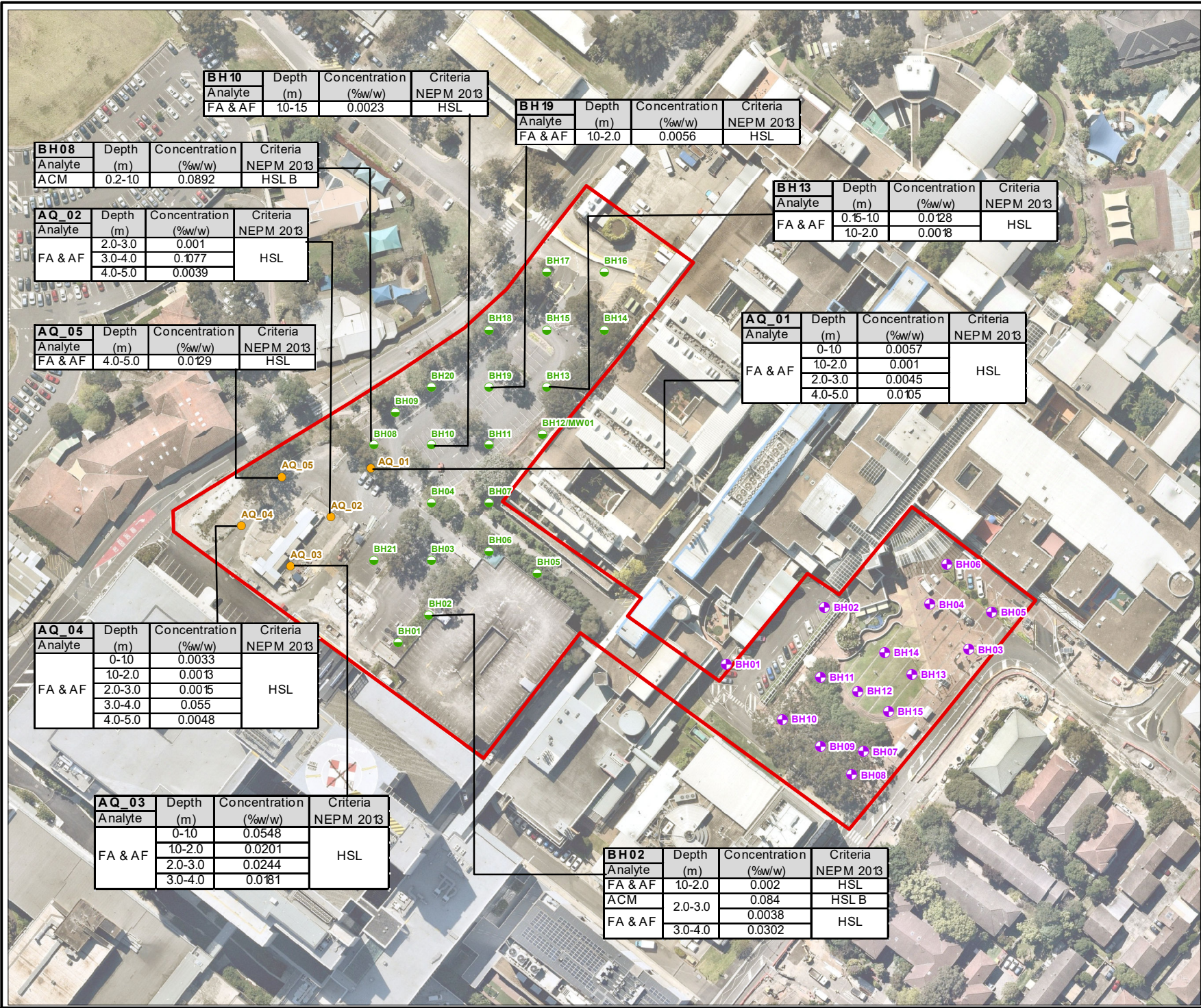


Coord. Sys. GDA 1994 MGA Zone 56

**Westmead Hospital RAP PSB,
Westmead, NSW**

ASBESTOS DETECTIONS

FIGURE 4A



- Legend:**
- Approximate Site Boundary
 - Historical Area 6 Sample Locations (JBS&G 2017a)
 - Historical Sample Location (JBS&G 2019)
 - Historical Sample Location (JBS&G 2020)



Job No: 56200

Client: Health Infrastructure

Version: R08 RAP PSB Date 6/11/2020

Drawn By: AV Checked By: JS

Scale 1:1,800

Coord. Sys. GDA 1994 MGA Zone 56

**Westmead Hospital RAP PSB,
Westmead, NSW**

ASBESTOS EXCEEDANCES

FIGURE 4B



Legend:

- Approximate Site Boundary
- Proposed Data Gap Soil Sampling Locations - 20m Grid
- 20 x 20m Grid



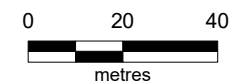
Job No: 56200

Client: Health Infrastructure

Version: R08 RAP SB Date 6/11/2020

Drawn By: AS/RH Checked By: CB

Scale 1:1,600



Coord. Sys. GDA 1994 MGA Zone 56

**Westmead Hospital RAP PSB,
Westmead, NSW**

DATA GAP ASSESSMENT

FIGURE 5



Legend:

- Approximate Site Boundary
- Extent of required marker and capping layer



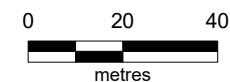
Job No: 56200

Client: Health Infrastructure

Version: R08 RAP SB Date 6/11/2020

Drawn By: AS/RH Checked By: CB

Scale 1:1,600



Coord. Sys. GDA 1994 MGA Zone 56

**Westmead Hospital RAP PSB,
Westmead, NSW**

EXTENT OF REMEDIATION

FIGURE 6

Appendix A Summary Tables



	Asbestos																	
	Approx. Sample Mass	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil	Mass ACM	Mass Asbestos in ACM	Mass FA	Mass Asbestos in FA	Mass AF	Mass Asbestos in AF	Mass Asbestos in FA & AF	Asbestos ID in Soil	Total Asbestos g/kg*	ACM - Comment	AF - Comment	FA - Comment	Organic Fibres - Comment	Respirable Fibres - Comment	Synthetic Fibres - Comment
	g	%w/w	%w/w	g	g	g	g	g	g	g	Comment	g/kg	Comment	Comment	Comment	Comment	Comment	Comment
EQL																		
NEPM 2013 EIL, EILs Aged Sediment																		
NEPM 2013 ESL Urban Residential and Public Open Space, Fine Soil																		
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Residential - HSL B		0.04																
NEPM 2013 HSL Asbestos in Soil - FA & AF - HSL			0.001															
NEPM 2013 Mgmt Limits - Residential, Parkland and Public Open Space, Fine																		
NEPM 2013 Soil HIL B																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 0 to <1m																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 1 to <2m																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 2 to <4m																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 4m+																		


Field ID	Fill/Natural	Date / Parent	SampleCode	Report #															
BH01 0.1-1.0	Fill	27/04/2019	S19-Ap38901	652817	578	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}
BH01 0.2-0.3	Fill	27/04/2019	M19-Ap39517	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH01 1.0-2.0	Fill	27/04/2019	S19-Ap38902	652817	699	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}
BH01 1.9-2.0	Fill	27/04/2019	M19-Ap39518	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH01 2.0-3.0	Fill	27/04/2019	S19-Ap38903	652817	687	0	0.0004	0	0	0.0046	0.0028	0	0	0.0028	-	-	1 ^{#40}	1 ^{#40}	1 ^{#4}
BH01 5.3-5.6	Natural	27/04/2019	M19-Ap39519	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02 0.1-0.3	Fill	27/04/2019	M19-Ap39520	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02 0.1-0.3	Fill	27/04/2019	S19-Ap38904	652817	655	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}
BH02 0.4-1.0	Fill	27/04/2019	S19-Ap38905	652817	749	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}
BH02 1.0-2.0	Fill	27/04/2019	S19-Ap38906	652817	622	0	0.002	0	0	0.0149	0.0104	0.0019	0.0019	0.0123	-	-	1 ^{#40}	1 ^{#23}	1 ^{#28}
BH02 2.0-3.0	Fill	27/04/2019	S19-Ap38986	652817	660	0.084	0.0038	5.549	0.5549	0.0394	0.0236	0.0016	0.0016	0.0252	-	-	1 ^{#33}	1 ^{#30}	1 ^{#29}
BH02 2.9-3.0	Fill	27/04/2019	M19-Ap39521	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02 3.0-4.0	Fill	27/04/2019	S19-Ap38911	652817	661	0	0.0302	0	0	0.5715	0.2	0	0	0.2	-	-	1 ^{#40}	1 ^{#40}	1 ^{#34}
BH03 1.0-2.0	Fill	27/04/2019	S19-Ap38909	652817	751	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}
BH03 3.0-4.0	Fill	27/04/2019	S19-Ap38910	652817	576	0	0.0004	0	0	0	0	0.0022	0.0022	0.0022	-	-	1 ^{#40}	1 ^{#10}	1 ^{#40}
BH03 3.9-4.0	Fill	27/04/2019	M19-Ap39522	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03 4.5-5.5	Fill	27/04/2019	S19-Ap38912	652817	511	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}
BH03 4.6-4.7	Fill	27/04/2019	M19-Ap39523	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04 0.1-1.0	Fill	27/04/2019	S19-Ap38913	652817	805	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}
AQ-QA1	Fill	BH04 0.1-1.0	S19-Ap38969	652817	815	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}
AQ-QC1	Fill	BH04 0.1-1.0	216396-6	216396	-	-	-	-	-	-	-	-	-	0	<0.1	-	-	-	-
BH04 0.4-0.5	Fill	27/04/2019	M19-Ap39524	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA1	Fill	BH04 0.4-0.5	M19-Ap39554	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC1	Fill	BH04 0.4-0.5	216396-1	216396	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04 3.0-4.0	Fill	27/04/2019	S19-Ap38914	652817	484	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}
BH04 4.2-4.8	Fill	27/04/2019	S19-Ap38915	652817	527	0	0.0003	0	0	0.0026	0.0016	0	0	0.0016	-	-	1 ^{#40}	1 ^{#40}	1 ^{#4}
BH04 4.6-4.8	Natural	27/04/2019	M19-Ap39525	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05 0.05-1.0	Fill	27/04/2019	S19-Ap38916	652817	858	0	0.0006	0	0	0	0	0.0048	0.0048	0.0048	-	-	1 ^{#40}	1 ^{#10}	1 ^{#40}
BH05 1.0-2.0	Fill	27/04/2019	S19-Ap38917	652817	641	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}
BH05 1.9-2.0	Fill	27/04/2019	M19-Ap39526	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05 2.0-2.5	Fill	27/04/2019	S19-Ap38918	652817	701	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}
BH06 0.05-0.8	Fill	27/04/2019	S19-Ap38919	652817	559	0	0.0001	0	0	0	0	0.0004	0.0004	0.0004	-	-	1 ^{#40}	1 ^{#10}	1 ^{#40}
AQ-QA2	Fill	BH06 0.05-0.8	S19-Ap38970	652817	530	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}
AQ-QC2	Fill	BH06 0.05-0.8	216396-7	216396	-	-	-	-	-	-	-	-	-	0	<0.1	-	-	-	-
BH06 0.1-0.3	Fill	27/04/2019	M19-Ap39527	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA2	Fill	BH06 0.1-0.3	M19-Ap39555	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC2	Fill	BH06 0.1-0.3	216396-2	216396	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06 0.8-1.5	Fill	27/04/2019	S19-Ap38920	652817	490	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}
BH06 1.8-2.0	Fill	27/04/2019	S19-Ap38921	652817	546	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}
BH07 0.9-1.0	Fill	27/04/2019	M19-Ap39528	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA3	Fill	BH07 0.9-1.0	M19-Ap39556	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC3	Fill	BH07 0.9-1.0	216396-3	216396	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



	Asbestos																	
	Approx. Sample Mass	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil	Mass ACM	Mass Asbestos in ACM	Mass FA	Mass Asbestos in FA	Mass AF	Mass Asbestos in AF	Mass Asbestos in FA & AF	Asbestos ID in Soil	Total Asbestos g/kg*	ACM - Comment	AF - Comment	FA - Comment	Organic Fibres - Comment	Respirable Fibres - Comment	Synthetic Fibres - Comment
	g	%w/w	%w/w	g	g	g	g	g	g	g	Comment	g/kg	Comment	Comment	Comment	Comment	Comment	Comment
EQL																		
NEPM 2013 EIL, EILs Aged Sediment																		
NEPM 2013 ESL Urban Residential and Public Open Space, Fine Soil																		
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Residential - HSL B		0.04																
NEPM 2013 HSL Asbestos in Soil - FA & AF - HSL			0.001															
NEPM 2013 Mgmt Limits - Residential, Parkland and Public Open Space, Fine																		
NEPM 2013 Soil HIL B																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 0 to <1m																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 1 to <2m																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 2 to <4m																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 4m+																		

Field ID	Fill/Natural	Date / Parent	SampleCode	Report #																			
BH07 1.0-2.0	Fill	27/04/2019	S19-Ap38922	652817	842	0	0.0005	0	0	0	0.0018	0.0014	0.031	0.0031	0.0045	-	-	1#40	1#13	1#8	1#38	1#37	1#40
AQ-QA3	Fill	BH07 1.0-2.0	S19-Ap38971	652817	660	0	0	0	0	0	0	0	0	0	0	-	-	1#40	1#40	1#40	1#38	1#37	1#40
AQ-QC3	Fill	BH07 1.0-2.0	216396-8	216396	-	-	-	-	-	-	-	-	-	-	0	<0.1	-	-	-	-	-	-	
BH07 2.0-3.0	Fill	27/04/2019	S19-Ap38928	652817	505	0	0	0	0	0	0	0	0	0	0	-	-	1#40	1#40	1#40	1#38	1#37	1#40
BH07 3.8-4.5	Fill	27/04/2019	S19-Ap38924	652817	611	0	0.0003	0	0	0	0.0018	0.0018	0.0018	0.0018	0.0018	-	-	1#40	1#11	1#40	1#38	1#37	1#40
BH07 4.6-4.8	Natural	27/04/2019	M19-Ap39529	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH08 0.2-1.0	Fill	27/04/2019	S19-Ap38925	652817	717	0.0892	0.0004	5.33	0.6396	0	0	0.0029	0.0029	0.0029	0.0029	-	-	1#18	1#2	1#40	1#38	1#37	1#40
BH08 1.0-2.0	Fill	27/04/2019	S19-Ap38926	652817	796	0	0	0	0	0	0	0	0	0	0	-	-	1#40	1#40	1#40	1#38	1#37	1#40
BH08 1.9-2.0	Fill	27/04/2019	M19-Ap39530	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH08 2.0-3.0	Fill	27/04/2019	S19-Ap38927	652817	824	0	0.0006	0	0	0.0066	0.0053	0	0	0	0.0053	-	-	1#40	1#40	1#8	1#38	1#37	1#40
BH09 0.05-1.0	Fill	27/04/2019	S19-Ap38929	652817	785	0	0	0	0	0	0	0	0	0	0	-	-	1#40	1#40	1#40	1#38	1#37	1#40
BH09 1.0-2.0	Fill	27/04/2019	S19-Ap38930	652817	672	0	0	0	0	0	0	0	0	0	0	-	-	1#40	1#40	1#40	1#38	1#37	1#40
BH09 3.4-3.5	Fill	27/04/2019	M19-Ap39968	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH10 0.15-1.0	Fill	27/04/2019	S19-Ap38933	652817	852	0	0	0	0	0	0	0	0	0	0	-	-	1#40	1#40	1#40	1#38	1#37	1#40
BH10 0.4-0.5	Fill	27/04/2019	M19-Ap39532	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH10 1.0-1.5	Fill	27/04/2019	S19-Ap38934	652817	634	0.0006	0.0023	0.0253	0.0038	0.0178	0.0107	0.0269	0.004	0.0147	-	-	1#14	1#12	1#16	1#38	1#37	1#40	
BH11 0.15-0.3	Fill	27/04/2019	M19-Ap39533	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH11 0.15-1.0	Fill	27/04/2019	S19-Ap38935	652817	970	0	0	0	0	0	0	0	0	0	0	-	-	1#40	1#40	1#40	1#38	1#37	1#40
BH11 1.0-2.0	Fill	27/04/2019	S19-Ap38995	652817	929	0	0.0005	0	0	0.0048	0.0038	0.0008	0.0008	0.0046	-	-	1#40	1#3	1#4	1#38	1#37	1#40	
BH11 3.6-3.8	Fill	27/04/2019	M19-Ap39535	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH11 3.6-4.2	Fill	27/04/2019	S19-Ap38937	652817	557	0	0	0	0	0	0	0	0	0	0	-	-	1#40	1#40	1#40	1#38	1#37	1#40
BH11 4.2-4.4	Natural	27/04/2019	M19-Ap39536	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH12 0.1-1.0	Fill	27/04/2019	S19-Ap38938	652817	904	0	0	0	0	0	0	0	0	0	0	-	-	1#40	1#40	1#40	1#38	1#37	1#40
BH12 1.0-2.0	Fill	27/04/2019	S19-Ap38939	652817	770	0	0	0	0	0	0	0	0	0	0	-	-	1#40	1#40	1#40	1#38	1#37	1#40
BH12 1.9-2.0	Fill	27/04/2019	M19-Ap39537	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH12 2.0-3.0	Fill	27/04/2019	S19-Ap38940	652817	639	0	0.0003	0	0	0	0	0.0018	0.0018	0.0018	0.0018	-	-	1#40	1#9	1#40	1#38	1#37	1#40
BH13 0.15-1.0	Fill	28/04/2019	S19-Ap38941	652817	868	0	0.0089	0	0	0.1357	0.0678	0.0091	0.0091	0.0769	-	-	1#40	1#17	1#16	1#38	1#37	1#40	
AQ-QA4	Fill	BH13 0.15-1.0	S19-Ap38972	652817	782	0	0.0128	0	0	0.1391	0.0974	0.0029	0.0029	0.1003	-	-	1#40	1#32	1#31	1#38	1#37	1#40	
AQ-QC4	Fill	BH13 0.15-1.0	216396-9	216396	-	-	-	-	-	-	-	-	-	-	0	<0.1	-	-	-	-	-	-	
BH13 0.4-0.5	Fill	28/04/2019	M19-Ap39538	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH13 1.0-2.0	Fill	28/04/2019	S19-Ap38942	652817	767	0	0.0018	0	0	0.0152	0.0091	0.0044	0.0044	0.0135	-	-	1#40	1#17	1#16	1#38	1#37	1#40	
BH13 2.0-2.4	Fill	28/04/2019	S19-Ap38943	652817	683	0	0.0005	0	0	0.0028	0.0017	0.0016	0.0016	0.0033	-	-	1#40	1#2	1#1	1#38	1#37	1#40	
BH14 0.1-1.0	Fill	28/04/2019	S19-Ap38944	652817	792	0	0	0	0	0	0	0	0	0	0	-	-	1#40	1#40	1#40	1#38	1#37	1#40
BH14 0.9-1.0	Fill	28/04/2019	M19-Ap39539	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH14 1.0-2.0	Fill	28/04/2019	S19-Ap38945	652817	794	0	0	0	0	0	0	0	0	0	0	-	-	1#40	1#40	1#40	1#38	1#37	1#40
BH14 2.0-2.9	Fill	28/04/2019	S19-Ap38946	652817	861	0	0	0	0	0	0	0	0	0	0	-	-	1#40	1#40	1#40	1#38	1#37	1#40
BH15 0.1-0.3	Fill	28/04/2019	M19-Ap39540	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH15 0.1-0.3	Fill	28/04/2019	S19-Ap38947	652817	431	0	0	0	0	0	0	0	0	0	0	-	-	1#40	1#40	1#40	1#38	1#37	1#40
BH15 0.3-1.0	Fill	28/04/2019	S19-Ap38948	652817	783	0	0.0001	0	0	0	0	0.0011	0.0011	0.0011	0.0011	-	-	1#40	1#10	1#40	1#38	1#37	1#40
BH15 1.0-2.0	Fill	28/04/2019	S19-Ap38949	652817	737	0	0.0003	0	0	0	0	0.0023	0.0023	0.0023	0.0023	-	-	1#40	1#10	1#40	1#38	1#37	1#40
BH15 2.6-2.7	Fill	28/04/2019	M19-Ap39541	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH16 0.2-0.5	Fill	28/04/2019	S19-Ap38950	652817	414	0	0	0	0	0	0	0	0	0	0	-	-	1#40	1#40	1#40	1#38	1#37	1#40
BH16 0.5-1.5	Fill	28/04/2019	S19-Ap38951	652817	760	0	0	0	0	0	0	0	0	0	0	-	-	1#40	1#40	1#40	1#38	1#37	1#40
BH16 1.4-1.5	Fill	28/04/2019	M19-Ap39542	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH16 1.5-2.4	Fill	28/04/2019	S19-Ap38952	652817	721	0	0	0	0	0	0	0	0	0	0	-	-	1#40	1#40	1#40	1#38	1#37	1#40
BH17 0.1-0.4	Fill	28/04/2019	S19-Ap38953	652817	663	0	0	0	0	0	0	0	0	0	0	-	-	1#40	1#40	1#40	1#38	1#37	1#40



	Asbestos																	
	Approx. Sample Mass	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil	Mass ACM	Mass Asbestos in ACM	Mass FA	Mass Asbestos in FA	Mass AF	Mass Asbestos in AF	Mass Asbestos in FA & AF	Asbestos ID in Soil	Total Asbestos g/kg*	ACM - Comment	AF - Comment	FA - Comment	Organic Fibres - Comment	Respirable Fibres - Comment	Synthetic Fibres - Comment
	g	%w/w	%w/w	g	g	g	g	g	g	g	Comment	g/kg	Comment	Comment	Comment	Comment	Comment	Comment
EQL																		
NEPM 2013 EIL, EILs Aged Sediment																		
NEPM 2013 ESL Urban Residential and Public Open Space, Fine Soil																		
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Residential - HSL B		0.04																
NEPM 2013 HSL Asbestos in Soil - FA & AF - HSL			0.001															
NEPM 2013 Mgmt Limits - Residential, Parkland and Public Open Space, Fine																		
NEPM 2013 Soil HIL B																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 0 to <1m																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 1 to <2m																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 2 to <4m																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 4m+																		

