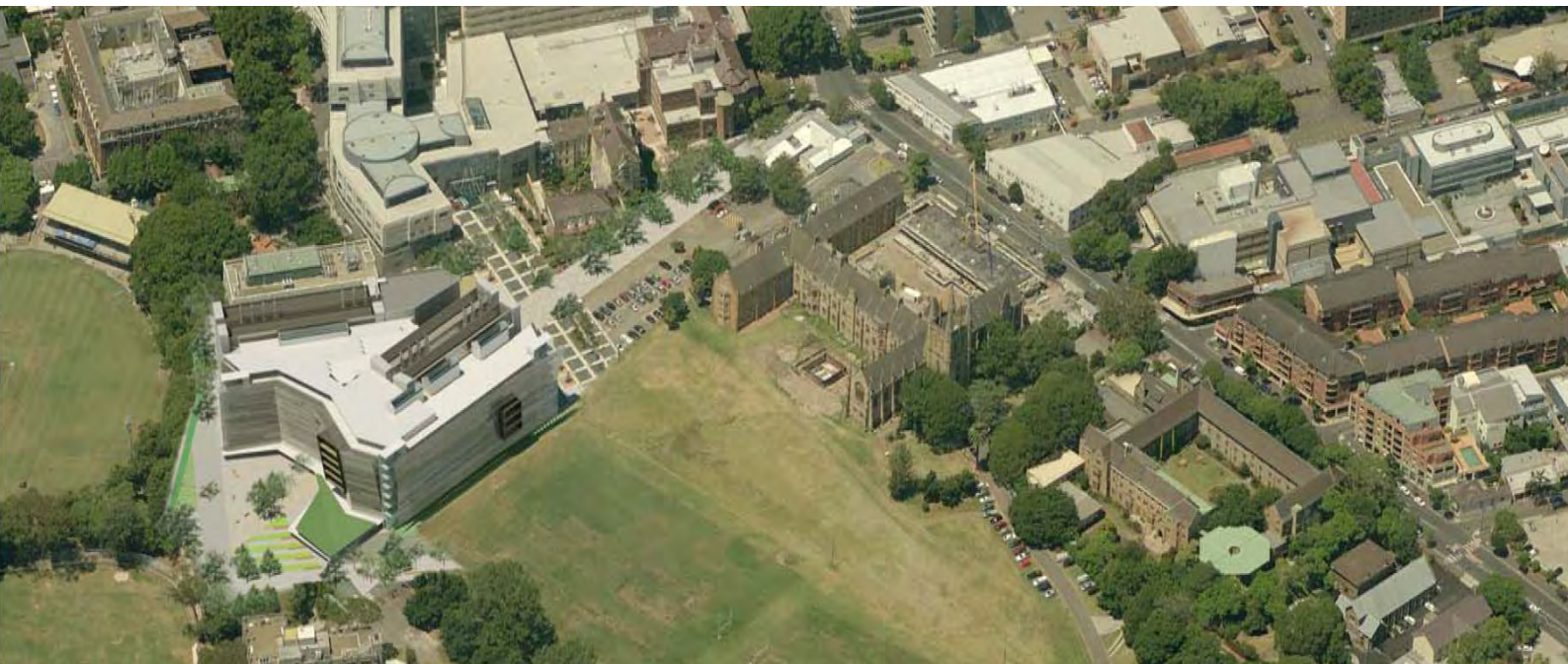
The University of Sydney

pjep.

environmental assessment

Centre for Obesity, Diabetes and Cardiovascular Disease Project

December 2009



Prepared for:

The University of Sydney

The University of Sydney
Campus Infrastructure and Services
Level 2, Services Building, G12
UNIVERSITY OF SYDNEY NSW 2006

Prepared by:

pjep.

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striving for balance between economic, social and environmental ideals…

PJEP Ref: Environmental Assessment_Dec09

DISCLAIMER

CERTIFICATION BY AUTHOR

Part 3A Environmental Assessment

Prepared under the *Environmental Planning and Assessment Act 1979*

Environmental Assessment prepared by

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Project to which Part 3A applies

Application number	09_0051
Project	Proposed Centre for Obesity, Diabetes and Cardiovascular Disease Project, Camperdown Campus, University of Sydney
Proponent name	University of Sydney
Proponent address	Campus Infrastructure and Services Level 2, Services Building, G12 UNIVERSITY OF SYDNEY NSW 2006
Land to be developed	Lot 1 in DP 1115224, Part Lot 101 in DP 819 559, and part of the principal grant to the University of Sydney dated 18 January 1855, Local Government Area of Sydney, Parish of Petersham, County of Cumberland.

Certificate

I certify that I have prepared the contents of this document, and to the best of my knowledge the assessment:

- has been prepared in accordance with the requirements of Part 3A and the Regulations; and
- does not contain false or misleading information.

Signature

Name Phillip Jones
Date 14 December 2009

EXECUTIVE SUMMARY

The University of Sydney is proposing to develop a world class centre for research and training in health and life sciences on its Camperdown Campus.

The project, known as the Centre for Obesity, Diabetes and Cardiovascular Disease project (CODCD project), aims to promote collaborative research and education into the prevention and control of those diseases that pose the greatest current health threat to Australian citizens.

The project is a landmark project for the University, and would enhance the long standing collaborative links between the University, the Sydney South West Area Heath Service (SSWAHS) including the Royal Prince Alfred Hospital (RPA), and the Sydney Institute for Health and Medical Research (SIHMR).

The project has been designed in a manner that is consistent with the University's draft Campus 2020 Masterplan, and involves:

- subdivision of the site to adjust lot boundaries between the University and the RPA;
- demolition of buildings and earthworks across the site;
- construction and use of the CODCD, comprising a single 8 level building (plus 2 basement levels and rooftop plant) with a total gross floor area of approximately 45,000 m^2;
- ancillary services, including internal access roads and utilities.

The project has a capital investment value of approximately $350 million, which would be supported in part by the Commonwealth Government through its Education Investment Fund initiative to stimulate education, research and employment. The CODCD would accommodate a gross staff population of 1,140, including the generation of 290 new employment positions. The CODCD would also accommodate a student population of up to 980.

The proposal constitutes a 'major project', and consequently requires the approval of the Minister for Planning under Part 3A of the *Environmental Planning and Assessment Act 1979*.

The key environmental issues identified for assessment in this Environmental Assessment include:

- layout and design, including landscaping and visual amenity;
- soil and water;
- noise;
- traffic and transport;
- heritage;
- sustainability (particularly energy and water conservation); and
- infrastructure and services.

Assessment of these and other environmental issues indicates that the project is able to be conducted in a manner that would not result in any significant environmental impacts, or impacts on the amenity of surrounding land users.

The CODCD has been designed to a high standard to befit its anticipated status as a world class centre for medical research and training, within a functional framework that maximises collaboration between researchers and across disciplines. The CODCD has also been designed in a manner that respects its physical and historic setting, and incorporates best practice energy and water savings measures.

The University has committed to a range of measures to ensure that the project is undertaken in an orderly, environmentally responsible and sustainable manner.

Importantly, the project would directly promote the NSW Government's strategic goals and direction for this part of Sydney. In this regard, the site is located within the *'Sydney Education and Health Precinct'* as identified in the Sydney City Draft Subregional Strategy, which aims to

promote the co-location or ‘clustering’ of education and health facilities in the area. Such co-location is recognised in the strategy as making a significant contribution to Australia’s body of medical research, and ultimately reinforcing the strengths of ‘Global Sydney’.

The project would also have significant direct social and economic benefits for Sydney through the provision of increased employment opportunities and a significant capital investment in the University. In time, the project is also expected to bring significant long term social benefits to all of society, through the prevention and control of some of our most life threatening and costly diseases.

Accordingly, it is considered that the project represents orderly development of the land. It is respectfully requested that the Minister, having due regard for the information submitted in this Environmental Assessment, grant approval to the project.

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J Air Quality Review
K Arborist Assessments
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O Traffic Assessment
P Waste Management Plan
Q SEPP 33 Hazard Assessment
R Statement of Commitments

1 INTRODUCTION

1.1 Overview

The University of Sydney (the University) is proposing to develop a world class Centre for Obesity, Diabetes and Cardiovascular Disease (CODCD) in the north western area of the University's Camperdown Campus (see Figure 1.1).

This Environmental Assessment has been prepared by PJEP Environmental Planning on behalf of the University to assist the Minister's and the Department of Planning's consideration of the CODCD project under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

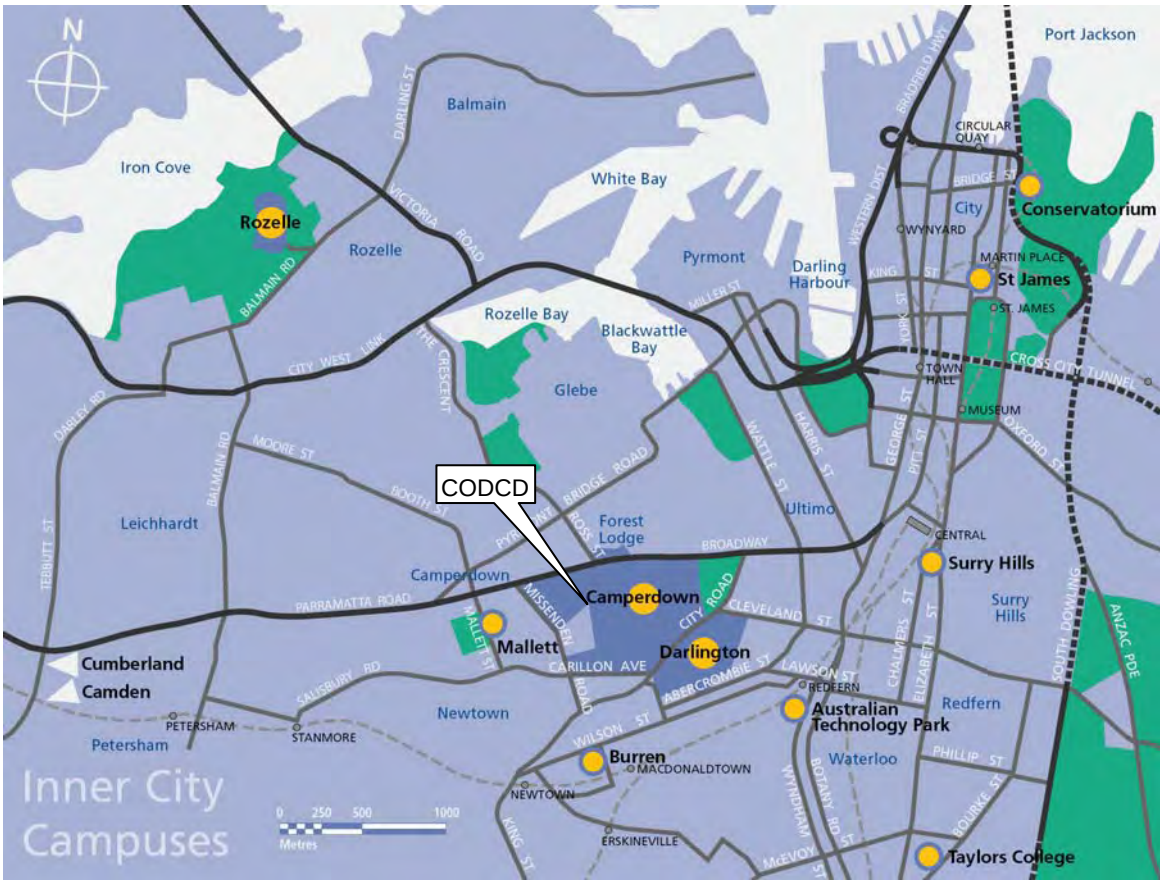


Figure 1.1: *Regional Context (Source: University of Sydney)*

1.2 Background

Cardiovascular disease, diabetes, and obesity are three of the most important health problems facing Australia today. The three are intimately related, with obesity causing diabetes, and diabetes causing a range of cardiac and vascular diseases.

Collectively, they challenge the length and quality of life for all Australians, with cardiovascular disease alone responsible for 39% of deaths and 18% of the disability adjusted life years lost to the Australian community (with indigenous and remote communities worse affected). They are the leading causes of death and disability in all rapidly ageing populations worldwide.

Furthermore, the rapid escalation of their costs (the current cost of diabetes is $6 billion) threatens health sector sustainability both here and overseas.

Solutions require research and education across a spectrum of science and medicine. With this in mind, the University intends to establish a major international Life Sciences Research Precinct (LSRP) on the Camperdown Campus dedicated to highly collaborative and multidisciplinary medical research and training. The first stage of this development is the proposed creation of the CODCD.

The CODCD project is the result of longstanding collaborative links between the Centre's partner organisations, which include the:

- University;
- Sydney South West Area Health Service (SSWAHS) including its premier teaching hospital, Royal Prince Alfred (RPA) Hospital; and
- Sydney Institute for Health and Medical Research (SIHMR), a consortium of University-affiliated research institutes largely located on the RPAH and University campuses.

The project has the following, highly commendable, mission:

> *'to improve the health of the community by the prevention and control of obesity, diabetes and cardio-vascular diseases. We shall achieve this by:*
> - *doing world-class research in basic and clinical sciences, population health and health systems;*
> - *translating this knowledge into practical solutions for chronic cardio-metabolic diseases;*
> - *partnering within and beyond the Centre; and*
> - *inspiring the next generation of scientific and clinical researchers.'*

The CODCD project is a landmark project for the University, creating a world class centre for medical research and training.

The project represents the first phase in the development of the LSRP, as identified in the University's (draft) *Campus 2020 Masterplan*.

The LSRP is ideally situated for development of medical research and training facilities, being located directly between the University and the RPA.

Indeed, the significance of the area for medical research and training is recognised in the NSW Government's strategic plans, which identify the area as part of the *'Sydney Education and Health Precinct'* (see Section 4.1 for further detail), which aims to promote co-location and medical and education facilities.

1.3 The Project

The key components of the CODCD project include:

- subdivision of the site to adjust lot boundaries between the University and the RPA;
- demolition of buildings, including the University's HK Ward Gymnasium and cricket nets, and the RPA's Missenden Psychiatry Unit building;
- bulk and detailed earthworks across the site;
- construction and use of the CODCD, comprising a single 8 level building (plus basement levels and rooftop plant) with a total gross floor area of approximately 45,000 m^2, including:
  - research areas:
    - wet and dry research labs;
    - research offices;
  - education areas:
    - teaching labs;

  - group learning;
  - teaching staff offices;
- ancillary support areas:
  - amenities (inc. cafés); and
  - administration, stores, supplies and waste areas; and
- ancillary services, including internal access roads and utilities servicing.

The project has a capital investment value of approximately $350 million, and the Centre would accommodate a total staff population of up to 1,140, of which approximately 290 would be new positions (ie. staff not currently employed by the University, RPA or other project partners).

The project is being funded partly by a substantial grant from the Federal Government's Education and Infrastructure Fund.

The project is discussed in detail in Section 3.

1.4 The Proponent

The University of Sydney is the proponent of the project.

As indicated above in Section 1.2, the University is developing the project in partnership with the Sydney South West Area Health Service (SSWAHS) including RPA, and the Sydney Institute for Health and Medical Research (SIHMR).

The CODCD partner institutions would contribute collaboratively to the research and teaching goals of the Centre according to their expertise, generally as follows:

- the University would contribute in the basic and enabling sciences (physics, chemistry, biology), biomedical sciences, nutrition, pharmacology, clinical epidemiology and public health;
- the SIHMR would contribute in biomedical, clinical and translational sciences, including health systems research; and
- the RPA/SSWAHS would contribute research and teaching capacity with a clinical orientation.

1.5 Environmental Assessment Team

This Environmental Assessment has been prepared by PJEP Environmental Planning in conjunction with a range of specialist consultants as listed in the following table.

Table 1.1: *Environmental Assessment Project Team*

Discipline	***Organisation***	***Study/Deliverable***
Project Management	Campus Infrastructure and Services, University of Sydney	Project Management
Architecture	Hassell	Principal Consultant, Architectural and Landscape Design
Functional Design	Aurora	Functional Design
Environmental Planning	PJEP Environmental Planning	Environmental Assessment
Soil and Water		
– Geotech	Douglas Partners	Geotechnical Assessment
– Site Contamination	Douglas Partners	Phase 1and 2 Contamination Assessments
– Stormwater	Arup	Stormwater Management Concept Plan
– Flooding	Arup	Flood Review
Noise	Wilkinson Murray	Noise Assessment
Air	PAE Holmes	Air Quality Review

Discipline	***Organisation***	***Study/Deliverable***
Sustainability (Energy and Greenhouse, Water, Materials and Waste)	Arup	ESD Report
	Steensen Varming	Sustainable Building Design Report
Flora and Fauna	The Tree School	Arborist Assessments and Tree Management Plan
Aboriginal Heritage	Jo McDonald Cultural Heritage Management	Aboriginal Heritage Assessment
Historical Heritage	Casey and Lowe	Non-Indigenous Archaeological Assessment
	Graham Brooks & Associates	Heritage Impact Statement
Traffic and Parking	Halcrow MWT	Traffic Assessment
Infrastructure and Services	Arup	Infrastructure Assessment
Landscaping	Hassell	Landscape Plan
Wastes and Hazards	Visy	Waste Management Plan
	SKM	SEPP 33 Analysis

2 THE SITE

2.1 Location and Context

The CODCD is proposed to be developed in the north-western corner of the University's Camperdown Campus, at the junction between the University, the RPA and St John's College (see Figure 2.1).

The site of the CODCD (the site) is located within the University's Life Sciences Research Precinct (LSRP), as identified in the University's (draft) *Campus 2020 Masterplan*[1]. The site also encompasses a portion of the RPA site, which is proposed to be divested to the University to accommodate the project.

Figures 2.1 to 2.3 below show the proposed CODCD site in relation to key landmarks on the University and RPA campuses. The LSRP is shown (hatched) on Figures 3.1 and 3.2.

The site is approximately 2 kilometres south west of the Sydney CBD, and is located within the City of Sydney local government area.

2.2 Site Analysis

The following provides a brief analysis of the site. Detailed information on environmental features of the site is provided in Section 6.

2.2.1 Site Description and Ownership

The site includes the following land parcels:

- Lot 1 in DP 1115224, owned by the University. This lot was divested from St John's College to the University in 2007 to support the development of the LSRP;
- a portion of Lot 101 in DP 819559, owned by RPA; and
- a portion of the principal grant to the University of Sydney dated 18 January 1855.

The University's Camperdown Campus has a total area of approximately 33.2 hectares, and the LSRP has an area of approximately 4.3 hectares.

2.2.2 Land Use

The LSRP is located in a hitherto less developed area of the University's Camperdown Campus. It is currently the home of the Veterinary Science faculty, which occupies the heritage JD Stewart Building and a variety of other buildings on the Parramatta Road frontage. Most of the buildings in the precinct are of poor quality and are at the end of their useful lives.

The CODCD site currently accommodates the following main land uses:

- part of the St John's College gravel car park (currently operated as a commercial car park);
- degraded University cricket nets;
- the University's HK Ward Gymnasium building;
- the RPA's Missenden Psychiatry Unit building; and
- part of the perimeter landscaping of St John's College oval and University landscaping.

[1] The precinct is generally identified as the Orphan School Creek Precinct in the masterplan. The University now refers to this part of the campus as the LSRP.

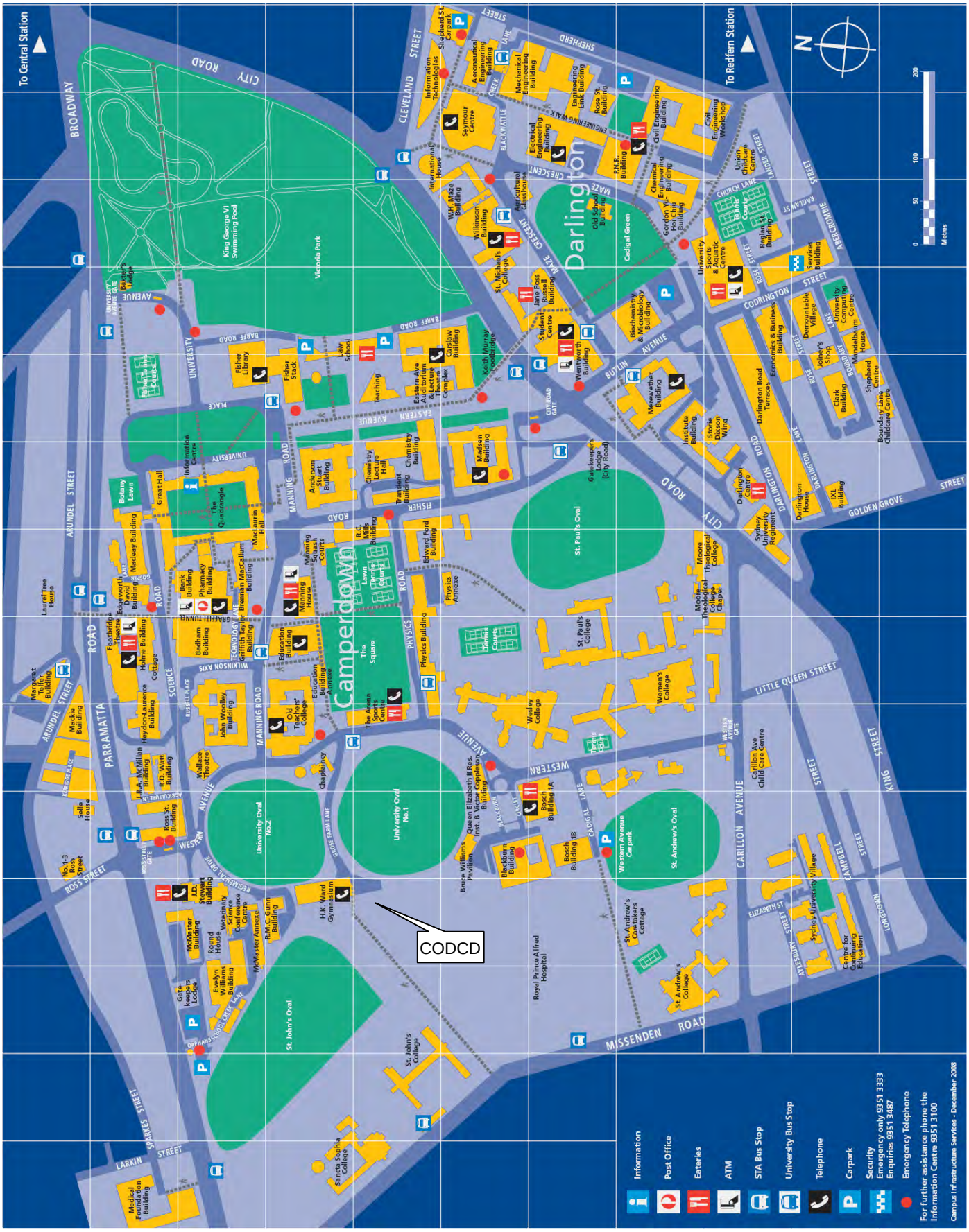


Figure 2.1: *Campus Layout Plan (Source: University of Sydney)*

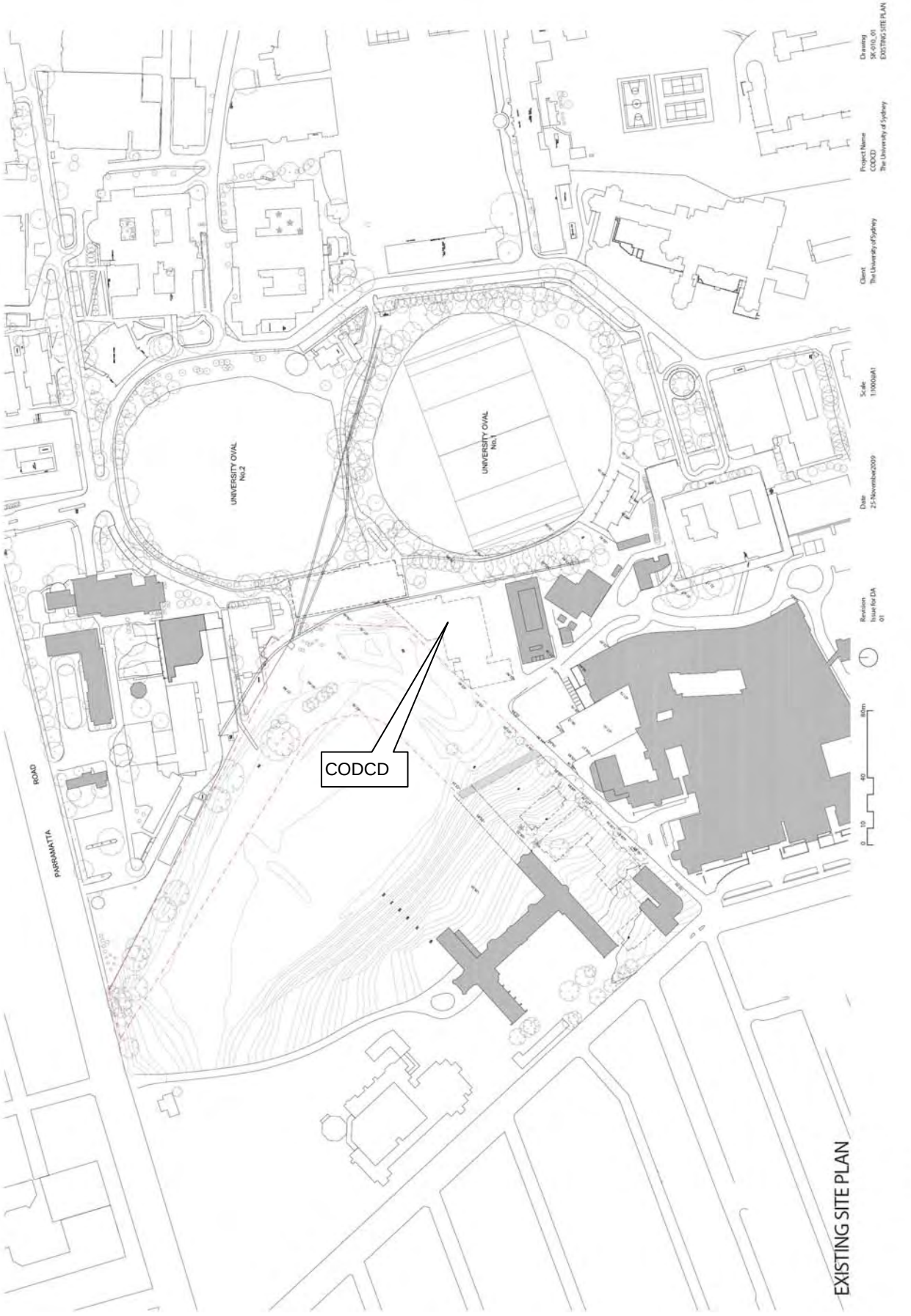


Figure 2.2: *Existing Site Plan (Source: Hassell)*

Figure 2.3: *Aerial Photo (Source: University of Sydney)*

2.2.3 Surrounding Land Use

The CODCD would be located generally within the confines of the University's Camperdown Campus, St John's College and RPA, and is well set back from public roads.

