



Health Infrastructure NSW
Construction Waste Management Plan

Paediatric Services Building at
The Children's Hospital at Westmead

27 November 2020

56200/133372 Rev B

JBS&G Australia Pty Ltd

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Abbreviations

Term	Definition
BCA	Building Code of Australia
CWMP	Construction Waste Management Plan
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
POEO Act	NSW <i>Protection of the Environment Operations Act 1997 and Amendment Act 2011</i>
PSB	Paediatric Services Building
SEARs	Secretary's Environmental Assessment Requirements
SCHN	Sydney Children's Hospital Network
WARR	Waste Avoidance and Resource Recovery
WRAPP	Waste Reduction and Purchasing Policy

1. Introduction

JBS&G Australia Pty Ltd has been engaged by PricewaterhouseCoopers Australia (PWC) on behalf of Health Infrastructure NSW (HI, the client) to prepare a Construction Waste Management Plan (CWMP) for construction of The Children's Hospital at Westmead (CHW) Paediatric Services Building (PSB) and associated infrastructure.

Pursuant to the *Environmental Planning and Assessment Act 1979*, and Regulation (2000), the project is considered a State Significant Development, requiring the preparation of an Environmental Impact Statement (EIS). This CWMP has been prepared to support the Environmental Impact Statement in response to waste management requirements for the project.

1.1 Scope

This CWMP has been developed to address the Secretary's Environmental Assessment Requirements (SEARs) issued by the NSW Department of Planning and Environment (SSD-10349252), with regard to waste management. The SEARs waste management requirement is described in **Table 1.1** below.

Table 1.1 Waste Scope

Key Issue	Requirement
Waste	• Identify, quantify and classify the likely waste streams to be generated during construction and operation. • Describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste. • Identify appropriate servicing arrangements (including but not limited to, waste management, loading zones, mechanical plant) for the site. • Provide a hazardous materials survey of existing aboveground buildings that are proposed to be demolished or altered.

In accordance with the SEARs requirements, this CWMP addresses the likely waste streams and indicative estimated quantities, and proposes management, reuse, recycling and disposal procedures during construction of the PSB. Operational waste management for the PSB will be covered in a separate report prior to construction. The hazardous materials survey of the P17 car park proposed to be demolished has been provided as a separate report.

1.2 Objectives

The key objectives of this CWMP are to identify the types and quantities of potential waste streams, and establish management measures to prevent environmental harm, minimise waste and maximise resource preservation.

Specific objectives addressed by this CWMP include to:

- address the SEARs requirements for waste for the PSB;
- promote waste minimisation through avoiding and reducing waste generation;
- comply with legislative criteria and adhere to waste minimisation guidance and standards;
- apply the waste management hierarchy (**Section 6.1**) throughout construction; and
- specify safe and appropriate management of potentially contaminated wastes.

2. Project Description

2.1 Background

CHW forms part of the Sydney Children's Hospital Network (SCHN) and is committed to providing world-class paediatric health care in a family-focused, healing environment. CHW falls within the Westmead Precinct which is one of the largest health, education, research and training precincts in Australia and a key provider of jobs for the greater Parramatta and western Sydney region.

A master planning study of the Precinct was undertaken in November 2013 to inform planning and redevelopment of Westmead Hospital and CHW.

This Master Plan has been updated and optimised to identify the preferred location for a new PSB.

2.2 Location

The Westmead Precinct is located 25 km west of the Sydney CBD. The Parramatta CBD is located approximately 2.5 km southeast of the hospital precinct.

The proposed location for the PSB site is centrally located within the precinct, east of the newly constructed Acute Services Building (ASB) and between the existing Adults and CHW Hospitals.

The location of the proposed PSB site is shown in **Figure 1**.

2.3 Existing Environment

The natural topography of the Westmead Hospital Precinct is downwards to the north and northwest, with surface levels ranging from approximately RL 32 m AHD in the south-western corner of the campus to about RL 10 m AHD along the Toongabbie Creek and Parramatta River; and about RL 18 m AHD in the north-eastern corner to approximately RL 10 m AHD along Darling Mills Creek and Parramatta River.

The Toongabbie Creek is a natural waterway situated along the northern boundary of the precinct. According to flood mapping undertaken by Parramatta City Council, the northwest development zone is located above the 1 in 100 year flood planning level, but within the probable maximum flood event level (average recurrence interval of between 10,000 to 100,000 years).

The Remedial Action Plan (RAP), developed by JBS&G to investigate existing site conditions and provide a remedial strategy for the site, identified that asbestos impacted soils were known to be present at the site. Measures outlined in the RAP are being undertaken as a component of this SSDA approval.

2.4 Demolition and Construction Activities

Prior to construction of the PSB, demolition of the existing 4 level car park will be required. Demolition of the car park is being undertaken via a REF approvals pathway and thus will be completed prior to, and is not the subject of, the SSDA for the PSB.

The project involves:

- 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 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.

A copy of the PSB design plans are provided in **Appendix A**.

2.5 Commencement

The project is anticipated to commence in 2021.

Prior to commencement of construction, detailed plans for environmental management and waste management during construction will be developed. These will be based on detailed design and construction planning and will supersede the information provided in this plan.

3. Legislative Requirements and Guidelines

3.1 Legislation

This CWMP has been prepared in accordance with the requirements of the NSW *Waste Avoidance and Resource Recovery Act 2001*, and the NSW *Protection of the Environment Operations Act 1997 and Amendment Act 2011* (POEO Act). These and other key legislation relevant to waste management at the site are provided in **Table 3.1**.

Table 3.1 NSW Waste Legislation Summary

Legislation	Purpose
<i>Waste Avoidance and Resource Recovery Act 2001</i>	The Act promotes waste avoidance and resource recovery, and is administered by NSW EPA. The Act establishes a scheme to promote extended producer responsibility in place of industry waste reduction plans, and continues the Waste Fund for the purpose of funding relevant programs and NSW EPA. Objectives of the Act include: • to encourage the most efficient use of resources and to reduce environmental harm; • to ensure that resource management options are considered against a hierarchy (see Section 6.1); • provide for the continual reduction in waste generation; • to minimise the consumption of natural resources and the final disposal of waste; • to ensure that industry shares with the community the responsibility for reducing and dealing with waste; and • to assist in the achievement of the objectives of the Protection of the Environment Operations Act 1997.
<i>Protection of the Environment Operations Act 1997 and Amendment Act 2011</i> <i>Protection of the Environment Operations (Waste) Regulation 2014</i> <i>Protection of the Environment Operations (General) Regulation 2009</i>	The Act is the key piece of environment protection legislation administered by the EPA. The object of the Act is to achieve the protection, restoration and enhancement of the quality of the NSW environment. The Act enables the Government to establish policy instruments for setting environmental standards, goals, protocols and guidelines.
<i>Environmental Planning and Assessment Act 1979</i> <i>Environmental Planning and Assessment Regulation 2000</i>	The Act and the Regulation provide the overarching structure for planning in NSW. They provide for a number of other statutory documents to support the planning structure, including State Environmental Planning Policies and Local Environmental Plans. The objectives include: • the proper management, development and conservation of natural and artificial resources; and • to encourage ecologically sustainable development.
<i>Contaminated Land Management Act, 1997 and Amendment Act 2008</i>	The Act establishes a process for investigating and (where appropriate) remediating land that the EPA considers to be contaminated significantly enough to require regulation.

3.2 Guidelines

Guidance documents and policies considered in the preparation of this CWMP are included in **Table 3.2**.

Table 3.2 NSW Guidance Summary

Guideline	Purpose
NSW Environment Protection Authority (EPA) Waste Classification Guidelines (Part 1) 2014	The Waste Classification Guidelines have been established by the NSW EPA to assist waste generators to classify wastes. Wastes are classified into groups that pose similar risks to environment and human health. Waste classifications are discussed further in Section 4.1 .
Building Code of Australia (BCA)	The BCA contains technical provisions for the design and construction of buildings and other structures, covering such matters as structure, fire resistance, access and egress, services and equipment, and energy efficiency as well as certain aspects of health and amenity.
NSW EPA's Waste Avoidance and Resource Recovery (WARR) Strategy 2014-21	The WARR strategy provides a framework for waste management for the state until 2021. Key targets include: • avoid and reduce waste generation; • increase recycling; • divert more waste from landfill; • manage problem wastes better; • reduce litter; and • reduce illegal dumping.
NSW EPA's Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities 2012	The guide provides advice to assist architects, developers, council staff and building managers to incorporate better waste management practice into the design, establishment, operation and ongoing management of waste services in commercial and industrial developments.
NSW Government Resource Efficiency Policy 2014	The policy aims to reduce the operating costs of NSW Government agencies through resource efficiency, and ensure that they provide leadership in resource-productivity. The policy replaces the previous NSW Government Sustainability Policy and streamlines reporting under the Waste Reduction and Purchasing Policy (WRAPP). Local government, state-owned corporations, public trading enterprises and public financial enterprises are strongly encouraged to adopt this policy's approach.
Waste management Guidelines for health care facilities 1998 (NSW Health)	The Guidelines provide a minimum standard for safe and efficient waste management for NSW Public Health Care Facilities. They represent the result of consultation with the Environmental Protection Authority (EPA), WorkCover, Waste Industry and health workers.
How to manage and control asbestos in the workplace, Code of Practice, 2019 (NSW Government)	The Code of Practice is an approved code of practice under section 274 of the <i>Work Health and Safety Act 2011</i> . The Code provides guidance on how to manage risks associated with asbestos and asbestos containing material at the workplace and thereby minimise the incidence of asbestos-related diseases such as mesothelioma, asbestosis and lung cancer.
Australian Government Construction and Demolition Waste Guide, 2011	The aim of the guide is to help develop effective markets for materials diverted or derived from the construction and demolition waste stream.
Australian Government Sustainable Procurement Guide, 2013.	The Guide aims to reduce the adverse environmental, social and economic impacts of purchased products and services throughout their life through considerations such as waste disposal and the cost of operation and maintenance over the life of the goods. The Guide was developed to assist Australian Government purchasers to include sustainability considerations in all stages of the procurement process, from identifying the business need to disposing of goods.

3.3 Waste Management Policy

This CWMP takes account the Sydney Children's Hospital Network (SCHN) Waste Management Policy (2015). The Waste Management Policy has been designed to familiarise SCHN employees with their responsibilities in waste management in order to comply with legislative requirements.

The policy is primarily focused on waste management associated with health care facilities and, in particular, hospital waste streams including waste related to general hospital activities as well as general waste. Management measures required for construction activities are generally not comparable with those outlined in the policy manual for hospital waste, with the exception of general (putrescible) waste. As such, this CWMP has been prepared as a stand-alone document to complement the policy manual.

The management of general waste described in the policy manual for non-clinical areas in a hospital setting is consistent with the requirements of general waste on the PSB site. This includes management and appropriate segregation of products not able to be recycled (general food/household waste, confidential waste, trade waste) from those that are recyclable (paper, glass, plastic, e-waste etc). The construction contractor will liaise with SCHN to determine opportunities for storage and collection of general waste within the existing waste management system.

The SCHN commitment to provide a sustainable future, by supporting a waste management program that is safe, efficient, cost effective and protects the environment, is maintained throughout this waste strategy.

4. Waste Streams and Classification

4.1 EPA Waste Classification

As described in **Section 3.2**, the NSW EPA Waste Classification Guidelines (Part 1) provides for the classification of wastes into groups that pose similar risks to the environment and human health (NSW EPA, 2014b), which are defined in the *Protection of the Environment Operations Act 1997*. Classes of waste described in the guideline are:

- Special waste
- Liquid waste
- Pre-classified waste:
 - Hazardous waste
 - Restricted solid waste
 - General solid waste (putrescible)
 - General solid waste (non-putrescible).

Special Waste

Special wastes are wastes that pose specific regulatory requirements due to the risks of harm to the environment and human health. These wastes include clinical and related waste, asbestos waste, waste tyres, and anything classified as special waste under an EPA gazettal notice. Special wastes associated with the PSB are described further in **Section 6.3**.

Liquid Waste

Liquid waste is classified as any waste (other than special waste) that meets the following criteria:

- has an angle of repose of less than 5 degrees above horizontal;
- becomes free-flowing at or below 60 degrees Celsius or when it is transported;
- is generally not capable of being picked up by a spade or shovel; and/or
- is classified as liquid waste under an EPA gazettal notice.

Pre-classified Waste

Where the waste is neither liquid nor special waste; the EPA has pre-classified other commonly generated waste types, as defined in Schedule 1 of the *Protection of the Environment Operations Act 1997*. This includes hazardous waste, restricted solid waste, general solid (putrescible) and general solid (non-putrescible) waste. Putrescible waste is the component of the waste stream that is liable to become putrid, and usually refers to vegetative, food and animal products.

A list of all currently gazetted waste classifications are provided on the EPA website at: www.epa.nsw.gov.au/waste/wastetypes.htm.

4.2 Waste Streams and Classifications

Potential waste types and corresponding EPA classifications for construction of the PSB building are summarised in **Table 4.1**.

Table 4.1 Potential Waste Types and Classifications

Waste Type	EPA Classification	Generated during construction
Concrete	General solid waste (non-putrescible)	Y
Road materials (asphalt, rubble, crushed rock)	General solid waste (non-putrescible)	Y
Soils and sands	General solid waste (non-putrescible)	Y
Contaminated materials (asbestos)	Special waste	Potential
Rock and excavated stone	General solid waste (non-putrescible)	Y
Metals (steel, aluminium, stainless steel, and copper piping or wire)	General solid waste (non-putrescible)	Y
Timber	General solid waste (non-putrescible)	Y
Plastics – packaging	General solid waste (non-putrescible)	Y
Plastics – durables (non-packaging)	General solid waste (non-putrescible)	Y
Plasterboard	General solid waste (non-putrescible)	Y
Glass	General solid waste (non-putrescible)	Y
Electrical (HV and LV)	General solid waste (non-putrescible)	Y
Optic fibre wiring	General solid waste (non-putrescible)	Y
Light bulbs	Hazardous waste	Potential
Batteries	Hazardous waste	Potential
Empty drums (e.g. oil, fuel, chemicals, paint, spill clean-up)	Hazardous waste if the containers previously used to store Dangerous Goods (Class 1, 3, 4, 5 or 8) and from which residues have not been removed by washing or vacuuming. General solid (non-putrescible) waste if containers cleaned by washing or vacuuming.	Y
General refuse	General solid waste (putrescible) General solid waste (non-putrescible)	Y
PVC pipes (stormwater, electrical, optic fibre, sewer)	General solid waste (non-putrescible)	Y
Site runoff (waste water)	Liquid waste	Y
Sewage	Liquid waste	Y

5. Construction Waste Quantities

Indicative quantities of waste likely to be generated during construction (excluding excavation and other enabling works) have been calculated based on published waste generation rates for construction projects. Published data for total waste volumes per unit area and for waste composition have been used, and combined with the total areas of each component of the project to estimate waste generation.

