Architecture
Interior Design
Landscape Architecture
Planning
Urban Design

Australia
PR China
Hong Kong SAR
Singapore
Thailand

CODCD_ PART 3A ARCHITECTURAL DESIGN REPORT

Prepared for University of Sydney
November 2009

HASSELL

Contact

Rob Hawkins Principal
rhawkins@hassell.com.au

HASSELL
Level 2
88 Cumberland Street
Sydney NSW 2000 Australia
Phone +61 2 9101 2000
Fax +61 2 9101 2100

HASSELL Limited
ABN 24 007 711 435

Content

01____Project Objectives

The CODCD will bring together - under one roof – research groups from enabling sciences (e.g. chemistry, physics, biology); biomedical sciences or theoretical medicine (e.g. molecular biology, cell biology); bioinformatics and computational biology; clinical research, and health policy. The CODCD facility has been designed to encourage formal and informal interaction between these groups in order to foster a cross-fertilisation of research and educational ideas.

The project will generate a world-class research facility that:
_Develops effective solutions for Obesity, Diabetes and Cardiovascular Disease through basic and clinical research
_Establishes strong links with neighbouring institutions in order to translate knowledge from molecule to medicine
_Translates scientific knowledge into accessible, evidence-based input for policy makers
_Attracts and retains outstanding researchers, clinicians, and administrative leaders
_Enables CODCD researchers to collaborate informally and formally with each other, and with external researchers
_Provides high-quality education for undergraduate and postgraduate students and encourages them to consider a career in research
_Accommodates a range of wet, dry and clinical research activities that allow for the flexible formation of integrated research groups
_Makes a positive contribution to the University of Sydney & RPAH Campuses

The CODCD will employ a translational research model to achieve its research objectives. In its most basic form, the translational model envisaged drives clinical research through the interaction of basic and clinical sciences.

A further goal of the CODCD is that these interactions will stimulate new translational research projects, around which multi-disciplinary teams will form. These teams will integrate and translate expertise to develop new solutions for Obesity, Diabetes and Cardiovascular Disease, and will, in effect, form the heart of the research activities of the CODCD. These integrative teams will have suitably designed, flexible research spaces made available to them in the form of the CODCD Multidisciplinary Core Facility.

To assist in attracting and retaining outstanding researchers, the CODCD research groups will be comprehensively supported by the following shared facilities (tertiary units) to be located within a centralised core services building within the CODCD precinct:
_Imaging Unit
_Bioinformatics and Computational Biology Units
_Structural Biology Unit
_Drug Design Unit
_Cytometry Unit
_Biological Services Unit (animal holding)
_Ambulatory clinics
_Genomics and Proteomics units

Site Photo

02____Site Analysis

2.1 Commentary and site photos of existing

The site occupies in part the current location of the Missenden Psychiatric Unit which will be replaced by the CODCD. It is adjacent to the Centenary Institute and close to the RPA Entrance. The site also falls on the access along John Hopkins Drive which connects off Missenden Road. John Hopkins Drive was identified in early Wilkinson Plans as part of the strategy for this part of the site connecting Missenden Road through to the first Oval No.1 and beyond to the greater campus master plan.

The site also forms a south east boundary to the St Johns College Playing fields and an edge to the open space in front of St Johns College.
The site edges the current access way between Oval No.1 and Oval No.2 along Grose Farm Lane to St Johns Ovals forming a western edge to this route.

In a North/South direction, the site edges onto a desire line between Vet Sciences and the Blackburn Building – currently obstructed by the H K Ward Gymnasium which will be removed as part of this project.

2.2 The Precinct Scale

The site is adjacent to the Centenary Institute, also a research facility which has 6 floors and a half basement. The CODCD will provide research facilities for the Centenary. The site is also adjacent to the RPA entrance off John Hopkins Drive. The RPA is a large teaching hospital rising in scale from 6 floors on John Hopkins side and higher further back in the site.

The CODCD needs to have a close connectivity with the RPA in terms of function and collaboration. The CODCD will have strong relationships with this part of the campus and hospital buildings – including those fronting Missenden Road such as the future Life House development, which will also consolidate the scale in this area.

To the north of the site, the Gunn building is of smaller scale (7 storey). It is envisaged this building will be developed in the future, in line with the master plan, to a scale closer to the CODCD (and of a similar function). This will ultimately create a Life Science Precinct that connects medicine to Veterinary Sciences to allow transfer of information and research between the two facilities.