Land use immediately surrounding the proposed CODCD building includes:

- North – the University's Veterinary Science faculty;
- East – the University's Oval No.1 and Oval No.2;
- South – RPA, including the Centenary Institute (a medical research facility engaged in seeking improved treatments and cures for cancer, cardiovascular and infectious diseases); and
- West – St John's College and Sancta Sophia College (residential colleges for the University), along with the St John's College oval.

Land use in the wider area includes:

- North – mixed uses including retail, commercial and residential beyond Parramatta Road;
- East – the University's Camperdown Campus;
- South – RPA, with mixed use including residential use beyond Carillon Avenue; and
- West – RPA, with mixed use including hospital and residential use beyond Missenden Road.

The nearest sensitive receivers to the project area include:

- St John's College and Sancta Sophia College, about 150 metres to the southwest at the closest point;
- the RPA, with the Centenary Institute located immediately to the south;
- teaching and research facilities within the University, with the closest being the RMC Gunn Building about 100 metres to the north;
- residents beyond Parramatta Road, about 250 metres to the north; and
- residents beyond Missenden Road, about 250 metres to the southwest.

2.2.4 Topography

The project area is relatively flat, generally sloping gently south to north (see Figure 2.2). Existing ground levels across the site range from approximately 23 metres AHD on the southern side of the CODCD building and 22 metres AHD on the northern side.

The topography of the site has been significantly altered from its natural state for development of the University and RPA many years ago, particularly levelling undertaken for the construction of the St John's College Oval.

2.2.5 Geology and Soils

The underlying geology of the site comprises Ashfield Shale, which typically consists of shale and laminite.

The soil profile reflects the historic filling of the site to accommodate the urban land uses including the St John's College oval, and typically includes:

- clayey fill to depths of between 0.6 metres and 6.6 metres; above
- natural clays; above
- shale and sandstone bedrock, at depths of between 4.0 metres and 9.8 metres.

Site assessments undertaken for the project indicate that the site has some risk of low-level contamination, and potential acid sulfate soils.

Geological and soil aspects of the project, including contamination and acid sulfate soils, are discussed further in Section 6.1.

2.2.6 Water and Flooding

There are no natural watercourses on or in proximity to the site, with the site draining generally from south to north in accordance with the site topography. Stormwater from the site drains to pipe infrastructure in Parramatta Road, which drains north to Johnstons Creek, eventually discharging into Sydney Harbour at Rozelle Bay (see Figure 1.1).

Historically, Orphan School Creek drained through the site in a south-east to north-west direction, though this creek was filled many years ago for the construction of the University and St John's Oval (the alignment of the former creek is shown on Figure 6.4, and generally follows the alignment of Orphan School Creek Lane).

The site is located above the 1 in 100 year flood level.

Water and flooding aspects of the project are discussed further in Section 6.1.

2.2.7 Noise and Air Quality

The acoustic environment of the project area reflects its urban setting near the Sydney CBD. The noise environment is particularly affected by traffic noise on Parramatta Road.

Air quality also reflects the site's urban setting, and is considered to be typical of the Sydney airshed.

As identified above, the nearest sensitive receivers to the site are the dormitories on St John's College and Sancta Sophia College, approximately 150 metres to the south-west (at the closest point), and the RPA, including the Centenary Institute which is immediately to the south of the site.

Noise and air quality aspects of the project are discussed further in Sections 6.3 and 6.4, respectively.

2.2.8 Flora and Fauna

The site and the wider LSRP is predominantly cleared, however there is mature landscaped treed vegetation along the eastern and south eastern perimeters of St John's Oval, around the perimeter of the University Ovals No.1 and No.1, as well as tree and shrub landscaping around the Missenden Unit and HK Ward Gymnasium buildings (see Figure 2.3).

The treed vegetation contains many weedy species, although there are groups of native trees, which vary in condition from poor to good.

The vegetation is not considered to provide significant habitat for native fauna, given its generally small, linear and predominantly poor condition, and lack of connectivity to areas of remnant bushland. However, at least some of the vegetation does provide habitat for birds and possums.

Ecological aspects of the project are discussed in detail in Section 6.6.

2.2.9 Heritage

The site is located within the Sydney University heritage conservation area, the University of Sydney Site Landscaping heritage item and the Royal Prince Alfred Hospital Group heritage item, as identified in the *South Sydney Local Environmental Plan 1998* (see Figure 2.4).

The Missenden Psychiatry Unit Building is also listed as an item of heritage value on NSW Health's 'Section 170' heritage register.

There are also a number of identified heritage items in the vicinity of the site as indicated on Figure 2.4, including St John's College directly to the west.

Aboriginal archaeological assessment undertaken for the project indicates that the project area has low archaeological potential given its previous disturbance. No Aboriginal sites/objects have been identified on the site.

Non-indigenous archaeological assessment undertaken for the project indicates that the northern part of the LSRP area adjacent Parramatta Road has the potential to contain remains of Grose Farm, a government farm established by Governor Macquarie c1819, with the potential remains considered to have State heritage significance. This area would not be disturbed by the project.

Heritage aspects of the project are discussed further in Section 6.7.

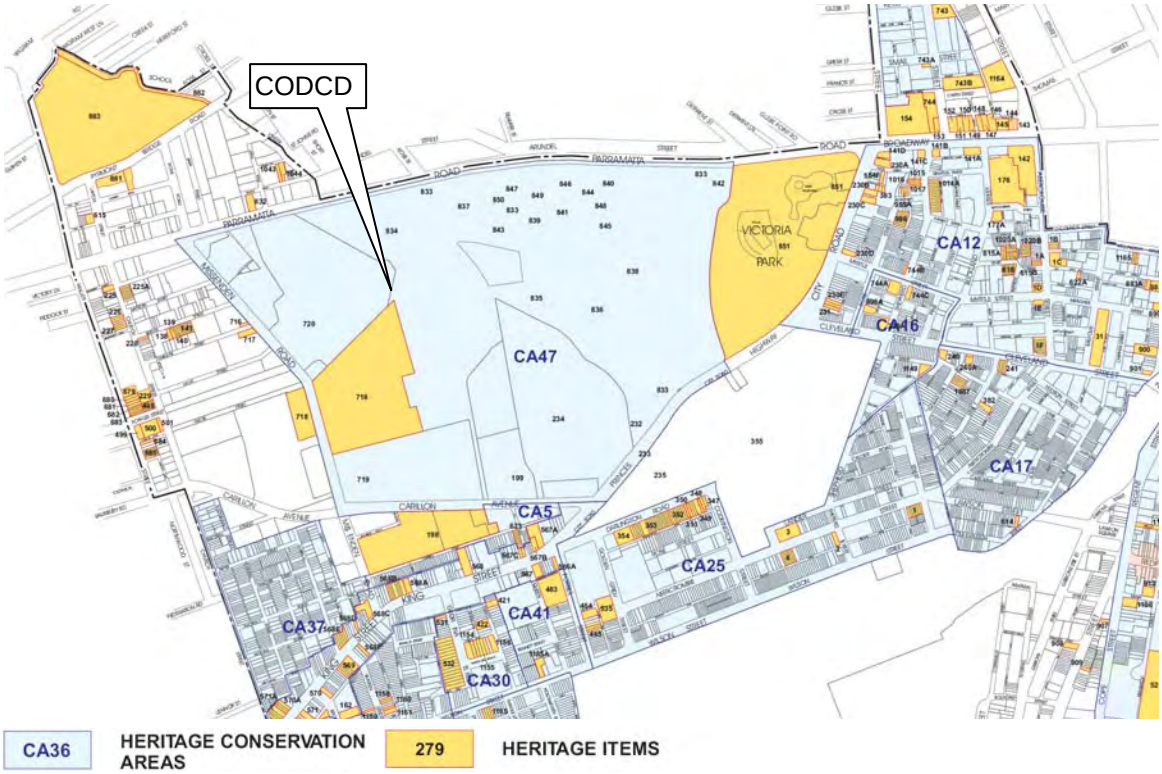


Figure 2.4: *Heritage Items under South Sydney LEP 1998 (Source: South Sydney LEP 1998)*

2.2.10 Visual Context

As stated above, the LSRP is located in a hitherto less developed area of the University, and has suffered from a lack of capital investment and maintenance in the past.

Visually, the site is dominated by St John's College and RPA, as well as St John's Oval and the vegetation along its eastern flank.

The CODCD building site is well set back from public roads, including Parramatta Road to the north and Missenden Road to the west.

Key visual receivers include:

- RPA to the south;
- St John's College and Sancta Sophia College to the west;
- the University itself to the north and east, with a particular view corridor across the University Oval No.s 1 and 2; and
- commuters on Parramatta Road, across the St John's College oval to the northwest.

Visual amenity aspects of the project are discussed further in Section 6.1.

2.2.11 Infrastructure and Services

Access and Road Network

The site is located near the intersection of Parramatta Road and Missenden Road, although the CODCD building would be well set back from these key arterial roads.

Vehicular access to the CODCD site is currently available through the University, principally via Regimental Drive and Ross Street from Parramatta Road (see Figures 1.1 and 2.1). The Ross Street / Parramatta Road intersection is signalised.

Access is also available through the RPA via John Hopkins Drive from Missenden Road. The John Hopkins Drive / Missenden Road intersection is not signalised and provides primary access to RPA.

Stormwater Drainage

There are 2 existing stormwater pipes within the site area, including a large 1,050 millimetre diameter Sydney Water pipe and a smaller University feeder pipe of unknown diameter. The larger Sydney Water pipe is able to service the stormwater discharge from the project site (potentially subject to relocation).

Potable Water

There is an existing Sydney Water mains water supply available below and adjacent to the University Ovals No.1 and 2, which is able to service the project.

There is also an existing, though disconnected, 1,050 millimetre diameter Sydney Water pipe directly below the site.

Sewer

There is an existing Sydney Water sewer main just to the north of the site which, subject to augmentation, is able to service the project.

Electricity

Electrical infrastructure within the University is distributed around the campus via high voltage underground cables originating from various Energy Australia zone substations. This infrastructure is able to service the project, subject to augmentation.

Gas

There is an AGL reticulated high pressure gas main below the site, which is able to service the project (subject to relocation).

Telecommunications

There are 2 underground cable trenches and 2 microwave links within the project site. The University's IT network has adequate capacity to service the project (subject to relocation of the assets that are within the building footprint).

3 THE PROJECT

3.1 Project Summary

The University is proposing to construct and operate a medical research and training facility on the Camperdown Campus – known as the Centre for Obesity, Diabetes and Cardiovascular Disease (CODCD). The layout of the CODCD is shown on Figures 3.1 to 3.7, and the main components of the proposal are outlined in the following table.

Table 3.1: *CODCD Project Summary*

Project Summary	**Construction and use of a medical research and training facility, including:** • **subdivision;** • **demolition;** • **bulk and detailed earthworks;** • **construction and use of the CODCD facility;** • **ancillary services, including internal access roads and utilities servicing.**
Proposed Use	University purposes, predominately medical research and training/education, with ancillary facilities including cafés
Subdivision	Lot boundary adjustment between the University and the RPA
Demolition	Demolition of the University's HK Ward Gymnasium building and cricket nets, the RPA's Missenden Psychiatry Unit building, and part of the St John's College commercial (gravel) car park
Earthworks	Bulk earthworks across the site to create a level building pad and to excavate basement levels. Approximately 50,000m^3 of fill to be exported.
Facility Description	The CODCD would comprise a single 8 level building (plus 2 basement levels and rooftop plant) with a total gross floor area of approximately 45,000 m^2, including: • research areas: o wet and dry research labs o research offices • education areas: o teaching labs o group learning o teaching staff offices • ancillary support areas: o amenities (inc. cafés) o administration, stores, supplies and waste areas
Capital Investment Value	$350 million
Employees	Construction – Estimated 200 full time equivalent construction jobs Operation – Total building population of up to 1,140 staff, including 290 new employees
Infrastructure and Services:	
Access and Roads	Construction of internal access and circulation roads and car parking (215 spaces). No external roadworks are required
Stormwater Drainage	Relocation of existing Sydney Water stormwater main around the CODCD building (unless able to remain in-situ). On-site stormwater collection, detention and treatment, with connection to relocated stormwater mains within the campus.
Potable Water	The site would be connected to existing Sydney Water mains supply beneath the University ovals. The proposal includes a number of water savings measures, including water efficient (4-star minimum) fixtures and harvesting of roof rainwater for toilet flushing, cooling tower make-up and irrigation.
Sewer	The site would be connected to reticulated sewer to the north of the site (within the campus), which would be augmented to accommodate the project.
Electricity	The facility is able to be serviced from existing electrical supplies in the area, subject to some augmentation. The project includes an ambitious energy savings benchmark (40% reduction), based on a number of substantial active and passive

	energy savings measures, including a double-skin façade, central voids, and potential geothermal heat exchange system and tri-generation system.
Gas	Relocation of, and connection to, the existing AGL reticulated high pressure gas main within the site.
Telecommunications	Relocation of, and connection to, the existing University IT fibre optic network within the site.

3.2 Subdivision

The CODCD site lies partly within Lot 101 in DP 819559, owned by the RPA (see Figure 3.1). Consequently, the boundary between the University and the RPA is proposed to be adjusted to revest a portion of Lot 101 from the RPA. The RPA has agreed to this boundary adjustment.

The proposed subdivision is shown on Figure 3.2. A final subdivision plan would be prepared, to the satisfaction of Department of Planning, prior to obtaining a subdivision certificate for the subdivision.

3.3 Demolition

The project requires the demolition of University's HK Ward Gymnasium building and associated (degraded) cricket nets, the RPA's Missenden Psychiatry Unit building, and part of the St John's College commercial (gravel) car park. The Missenden Unit and the sporting facilities would be relocated to other areas of the RPA/University (subject to separate approval/s, if required)[2].

Demolition would be undertaken in accordance with a detailed Waste Management Plan for the project, which would target a 90% diversion of demolition (and construction) waste from landfill. It would also provide for a hazardous materials survey to be undertaken of the HK Ward Gymnasium and Missenden Unit buildings prior to demolition (see Section 6.9).

All demolition would be undertaken in accordance with applicable standards and guidelines, including *Australian Standard AS 2601-2001: The Demolition of Structures*.

3.4 Earthworks and Construction

Bulk earthworks works would be undertaken across the site to create a level building pad for development of the CODCD and to excavate the basement levels. The building would be constructed at a finished ground level of approximately 23.5 metres AHD.

The earthworks would require exportation of approximately 50,000m^3 of fill from the site. The excavated fill is likely to be contaminated to an extent, and would therefore be managed in accordance with a Remedial Action Plan for the site (see Section 6.2). This would include classification of the exported material in accordance with Department of Environment, Climate Change and Water's (DECCW) guidelines, and disposal of the fill at a landfill appropriately licensed to accept the material.

Once the bulk earthworks are complete, construction works associated with the project would involve:

- detailed earthworks, including stormwater drainage works;
- infrastructure and site servicing;
- construction of the CODCD; and
- site landscaping.

Construction works would be undertaken in accordance with a detailed Environmental Management Strategy, prepared to the satisfaction of the Department of Planning.

The building works are expected to take approximately 24 months to complete, with internal fitout, commissioning and occupation occurring over an additional 6 to 8 months.

[2] The SSWAHS has plans to relocate the occupants and functions of the Missenden Unit into existing hospital facilities in 2010.