Estimates of total waste volumes per unit area have been derived from benchmark data developed by the UK Building Research Establishment (see **Table 5.1**), which is based on waste generation at various construction projects including healthcare, commercial, industrial and public buildings. A value of 20 m³ per 100 m² has been adopted to estimate waste generation for the PSB, as an average between healthcare and public building waste. A value of 13 m³ per 100 m² has been adopted for the carpark areas, levels containing plant, levels set aside for expansion, consistent with the industrial buildings project type, which most closely reflects this project component.

Table 5.1 Average Volume of Waste Produced by Different Project Types

Project Type	Average volume (m3) of waste per 100 m2
Residential	18.1
Public buildings	20.9
Leisure	14.4
Industrial Buildings	13.0
Healthcare	19.1
Education	20.7
Commercial Other	17.4
Commercial Offices	19.8
Commercial Retail	20.9

Source: BRE (2012)

Indicative waste composition information shown in **Table 5.2** (derived from the Sustainability Victoria Waste Wise Tool Kit (2013)) has then been applied to the estimated total waste volumes to estimate quantities for each waste stream.

Table 5.2 Guideline to Waste Composition and Volumes - Construction

Material	Estimated Waste %	Conversion Factor (Density) (Tonne per m ³)
Hard material	32%	1.2
Timber	24%	0.3
Plastics	15%	0.13
Cement sheet	9%	0.5
Gypsum material	6%	0.2
Metals	6%	0.9
Paper / card	4%	0.1
Vegetation	3%	0.15
Soil	1%	1.6
Other	0.3%	0.3

Table 5.3 summarises the waste types and indicative volumes that have been estimated for construction of the PSB. The total waste volumes for each of these components of the development has been estimated using the following floor areas, which have been derived from the design plans in **Appendix A**:

- PSB, areas developed for healthcare – 43 300 m²;
- PSB, other areas – plant, car parking, etc – 26 300 m².

The quantities outlined in **Table 5.3** are high level estimates and are intended to provide an indication of potential waste generation quantities. It is expected that actual waste quantities and composition will vary depending on outcomes of detailed design, materials specification and

construction planning and methods. Strategies that will be implemented to minimise waste generation and maximise reuse and recycling are outlined in **Section 6**.

Table 5.3 Waste Types and Indicative Volumes

Material	Estimated waste % (see Table)	Estimated Waste (m3)		Estimated Waste (Tonnes)	
		PSB – areas developed for healthcare	PSB – other areas	PSB – areas developed for healthcare	PSB – other areas
Hard material	32%	2771	1117	3325	1341
Timber	24%	2078	838	624	251
Plastics	15%	1299	524	169	68
Cement sheet	9%	780	314	390	157
Gypsum material	6%	520	210	104	42
Metals	6%	520	210	468	189
Paper / card	4%	346	140	35	14
Vegetation	3%	260	105	39	16
Soil	1%	87	35	139	56
Other	0.3%	26	10	8	3
TOTAL	100%	8687	3503	5301	2137

It is also understood that a final CWMP will be prepared by the construction contractor when appointed.

6. Waste Management

6.1 Waste Hierarchy

Waste management for the project will be undertaken in accordance with the waste hierarchy, which underpins the objectives of the *Waste Avoidance and Resource Recovery Act 2001*. The waste hierarchy shown in **Diagram 6.1** demonstrates preferred approaches to waste management to ensure sustainable development and use of resources.

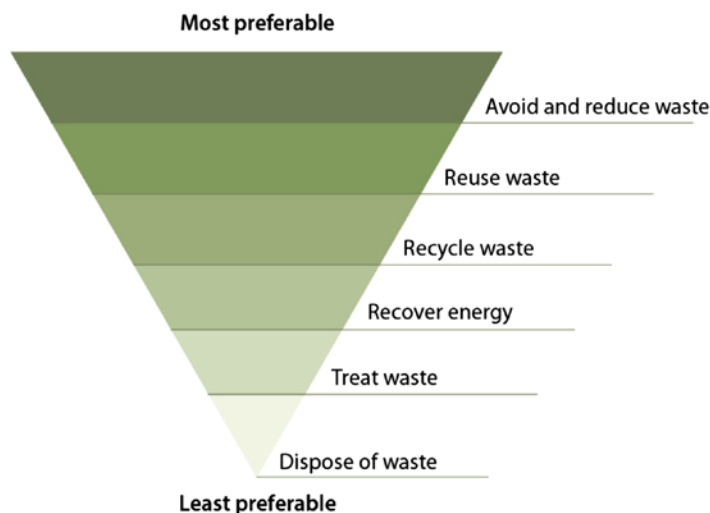


Diagram 6.1 – NSW EPA Waste Hierarchy

The hierarchy also aims to maximise efficiency and avoid unnecessary consumption of resources. This CWMP seeks to implement the waste hierarchy to minimise waste disposal and promote waste reduction in order of preference:

- Reduce or avoid waste through selection of items and design.
- Reuse materials without further processing.
- Recycle and process waste for reuse as a new product.
- Recover energy through combustion of materials where acceptable and in accordance EPA regulations.
- Treat waste to stabilise the waste product for disposal or reuse.
- Dispose of waste when no other management options are appropriate.

This section describes waste management measures in line with the hierarchy, and provides specific waste management strategies for the key waste classifications described in **Section 4**.

6.1.1 Avoidance and Reduction of Waste

The construction contractor will be required to avoid waste generation, and endeavour to reuse waste where available. Waste will be avoided through strategic selection of materials during design and purchasing that consider options which may reduce waste generation for construction of the PSB. This includes consideration of procurement of materials which are prefabricated, use minimal packaging, and are suitable for reuse across the site. Selection of construction materials will also consider the use of recycled items where practicable.

Opportunities to avoid wastes generated by construction include:

- Develop a procurement policy which considers waste avoidance measures such as:

- Order site specific or prefabricated items where practicable to minimise surplus material.
- Consider packaging material provided by suppliers during purchasing and reduce this requirement where possible, or consider returnable packaging.
- Material selection to consider recycled items.
- Refine waste stream estimates to ensure adequate on-site storage and waste segregation.
- Refine estimated volumes of materials for construction.

6.1.2 Reuse and Recycling

To maximise opportunities for reuse of waste materials onsite, measures to separate waste streams will be implemented. This includes segregating wastes into appropriate dedicated bins or areas for reclamation on site or transportation to a designated recycling facility.

Where practicable, uncontaminated spoil will be stockpiled for use during construction. Excavated materials containing asbestos cannot be safely recycled, and direct treatment and/or disposal is the most appropriate option. The construction contractor will liaise with a licensed asbestos removalist and local council to determine a suitable disposal facility, as discussed in **Section 6.3**.

Procedures to manage the reuse and recycling of waste materials during construction include:

- Incorporate waste management into development staging to promote reuse of materials across the site.
- Ensure areas for waste segregation are easily accessible and clearly defined.
- Ensure contractors are familiar with onsite waste storage areas for appropriate waste segregation.
- Determine suitability of materials generated during demolition for use in construction.
- Consider opportunities for materials reuse in areas in proximity to the site or local construction activities where practicable.

6.1.3 Treatment and Disposal

Project wastes may require treatment to stabilise them for appropriate disposal to reduce the risk of harm to human health or the environment. These materials are not suitable for reuse or recycling, and will be segregated and disposed of via a suitably qualified contractor for the waste stream.

Wastes will only be sent to landfill or disposal facilities where the prioritised management methods in the hierarchy cannot be implemented in a cost effective or practical manner. The construction contractor will liaise with the local council to determine appropriate disposal locations for potential waste streams.

Measures to manage the treatment and disposal of waste materials during construction include:

- Ensure wastes which cannot be reused or recycled and require disposal are clearly segregated from those which have the potential to be reused.
- Contractors and staff to be inducted into site waste management practices.
- Hazardous materials including asbestos to be disposed of in accordance with the handling and disposal requirements of SafeWork NSW and NSW EPA.
- General wastes to be disposed of in accordance with local council requirements.
- Toilet facilities must be regularly serviced and emptied by a licensed contractor.

6.2 Waste Stream Options

In addition to the waste management measures in **Section 6.1** aligned to the waste management hierarchy, waste stream specific management options will be implemented across the site to ensure appropriate waste handling. Key waste stream management options associated with construction are described below. The numbers and size of waste storage bins, containers, stockpile areas and loading zones on site will be determined by the construction contractor.

6.2.1 Concrete

Options exist for recovery of components of concrete associated with excess concrete following each pour during construction. Approximately 1 – 2 m³ may be expected at the end of each pour, during construction of the PSB, particularly associated with construction of foundations, structural slabs, floors, columns, kerbs, walkways, driveways, walls, and the helicopter pad.

Concrete can be reprocessed and may, in some instances, be reused across site, however, the general practice is to crush the concrete and arrange for disposal to a recycling facility or disposal offsite.

Options may include disposal of excess concrete to a HDPE lined pit on site, to allow for regular crushing and reprocessing or disposal to a recycling facility; or to place wet supply back into supply trucks to return to the manufacturer at the cost of an additional fee.

The construction contractor will determine suitable disposal of concrete waste in accordance with the waste management hierarchy.

6.2.2 Asphalt

Excess asphalt as a result of road works and carpark construction will most likely be recycled at an appropriately licensed facility. Measures to identify an appropriate asphalt plant will be assessed and undertaken by the construction contractor. Asphalt may also be used across the site where practicable.

Asphalt that has set and dried is potentially 100 per cent recyclable, however, reprocessing is not as readily undertaken as concrete (DSEWPaC, 2011).

6.2.3 Soils and Sand

Soils and sand excavated during footing and foundation construction which are designated as clean fill may be redistributed across the site for filling, levelling or landscaping provided they have not been in contact with asbestos containing materials. Where stockpiling is required prior to redistribution, control measures to avoid sediment and erosion will be implemented where appropriate. This may include establishing a bund or lining of the base with an impermeable HDPE plastic liner.

Where excess soil cannot be redistributed or has been situated in proximity to asbestos containing materials, the sand and soils are required to be treated and/or disposed of as contaminated waste via a licensed transporter to a disposal facility.

6.2.4 Rock and excavated stone

Excavation during preparation of footings for the PSB site may recover rock and stone. Depending upon the quantities and properties of the materials generated, materials may be used as aggregate or sub-base for other works across the site. The staging of the development as determined by the construction contractor will consider the timing of excavation and the construction of components of the redevelopment program to ensure availability and appropriate reuse of these materials across the site.

6.2.5 Metals

Metal wastes will most likely result from excess materials purchased for the site such as steel reinforcement. The purchasing procedure will consider appropriate procurement of materials to ensure a reduction in metal wastes. Where excess materials are encountered, reprocessing of mixed steel is a straightforward and common practice in the construction industry (DSEWPac, 2011). The construction contractor will investigate and determine appropriate storage and reprocessing of metals to reduce waste, including location and signage of skip bins onsite.

6.2.6 Timber

Quantities of timber associated with preparation of concrete slabs during construction will be dependent on the formwork methods used. The use of a system such as Bondek, which is a steel structural decking and ceiling system for concrete slabs, would result in less timber and formwork waste. Where timber is used for formwork, this may be re-used across site, however, it is anticipated that much of it will require disposal throughout the construction program and at the end of the program as the product degrades.

Timber associated with builder's wastes and packaging will be reduced through implementation of the purchasing procedure. Where timber framework is required for construction, items may be salvaged where safe and cost effective to do so. Reclaimed timber can be used for a variety of applications or distributed to salvage yards for reuse. The construction contractor will determine the viability of this option in consideration of the waste hierarchy. This includes liaising with a timber recycling and recovery contractor for collection and reprocessing of timber. The contractor will determine options of reuse of reprocessed timber across the site, including the use of woodchips during landscaping.

Salvaging timber from the construction works is a difficult process due to occupational health and safety requirements and the diminished quality of the refuse timber. Where reuse of timber is not feasible, the construction contractor will organise disposal of the timber to a licensed waste facility.

6.2.7 Plasterboard

Uncontaminated plasterboard (e.g. offcuts) or material with low levels of contamination such as nails and screws is completely recyclable and can be recycled for use in new plasterboard or the gypsum used in agricultural soil conditioners. The construction contractor will investigate and determine appropriate storage and recycling of plasterboard to reduce waste, including location and signage of skip bins onsite.

6.2.8 Plastics

Plastic wastes associated with packaging for construction materials can be recycled or in some cases returned to the supplier of the materials for reuse. The construction contractor will determine the approach to management of these plastics through correspondence with suppliers. Where possible, plastic (non-durable) wastes will be reduced through the procurement process.

6.2.9 General Waste

Wastes such as food waste, organics and biodegradable material will be created as a result of worker activity on site. Non-putrescible wastes are generally inert, or solid, and are not able to be composted, recycled, reprocessed or reused.

The construction contractor will liaise with SCHN to determine an appropriate means of putrescible waste disposal, and options for disposal within the existing waste management system at the hospital. If this option is not viable, the construction contractor will determine an appropriate waste disposal facility, and ensure adequate bins are provided on site for putrescible waste. This is particularly important around worker congregation areas, site office areas and toilet facilities.

It is likely that general waste will increase at times of internal and service fittings during construction, primarily associated with excess packaging materials and workers on site. The construction contractor will determine the location of skip bins, and specify waste stream separation measures across the site. It is anticipated that a skip bin approximately 10 m³ specifically allocated to general waste will be required on each building level.

Where possible, co-mingled recycling bins will be provided in common areas at work sites for plastic and glass bottles, soft drink cans, aluminium and tin cans to avoid these items being disposed to landfill. Specialised bins for cigarette butts will also be provided outside lunchrooms and nearby common areas at work sites.

6.2.10 Hazardous Waste

Small quantities of hazardous wastes may be generated (e.g. light bulbs, batteries, used drums from oil, fuel, chemicals or paint). Separate containers for the safe storage of these wastes will be provided where applicable, prior to removal offsite by an appropriately licensed contractor for recycling or disposal at a licensed facility.

6.2.11 Other Considerations

To ensure waste is not unintentionally tracked offsite, the vehicles or trailers used to transport waste or excavated spoil from the site will be covered before leaving the site, to prevent spillage or escape of dust, waste or spoil from the vehicle or trailer. Any mud, splatter, dust and other material that is likely to fall from the wheels, underside or body of vehicles, or plant leaving the site will also be removed through a wash down area prior to leaving the site.