Field ID	Fill/Natural	Date / Parent	SampleCode	Report #																
BH17 0.4-0.5	Fill	28/04/2019	M19-Ap39543	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH17 0.4-1.4	Fill	28/04/2019	S19-Ap38954	652817	770	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}
AQ-QA5	Fill	BH17 0.4-1.4	S19-Ap38973	652817	667	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}
AQ-QC5	Fill	BH17 0.4-1.4	216396-10	216396	-	-	-	-	-	-	-	-	-	-	0	<0.1	-	-	-	-
BH17 1.4-1.8	Fill	28/04/2019	S19-Ap38955	652817	680	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}
BH17 1.8-2.0	Natural	28/04/2019	M19-Ap39544	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA5	Natural	BH17 1.8-2.0	M19-Ap39557	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC5	Natural	BH17 1.8-2.0	216396-5	216396	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH18 0.15-1.0	Fill	28/04/2019	S19-Ap38956	652817	893	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}
BH18 0.9-1.0	Fill	28/04/2019	M19-Ap39545	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH18 1.0-2.0	Fill	28/04/2019	S19-Ap38957	652817	820	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}
BH18 2.0-2.9	Fill	28/04/2019	S19-Ap38958	652817	780	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}
BH19 0.15-1.0	Fill	28/04/2019	S19-Ap38959	652817	837	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}
BH19 1.0-2.0	Fill	28/04/2019	S19-Ap38960	652817	771	0.0064	0.0056	0.7048	0.0493	0.0534	0.0401	0.0028	0.0028	0.0429	-	-	1 ^{#7}	1 ^{#23}	1 ^{#16}	1 ^{#38}
BH19 2.5-2.7	Fill	28/04/2019	M19-Ap39546	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH19 3.5-3.7	Fill	28/04/2019	S19-Ap39000	652817	400	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}
BH19 3.7-3.9	Fill	28/04/2019	M19-Ap39547	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH19 3.7-4.3	Fill	28/04/2019	S19-Ap38962	652817	462	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}
BH19 4.1-4.3	Fill	28/04/2019	M19-Ap39548	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH19 4.3-4.5	Natural	28/04/2019	M19-Ap39549	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH20 0.15-1.0	Fill	28/04/2019	S19-Ap38963	652817	843	0	0.0003	0	0	0	0	0.0026	0.0026	0.0026	-	-	1 ^{#40}	1 ^{#3}	1 ^{#40}	1 ^{#38}
BH20 2.0-3.0	Fill	28/04/2019	S19-Ap38964	652817	888	0	0.0001	0	0	0	0	0.0005	0.0005	0.0005	-	-	1 ^{#40}	1 ^{#10}	1 ^{#40}	1 ^{#38}
BH20 2.9-3.0	Fill	28/04/2019	M19-Ap39550	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH20 3.2-4.0	Fill	28/04/2019	S19-Ap38965	652817	622	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}
BH20 4.4-4.5	Fill	28/04/2019	M19-Ap39551	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH21 1.0-2.0	Fill	28/04/2019	S19-Ap38966	652817	656	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}
BH21 1.9-2.0	Fill	28/04/2019	M19-Ap39552	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH21 3.0-4.0	Fill	28/04/2019	S19-Ap38967	652817	340	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}
BH21 4.4-4.5	Fill	28/04/2019	M19-Ap39553	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH21 5.0-5.4	Fill	28/04/2019	S19-Ap38968	652817	528	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}
BH22 0.1-0.5	Fill	4/05/2019	S19-My08349	654086	573	0	0.0031	0	0	0	0	0.02	0.018	0.018	-	-	1 ^{#40}	1 ^{#21}	1 ^{#40}	1 ^{#38}
BH22 0.5-0.6	Fill	4/05/2019	M19-My09485	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH22 0.5-1.5	Fill	4/05/2019	S19-My08350	654086	579	0	0.0031	0	0	0	0	0.02	0.018	0.018	-	-	1 ^{#40}	1 ^{#30}	1 ^{#40}	1 ^{#38}
BH22 1.5-2.5	Fill	4/05/2019	S19-My08351	654086	803	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}
BH22 3.6-3.7	Natural	4/05/2019	M19-My09486	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH23 0.1-0.3	Fill	4/05/2019	M19-My09487	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH23 0.1-1.0	Fill	4/05/2019	S19-My08352	654086	576	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}
BH23 0.5-0.6	Fill	4/05/2019	M19-My09488	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH23 1.0-1.1	Fill	4/05/2019	M19-My09489	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH24 0.1-0.3	Fill	4/05/2019	M19-My09490	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH24 0.1-1.0	Fill	4/05/2019	S19-My08353	654086	673	0	0.0149	0	0	0	0	0.502	0.1004	0.1004	-	-	1 ^{#40}	1 ^{#25}	1 ^{#40}	1 ^{#38}
BH24 1.0-1.1	Fill	4/05/2019	M19-My09491	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH24 1.0-1.5	Fill	4/05/2019	S19-My08354	654086	584	0	0.0096	0	0	0	0	0.28	0.056	0.056	-	-	1 ^{#40}	1 ^{#19}	1 ^{#40}	1 ^{#38}
BH25 0.1-0.2	Fill	4/05/2019	M19-My09492	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH25 0.1-1.0	Fill	4/05/2019	S19-My08355	654086	667	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}
BH25 2.0-2.1	Natural	4/05/2019	M19-My09493	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



	Asbestos																	
	Approx. Sample Mass	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil	Mass ACM	Mass Asbestos in ACM	Mass FA	Mass Asbestos in FA	Mass AF	Mass Asbestos in AF	Mass Asbestos in FA & AF	Asbestos ID in Soil	Total Asbestos g/kg*	ACM - Comment	AF - Comment	FA - Comment	Organic Fibres - Comment	Respirable Fibres - Comment	Synthetic Fibres - Comment
	g	%w/w	%w/w	g	g	g	g	g	g	g	Comment	g/kg	Comment	Comment	Comment	Comment	Comment	Comment
EQL																		
NEPM 2013 EIL, EILs Aged Sediment																		
NEPM 2013 ESL Urban Residential and Public Open Space, Fine Soil																		
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Residential - HSL B		0.04																
NEPM 2013 HSL Asbestos in Soil - FA & AF - HSL			0.001															
NEPM 2013 Mgmt Limits - Residential, Parkland and Public Open Space, Fine																		
NEPM 2013 Soil HIL B																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 0 to <1m																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 1 to <2m																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 2 to <4m																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 4m+																		

Field ID	Fill/Natural	Date / Parent	SampleCode	Report #	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
QA06	Natural	BH25 2.0-2.1	216850-3	216850	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH26 0.1-1.0	Fill	4/05/2019	S19-My08356	654086	509	0	0.0142	0	0	0	0	0.08	0.072	0.072	-	-	1 ^{#40}	1 ^{#21}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
AQ-QA6	Fill	BH26 0.1-1.0	216850-1	216850	-	-	-	-	-	-	-	-	-	-	0	<0.1	-	-	-	-	-	-
AQ-QC6	Fill	BH26 0.1-1.0	S19-My08377	654086	493	0	0.0101	0	0	0	0	0.199	0.0498	0.0498	-	-	1 ^{#40}	1 ^{#5}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
BH26 0.5-0.6	Fill	4/05/2019	M19-My09494	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH26 1.0-1.5	Fill	4/05/2019	S19-My08357	654086	383	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
BH27 0.1-0.2	Fill	4/05/2019	M19-My09531	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH27 0.1-1.3	Fill	4/05/2019	S19-My08358	654086	694	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
BH27 1.0-1.1	Fill	4/05/2019	M19-My09495	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH28 0.1-0.2	Fill	4/05/2019	M19-My09496	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH28 0.1-1.0	Fill	4/05/2019	S19-My08359	654086	677	0	0.0017	0	0	0	0	0.013	0.0117	0.0117	-	-	1 ^{#40}	1 ^{#21}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
BH28 1.0-1.6	Fill	4/05/2019	S19-My08360	654086	636	0	0.0269	0	0	0	0	0.57	0.171	0.171	-	-	1 ^{#40}	1 ^{#27}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
BH29 0.0-1.0	Fill	4/05/2019	S19-My08361	654086	606	0	0.0076	0	0	0	0	0.0515	0.0464	0.0464	-	-	1 ^{#40}	1 ^{#30}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
BH29 0.05-0.1	Fill	4/05/2019	M19-My09497	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH30 0.0-0.5	Fill	4/05/2019	S19-My08362	654086	671	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
BH30 0.4-0.5	Fill	4/05/2019	M19-My09498	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH31 0.0-1.0	Fill	4/05/2019	S19-My08363	654086	811	0	0.0012	0	0	0	0	0.0111	0.01	0.01	-	-	1 ^{#40}	1 ^{#21}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
BH31 0.05-0.1	Fill	4/05/2019	M19-My09544	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH31 0.9-1.0	Fill	4/05/2019	M19-My09499	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH32 0.0-1.0	Fill	4/05/2019	S19-My08364	654086	721	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
BH32 0.05-0.1	Fill	4/05/2019	M19-My09500	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH32 1.0-2.0	Fill	4/05/2019	S19-My08365	654086	578	0	0.0045	0	0	0	0	0.087	0.0261	0.0261	-	-	1 ^{#40}	1 ^{#25}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
BH32 1.9-2.0	Fill	4/05/2019	M19-My09501	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH32 2.0-2.2	Fill	4/05/2019	S19-My08366	654086	678	0	0.0003	0	0	0	0	0.0035	0.0018	0.0018	-	-	1 ^{#40}	1 ^{#6}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
BH33 0.1-0.2	Fill	4/05/2019	M19-My09502	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH33 0.1-1.2	Fill	4/05/2019	S19-My08367	654086	606	0	0.0019	0	0	0	0	0.013	0.0117	0.0117	-	-	1 ^{#40}	1 ^{#21}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
BH34 0.1-1.0	Fill	4/05/2019	S19-My08368	654086	550	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
BH34 0.5-0.6	Fill	4/05/2019	M19-My09503	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH35 0.0-1.0	Fill	4/05/2019	S19-My08369	654086	727	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
BH35 0.9-1.0	Fill	4/05/2019	M19-My09504	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH36 0.5-0.6	Fill	4/05/2019	M19-My09505	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH36 0.5-1.0	Fill	4/05/2019	S19-My08370	654086	576	0	0.1078	0	0	1.321	0.3963	0.25	0.225	0.6213	-	-	1 ^{#40}	1 ^{#21}	1 ^{#20}	1 ^{#38}	1 ^{#37}	1 ^{#40}
BH36 1.0-1.8	Fill	4/05/2019	S19-My08371	654086	715	0	0.1522	0	0	0	0	1.21	1.089	1.089	-	-	1 ^{#40}	1 ^{#30}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
BH36 1.2-1.3	Fill	4/05/2019	M19-My09506	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH37 0.0-0.9	Fill	4/05/2019	S19-My08372	654086	720	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
BH37 0.05-0.1	Fill	4/05/2019	M19-My09507	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH38 0.0-1.0	Fill	4/05/2019	S19-My08373	654086	546	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
BH38 0.05-0.1	Fill	4/05/2019	M19-My09564	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH38 0.9-1.0	Fill	4/05/2019	M19-My09508	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH39 0.0-1.0	Fill	4/05/2019	S19-My08374	654086	603	0.0503	0.018	2.53	0.3036	0	0	0.121	0.1089	0.1089	-	-	1 ^{#24}	1 ^{#17}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
BH39 0.05-0.1	Fill	4/05/2019	M19-My09509	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH40 0.0-1.0	Fill	4/05/2019	S19-My08375	654086	548	0	0.0058	0	0	0.0721	0.0216	0.0111	0.01	0.0316	-	-	1 ^{#40}	1 ^{#21}	1 ^{#22}	1 ^{#38}	1 ^{#37}	1 ^{#40}
BH40 0.4-0.5	Fill	4/05/2019	M19-My09510	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH41 0.0-1.0	Fill	4/05/2019	S19-My08376	654086	517	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
BH41 0.9-1.0	Fill	4/05/2019	M19-My09511	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH42 0.0-1.0	Fill	4/05/2019	S19-My08379	654086	564	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}



	Asbestos																	
	Approx. Sample Mass	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil	Mass ACM	Mass Asbestos in ACM	Mass FA	Mass Asbestos in FA	Mass AF	Mass Asbestos in AF	Mass Asbestos in FA & AF	Asbestos ID in Soil	Total Asbestos g/kg*	ACM - Comment	AF - Comment	FA - Comment	Organic Fibres - Comment	Respirable Fibres - Comment	Synthetic Fibres - Comment
	g	%w/w	%w/w	g	g	g	g	g	g	g	Comment	g/kg	Comment	Comment	Comment	Comment	Comment	Comment
EQL																		
NEPM 2013 EIL, EILs Aged Sediment																		
NEPM 2013 ESL Urban Residential and Public Open Space, Fine Soil																		
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Residential - HSL B		0.04																
NEPM 2013 HSL Asbestos in Soil - FA & AF - HSL			0.001															
NEPM 2013 Mgmt Limits - Residential, Parkland and Public Open Space, Fine																		
NEPM 2013 Soil HIL B																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 0 to <1m																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 1 to <2m																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 2 to <4m																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 4m+																		

Field ID	Fill/Natural	Date / Parent	SampleCode	Report #																		
BH42 0.4-0.5	Fill	4/05/2019	M19-My09512	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A6_01_1.5-1.6	Fill	29/08/2017	S17-Se02485	561477	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A6_02_3.5-3.6	Fill	29/08/2017	S17-Se02492	561477	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A6_03_0.5-0.6	Fill	29/08/2017	S17-Se02498	561477	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A6_03_1.5-1.6	Fill	29/08/2017	S17-Se02499	561477	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A6_04_2.5-2.6	Fill	29/08/2017	S17-Se02504	561477	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A6_05_3.5-3.6	Fill	29/08/2017	S17-Se02512	561477	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA20170829_B	Fill	29/08/2017	S17-Se02520	561477	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC20170829-B	Fill	29/08/2017	174925-2	174925	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A6_01_0-1AQ	Fill	29/08/2017	S17-Se02486	561477	726	0	0.0057	0	0	0.0174	0.0052	0.1454	0.0364	0.0416	-	-	1 ^{#40}	1 ^{#19}	1 ^{#29}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_01_1-2AQ	Fill	29/08/2017	S17-Se02487	561477	602	0	0.001	0	0	0.0012	0.0005	0.0154	0.0054	0.0059	-	-	1 ^{#40}	1 ^{#12}	1 ^{#29}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_01_2-3AQ	Fill	29/08/2017	S17-Se02488	561477	669	0.0111	0.0045	0.4939	0.0741	0.0677	0.0271	0.0158	0.0032	0.0302	-	-	1 ^{#33}	1 ^{#12}	1 ^{#29}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_01_3-4AQ	Fill	29/08/2017	S17-Se02489	561477	733	0	0.0005	0	0	0	0	0.0161	0.004	0.004	-	-	1 ^{#40}	1 ^{#12}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_01_4-5AQ	Fill	29/08/2017	S17-Se02490	561477	607	0	0.0105	0	0	0	0	0.2545	0.0636	0.0636	-	-	1 ^{#40}	1 ^{#12}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_01_5-6AQ	Fill	29/08/2017	S17-Se02491	561477	533	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_02_0-1AQ	Fill	29/08/2017	S17-Se02493	561477	526	0	0.0004	0	0	0	0	0.0022	0.0022	0.0022	-	-	1 ^{#40}	1 ^{#11}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_02_1-2AQ	Fill	29/08/2017	S17-Se02551	561477	636	0	0.0003	0	0	0.0027	0.0014	0.0033	0.0008	0.0022	-	-	1 ^{#40}	1 ^{#5}	1 ^{#29}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_02_2-3AQ	Fill	29/08/2017	S17-Se02494	561477	625	0	0.001	0	0	0.0129	0.0052	0.001	0.001	0.0062	-	-	1 ^{#40}	1 ^{#5}	1 ^{#29}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_02_3-4AQ	Fill	29/08/2017	S17-Se02495	561477	459	0	0.1077	0	0	1.647	0.4942	0	0	0.4942	-	-	1 ^{#40}	1 ^{#40}	1 ^{#29}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_02_4-5AQ	Fill	29/08/2017	S17-Se02496	561477	442	0	0.0039	0	0	0.0571	0.0171	0.0002	0.0002	0.0173	-	-	1 ^{#40}	1 ^{#5}	1 ^{#29}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_02_5-6AQ	Fill	29/08/2017	S17-Se02497	561477	579	0	0	0	0	0	0	0.0001	0.0001	0.0001	-	-	1 ^{#40}	1 ^{#9}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_03_0-1AQ	Fill	29/08/2017	S17-Se02500	561477	656	0.1002	0.0548	4.382	0.6573	0.1687	0.0844	0.7865	0.2753	0.3596	-	-	1 ^{#18}	1 ^{#12}	1 ^{#16}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_03_1-2AQ	Fill	29/08/2017	S17-Se02501	561477	661	0.0294	0.0201	1.293	0.194	0.1706	0.0853	0.1184	0.0474	0.1327	-	-	1 ^{#18}	1 ^{#12}	1 ^{#16}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_03_2-3AQ	Fill	29/08/2017	S17-Se02502	561477	637	0	0.0244	0	0	0.0335	0.0201	0.3865	0.1353	0.1554	-	-	1 ^{#40}	1 ^{#12}	1 ^{#16}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_03_3-4AQ	Fill	29/08/2017	S17-Se02503	561477	299	0.0233	0.0181	0.4646	0.0697	0.0835	0.0251	0.1162	0.0291	0.0541	-	-	1 ^{#33}	1 ^{#12}	1 ^{#16}	1 ^{#38}	1 ^{#37}	1 ^{#36}



	Asbestos																	
	Approx. Sample Mass	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil	Mass ACM	Mass Asbestos in ACM	Mass FA	Mass Asbestos in FA	Mass AF	Mass Asbestos in AF	Mass Asbestos in FA & AF	Asbestos ID in Soil	Total Asbestos g/kg*	ACM - Comment	AF - Comment	FA - Comment	Organic Fibres - Comment	Respirable Fibres - Comment	Synthetic Fibres - Comment
	g	%w/w	%w/w	g	g	g	g	g	g	g	Comment	g/kg	Comment	Comment	Comment	Comment	Comment	Comment
EQL																		
NEPM 2013 EIL, EILs Aged Sediment																		
NEPM 2013 ESL Urban Residential and Public Open Space, Fine Soil																		
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Residential - HSL B		0.04																
NEPM 2013 HSL Asbestos in Soil - FA & AF - HSL			0.001															
NEPM 2013 Mgmt Limits - Residential, Parkland and Public Open Space, Fine																		
NEPM 2013 Soil HIL B																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 0 to <1m																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 1 to <2m																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 2 to <4m																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 4m+																		

Field ID	Fill/Natural	Date / Parent	SampleCode	Report #																		
A6_04_0-1AQ	Fill	29/08/2017	S17-Se02505	561477	546	0.0143	0.0033	0.5192	0.0779	0.0204	0.0082	0.0489	0.0098	0.0179	-	-	1 ^{#33}	1 ^{#30}	1 ^{#16}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_04_1-2AQ	Fill	29/08/2017	S17-Se02506	561477	524	0	0.0013	0	0	0.0057	0.0034	0.0175	0.0035	0.0069	-	-	1 ^{#40}	1 ^{#12}	1 ^{#16}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_04_2-3AQ	Fill	29/08/2017	S17-Se02507	561477	409	0	0.0015	0	0	0.0122	0.0049	0.0013	0.0013	0.0062	-	-	1 ^{#40}	1 ^{#12}	1 ^{#16}	1 ^{#38}	1 ^{#37}	1 ^{#36}
A6_04_3-4AQ	Fill	29/08/2017	S17-Se02508	561477	437	0	0.055	0	0	0.3376	0.1182	0.6104	0.1221	0.2402	-	-	1 ^{#40}	1 ^{#12}	1 ^{#16}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_04_4-5AQ	Fill	29/08/2017	S17-Se02509	561477	460	0	0.0048	0	0	0.0387	0.0155	0.0256	0.0064	0.0219	-	-	1 ^{#40}	1 ^{#12}	1 ^{#16}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_04_5-6AQ	Fill	29/08/2017	S17-Se02510	561477	503	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_04_6-7AQ	Fill	29/08/2017	S17-Se02511	561477	481	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_05_0-1AQ	Fill	29/08/2017	S17-Se02513	561477	701	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_05_1-2AQ	Fill	29/08/2017	S17-Se02514	561477	590	0	0.0003	0	0	0.0047	0.0019	0	0	0.0019	-	-	1 ^{#40}	1 ^{#40}	1 ^{#29}	1 ^{#38}	1 ^{#37}	1 ^{#40}
QA20170829_A	Fill	29/08/2017	S17-Se02519	561477	582	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
QC20170829-A	Fill	29/08/2017	174925-1	174925	547	0	0	0	0	0	0	0	0	0	-	-	1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_05_2-3AQ	Fill	29/08/2017	S17-Se02515	561477	473	0	0	0	0	0	0	0.0002	0.0002	0.0002	-		1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_05_3-4AQ	Fill	29/08/2017	S17-Se02516	561477	520	0	0	0	0	0	0	0	0	0	-		1 ^{#40}	1 ^{#40}	1 ^{#40}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_05_4-5AQ	Fill	29/08/2017	S17-Se02517	561477	436	0	0.0129	0	0	0.1266	0.0506	0.0291	0.0058	0.0565	-		1 ^{#40}	1 ^{#40}	1 ^{#29}	1 ^{#38}	1 ^{#37}	1 ^{#40}
A6_05_5-6AQ	Fill	29/08/2017	S17-Se02518	561477	349	0	0.0003	0	0	0.004	0.001	0	0	0.001	-		1 ^{#40}	1 ^{#40}	1 ^{#29}	1 ^{#38}	1 ^{#37}	1 ^{#40}

Data Comments

#1 FA:Chrysotile; amosite and crocidolite asbestos detected in weathered fibre cement fragments.No asbestos detected at the reporting limit of 0.001% w/w.*

#2 AF:Chrysotile; amosite and crocidolite asbestos detected in the form of loose fibre bundles.No asbestos detected at the reporting limit of 0.001% w/w.*

#3 AF:Chrysotile and crocidolite asbestos detected in the form of loose fibre bundles.No asbestos detected at the reporting limit of 0.001% w/w.*

#4 FA:Chrysotile and amosite asbestos detected in weathered fibre cement fragments.No asbestos detected at the reporting limit of 0.001% w/w.*

#5 AF:Chrysotile asbestos detected in fibre cement fragment.Chrysotile and crocidolite asbestos detected in the form of loose fibre bundles.