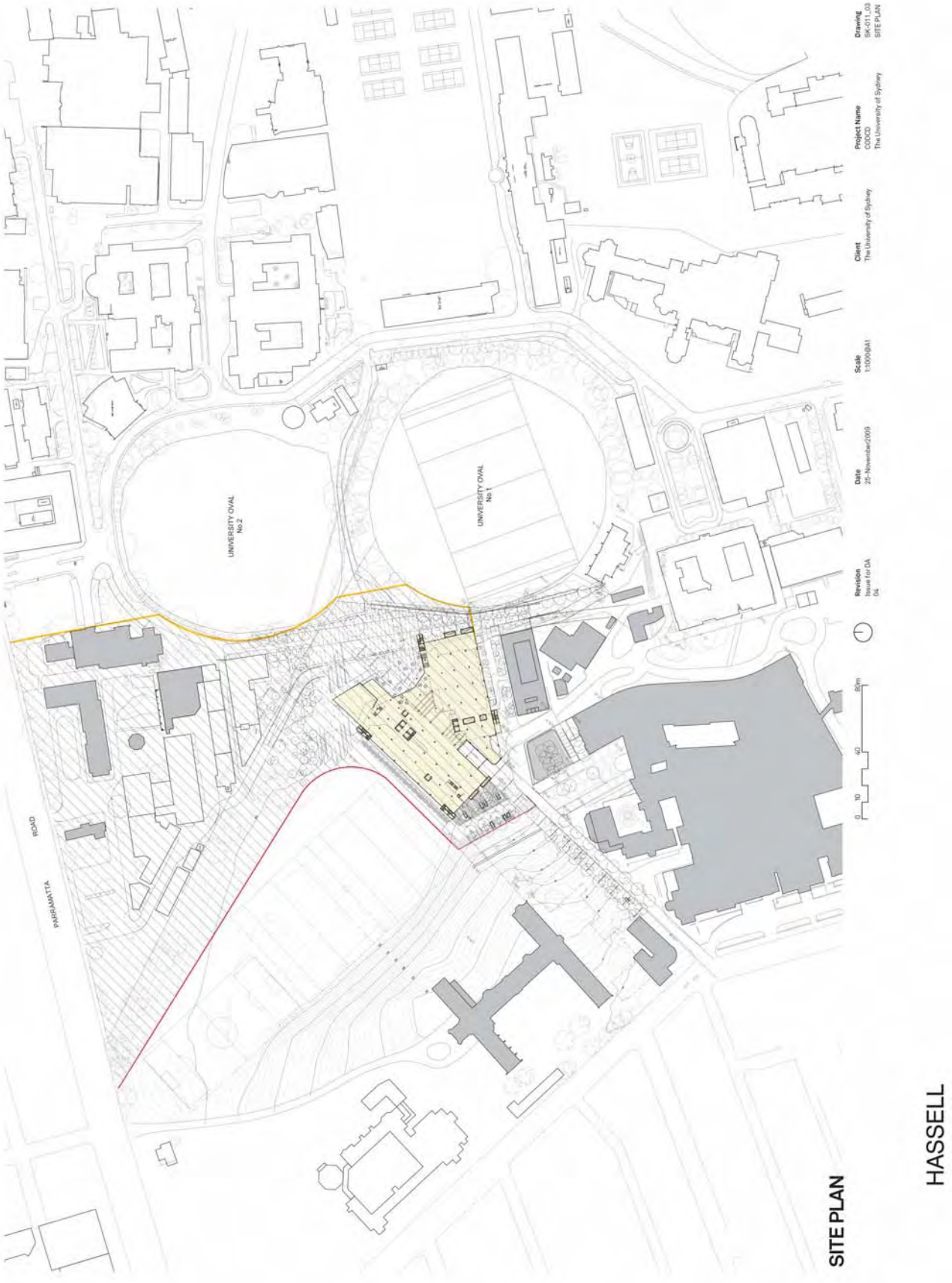


Figure 3.1: *Site Plan (Source: Hassell)*

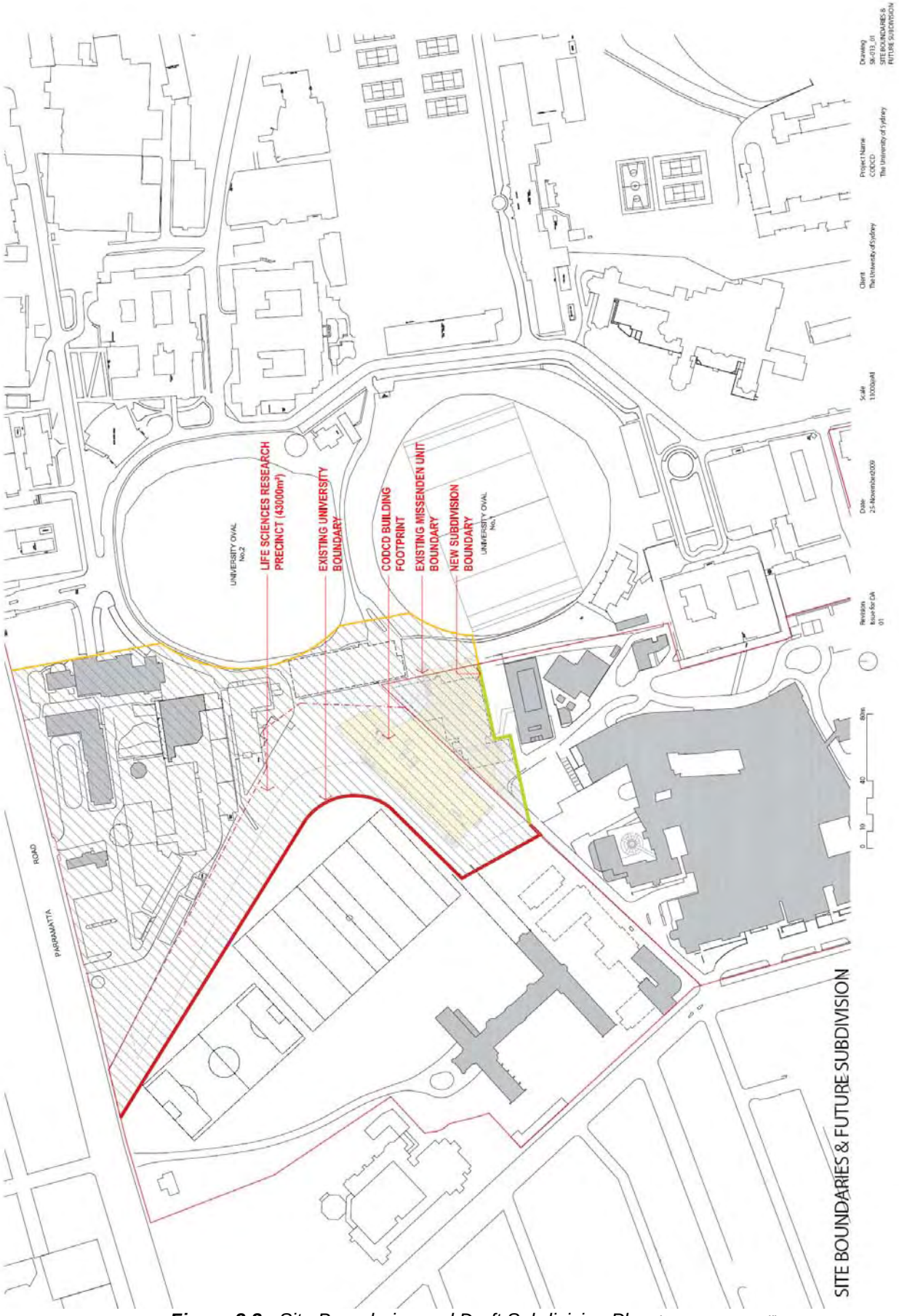


Figure 3.2: *Site Boundaries and Draft Subdivision Plan (Source: Hassell)*

Figure 3.3: *Ground Floor Plan (Source: Hassell)*

Figure 3.4: *Typical Research Level Floor Plan (Level 4) (Source: Hassell)*

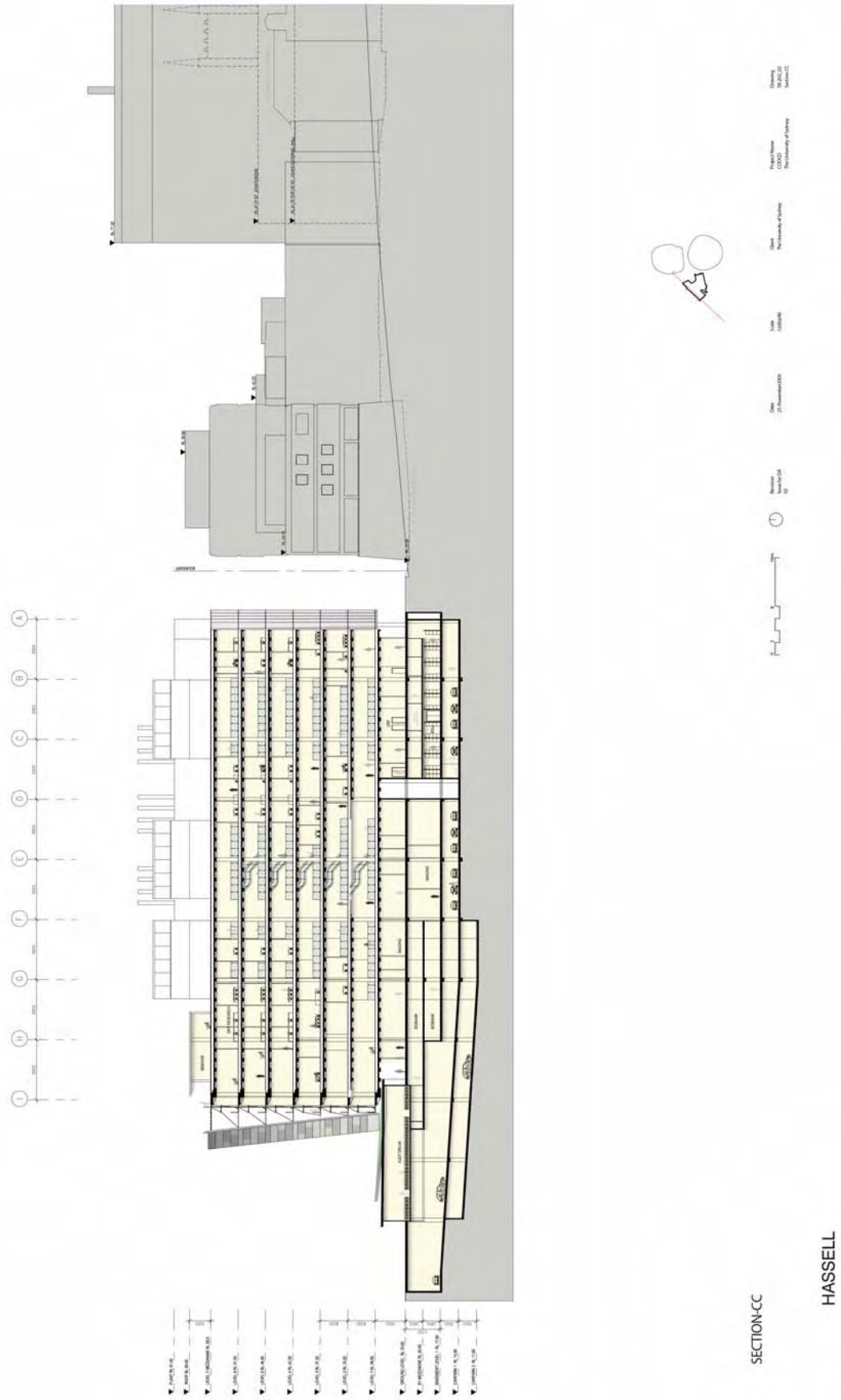


Figure 3.5: *Representative Section (Source: Hassell)*

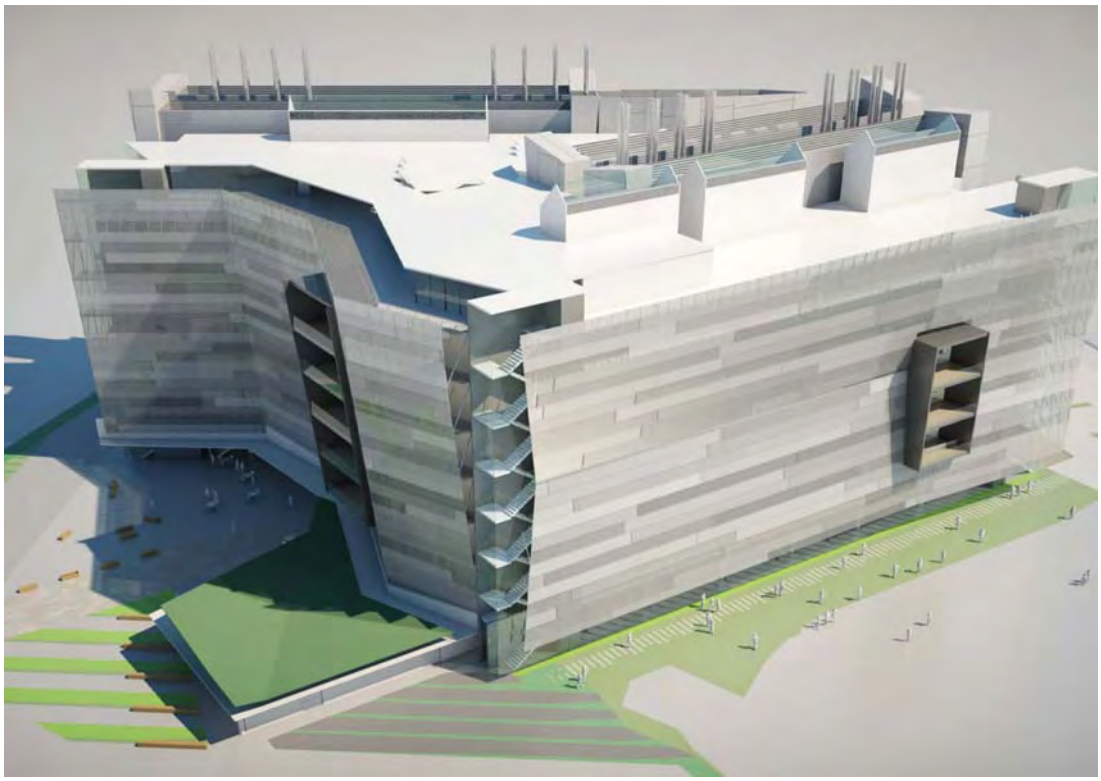


Figure 3.6: *Perspective from North-east (Source: Hassell)*

Figure 3.7: *Photomontage from North-east (Source: Hassell)*

3.5 Description of the CODCD

A summary of the CODCD building elements, and the associated areas and heights, is presented in the following table.

The design philosophy of the building is described in detailed in the architect's design statement in Section 6.1, and in the Design Report in **Appendix C**.

Essentially, the 8-level CODCD building consists of two major laboratory wings either side of a central 'through-site link' street connecting the RPA and St John's College with the University. The lower levels of the building would accommodate most of the education (including auditorium), support (including café) and specialist tertiary units which require public/patient interface. The floors above Level 1 typically comprise a laboratory wing and associated dry research (offices). The CODCD has been designed to maximise collaboration and natural daylighting, as discussed further in Section 6.1.

Table 3.2: *CODCD Elements and Area Schedule*

Building Elements and Areas	
• Research Areas, including: o wet and dry research labs o research offices	25,974 m^2
• Education Areas, including: o teaching labs o group learning o teaching staff offices	4,610 m^2
• Ancillary Support Areas, including: o amenities (inc. cafés on the ground level and on Level 7) o administration, stores, supplies and waste areas	4,526 m^2
Total Areas	
Useable floor area	35,110 m^2
Gross floor area (excluding parking)	44,814 m^2
Building footprint area	5,534 m^2
Parking area	7,114 m^2
Other paved area (hardstand and roads)	10,282 m^2
Landscape area	4,273 m^2
Floor Space Ratio (Camperdown Campus existing)	~0.99:1
Floor Space Ratio (Camperdown Campus with CODCD)	~1.14:1
Heights	
No. of levels above ground (inc. ground floor)	8
No. of levels below ground (basements)	2
Finished ground level	RL 23.5m
Maximum height	RL 59.9 (roof level) RL 61.5m (roof plant level)
Parking	
Car parking spaces	200 (plus 15 visitor spaces at grade)
Loading spaces	2 trucks plus sally port
Bicycle parking	125

3.5.1 Research Areas

The research areas are central to the operation of the CODCD, and would typically accommodate two types of research – wet and dry.

Wet research would involve testing and analysis of chemicals, drugs or biological matter in a controlled environment or laboratory.

Dry research would involve computational or data analysis, as well as work carried out by clinicians, clinical trials or public health researchers. Dry research areas would be similar to office environments.

In addition the research areas would contain 'tertiary units', which are specialist resource facilities shared by multiple research groups. The units would be accommodated in both laboratory (or controlled) and non-laboratory environments. Tertiary units would include a/an:

- Biobank, for long term cold storage of biological samples;
- Biological Services Unit (BSU), for animal holding and procedures;
- Clinical Research Facility (CRF), for clinical trials work, metabolic endocrine and cardio-vascular studies on human volunteers;
- Cytometry Unit, for cell analysis and sorting;
- Device Discovery Unit, for experimenting with new medical device designs;
- Hot lab for ionisation;
- Imaging (Cellular), which would accommodate state-of-the-art microscopy including in-vivo equipment;
- Imaging (Human and Animal), for in-vivo imaging of clinical trials volunteers and animal studies;
- Immunohistology, for preserving and investigating tissue and cell samples;
- Omics Group, which would accommodate Genomics, Proteomics Transcriptomics, Metabolomics, the Oxidative Stress Bioanalytic Facility and other molecular biology techniques;
- Tissue Culture laboratory; and
- Protein Production, to support the work of Proteomics and Structural Biology.

All of the research facilities would be established in accordance with the broad range of applicable standards and codes, including:

- National Health and Medical Research Council Codes of Practice;
- National Health and Occupational Safety Commission Code;
- Office of the Gene Technology Regulator requirements;
- Guidelines for Certification of PC2 and PC3 Facilities;
- NSW Government Radiation Control Act and Regulations;
- Animal Welfare Unit of NSW Department of Agriculture;
- Australian Code of Practice for the Care and Use of Animals for Scientific Purposes, 7th Edition, 2004;
- AS 2243 Safety in Laboratories;
- AS 2430 Classification of hazardous areas;
- AS 2982 Laboratory Design and Construction;
- AS 1940 The Storage and Handling of Flammable and Combustible Liquids;
- AS 1894 The Storage and Handling of Non-flammable and Cryogenic and Refrigerated Liquids;
- AS 2986 Medical Gas Systems;
- AS 2252 Laminar Flow Biological Cabinets;
- AS 2647 Biological Safety Cabinets;
- AS 4332 The Storage and Handling of Gases in Cylinders;
- AS 3780 The Storage and Handling of Corrosive Substances;
- AS 3760 In Service Safety Inspection and Testing of Electrical Equipment;
- AS 3745 Emergency Control Organisation and Procedures;
- University of Sydney Occupational Health and Safety policies;
- University of Sydney Guideline for Safety in Laboratories; and
- The Australasian Health Facility Guidelines (for Clinical Research Facility and Imaging (Human and Animal) Unit).

3.5.2 Education Areas

The CODCD's contribution to teaching and learning at the University is an important part of its mandate. The education spaces in the CODCD would comprise wet and dry teaching laboratories, as well as group education facilities including:

- a 300 seat capacity auditorium on the northern side of the CODCD at ground level, to be used for undergraduate lectures and as a venue for guest speakers and conferences;
- seminar rooms; and
- a Student Learning Commons, which would act as an informal learning and collaboration space for students.

3.5.3 Ancillary Support Areas

The CODCD would include a number of ancillary facilities to support the research and education areas. These would include:

- entrances and receptions to the University and RPA, including 2 connection bridges to the Centenary Institute to facilitate collaboration with the Institute;
- cafés , including a main 'healthy eating' café on the ground floor, and a staff café on Level 7;
- amenities, including staff showers and lockers in the basement to allow staff who cycle or walk/jog to work to shower and change;
- administration and IT support spaces;
- a centralised stores and waste management area in the basement, adjacent to the loading dock; and
- a centralised media preparation area and glass wash and decontamination area, in the basement.

3.6 Hours of Operation

The CODCD would operate up to 24 hours a day, 7 seven a week, 365 days a year.

Normal hours of operation would be 8:00am to 6:00pm, Monday to Friday, however some research functions would operate with extended normal hours, for example the Clinical Research Facility which would operate from 8:00am to 8:00pm.

Construction works for the project would be undertaken in accordance with the hours as stipulated in DECCW's *Interim Construction Noise Guideline*, namely:

- 7:00am to 6:00pm Monday to Friday;
- 8:00am to 1:00pm Saturdays; and
- no work on Sundays or public holidays.

Construction works that are inaudible at surrounding receivers may be undertaken outside these times.

3.7 Capital Investment

The project has a capital investment value of approximately $350 million.

The Commonwealth Government is funding $95m of the project cost as stimulus funding from the Education Infrastructure Fund (EIF).

3.8 Employment and Building Population

The CODCD would have a total staff population (including researchers, academic and teaching staff and support staff) of up to 1,140. Of this population, approximately 850 would be existing personnel based at the University, the RPA or other partner organisations, and approximately 290 would be new personnel.

The CODCD would also accommodate a student population of up to 980, of which up to 330 may be considered to be new students (based on the University's target increase in undergraduate teaching in CODCD-related subjects).

Further, the CODCD would accommodate up to 55 volunteers involved in clinical trials, of which 27 could be considered to be new to the University or RPA campus.

The construction phase of the project is expected to generate approximately 200 full time equivalent jobs.

3.9 Infrastructure and Services

The infrastructure and servicing strategy for the project is detailed in the Traffic Assessment and Infrastructure Assessment for the project, attached as **Appendix O** and **Appendix D**, respectively. A summary of the strategy is provided below.

3.9.1 Access and Road Network

Site Access and Internal Roads

Access to the site is proposed via existing entrances to the University with some new internal roads. Accesses would include:

- northern access from Parramatta Road via Orphans School Creek Lane and a new internal access road from Orphans School Creek Lane to the CODCD. This route would be the main construction access and operational access point to the CODCD's basement car park and loading dock;
- southern access from Western Avenue (and Carillon Avenue) via Blackburn Circuit and a new internal access road from Blackburn Circuit around the western side of University Oval No.1 to the CODCD. This route would provide operational access to the CODCD's basement car park;
- western access from Missenden Road via John Hopkins Drive. This route would provide access to the drop off / pick up facility and at-grade visitor parking for people attending the clinics, with no direct access to the CODCD's basement car park; and
- north-eastern access from Parramatta Road at the Ross Street intersection via Western Avenue and Regimental Drive. This route would provide access to the drop off / pick up facility only, with no direct access to the CODCD's basement car park.

External Roadworks

No external roadworks are required for the project.

Parking and Loading

A car park with 200 parking spaces would be provided in the CODCD basement levels. These spaces would be restricted to allocated staff parking.

Approximately 15 at grade visitor parking spaces would also be provided for drop off / pick up and short stay parking for clinical research patients on the western side of the CODCD, which would be accessed via John Hopkins Drive.

Loading facilities would also be provided in the CODCD basement.

All parking spaces would be appropriately sealed and linemarked.

3.9.2 Stormwater Drainage

The 1,050 millimetre diameter Sydney Water stormwater pipe within the site would be relocated around the eastern side of the CODCD building, in accordance with Sydney Water requirements (unless determined not to be required following detailed design). Sydney Water does not object to this proposal (see Appendix D).

Stormwater drainage from the site would be directed to the relocated stormwater pipe following on-site collection, detention and treatment.

Stormwater management is discussed further in Section 6.2.5.

3.9.3 Potable Water

Sydney Water potable water supplies are available from mains below and adjacent to University Ovals No.1 and 2, which are adequate to service the project.

The existing disconnected 1,050 millimetre diameter Sydney Water pipe beneath the footprint of the CODCD is proposed to be demolished and the easement extinguished. Sydney Water does not object to this proposal (see Appendix D).

As discussed in Section 3.10.1 below, the project includes a number of water savings measures which would significantly reduce potable water use on the site.

3.9.4 Sewer

The CODCD would be connected to the sewer main to the north of the site, within the University grounds.

The Infrastructure Assessment indicates that the sewer main may need to be augmented (ie. increased in size from 225 millimetres to 300 millimetres) to accommodate the additional load from the project. The need for such augmentation would be determined during detailed design for the building, and would be undertaken to the satisfaction of Sydney Water if found to be required.

3.9.5 Electricity

Energy Australia has advised that there is insufficient capacity within the existing electrical infrastructure to meet the operational needs of the project.

However, Energy Australia is currently upgrading its substation on the corner of Layton and Purkis Streets Camperdown, which will service the University including the CODCD site. The substation upgrade is planned to be completed in time for the operational phase of the CODCD project (ie. 2012).

The project includes the provision of new internal high voltage infrastructure to service the project, including installation of two new chamber substations within the CODCD building.

In the longer term, the Infrastructure Assessment notes that the University is planning the development of a new private zone substation on the University campus (subject to separate approval), to ensure adequate energy supply for future developments on the University.

As discussed in Section 3.10.2 below, the project includes considerable passive and active energy savings measures to reduce energy use associated with the facility, which would help to reduce demand on existing electricity supplies.

3.9.6 Gas

The existing AGL reticulated high pressure gas main within the site would be relocated around the eastern side of the CODCD building, in accordance with AGL requirements. The CODCD would be connected to the relocated main, which would provide gas for the building as part of the proposed tri-generation scheme (see Section 3.10). The gas main has adequate capacity to service the demand from the project.

3.9.7 Telecommunications

The existing University IT infrastructure within the site (including 2 cable trenches and 2 microwave links) would be relocated as necessary around the footprint of the CODCD building. The University IT network has adequate capacity to service the project.

3.10 Sustainable Building Design

The CODCD has been designed to be a landmark in sustainability, achieving high benchmarks for energy efficiency, water efficiency and indoor environmental quality.

To develop the sustainable building design initiatives, an Ecologically Sustainable Development (ESD) Report has been prepared for the project by Arup, which sets the overarching ESD framework for the project (see **Appendix E**). Based on the principles in the ESD Report, a Sustainable Building Design report for the CODCD has been prepared by Steensen Varming (see **Appendix F**).

A summary of the sustainable building design measures proposed for the CODCD is presented below.

3.10.1 Benchmarks

The proposed CODCD facility contains education and health related research/laboratory areas. There is currently no environmental performance rating tool (such as 'Green Star') that can be effectively applied to the CODCD.

Accordingly, the University has committed to the following key benchmarks for the CODCD:

- a target 40% reduction in annual energy consumption when compared to the average energy consumption of similar laboratory buildings throughout the world; and
- the development of a Green Star Design rating for the CODCD based on a custom laboratory rating tool, in consultation with the Green Building Council of Australia.

The key initiatives that have been proposed, or are being investigated, to meet these key benchmarks (and other benchmarks in the ESD report) are outlined in the following sections and illustrated in the schematic on Figure 3.8.

It is noted that some of the key measures – including the major geothermal heat exchanger and tri-generation plant – are subject to detailed feasibility analysis at this stage. Accordingly, whilst the University has committed to the key performance-based benchmarks in the ESD Report, it notes that some of the initiatives to reach these benchmarks may be subject to change. Any such change would not affect the overall performance of the CODCD, given that the benchmarks would be met.

3.10.2 Energy Conservation

Key Measures

The key energy savings measures that are proposed or are being investigated for the CODCD Project to meet the above benchmarks include:

- **Geothermal Heat Exchanger** – comprising a bore network installed under the University Oval No.1. The system would use heat in the earth to provide a renewable means of offsetting building heating loads in winter (and vice versa in summer). The system would have a capacity in the order of 3MW. The concept is shown on Figure 3.9;
- **Tri-generation** – comprising gas-driven engines coupled with absorption chillers. Electricity produced by the generators would offset power demands and waste heat from the generators would be used to produce chilled water for cooling and heating for the air handling system;

- **Energy efficient air handling systems** – including tempered make-up air (full fresh air systems), hybrid displacement ventilation to office areas, and night purge systems. These systems are considerably more energy efficient than conventional air handling systems;
- **Daylight Access** – Large voids/atria have been incorporated into the building design to harvest daylight from the roof into the core of the building, and reduce lighting demand and energy consumption. The skylights have been arranged with northerly orientations and curved profiles to maximise capture of daylight, and overhangs have been incorporated to shade high level summer sun; and
- **Double Skin Façade –** The northern and north westerly facades are veiled in a fritted glazed façade. The facade is multifunctional in achieving a system that provides a mechanism that filters light, view, climate, solar loads, glare, noise, maintenance, thermal comfort, weather protection and aesthetics.