6.3 Special Waste

Soils on site are known to be impacted with asbestos. Asbestos poses a risk to human health through exposure of loose fibres when damaged or disturbed. As such, asbestos is classified as special waste under the *Protection of the Environment Operations Act 1997*, and the EPA Waste Classification Guidelines (Part 1) 2014. Special wastes pose unique regulatory requirements due to the management responsibilities to minimise risk of harm.

Asbestos impacted soils will be managed in accordance with the Remedial Action Plan (RAP). Where safe and practicable, this will involve a cap and contain remedial strategy where asbestos materials are present. Where encapsulation is not possible, waste will be transported and disposed of in accordance with the requirements of the *Protection of the Environment Operations (Waste) Regulation 2014*, with disposal undertaken by a suitably qualified contractor.

It is possible that asbestos waste removal may be required where excavation is necessary for construction of footings for the PSB and other related accessways/landscaping. Further detailed design, and geotechnical assessment will determine the likelihood and potential volumes of asbestos waste. Handling and removal of asbestos waste will be undertaken in accordance with the RAP.

7. Implementation

This CWMP forms the basis of all waste management on site for the PSB construction. It is living document which will be reviewed and revised upon further site investigation and design following engagement of a construction contractor. Review of the CWMP will provide for accurate estimates of waste quantities to ensure appropriate onsite waste management in accordance with the waste management hierarchy.

A detailed schedule and planned work staging will also provide opportunities for waste reuse across the site and determine the requirements for temporary waste storage.

7.1 Roles and Responsibilities

It is expected that all personnel will commit to the CWMP and be responsible for their own actions in adhering the waste management objectives.

A Construction Site Manager will be the key person responsible for implementation of the CWMP and adherence to applicable legislation, guidelines, licensing and project conditions outlined in **Section 3**.

Table 7.1 presents suggested responsibilities for waste management. These may be refined upon appointment of the construction contractor.

Table 7.1 Roles and Responsibilities

Role	Responsibility
Environmental Management Representative	Compliance with applicable environmental licences, legislation and project conditions. Ensure environmental management plan(s) across the site are adhered to and accurate to site conditions. Undertake inspections to ensure compliance.
Construction Site Manager	Ensuring workers and subcontractors are inducted into the CWMP along with other applicable management plans. Responsible for undertaking procurement of construction materials in accordance with the waste management hierarchy. Segregation of waste streams where required to ensure appropriate use, treatment and/or disposal.
Health and Safety Manager	Safety inductions for all staff, workers and visitors. Work with Construction Site Manager to determine safe handling of asbestos waste in compliance with regulatory requirements.
Site Workers	Responsible for acting in accordance with the CWMP and site inductions. Informing the Construction Site Manager of any waste management incidences and Health and Safety Manager of any safety issues associated with on-site activities.

7.2 Training and Awareness

Staff present on site during the construction stage of the project will be required to undertake induction and awareness training inclusive of the CWMP and site specific waste management. This includes:

- Induction to the waste management hierarchy and use across the site
- Details of responsibilities for waste management and key personnel
- Site specific waste management practices relevant to the project stage such as:
 - Waste storage and stockpiling locations
 - Waste disposal requirements
 - Hazardous or special wastes
 - Record of waste disposal details and receipts
- Knowledge of emergency response procedures and contacts

Signage will be provided on site to ensure waste management measures are communicated across the site, particularly for contractors and visitors who are not regularly on site. Signage will highlight correct procedures for separating wastes where required, locations of bins and waste storage areas, labelling of designated bins, potential hazards associated with the waste streams and handling, and contact details should any issues be encountered.

Signage will be prepared and located on site in accordance with the Australian Standard (AS 1319) for safety signs, and the NSW EPA and Australian Standard for recycling signage.

8. Monitoring and Reporting

The following activities will be undertaken to inform future onsite waste management and to determine the success of the CWMP:

- Ensure waste quantities generated are recorded, including tracking of receipts from waste recycling or disposal.
- Record waste classification and testing results.
- Review the CWMP in light of any changes to construction activities or further information which may alter waste management practices.
- Undertake auditing of waste management across the site as a component of broader environmental site audits.
- Undertake visual inspections daily to ensure waste management controls are implemented and maintained across site.
- Undertake final review of the CWMP upon project completion to ensure information accurately reflects site activities, and to assist future waste management.

Outcomes of audits and waste tracking will be reported to Health Infrastructure NSW, potentially through weekly or monthly reporting to ensure waste management objectives are adhered to.

8.1 Corrective Action

Where formal auditing, daily visual inspections or incident reporting identify incorrect storage or disposal procedures, or maintenance or waste management issues, observations will be promptly reported to the Construction Site Manager and recorded. The Construction Site Manager will determine appropriate measures to rectify the issues in a timely manner in consultation with the Environmental Management Representative and Health and Safety Manager where required.

9. 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.

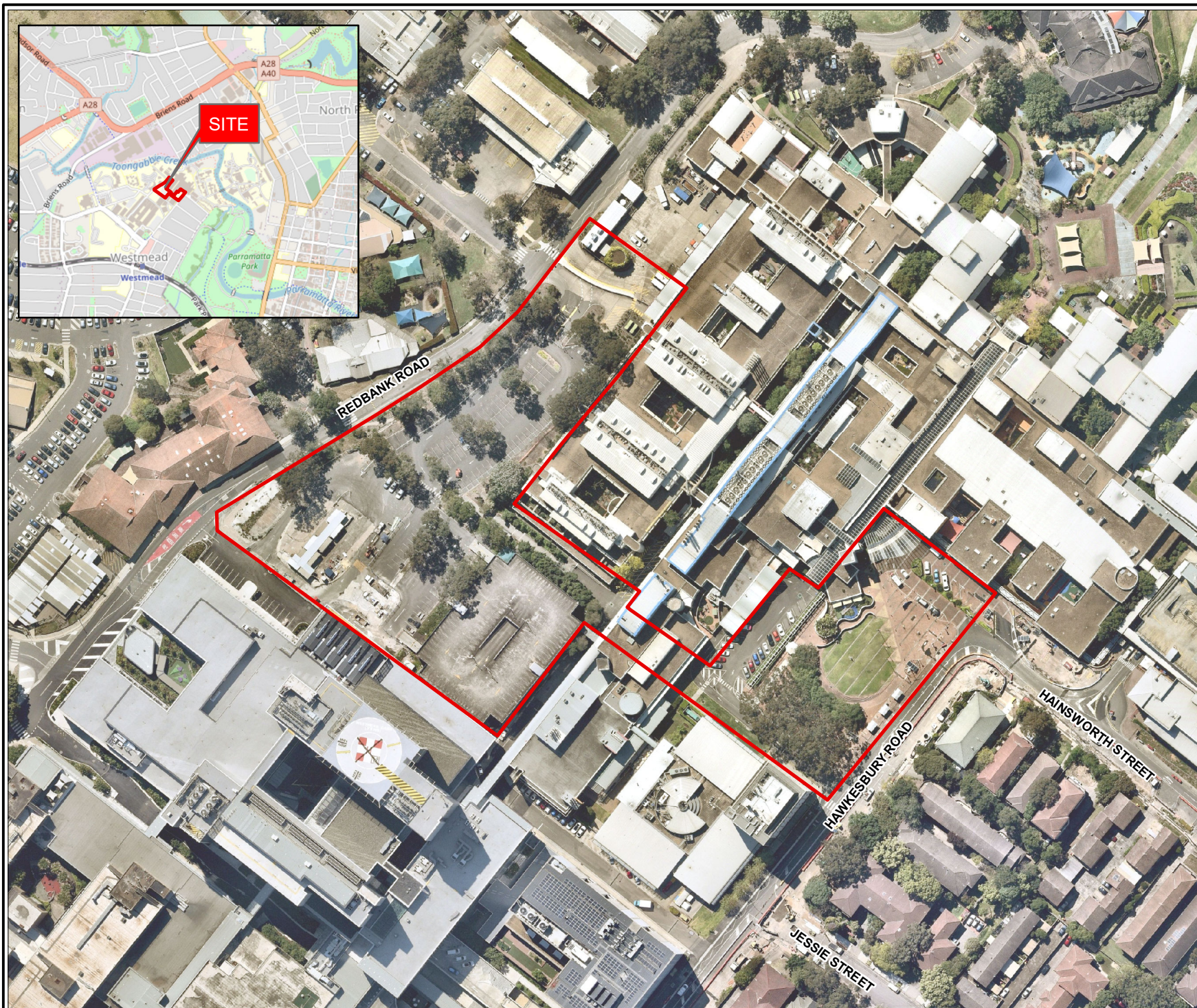
The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

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10. References

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Figures



Legend:

 Approximate Site Boundary



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Client: Health Infrastructure

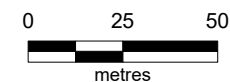
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Coord. Sys. GDA 1994 MGA Zone 56

**Westmead Hospital PSB,
Westmead, NSW**

SITE LAYOUT

FIGURE 1



Legend:

Approximate Site Boundary



Job No: 56200

Client: Health Infrastructure

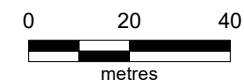
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**Westmead Hospital PSB,
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DESIGN PLAN

FIGURE 2

Appendix A Westmead Redevelopment: PSB Design Plans

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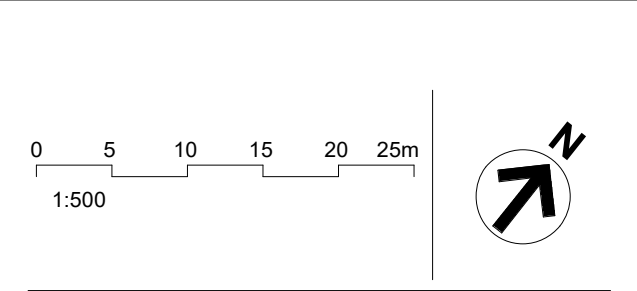
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Sheet Name	LOCATION PLAN - AERIAL PHOTOGRAPH
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Project No	19038	Revision	A
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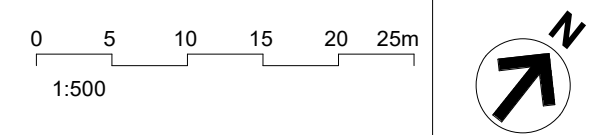
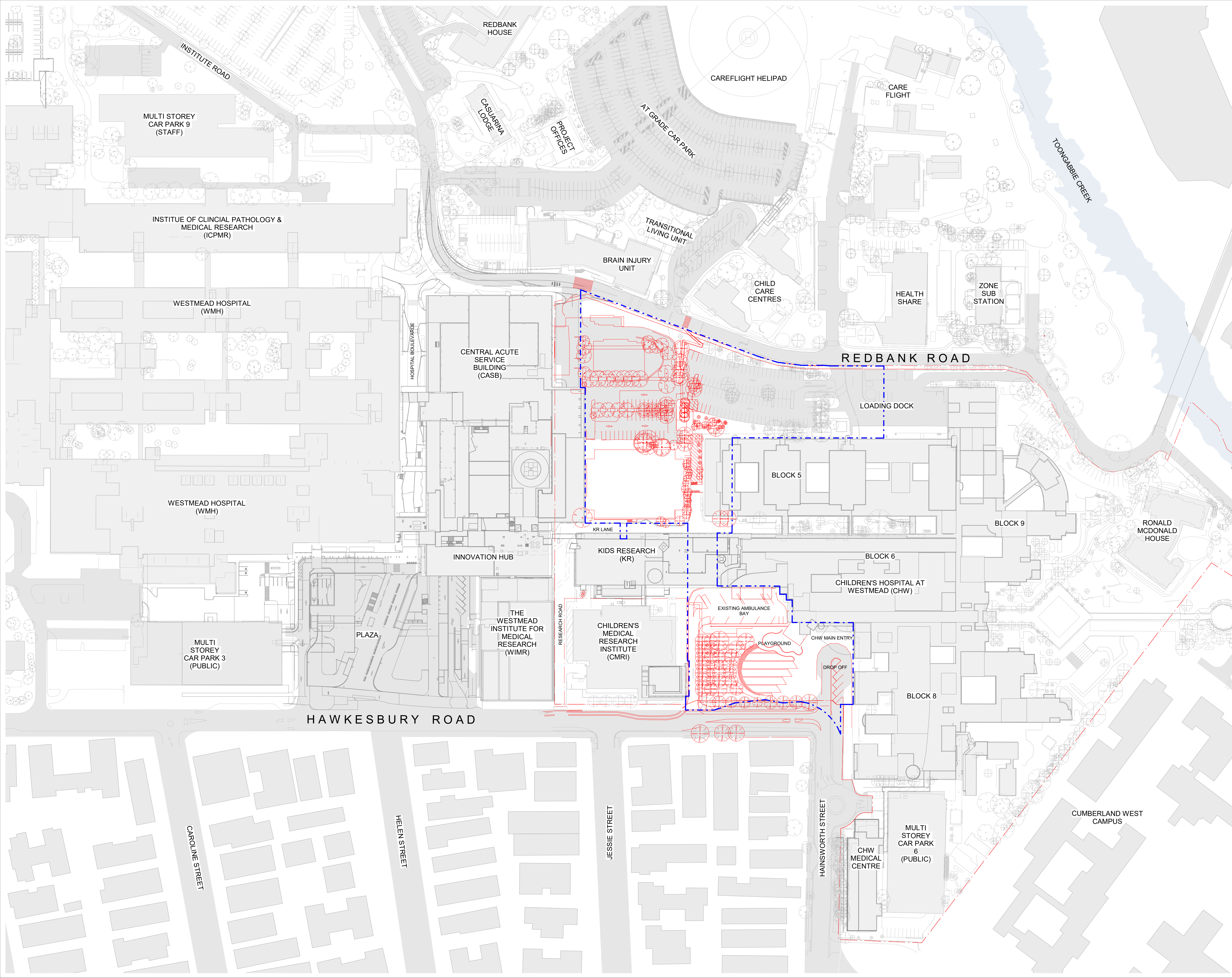
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 EXISTING BUILDINGS/ROADS
 CHW SITE BOUNDARY
 PLANNING APPLICATION BOUNDARY
 EXISTING TREES

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- 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