To the North West is St John's College, which sits on top of a ridge giving it a greater height in relation to the CODCD site. St John's College also has a future development strategy which has already commenced and will consolidate the vacant sites around the college

2.3 Future development

2.3.1_University of Sydney

This project is to form the first stage of a revitalisation of this end of the Sydney University Campus. The scale of future development to the north of this site is shown on the image below.

01_

02_

03_

04_

01_ RPA Building
02_ St Johns
03_ Centenary
04_ Site Boundary Plan

02____Site Analysis

Future development has been master planned to allow future research scale buildings which reduce in height as they move north to eventually incorporate some of the higher quality existing Vet Science buildings. These new buildings would be arranged to form a strong - but permeable - boundary to a new pedestrian link that edges the ovals No.1 and No.2, a link that reinforces a student movement between Blackburn and Vet Sciences.(See Landscape section if this Report for more details)

The buildings are oriented in an East/West direction allowing view corridors that extend the University grain down to St Johns oval. These buildings will eventually develop through to Parramatta Road forming an edge and a presence for the University on this part of the campus.

The formation of this pedestrian connection parallels the University's Eastern Avenue, which has been recently created in the university, bounded by the new Law Building and the Jane Foss Building – it is seen as equivalent and an equally important organising structure for the Western End of the campus.

The CODCD development see's the consolidation of the Medical, Veterinary Sciences and related Research. Approximately (60,000 sqm) of additional research and educational space is planned over the next 10-15 years.
The next development phase to the CODCD would be approximately 15,000 sqm of Medical education and research space.

The Development takes account of the future development in the precinct by creation of a north south pedestrian link, a major public forecourt space off this link and establishment of an urban design geometry for the future public spaces and pedestrian and vehicular pathways.

2.3.2_St Johns College

It is understood that St Johns College propose to develop additional student accommodation and parking on their site to the west of the CODCD site. The view corridor (for RPA) established between the St John's college expansion site,and the CODCD site, mitigates any future impact of the CODCD on this potential future development

2.3.3_RPA Hospital

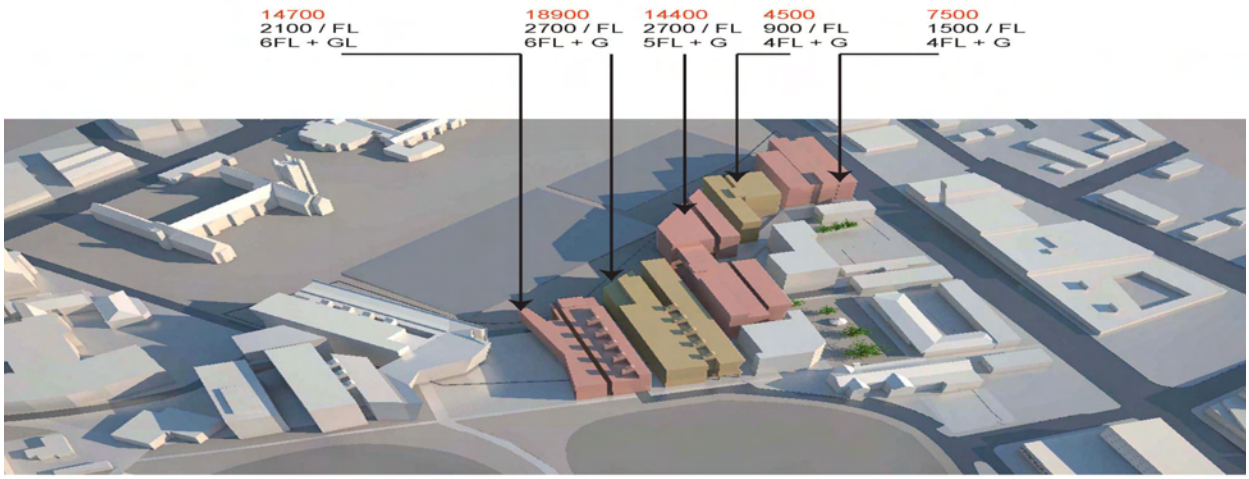
We are unaware of any future proposed development on the RPA Site adjacent to the CODCD Site.

2.3.4_Master plan structure for the precinct

The CODCD development offers the opportunity to develop a unifying urban design and public domain strategy for the western precinct of the Sydney University campus and its integration with the adjoining RPA hospital site and St John College. Within the university grounds it offers the ability to unify the Schools of Medicine and Veterinary Sciences.