#6 AF:Chrysotile and crocidolite asbestos detected in fibre cement fragments.No asbestos detected at the reporting limit of 0.001% w/w.*

#7 ACM:Chrysotile and amosite asbestos detected in fibre cement fragments.No asbestos detected at the reporting limit of 0.01% w/w.

#8 FA:Chrysotile asbestos detected in weathered fibre cement fragments.No asbestos detected at the reporting limit of 0.001% w/w.*

#9 AF:Crocidolite asbestos detected in the form of loose fibre bundles.No asbestos detected at the reporting limit of 0.001% w/w.*

#10 AF:Chrysotile asbestos detected in the form of loose fibre bundles.No asbestos detected at the reporting limit of 0.001% w/w.*

#11 AF:Amosite asbestos detected in the form of loose fibre bundles.No asbestos detected at the reporting limit of 0.001% w/w.*

#12 AF:Chrysotile; amosite and crocidolite asbestos detected in the form of loose fibre bundles and fibre cement fragments.

#13 AF:Chrysotile asbestos detected in fibre cement fragments.No asbestos detected at the reporting limit of 0.001% w/w.*

#14 ACM:Chrysotile asbestos detected in fibre cement fragments.No asbestos detected at the reporting limit of 0.01% w/w.

#15 ESDAT Combined with Non-Detect Multiplier of 0.5. Some Analytes are missing from this Combined Compound.

#16 FA:Chrysotile; amosite and crocidolite asbestos detected in weathered fibre cement fragments. #17 AF:Chrysotile; amosite and crocidolite asbestos detected in the form of loose fibre bundles.

#18 ACM:Chrysotile; amosite and crocidolite asbestos detected in fibre cement fragments. #19 AF:Chrysotile; amosite and crocidolite asbestos detected in fibre cement fragmentss.

#20 FA:Chrysotile and crocidolite asbestos detected in weathered fibre cement fragments. #21 AF:Chrysotile and crocidolite asbestos detected in the form of loose fibre bundles.

#22 FA:Chrysotile and amosite asbestos detected in weathered fibre cement fragments. #23 AF:Chrysotile and amosite asbestos detected in the form of loose fibre bundles.

#24 ACM:Chrysotile and crocidolite asbestos detected in fibre cement fragments. #25 AF:Chrysotile and crocidolite asbestos detected in fibre cement fragments.

#26 ESDAT Combined. Some Analytes are missing from this Combined Compound. #27 AF:Chrysotile and amosite asbestos detected in fibre cement fragments.

#28 FA:Chrysotile and amosite asbestos detected in soft plaster material. #29 FA:Chrysotile asbestos detected in weathered fibre cement fragments.

#30 AF:Chrysotile asbestos detected in the form of loose fibre bundles. #31 FA:Amosite asbestos detected in weathered fibre cement fragments.

#32 AF:Amosite asbestos detected in the form of loose fibre bundles. #33 ACM:Chrysotile asbestos detected in fibre cement fragments.

#34 FA:Chrysotile asbestos detected in insulation material. #35 ESDAT Combined with Non-Detect Multiplier of 0.5.

#36 Synthetic mineral fibres detected. #37 No respirable fibres detected.

#38 Organic fibres detected. #40 Nil

[illegible]

BH01 0.1-1.0	F	27/04/2019	M19-Ap39517	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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Table A - Summary of Soil Analytical Results
Project Number: 56200
Project Name: Westmead Children's Hospital Stage 2 DSI

[illegible]

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Table C - Soil Summary Results for Waste Classification
Project Number: 56200
Project Name: Westmead Kids Hospital Stage 2

[illegible]

Project Name: Westmead Kids Hospital Stage 2

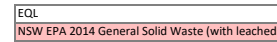


BH15 2.6-2.7	28/04/2019	M19-Ap39541	652879	12	<0.4	36	21	-	31	<0.1	11	30	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	<1.21 ^{est}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-																																																																																																																																																																																																																																																																																															
BH16 0.2-0.5	28/04/2019	S19-Ap38950	652817	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																																																																																																																																																																																																																																																																																																		
BH16 0.5-1.5	28/04/2019	S19-Ap38951	652817	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																																																																																																																																																																																																																																																																																																		
BH16 1.4-1.5	28/04/2019	M19-Ap39542	652879	9.1	<0.4	13	33	-	25	<0.1	8.9	32	<20	<20	78	<50	78	<50	110	<100	110	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	<1.21 ^{est}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-																																																																																																																																																																																																																																																																																													
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BH17 0.4-0.5	28/04/2019	M19-Ap39543	652879	10	<0.4	16	41	-	46	<0.1	17	91	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	<1.21 ^{est}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-																																																																																																																																																																																																																																																																																												
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AQ-QA5	BH17 0.4-1.4	S19-Ap38973	652817	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																																																																																																																																																																																																																																																																																																		
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BH17 1.8-2.0	28/04/2019	M19-Ap39544	652879	16	<0.4	32	28	-	31	<0.1	9.9	42	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	<1.21 ^{est}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-																																																																																																																																																																																																																																																																																												
QA5	BH17 1.8-2.0	M19-Ap39557	652879	19	<0.4	37	34	-	41	<0.1	11	47	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	<1.21 ^{est}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-																																																																																																																																																																																																																																																																																											
QC5	BH17 1.8-2.0	216396-5	216396	14	<0.4	24	18	-	20	<0.1	6	27	<25	<50	<100	<100	-	<50	<100	<100	<50	<50	<25	<25	<0.2	<1	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<

[illegible]

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Project Name: Westmead Kids Hospital Stage 2

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Project Name: Westmead Kids Hospital Stage 2

[illegible]

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	Monocyclic Aromatic Hydrocarbons											Miscellaneous Hydrocarbons							Chlorinated Benzenes						Trihalomethanes			Miscellaneous Industrial Chemicals																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	1,2,4-trimethyl benzene		1,3,5-trimethyl benzene		4-isopropyl toluene		Bromobenzene		Isopropylbenzene		n-butyl benzene		n-propyl benzene		sec-butyl benzene		Styrene		Tert-butyl benzene		Total MAH*		1,2-dibromomethane		2-Butanone (MEK)		4-Methyl-2-pentanone (MIBK)		Bromomethane		Cyclohexane		Dibromomethane		Iodomethane		1,2,3-trichlorobenzene		1,2,4-trichlorobenzene		1,2-Dichlorobenzene		1,3-dichlorobenzene		1,4-dichlorobenzene		Chlorobenzene		Hexachlorobenzene		Bromedichloromethane		Chloroform		Dibromochloromethane		Tribromomethane																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

Field ID	Date / Parent	SampleCode	Report Number																												
BH36 0.5-0.6	4/05/2019	M19-My09505	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-
BH36 0.5-1.0	4/05/2019	S19-My08370	654086	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH36 1.0-1.8	4/05/2019	S19-My08371	654086	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH36 1.2-1.3	4/05/2019	M19-My09506	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-
BH37 0.0-0.9	4/05/2019	S19-My08372	654086	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH37 0.05-0.1	4/05/2019	M19-My09507	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-
BH38 0.0-1.0	4/05/2019	S19-My08373	654086	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH38 0.05-0.1	4/05/2019	M19-My09564	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH38 0.9-1.0	4/05/2019	M19-My09508	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-
BH39 0.0-1.0	4/05/2019	S19-My08374	654086	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH39 0.05-0.1	4/05/2019	M19-My09509	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-
BH40 0.0-1.0	4/05/2019	S19-My08375	654086	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH40 0.4-0.5	4/05/2019	M19-My09510	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-
BH41 0.0-1.0	4/05/2019	S19-My08376	654086	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH41 0.9-1.0	4/05/2019	M19-My09511	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-
BH42 0.0-1.0	4/05/2019	S19-My08379	654086	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH42 0.4-0.5	4/05/2019	M19-My09512	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-

Table C - Soil Summary Results for Waste Classification
Project Number: 56200
Project Name: Westmead Kids Hospital Stage 2




	Asbestos											Herbicides & Fungicides	Organic Sulfur Compounds	Ionic Balance			Other				EPA VIC - IWRG621				
	Approx. Sample Mass	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil	Mass ACM	Mass Asbestos in ACM	Mass FA	Mass Asbestos in FA	Mass AF	Mass Asbestos in AF	Mass Asbestos in FA & AF	Asbestos ID in Soil	Total Asbestos g/kg*													
EQL	g	%w/w	%w/w	g	g	g	g	g	g	g	Comment	g/kg	Dinoseb	Carbon disulfide	Cation Exchange Capacity	EC 1:5 soil:water	pH_Lab	% Clay	% Moisture 103°C	Moisture	Total Organic Carbon	Chlorinated Hydrocarbons EPAVIC	Other Chlorinated Hydrocarbons EPAVIC	Organochlorine Pesticides EPAVIC	Other Organochlorine Pesticides EPAVIC
NSW EPA 2014 General Solid Waste (with leached)												20		0.5	0.05	10	0.1	1	1		0.1	0.5	0.5	0.1	0.1
Field ID	Date / Parent	SampleCode	Report Number																						
BH01 0.1-1.0	27/04/2019	S19-Ap38901	652817	578	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH01 0.2-0.3	27/04/2019	M19-Ap39517	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	-	-	-	-	-	-
BH01 1.0-2.0	27/04/2019	S19-Ap38902	652817	699	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH01 1.9-2.0	27/04/2019	M19-Ap39518	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	-	-	-
BH01 2.0-3.0	27/04/2019	S19-Ap38903	652817	687	0	0.0004	0	0	0.0046	0.0028	0	0	0.0028	-	-	-	-	-	-	-	-	-	-	-	-
BH01 5.3-5.6	27/04/2019	M19-Ap39519	652879	-	-	-	-	-	-	-	-	-	-	-	-	10	110	4.4	39	17	-	0.3	-	-	-
BH02 0.1-0.3	27/04/2019	M19-Ap39520	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.5	-	-	-	-	-	-	-
BH02 0.1-0.3	27/04/2019	S19-Ap38904	652817	655	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02 0.4-1.0	27/04/2019	S19-Ap38905	652817	749	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02 1.0-2.0	27/04/2019	S19-Ap38906	652817	622	0	0.002	0	0	0.0149	0.0104	0.0019	0.0019	0.0123	-	-	-	-	-	-	-	-	-	-	-	-
BH02 2.0-3.0	27/04/2019	S19-Ap38986	652817	660	0.084	0.0038	5.549	0.5549	0.0394	0.0236	0.0016	0.0016	0.0252	-	-	-	-	-	-	-	-	-	-	-	-
BH02 2.9-3.0	27/04/2019	M19-Ap39521	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02 3.0-4.0	27/04/2019	S19-Ap38911	652817	661	0	0.0302	0	0	0.5715	0.2	0	0	0.2	-	-	-	-	-	-	-	-	-	-	-	-
BH03 1.0-2.0	27/04/2019	S19-Ap38909	652817	751	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03 3.0-4.0	27/04/2019	S19-Ap38910	652817	576	0	0.0004	0	0	0	0	0.0022	0.0022	0.0022	-	-	-	-	-	-	-	-	-	-	-	-
BH03 3.9-4.0	27/04/2019	M19-Ap39522	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-
BH03 4.5-5.5	27/04/2019	S19-Ap38912	652817	511	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03 4.6-4.7	27/04/2019	M19-Ap39523	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04 0.1-1.0	27/04/2019	S19-Ap38913	652817	805	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
AQ-QA1	BH04 0.1-1.0	S19-Ap38969	652817	815	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
AQ-QC1	BH04 0.1-1.0	216396-6	216396	-	-	-	-	-	-	-	0	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04 0.4-0.5	27/04/2019	M19-Ap39524	652879	-	-	-	-	-	-	-	-	-	<20	<0.5	-	-	-	-	-	-	-	-	-	-	-
QA1	BH04 0.4-0.5	M19-Ap39554	652879	-	-	-	-	-	-	-	-	-	<20	<0.5	-	-	-	-	-	-	-	-	-	-	-
QC1	BH04 0.4-0.5	216396-1	216396	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04 3.0-4.0	27/04/2019	S19-Ap38914	652817	484	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
BH04 4.2-4.8	27/04/2019	S19-Ap38915	652817	527	0	0.0003	0	0	0.0026	0.0016	0	0	0.0016	-	-	-	-	-	-	-	-	-	-	-	-
BH04 4.6-4.8	27/04/2019	M19-Ap39525	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05 0.05-1.0	27/04/2019	S19-Ap38916	652817	858	0	0.0006	0	0	0	0	0.0048	0.0048	0.0048	-	-	-	-	-	-	-	-	-	-	-	-
BH05 1.0-2.0	27/04/2019	S19-Ap38917	652817	641	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
BH05 1.9-2.0	27/04/2019	M19-Ap39526	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05 2.0-2.5	27/04/2019	S19-Ap38918	652817	701	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
BH06 0.05-0.8	27/04/2019	S19-Ap38919	652817	559	0	0.0001	0	0	0	0	0.0004	0.0004	0.0004	-	-	-	-	-	-	-	-	-	-	-	-
AQ-QA2	27/04/2019	S19-Ap38970	652817	530	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
AQ-QC2	27/04/2019	216396-7	216396	-	-	-	-	-	-	-	0	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06 0.1-0.3	27/04/2019	M19-Ap39527	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA2	BH06 0.1-0.3	M19-Ap39555	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC2	BH06 0.1-0.3	216396-2	216396	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06 0.8-1.5	27/04/2019	S19-Ap38920	652817	490	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
BH06 1.8-2.0	27/04/2019	S19-Ap38921	652817	546	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
BH07 0.9-1.0	27/04/2019	M19-Ap39528	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA3	BH07 0.9-1.0	M19-Ap39556	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC3	BH07 0.9-1.0	216396-3	216396	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH07 1.0-2.0	27/04/2019	S19-Ap38922	652817	842	0	0.0005	0	0	0.0018	0.0014	0.031	0.0031	0.0045	-	-	-	-	-	-	-	-	-	-	-	-
AQ-QA3	BH07 1.0-2.0	S19-Ap38971	652817	660	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
AQ-QC3	27/04/2019	216396-8	216396	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH07 2.0-3.0	27/04/2019	S19-Ap38928	652817	505	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
BH07 3.8-4.5	27/04/2019	S19-Ap38924	652817	611	0	0.0003	0	0	0	0	0.0018	0.0018	0.0018	-	-	-	-	-	-	-	-	-	-	-	-
BH07 4.6-4.8	27/04/2019	M19-Ap39529	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH08 0.2-1.0	27/04/2019	S19-Ap38925	652817	717	0.0892	0.0004	5.33	0.6396	0	0	0.0029	0.0029	0.0029	-	-	-	-	-	-	-	-	-	-	-	-
BH																									

Table C - Soil Summary Results for Waste Classification
Project Number: 56200
Project Name: Westmead Kids Hospital Stage 2



				Asbestos										Herbicides & Fungicides		Organic Sulfur Compounds		Ionic Balance			Other			EPA VIC - IWRG621					
				Approx. Sample Mass	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil	Mass ACM	Mass Asbestos in ACM	Mass FA	Mass Asbestos in FA	Mass AF	Mass Asbestos in AF	Mass Asbestos in FA & AF	Asbestos ID in Soil	Total Asbestos g/kg*	Dinoseb	Carbon disulfide	Cation Exchange Capacity	EC 1:5 soil:water	pH_Lab	% Clay	% Moisture 103°C	Moisture	Total Organic Carbon	Chlorinated Hydrocarbons EPAVIC	Other Chlorinated Hydrocarbons EPAVIC	Organochlorine Pesticides EPAVIC	Other Organochlorine Pesticides EPAVIC	
Field ID	Date / Parent	SampleCode	Report Number	g	%w/w	%w/w	g	g	g	g	g	g	g	Comment	g/kg	mg/kg	mg/kg	meq/100g	µS/cm	ph Units	%	%	%	%	mg/kg	mg/kg	mg/kg	mg/kg	
EQL																20	0.5	0.05	10	0.1	1	1		0.1	0.5	0.5	0.1	0.1	
NSW EPA 2014 General Solid Waste (with leached)																													
BH15 2.6-2.7	28/04/2019	M19-Ap39541	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	-	-	-	-	-	<0.1	<0.1	
BH16 0.2-0.5	28/04/2019	S19-Ap38950	652817	414	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH16 0.5-1.5	28/04/2019	S19-Ap38951	652817	760	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH16 1.4-1.5	28/04/2019	M19-Ap39542	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.4	-	-	-	-	-	<0.1	<0.1	
BH16 1.5-2.4	28/04/2019	S19-Ap38952	652817	721	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH17 0.1-0.4	28/04/2019	S19-Ap38953	652817	663	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH17 0.4-0.5	28/04/2019	M19-Ap39543	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	-	<0.1	<0.1	
BH17 0.4-1.4	28/04/2019	S19-Ap38954	652817	770	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
AQ-QA5	BH17 0.4-1.4	S19-Ap38973	652817	667	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
AQ-QC5	BH17 0.4-1.4	216396-10	216396	-	-	-	-	-	-	-	-	-	-	0	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH17 1.4-1.8	28/04/2019	S19-Ap38955	652817	680	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH17 1.8-2.0	28/04/2019	M19-Ap39544	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	-	-	-	-	<0.1	<0.1	<0.1	
QA5	BH17 1.8-2.0	M19-Ap39557	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	<0.1	<0.1	<0.1	
QC5	BH17 1.8-2.0	216396-5	216396	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-	-	-	-	-
BH18 0.15-1.0	28/04/2019	S19-Ap38956	652817	893	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH18 0.9-1.0	28/04/2019	M19-Ap39545	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	-	<0.1	<0.1	<0.1	
BH18 1.0-2.0	28/04/2019	S19-Ap38957	652817	820	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH18 2.0-2.9	28/04/2019	S19-Ap38958	652817	780	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH19 0.15-1.0	28/04/2019	S19-Ap38959	652817	837	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH19 1.0-2.0	28/04/2019	S19-Ap38960	652817	771	0.0064	0.0056	0.7048	0.0493	0.0534	0.0401	0.0028	0.0028	0.0429	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	
BH19 2.5-2.7	28/04/2019	M19-Ap39546	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	12	-	-	<0.5	<0.5	<0.1	<0.1	<0.1	
BH19 3.5-3.7	28/04/2019	S19-Ap39000	652817	400	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH19 3.7-3.9	28/04/2019	M19-Ap39547	652879	-	-	-	-	-	-	-	-	-	-	-	-	<20	<0.5	-	-	-	14	-	-	<0.5	<0.5	<0.1	<0.1	<0.1	
BH19 3.7-4.3	28/04/2019	S19-Ap38962	652817	462	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH19 4.1-4.3	28/04/2019	M19-Ap39548	652879	-	-	-	-	-	-	-	-	-	-	-	-	<20	<0.5	-	-	-	16	-	-	<0.5	<0.5	<0.1	<0.1	<0.1	
BH19 4.3-4.5	28/04/2019	M19-Ap39549	652879	-	-	-	-	-	-	-	-	-	-	-	-	<20	<0.5	-	-	-	15	-	-	<0.5	<0.5	<0.1	<0.1	<0.1	
BH20 0.15-1.0	28/04/2019	S19-Ap38963	652817	843	0	0.0003	0	0	0	0	0.0026	0.0026	0.0026	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH20 2.0-3.0	28/04/2019	S19-Ap38964	652817	888	0	0.0001	0	0	0	0	0.0005	0.0005	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH20 2.9-3.0	28/04/2019	M19-Ap39550	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	-	-	-	<0.1	<0.1	<0.1	
BH20 3.2-4.0	28/04/2019	S19-Ap38965	652817	622	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH20 4.4-4.5	28/04/2019	M19-Ap39551	652879	-	-	-	-	-	-	-	-	-	-	-	-	<20	<0.5	-	-	-	17	-	-	<0.5	<0.5	<0.1	<0.1	<0.1	
BH21 1.0-2.0	28/04/2019	S19-Ap38966	652817	656	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH21 1.9-2.0	28/04/2019	M19-Ap39552	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.2	-	-	-	-	<0.1	<0.1	<0.1	
BH21 3.0-4.0	28/04/2019	S19-Ap38967	652817	340	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH21 4.4-4.5	28/04/2019	M19-Ap39553	652879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-	-	-	<0.1	<0.1	<0.1	
BH21 5.0-5.4	28/04/2019	S19-Ap38968	652817	528	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH22 0.1-0.5	4/05/2019	S19-My08349	654086	573	0	0.0031	0	0	0	0	0.02	0.018	0.018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH22 0.5-0.6	4/05/2019	M19-My09485	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	-	-	-	-	<0.1	<0.1	<0.1	
BH22 0.5-1.5	4/05/2019	S19-My08350	654086	579	0	0.0031	0	0	0	0	0.02	0.018	0.018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH22 1.5-2.5	4/05/2019	S19-My08351	654086	803	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH22 3.6-3.7	4/05/2019	M19-My09486	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	160	4.8	29	18	-	0.7	-	-	-	-	
BH23 0.1-0.3	4/05/2019	M19-My09487	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	-	-	-	-	-	-	
BH23 0.1-1.0	4/05/2019	S19-My08352	654086	576	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH23 0.5-0.6	4/05/2019	M19-My09488	654111	-	-	-	-	-	-	-	-	-	-	-	-	<20	-	-	-	-	6.2	-	-	-	-	<0.1			