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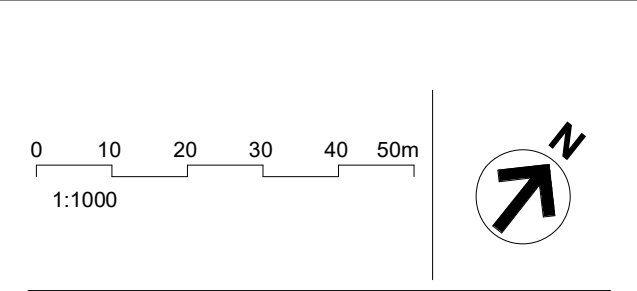
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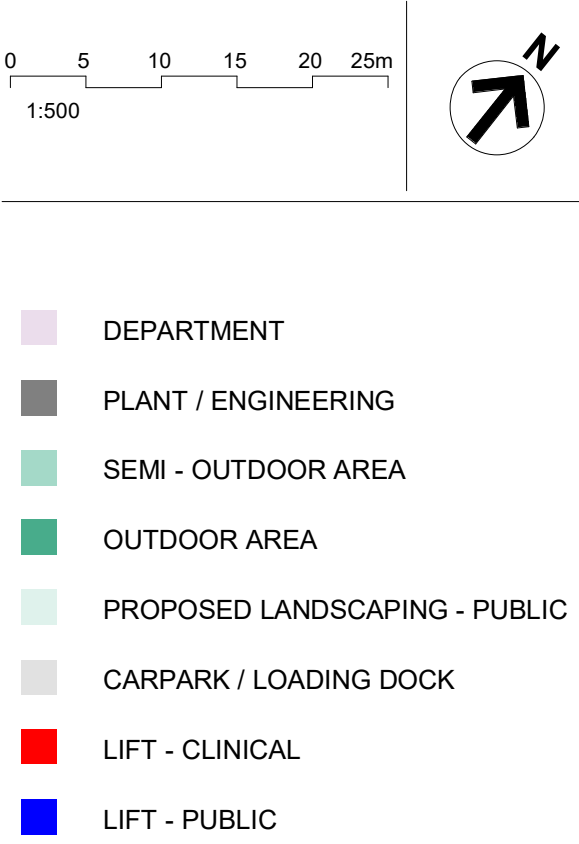
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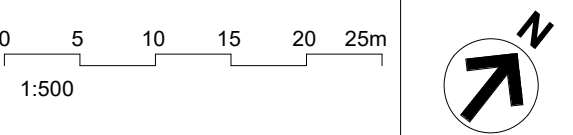
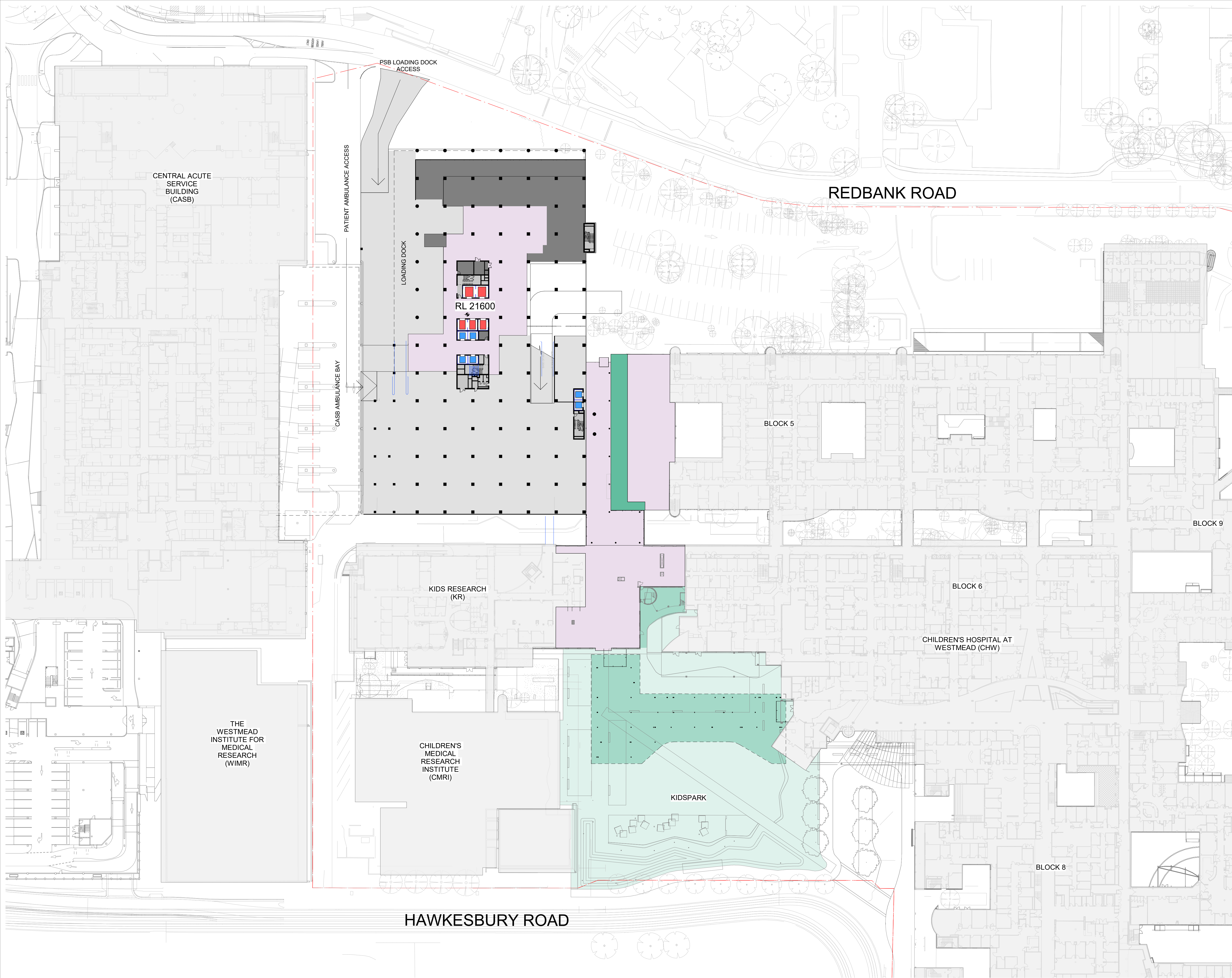
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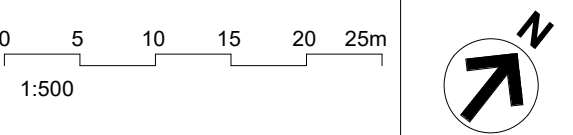
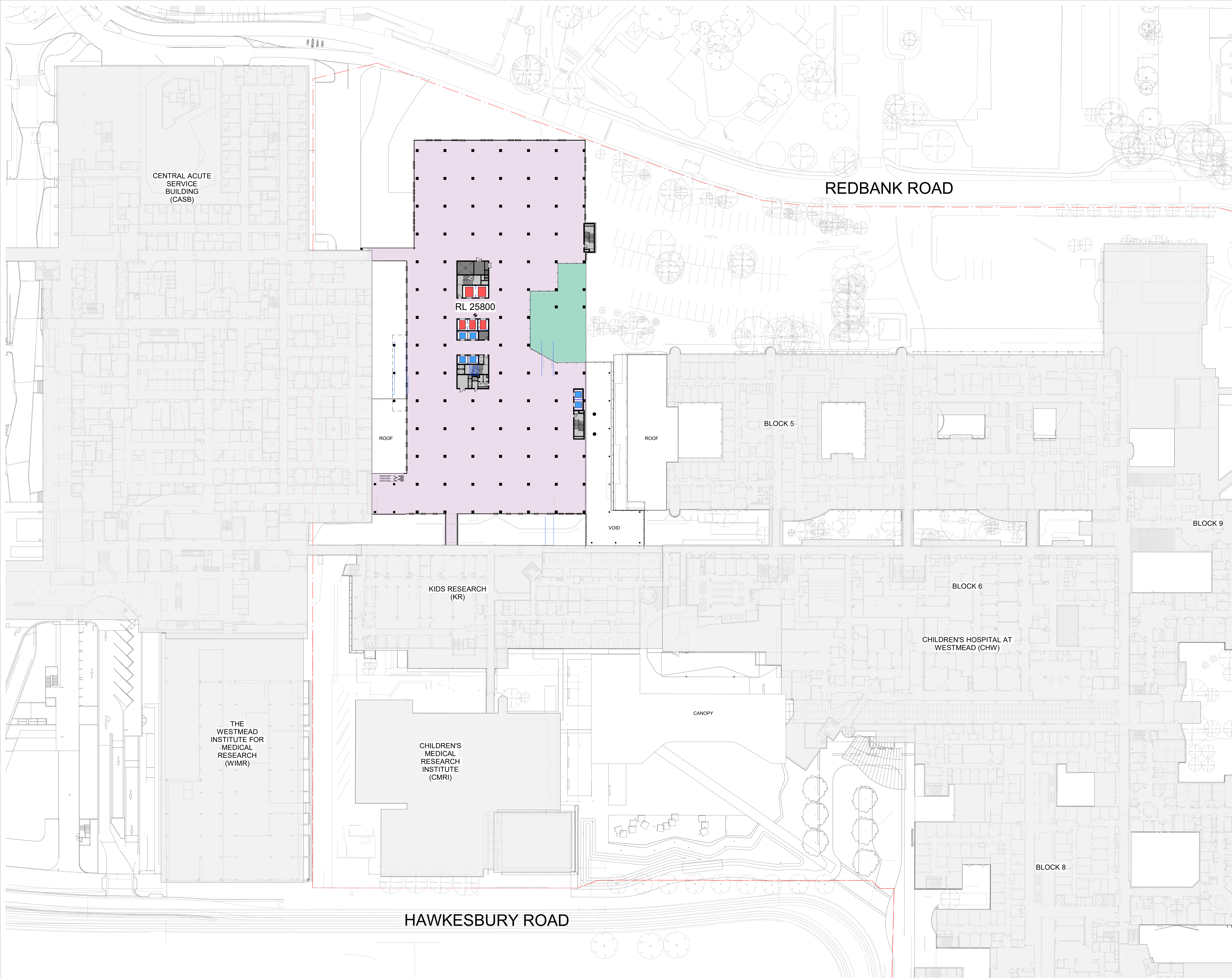
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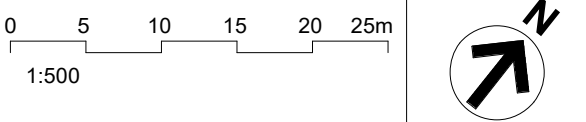
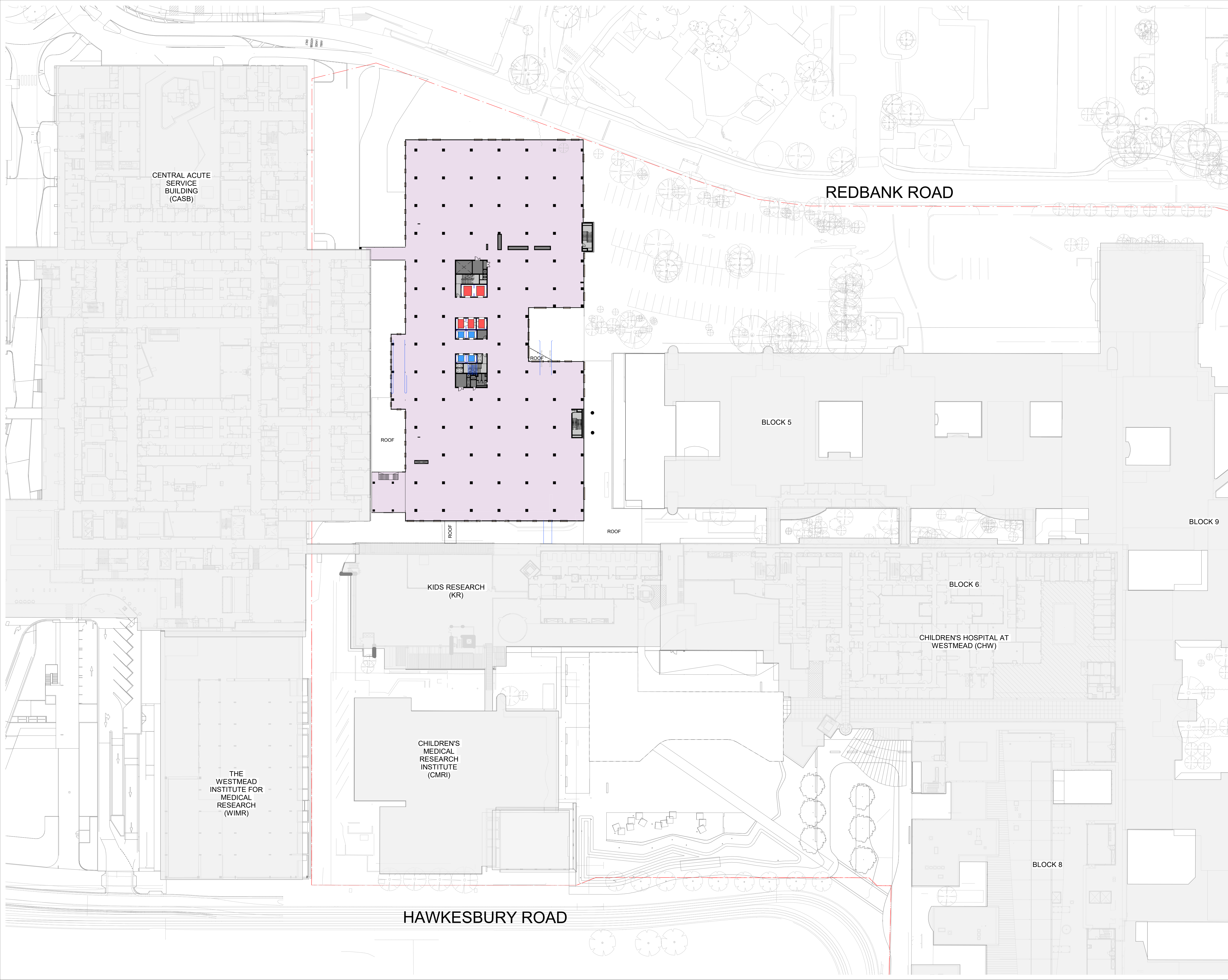
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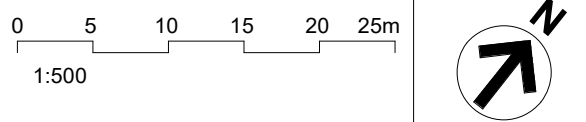
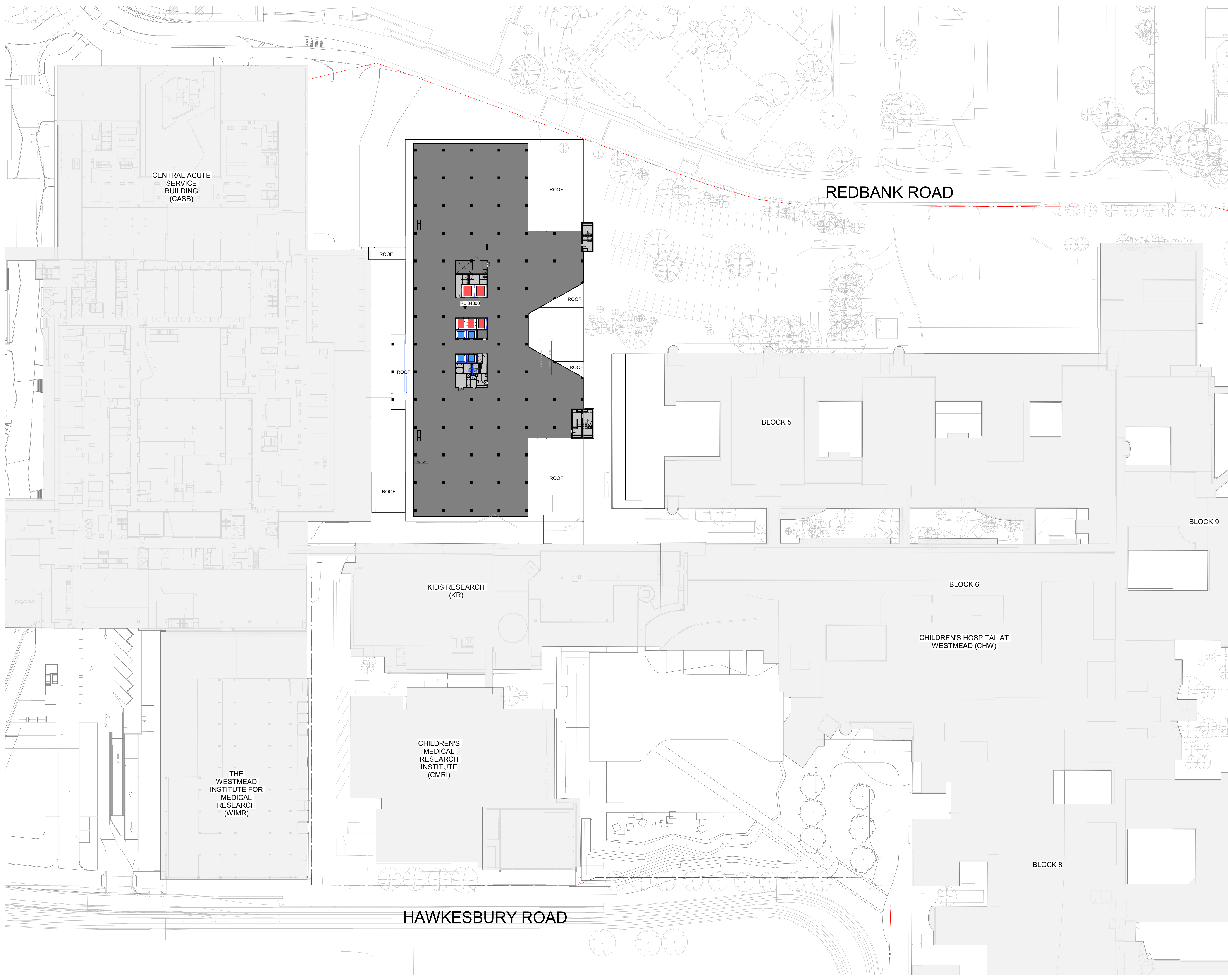
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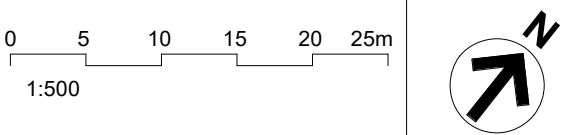
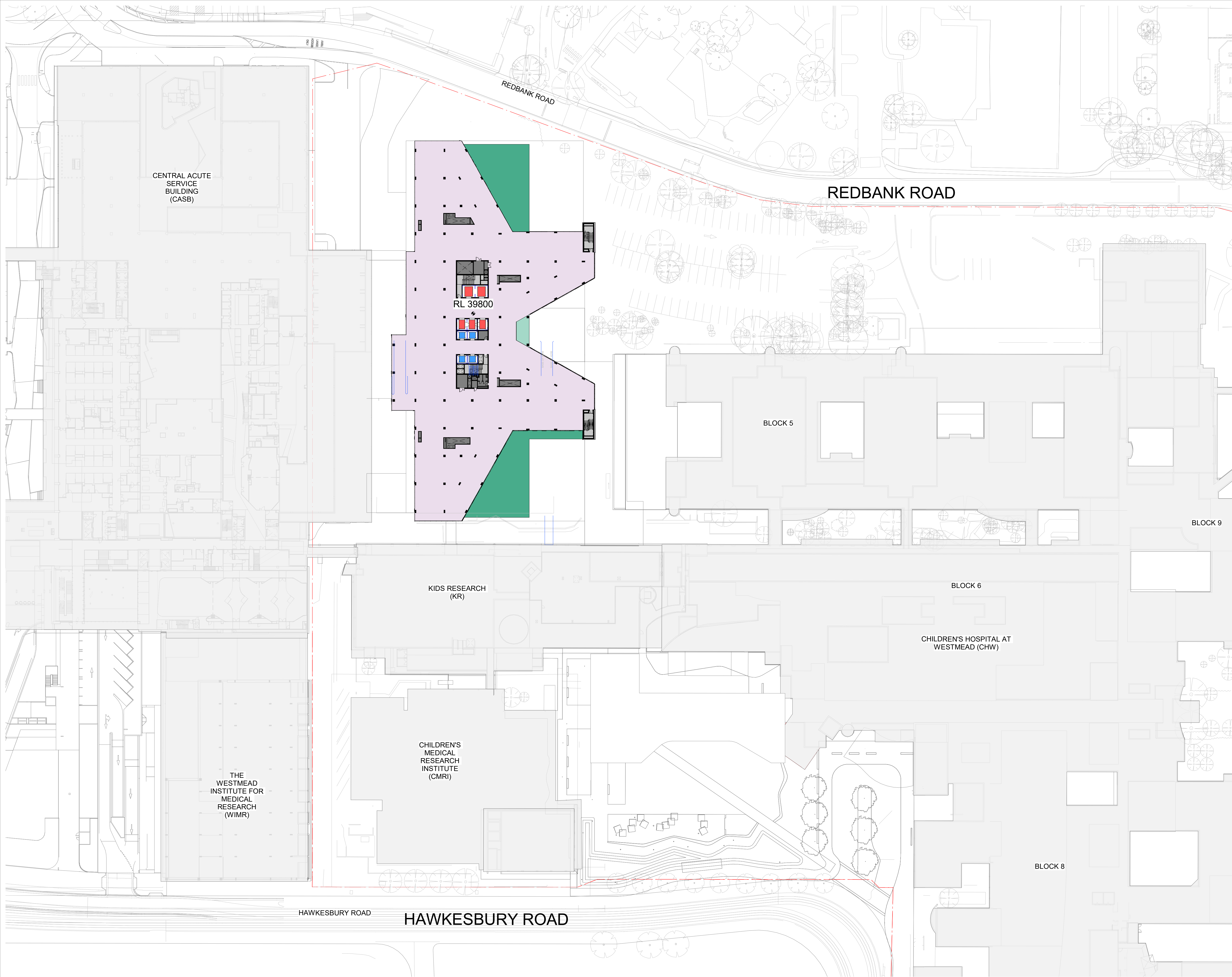
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Sheet Name	PROPOSED PLAN - LEVEL 05
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St Leonards, NSW 2065
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www.hinfra.health.nsw.gov.au