2.4 View Analysis

The main views to the site are along John Hopkins Drive from Missenden Road; from the St.Johns Parramatta Road entrance looking across the St John's oval; from the Sydney University Parramatta entrance to the campus as you approach oval No.2, and as you pass along Grose Farm Lane between oval No.1 and No.2. However – there are longer distant views across the ovals from the east; these are largely concealed by the trees of the University No.1 Oval.



Potential Masterplan for future development of the University's Western Precinct

02____Site Analysis

The John Hopkins Drive view is an important entry to the site for those connecting from the hospital; the view across St John's oval after entry from Parramatta Road has a relationship to the greenery of the oval and to St John's College; the view from the Sydney Uni Parramatta Road entrance to the site is seen as the university front door for visitors to the site. The view along Grose Farm lane is seen as important for students connecting with the site from within the university grounds.

2.4.1_Views from adjacent properties

St Johns College, and the adjacent Centenary Institute located on the RPA site, and the RPA, will have their views affected by the CODCD.

2.4.2_St Johns College

St John' Colleges current views to the East are defined and foreshortened by the current tree line on the East side of St Johns Oval, the existing HK Ward Gymnasium and the Missenden Unit, Mental health building. These views to the east will not be effected , however views from upper levels of the College across the roof of the Missenden unit to the university beyond will be obstructed in a segment to the south east. (see diagram).

The view amenity of StJohn's College may also be improved, by the demolition of the above existing buildings and the creation by the CODCD development of a view corridor into the university grounds via the forecourt being created to the north of the CODCD (see diagram).

2.4.3_RPA Hospital

There will be some loss of views to the university from rooms on the north elevation of the RPA Hospital, due to the development of the CODCD. 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 reservation which is a condition of the land sale Deed between St John's and the University as shown on the site plan. This view corridor is amplified in the design by the extension of the landscape treatment from the Hospitals entry across John Hopkins Drive to the St Johns Oval.

2.4.4_Centenary Institute

The Centenary Institute will suffer the greatest loss of views from rooms on it's northern façade. The rooms in the centre of the building will lose the majority of their views. The rooms at the east and western ends of the building will maintain some diagonal views to the University and to the St John's College respectively.

The Centenary Institute, who will also be occupying some floors of the CODCD are to be linked by way of aerial bridges at their Levels 5 and 3, as well as a link to the basement level. Such co-location has resulted in the loss of views. A landscape courtyard is proposed between the Centenary Institute and the CODCD to provide a local view to those central rooms with view loss

2.5 Physical Constraints

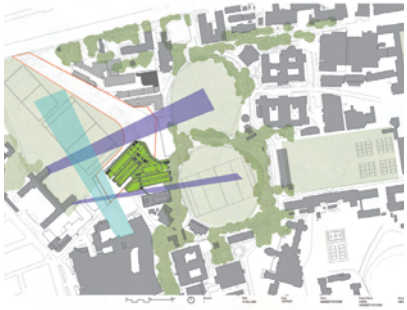
Currently the site is occupied by a 3 storey brick building occupied by The Missenden Psychiatric unit. This unit is to be relocated and the building demolished. Also close to the site is the HK Ward Gymnasium, which will

01_

02_

03_

04_



05_

01_ John Hopkins Drive
02_ John Hopkins Drive - After
03_ View from St Johns Oval
04_ View from St Johns Oval - After
05_ Views from StJohns College and RPA Hospital

be removed to allow access to the site. There are also constraints in the agreements with St Johns College based on the previous master plan which set 'suggested' boundary's to the site and set backs that allow St Johns College to continue their enjoyment of the oval without being visually blocked by the development.

Other constraints have been placed on the development as part of the design response, which is described later as part of the overall concept – these included distance from Centenary, and relationships to John Hopkins Drive and the Ovals No 1 and No 2.

2.6 The Design Process and Options explored

The design process explored a number of approaches in parallel; the building type is a complex relationship of research laboratories, teaching facilities, office space and shared or tertiary specialist spaces and these needed to be rigorously planned to meet the very specific requirements laid down in the brief. Along with this however, were requirements to explore the ideas of collaboration between departments, and collaboration with the wider research environment – in particular Centenary and RPA.

The site also brought some very specific opportunities to stimulate this part of the site and provide physical connectivity between the hospital and the university, as well as creating a new urban space which sat within a new master plan structure for the area. Lastly, it was important to incorporate a very strong environmental agenda – and this needed to balance with specific energy requirements for laboratory buildings.
The physical design process used sketches – but mainly models- to explore the relationship of options to the site. Over 24 option models were developed to test program, site and relationships and massing to adjacent developments. These mainly grouped into 3 options. The options were reviewed both internally at HASSELL and by invited critique from Paul Berkemeier and comments led to refinement.