	Asbestos											Herbicides & Fungicides	Organic Sulfur Compounds	Ionic Balance			Other			EPA VIC - IWRG621									
	Approx. Sample Mass	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil	Mass ACM	Mass Asbestos in ACM	Mass FA	Mass Asbestos in FA	Mass AF	Mass Asbestos in AF	Mass Asbestos in FA & AF	Asbestos ID in Soil	Total Asbestos g/kg *	Dinoseb	Carbon disulfide	Cation Exchange Capacity	EC 1:5 soil:water	pH_Lab	% Clay	% Moisture 103oC	Moisture	Total Organic Carbon	Chlorinated Hydrocarbons EPAVIC	Other Chlorinated Hydrocarbons EPAVIC	Organochlorine Pesticides EPAVIC	Other Organochlorine Pesticides EPAVIC				
	g	%w/w	%w/w	g	g	g	g	g	g	g	Comment	g/kg	mg/kg	mg/kg	meq/100g	µS/cm	ph Units	%	%	%	%	mg/kg	mg/kg	mg/kg	mg/kg				
EQL													20	0.5	0.05	10	0.1	1	1		0.1	0.5	0.5	0.1	0.1				
NSW EPA 2014 General Solid Waste (with leached)																													
Field ID	Date / Parent	SampleCode	Report Number	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
BH36 0.5-0.6	4/05/2019	M19-My09505	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	<0.1	<0.1				
BH36 0.5-1.0	4/05/2019	S19-My08370	654086	576	0	0.1078	0	0	1.321	0.3963	0.25	0.225	0.6213	-	-	-	-	-	-	-	-	-	-	-	-				
BH36 1.0-1.8	4/05/2019	S19-My08371	654086	715	0	0.1522	0	0	0	0	1.21	1.089	1.089	-	-	-	-	-	-	-	-	-	-	-	-				
BH36 1.2-1.3	4/05/2019	M19-My09506	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.9	-	-	-	-	<0.1	<0.1				
BH37 0.0-0.9	4/05/2019	S19-My08372	654086	720	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-				
BH37 0.05-0.1	4/05/2019	M19-My09507	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	<0.1	<0.1				
BH38 0.0-1.0	4/05/2019	S19-My08373	654086	546	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-				
BH38 0.05-0.1	4/05/2019	M19-My09564	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.9	-	-	-	-	-	-				
BH38 0.9-1.0	4/05/2019	M19-My09508	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	-	-	-	-	<0.1	<0.1				
BH39 0.0-1.0	4/05/2019	S19-My08374	654086	603	0.0503	0.018	2.53	0.3036	0	0	0.121	0.1089	0.1089	-	-	-	-	-	-	-	-	-	-	-	-				
BH39 0.05-0.1	4/05/2019	M19-My09509	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-	-	<0.1	<0.1				
BH40 0.0-1.0	4/05/2019	S19-My08375	654086	548	0	0.0058	0	0	0.0721	0.0216	0.0111	0.01	0.0316	-	-	-	-	-	-	-	-	-	-	-	-				
BH40 0.4-0.5	4/05/2019	M19-My09510	654111	-	-	-	-	-	-	-	-	-	-	<20	-	-	-	-	17	-	-	-	-	<0.1	<0.1				
BH41 0.0-1.0	4/05/2019	S19-My08376	654086	517	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-				
BH41 0.9-1.0	4/05/2019	M19-My09511	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	-	-	-	-	<0.1	<0.1				
BH42 0.0-1.0	4/05/2019	S19-My08379	654086	564	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-				
BH42 0.4-0.5	4/05/2019	M19-My09512	654111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-	-	-	<0.1	<0.1				

Table D - Leachate Results for Waste Classification
Project Number: 56200
Project Name: Westmead Kids Hospital Stage 2

	Metals & Metalloids			Ionic Balance			
	Chromium (Total)	Lead	Nickel	pH (TCLP - HCl addition)	pH (TCLP - initial)	pH (TCLP - off)	pH (Leachate fluid)
	mg/L	mg/L	mg/L	ph Units	ph Units	ph Units	ph Units
EQL	0.01	0.01	0.01	0.1	0.1	0.1	0.1
NSW EPA 2014 General Solid Waste (leached)		5	2				

Field_ID	Date	SampleCode	Report Number							
BH04 0.4-0.5	27/04/2019	M19-My15191	654831	<0.01	<0.01	0.06	1.5	6.3	5.7	5.1
BH10 0.4-0.5	27/04/2019	M19-My15192	654831	<0.01	0.02	0.06	1.7	6.3	5.1	5.1
BH19 2.5-2.7	27/04/2019	M19-My15193	654831	<0.01	<0.01	0.03	1.7	5.9	6	5.1
BH20 2.9-3.0	27/04/2019	M19-My15194	654831	<0.01	0.02	0.05	1.7	6.1	5.4	5.1
BH24 1.0-1.1	4/05/2019	M19-My21393	655528	-	0.03	-	1.7	6.9	5.1	5
BH33 0.1-0.2	4/05/2019	M19-My21394	655528	-	-	0.03	2.3	9.1	5.9	5

Table A: CHW Forecourt Chemical Results
Project Number: 56200
Project Name: Westmead Kids Hospital Stage 2 Forecourt



	Chlorinated Alkenes													Solvents			Phenols																				
	1,1-dichloroethene	1,1-dichloropropene	1,3-dichloropropene	2-chlorobutene	1-chloropropene	4-chlorobutene	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl Chloride	2-Propanone (Acetone)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,4-dinitrophenol	2,6-dichlorophenol	2-chlorophenol	2-Methylphenol	2-nitrophenol	3,4,5-Methylphenol	4,6-Dinitro-2-methylphenol	4,6-Dinitro-o-clohexyl phenol	4-Chloro-3-Methylphenol	4-nitrophenol	Phenol	Phenols (Total)	Total Halogenated Phenol	Total Non-Halogenated Phenol	Total Tetrachlorophenols				
EQL	0.5	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	0.5	0.5	mg/kg	mg/kg	mg/kg	mg/kg	0.5	mg/kg	0.5	1	1	mg/kg	mg/kg	mg/kg	0.5	mg/kg	0.5	0.2	1	mg/kg	5	20	1	5	0.5	mg/kg	mg/kg	1	20	mg/kg	10
NEPC 2013 EIL, EILs Aged Sediment																																					
NEPM 2013 ESL Urban Residential and Public Open Space, Fine Soil																																					
NEPM 2013 Mgmt Limits - Residential, Parkland and Public Open Space, Fine																																					
NEPM 2013 Soil HIL B																																					
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 0 to <1m																														45000							
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 1 to <2m																																					
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 2 to <4m																																					

Field ID	Sample Date	Report Number	Soil Type																																
BH01-0.3-0.4	26/02/2020	705084	Fill	<0.5	-	<1 ^{HA}	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<0.5	-	<1	<20	<10
BH01-1.5-1.6	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02-0.05-0.1	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02-0.5-0.6	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC1	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA-1	26/02/2020	237710	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03-0.05-0.1	26/02/2020	705084	Fill	<0.5	-	<1 ^{HA}	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<0.5	-	<1	<20	<10
BH03-1.5-1.6	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04-0.7-0.8	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05-0.3-0.4	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06-0-0.1	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH07-0.1-0.2	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH07-1.5-1.6	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH08-0.5-0.6	26/02/2020	705084	Fill	<0.5	-	<1 ^{HA}	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<0.5	-	<1	<20	<10
QC2	26/02/2020	705084	Fill	<0.5	-	<1 ^{HA}	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<0.5	-	<1	<20	<10
QA-2	26/02/2020	237710	Fill	<1	<1	<2 ^{HA}	<1	-	<1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	-	-	-	-
BH08-1.5-1.6	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH08-2.5-2.6	26/02/2020	705084	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH09-0.3-0.4	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH10-0.5-0.6	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH10-0-0.1	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11-0.8-0.9	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12-0.2-0.3	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<0.5	-	<1	<20	<10
BH12-3.0-3.1	26/02/2020	705084	Fill	<0.5	-	<1 ^{HA}	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH13-0.0-0.1	2/03/2020	705475	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH14-0.3-0.4	2/03/2020	705475	Fill	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<0.5	-	<1	<20	<10
BH14-0.9-1.0	2/03/2020	705475	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH15-0.3-0.4	2/03/2020	705475	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Data Comments
#1 ESDAT Combined with Non-Detect Multiplier of 0.5. Some Analytes are missing from this
#2 ESDAT Combined. Some Analytes are missing from this Combined Compound.
#3 ESDAT Combined with Non-Detect Multiplier of 0.5.
#4 ESDAT Combined.

Table A: CHW Forecourt Chemical Results
Project Number: 56200
Project Name: Westmead Kids Hospital Stage 2 Forecourt



	Monocyclic Aromatic Hydrocarbons										Miscellaneous Hydrocarbons							Chlorinated Benzenes						Trihalomethanes		Herbicides & Fungicides	Organic Sulfur Compounds	Other						
	1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	4-isopropyl toluene	Bromobenzene	Isopropylbenzene	n-butyl benzene	n-propyl benzene	sec-butyl benzene	Styrene	Tert-butyl benzene	Total MAH*	1,2-dibromomethane	2-butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Bromomethane	Cyclohexane	Dibromomethane	Iodomethane	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	Hexachlorobenzene	Bromodichloromethane	Chloroform	Dibromochloromethane	Trichloromethane					
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	Mg/KG	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%
EQL	0.5	0.5		0.5	0.5				0.5		0.5	0.5	0.5	0.5	0.5		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.05	0.5	0.5	0.5	0.5		20	0.5	1	
NEPC 2013 EIL, EILs Aged Sediment																																		
NEPM 2013 ESL Urban Residential and Public Open Space, Fine Soil																																		
NEPM 2013 Mgmt Limits - Residential, Parkland and Public Open Space, Fine																																		
NEPM 2013 Soil HIL B																									15									
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 0 to <1m																																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 1 to <2m																																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 2 to <4m																																		

Field ID	Sample Date	Report Number	Soil Type																														
BH01-0.3-0.4	26/02/2020	705084	Fill	<0.5	<0.5	-	<0.5	<0.5	-	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	<20	<0.5		14	
BH01-1.5-1.6	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	17	
BH02-0.05-0.1	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	6.6	
BH02-0.5-0.6	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	14	
QC1	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	12	
QA-1	26/02/2020	237710	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	15	
BH03-0.05-0.1	26/02/2020	705084	Fill	<0.5	<0.5	-	<0.5	<0.5	-	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	<20	<0.5		8.1	
BH03-1.5-1.6	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	6.9	
BH04-0.7-0.8	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	19	
BH05-0.3-0.4	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	6.5	
BH06-0-0.1	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	16	
BH07-0.1-0.2	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	7.7	
BH07-1.5-1.6	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	8.8	
BH08-0.5-0.6	26/02/2020	705084	Fill	<0.5	<0.5	-	<0.5	<0.5	-	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	<20	<0.5		11	
QC2	26/02/2020	705084	Fill	<0.5	<0.5	-	<0.5	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<20	<0.5		11
QA-2	26/02/2020	237710	Fill	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.1	<1	<1	<1	<1	-	-		13	
BH08-1.5-1.6	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	13	
BH08-2.5-2.6	26/02/2020	705084	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	13	
BH09-0.3-0.4	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	9	
BH10-0.5-0.6	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	14	
BH10-0-0.1	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	3.2	
BH11-0.8-0.9	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	3.9	
BH12-0.2-0.3	26/02/2020	705084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	<20	-	-	15	
BH12-3.0-3.1	26/02/2020	705084	Fill	<0.5	<0.5	-	<0.5	<0.5	-	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	-	<0.5		19
BH13-0.0-0.1	2/03/2020	705475	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	18	
BH14-0.3-0.4	2/03/2020	705475	Fill	<0.5	<0.5	-	<0.5	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.5	<20	<0.5		15	
BH14-0.9-1.0	2/03/2020	705475	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	13	
BH15-0.3-0.4	2/03/2020	705475	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	15	

Data Comments
#1 ESDAT Combined with Non-Detect Multiplier of 0.5. Some Analytes are missing from this
#2 ESDAT Combined. Some Analytes are missing from this Combined Compound.
#3 ESDAT Combined with Non-Detect Multiplier of 0.5.
#4 ESDAT Combined.

Table B: Asbestos Results
Project Number: 56200
Project Name: Westmead Kids Hospital Stage 2 Forecourt

				Asbestos										Asbestos - Trace Analysis															
				Approx. Sample Mass	Asbestos from ACM in Soil		Asbestos from FA & AF in Soil		Mass ACM		Mass Asbestos in ACM		Mass FA		Mass Asbestos in FA		Mass AF		Mass Asbestos in AF		Mass Asbestos in FA & AF		Asbestos Reported Result	ACM - Comment	AF - Comment	FA - Comment	Organic Fibres - Comment	Respirable Fibres - Comment	Synthetic Fibres - Comment
					g	%w/w	%w/w	g	g	g	g	g	g	g	g	g	g	g	g	g	Comment	Comment							
EQL																													
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Residential - HSL B					0.04																								
NEPM 2013 HSL Asbestos in Soil - FA & AF - HSL						0.001																							
Field ID	Sample Date	Report Number	Soil Type																										
BH01-0.05-0.3	26/02/2020	705084	Fill	770	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH01-0.3-1.0	26/02/2020	705084	Fill	584	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH01-1.0-2.0	26/02/2020	705084	Fill	480	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH01-2.0-2.5	26/02/2020	705084	Fill	534	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH02-0.05-0.4	26/02/2020	705084	Fill	652	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
QC1	26/02/2020	705084	Fill	571	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
QA-1	26/02/2020	237710	Fill	516	<0.01	<0.001	-	-	-	-	-	-	-	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	-	-	-									
BH02-0.4-1.4	26/02/2020	705084	Fill	617	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH03-0.05-1.0	26/02/2020	705084	Fill	708	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH03-1.0-1.5	26/02/2020	705084	Fill	976	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH03-1.5-2.5	26/02/2020	705084	Fill	648	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH04-0.05-0.7	26/02/2020	705084	Fill	610	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH04-0.7-0.8	26/02/2020	705084	Fill	793	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH05-0-1.0	26/02/2020	705084	Fill	667	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH05-1.0-1.2	26/02/2020	705084	Fill	873	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH06-0-0.6	26/02/2020	705084	Fill	689	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH07-0-0.1	3/02/2020	705475	Fill	991	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH07-0.1-1.0	3/02/2020	705475	Fill	911	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH07-1.0-1.5	3/02/2020	705475	Fill	963	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH07-1.5-2.0	3/02/2020	705475	Fill	819	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH08-0-0.2	3/02/2020	705475	Fill	989	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH08-0.2-0.5	3/02/2020	705475	Fill	843	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH08-0.5-1.5	3/02/2020	705475	Fill	776	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH08-1.5-2.0	3/02/2020	705475	Fill	830	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH09-0-0.3	3/02/2020	705475	Fill	1004	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
QC020320-1	3/02/2020	705475	Fill	947	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
QA020320-1	3/02/2020	238035	Fill	1039	<0.01	<0.001	-	-	-	-	-	-	-	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH09-0.3-0.5	3/02/2020	705475	Fill	920	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH09-0.5-1.4	3/02/2020	705475	Fill	911	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH09-1.4-2.0	3/02/2020	705475	Fill	886	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH10-FRAG	3/02/2020	705475	Fill	221	-	-	-	-	-	-	-	-	-	Chrysotile, amosite and crocidolite asbestos detected.	Grey compressed fibre cement material.	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH10-0-0.3	3/02/2020	705475	Fill	1007	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH10-0.3-0.5	3/02/2020	705475	Fill	848	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH10-0.5-1.2	3/02/2020	705475	Fill	891	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH11-0-0.3	3/02/2020	705475	Fill	912	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH11-0.3-0.8	3/02/2020	705475	Fill	876	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH11-0.8-1.4	3/02/2020	705475	Fill	876	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH12-0-0.2	3/02/2020	705475	Fill	770	0.031	0	2.4	0.24	0	0	0	0	0	Chrysotile asbestos detected in fibre cement fragment.	Approximate raw weight of ACM = 2.4 g	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH12-0.2-1.3	3/02/2020	705475	Fill	715	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH12-1.3-1.6	3/02/2020	705475	Fill	628	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH12-1.6-2.0	3/02/2020	705475	Fill	645	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH12-2.0-3.0	3/02/2020	705475	Fill	774	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH12-3.0-3.5	3/02/2020	705475	Fill	606	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH13-0-0.3	3/02/2020	705475	Fill	738	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH13-0.3-0.4	3/02/2020	705475	Fill	652	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH14-0-0.3	3/02/2020	705475	Fill	643	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
QC020320-2	3/02/2020	705475	Fill	652	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
QA020320-2	3/02/2020	238035	Fill	775	<0.01	<0.001	-	-	-	-	-	-	-	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH14-0.3-1.3	3/02/2020	705475	Fill	783	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH15-0-0.3	3/02/2020	705475	Fill	761	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									
BH15-0.3-1.3	3/02/2020	705475	Fill	771	0	0	0	0	0	0	0	0	0	No asbestos detected at the reporting limit of 0.001 % w/w.	Nil	Nil	Nil	Organic fibres detected.	No respirable fibres detected.	Nil									

Table C: Waste Classification Chemical Concentrations
Project Number: 56200
Project Name: Westmead Kids Hospital Stage 2 Forecourt



JBS&G	Phenols																Monocyclic Aromatic Hydrocarbons																Miscellaneous Hydrocarbons									
	C,4,5-trichlorophenol	C,4,6-trichlorophenol	C,4,6-trichlorophenol	C,4,6-tetrachlorophenol	C,4-dinitrophenol	C,4-dinitrophenol	C,6-dichlorophenol	2-chlorophenol	2-Methylphenol	2-nitrophenol	B & 4-Methylphenol	C,6-dinitro-2-methylphenol	C,6-dinitro-o-cydoxyl phenol	4-Chloro-3-Methylphenol	4-nitrophenol	Phenol	Pends [Total]	Total Halogenated Phenol	Total Non-Halogenated Phenol	Total Tetrachlorophenols	C,2,4-trimethyl benzene	C,3,5-trimethyl Benzene	4-isopropyl toluene	Bromobenzene	n-propylbenzene	p-butyl benzene	m-propyl benzene	sec-butyl benzene	tolylene	ter-butyl benzene	Total MAH*	C,2-dibromomethane	2-Butanone [MIX]	4-Methyl-2-pentanol (MAH)	Bromomethane	cyclohexane	tribromomethane	Iodomethane				
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	MG/Kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
[EQ]	1	1	0.5	0.5	5	0.5	0.5	0.5	0.2	1	0.4	5	20	1	5	0.5		1	20	10	0.5	0.5							0.5		0.5	0.5		0.5	0.5							
NSW EPA 2014 General Solid Waste (CT1)	8000	40							4000																				60				4000									
NSW EPA 2014 Restricted Solid Waste (C72)	32000	160							16000																				240				16000									

Field ID	Sample Date	Report Number																																							
BH01-0.3-0.4	26/02/2020	705084	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<0.5	-	<1	<20	<10	<0.5	<0.5	-	<0.5	<0.5	-	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5		
BH01-1.5-1.6	26/02/2020	705084	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH02-0.05-0.1	26/02/2020	705084	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH02-0.5-0.6	26/02/2020	705084	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
QA-1	26/02/2020	237710	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
QC1	26/02/2020	705084	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH03-0.05-0.1	26/02/2020	705084	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<0.5	-	<1	<20	<10	<0.5	<0.5	-	<0.5	<0.5	-	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5		
BH03-1.5-1.6	26/02/2020	705084	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH04-0.7-0.8	26/02/2020	705084	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH05-0.3-0.4	26/02/2020	705084	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH06-0-0.1	26/02/2020	705084	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH07-0.1-0.2	26/02/2020	705084	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH07-1.5-1.6	26/02/2020	705084	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH08-0.5-0.6	26/02/2020	705084	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<0.5	-	<1	<20	<10	<0.5	<0.5	-	<0.5	<0.5	-	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5		
QA-2	26/02/2020	237710	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	-	<1	<20	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
QC2	26/02/2020	705084	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<0.5	-	<1	<20	<10	<0.5	<0.5	-	<0.5	<0.5	-	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5		
BH08-1.5-1.6	26/02/2020	705084	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH08-2.5-2.6	26/02/2020	705084	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH09-0.3-0.4	26/02/2020	705084	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH10-0.5-0.6	26/02/2020	705084	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH10-0-0.1	26/02/2020	705084	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH11-0.8-0.9	26/02/2020	705084	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH12-0.2-0.3	26/02/2020	705084	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<0.5	-	<1	<20	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH12-3.0-3.1	26/02/2020	705084	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH13-0.0-0.1	2/03/2020	705475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH14-0.3-0.4	2/03/2020	705475	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<0.5	-	<1	<20	<10	<0.5	<0.5	-	<0.5	<0.5	-	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5		
BH14-0.9-1.0	2/03/2020	705475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH15-0.3-0.4	2/03/2020	705475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Data Comments

#2 ESDAT Combined with Non-Detect Multiplier of 0.5. Some Analytes are missing from this Compound.