PROJECT

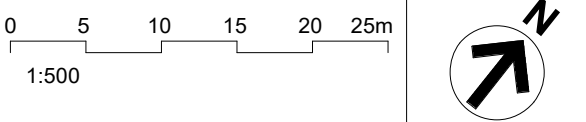
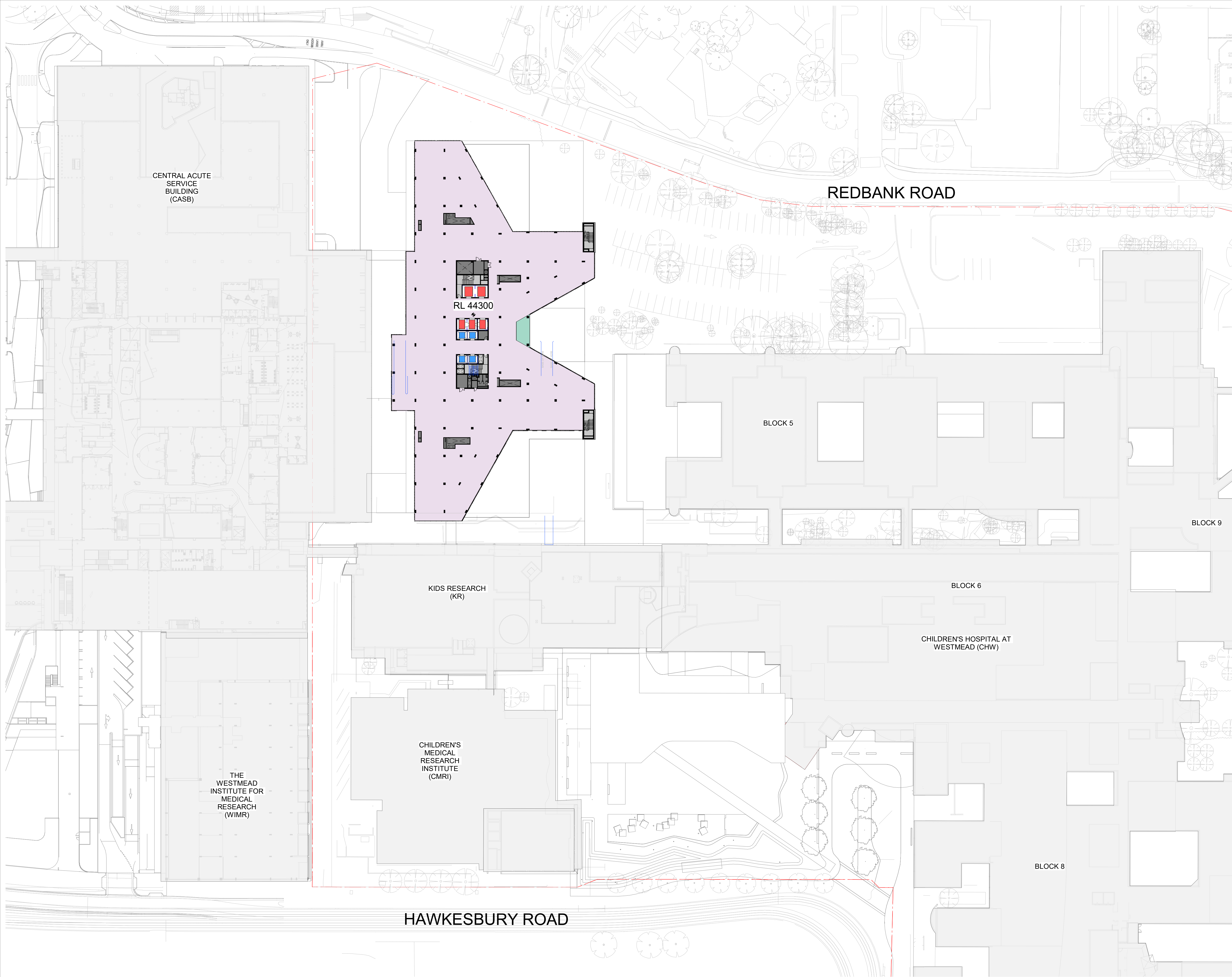
The Children's Hospital at Westmead Stage 2 Redevelopment

Sheet Name

PROPOSED PLAN - LEVEL 06

Scale	1 : 500@A1	Date	16/11/20
Drawn By	SM	Checked By	AF
Project No	19038		
Drawing No	CHW-AR-DG-PSB-SSD015		

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- SEMI - OUTDOOR AREA
- OUTDOOR AREA
- PROPOSED LANDSCAPING - PUBLIC
- CARPARK / LOADING DOCK
- LIFT - CLINICAL
- LIFT - PUBLIC

A	ISSUED FOR INFORMATION	16/11/20
REV	MECHANICAL / ELECTRICAL	
 Wood & Griev Engineers Level 6, Building B, 207 Pacific Highway, St Leonards NSW Australia 2065 T +61 2 8484 7000 enquiries.sdy@stantec.com https://www.stantec.com		
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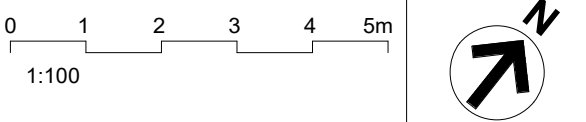
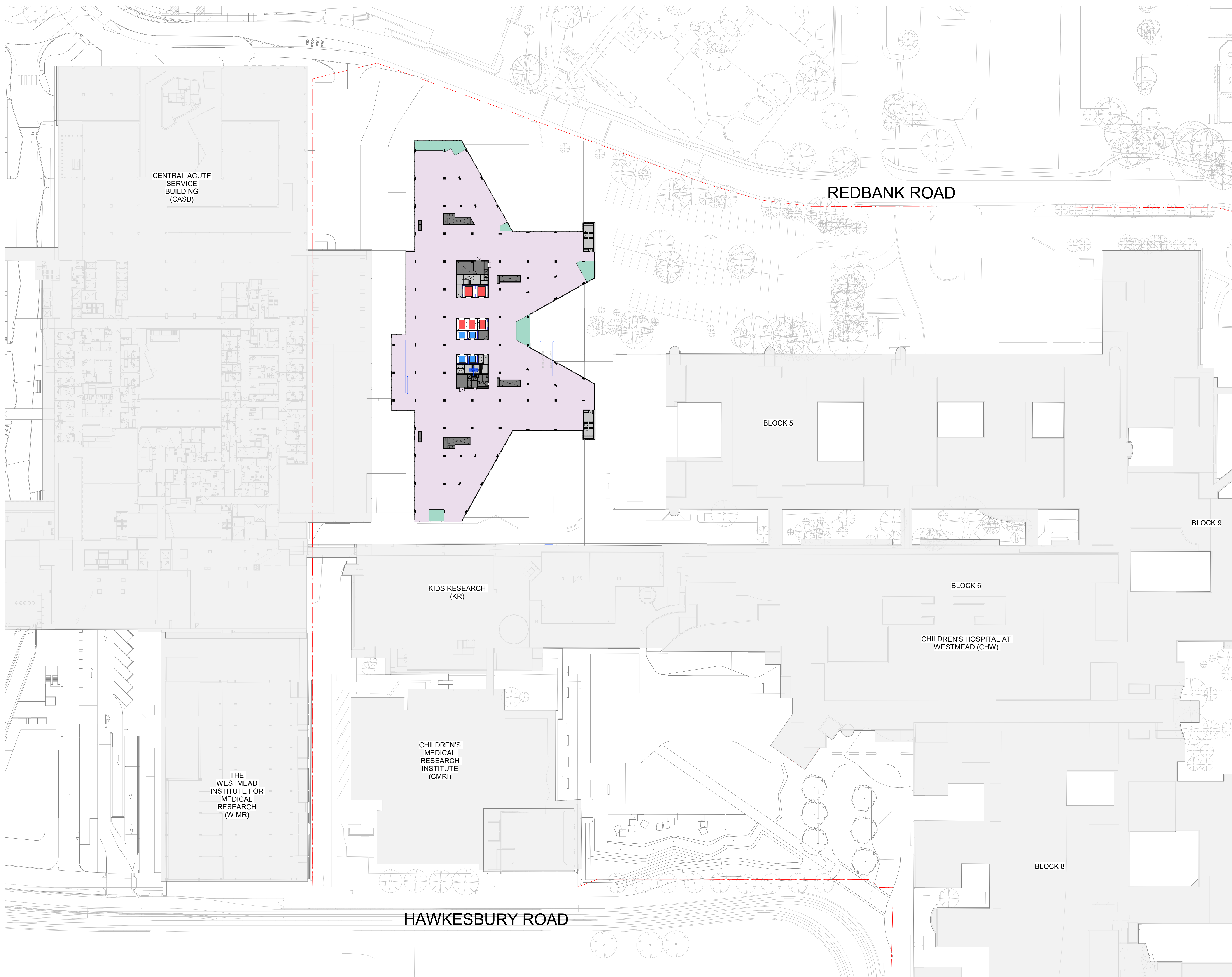
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PROJECT	
The Children's Hospital at Westmead Stage 2 Redevelopment	