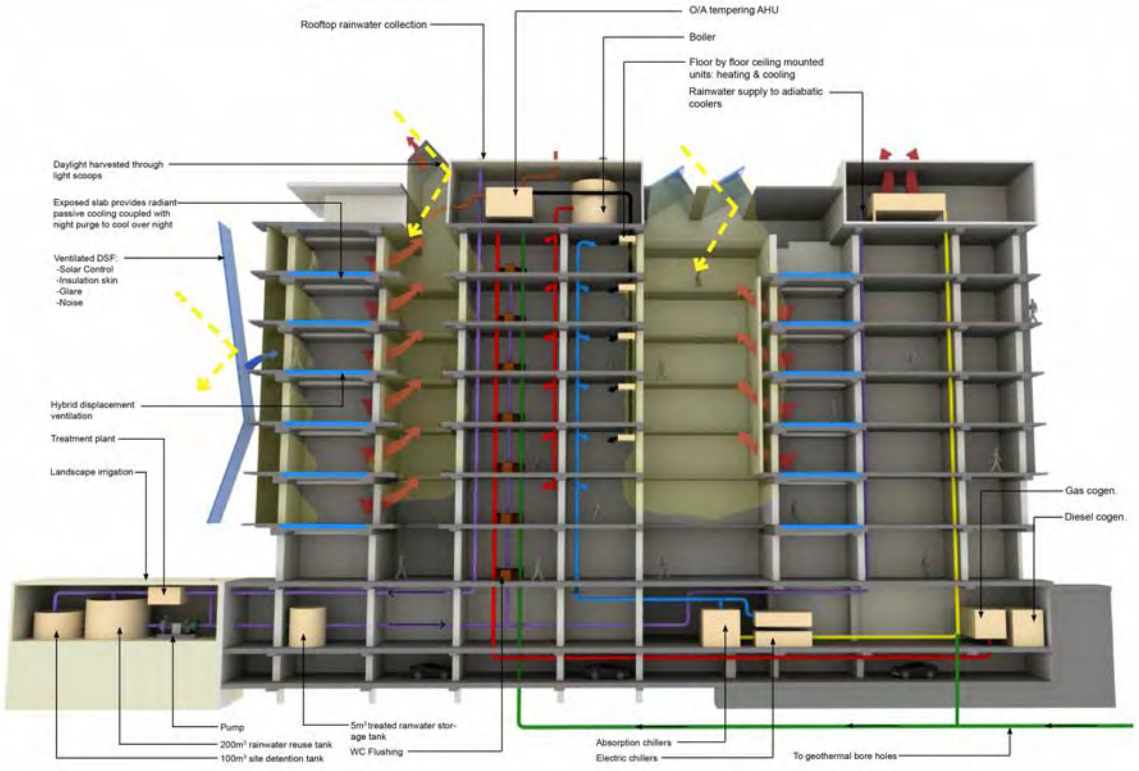


Figure 3.8: *Schematic of CODCD Sustainable Building Design Initiatives (Source: Steensen Varming)*

Other Passive Energy Efficiency Measures

In addition to the key measures described above, the CODCD has been designed in accordance with the following best practice passive measures to reduce energy wastage:

- extensive use of high efficiency glazing on the northern facades to maximise natural light whilst addressing the effects of solar gain/glare to perimeter spaces;
- maximisation of natural ventilation where appropriate for both ventilation and cooling purposes;
- room heights designed to achieve a sensible balance between functional need and economy; and
- ensuring a well insulated and sealed external building envelope with thermal mass to dampen the effect of external environmental conditions.

Other Active Energy Efficiency Measures

In addition to the key measures described above, the CODCD would incorporate the following best practice active measures in order to reduce energy wastage:

- heat recovery from ventilation systems where potential heat recovery sources exist;
- excess relief air from the building office spaces to be naturally released through the three main void/atria spaces reducing need to provide dedicated air conditioning to these areas;
- use of hot water boiler plant to handle local zone heating;
- use of energy efficient motors for pumps and fans;
- control facilities via local and remote stations enabling plant usage to match occupancy patterns;
- separation of engineering systems to serve building zones individually and achieve maximum turn down;
- efficient pipe runs and insulation of distribution pipework and ductwork to minimise unwanted heat gains/losses;
- (possible) inclusion of thermal storage devices to address peak loads and maximise plant efficiencies; and
- use of energy efficient lighting fittings and automatic control systems (except where it conflicts with functional requirements).

Figure 3.9: *Geothermal Heat Exchange Concept Plan (Source: Steensen Varming)*

3.10.3 Water Conservation

The project includes a number of water savings measures, including:

- roof rainwater collection including façade rainwater capture, for use in toilet flushing, cooling tower make-up and irrigation (preliminary designs indicate an optimum tank size of 200m^3);
- installation of water efficient fixtures to all sanitary fixtures (4-star minimum for WCs and 5-star for other fixtures);
- installation of drip irrigation systems;
- provision for fire services test water from fire systems to be discharged for reuse into the rainwater reuse tank; and
- installation of state-of-the-art water consumption metering to enable monitoring and analysis of water use.

These water savings measures would significantly reduce potable water use associated with the project.

3.11 Landscaping

Landscaping would be undertaken both within the University and within the RPA in accordance with the Landscape Plan prepared for the project, prepared by Hassell.

Refer to Section 6.1 for detail on the landscaping principles.

Figure 3.10: *Landscape Masterplan (Source: Hassell)*

3.12 Lighting and Security

The CODCD would include a range of security installations, which would be managed by the University's Security Service.

Security measures would include:

- electronic access card control of all pedestrian access points to the CODCD, except main reception doors and public amenity areas (eg. student common areas, cafes), which would be unsecured during normal operating hours;
- boom gates and electronic access card control at vehicular access points, except at reception drop-off areas;
- alarm systems and CCTV; and
- 24 hour patrol by the University's Security Service.

All external lighting would be installed in compliance with *AS 4282(INT) - Control of Obtrusive Effects of Outdoor Lighting*.

3.13 Signage

Final signage details for the CODCD have not been resolved at this stage.

To ensure that signage is designed and installed in an orderly and high quality manner, the University has committed to the preparation of a Signage Strategy for the project, to be prepared in consultation with RPA, the residential colleges and Council, and to the satisfaction of the Department of Planning.

4 PLANNING CONTEXT

4.1 Strategic Context

4.1.1 Metro Strategy

The *Sydney Metropolitan Strategy* (the Metro Strategy) released in December 2005, is the State Government's long term planning blueprint for the Sydney Metropolitan Area for the next 20 years. It caters for the creation of 500,000 extra jobs over the period to 2030.

The strategy acknowledges that *'investing in education is vital to maintaining Sydney's [global] competitive edge'*, and recognises that *'major education and health facilities are clustered in or close to the centre of Sydney in particular around Sydney University and Royal Prince Alfred Hospital…'*.

The University and RPA are specifically identified in the strategy as knowledge precincts that contribute to Sydney's competitive strengths globally, as well as being an important health and higher education 'cluster' (see Figures 4.1 and 4.2).

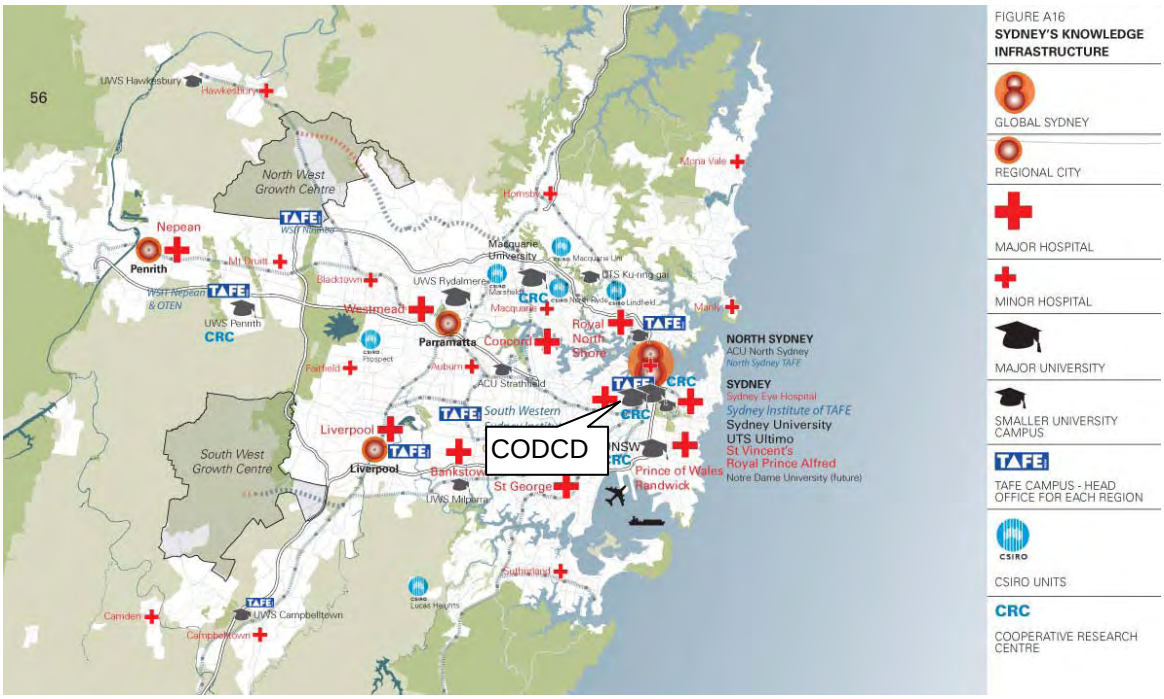


Figure 4.1: *Sydney's Knowledge Infrastructure (Source: Metro Strategy)*

The strategy also recognises the economic benefits of research and development in the health sector, stating that *'historically, annual rates of return from Australian health research and development were up to $5 for every $1 spent'*.

The CODCD project is considered to be wholly consistent with the Metro Strategy's objectives and targets, in particular:

- Objective A2 – Increase Innovation and Skills Development;
  - Target A2.2 – Strengthen industry clusters;
  - Target A2.3 – Support magnet infrastructure;
- Objective B3 – Cluster Businesses and Knowledge-based Activities in Strategic Centres;
- Objective B4 – Concentrate Activities Near Public Transport; and
- Objective B5 – Protect and Strengthen the Primary Role of Economic Corridors.

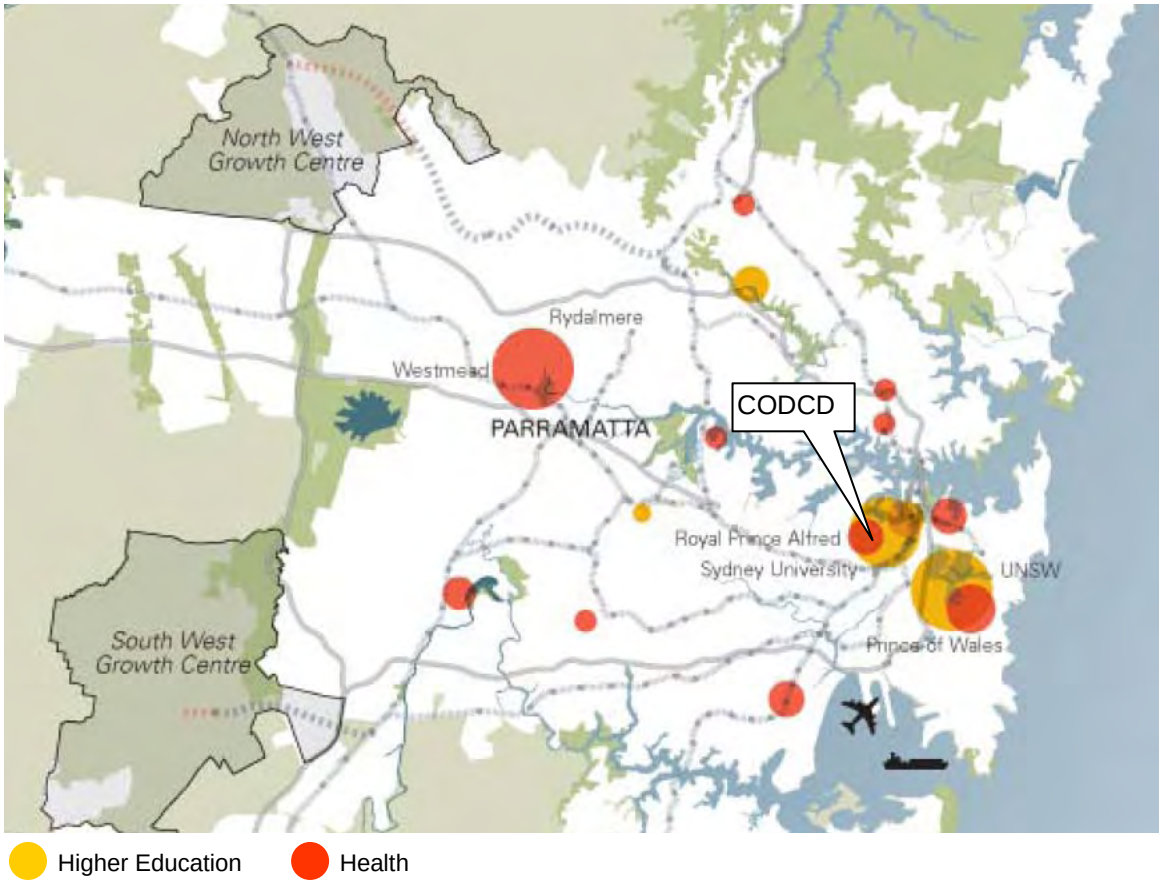


Figure 4.2: *Sydney's Health and Education Clusters (Source: Metro Strategy)*

4.1.2 Sydney City Draft Subregional Strategy

The *Sydney City Draft Subregional Strategy* builds on the strategic planning framework established under the Metro Strategy, and acts as a broad framework for the long term development of the Sydney subregion.

One of the key directions for the City of Sydney, as outlined in the strategy, is for the NSW Government and the City of Sydney to continue to promote existing and emerging 'clusters', including the education hubs around the University of Sydney, and health and medical research hubs around Royal Prince Alfred Hospital. The CODCD project directly supports this goal.

Indeed, the site is identified as part of the 'Sydney Education and Health Precinct' under the strategy (see Figure 4.3). The strategy states that the precinct, *'located to the south and west of the Sydney CBD, is a major area for education, medical and other research and technology-based jobs. The area contains world-class education infrastructure at the University of Sydney, University of Technology Sydney and Sydney Institute of Technology as well as the Royal Prince Alfred Hospital and the headquarters of the ABC. Substantial capabilities in health, medical and biotechnology research exist within the area'.*

The strategy further states that co-location of health and education institutions within these precincts *'makes a significant contribution to Australia's body of medical research. Promotion of these activities will increase recognition of research being undertaken, and may entice further organisations to locate within this area, thus reinforcing the strengths of Global Sydney'*.

The CODCD project directly reflects, and promotes, this strategic planning goal.

Figure 4.3: *Sydney City Subregional Structure Plan, showing Sydney Education and Health Precinct in orange (Source: Sydney City Draft Subregional Strategy)*

Further, the CODCD project is considered to be wholly consistent with the strategy's specific targets and actions, in particular:

- Action A2.1.2 – …strengthen partnerships and investigate opportunities for government and institutions to work together within the Sydney Education and Health Precinct and the wider 'creative crescent' to promote innovation;
- Action A.2.1.3 – …work together to identify opportunities for collaboration and to raise the profile of research in Sydney; and
- Action A2.2.3 – …promote the City East and the Sydney Education and Health precincts as centres of excellence in biomedical research and development.

4.1.3 State Plan

The *State Plan: A New Direction for NSW*, released in November 2006, sets out the priorities for NSW State Government action over the next 10 years. The Plan includes 34 priorities and 60 targets designed to deliver better services and improve accountability across the public sector.

The CODCD project would directly contribute to a number of the plan's important priorities and targets, including the following priorities:

- S2 – Improved survival rates and quality of life for people with potentially fatal or chronic illness through improvements in health care;
- S3 – Improved health through reduced obesity, smoking, illicit drug use and risk drinking;
- F5 – Reduced avoidable hospital admission;
- P1 – Increased business investment; and
- P4 – More people participating in education and training throughout their life.

4.1.4 University 2020 Masterplan

The (draft) *Campus 2020 Masterplan*[3] is the University's response to the pressing development drivers of increased student enrolments, growing and evolving teaching and accommodation needs, and an ageing building stock.

The masterplan has the following key planning objectives:

1. Enhancing the campus environment;
2. Engaging the community;
3. Supporting academic excellence;
4. Enhancing the student experience;
5. Ensuring a green and environmentally responsible campus; and
6. Sustainability of capital development and asset management.

Progress has already been made towards achieving these goals with the recent completion of the Law Building, Jane Foss Russell Building, and the new pedestrian mall running from Abercrombie Street to the Main Quad via Eastern Avenue (see Figure 4.4).

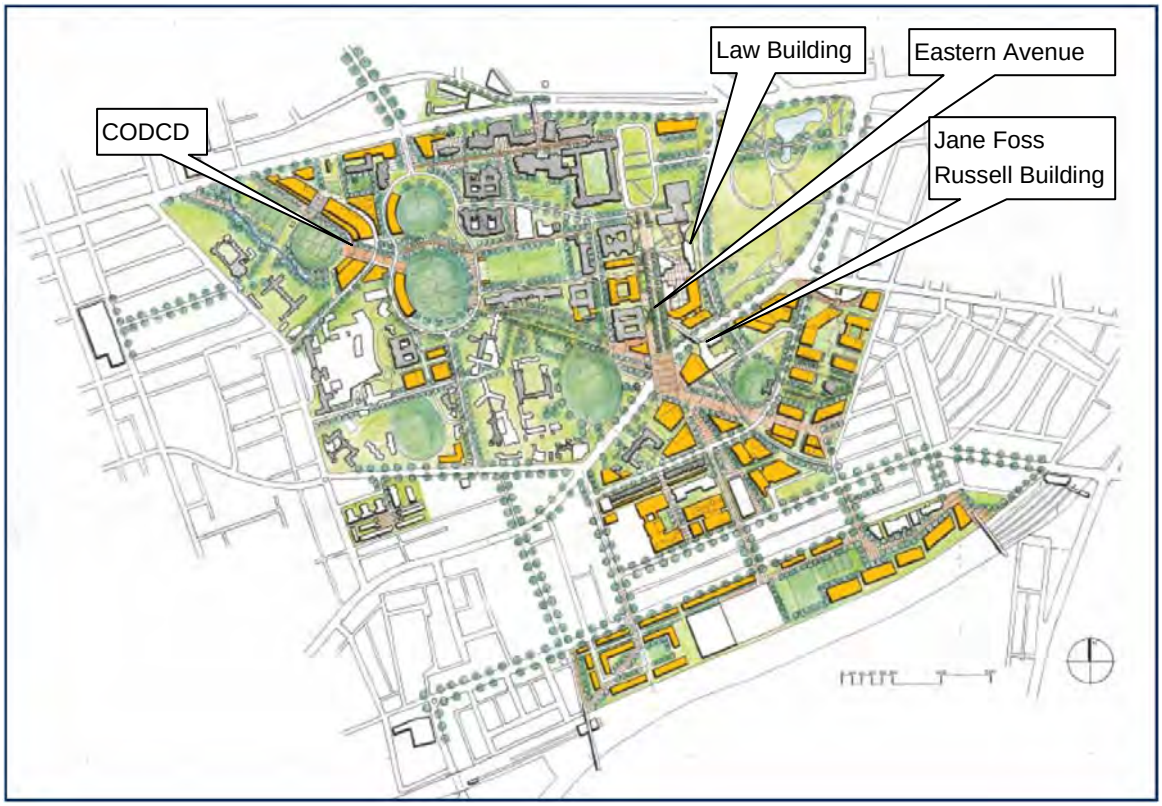


Figure 4.4: *University of Sydney Indicative Layout in 2030, showing recently completed developments and the CODCD (Source: Draft Campus 2020 Draft Masterplan)*

The CODCD would be the next major facility to be completed on the Camperdown campus under the masterplan.

In this regard, the CODCD forms in integral part of the Orphan School Creek Precinct as described in the masterplan (the precinct has since been renamed the Life Sciences Research Precinct (LSRP) by the University, in recognition of the envisaged future role of the precinct).

[3] Campus 2020 Masterplan: Building the future University, Volume 1, University Masterplan, March 2008

The masterplan notes that the precinct is the most remote from the centre of the Camperdown Campus and has suffered from a lack of major capital investment for many years, and thus presents a major redevelopment opportunity for the University.

The masterplan states that *'it is envisaged that the [LSRP] precinct will become a hub for advanced health and life sciences research in a complex of new buildings…'*, noting that the complex could provide up to 100,000m^2 gross floor area of laboratory and research space.

Figure 4.5: *Indicative Precinct Development in Masterplan (Source: Draft Campus 2020 Draft Masterplan)*

The CODCD is broadly consistent with the 2020 Masterplan, as it would provide a major health and life sciences research and training facility within the LSRP.

The only real departure from the masterplan is that the CODCD does not fully respect the envisaged new north-west to south-east trending 'diagonal' axis indicated on the structure plan for the 2020 Masterplan as shown on Figure 4.6 (with the CODCD auditorium largely sitting on this axis).

Figure 4.6: *University Structure Plan (Source: Draft Campus 2020 Draft Masterplan)*

The masterplan recognises that the structure of the Camperdown Campus is predominantly rectilinear with the primary north-south axes being Eastern Avenue and the Wilkinson Axis from the Refectory to the Physics Building (see Figure 4.6). The masterplan states that both of these axes should be preserved and reinforced in the future development of the campus.

The new north-west to south-east secondary axis indicated in the masterplan arises from the desire to 'connect' the north-western parts of the Camperdown Campus with the Darlington Campus and North Eveleigh[4]. The masterplan notes that this new diagonal axis *'would provide a key linkage between disparate parts of the University and create opportunity for new pedestrian pathways, as well as opening up attractive, but little appreciated, parts of the campus'*.

Since preparation of the 2020 Masterplan, the University has continued to review and improve the masterplan in consultation with a range of university users and urban design experts. As part of this review, the University has concluded that it would not be prudent, reasonable or feasible to construct – in physical form at least – the 'diagonal' axis through the University. Some of the reasons for this include:

- the axis is significantly compromised and constrained by topography, particularly through the middle of the Camperdown Campus, thus significantly degrading any visual benefits of a physical axis;
- the axis is significantly compromised by the presence of the University, St Paul's and St John's ovals; and
- the axis constrains development along the major north-south and east-west axes, and creates suboptimal triangular development sites.

Notwithstanding, the University acknowledges the key rationale behind the axis, namely to provide a connection from the north-western area of the Camperdown Campus down into the middle of the campus and through into the Darlington Campus and North Eveleigh.

Rather than a physical axis, the University believes that this key objective can be achieved through by ensuring that well structured pedestrian and bicycle paths exist between these areas of the University. In this regard, the project has been designed to ensure that these pedestrian and cycle paths are provided, as discussed in Section 6.8.

The proposed structure for the CODCD and the wider LSRP is further discussed in Section 6.1.

4.2 Statutory Context

4.2.1 Major Project

The proposal is classified as a major project under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act), as it involves development for the purpose of health, medical or related research with a capital investment value of more than $15 million (and more than 100 employees), and therefore triggers the criteria in Clause 19 of Schedule 1 of *State Environmental Planning Policy (Major Development) 2005*.

The Minister for Planning has formed the opinion that the proposal is development of a kind that is described in Schedule 1 of the Major Development SEPP. Consequently, the Minister for Planning is the approval authority for the project.

4.2.2 Permissibility

The site is zoned 5 – Special Uses (University) under the *South Sydney Local Environmental Plan (LEP) 1998* (see Figure 4.7).

[4] The University is currently in negotiations with the NSW Government to purchase the North Eveleigh site to add to the University campuses.

The objectives of Zone No 5 are:

(a) *to facilitate certain development on land which is, or is proposed to be, used by public authorities, institutions, organisations or the Council to provide community facilities, services, utilities or transport facilities, and*

(b) *to allow other ancillary development which is incidental to the primary use specified on the map, and*

(c) *to provide flexibility in the development of sites identified for special uses by allowing development which is permissible on adjoining or adjacent land, and*

(d) *for land in the zone and within Green Square, in addition to the above:*

  (i) *to reflect and reinforce the need for proper recognition of community land and facilities as part of a robust public domain in the Green Square locality, and*

  (ii) *to recognise that protecting and improving the quality, accessibility and impact of the public domain makes a fundamental contribution to the social, economic, environmental and urban design outcomes for the area, and*

  (iii) *to ensure that development contributes to a sustainable, vibrant community, and reflects equal and integrated consideration of social, economic and environmental design issues.*

Development for 'University' purposes is permissible with consent in this zone. Therefore, the project is permissible with consent. Further, it is considered that the project is able to be undertaken in a manner that is consistent with the zone objectives.