#3 ESDAT Combined. Some Analytes are missing from this Combined Compound.

#4 ESDAT Combined with Non-Detect Multiplier of 0.5.

#7 ESDAT Combined.

Table C: Waste Classification Chemical Concentrations
Project Number: 56200
Project Name: Westmead Kids Hospital Stage 2 Forecourt



	Chlorinated Benzenes								Trihalomethanes				Miscellaneous Industrial Chemicals	Herbicides & Fungicides	Organic Sulfur Compounds
	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	Hexachlorobenzene	Bromodichloromethane	Chloroform	Dibromochloromethane	Tribromomethane	Hexachlorobutadiene			
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			0.5	0.5	0.5	0.5	0.05	0.5	0.5	0.5	0.5			20	0.5
NSW EPA 2014 General Solid Waste (CT1)			86		150	2000			120						
NSW EPA 2014 Restricted Solid Waste (CT2)			344		600	8000			480						

Field ID	Sample Date	Report Number													
BH01-0.3-0.4	26/02/2020	705084	-	-	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	-	<20	<0.5
BH01-1.5-1.6	26/02/2020	705084	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
BH02-0.05-0.1	26/02/2020	705084	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
BH02-0.5-0.6	26/02/2020	705084	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
QA-1	26/02/2020	237710	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
QC1	26/02/2020	705084	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
BH03-0.05-0.1	26/02/2020	705084	-	-	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	-	<20	<0.5
BH03-1.5-1.6	26/02/2020	705084	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
BH04-0.7-0.8	26/02/2020	705084	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
BH05-0.3-0.4	26/02/2020	705084	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
BH06-0-0.1	26/02/2020	705084	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
BH07-0.1-0.2	26/02/2020	705084	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
BH07-1.5-1.6	26/02/2020	705084	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
BH08-0.5-0.6	26/02/2020	705084	-	-	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	-	<20	<0.5
QA-2	26/02/2020	237710	<1	<1	<1	<1	<1	<0.1	<1	<1	<1	<1	<1	-	-
QC2	26/02/2020	705084	-	-	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	-	<20	<0.5
BH08-1.5-1.6	26/02/2020	705084	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
BH08-2.5-2.6	26/02/2020	705084	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
BH09-0.3-0.4	26/02/2020	705084	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
BH10-0.5-0.6	26/02/2020	705084	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
BH10-0-0.1	26/02/2020	705084	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
BH11-0.9-0.9	26/02/2020	705084	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
BH12-0.2-0.3	26/02/2020	705084	-	-	-	-	-	<0.05	-	-	-	-	-	<20	-
BH12-3.0-3.1	26/02/2020	705084	-	-	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	-	-	<0.5
BH13_0.0-0.1	2/03/2020	705475	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
BH14_0.3-0.4	2/03/2020	705475	-	-	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	-	<20	<0.5
BH14_0.9-1.0	2/03/2020	705475	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
BH15_0.3-0.4	2/03/2020	705475	-	-	-	-	-	<0.05	-	-	-	-	-	-	-

Data Comments
#2 ESDAT Combined with Non-Detect Multiplier of 0.5. Some Analytes are missing fr
#3 ESDAT Combined. Some Analytes are missing from this Combined Compound.
#4 ESDAT Combined with Non-Detect Multiplier of 0.5.
#7 ESDAT Combined.

Table D: Nickel TCLP Results
 Project Number: 56200
 Project Name: Westmead Kids Hospital Stage 2 Forecourt




		Metals & Metalloids	Ionic Balance		
		Nickel	pH (TCLP - HCl addition)	pH (TCLP - initial)	pH (TCLP - off)
		mg/L	ph Units	ph Units	ph Units
EQL		0.01	0.1	0.1	0.1
NSW EPA 2014 General Solid Waste (leached)		2			
NSW EPA 2014 Restricted Solid Waste (leached)		8			

Field ID	Sample Date	Soil Type	Lab_Report_Number				
BH02-0.05-0.1	26/02/2020	Fill	706578	0.08	1.7	8.5	5.5

Appendix B Development Plans

A	ISSUED FOR INFORMATION	16/11/20
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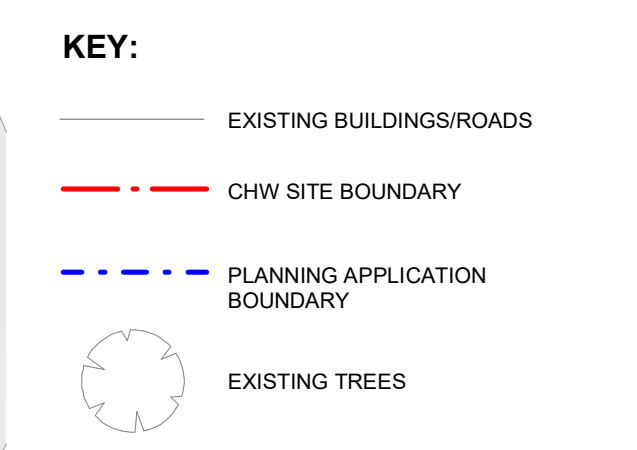
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PROJECT	The Children's Hospital at Westmead Stage 2 Redevelopment
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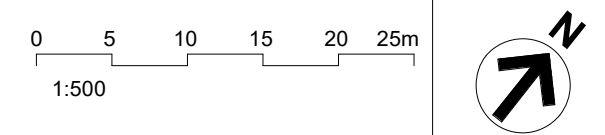
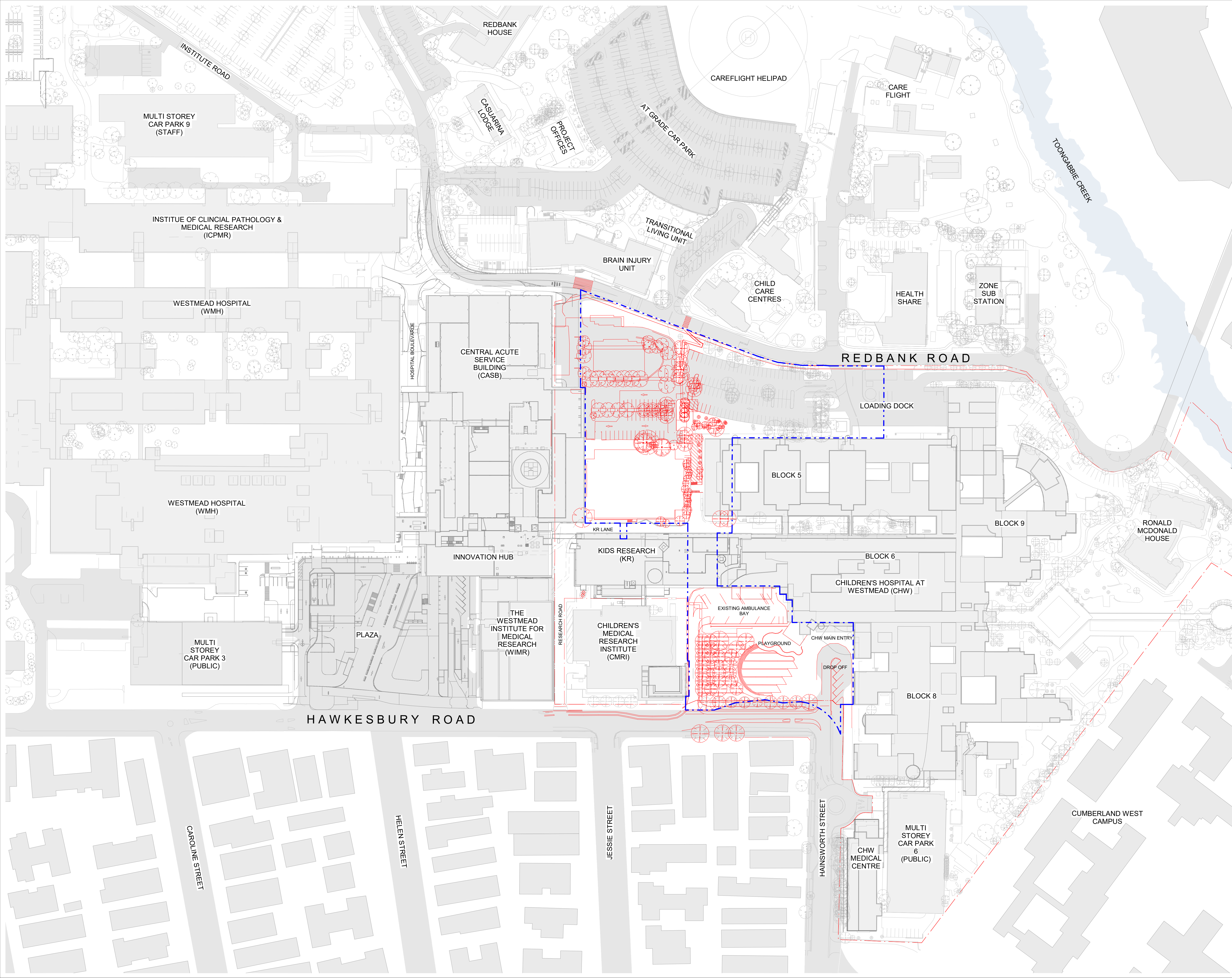
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Drawn By	SM	Checked By	AF
Project No	19038	Revision	A
Drawing No	CHW-AR-DG-PSB-SSD002		

FOR INFORMATION



Scale	Date
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Drawn By SM	Checked By AF
	Revision A
Project No	19038
Drawing No	
CHW-AR-DG-PSB-SSD003	



- KEY:**
- BUILDINGS/ROADS TO BE DEMOLISHED
 - EXISTING/ RETAINED
 - CHW SITE BOUNDARY
 - PLANNING APPLICATION BOUNDARY
 - TREES TO BE REMOVED
 - TREES TO BE RETAINED
 - EXTENT OF PAVED AREA DEMOLITION/ MODIFICATION

A	ISSUED FOR INFORMATION	16/11/20
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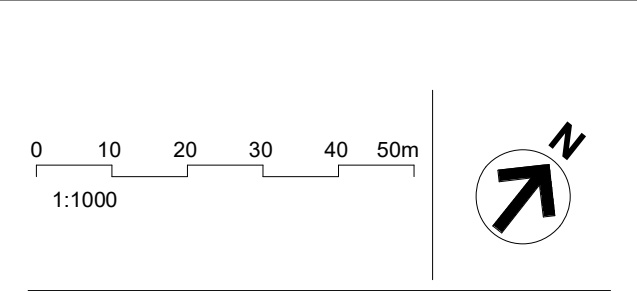
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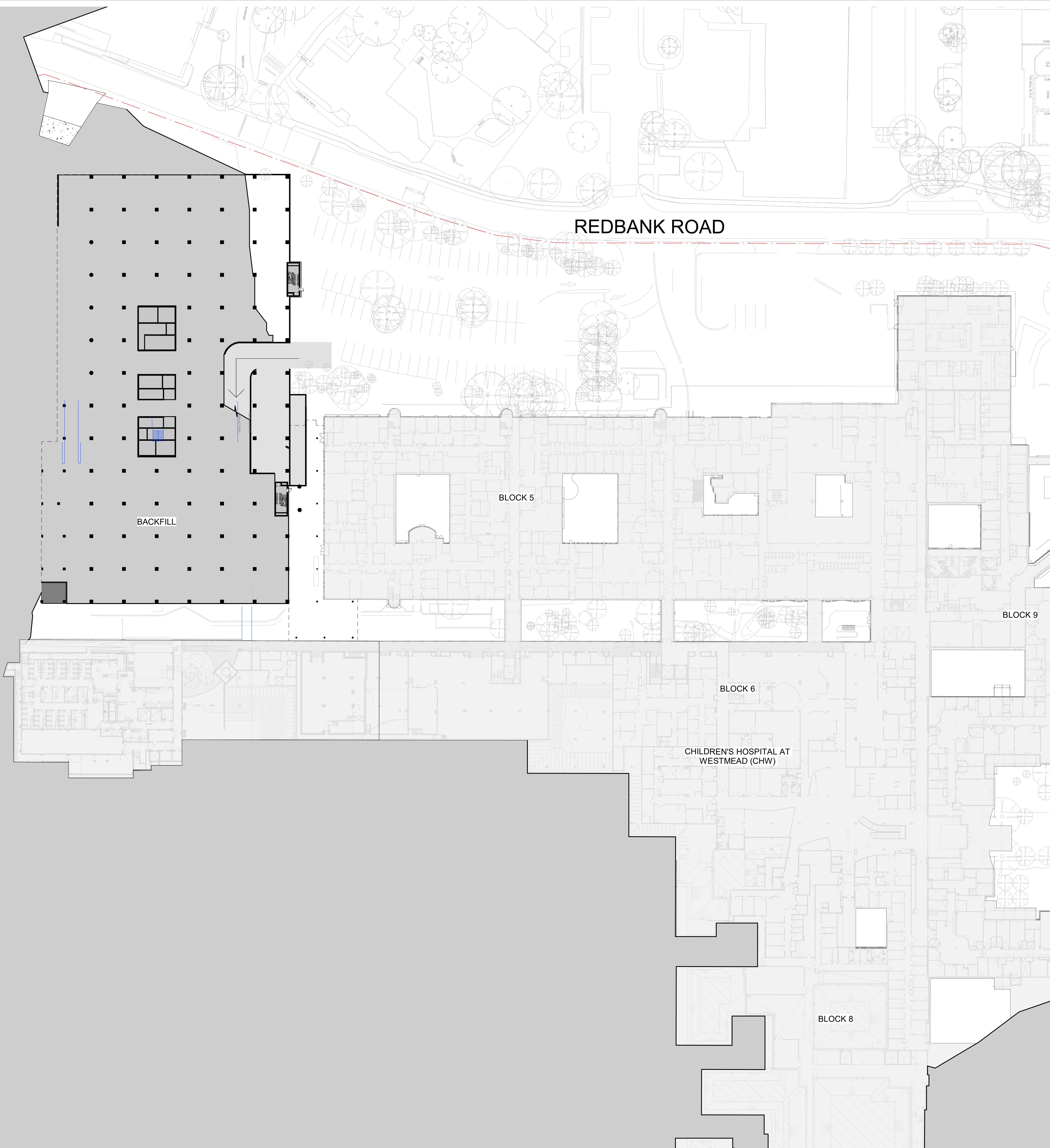
The Children's Hospital at Westmead Redevelopment

Sheet Name		16/11/20	
SITE PLAN - DEMOLITION		Revision	
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Drawn By		Checked By	
HR		AF	
Project No		19038	
Drawing No		CHW-AR-DG-PSB-SSD004	

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OUTDOOR AREA

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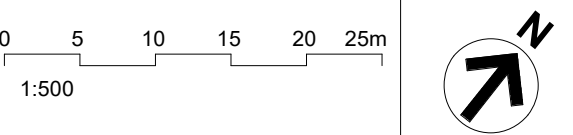
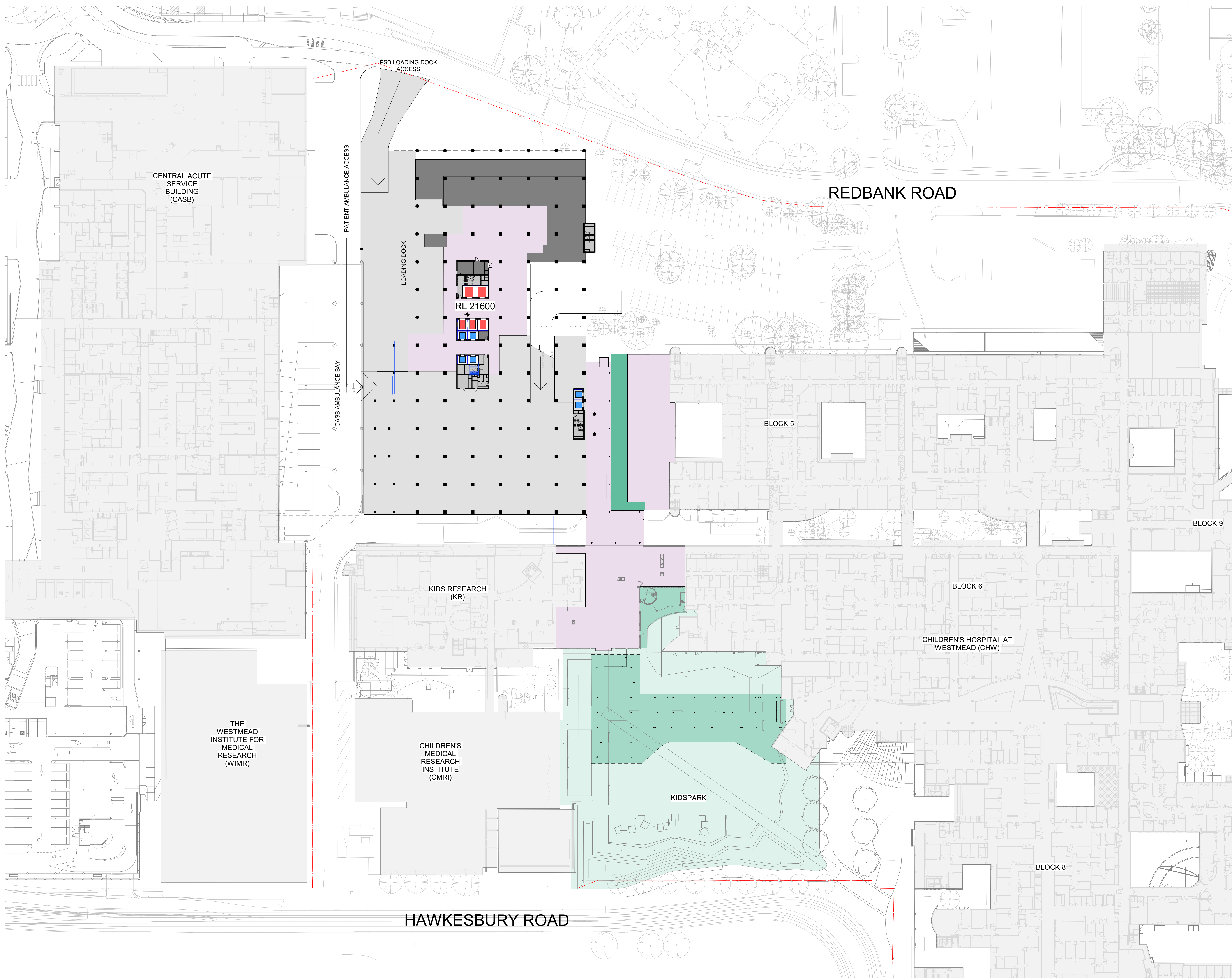
The Children's Hospital at Westmead Stage 2 Redevelopment

Sheet Name

PROPOSED PLAN - LEVEL 01

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Drawn By	SM	Checked By	AF
Project No	19038	Revision	A
Drawing No	CHW-AR-DG-PSB-SSD010		

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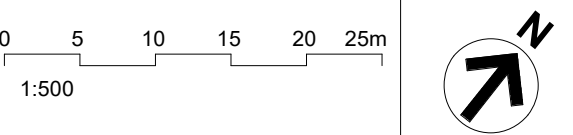
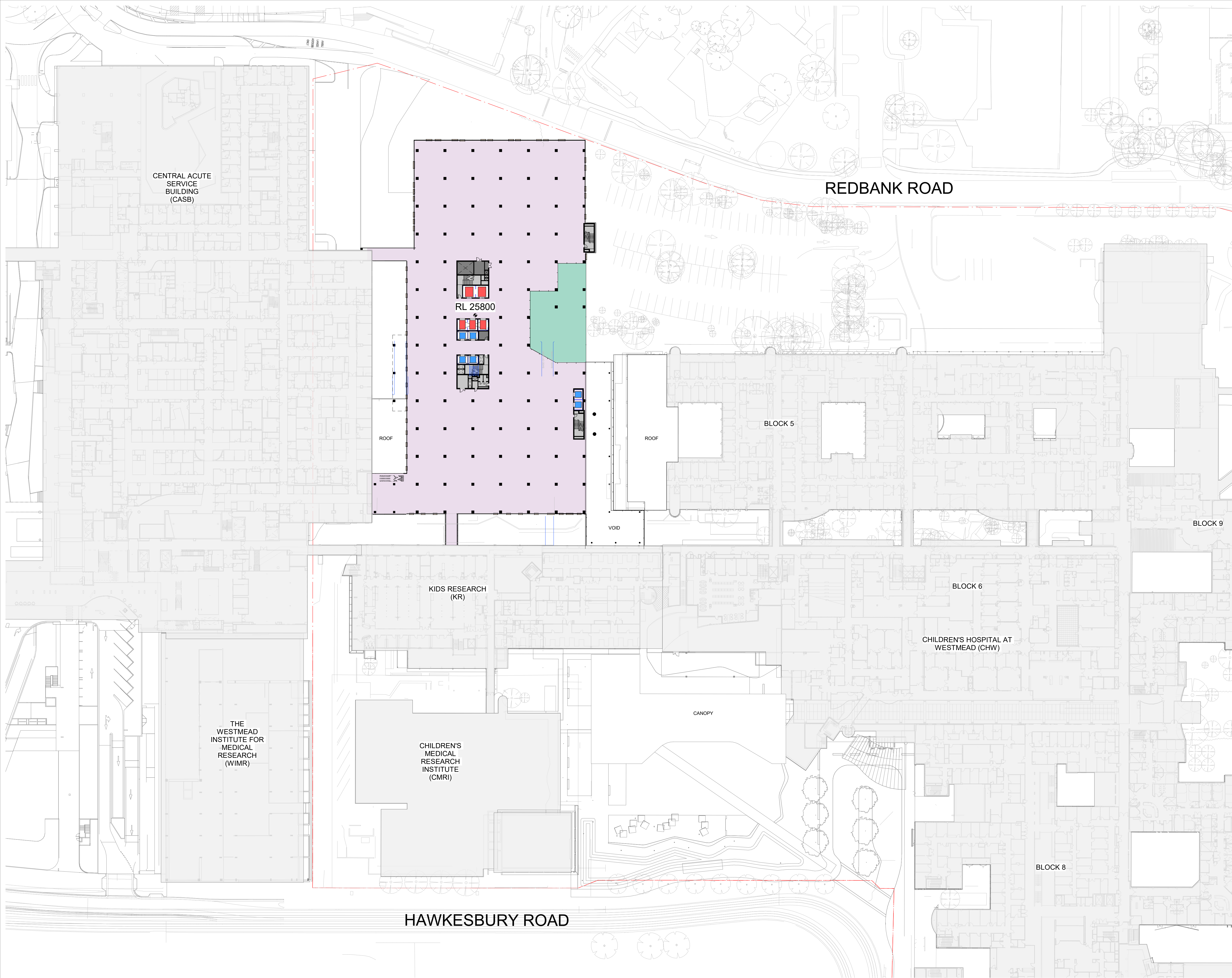
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PROPOSED PLAN - LEVEL 02