Sheet Name	
PROPOSED PLAN - LEVEL 07	

Scale	Date	
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Drawn By	Checked By	Revision
SM	AF	A
Project No	19038	
Drawing No	CHW-AR-DG-PSB-SSD016	

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- LIFT - PUBLIC

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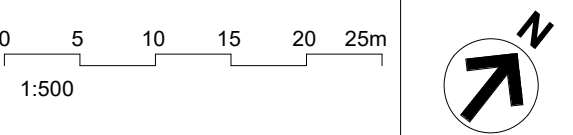
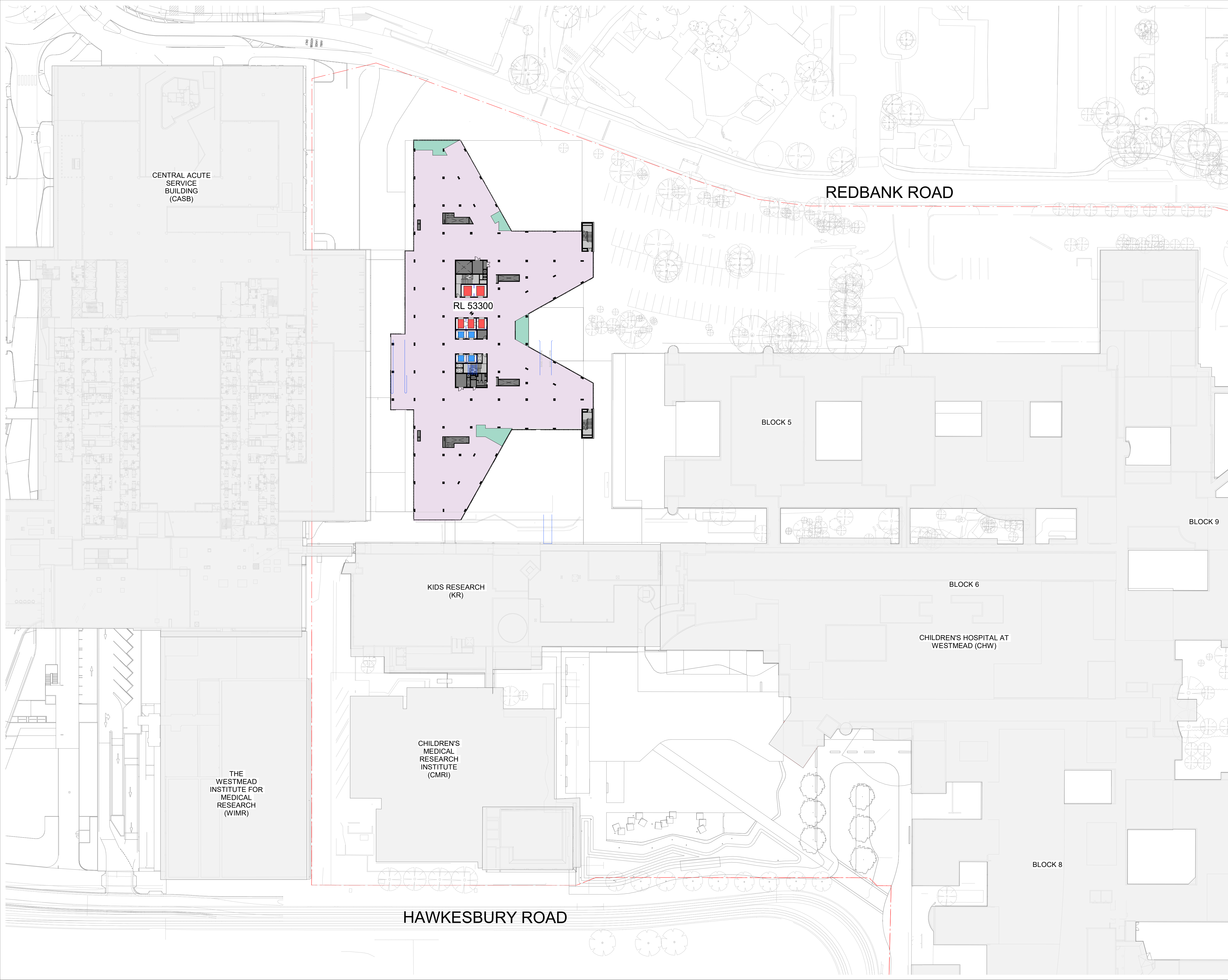
PROJECT
The Children's Hospital at Westmead Stage 2 Redevelopment

Sheet Name
PROPOSED PLAN - LEVEL 08

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Drawn By	Checked By	Revision
SM	AF	A
Project No	19038	
Drawing No	CHW-AR-DG-PSB-SSD017	

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- CARPARK / LOADING DOCK
- LIFT - CLINICAL
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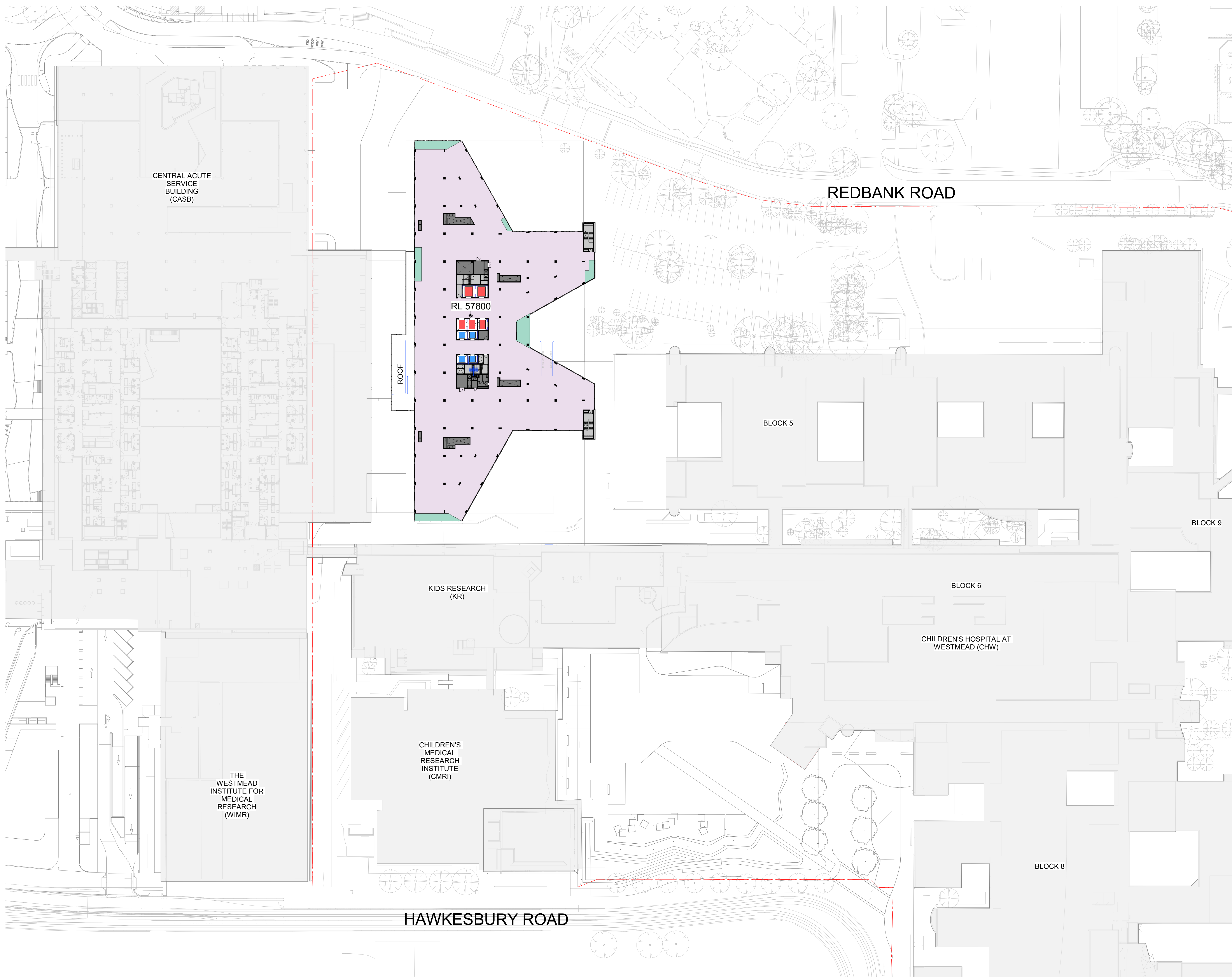
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The Children's Hospital at Westmead Stage 2 Redevelopment	

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

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- LIFT - PUBLIC

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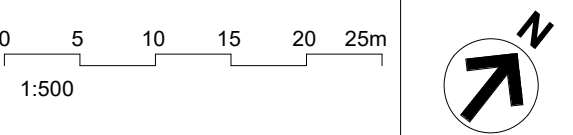
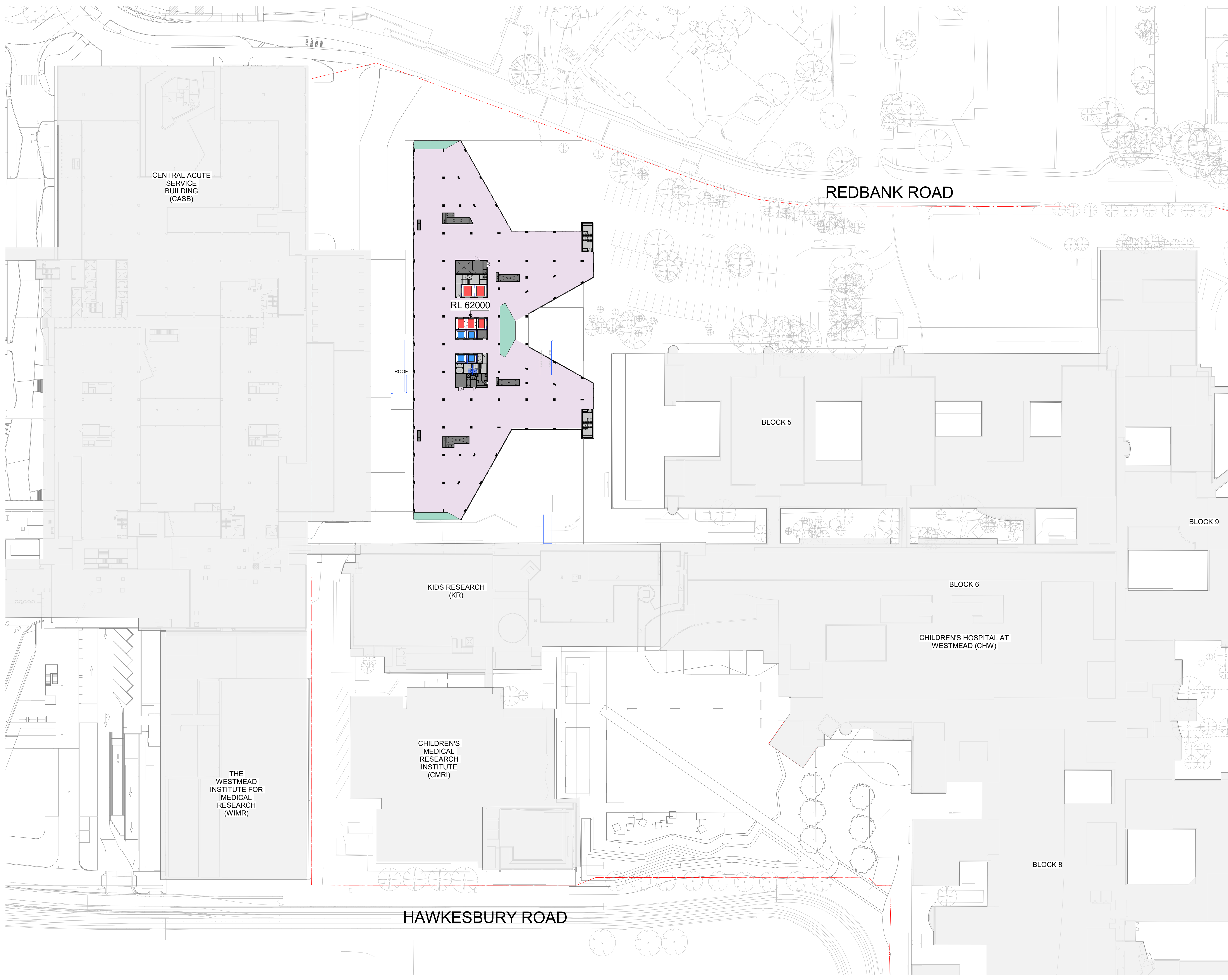
CLIENT	Health Infrastructure NSW
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PROJECT	The Children's Hospital at Westmead Stage 2 Redevelopment
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Sheet Name	PROPOSED PLAN - LEVEL 10
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Scale	1 : 500@A1	Date	16/11/20
Drawn By	SM	Checked By	AF
Project No	19038	Revision	A
Drawing No	CHW-AR-DG-PSB-SSD019		