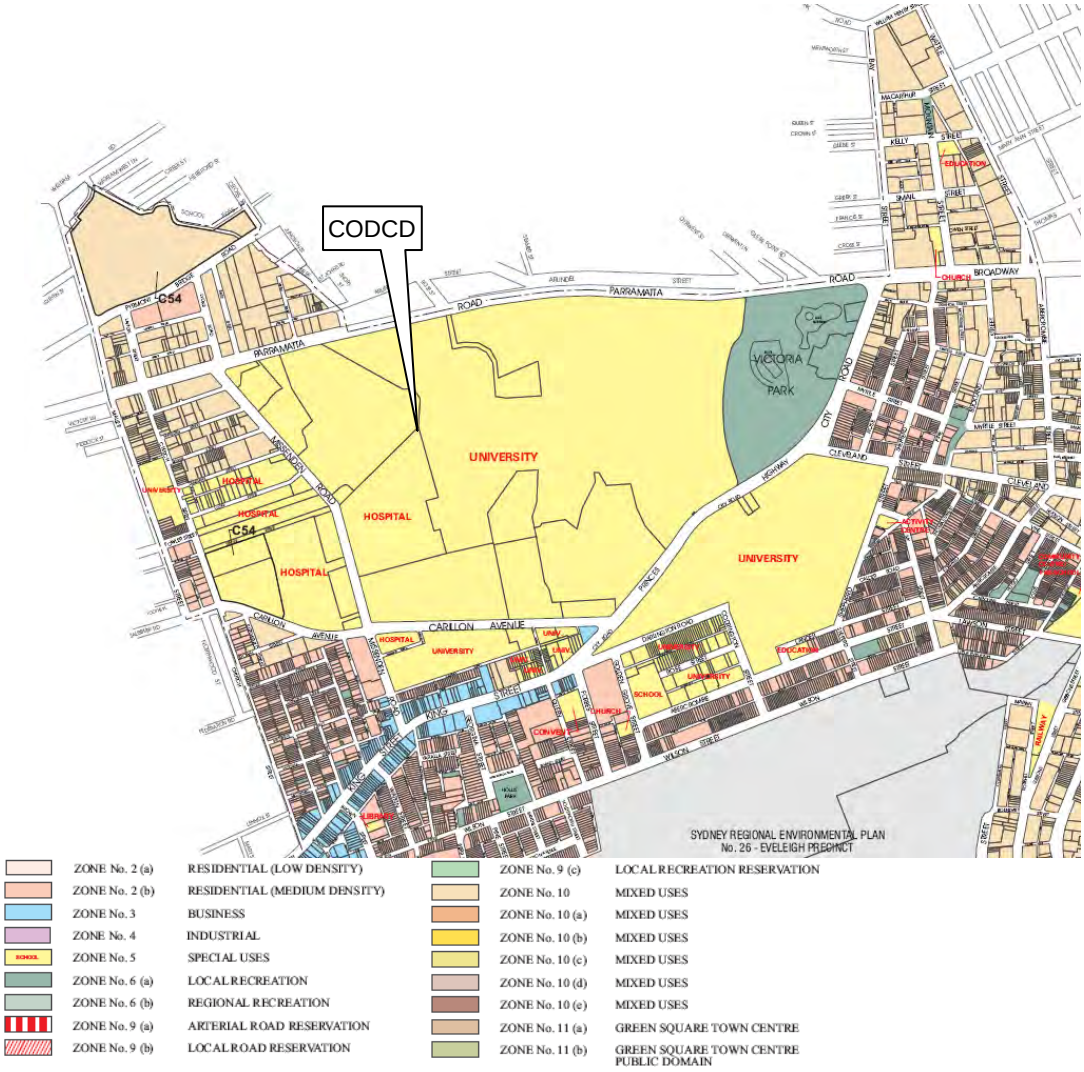


Figure 4.7: *Zoning Plan (Source: South Sydney LEP 1998)*

4.2.3 Environmental Planning Instruments

The following environmental planning instruments have been considered during the preparation of the Environmental Assessment:

- *SEPP No.33 – Hazardous and Offensive Development;*
- *SEPP No.55 – Remediation of Land;*
- *SEPP (Major Development) 2005;*
- *SEPP (Infrastructure) 2007;*
- *South Sydney Local Environmental Plan (LEP) 1998.*

Consideration of these instruments is provided below. It is considered that none of the instruments substantially govern the carrying out of the project. Further, it is considered that the project is able to be conducted in a manner that is consistent with the aims, objectives and provisions of the applicable instruments.

SEPP No.33 – Hazardous and Offensive Development

SEPP 33 provides definitions for hazardous and offensive industry to enable decisions on developments to be made on the basis of merit, rather than on industry type per se.

An analysis of the project with regard to SEPP 33, and the Department of Planning's *Applying SEPP 33* guidelines, is provided in Section 6.9.2. Subject to further consideration of infectious substances during detailed design, it is considered that the project is unlikely to result in any significant off-site risk and is able to be conducted in a manner that is consistent with the aims and objectives of SEPP 33.

SEPP No.55 – Remediation of Land

SEPP 55 aims to provide for a statewide planning approach to the remediation of contaminated land, and in particular, to promote the remediation of contaminated land for the purpose of reducing risk of harm to human health or any other aspect of the environment.

Clause 7 of the SEPP requires a consent authority to consider whether the land to which a project/development application relates is contaminated, and if the land is contaminated, to be satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation), prior to granting consent.

The potential for site contamination on the land is considered in Section 6.2, which found that the land is not significantly contaminated and would be fit for the intended use following remediation of localised contamination (via classification and off-site disposal – see Section 6.2.2 for detail). As such, the project is able to be conducted in a manner that is consistent with the aims, objectives and provisions of SEPP 55.

SEPP (Major Development) 2005

SEPP (Major Development) 2005 aims to identify projects of State or regional planning significance that are of a kind that the approval and assessment process under Part 3A of the EP&A Act should apply.

As stated in Section 4.2.1 above, the project constitutes a class of development in Schedule 1 of the SEPP. Consequently, the Minister is the approval authority for the project.

SEPP (Infrastructure) 2007

SEPP (Infrastructure) 2007 aims to facilitate the effective delivery of infrastructure across the State.

Clause 28 of the SEPP provides that development for the purpose of educational establishments on land on which there is an existing educational establishment, is permissible with consent.

Clause 104 of the SEPP applies to traffic generating development and ensures that the RTA is given the opportunity to make representations on certain traffic generating development applications before a consent authority makes a determination on the proposal.

The project meets the thresholds in schedule 3 of the SEPP (as an educational establishment with more than 50 students), and is therefore considered to be traffic generating development for the purposes of the SEPP. Consequently, the application will need to be referred to the RTA for comment.

The RTA has been consulted during preparation of the Environment Assessment (see Section 5), and traffic assessment indicates that the project is unlikely to result in any significant traffic impacts (see Section 6.5).

South Sydney Local Environmental Plan (LEP) 1998
As stated in Section 4.2.2 above, the site is zoned for university purposes under the South Sydney LEP and the project is permissible with consent in this zone.

A number of special provisions of the LEP are applicable to the project. Consideration of these provisions is provided in the following table.

Table 4.1: *Consideration of Relevant South Sydney LEP Special Provisions*

Clause	***Provision***	***Project Complies***	***Consideration***
Part 4, Div.1	***Heritage Conservation*** Requires consent authorities to consider the impacts on heritage items and heritage conservation areas, including sites of Aboriginal or non-Aboriginal archaeological significance.	Yes	The University is listed as a heritage conservation area under the LEP, and both St John's College and the Royal Prince Alfred Hospital Group are listed as heritage items, as is the JD Stewart Building on the University (see Figure 2.4). Consideration of heritage impacts is provided in Section 6.7.
Cl.28	***Design Principles and Masterplans*** Requires consent authorities to consider a number of built environment design principles and, where applicable, available masterplans. The design principles relate to: • topography and setting; • streetscape and character; • scale and design; • privacy and solar access; • energy efficiency; • public domain; • visual amenity; and • complementary land uses.	Yes	The project has been designed in a manner that is consistent with the design principles (see Section 6.1 in particular), and the University's Campus 2020 Masterplan.
Cl.33	***Community Use*** This clause allows the community use of the land and facilities of educational establishments and to the commercial operation of those facilities	Yes	Noted
38	***Flooding*** Requires consent authorities to consider the flood-related impacts of development	Yes	Flooding is considered in Section 6.2.
39	***Site Contamination*** Requires consent authorities to consider the potential for site contamination	Yes	Site contamination is considered in Section 6.2.

4.2.4 Objects of the EP&A Act

Section 5 of the EP&A Act sets out the objects of the Act. It is considered that the objects of most relevance to the project are those found in Section 5(a)(i)-(vii). These objects are reproduced below:

> *The objects of this Act are:*
> *(a) to encourage:*
> *(i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment*
> *(ii) the promotion and co-ordination of the orderly and economic use and development of land,*
> *(iii) the protection, provision and co-ordination of communication and utility services,*
> *(iv) the provision of land for public purposes,*
> *(v) the provision and co-ordination of community services and facilities,*
> *(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*
> *(vii) ecologically sustainable development.*

It is considered that the project is able to be carried out in a manner that is consistent with these objects. In particular, it is noted that the project:

- would not sterilise or adversely affect any known natural resources of significance (Object 5(a)(i));
- provides for the orderly and economic use of the land (Object 5(a)(ii)) as it allows for the development of a high-tech medical research and training facility in a recognised health and education precinct;
- is able to be readily serviced by existing and planned utility services in the locality (Object 5(a)(iii));
- provides for the orderly provision and use of land for public and community purposes (ie. medical research and training) (Objects 5(a)(iv) and (v));
- is able to be carried out without any significant environmental impacts (Object 5(a)(vi)); and
- is able to be undertaken in a manner that is consistent with the principles of ecologically sustainable development (Object 5(a)(vii)), including:
  - the precautionary principle – it is considered that, following environmental assessment, there is good scientific understanding of the environmental impacts of the project. The assessment indicates that the project does not entail a threat of serious or irreversible environmental damage;
  - inter-generational equity – the project would not adversely affect future generations. Indeed, the project seeks to significantly benefit current and future generations through reducing chronic disease;
  - conservation of biological diversity and ecological integrity – the project is not expected to have a significant impact on biodiversity values of the site (see Section 6.6); and
  - improved valuation, pricing and incentive mechanisms.

4.3 Development Contributions

4.3.1 City of Sydney Development Contributions Plan 2006

The City of Sydney's *City of Sydney Development Contributions Plan 2006*, prepared under Section 94 of the EP&A Act, was adopted by Council in March 2007.

The University's Camperdown Campus is located within the 'western precinct' under the contributions plan. Developer contributions for employment-related development are levied on a per worker basis to contribute to the following services and facilities:

- community and recreation facilities;
- public domain facilities;
- new open space;
- accessibility facilities; and
- plan management.

The applicable contributions rate for the western precinct is $1,509.04[5] per worker, with the bulk of this contribution going toward provision of new open space.

With an estimated 290 new workers, the project would ordinarily require an estimated contribution of around $377,260.

However, Sections 2.13 and 2.14 of the contributions plan provide for merit exemption to the payment of development contributions for developments by the Crown (and other proponents) in certain cases, including developments:

- which provide a distinct community benefit on a not-for-profit basis; or
- by or for non-profit organisations which provide a distinct community benefit.

The CODCD project meets both of these criteria, as it would provide distinct and marked community benefits (not the least of which is seeking solutions for those diseases that pose the greatest current health threat to Australian citizens), and is being undertaken by a non-profit organisation (ie. the University and its CODCD partners).

The contributions plan states that any claim for exemption should be included in the application to enable the City of Sydney Council to make a merit based assessment of the unique case for exemption.

The University has made initial enquiries with the City of Sydney regarding the case for exemption for the CODCD project, and the City does not object to the University making a case for exemption. It is respectively requested that the City of Sydney, having regard to the information presented in this Environmental Assessment, consider the University's request for exemption in its consideration of, and submission on, the project.

[5] As at April 2007, subject to indexation

5 CONSULTATION AND IDENTIFICATION OF KEY ISSUES

Planning for the project has involved consultation with relevant government authorities, service providers and project stakeholders including surrounding landowners.

Based on the consultation undertaken, it is considered that the University, the project team and the relevant stakeholders have gained a good appreciation of the key issues relevant to the project and development of the site. Stakeholders consulted, and the key issues raised by or considered to be of relevance to these stakeholders, are listed in the following table.

Table 5.1: *Stakeholder Consultation and Issues Raised*

Stakeholder	***Main Consultation Forum/s***	***Key Issues***
Government Authorities		
Department of Planning	• Pre-lodgement meeting; • Director-General's Requirements	• General planning and environmental issues; • Layout and design including landscaping / visual amenity; • Stormwater and groundwater management; • Flora and fauna; • Traffic and transport; • Heritage; • Sustainability measures, particularly in relation to water and energy use, and waste management; • Site contamination; • Infrastructure and services; • Developer contributions; and • Construction management.
City of Sydney Council	• Pre-lodgement meeting	• General planning and environmental issues; • Visual amenity – built form inc. heights, setbacks, fencing and landscaping; • Noise; • Sustainability and resource use; • Soil and water – including stormwater drainage and OSD; • Traffic and parking.
NSW Transport and Infrastructure	• Telephone (for traffic assessment)	• Transport infrastructure
Roads and Traffic Authority	• Telephone (for traffic assessment)	• Traffic and transport
Department of Environment, Climate Change and Water	• Telephone	• General environmental issues (inc. waste management)
NSW Office of Water	• None[1]	• Water licensing
Service Providers		
Energy Australia	• Meeting and/or telephone (for infrastructure assessment)	• Electrical servicing and capacity issues
Sydney Water	• As above	• Water and sewer servicing, and stormwater, including the need for relocation of assets
AGL	• As above	• Gas servicing

Stakeholder	*Main Consultation Forum/s*	*Key Issues*
Project Stakeholders		
University of Sydney user groups; Sydney South West Area Health Service (SSWAHS) including RPA; and Sydney Institute for Health and Medical Research (SIHMR) comprising a consortium of University-affiliated research institutes.	• Project User Group meetings	• Functionality for world-class collaborative medical research and training; • Accessibility to nearby facilities, including the RPA and Centenary Institute and the University Campus; • Layout and design; • Administrative support and services.
Surrounding Landowners		
Royal Prince Alfred Hospital	• Project User Group meetings	• See project stakeholders above
St John's College / Sancta Sophia College	• Meetings	• Layout and design; • Heritage; • Stormwater and infrastructure; • Sporting amenities.

1 There are no water licensing requirements for the project, nor are there any waterbodies in the vicinity of the site

The Director-General of the Department of Planning has provided his environmental assessment requirements for the project. These requirements are reproduced in **Appendix A**.

The key issues identified for assessment in the Director-General's environmental assessment requirements and/or the University's consultation and assessment of the project to date, include:

- layout and design, including landscaping and visual amenity;
- soil and water;
- noise;
- traffic and transport;
- heritage;
- sustainability (particularly energy and water conservation); and
- infrastructure and services.

These issues, along with other environmental issues of relevance to the project, are addressed in Sections 3 and 6 of this Environmental Assessment.

6 ENVIRONMENTAL IMPACTS

6.1 Layout and Design

The CODCD building and landscaping has been designed by respected architects Hassell, based on a functional design brief prepared by specialist health facility planners Aurora Projects, in collaboration with the project partners. The design has also been peer reviewed by independent architectural expert Paul Berkemeier.

Hassell's Design Report is attached as **Appendix C**. The following provides a summary of the report and the design-related impacts associated with the CODCD project.

6.1.1 Architectural Design

Precinct Structure

The CODCD project offers the opportunity to develop a unifying urban design and public domain strategy for the western precinct of the University's Camperdown Campus, and its integration with the adjoining RPA and St John's College.

In this regard, the Design Report includes a broad structure plan to assist and guide the orderly development of the LSRP and the CODCD building. This structure plan has been based on a broad site and constraints analysis, including consideration of:

- the objectives of the CODCD and LSRP;
- the existing scale of the precinct and surrounds;
- the University's masterplan and future development potential of the LSRP;
- important views, including those to and from Parramatta Road, Missenden Road, John Hopkins Drive, the RPA, St John's College and Sancta Sophia College, and the University itself; and
- the physical constraints of the site.

The broad structure is shown on Figure 6.1, with the major components including:

- a key north-south axis from the University's Blackburn Building north to Parramatta Road, which would act as a major connective thoroughfare for the western part of the campus. The axis is parallel to the historic and important Wilkinson Axis and the Eastern Avenue Axis (as discussed in Section 4.1.4), and would connect and highlight important heritage buildings on the campus, including the Blackburn Building, JD Stewart Building and McMaster Building;
- an equally strong connection between John Hopkins Drive and the University Ovals, providing connection from the RPA and St John's College into the University campus; and
- retention of a view corridor between the LSRP (and CODCD) and the RPA and St John's College.

CODCD Design Evolution

The designers explored a number of design options for the CODCD, based on the site analysis, structure planning, the functional design brief and the CODCD objectives, including the aim of maximising collaboration between researchers.

The design evolution is detailed in the Design Report, but was based around 3 main options. Over 24 models were developed based on these 3 main options to test programme, site and relationships and massing to adjacent developments. The 3 options can be summarised as:

- Option 1 – a traditional arrangement of laboratories around a central atrium;
- Option 2 – angular responses around a central atrium; and
- Option 3 – offices wrapping around the laboratories and facing the views.

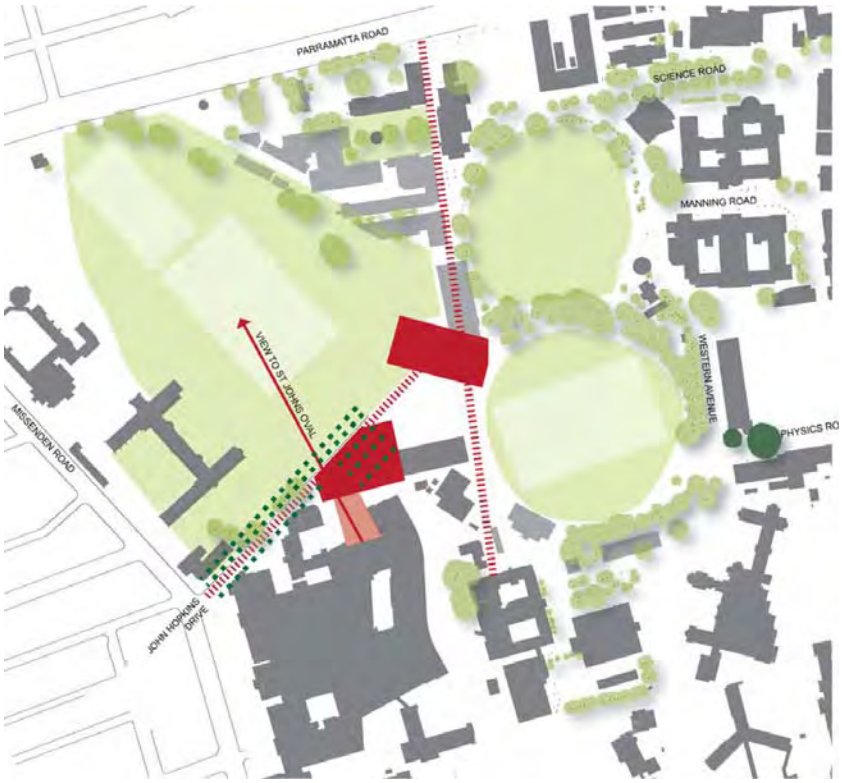


Figure 6.1: *CODCD and LSRP Structure Plan (Source: Hassell)*

Options 1 and 2 were ultimately discounted for a number of reasons, including that they:

- did not make full use of the views;
- presented a closed face to the site, with the laboratories having to be heavily shaded;
- did not easily address the need for a link between the RPA and the University;
- blocked views from Grose Farm Lane to St John's Oval; and/or
- did not easily address the need for an entrance to the east.

Option 3 was found to have benefits of protecting the laboratories from sun penetration, giving offices good views, and allowing strong connectivity from the RPA and John Hopkins Drive through into the University. It also allows creation of a good open space and entrance to the north-east of the CODCD, which provides a view corridor as well as an ideal gathering place in the north-east sun adjacent to the ovals.

The proposed CODCD building is the culmination of the design process evolving out of Option 3.

Building Description

As outlined in Section 3.5, the 8-level CODCD building consists of two major laboratory wings either side of a central 'through-site link' street (see Figure 6.2) connecting the RPA and St John's College with the University.

In terms of building uses, the lower levels (Ground and Level 1) have been designed to accommodate most of the education, support (including café) and tertiary units which require public/patient interface. The floors above Level 1 typically comprise a laboratory wing and associated dry research (offices). The typical laboratory floors have been designed to maximise collaboration both within and between floors, and to maximise natural daylight. In this regard lightwalls and stairs connect all the typical floor levels, and each of the typical laboratory areas are connected by way of a 'lab coat corridor'.

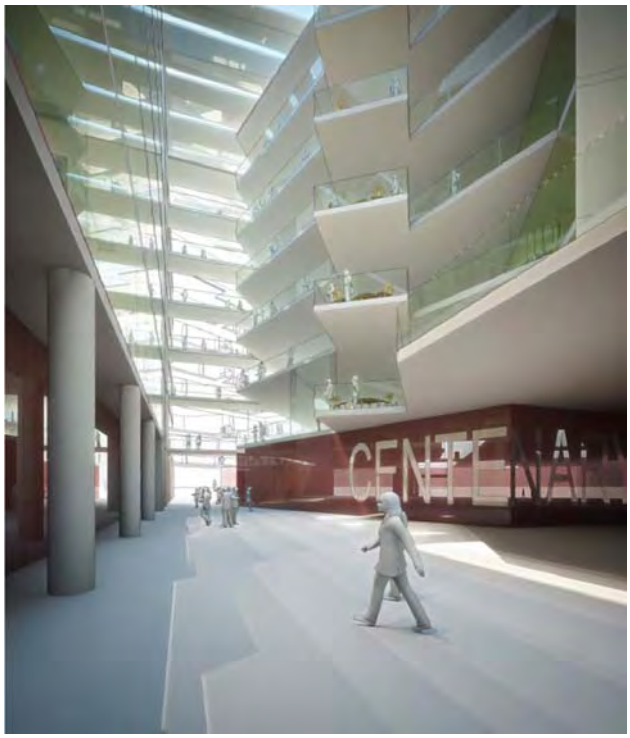


Figure 6.2: *Perspective of 'Through-site Link' (Source: Hassell)*

Design Quality

The CODCD has been designed to the highest standards in order to attract the highest quality researchers from around the world, and to reflect its anticipated status within the University.

The innovative CODCD design, with unique levels of natural daylighting, visual connectivity between floors and visibility from the 'through-site link' displaying the research activity within the building, would assist in achieving this.

The building's materials have been selected to respond to the adjoining precinct buildings. The solid vertical elements of the building are proposed to be finished in a honed precast concrete in warm colour tones.

The major portion of the façade is a glazed double-skin ventilating screen. The glass on the external sun screen includes a fritted[6] patterning, designed to break down the scale of the façade into smaller elements. The fritted pattern would reflect the patterns and tonal changes of the historic St John's College.

Form, Massing and Scale

As outlined above, the CODCD building form is a culmination of extensive site analysis, structure planning, functional design and design testing.

The need for a strong link between the RPA and the University was formative in the idea of splitting the two laboratory wings across an accessible atrium. This 'through-site link' has been designed to entice students and researchers to move through the building, and to provide distinctive 'entrances' to both the RPA and the University.

In this regard, the CODCD has been designed as a bridge between the University, the RPA and the residential colleges, as well as reinforcing movements and connectivity within the University (between Vet Science and Medicine Faculties). To achieve this, the atrium is seen as an internal street, that allows free passage.

[6] A film of shading similar to advertising on bus windows.

In terms of massing and scale, it is noted that the 8 level building has a height of approximately RL 59.0 metres, which is compatible with the heights of adjacent buildings including the RPA (up to RL 71.3 metres), St Johns College (ridge height of RL 47.7 metres, with its spires about the same height as the CODCD roof) and the Centenary Institute (RL 51.5 metres) – as shown on the Sections in **Appendix B**. The building mass is compatible with that of the adjacent RPA, and with the attributes of the site.

It is also noted that the building would not significantly increase the existing total floor space ratio of the Camperdown Campus (ie. an increase from about 0.99:1 to about 1.14:1).

6.1.2 Visual Amenity

The key public and off-site views to/from the CODCD site are:

- Parramatta Road, across St John's Oval, to the north and north-west;
- the RPA and down John Hopkins Road from Missenden Road to the south and south-west; and
- St John's College and Sancta Sophia College, to the west.