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Drawn By	SM	Checked By	AF
Project No	19038	Revision	A
Drawing No	CHW-AR-DG-PSB-SSD011		

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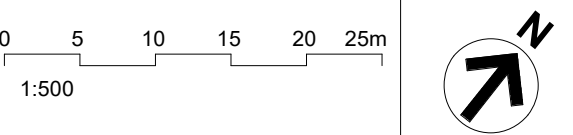
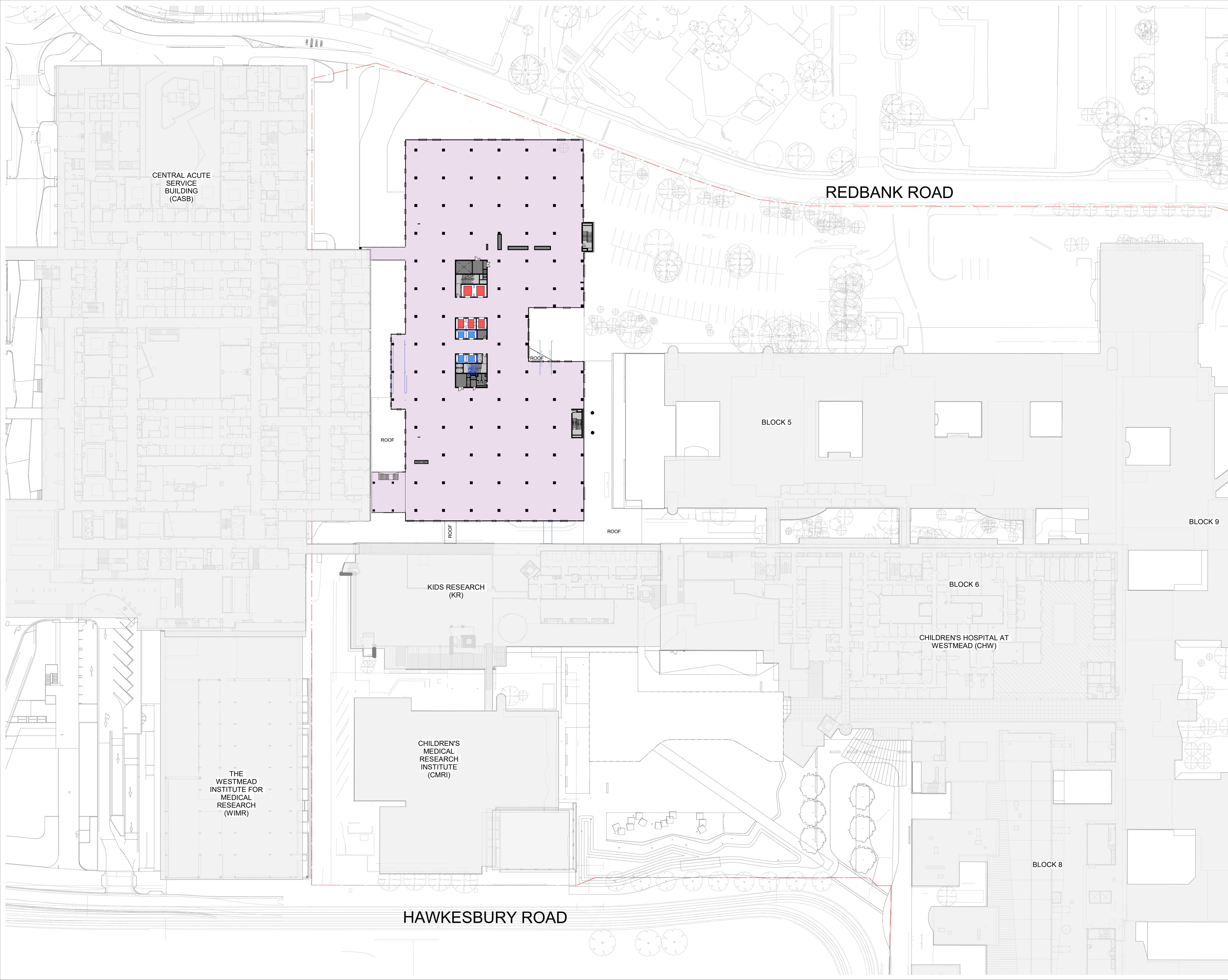
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PROPOSED PLAN - LEVEL 03



Scale	1 : 500@A1	Date	16/11/20
Drawn By	SM	Checked By	AF
Project No	19038	Revision	A
Drawing No	CHW-AR-DG-PSB-SSD012		

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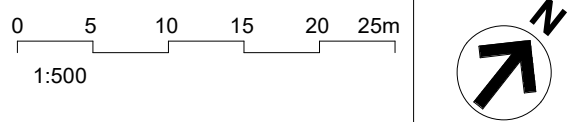
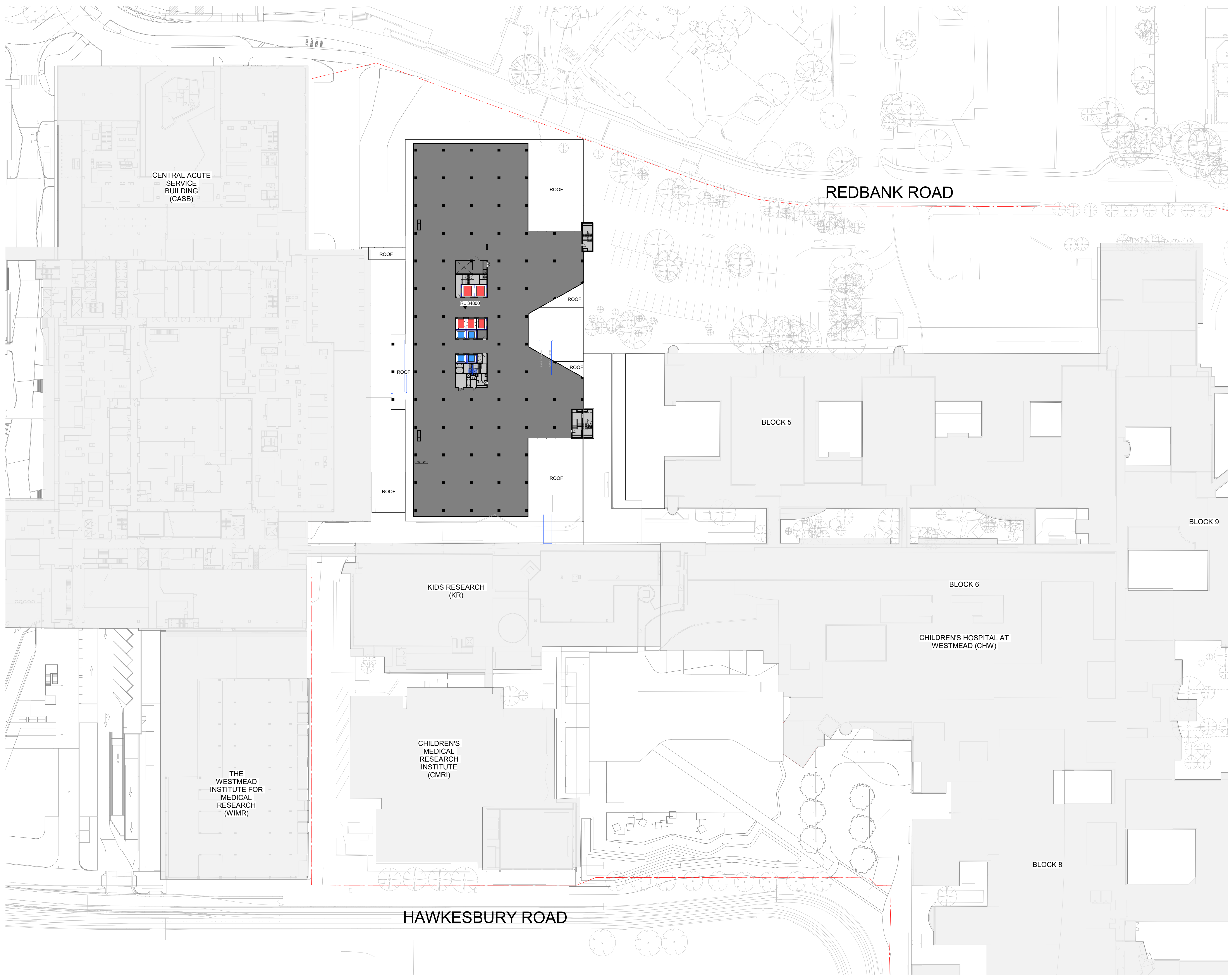
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Stage 2 Redevelopment

Sheet Name
PROPOSED PLAN - LEVEL 04


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Project No	19038	Revision	A
Drawing No	CHW-AR-DG-PSB-SSD013		

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- LIFT - CLINICAL
- LIFT - PUBLIC

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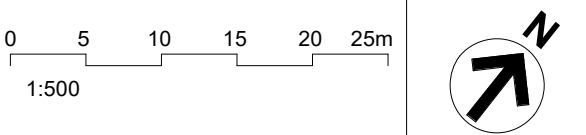
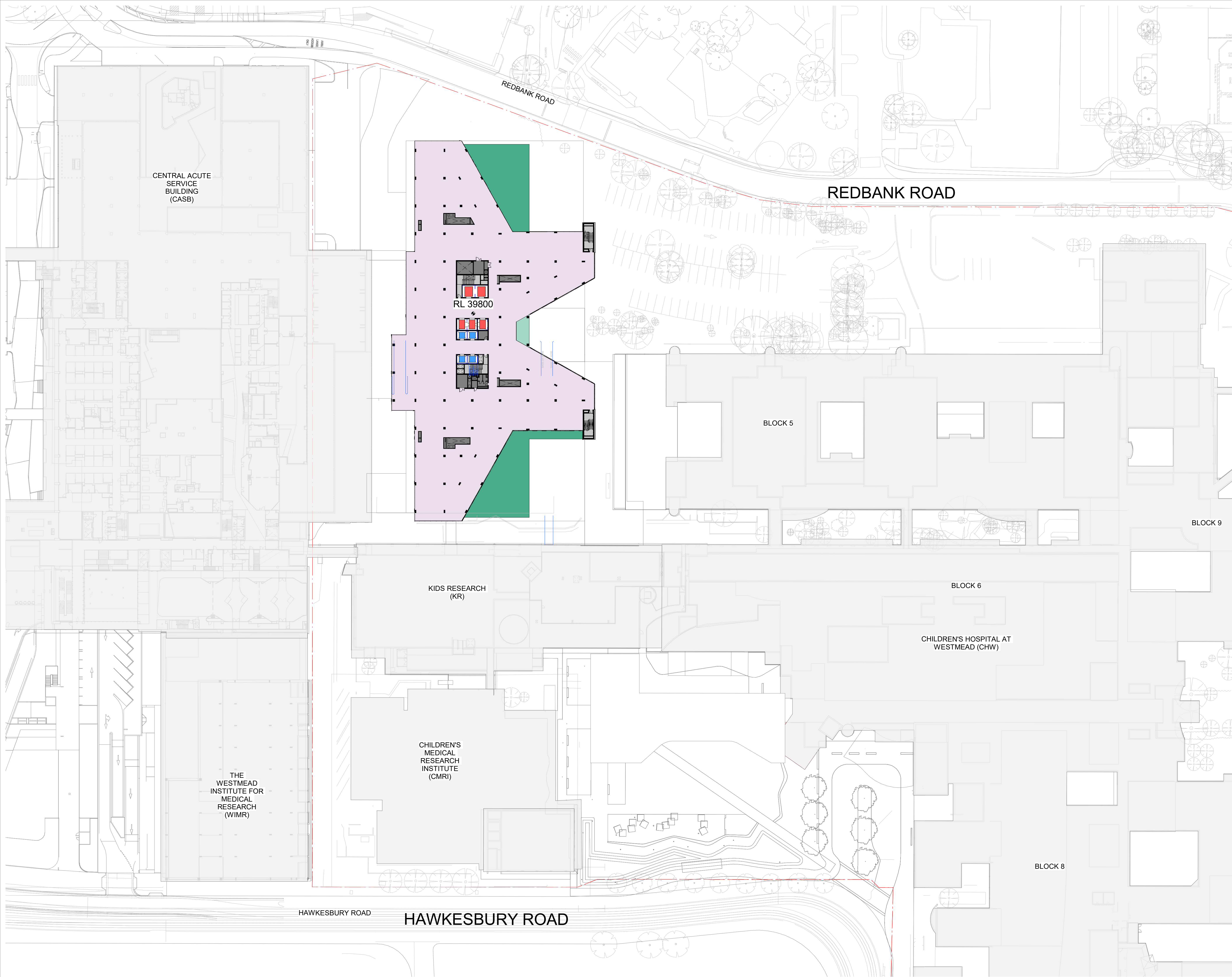
PROJECT
The Children's Hospital at Westmead Stage 2 Redevelopment

Sheet Name
PROPOSED PLAN - LEVEL 05



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Project No		Revision	A
Drawing No			19038
CHW-AR-DG-PSB-SSD014			

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- PROPOSED LANDSCAPING - PUBLIC
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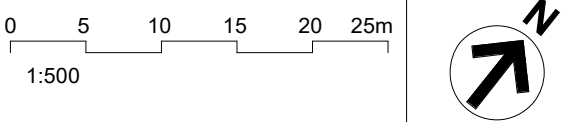
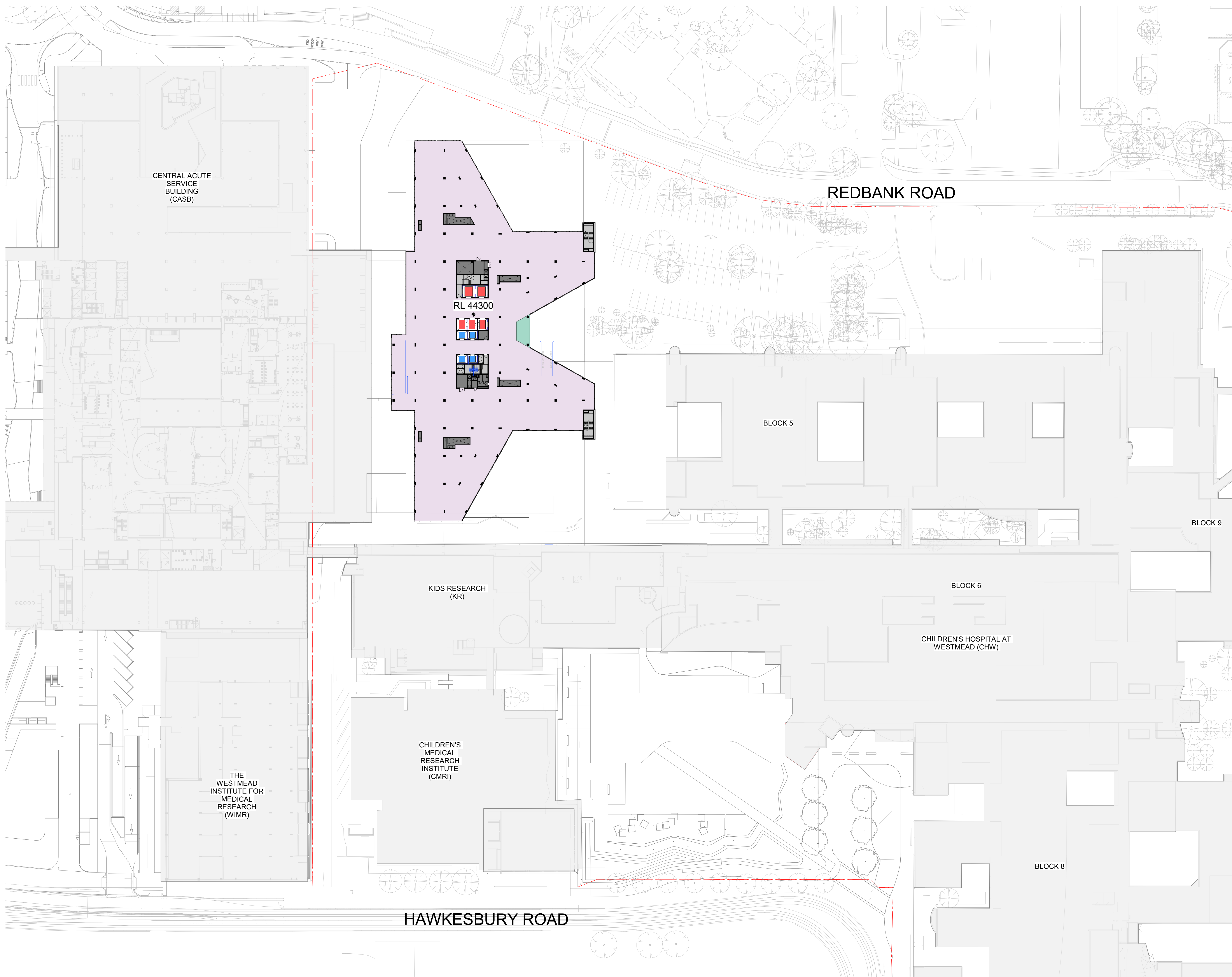
The Children's Hospital at Westmead
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Sheet Name



PROPOSED PLAN - LEVEL 06

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Project No	19038		
Drawing No	CHW-AR-DG-PSB-SSD015		

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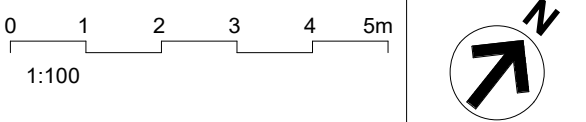
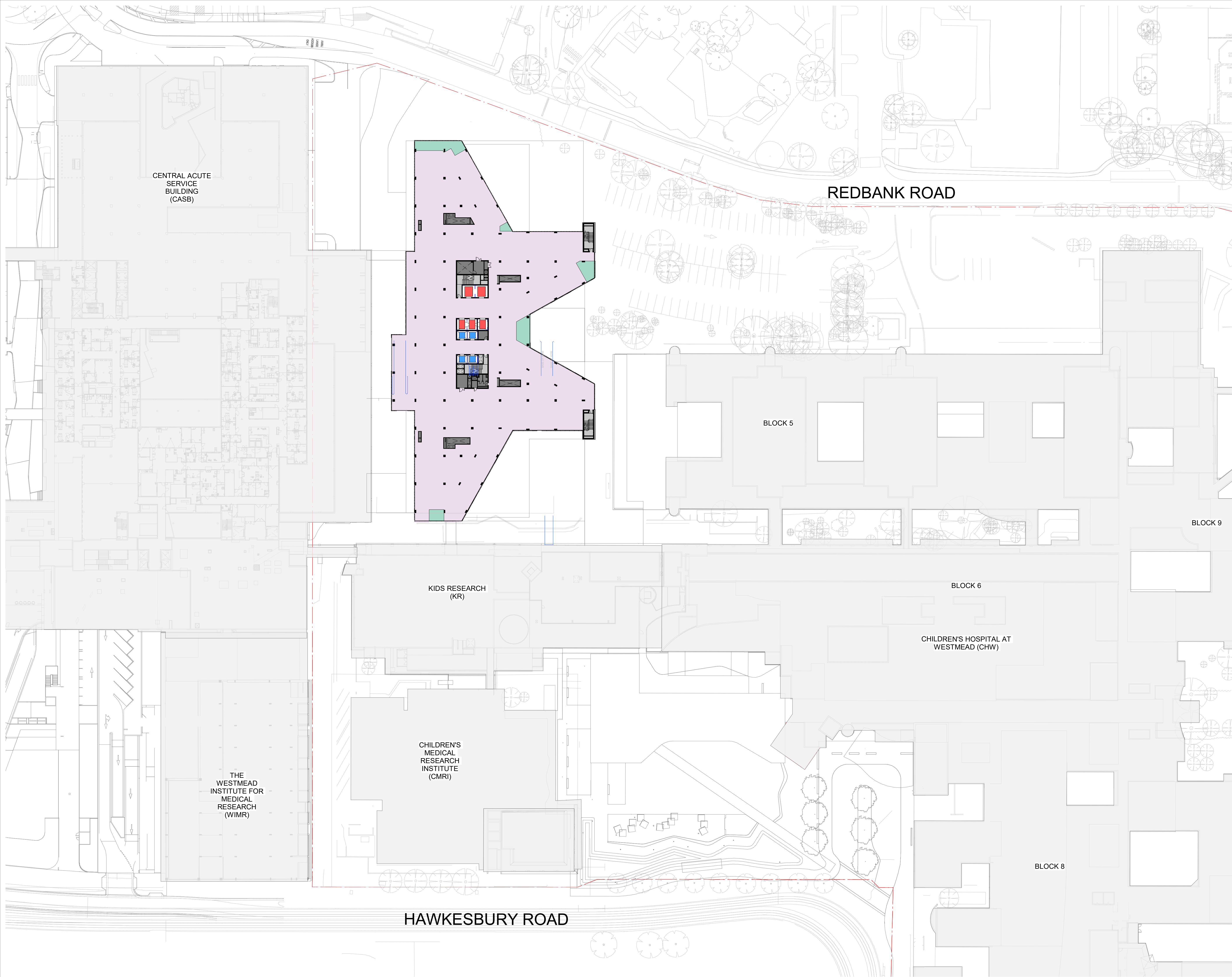
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PROJECT
The Children's Hospital at Westmead Stage 2 Redevelopment