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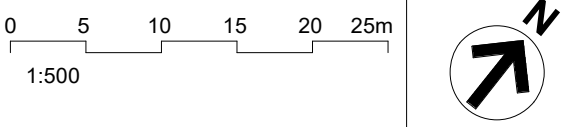
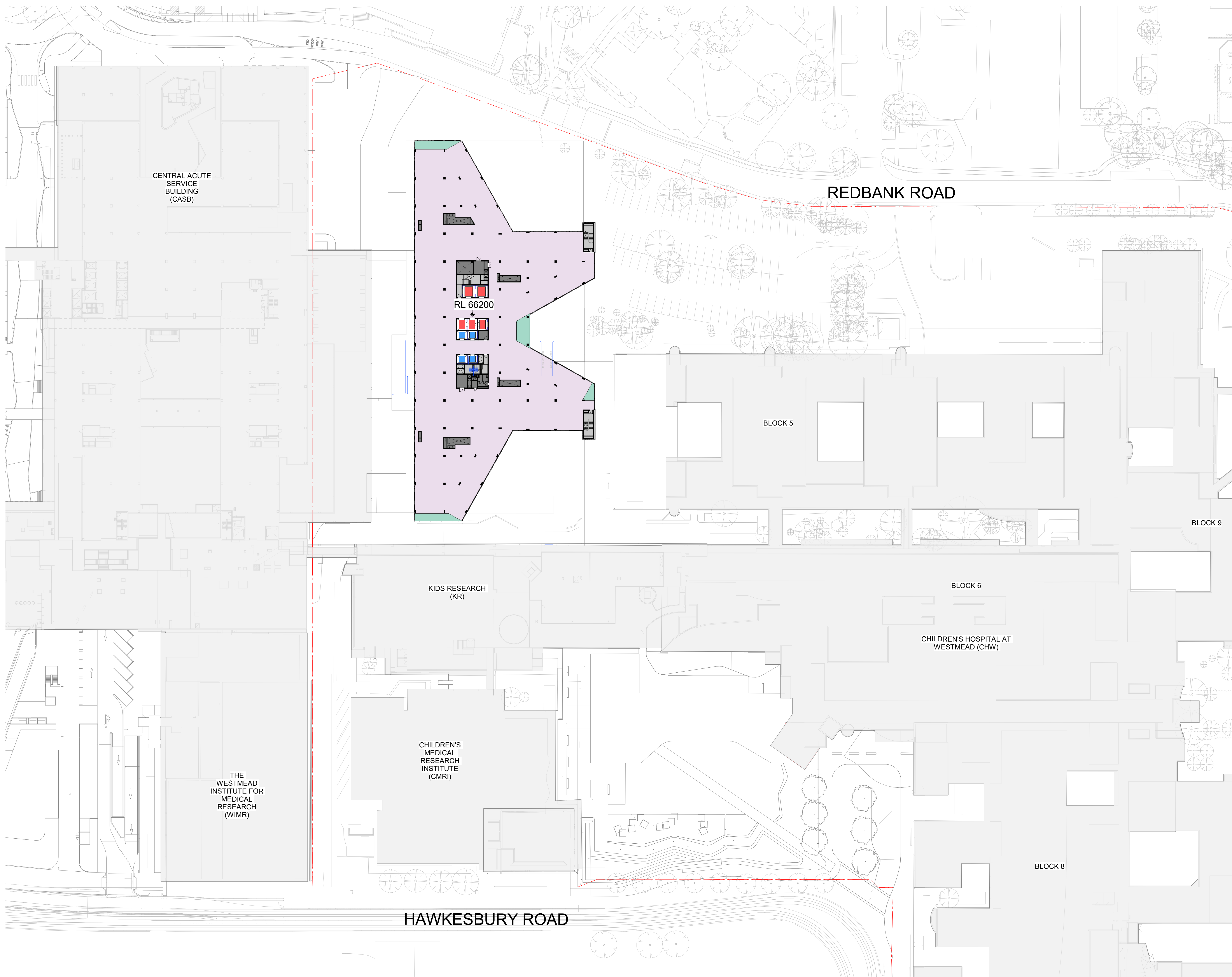
PROJECT
The Children's Hospital at Westmead Stage 2 Redevelopment

Sheet Name
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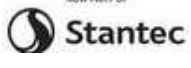
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Drawn By	SM	Checked By	AF
Project No	19038	Revision	A
Drawing No	CHW-AR-DG-PSB-SSD020		

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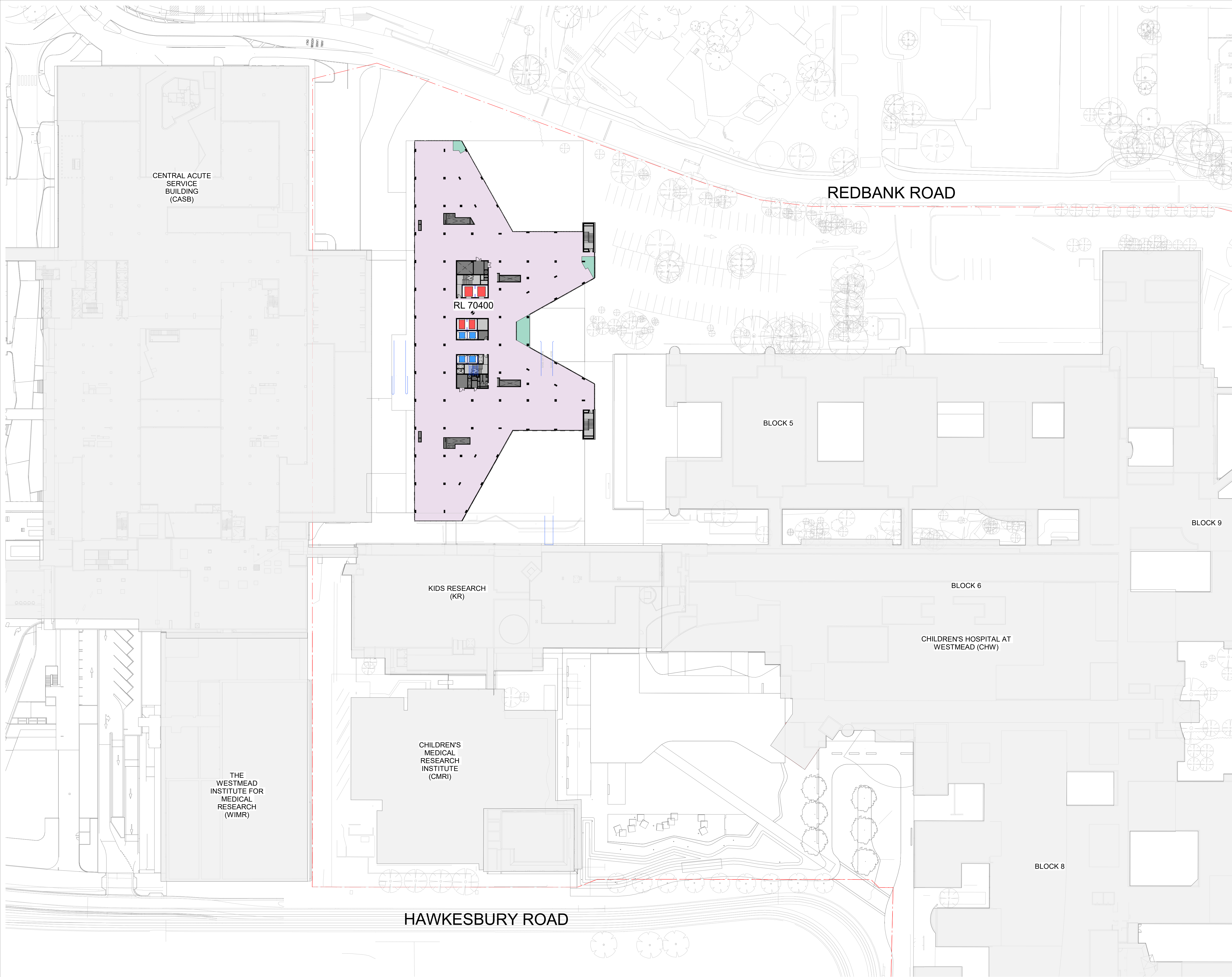
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Health Infrastructure NSW Level 6, 1 Reserve Road St Leonards, NSW 2065 T +61 2 9978 5402 www.hinfra.health.nsw.gov.au	
	

PROJECT	
The Children's Hospital at Westmead Stage 2 Redevelopment	

Sheet Name	
PROPOSED PLAN - LEVEL 12	

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-SSD021		

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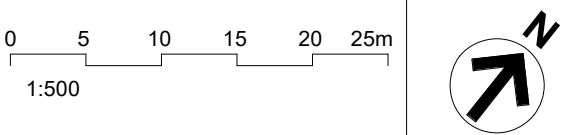
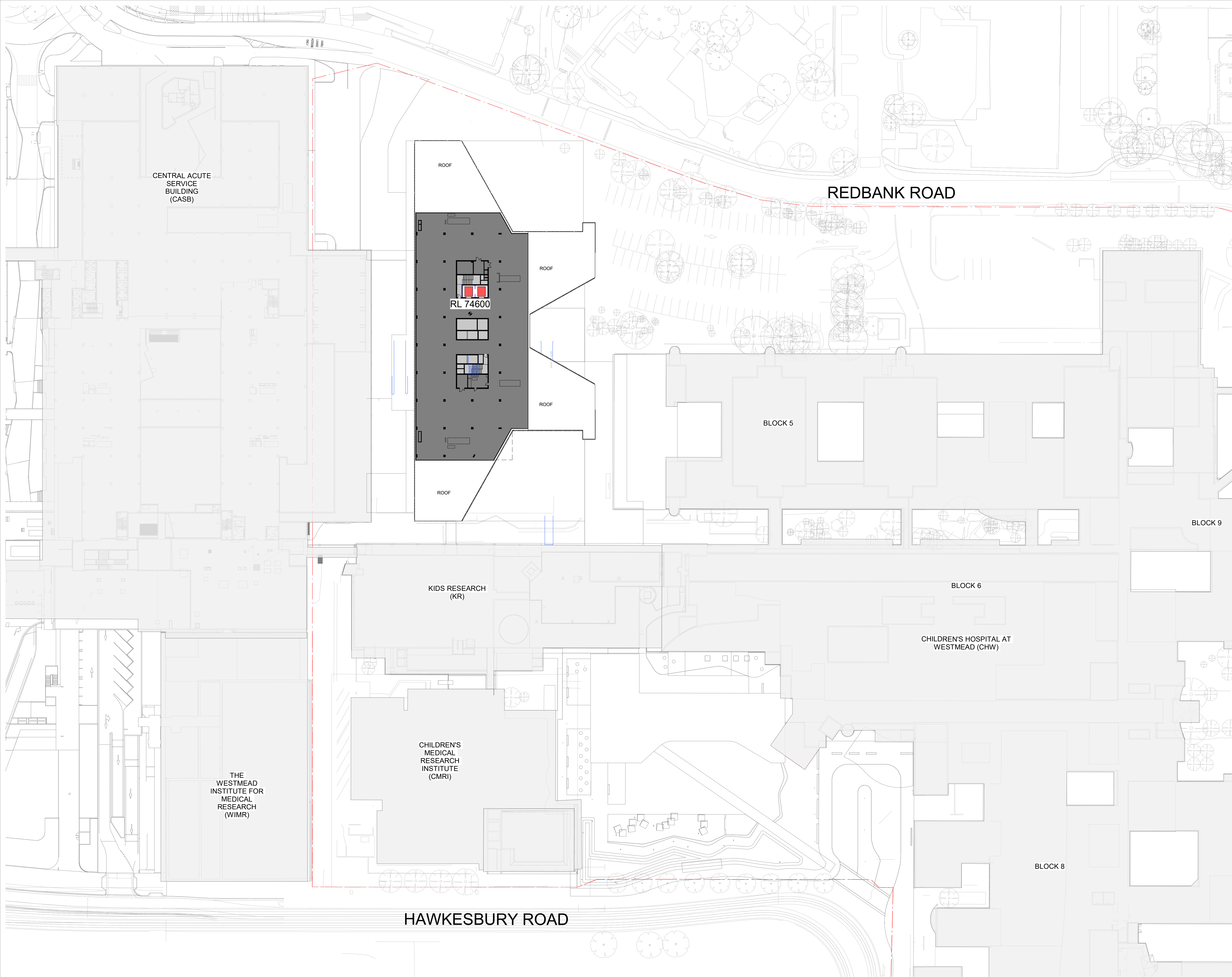
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The Children's Hospital at Westmead Stage 2 Redevelopment

Sheet Name
PROPOSED PLAN - LEVEL 13

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Drawn By	Checked By	Revision
SM	AF	A
Project No	19038	
Drawing No	CHW-AR-DG-PSB-SSD022	

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- PROPOSED LANDSCAPING - PUBLIC
- CARPARK / LOADING DOCK
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PROJECT