There are also significant views from within the University, particularly across the University Ovals No.1 and No.2. The project has been designed in a manner that respects and enhances these 'on-site' views, principally through presenting a high quality façade to the ovals, and through the creation of an open space 'square' on the northern side of the CODCD.

The Design Report includes a view analysis from each of the key off-site receivers, all of which would be affected to some degree by the CODCD. A summary is provided below.

St John's College, Sancta Sophia College and Parramatta Road

The Design Report notes that the CODCD would not affect St John's and Sancta Sophia Colleges' views to the north-east across St John's Oval, which are the main views from the colleges. However, the existing views from the upper levels of St John's College across the roof of the Missenden Unit building to the University beyond would be obstructed in a segment to the east.

The report notes that the some of the views from St John's College may be improved as a result of the project, through the demolition of the poor quality HK Ward Gymnasium building and the Missenden Unit building, and the creation of a view corridor into the University grounds via the forecourt being created to the north of the CODCD.

The view from Parramatta Road to the CODCD is shown on the photomontage on Figure 6.3. As the CODCD is significantly set back from the road, and would not obstruct views to St John's College, it is considered that the project would not result in any adverse visual impacts from this receiver location.

RPA Hospital, Centenary Institute and Missenden Road

The Design Report states that the project would result in some loss of views to the University from rooms on the north elevation of the RPA. This however has been mitigated in the design by locating the CODCD as far to the east on its site as practical. This increases the width of the view corridor between the CODCD and the RPA / St John's College.

This view corridor would be amplified in the design by the extension of the landscape treatment from the Hospital's entry across John Hopkins Drive to the St Johns Oval.

The Centenary Institute would suffer the greatest loss of views from rooms on its northern façade, however it is noted that the Institute is a partner in the project and the Institute building is essentially being integrated into the CODCD through the provision of aerial bridges between the

facilities. To mitigate the view loss, the project includes a landscape courtyard between the Centenary Institute and the CODCD to provide a local view to those central rooms with view loss.

Views from Missenden Road are largely obstructed by existing development on St John's College and the RPA, although there is a small view corridor directly down John Hopkins Drive. This view to the CODCD is shown on the photomontage on Figure 6.3. It is considered that the project would not result in any adverse visual impacts from this receiver location.

Figure 6.3: *Photomontages from Parramatta Road and Missenden Road (Source: Hassell)*

6.1.3 Overshadowing, Wind and Reflectivity

Analysis undertaken in the Design Report indicates that the project would not result in any significant overshadowing, wind or reflectivity impacts, except for overshadowing of the Centenary Institute. As stated above, the Centenary Institute is a partner in the project, and the Institute building has been integrated into the design of the CODCD. The maintenance of a separation distance between the buildings would ensure that adequate solar penetration into the Institute building is retained.

6.1.4 Landscape and Public Domain Design

The landscape design for the project reflects the objective of maximising connectivity between the University and RPA and the residential colleges, and improving the clarity of pedestrian circulation in the western area of the Campus.

Key components of the landscape plan include:

- the development of a large open space or 'square' on the northern side of the CODCD;
- landscaping to develop the first stage of the new north-south axis developed in the structure planning for the project (as above). It is proposed that this new axis would have a less formal character that the recently upgraded Eastern Avenue axis;
- a new garden between the CODCD and the Centenary Institute; and
- incorporating water sensitive urban design principles in perimeter landscaping.

The landscape design philosophy is further detailed in the Design Report, and the project landscape plans are included in **Appendix B**. It is considered that the landscape design is consistent with the CODCD project objectives, and would significantly improve the aesthetic

appeal of this part of the Camperdown Campus, which has suffered from a lack of structured public domain design in the past.

6.2 Soil and Water

6.2.1 Erosion and Sedimentation

The project involves earthworks across the site to excavate basement levels and create a level building pad for construction of the CODCD and ancillary services.

As discussed in Section 2.2.5, the project site is relatively flat and there are no natural watercourses in the vicinity of the site. As such, the risk of significant erosion and sedimentation associated with the project is considered to be low.

Erosion and sedimentation risks are able to be effectively managed using standard best practice control measures, including:

- minimising disturbance areas;
- diverting 'clean' run-on water around disturbance areas;
- controlling 'dirty' run-off water from within the disturbance area via various controls such as sediment fencing and basins; and
- rehabilitating disturbed areas as quickly as possible following disturbance.

In addition, particular measures would need to be implemented during the relocation of the Sydney Water stormwater pipe around the CODCD building (see Section 3.9). These measures would include duplication of the pipe prior to decommissioning of the existing pipe, with prompt completion of the pipe reconnections during a forecast dry period.

To manage these erosion and sedimentation risks during construction, the University has committed to the preparation and implementation of a detailed Erosion and Sediment Control Plan for the project. The plan would be prepared in accordance with the above principles and Landcom's (2004) *Managing Urban Stormwater: Soils and Construction* manual (ie. the 'Blue Book'), prior to the commencement of building works.

The University has also committed to the preparation of a detailed Stormwater Management Plan for the project (see Section 6.2.5 below), which would include measures to minimise erosion during the relocation of the Sydney Water stormwater pipe.

6.2.2 Site Contamination

Site contamination assessments have been undertaken for the project by Douglas Partners, including a Phase 1 Site Assessment and a detailed Phase 2 Site Assessment. The assessments are attached in **Appendix G** and **Appendix H**, respectively.

The Phase 1 Assessment, which considered the whole LSRP, found that the precinct has been subject to filling in the past, with the fill ranging in depth from 0.6 metres to approximately 6.0 metres. Filling material generally comprised natural material (sand, silt and clay), although some ash, slag, gravel, bricks and ironstone was identified, suggesting at least some potential for contamination. Some fibre cement fragments were also observed in a localised area.

The Phase 1 Assessment included some limited soil and groundwater sampling, which found that the site soils and groundwater were generally within applicable assessment criteria, with the exception of:

- soil from one bore (near the CODCD site), which returned elevated lead and benzo(a)pyrene levels. The elevated levels may be related to ash and slag observed in the fill material; and
- a fibre cement fragment identified in one area (to the north of the CODCD site), which may or may not contain asbestos.

The Phase 1 Assessment recommended additional investigation of these contamination sources, which was subsequently undertaken in the Phase 2 Assessment.

The Phase 2 Assessment was undertaken in accordance with applicable DECCW and National Environment Protection Measure (NEPM) guidelines, and included analysis of:

- soil samples from 7 bores across the site; and
- groundwater samples from 2 groundwater wells.

The samples were analysed for a range of potential contaminants, including:

- total petroleum hydrocarbons (TPH), and benzene, toluene, ethyl benzene and xylene (BTEX);
- Polycyclic Aromatic Hydrocarbons (PAHs), phenols and volatile organic compounds (VOCs);
- Heavy metals (arsenic, barium, cadmium, chromium, copper, lead, manganese, mercury, nickel and zinc);
- Organochlorine Pesticides (OCPs) and Polychlorinated biphenyls (PCBs); and
- Asbestos.

Concentrations of contaminants were found to be below the applicable site assessment criteria in all of the samples, with the exception of benzo(a)pyrene on one bore, in a similar location to that identified in the Phase 1 study. Groundwater results from the same location also returned elevated benzo(a)pyrene levels, as well as elevated TPH. However, the assessment considered that the elevated TPH result was probably an anomaly caused by cross-contamination during the drilling process.

The assessment concludes that the elevated benzo(a)pyrene and lead in one localised area is likely to be related to ash and slag identified in some fill material.

On the basis of the soil and groundwater results, including leachability testing which found that the contaminants are not significantly mobile (lending weight to the conclusion that the contaminants are related to slag/ash waste), the assessment conservatively classified the fill material[7] for off-site disposal as:

- Solid Waste with respect to chemical contaminants; and
- Asbestos Waste (but can be disposed of at a Solid Waste landfill).

However, given the variability of the fill material on site (and the localised nature of the identified contamination), the assessment recommends additional ex-situ soil sampling and classification during excavation of the material.

Given the findings of the Phase 1 and 2 site contamination assessments, it is considered that the site is not significantly contaminated and would be fit for its intended use, subject to removal of the localised contamination. To ensure that this occurs appropriately, the University has committed to undertaking the excavation and remediation in accordance with a Remedial Action Plan, prepared in accordance with relevant DECCW guidelines, prior to the commencement of excavation for the project.

6.2.3 Acid Sulfate Soils

The Phase 1 Site Assessment (see **Appendix G**) found that the site contains acid sulfate soils (ASS) and potential acid sulfate soils (PASS) at depths below the regional groundwater table (ie. approximately 3 metres below ground level).

Given that the project involves excavation down to approximately 12 metres for the basement levels, there is potential for disturbance of ASS and/or PASS material. If uncontrolled, the acid

[7] In accordance with DECCW's *Environmental Guidelines: Assessment Classification and Management of Liquid and Non-Liquid Wastes (1999)*

produced by the oxidation of ASS and PASS material can significantly affect building structures and the downstream environment.

Acid sulfate soils are able to be effectively managed using established best practice techniques, including:

- minimising disturbance areas;
- minimising the exposure of excavated PASS and ASS material to the atmosphere (ie. to oxidising environments);
- ensuring good erosion and sediment control;
- treatment of affected soils (with lime);
- appropriate classification and disposal of excavated PASS and ASS material; and
- appropriate consideration and treatment of concrete footings and sub-ground building materials.

To manage acid sulfate soil risk associated with the project, the University has committed to preparing and implementing an Acid Sulfate Soil Management Plan for the project. The plan would be prepared in accordance with the above principles and the NSW Acid Sulphate Soil Advisory Committee's (1998) *Acid Sulfate Soil Manual*, prior to the commencement of building works.

6.2.4 Riparian Areas and Waterbodies

There are no natural riparian areas (ie. creeks and rivers) on or in the vicinity of the site. Accordingly, the project would not have any direct impacts on riparian areas.

Indirect impacts (principally through erosion and sedimentation during construction and pollution during operations) are discussed in separate sections above and below.

6.2.5 Stormwater Management

The project has been designed in accordance with integrated water cycle management (IWCM) and water sensitive urban design (WSUD) principles to ensure that it meets applicable stormwater quantity and quality criteria.

The broad stormwater strategy for the project is outlined in the Infrastructure Assessment (see **Appendix D**), and includes provision of:

- roof rainwater harvesting tank/s;
- on-site detention and permissible site discharge in accordance with Sydney Water guidelines[8], to control stormwater quantity;
- stormwater quality improvement devices (such as bio-retention swales and gross pollutant traps) to meet best practice guidelines, including:
  - 80% reduction in total suspended solids;
  - 45% reduction in total phosphorus; and
  - 45% reduction in total nitrogen.

Preliminary assessment undertaken in the Infrastructure Assessment indicates that the relevant stormwater quantity and quality requirements are able to be readily met for the project.

To ensure that stormwater is appropriately designed and managed, the University has committed to preparing and implementing a detailed Stormwater Management Plan for the project. The plan would be prepared in accordance with the above principles and applicable Sydney Water and/or Council requirements, prior to the commencement of building works.

[8] Sydney Water's requirements apply (rather than Council's) as the site drains to its stormwater infrastructure.

6.2.6 Flooding

A Flood Review has been undertaken by Arup as part of the Infrastructure Assessment, and is attached as **Appendix D**.

The review notes that Sydney Water's drainage infrastructure downstream of the site has limited capacity (ie. up to the 5 year ARI storm event). Therefore, a large proportion of the flows from a 100 year storm event would flow overland to the catchment's low point, which is the University's Oval No.1. The oval has an elevation of (conservatively) RL 20.4 metres AHD.

The Flood Review estimated the level of flooding in Oval No.1 over a range of storm events, with the results indicating that the maximum 100 year flood depth in the oval would be 1.9 metres (ie. RL 22.3 metres AHD). Based on this flood depth and general flood planning levels (ie. 100 year flood level plus 0.5 metres freeboard), the Flood Review recommends that the minimum ground floor level of the CODCD (including entrances to basement levels) be set at 22.8 metres AHD.

The CODCD has been designed with a ground floor level (including entrances to basement levels) of 23.5 metres AHD, which is comfortably above the flood planning level.

The review notes that site grading would need to be considered during detailed design for the building, to ensure appropriate management of overland flows and ensure that there is no increase of flows leaving the site.

The University has committed to including such consideration as part of the detailed Stormwater Management Plan for the project.

With these measures, it is considered that the project is unlikely to be affected by, or adversely affect, flooding in the area.

6.2.7 Soil and Water Pollution

The CODCD project does not involve processes that entail a significant risk of soil or water pollution, however the project does include the storage and use of a range of dangerous goods and hazardous materials which, if not appropriately managed, could impact soil and water resources.

Storage and handling of all dangerous goods and hazardous materials would be undertaken in accordance with the Dangerous Goods Code and *AS 1940-2004: The storage and handling of flammable and combustible liquids*. In this regard, all hazardous substances would be stored internally within the building, in appropriately bunded areas with no external drainage to stormwater or to land or water resources.

Waste management, including disposal of liquid wastes, is discussed in Section 6.9.

6.3 Noise

A Noise Impact Assessment has been undertaken for the project by Wilkinson Murray, and is attached as **Appendix I**. The assessment includes consideration of construction, operational and traffic related noise, and has been undertaken in accordance with applicable noise guidelines including DECCW's:

- *Industrial Noise Policy (INP)*;
- *Interim Construction Noise Guideline*; and
- *Environmental Criteria for Road Traffic Noise*.

The assessment was undertaken with reference to the nearest residential and commercial sensitive receivers in the vicinity of the site, including:

- St John's College (residential college);
- Sancta Sophia College (residential college);

- the Centenary Institute (RPA Hospital); and
- the University's RMC Gunn Building.

The Centenary Institute and RMC Gunn Building are commercial buildings used for teaching or research, and are therefore considered as sensitive receivers.

The nearest residential receivers outside the University are on Parramatta Road, approximately 250 metres north of the site.

6.3.1 Construction Noise

The construction period for the project is expected to extend for approximately 24 months, with fitout and commissioning expected to continue for a further 6 to 8 months. The main noise-generating construction works would be the demolition, earthworks and foundations phase, and to a lesser extent building construction.

Predicted maximum and typical construction noise levels at the nearest sensitive receivers are provided in Table 6.1 below, along with the applicable criteria.

Table 6.1: *Construction Noise Predictions dB(A) $L_{A10(15\ mins)}$ (exceedances in brackets)*

Receiver	***Demolition***		***Earthworks***		***Superstructure***		***Criterion***
	Maximum	***Typical***	***Maximum***	***Typical***	***Maximum***	***Typical***	
St John's College	**63 (+7)**	**60 (+4)**	**60 (+4)**	**58 (+2)**	**58 (+2)**	56	56
Sancta Sophia College	**59 (+3)**	**58 (+2)**	56	55	54	53	56
Centenary Institute	**83 (+13)**	**75 (+5)**	**80 (+10)**	**72 (+2)**	**78 (+8)**	70	70
RMC Gunn Building	58	64	55	61	**78 (+8)**	59	70

The assessment indicates that the project's construction noise emissions would exceed the applicable criteria at all of the sensitive receiver locations.

The assessment notes that the construction noise criterion for the residential colleges (ie. 56 dBA) is conservative, given that background noise levels in the area are already above 60 dBA in some locations.

It is further noted that the Centenary Institute and the RMC Gunn Building are affiliated with the project partners (SSWAHS and the University respectively), and therefore noise at these receivers is considered able to be managed through internal arrangements between the University and the Centenary Institute.

To manage construction noise impacts at St John's College and Sancta Sophia College, the University has committed to restricting construction to day time hours, as detailed in Section 3.6.

The University has also committed to preparing a construction noise management plan for the project, in consultation with the RPA and St John's and Sancta Sophia colleges. This plan would be prepared as part of a wider Environmental Management Strategy for the project.

6.3.2 Operational Noise

Using the procedures in the Industrial Noise Policy, the noise assessment defined the following project specific noise criteria for the operational phase of the CODCD project.

Table 6.2: *Operational Noise Criteria*

Receiver	***Day***	***Evening***	***Night***	***Night (sleep disturbance)***
St John's College and Sancta Sophia College	51 $L_{Aeq(15\ min)}$	45 $L_{Aeq(period)}$	41 $L_{Aeq(period)}$	65 $L_{A1(1\ min)}$
Centenary Institute	50 $L_{Aeq(15\ min)}$	50 $L_{Aeq(15\ min)}$	50 $L_{Aeq(15\ min)}$	n/a
RMC Gunn Building	65 $L_{Aeq(15\ min)}$	65 $L_{Aeq(15\ min)}$	65 $L_{Aeq(15\ min)}$	n/a

Note: With regard to time periods:

- *Day is the period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and public holidays;*
- *Evening is the period from 6pm to 10pm; and*
- *Night is the period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and public holidays.*

The noise assessment includes consideration of the main noise generating components of the CODCD project – namely mechanical services and internal traffic (off-site traffic is considered separately below) – against these criteria, as summarised below.

Mechanical Services

Most mechanical services would operate from 7.00am to 8.00pm (ie. during the day and evening periods only). However, there may be limited plant (such as some air conditioning and fume cupboard exhaust fans) operating 24 hours during extended operating times.

The design of mechanical services is as yet only at a schematic stage and detailed noise predictions cannot be undertaken.

However, the noise assessment indicates that if the mechanical services for the entire building were considered as one source, a reasonable total sound power level for the equipment of 105 dBA would achieve the 45 dBA evening criterion at St John's College.

Given this, the noise assessment considers that there is no technical impediment to meeting the noise criteria at all sensitive receivers, noting that engineering treatment methods that could be adopted include:

- judicious selection of plant and equipment behind built elements to provide shielding to residences;
- acoustic screens/enclosures;
- acoustic louvres for plant rooms;
- silencers, for example on carpark exhaust fans; and
- acoustically lined ductwork.

The assessment also notes that emergency diesel generators for the building (which would be located in the basement) may need to be built with an acoustical designed enclosure, as is typical for such plant in commercial buildings.

To ensure that the mechanical plant is designed in a manner that protects the amenity of surrounding sensitive receivers, the University has committed to:

- complying with the applicable project specific noise criteria; and
- undertaking noise compliance monitoring following the commencement of operations to demonstrate that the project complies with the applicable criteria.

With these measures, it is considered that the project would not result in any significant noise impact to surrounding receivers.

Internal Traffic

The noise assessment indicates that noise levels from on-site cars and truck deliveries, predicted as less than 35 dBA and 40 dBA respectively at the residential colleges, would meet the applicable L_{Aeq} operational criteria at all times of the day.

Similarly, the predicted on-site traffic noise level at the nearest University building (ie. 50 dBA) would also meet the applicable criteria for these buildings.

Combined Operational Noise
The noise assessment indicates that the combined operational noise associated with the project (ie. plant noise and traffic noise) can be readily controlled to meet the applicable noise criteria in Table 6.2 above. As outlined above, the University has committed to meeting the applicable operational criteria and to undertaking noise monitoring to demonstrate this compliance.

Sleep Disturbance
In addition to the above operational noise emissions, which are based on average noise levels over a 15 minute period, sudden or short-lived noise emissions at night have the potential to result in sleep disturbance.

The main potential source of such noise associated with the project would be night time truck deliveries. The noise assessment indicates that the maximum L_{A1} noise level at St John's and Sancta Sophia colleges would be 45 dBA, which is well within the applicable sleep disturbance criteria (ie. 65 dBA).

6.3.3 Traffic Noise

The site provides direct access to the arterial road network, including Parramatta Road and Missenden Road. Given the road network, and the moderate traffic volumes associated with the project (see Section 6.8), the project is not expected to result in any traffic noise impacts. The noise assessment indicates that the project would increase traffic noise on Parramatta Road by less than 0.1 dBA, which would not be perceptible.

6.4 Air Quality

The main sources of air emissions associated with the project would be:
- dust during construction;
- plant and vehicle emissions; and
- emissions from laboratory fume cupboards.

Dust emissions during construction works – the majority of which would be associated with bulk earthworks – are considered able to be managed in accordance with standard best practice techniques, including:
- minimising the area of disturbance as far as practicable during works;
- minimising drop heights for materials being worked on the site;
- keeping exposed surfaces moist at all times;
- rehabilitating/revegetating disturbed surfaces as soon as practicable; and
- ensuring that trucks are covered and do not track sediment onto public roads.

These measures would be documented in a construction dust management plan, which would be prepared as part of an Environmental Management Strategy for the project.

Air emissions from vehicles, plant and equipment would be fairly typical of a modern commercial building, the levels of which are not expected to result in any significant air quality impacts. Initiatives to encourage sustainable transport (see Section 6.8) and minimise energy use (see Section 3.10) associated with the project would help to reduce these air emissions.

Emissions from fume cupboards in laboratories would include a mix of chemical and biological substances, which would be vented to the atmosphere via stacks on the CODCD building roof.

To assess the potential air quality impacts associated with these emissions, an air quality review of the project was undertaken by specialist air quality consultants PAE Holmes, and is attached as **Appendix J**.

The review notes that there would be a wide range of laboratory activities undertaken within the CODCD building and consequently it is not possible to estimate precisely the quantity of emissions which would take place at any one time.

However, the review considers it unlikely that the emissions from the building would result in any changes to off-site air quality impacts and that there would be no difficulty in meeting the applicable ground level concentration criteria for the various analytes that would be emitted from the facility.

This is based on the relative height of the building and that the roof-top vents for the fume extraction system would be 6 metres above this with a sufficient exit velocity to ensure good dispersion.

The review notes that a more significant issue is that the emissions from the vents could enter air-conditioning intake points or openable windows on the CODCD and/or adjacent buildings, including St John's College and the RPA.

In order to assess this in detail the review recommends that computational fluid dynamic (CFD) modelling be undertaken on the final building configuration in order to ultimately refine the design of the extraction system. On the basis of the findings from previous similar studies, the review anticipates that there is unlikely to be any significant impact.

The University has committed to undertaking this CFD modelling, prior to construction of the building, to ensure that the CODCD is designed to comply with the relevant air quality criteria.

6.5 Greenhouse Gases and Climate Change

By far the greatest source of greenhouse gas (GHG) emissions associated with the CODCD project would be indirect (or 'Scope 2') emissions associated with energy use at the facility. Other GHG emission sources would include emissions associated with employee and visitor commuting and delivery of goods and materials, and direct emissions from laboratory processes.

Energy Use Related Emissions

As detailed in Section 3.10, the CODCD has been designed to be a landmark in sustainability, achieving high benchmarks for energy efficiency, water efficiency and indoor environmental quality.

Although there is currently no environmental performance rating tool (such as 'Green Star') that can be effectively applied to the CODCD, the University has committed to achieving a target 40% reduction in annual energy consumption when compared to the average energy consumption of similar laboratory buildings throughout the world (see Section 3.10).

The Sustainable Building Design Report (see **Appendix F**) estimates that the two key energy efficiency measures being investigated – namely tri-generation and the geothermal heat exchanger – would reduce GHG emissions by approximately 5,400 tonnes of CO_2 equivalent per year. This saving is equivalent to the annual GHG emissions produced by approximately 1,300 cars.

Transport Related Emissions

As detailed in Section 6.8, the CODCD would generate only moderate traffic volumes, has good access to existing and planned public transport, and includes sustainable transport measures including bicycle and pedestrian facilities. Accordingly, project-related transport is not expected to generate significant GHG emissions.

Direct Laboratory and Occupant Emissions

GHG emissions associated with laboratory and occupant use would be typical of commercial and laboratory environments, the levels of which are not expected to be significant.

6.6 Flora and Fauna

As discussed in Section 2.2.8, the site is predominantly cleared, however there is mature landscaped treed vegetation along the eastern and south eastern perimeters of St John's Oval and around the western perimeter of University Oval No.1, as well as tree and shrub landscaping around the Missenden Unit and HK Ward Gymnasium buildings (see Figure 2.3).

The vegetation is not considered to provide significant habitat for native fauna, given its small, linear and generally poor condition, and lack of connectivity to areas of remnant bushland. However, at least some of the vegetation does provide habitat for birds and possums.