Sheet Name
PROPOSED PLAN - LEVEL 07

Scale	Date	
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SM	AF	A
Project No	19038	
Drawing No	CHW-AR-DG-PSB-SSD016	

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- LIFT - CLINICAL
- LIFT - PUBLIC

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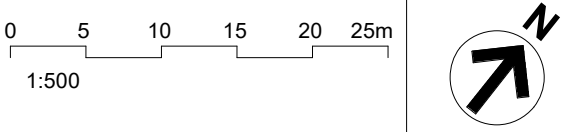
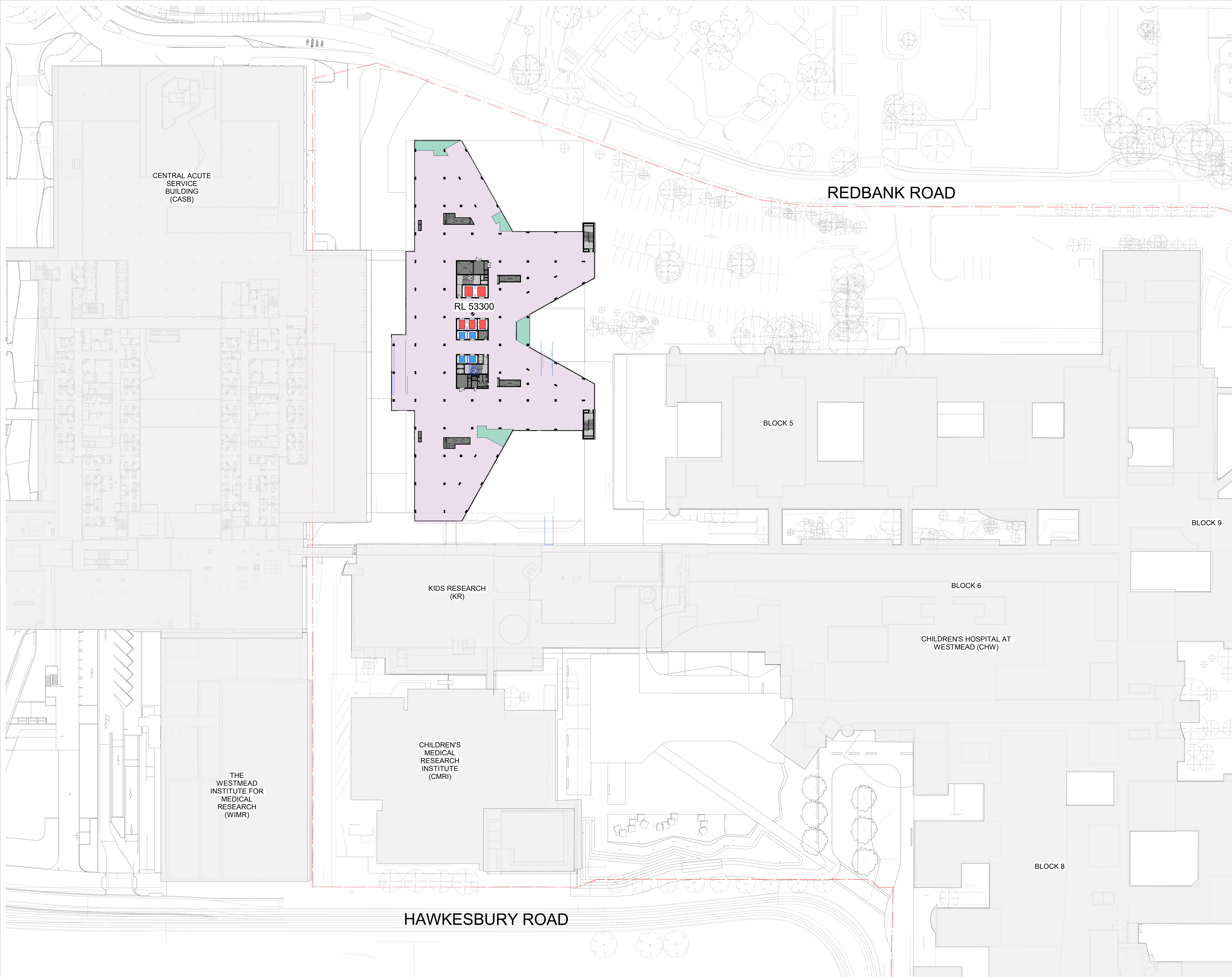
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PROJECT
The Children's Hospital at Westmead Stage 2 Redevelopment

Sheet Name
PROPOSED PLAN - LEVEL 08

Scale	1 : 500@A1	Date	16/11/20
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Project No	19038	Revision	A
Drawing No	CHW-AR-DG-PSB-SSD017		

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- LIFT - CLINICAL
- LIFT - PUBLIC

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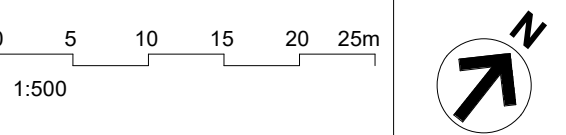
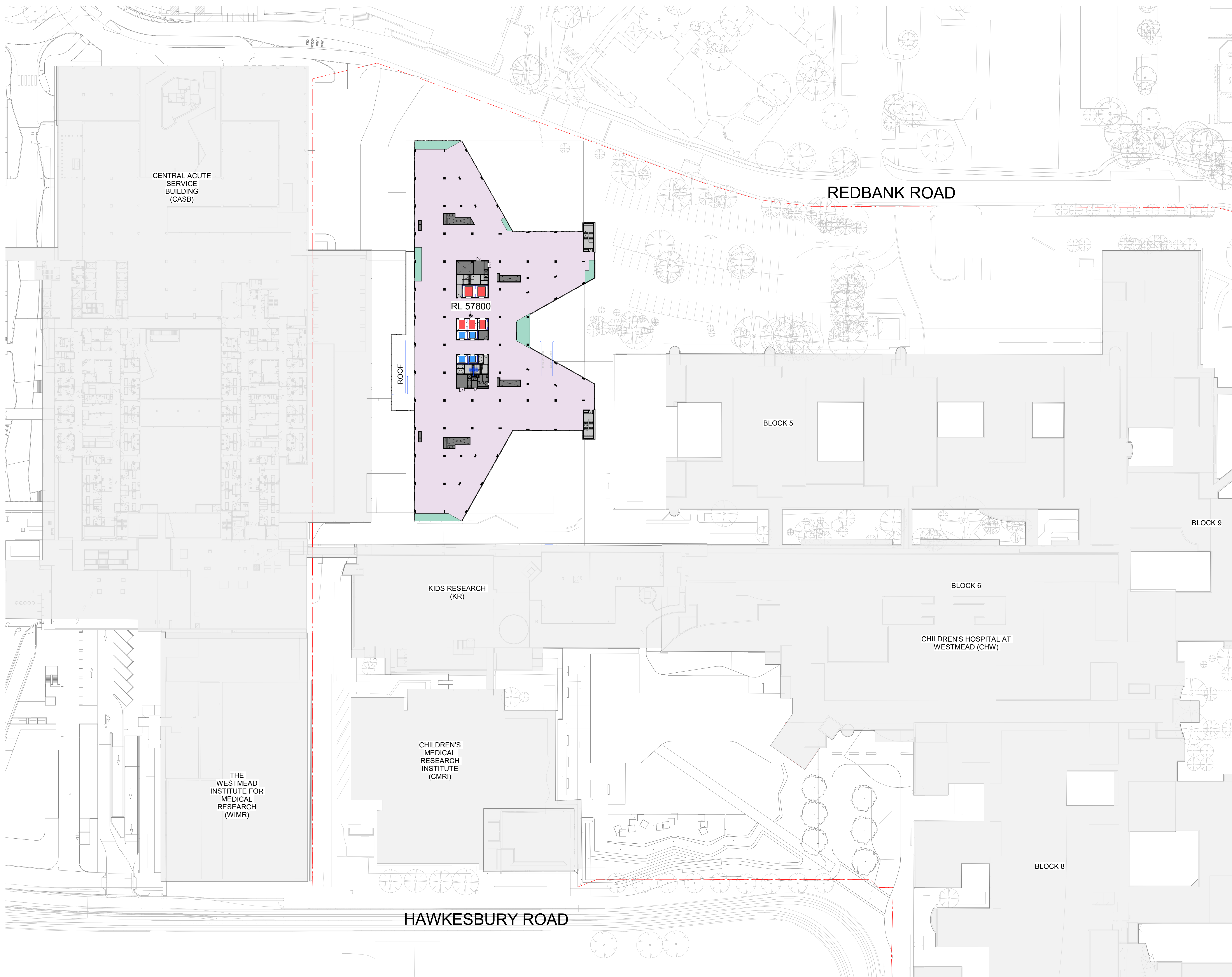
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The Children's Hospital at Westmead Stage 2 Redevelopment	

Sheet Name	
PROPOSED PLAN - LEVEL 09	

Scale	Date
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Drawn By	Checked By
SM	AF
Project No	Revision
	A
Drawing No	19038
CHW-AR-DG-PSB-SSD018	


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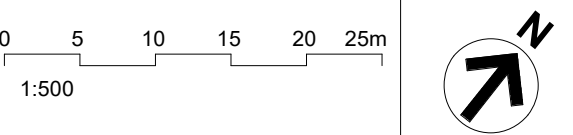
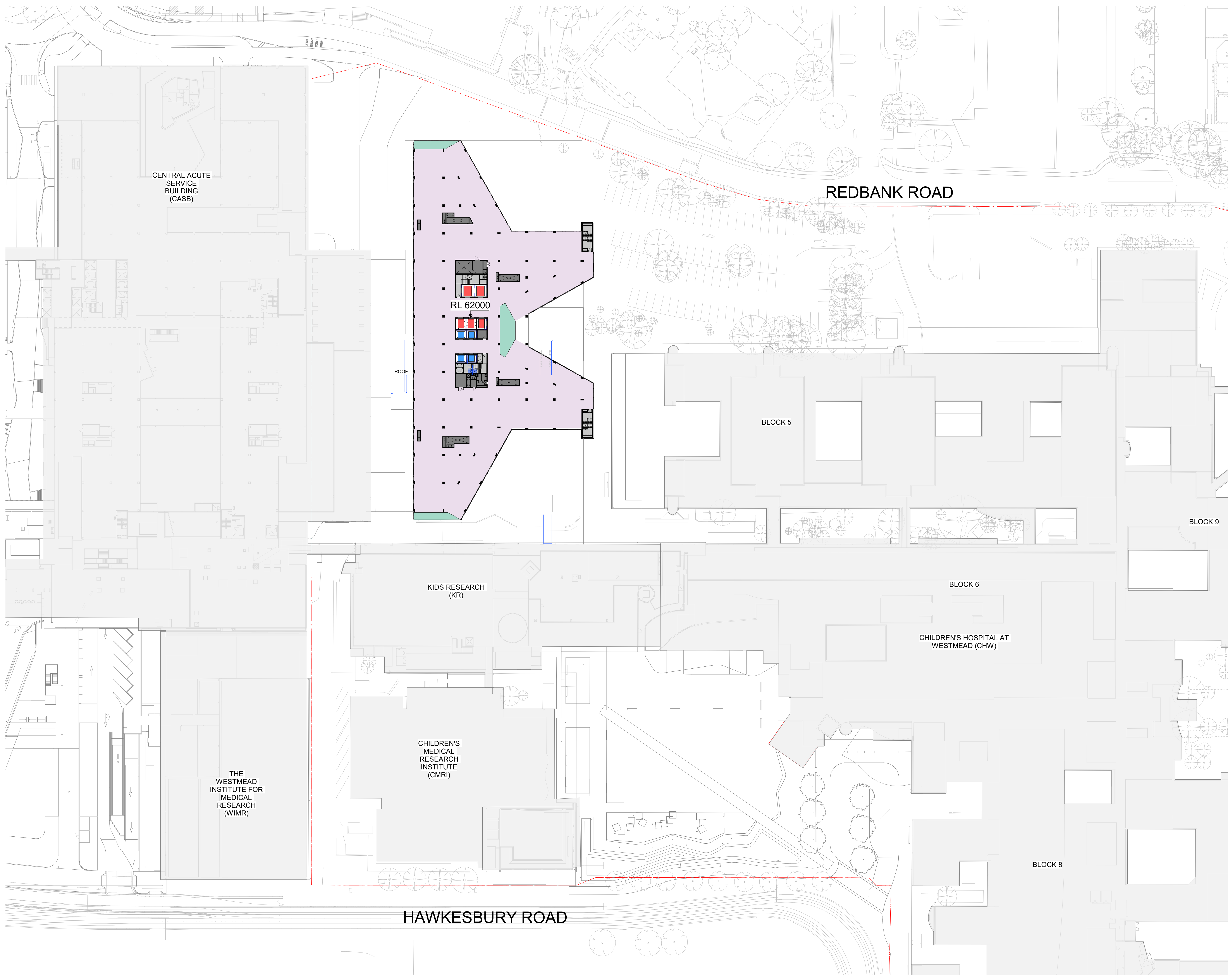
PROJECT
The Children's Hospital at Westmead
Stage 2 Redevelopment

Sheet Name
PROPOSED PLAN - LEVEL 10



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SM	AF	A
Project No	19038	
Drawing No	CHW-AR-DG-PSB-SSD019	

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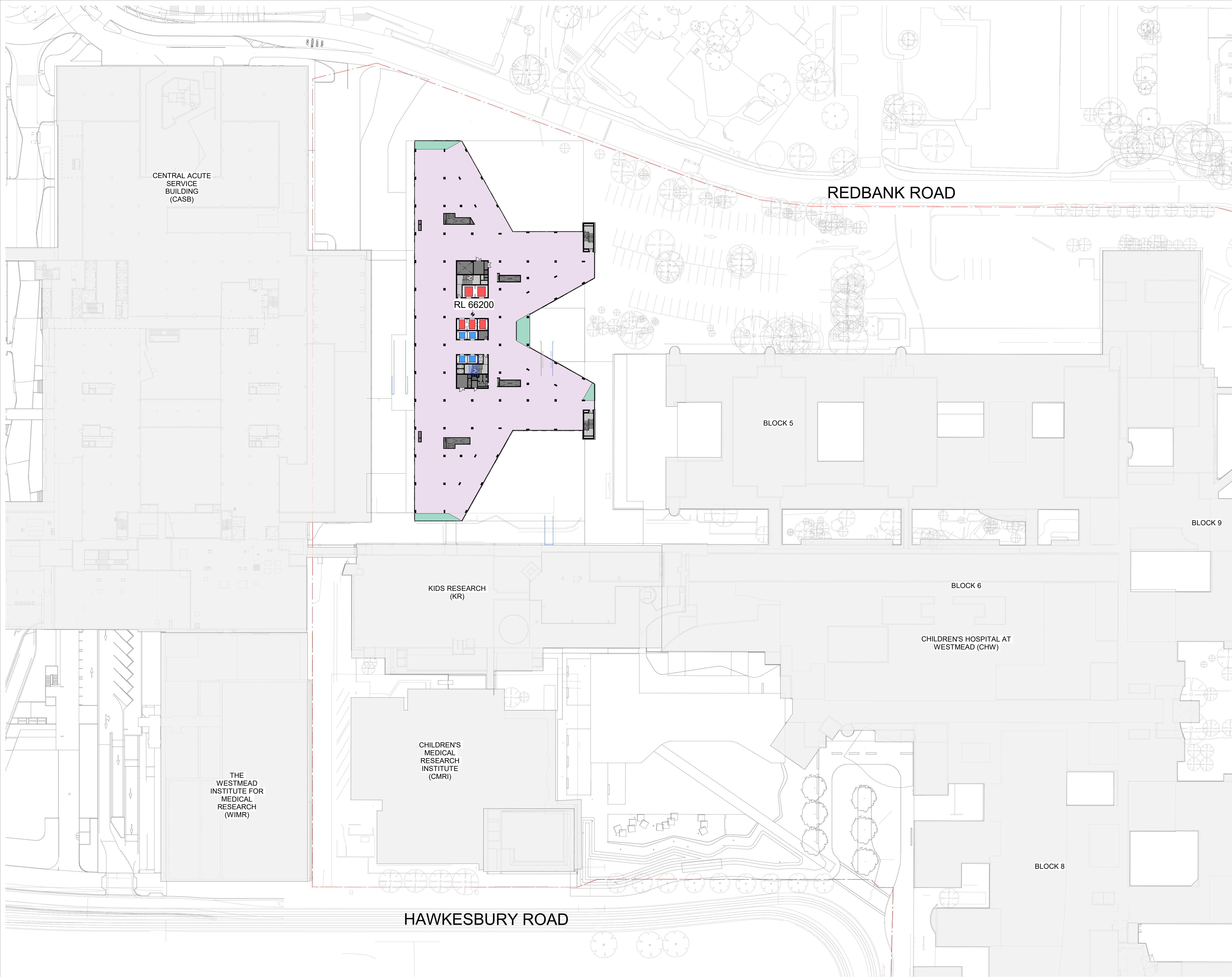
The Children's Hospital at Westmead Stage 2 Redevelopment

Sheet Name
PROPOSED PLAN - LEVEL 11

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Project No	19038	Revision	A
Drawing No	CHW-AR-DG-PSB-SSD020		

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The Children's Hospital at Westmead Stage 2 Redevelopment

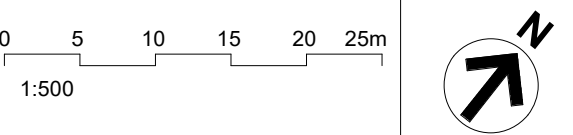
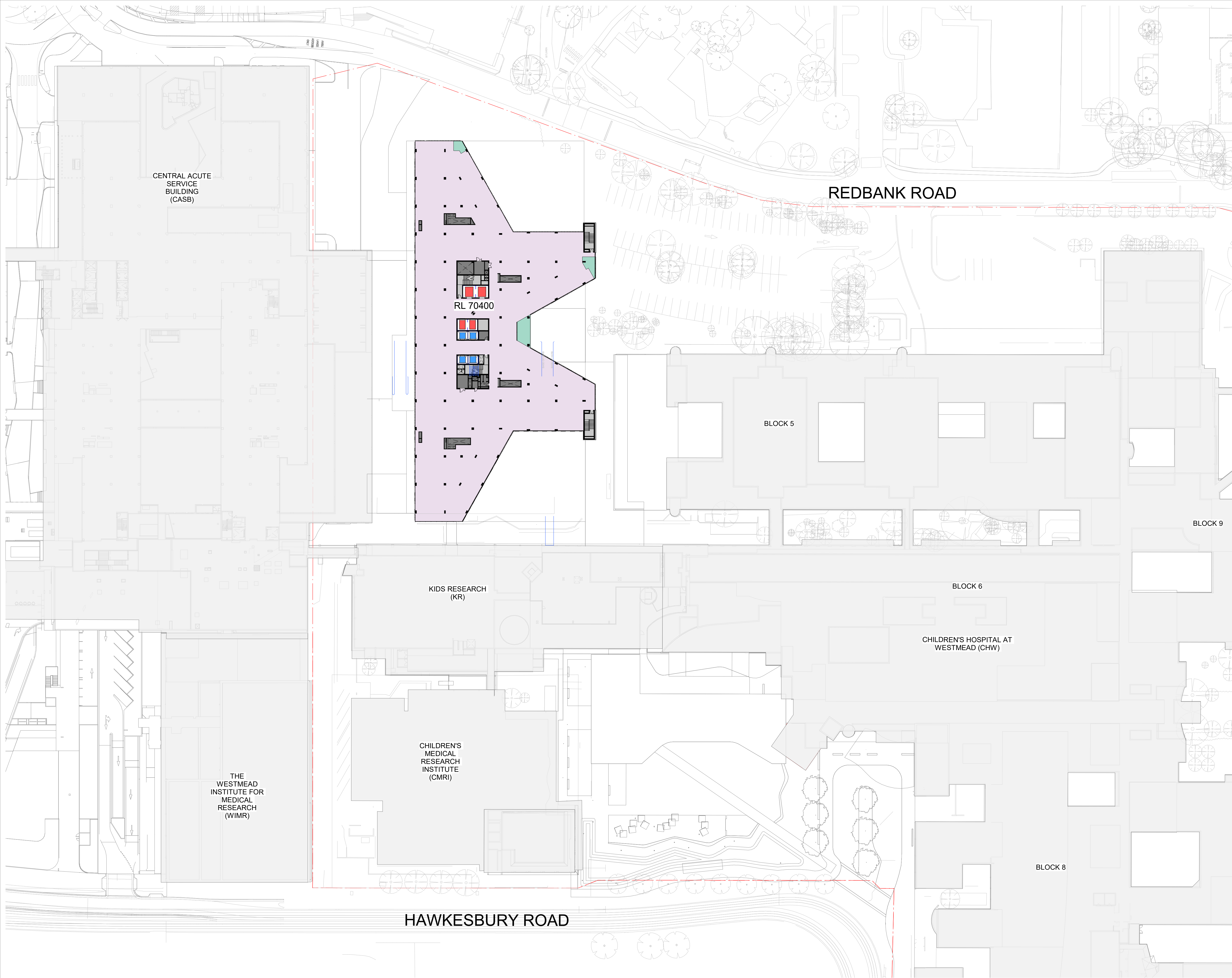
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PROPOSED PLAN - LEVEL 12