The Children's Hospital at Westmead
Stage 2 Redevelopment

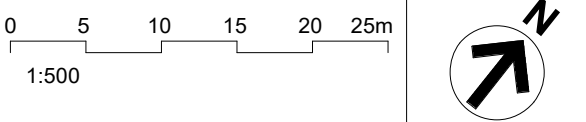
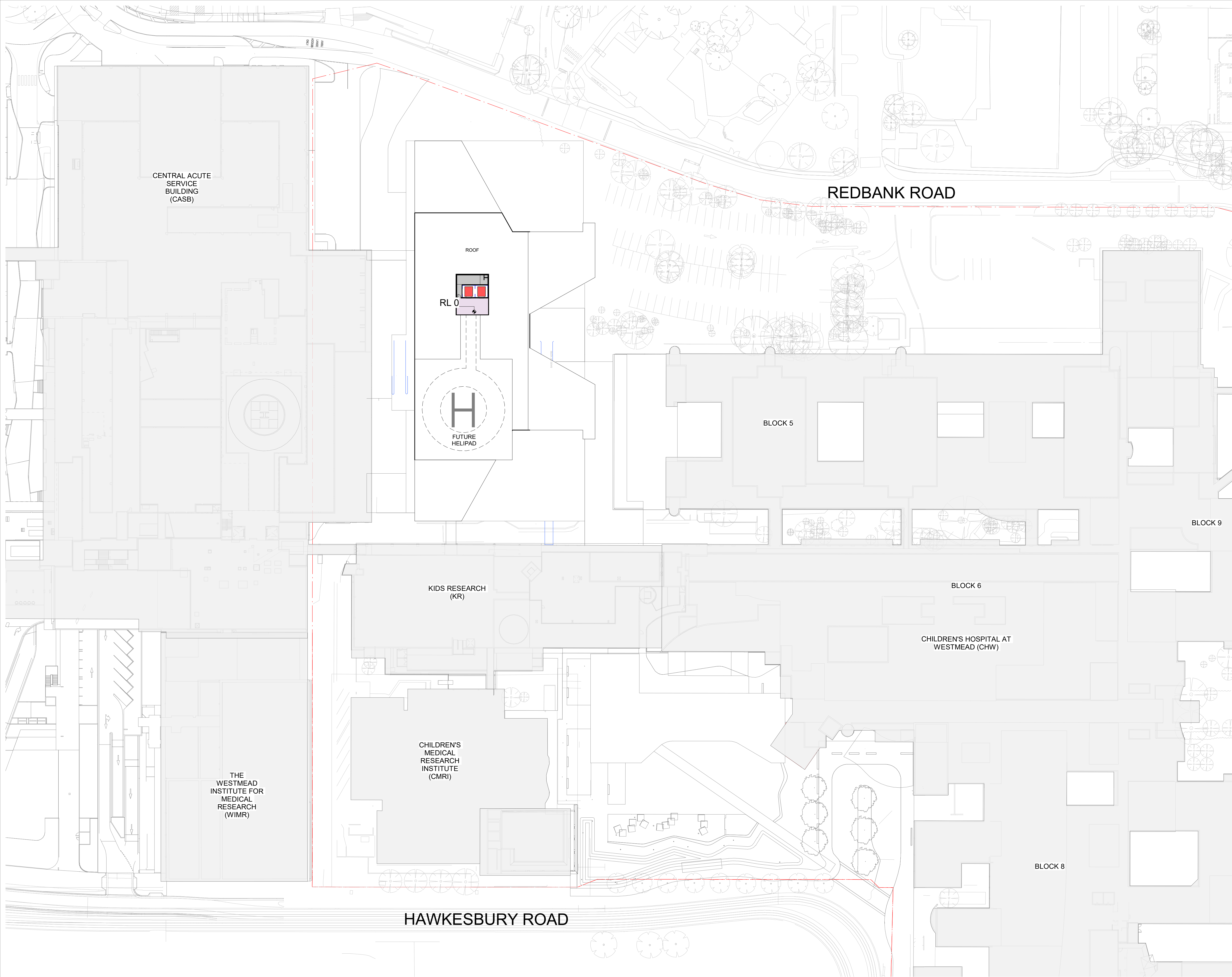
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PROPOSED PLAN - LEVEL 14

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Drawn By	SM	Checked By	AF
Project No	19038	Revision	A
Drawing No	CHW-AR-DG-PSB-SSD023		

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- LIFT - CLINICAL
- LIFT - PUBLIC

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PROJECT

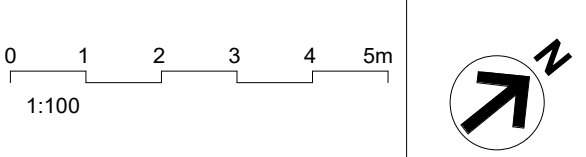
The Children's Hospital at Westmead Stage 2 Redevelopment

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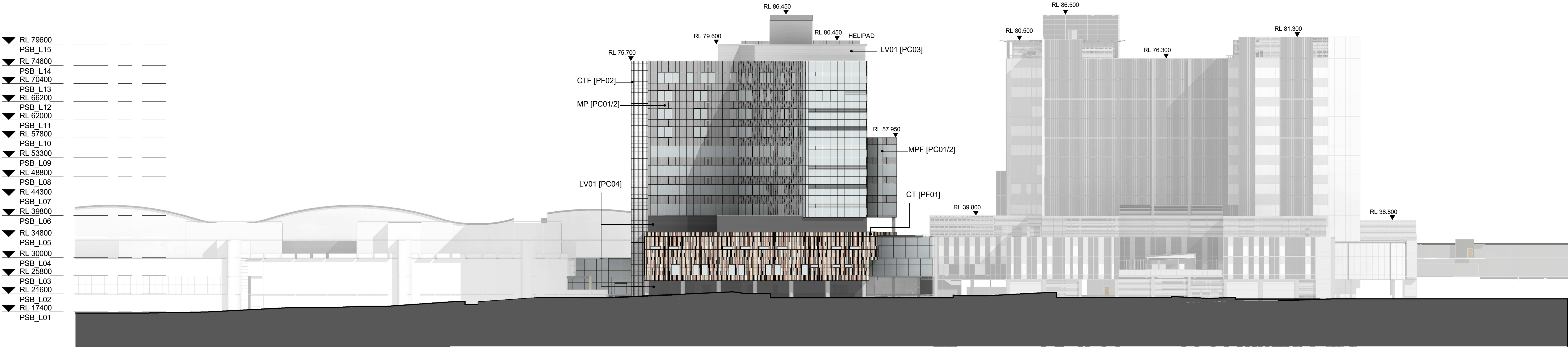
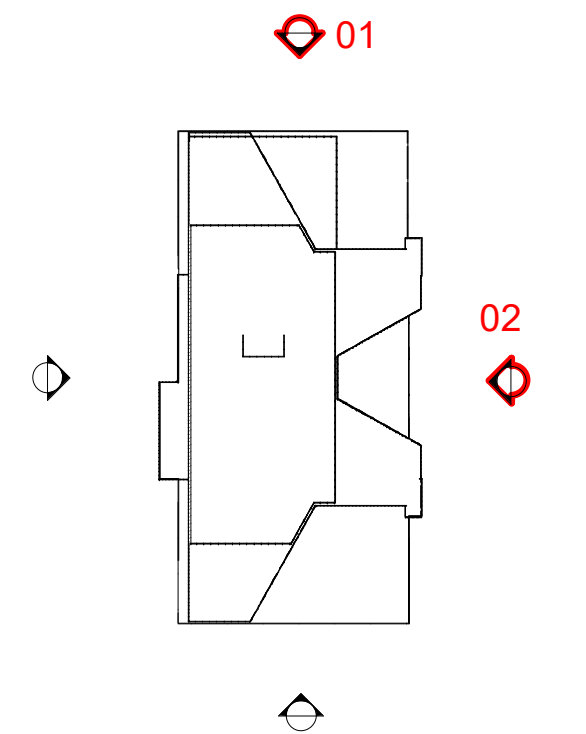
PROPOSED PLAN - LEVEL 15 - HELIPAD - ROOF

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Drawn By	Checked By	Revision
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KEY PLAN



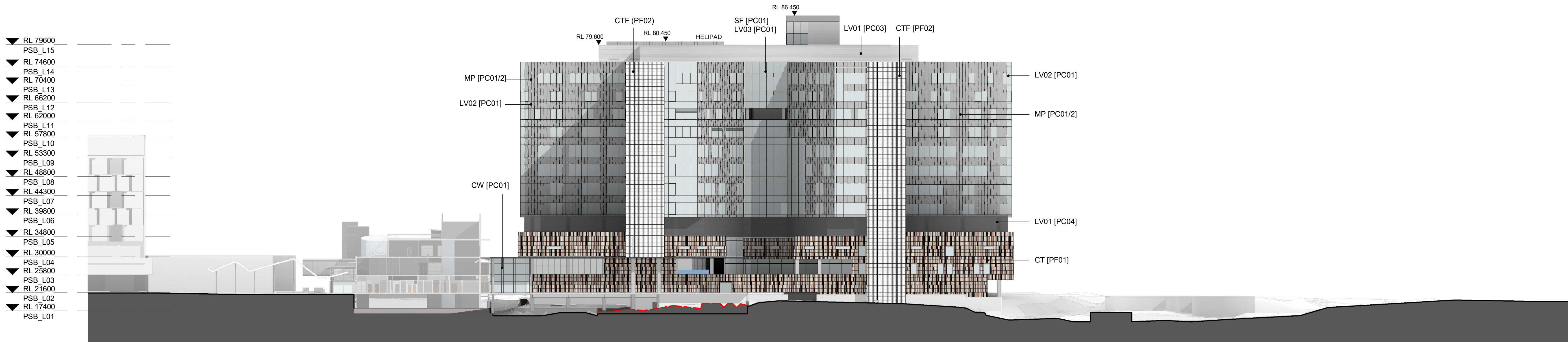
1 NORTH WEST ELEVATION - PROPOSED

1 : 500

EXISTING CHILDREN'S HOSPITAL WESTMEAD

PAEDIATRIC SERVICES BUILDING

CENTRAL ACUTE SERVICES BUILDING



2 NORTH EAST ELEVATION - PROPOSED

1 : 500

CMRI

KIDS PARK

KIDS RESEARCH INSTITUTE

PAEDIATRIC SERVICES BUILDING

REDBANK ROAD

CHILD CARE CENTRE

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PROJECT

The Children's Hospital at Westmead

Stage 2 Redevelopment

Sheet Name

ELEVATIONS - SHEET 01

Scale

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Date

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Checked By

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Revision

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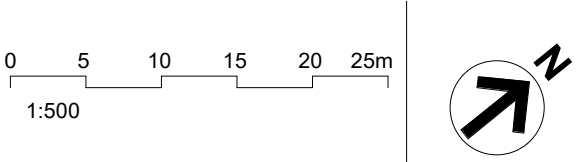
19038

Drawing No

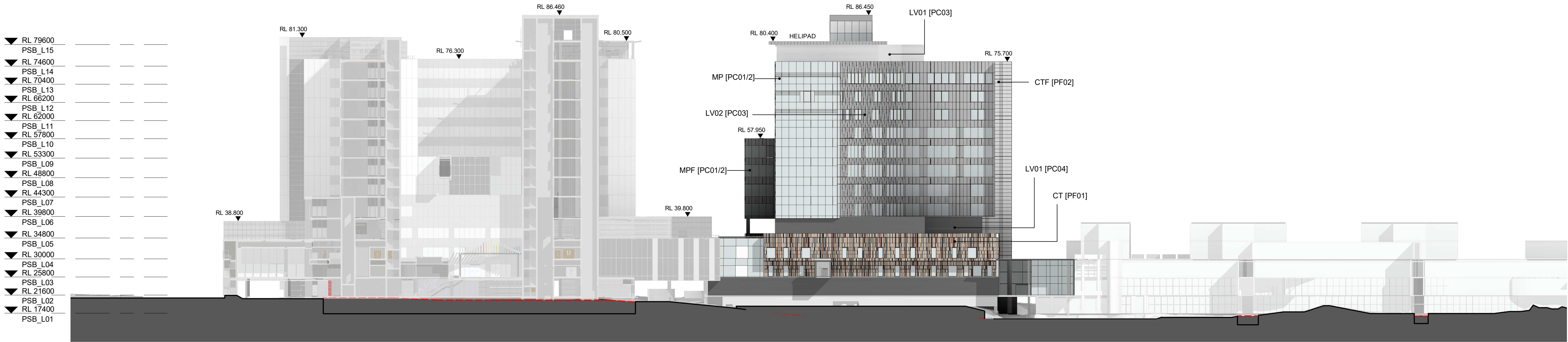
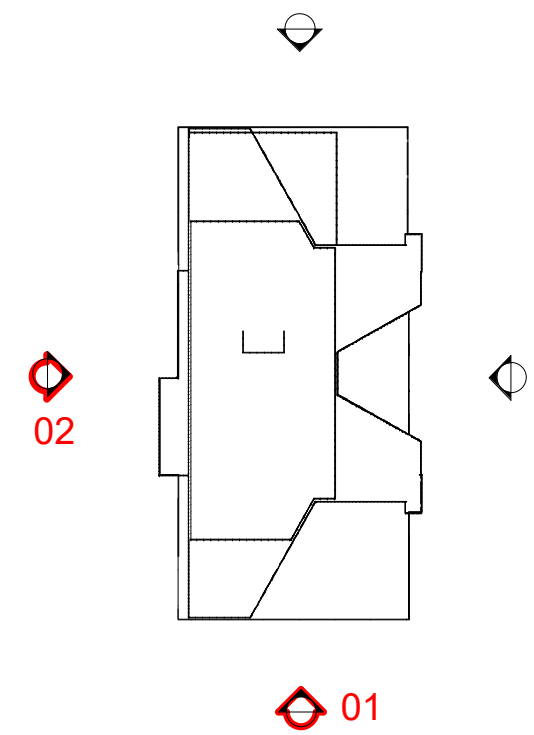
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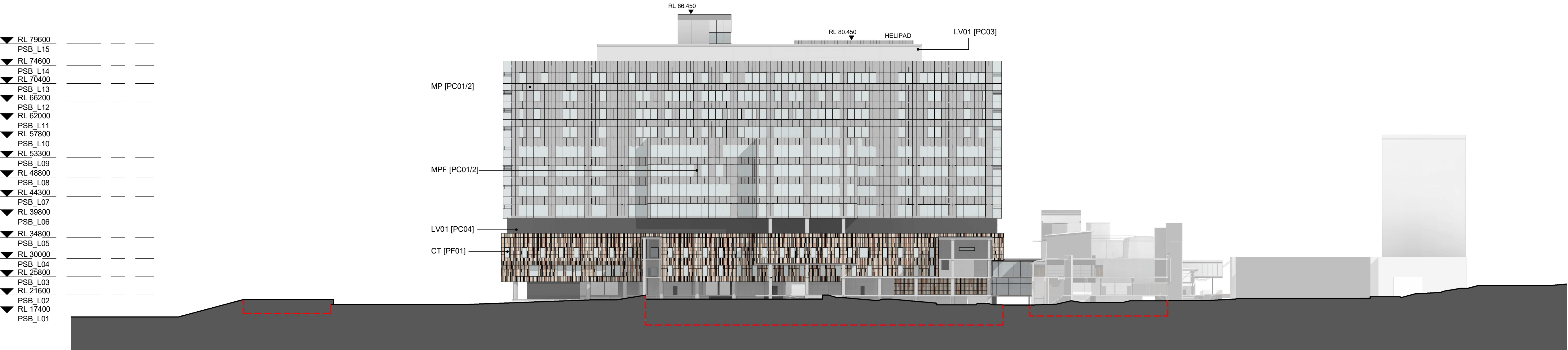


KEY PLAN



1 SOUTH EAST ELEVATION - PROPOSED

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



2 SOUTH WEST ELEVATION - PROPOSED

REDBANK ROAD PAEDIATRIC SERVICES BUILDING KIDS RESEARCH INSTITUTE KIDS WAY CMRI

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PROJECT
The Children's Hospital at Westmead
Stage 2 Redevelopment

Sheet Name
ELEVATIONS - SHEET 02

Scale	1 : 500@A1	Date	16/11/20
Drawn By	LL	Checked By	AF
Project No	19038	Revision	A
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FOR INFORMATION

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