Two arborist assessments/tree management plans have been undertaken for the project area, including one covering the LSRP area and the other covering the vegetation surrounding University Ovals No.1 and No.2. Both assessments were undertaken by the Tree School, and are attached in **Appendix K**.

A summary of the vegetation in each area, and the impacts on the vegetation as a result of the project, is presented below.

Life Sciences Research Precinct Vegetation

The arborist assessment for the LSRP divided the precinct into 3 sub-precincts for the purposes of the assessment, including:

- Precinct 1 – the northern area of the LSRP adjacent Parramatta Road;
- Precinct 2 – the central area of the LSRP, down to the northern end of the HK Ward Gymnasium building; and
- Precinct 3 – the southern portion of the LSRP.

The CODCD project site is located generally within Precinct 3, and the southern portion of Precinct 2.

Overall, the assessment found that there are few trees of high retention value within the LSRP. Much of the vegetation consists of weed species and trees that are in poor condition or that are easily replaced in landscaping. The assessment does note, however, that collectively the vegetation provides a good visual barrier between St John's Oval and the service-related buildings in the University's Veterinary Science Faculty, as well as providing some habitat value.

The assessment found that the greatest number of significant trees and those with the highest retention value are located in Precinct 1. These include 5 *Ficus macrophylla* (Moreton Bay Figs), which have a high retention value as a group. The project would not disturb any vegetation in Precinct 1.

Precinct 2 was found to contain mainly weed species, trees that are over-mature or that could easily be replaced. The most significant trees in this precinct include 3 visually significant *Populus deltoides* (Cottonwood) along the St John's College boundary and 1 *Corymbia citriodora* (Lemon-scented Gum) on the southern side of the RMC Gunn Building. The project would not disturb these trees.

Precinct 3 was assessed as having few trees of high retention value, with the only significant trees being a mature *Ficus rubiginosa* (Port Jackson Fig) on the eastern side of the HK Ward Gymnasium, and two *C. citriodora* (Lemon-scented Gum) on the western side of the gymnasium. There are also a number of trees that may be able to be transplanted in this precinct, including a Cotton Palm, Water Gums and a Cabbage Tree Palm.

The project would require the removal of most of the vegetation in Precinct 3, however the Port Jackson Fig on the eastern side of the HK Ward Gymnasium would be retained (unless detailed design determines otherwise) and has been integrated into the landscaping for the project.

Given the generally degraded nature of the vegetation, it is considered that the required vegetation clearing within the LSRP would not result in any significant impact on the flora and fauna values of the precinct.

As discussed in Section 6.1, a detailed Landscape Plan has been prepared for the project, which would help to mitigate the loss of vegetation required for the project.

The University has also committed to salvaging those trees that are able to be transplanted, prior to construction works.

University Ovals Vegetation

The arborist assessment/tree management plan for the perimeter vegetation surrounding the University Ovals No.1 and No.2 was undertaken in February 2008 in response to concerns regarding potential hazards caused by the trees. In the lead up to the assessment, one large tree had failed and other trees located around the ovals had lost large branches.

The management plan recognises that Ovals No.1 and No.2 are significant recreational open spaces within the campus, and that the mixed mature tree plantings surrounding the Ovals are an important feature of this open space. However, the plan notes that the species selection and planting locations have not been guided by a formal design concept or tree planting plan. A wide variety of types and styles of trees have been planted in an irregular fashion resulting in an ambiguous landscape character.

The plan also notes that the ovals have an ageing tree population with blocks of single species of the same age. Accordingly, a large percentage of the trees will require removal over a short time period as they all arrive at the end of their useful life.

Given the existing hazards, aging tree stock, variable health and the ad hoc planting design, the assessment establishes a management plan for the gradual removal of the vegetation and replacement with a well planned and appropriate planting stock. The plan recommends that trees are removed as blocks to provide the opportunity to replant in a planned and unified manner.

The project would require the removal of a number of trees on the western perimeter of Oval No.1 (ie. within Groups 3 to 7 as identified in the tree management plan).

The assessment states that Oval No. 1 is characterised by the planting of an eclectic mix of mainly large exotic and Australian rainforest species. The plantings include *Grevillea robusta* (Silky Oak), *Eucalyptus camaldulensis* (River Red Gum), *Eucalyptus bicostata* (Southern Blue Gum), *Lophostemon confertus* (Brush Box), *Erythrina x sykesii* (Coral Tree), *Corymbia eximia* (Yellow Bloodwood), *Cinnamomum camphora* (Camphor Laurel), *Ficus rubignosa* (Port Jackson Fig) and *Ficus microcarpa* var. *'Hilli'* (Hills Weeping Fig).

The trees within Groups 3 to 7 vary in health from poor to good, and are generally mature to over-mature. The management plan does not identify any trees of as having significant conservation or retention status, and recommends management ranging from high priority removal to replacement over the medium to long term (ie. 15-40 years). (However, it is noted that the arborist assessment for the LSRP did identify the Port Jackson Fig on the eastern side of the HK Ward Gymnasium as having some retention value, as described above).

In light of the findings and recommendations of the tree management plan, it is considered that the removal of mature tree plantings around the western perimeter of Oval No. 1 would not result in any significant impact to the flora and fauna values of the area. (As outlined above, the Port Jackson Fig on the eastern side of the HK Ward Gymnasium would be retained).

In this regard, the project does present the opportunity to remove and replace the vegetation in a block manner, in accordance with the recommendations of the tree management plan. This

allows the replacement of the trees in an orderly and well planned manner, which would be undertaken in accordance with the detailed Landscape Plan for the project (see Section 6.1).

6.7 Archaeology and Heritage

6.7.1 Aboriginal Heritage

An Aboriginal Heritage Assessment for the LSRP including the CODCD site has been undertaken by Jo McDonald Cultural Heritage Management, and is attached in **Appendix L**. The assessment was undertaken in consultation with the Aboriginal community, which in this case comprised the Metropolitan Local Aboriginal Land Council (LALC).

The assessment involved archaeological survey of the site, along with background research, database searches, consultation and predictive analysis of the potential for archaeological significance.

The assessment did not identify any Aboriginal sites/objects or areas of potential archaeological deposit (PAD) within or in proximity to the site or wider LSRP.

Due to the highly disturbed nature of the site, the assessment concluded that the area generally has low-to-no archaeological potential/significance, and can be considered developable without Aboriginal archaeological constraint.

However, the assessment noted that the demolition of buildings required for the project – namely the HK Ward Gymnasium building and the Missenden Unit building – may reveal intact archaeological deposit below their foundations. Accordingly, the assessment recommends that these buildings should be subject to further archaeological assessment after their demolition.

The University has committed to undertaking this additional archaeological assessment, in accordance with DECCW guidelines and in consultation with the Aboriginal community, following demolition of the applicable buildings.

With the implementation of this measure, the project is not expected to have any significant impact on Aboriginal heritage.

6.7.2 Historical Heritage

Two non-indigenous historical heritage assessments have been undertaken for the project, namely:

- a Non-indigenous Archaeological Assessment to investigate below-ground heritage potential, undertaken by Casey and Lowe; and
- a Statement of Heritage Impact to assess above-ground heritage impacts, undertaken by Graham Brooks and Associates.

These assessments are attached in **Appendix M** and **Appendix N**, respectively. The key findings and recommendations from the assessments are summarised below.

Non-Indigenous Archaeology

The Non-indigenous Archaeological Assessment included a detailed literature and site history review including review of previous archaeological assessments, consideration of the potential archaeological resource of the site, archaeological survey of the site, and an assessment of the significance of the identified heritage items.

The assessment found that the LSRP has the potential to contain remains of Grose Farm, a government farm established by Governor Macquarie c1819 to raise fodder for the horses and oxen employed on public works in Sydney, as well as provide training in agricultural practices for convict men and boys. The farm had barrack accommodation for up to 160 convicts.

The farm structures included brick and timber convict barracks, huts, a dam with ponds and brick airing sheds, a fenced garden area along the creekline and fenced paddocks (see Figure 6.4).

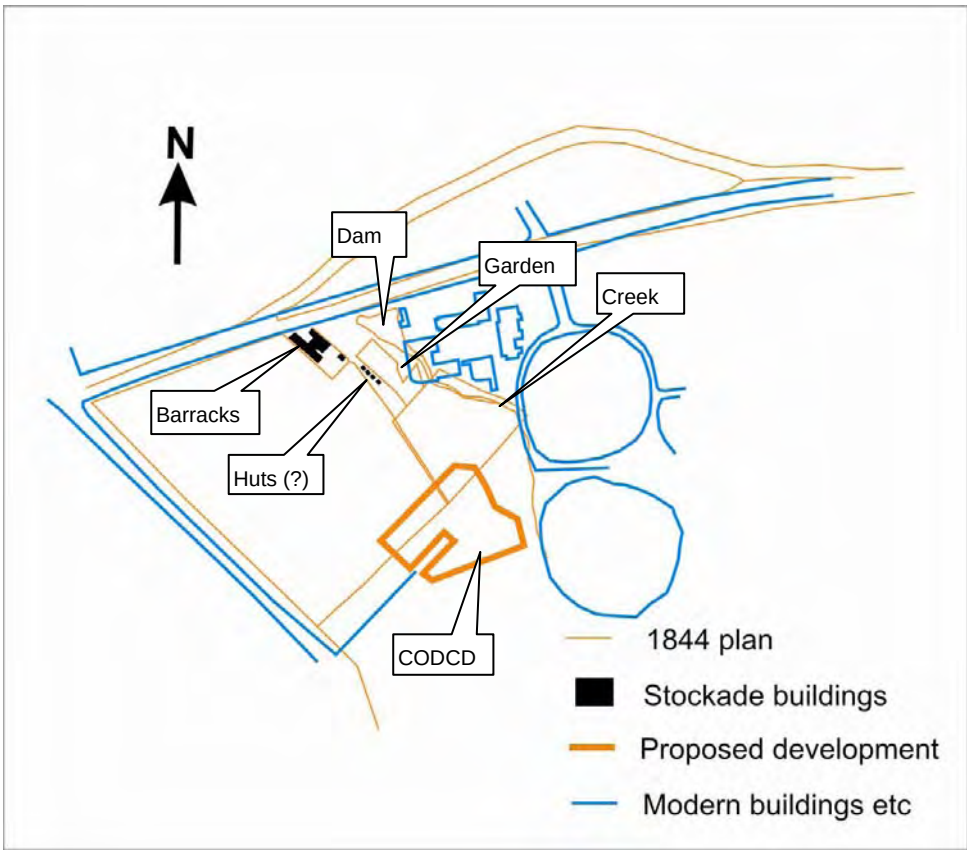


Figure 6.4: *Location of Potential Grose Farm Remains (in relation to modern buildings and the CODCD site)* *(Source: Casey and Lowe)*

Operation of the public farm ceased c1832, however the buildings were still present in 1844. The assessment notes that the buildings may have been demolished when the land was acquired for construction of the University in the 1850s.

The archaeologist assessed the potential remains as being of State heritage significance.

As shown on Figure 6.4, the potential Grose Farm remains are located in the northern area of the LSRP, and are well removed from the disturbance area for the CODCD project. Accordingly, the project would not have any impact on the potential remains.

Notwithstanding, it is noted that the University Archaeology Department is separately (ie. unrelated to the CODCD project) planning to investigate the potential remains further using ground penetrating radar techniques.

Built Heritage

As outlined in Section 2.2.9, the site is located within the Sydney University heritage conservation area under the *South Sydney Local Environmental Plan (LEP) 1998* (see Figure 2.4).

The site is also located within the boundaries of two broad heritage items listed under the LEP, including the:

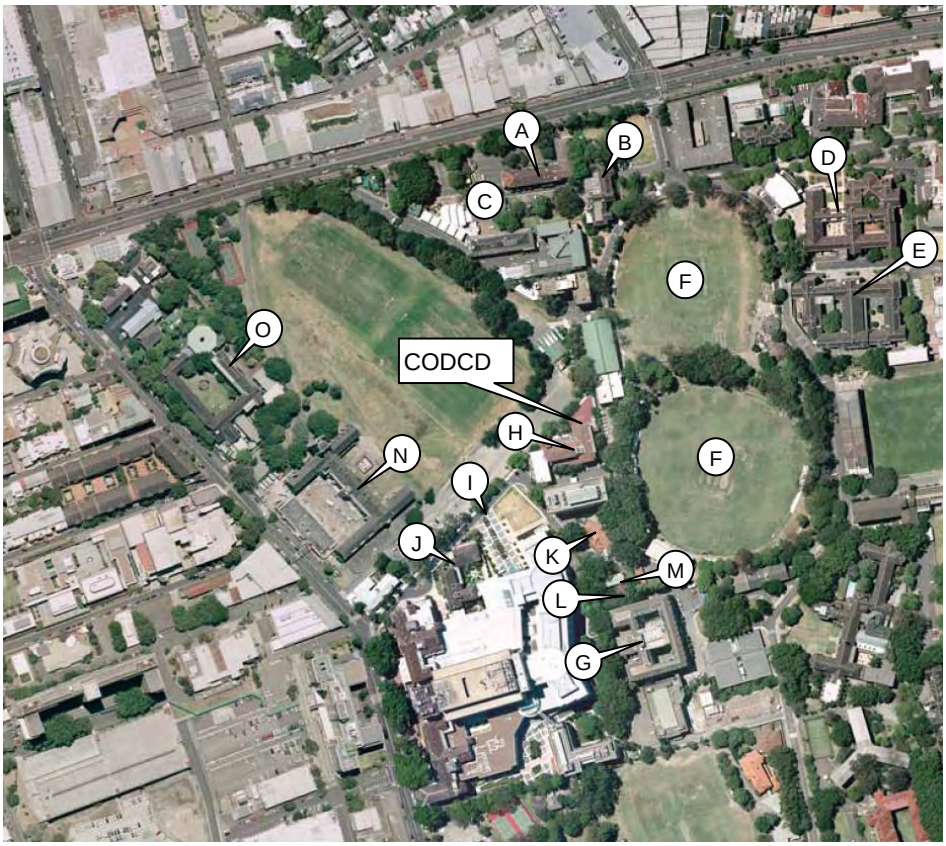
- University of Sydney Site Landscaping item; and
- Royal Prince Alfred Hospital Group heritage item.

The site is also located within the boundaries of a two items identified in NSW Health's Section 170 Register[9], including:

- the Missenden Psychiatry Unit Building; and
- John Hopkins Drive.

In addition to these heritage items directly affected by the CODCD project, there are also a considerable number of heritage items in the vicinity of the site that are listed in the South Sydney LEP and/or the University's or NSW Health's Section 170 Registers. These items are shown on Figure 6.5.

The Statement of Heritage Impact includes a comprehensive assessment of the impacts of the CODCD project on all heritage items on and in the vicinity of the site. A summary of the findings of the assessment is presented in the following table.



Key:
University Items
A McMaster Laboratory
B JD Stewart Building
C Vet Science Precinct
D John Woolley Building
E Old Teachers College
F University Ovals No.1 & 2
G Blackburn Building

RPA Items
H Missenden Unit Building
I John Hopkins Drive
J Resident Medical Officers' Q'trs
K Immunology Building
L Rear Gardens
M Chapel and Morgue

Residential Colleges
N St John's College
O Sancta Sophia College*

* Not a recognised heritage item

Figure 6.5: *Heritage Items in Vicinity of Site (Source: University of Sydney / Graham Brooks)*

[9] The *Heritage Act 1977* requires that Government agencies keep a heritage and conservation register, commonly known as a Section 170 Register, listing heritage assets under its ownership, occupation or management.

Table 6.3: *Summary of Heritage Impacts*

Heritage Item	***Heritage List on which it is included***	***Summary of Heritage Impact***
Items Within CODCD Site		
Sydney University Conservation Area (CA47)	*South Sydney LEP*	The proposed demolition of the HK Ward Gymnasium and the Missenden Unit, and the construction of the multi-level CODCD for the University is considered to be compatible with the established heritage significance of the Conservation Area.
The University of Sydney Site Landscaping	*South Sydney LEP*	The proposed changes within the boundaries of the University Grounds, as defined in the *University of Sydney Grounds Conservation Plan (October 2002)*, are considered to be consistent with the provisions of the *LEP* and the guidelines of the *University of Sydney Grounds Conservation Plan.* There would be no adverse impact on the established heritage significance of the University Grounds, or on views to, and from, adjacent heritage items as a result of the project.
Royal Prince Alfred Hospital Group	*South Sydney LEP*	The project is considered to be generally consistent with the policies of the *RPA Hospital Conservation Management Plan (CMP)*. The project does represent a variation to Policy 3.1.1 of the CMP (ie. retain the distinct boundaries of the hospital precinct) but this variation is considered to be supported in the context of the location of the subject site at the border with the University grounds, and the historical development of research facilities at the hospital in conjunction with the Medical School of the University.
Missenden Unit (Former Psychiatry / Anaesthetics Block)	Included in *South Sydney LEP* Conservation Area and RPAH Group; NSW Health Section 170 Register	The demolition of this building, graded as being of neutral heritage significance in the *RPA Hospital CMP* is considered to be an acceptable outcome. The impact of this demolition could be mitigated by preparing an archival photographic recording of the building, to be lodged with the museum collection.
John Hopkins Drive	Included in *South Sydney LEP* Conservation Area and RPAH Group; NSW Health Section 170 Register	The project is consistent with Policies 3.2.1, 3.2.2, 3.2.3 and 3.2.4 of the *RPA Hospital CMP*. It would have no adverse impact on the established heritage significance of John Hopkins Drive as the view to St John's oval (the remnant grazing lands of the University) from John Hopkins Drive and the view corridor from the entrance of the RPA Women and Babies Hospital would be retained.
Items in the Vicinity of the CODCD Site		
J D Stewart Building	*South Sydney LEP;* University's Section 170 Register	As there is no visual link between this building and the subject site, due to its physical separation and the intervening buildings and trees, there would be no adverse impact on the established heritage significance of this building.
John Woolley Building	*South Sydney LEP;* University's Section 170 Register	The assessment of heritage impact for this building is limited to that of views due to the extensive physical separation from the subject site. The new built element in the background view from the vicinity of this building would not have an adverse impact on its established heritage significance.
Teachers College (Old)	University's Section 170 Register	This item was not specifically assessed in the heritage statement, as such assessment is not required under the Section 170 Register. Given its good separation from the CODCD site, no adverse impacts are expected on this item.
University Ovals No.1 and No.2	University's Section 170 Register	This item was not specifically assessed in the heritage statement, as such assessment is not required under the Section 170 Register. The CODCD building has been designed with a similar setback to the ovals as adjacent buildings (including the multi-level Centenary Institute, and as such no adverse impacts are expected on the Ovals. The project includes a landscaping strategy for the perimeter vegetation affected by the project.
McMaster Laboratory	University's Section 170 Register	This item was not specifically assessed in the heritage statement, as such assessment is not required under the Section 170 Register. The item is well separated from the CODCD site, and as such no adverse impacts are expected.

Heritage Item	***Heritage List on which it is included***	***Summary of Heritage Impact***
Blackburn Building	University's Section 170 Register	This item was not specifically assessed in the heritage statement, as such assessment is not required under the Section 170 Register. The Blackburn Building is physically and visually separated from the CODCD site by the multi-storey Centenary Institute, and as such no adverse impacts are expected.
Veterinary Science Precinct	University's Section 170 Register	This item was not specifically assessed in the heritage statement, as such assessment is not required under the Section 170 Register. It is considered that the CODCD project is compatible with the heritage values of the precinct.
Resident Medical Officers' Quarters	Included in *South Sydney LEP* Conservation Area and RPAH Group; NSW Health Section 170 Register	The impact of the project on the adjacent Resident Medical Officers' Quarters is limited to that of views. There would be no adverse impact on views to, or from, this building resulting from the project.
Rear Gardens	Included in *South Sydney LEP* Conservation Area and RPAH Group; NSW Health Section 170 Register	As the project does not involve significant areas of planting within the hospital grounds there would be no impact on the established significance of this item.
The University Boundary (10 Missenden Road)	Included in *South Sydney LEP* Conservation Area and RPAH Group; NSW Health Section 170 Register	As the project does not involve the site of the Hospital's early laundry and boiler house there would be no impact on the archaeological potential of this item.
Immunology Building	Included in *South Sydney LEP* Conservation Area and RPAH Group; NSW Health Section 170 Register	As the multi-storey Centenary Institute physically and visually separates this item from the CODCD site it is considered the project would have no adverse impact on its heritage significance, curtilage and setting.
Morgue and Chapel	Included in *South Sydney LEP* Conservation Area and RPAH Group; NSW Health Section 170 Register	As the multi-storey Centenary Institute physically and visually separates this item from the CODCD site it is considered the project would have no adverse impact on its heritage significance, curtilage and setting.
St John's College	*South Sydney LEP*	The CODCD would be partially sited on land recently purchased by the University from St John's College specifically for the project. The project is generally consistent with the objectives and controls of the sale deed. The CODCD would be set back from the edge of the boundary with St John's College, aligned with the southern facade of the college building, sited at a lower level and separated physically and visually by the landscaping. Although the CODCD building is large in scale the visual dominance of St John's College, set in its open landscape, would remain. The insertion of the new built element in this view would not detract from the significance of St John's College. The primary public view of the imposing eastern facade of St John's College (currently available from Parramatta Road and across St John's Oval, as well as from John Hopkins Drive) would be retained and enhanced with the increased pedestrian access to the area generated by the project. The CODCD building has been designed in a manner that respects and complements St John's College, including the finishes and colouration of building elements which have been based on the sandstone hues of the college building.

Heritage Item	*Heritage List on which it is included*	*Summary of Heritage Impact*
Sancta Sophia College	None (identified in DGRs)	It is considered that any impact the project would have on the potential heritage significance of Sancta Sophia College would be limited to that of views, due to its physical separation from the CODCD site. Considering the available views, it is concluded that the project would not have an adverse impact on the potential heritage significance of Santa Sophia College.

Based on the findings of the Statement of Heritage Impact, it is considered that the CODCD project has been designed in a manner that is consistent with, and would not have any significant impact on, the built heritage values of the area.

To mitigate the impacts on items directly affected by the project, the University has committed to undertaking archival recording of the Missenden Unit building and the HK Ward Gymnasium building and their surrounds, prior to demolition of the buildings.

6.8 Traffic and Parking

A Traffic and Transport Assessment has been undertaken for the project by Halcrow MWT, and is attached as **Appendix O**. A summary of the assessment is provided below.

6.8.1 Access and Road Network

Proposed vehicular access to the CODCD is shown on Figure 6.6, and includes:

- northern access from Parramatta Road via Orphans School Creek Lane and a new internal access road to the CODCD. This route would be the main construction access and operational access point to the CODCD's basement car park and loading dock;
- southern access from Western Avenue (and Carillon Avenue) via Blackburn Circuit and a new internal access road around the western side of University Oval No.1. This route would provide operational access to the CODCD's basement car park;
- western access from Missenden Road via John Hopkins Drive. This route would provide access to the drop off / pick up facility and at-grade visitor parking for people attending the clinics, with no direct access to the CODCD's basement car park; and
- north-eastern access from Parramatta Road at the Ross Street intersection via Western Avenue and Regimental Drive. This route would provide access to the drop off / pick up facility only, with no direct access to the CODCD's basement car park.

The proposed access arrangements have been developed in consideration of a number of factors, including:

- avoiding significant intensification of vehicle movements along John Hopkins Drive;
- providing direct vehicle access to basement car parking and loading areas;
- minimising interaction with pedestrian links;
- facilitating future development of the LSRP; and
- ensuring consistency with the University's *Campus 2020 Masterplan* traffic management strategy, including keeping vehicular traffic to the periphery of the campus.