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Project No	19038	Revision	A
Drawing No	CHW-AR-DG-PSB-SSD021		

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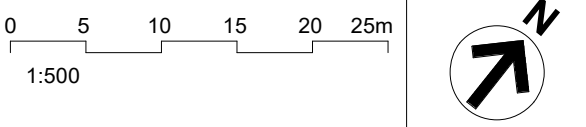
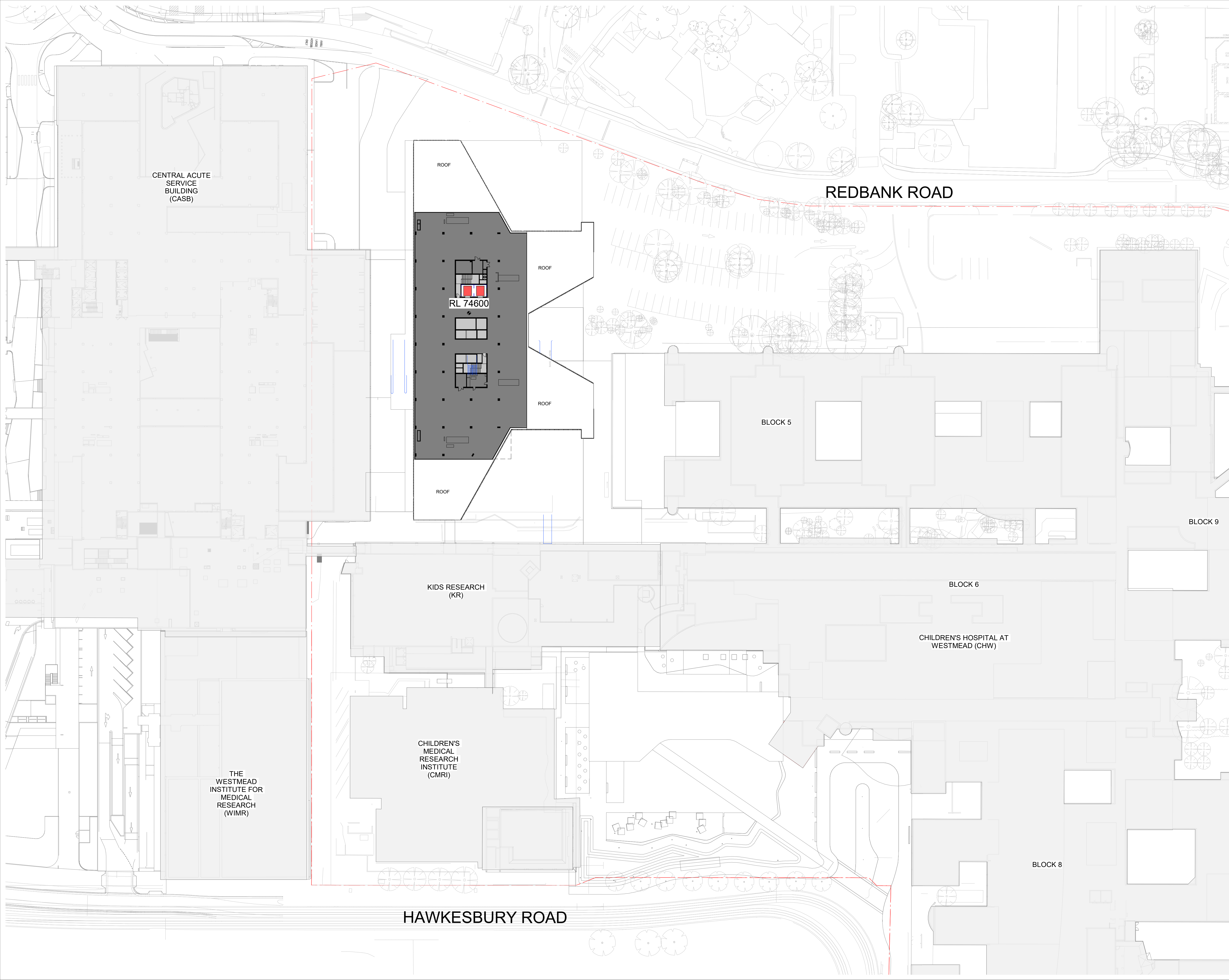
PROJECT	The Children's Hospital at Westmead Stage 2 Redevelopment
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Sheet Name
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Project No	19038	Revision	A
Drawing No	CHW-AR-DG-PSB-SSD022		

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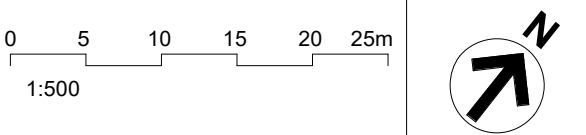
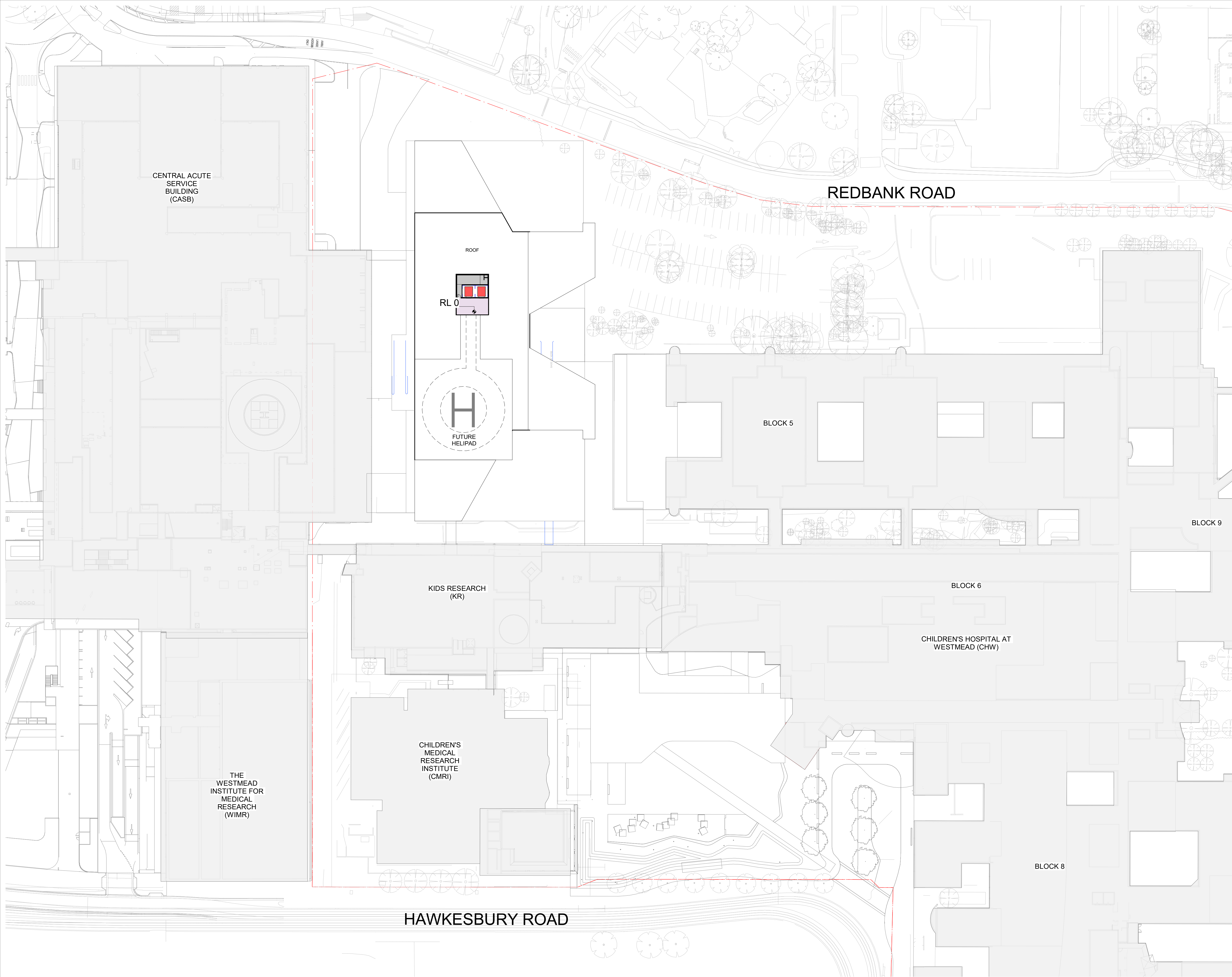
PROJECT
The Children's Hospital at Westmead Stage 2 Redevelopment

Sheet Name
PROPOSED PLAN - LEVEL 14

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SM	AF	A
Project No	19038	
Drawing No	CHW-AR-DG-PSB-SSD023	

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The Children's Hospital at Westmead Stage 2 Redevelopment

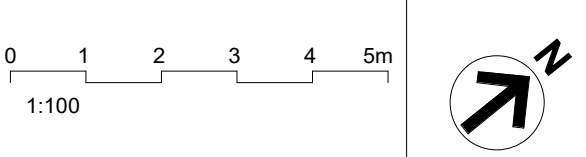
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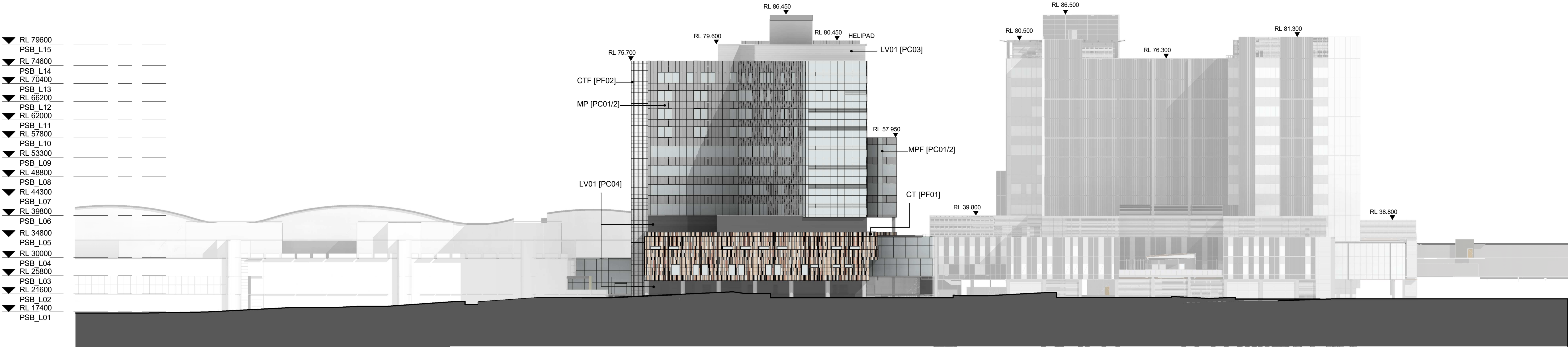
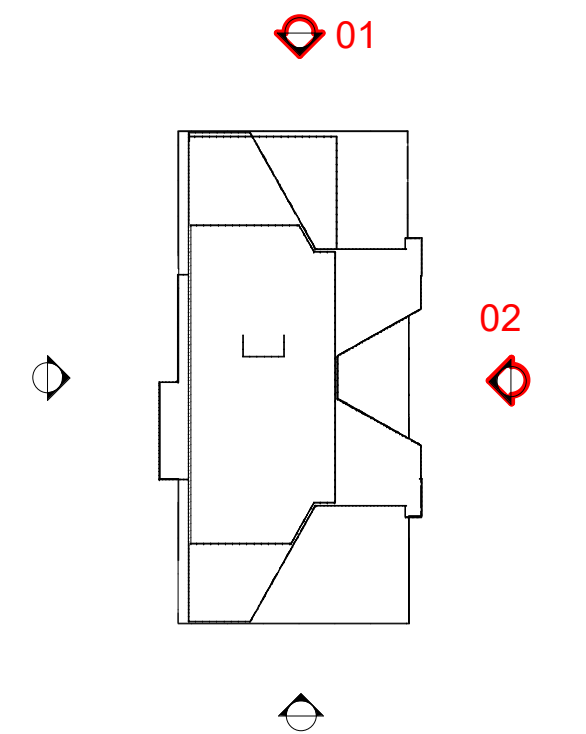
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Project No	19038	Revision	A
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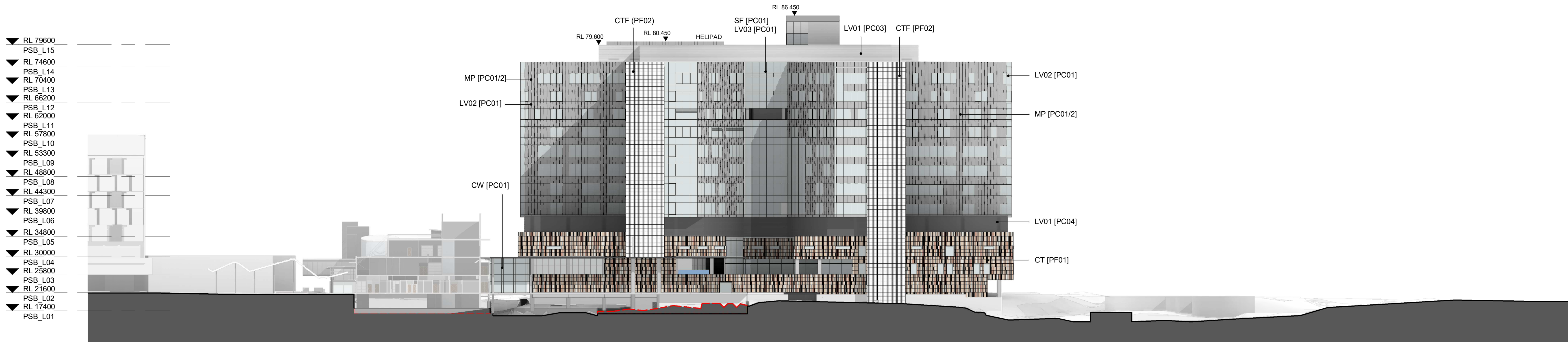
1 NORTH WEST ELEVATION - PROPOSED

1 : 500

EXISTING CHILDREN'S HOSPITAL WESTMEAD

PAEDIATRIC SERVICES BUILDING

CENTRAL ACUTE SERVICES BUILDING



2 NORTH EAST ELEVATION - PROPOSED

1 : 500

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PROJECT

The Children's Hospital at Westmead

Stage 2 Redevelopment

Sheet Name

ELEVATIONS - SHEET 01

Scale

1 : 500@A1

Drawn By

LL

Checked By

AF

Project No

19038

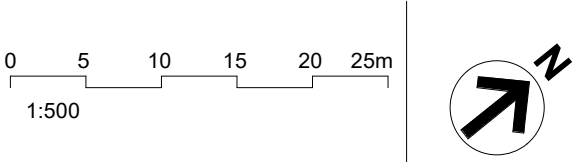
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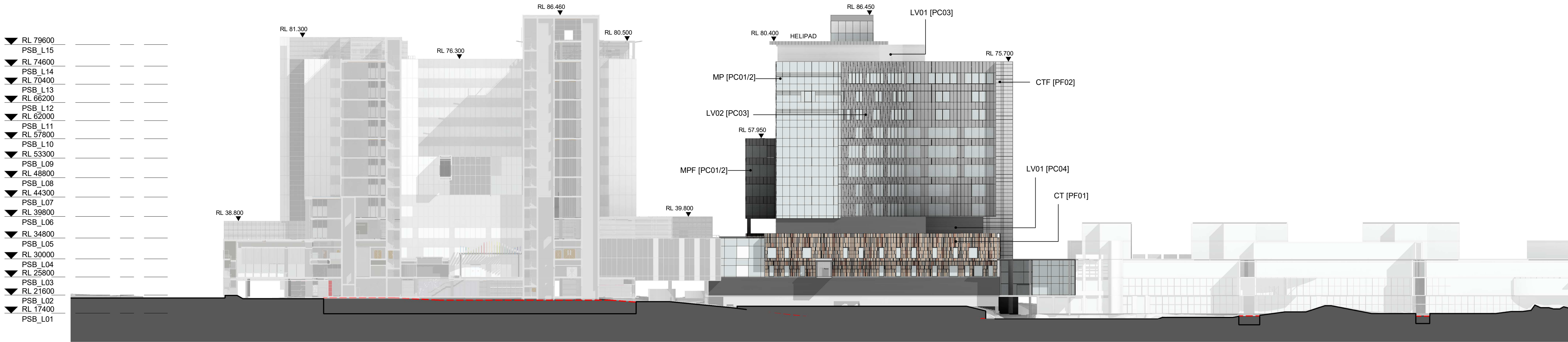
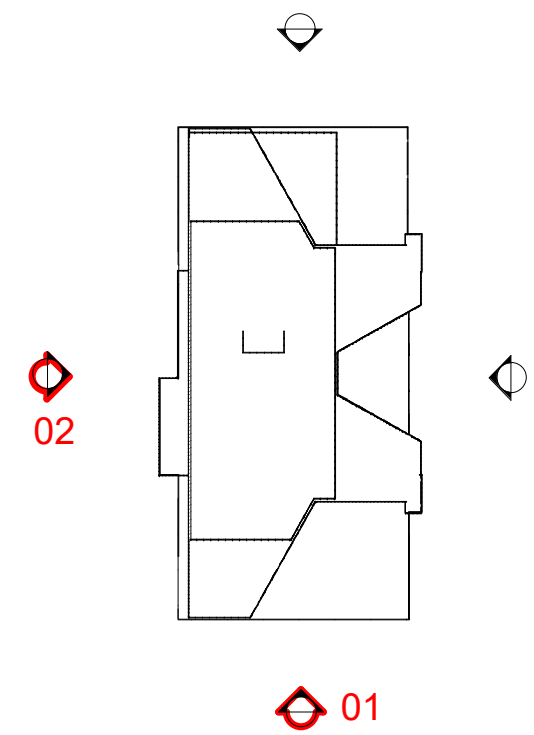
FOR INFORMATION

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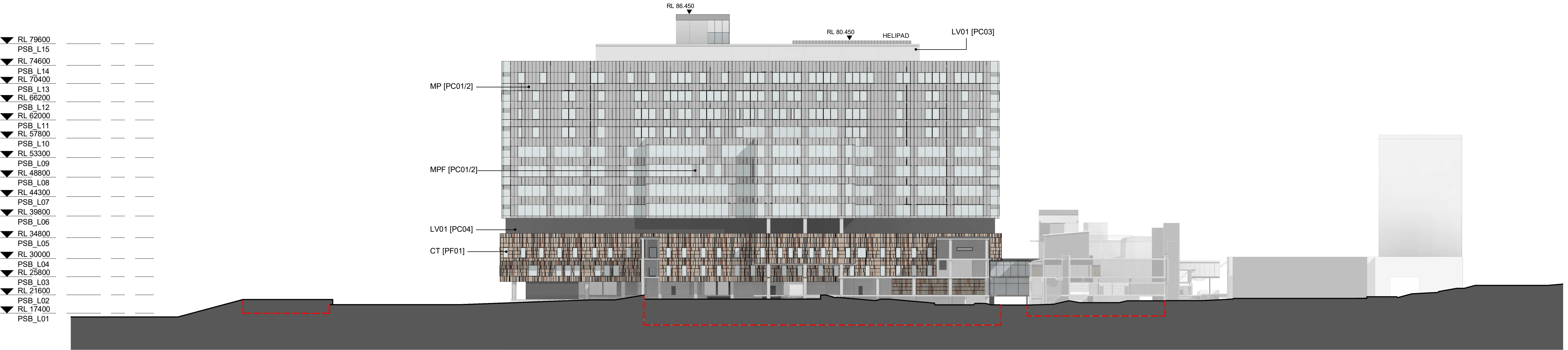
KEY PLAN



1 SOUTH EAST ELEVATION - PROPOSED

1 : 500

HOSPITAL BOULEVARDE CENTRAL ACUTE SERVICES BUILDING PAEDIATRIC SERVICES BUILDING EXISTING CHILDREN'S HOSPITAL WESTMEAD



2 SOUTH WEST ELEVATION - PROPOSED

1 : 500

REDBANK ROAD PAEDIATRIC SERVICES BUILDING KIDS RESEARCH INSTITUTE KIDS WAY CMRI

A ISSUED FOR INFORMATION 16/11/20

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NSW Health Infrastructure

PROJECT

The Children's Hospital at Westmead

Stage 2 Redevelopment

Sheet Name

ELEVATIONS - SHEET 02

Scale

1 : 500@A1

Drawn By

LL

Project No

19038

Drawing No

CHW-AR-DG-PSB-SSD031

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Date

16/11/20

Revision

A

Checked By

AF

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Appendix C Unexpected Finds Protocol

**BE AWARE
UNEXPECTED HAZARDS MAY BE PRESENT**



drums



asbestos



chemical bottles



odour

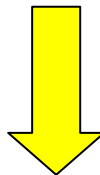


ash / slag

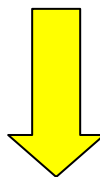


demolition waste

if you SEE or SMELL anything unusual



STOP WORK & contact the Site Foreman



do not restart working before the area has been
investigated and cleared by an Environmental
Consultant

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Document Status

Rev No.	Author	Reviewer	Approved for Issue		
		Name	Name	Signature	Date
A	Chris Bielby	John De Martin	Draft for Client Review	Draft for Client Review	6/11/2020
B	Chris Bielby, Jessica Staehli	Mitchell Hodgins, Matthew Bennett	Matthew Bennett	Draft for Auditor Review	27/11/2020
C	Chris Bielby, Jessica Staehli	Mitchell Hodgins, Matthew Bennett	Matthew Bennett	Draft for Auditor Review	9/2/2021