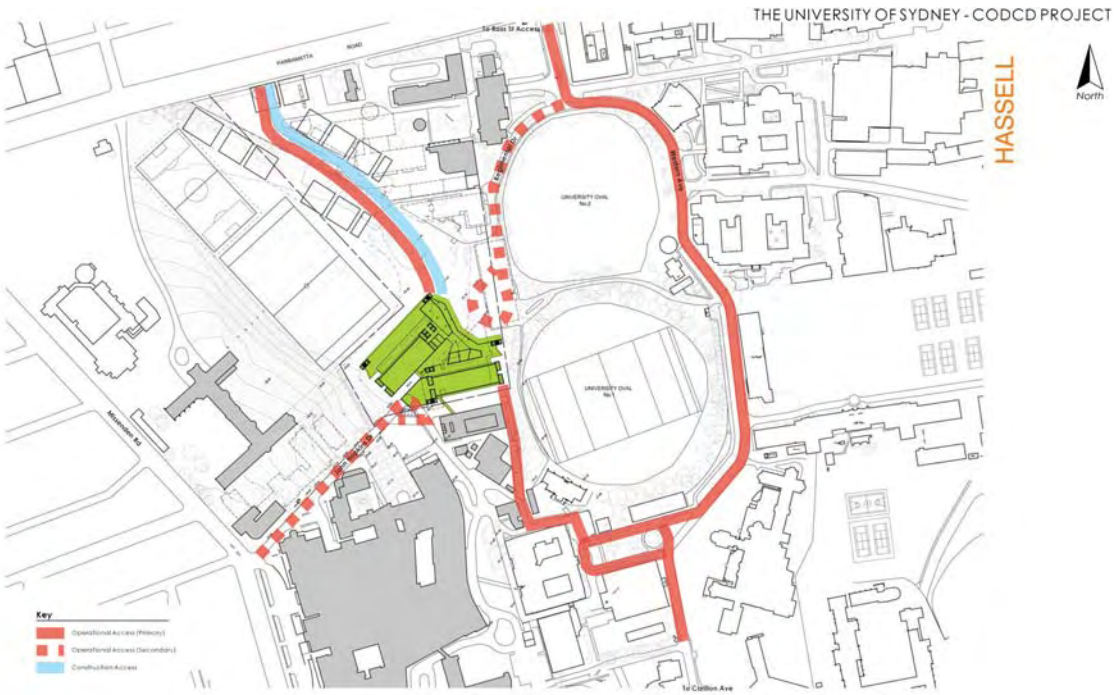


Figure 6.6: *CODCD Access Arrangements (Source: Halcrow MWT)*

6.8.2 Traffic Generation and Road Network Performance

Traffic Generation

Based on surveyed car park traffic generation rates and the proposed 200 space basement car park for the CODCD, the traffic assessment estimated the following traffic generation for the project.

Table 6.4: *Estimated CODCD Traffic Generation*

Time Period	***Vehicle Trips (veh/hr)***
Morning Peak	
In	110
Out	12
Total	122
Evening Peak	
In	8
Out	68
Total	76

Road Network Performance

Based on these traffic generation rates, the traffic assessment modelled the impact of the project on the capacity (ie. mid-block flows) of the surrounding road network, including public roads and internal University and RPA roads. The results are presented in the following table.

Table 6.5: *Predicted Road Network Traffic Volumes (Existing + CODCD)*

Road	***Morning Peak Hour***		***Evening Peak Hour***	
	2-way flow (veh/hr)	***% Increase (from existing)***	***2-way flow (veh/hr)***	***% Increase (from existing)***
Parramatta Road	3,147	0%	3,557	0%
Ross Street	839	6%	989	3%
Western Avenue	310	21%	322	11%
Orphan School Creek Lane	49	36%	52	41%
Missenden Road	969	2%	1,002	0%
John Hopkins Drive	122	0%	125	0%
Carillon Avenue	1,088	3%	1,111	1%

As indicated in the table, the CODCD project would generate the greatest increase to flows on Western Avenue and Orphan School Creek Lane. The increases on other roads are low at between 0 and 6%.

Based on these estimated volumes, the traffic assessment concludes that Western Avenue and Orphan School Creek Lane would have sufficient road capacity to accommodate the additional traffic from the project. The other nearby roads are also expected to continue to operate satisfactorily.

Intersection Performance

Based on the predicted traffic generation and the local road network, the traffic assessment modelled the impact of the project on potentially affected intersections. The results are presented in the following table.

Table 6.6: *Predicted Intersection Performance*

Intersection	***Control Type***	***Existing Performance***				***Predicted Performance (with CODCD)***			
		Morning Peak		***Evening Peak***		***Morning Peak***		***Evening Peak***	
		Av. Delay (sec)	***Level of Service***	***Av. Delay (sec)***	***Level of Service***	***Av. Delay (sec)***	***Level of Service***	***Av. Delay (sec)***	***Level of Service***
Parramatta Rd / Ross St / Western Ave (north)	Signal	15.7	B	16.1	B	17	B	17	B
Parramatta Rd / Orphan School Creek Ln	Priority	13.4	A	57.8	E	14	A	68	E
Carillon Ave / Western Ave (south)	Priority	30.4	C	32.2	C	34	C	38	C

Note: Level of Service is fully defined in the traffic assessment, however a summary of the ratings is:
A – Good operation
B – Good with acceptable delays
C – Satisfactory
D – Near capacity
E – At capacity
F – Extra capacity required

The modelling indicates that the project would not change the existing levels of service, or significantly increase delays, on any of the key intersections, with two of the three key intersections continuing to perform satisfactorily.

The modelling does indicate that the Parramatta Road / Orphan School Creek Lane left-in left-out intersection currently operates at capacity during the evening peak hour (for cars making left turns from Orphan School Creek Lane into Parramatta Road). However, the traffic assessment notes that the modelling on this intersection is likely to be conservative, as the model assumes that westbound traffic on Parramatta Road arrives randomly. In reality, the westbound traffic is highly influenced by upstream signalised intersection (including the Ross Street intersection), which tends to 'bunch' traffic together resulting in fluctuating traffic flows.

The assessment notes that it is this characteristic of traffic signal operation, combined with the Orphan School Creek Lane intersection's proximity to the traffic signals that enables the intersection to operate satisfactorily.

Furthermore, traffic flows exiting to Parramatta Road via Orphan School Creek Lane are relatively low (less than 40 vehicles per hour) and hence queuing within the University is minimal (1-2 vehicles).

The traffic assessment concludes that the proposed site access arrangements would satisfactorily accommodate the additional traffic associated with the CODCD, with no need to upgrade the public road network.

6.8.3 Parking

The parking strategy for the CODCD project has been designed in accordance with the University's *Campus 2020 Masterplan*, which encourages provision of basement car parking towards the periphery of the campus. The objective of this strategy is to allow for the removal of existing at grade parking scattered throughout the University and reduce the extent of vehicle intrusions into the Campus enabling the creation of more pedestrian orientated links and reducing pedestrian / vehicle conflicts.

In this regard, the project includes the provision of approximately 200 car parking spaces within a basement car park below the CODCD. These spaces would be restricted to allocated staff parking.

In addition approximately 15 visitor parking spaces would be provided for drop off / pick up and short stay parking for clinical research patients. These at grade spaces would be accessed via John Hopkins Drive.

The traffic assessment notes that application of the car parking rates in the City of Sydney Council's *Development Control Plan (DCP) No. 11* would require some 640 car parking spaces.

The provision of this amount of car parking is not considered to be consistent with the objectives of the DCP (which seeks to encourage a reduction in vehicular travel in South Sydney) or the transport objectives of the University's masterplan.

The provision of 200 basement car parking spaces and 15 clinic visitor spaces is considered to be an appropriate balance between satisfying staff parking demands, encouraging alternate transport modes and maintaining consistency with the masterplan objectives, particularly given the site's good access to public transport and sustainable transport modes, as outlined below.

6.8.4 Loading and Service Vehicle Arrangements

The project includes provision of adequate loading facilities within the basement of the CODCD building.

The loading dock and associated manoeuvring area would be separated from the car parking spaces, however service vehicles and cars accessing the car park would utilise the same access roads.

The sizes of delivery vehicles would vary from small vans to heavy rigid vehicles (12.5m long). No articulated vehicle access to the loading area is envisaged. It is anticipated that up to 40 service vehicles per day would access the proposed loading dock.

To manage the potential for conflict between cars, trucks and pedestrians, the traffic assessment recommends that a loading dock management plan be developed for operation of the loading area. The University has committed to preparing this plan prior to operation of the building, as part of a wider Environmental Management Strategy for the project.

6.8.5 Sustainable Transport

The CODCD site enjoys good access to existing and planned public transport and established cycle and pedestrian networks.

In this regard, the University is within walking distance of Redfern and MacDonaldtown railway stations, and bus services run along the University's frontages to Parramatta Road, City Road, Missenden Road and Carillon Avenue.

The proposed Sydney Metro also reflects the potential travel demand generated by the University, with Metro stations identified for Camperdown and Broadway (including directly to the north of the site on Parramatta Road).

As shown on Figure 6.7, the site has good access to the University's broad pedestrian and cycle structure, and the project has been designed in a manner that respects and encourages this structure, including the key provision of a ground level pedestrian link through the CODCD building from John Hopkins Drive to the existing pedestrian infrastructure between the University Ovals.

The project also includes the provision of approximately 125 bicycle parking spaces, which exceeds Council's DCP 11 requirements, as well as change facilities in the CODCD basement.

Figure 6.7: *University's Pedestrian and Bicycle Network (Source: Campus 2020 Masterplan)*

6.8.6 Construction Traffic

Access to the proposed construction site would be via the new internal access road from Parramatta Road along the Orphan School Creek Lane alignment.

To appropriately manage potential construction traffic-related impacts, the University has committed to preparing a detailed Construction Traffic Management Plan for the project. The plan would detail traffic generation, site access arrangements and implications on the operation and safety of the surrounding road network.

6.9 Wastes and Hazards

6.9.1 Wastes

Construction and Demolition Waste

The project would generate a considerable amount of construction and demolition waste, associated with:

- demolition of the HK Ward Gymnasium and Missenden Unit buildings;
- excavation (and export) of fill from the CODCD's basement levels; and
- building construction.

Both the HK Ward Gymnasium and Missenden Unit buildings are brick and concrete structures. Given their age, there is some potential that the buildings contain hazardous materials such as asbestos. To ensure that the risks associated with such materials is appropriately managed, the University has committed to undertaking a hazardous materials survey following de-population and prior to demolition of the structures.

Any hazardous substances identified would be managed and disposed in accordance with relevant legislative requirements and guidelines, including the *Code of Practice for the Safe Removal of Asbestos [NOHSC:2002 (2005)]* and the *Protection of the Environment Operations (Waste) Regulation 2005*.

These measures would be outlined in a Waste Management Plan for the construction and demolition phase, as outlined below.

The excavation phase would generate about 50,000m^3 of fill that would need to be exported from the site. As detailed in Section 6.2, some of the fill is expected to contain low-level contamination. As such, the excavation, storage and disposal of the material would be undertaken in accordance with a Remedial Action Plan, prepared in accordance with DECCW guidelines. This would include classification of the material in accordance with DECCW's *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes (June 1999).*

Construction of the CODCD building would also generate a considerable amount of waste. However, with appropriate planning and management, construction waste is able to be minimised through application of best practice waste avoidance, re-use and recycling measures.

In this regard, the ESD Report (see **Appendix E**) includes a target of diverting 90% of the construction and demolition waste from landfill. To achieve this target, the University has committed to preparing a Waste Management Plan for the construction and demolition phase of the project, prior to construction. The plan would be prepared as part of a wider Environmental Management Strategy for the project.

Operational Waste

As a medical research facility, the CODCD would generate a wide variety of waste streams.

A broad operational Waste Management Plan for the operational phase of the project has been prepared by Visy, and is attached as **Appendix P**. The plan is based on the functional design brief for the CODCD, prepared by Aurora Projects.

The CODCD would accommodate a Central Waste Collection area comprising a:

- General Waste Collection Room;
- Chemical Waste Collection Room;
- Clinical Waste Collection Room;
- Bedding Waste Holding Room;
- Central decontamination area; and
- Cold room with a chest freezer (for animal cadavers).

A summary of the waste streams and proposed management is presented in the following table.

Table 6.7: *Summary of Waste Streams and Management*

Waste Type	***Management and Disposal***
General Waste	Recyclable material (glass, plastic and metal) apart from paper and cardboard to be placed in with general waste bins in the CODCD and separated from general waste offsite.
Recyclable waste (paper and cardboard, inc. confidential waste)	Separated at source for off-site recycling
Hazardous waste	To operate on an exchange system via the Central Waste Collection area. Management of specific hazardous waste types is outlined below
Chemical waste	Non-hazardous chemical waste would be disposed to sewer, while hazardous chemical waste would be transported to the Chemical Waste Collection Room, which would be bunded and explosion-proof.
Clinical and related waste; including: • *General clinical waste* • *Recognisable human tissue* • *Cytotoxic waste* • *Animal carcasses* • *Bedding waste*	To be generally stored in the Clinical Waste Collection Room with direct access to a central decontamination area for sterilisation (refer to Waste Management Plan for procedures for specific clinical waste types)
Radioactive waste	Radioactive waste would only be accepted for disposal if its specific activity is certified as being less than 100 Becquerels per gram. The University's policy is that waste exceeding 100 Becquerels per gram must be stored locally pending decay. Radioactive waste of less than 100 Becquerels per gram would be packaged in accordance with the University's OH&S policy and disposed of in approved dangerous goods drums in the Chemical Waste Collection Room.
Sharps waste	To be collected in appropriately identified sharps containers, with management and disposal according to the nature of the waste (refer to Waste Management Plan for details)
Compressed gas cylinders waste	Transported to the Gas Cylinder Collection Room for collection and off-site refill by Contractor
Feminine hygiene waste	Collected at source by Contractor
Printer toner cartridges	Collected in marked bins for recycling by Contractor

The University has committed to undertaking the project in accordance with the Waste Management Plan (as may be updated from time to time).

6.9.2 Dangerous Goods and Hazardous Substances

As outlined in Section 4.2.3, SEPP 33 and the Department of Planning's *Applying SEPP 33* guidelines are used to ascertain whether a proposal is a 'potentially hazardous industry'.

A specialist SEPP 33 analysis has been undertaken for the project by SKM, and is attached as **Appendix Q**.

As detailed in the SEPP 33 analysis, the CODCD would store and use a range of dangerous goods, with types and quantities typical of similar medical research facilities with laboratory environments.

An indicative list of the dangerous goods that would be stored and used in the CODCD, and consideration against the screening thresholds in SEPP 33, is presented in the following table.

Table 6.8: *Summary of SEPP 33 Analysis*

DG Class	***Materials Stored***	***Qty Stored***	***SEPP 33 Consideration***	***Conclusion***
2.1	LPG, acetylene, hydrogen, in bulk or cylinders	220L	Storage under thresholds	Not potentially hazardous
2.2	N_2, O_2 in bulk or cylinders	10,000L	Not subject to screening review, as they do not contribute significantly to off-site risk	Not potentially hazardous
2.3	Toxic gases, chlorine, ammonia	200L	Storage under thresholds	Not potentially hazardous
3PGI	Ethanol	10,000L	Boundary of site (St Johns College or RPA) must be more than 10 metres away, which appears to be the case	Not potentially hazardous
3PGII	Various			
3PGIII	Various			
C1/C2	Diesel	5,000L	Storage under thresholds/requirements	Not potentially hazardous
5.1	Oxidising agents	500L	Storage under thresholds	Not potentially hazardous
5.2	Organic peroxides	50L	Storage under thresholds	Not potentially hazardous
6.2	Infectious substances	13.2m^3	Waste streams may need to be further reviewed	Potentially hazardous (subject to further review)
7	Radioisotopes		Not subject to screening review, as they are adequately covered by national regulations and guidelines	Not potentially hazardous
8	Corrosives	2,000L	Storage under thresholds	Not potentially hazardous
9	Waste oils, solvents, etc.		Not subject to screening review, as they do not contribute significantly to off-site risk	Not potentially hazardous

As indicated in the table, most of the dangerous goods storage is below the screening thresholds in SEPP 33, however the proposed storage of infectious substances (ie. substances containing micro-organisms, bacteria, viruses, etc that are believed to cause disease in humans or animals) does exceed the screening thresholds and may possibly be considered 'potentially hazardous'.

Infectious substances would comprise clinical and related waste, as described in Section 6.9.1 above. The CODCD would include a number of specialist facilities to manage such substances, including a dedicated Clinical Waste Collection Room with direct access to a central decontamination area for sterilisation.

Given this, and the stringent national regulations and guidelines covering clinical wastes, it is considered that the proposed storage of infectious substances is able to be managed in a manner such that the storage would not result in any significant impacts.

Notwithstanding, the SEPP 33 analysis acknowledges that a Preliminary Hazard Analysis (PHA) should be prepared to fully determine the risk associated with the infectious materials storage. However, the analysis also recognises that the details of clinical waste handling, storage and disposal for the CODCD would not be fully known until some stage during detailed design.

Consequently, the SEPP 33 analysis recommends that the PHA be prepared once these storage and handling details are fully understood (and ideally prior to building construction).

In accordance with this recommendation, the University has committed to preparing a PHA prior to construction of the CODCD building, to the satisfaction of the Department of Planning. The PHA would be prepared in consultation with the Department's Major Hazards Branch, and in accordance with the Department's *Applying SEPP 33* guidelines and *Hazardous Industry Planning Advisory Paper (HIPAP)* guidelines. If required as a result of the PHA, the University would also prepare additional studies (eg. a Safety Management System) in accordance with the relevant guidelines.

It is noted that all dangerous goods and hazardous substances storage and handling on site would be undertaken in accordance with applicable standards and codes (as outlined in Section 3.5).

7 PROJECT JUSTIFICATION AND CONCLUSION

7.1 Statement of Commitments Summary

The University has prepared a Statement of Commitments for the project, which is attached as **Appendix R**.

The Statement of Commitments outlines a range of measures that the University would implement during the detailed design, construction and operational phases of the project, to ensure that the project is undertaken in an orderly and environmentally responsible manner.

A summary of the key commitments is presented in the following table.

Table 7.1: *Statement of Commitments Summary*

Aspect	***Key Commitment***
Subdivision	The University will prepare a final subdivision plan to the satisfaction of the Department of Planning prior to obtaining a subdivision certificate for the site.
Soil and Water	*Erosion and Sediment Control* The University will prepare and implement an Erosion and Sediment Control Plan for the project prior to construction. *Acid Sulfate Soils* The University will prepare and implement an Acid Sulfate Soil Management Plan for the project prior to construction. *Stormwater Management* The University will prepare and implement a Stormwater Management Plan for the project prior to construction. *Site Contamination* The University will prepare a Remedial Action Plan to manage site contamination prior to building construction.
Noise	The University will only carry out audible construction works within the day-time period. The University will ensure that the operation of the project complies with the applicable project specific noise level criteria.
Air Quality and Odour	The University will implement all reasonable and feasible measures to control dust emissions, and ensure that the project does not generate offensive odour. The University will prepare a detailed Air Quality Assessment for the project prior to building construction.
Energy and Greenhouse Gas	The University will carry out the project generally in accordance with the energy savings measures in the sustainability reports for the project, including meeting an ambitious 40% energy reduction target an seeking a Green Star rating for the facility.
Flora and Fauna	The University will salvage any transplantable vegetation.
Heritage	*Aboriginal Heritage* The University will undertake additional Aboriginal archaeological investigation beneath the Missenden Unit and HK Ward Gymnasium buildings following their demolition, in consultation with the Aboriginal community. *Historical Heritage* The University will undertake archival recording of the Missenden Unit and HK Ward Gymnasium buildings.

Aspect	*Key Commitment*
Traffic and Parking	The University will construct internal roads and car parking in accordance with applicable standards, and provide suitable bicycle parking facilities for the project.
Visual Amenity	The University will maintain landscaping on site to a high quality, and ensure that all lighting is installed and maintained in a manner that does not cause nuisance.
Wastes and Hazards	The University will implement reasonable and feasible measures to minimise waste and carry out the project in accordance with the project Waste Management Plan. The University will prepare a Preliminary Hazard Analysis for the project to the satisfaction of the Department of Planning, prior to building construction.
Environmental Management	The University will prepare and implement an Environmental Management Strategy for the project, to the satisfaction of the Department of Planning.

7.2 Consideration of Alternatives

Alternatives to carrying out the project on the site in the proposed manner include:

- developing the site to a lesser or higher scale;
- developing the site with a different layout and/or design; and
- not undertaking the project at all.

In terms of project scale, it is noted that:

- the CODCD building is well set back from the public domain and key public road frontages, thus ensuring that the building does not dominate the streetscape;
- the CODCD is consistent with the bulk and scale of surrounding buildings, including the RPA main hospital building (Clinical Services Building);
- heritage assessment indicates that the CODCD would not adversely impact the heritage values of the area, including St John's College;
- the project would not significantly increase the total floor space ratio on the University (ie. from about 0.99:1 to 1.14:1), and the total FSR of the University with the CODCD is not considered excessive for the locality;
- the project scale is consistent with that envisaged in the University's Campus 2020 Masterplan; and
- environmental assessment indicates that the project is able to be undertaken in a manner that would not adversely affect the environment or surrounding landusers.

Accordingly, it is considered that the scale of the project provides a reasonable balance between maximising the development, research and employment opportunities of the site whilst ensuring that the amenity of the surrounding area is not adversely affected.

In terms of alternative layouts and/or designs, it is noted that:

- the CODCD has been designed to a high quality by respected architects Hassell in a manner that befits the Centre's anticipated status as a world class centre for medical research and training. A number of alternatives were considered during the evolution of the design, as outlined in Section 6.1 and detailed in the design report in **Appendix C**;
- the CODCD is based on a functional design framework that promotes collaboration between researchers, both on each floor and between building levels;
- the design of the CODCD has paid particular attention to its physical and heritage setting, ensuring that the building does adversely affect the heritage values of the area, particularly St John's College;
- the considerable amount of plant and equipment required for the operation of the CODCD has been cleverly integrated into the architectural design of the building; and
- the layout and design of the CODCD maximises the use of passive energy savings measures, including a northern building orientation and the use of extensive double-skin glazing and voids to maximise natural light, ventilation and heat control.

Accordingly, it is considered that the proposed building layout and design provides a good balance between the utilitarian needs of the CODCD, the setting and constraints of the site, and the desire for a visually attractive building that would promote world class research and training.

Not undertaking the project at all on the site is not considered to be a reasonable alternative, as:

- the project is consistent with, and indeed directly promotes, the strategic planning aims and objectives for the area as identified under the Metropolitan Strategy and the South Sydney Subregional Strategy;
- the project is not predicted to have any significant impacts on the environment or surrounding landusers; and
- not undertaking the project would negate the project's significant socio-economic benefits, as outlined below.

7.3 Project Need and Justification

It is not difficult to demonstrate the need for the CODCD Project, given that it aims to achieve groundbreaking solutions to those diseases that pose the greatest current health threat to Australian citizens. The CODCD plans to achieve this through a highly collaborative and cross-disciplinary approach that would enable the Centre to translate research and training into real treatments.

As outlined in Section 1.2, cardiovascular disease, diabetes, and obesity are three of the most important health problems facing Australia today. Collectively, they challenge the length and quality of life for all Australians, with cardiovascular disease alone responsible for 39% of deaths and 18% of the disability adjusted life years lost to the Australian community (with indigenous and remote communities worst affected).

They are the leading causes of death and disability in all rapidly ageing populations worldwide, including China and India. Furthermore, the rapid escalation of their costs (the current cost of diabetes is $6 billion) threatens health sector sustainability both here and overseas.

In this regard, the Project has two key drivers, namely:

- the economic and social consequences of obesity, diabetes and cardiovascular disease; and
- the existing relationships between the partner institutions with world-class expertise in obesity, diabetes and cardiovascular disease.

The Centre is expected to become a major drawcard in attracting and retaining talented and enthusiastic researchers, teachers, clinicians and students.

The site is ideally suited to the project, being located within the University's planned Life Sciences Research Precinct and directly between the University, the RPA Hospital (which is the Sydney South West Area Health Service's premier teaching hospital) and the Centenary Institute (a major medical research facility engaged in seeking improved treatments and cures for cancer, cardiovascular and infectious diseases).

Further, as detailed in Section 4.1 the site is recognised in NSW Government's strategic plans as part of the 'Sydney Education and Health Precinct', which aims to promote the co-location of medical research and training developments to reinforce the strengths of Global Sydney.

Environmental assessment indicates that the project is able to be conducted in a manner that would not result in any significant environmental impacts, or adversely affect the amenity of the surrounding area.

On balance, it is considered that the project represents the orderly and reasonable development of the land, and is therefore in the public interest.