Option 1 explored a traditional arrangement of labs arranged around a cental atrium – this was felt to increase collaboration by connectivity across the atrium. However – it was felt that this arrangement did not make full use of the views of the site and presented a closed face to the site with the labs having to be heavily shaded. The arrangement did not easily address the link form John Hopkins Drive, and the mass blocked views from Grose Farm Lane to St Johns Oval. Also, the building form did not easily address the idea of entrance from the east of the site and did not create a usable public space against the oval.

Image caption

02____Site Analysis

Option 2 used angular responses to the main site driving geometries of St Johns and the university 'grain'. These options also used a central atrium but although it responded to site links – it was felt to be too geometric and again labs presented a closed face to the outside world without befitting form the views. This form however, as option 1, did not provide a good address to the eastern part of the site and the strong north south pedestrian link being created between the Schools of Medicine and Veterinary Sciences.

Option 3, in its varied forms, basically suggested offices (dry research space) wrapping around the labs and facing the views. This had the benefit of protecting the labs from sun penetration whilst providing activated edges to the green spaces around the site, being St Johns Oval and the University oval precincts. The form and arrangement on the site also allowed connectivity from John Hopkins Drive deep into the building, and out the other side strengthening the connection to the hospital and university very literally. The form allowed the creation of a good public space for students to gather in the north east sun adjacent to the ovals and create a usable space and identifiable entry to the eastern part of the site.

The public space created at the entrance to the building captures cooling summer breezes, whilst sheltering from the winter winds.

2.7 Urban Design and Built form

2.7.1_Building Description

The building consists of two major laboratory wings either side of a central 'through-site link' street, connecting the RPAH precinct to the University.

The building consists of seven levels with a roof RL of 59.0. This compares with adjacent building heights as shown on the sections relating to the RPAH RL71.32 and RL59.69, St Johns RL47.2, and Centenary RL51.5m.

The ground plane of RL23.5 picks up ground levels along the lower part of John Hopkins Drive and links these to the Grose Farm Lane pedestrian link within the University, by level access.

The building sections show the general configuration of uses within the CODCD. Generally the education functions (Dry Teaching Labs, seminar, auditors) have been kept on the ground floor along with those aspects of translational research such as CRF and Imaging which require public/patient interface. A cafe is also located at the main entry to the project. Generally these help activate this level.

The other specialist teaching spaces (Computer labs and Wet Teaching Labs) have been located on the 1st floor to maximise the use of stairs and keep the student activity to the lower levels of the building.

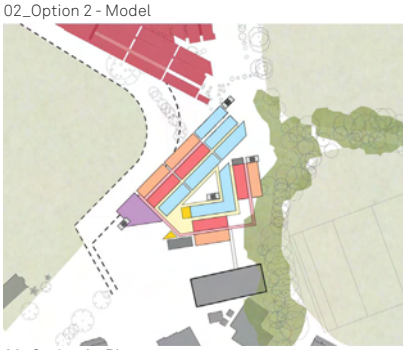
The floors above level 1 consist of a laboratory wing and associated dry research (offices). These are linked by a central collaboration space with its views into the central atrium. The typical lab floors have been designed to maximise visual connectivity between floors, and to maximise natural daylight to both

01_Option 1 - Model

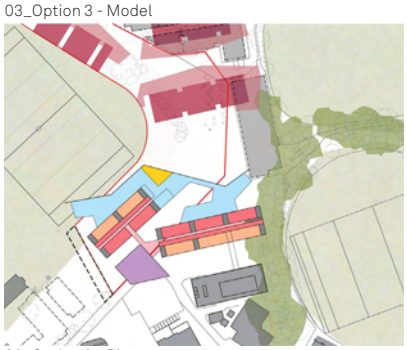
02_Option 2 - Model

03_Option 3 - Model

01_Option 1 - Plan



02_Option 2 - Plan



03_Option 3 - Plan

02____Site Analysis

the wet and dry research spaces. Light wells and stairs connect all the typical floor levels, and these are also acting as part of the building's ESD and Fire Safety agenda. ESD and Fire Engineering aspects of the design are in Section [ ] of this report.

Each of the typical lab areas are also connected by way of a 'lab coat corridor' to the Tertiary lab spaces. The tertiary lab element is used by researchers throughout the building and the University. A double goods lift provides access to all Tertiary lab floors and connects this area to the Basement.

The Basement 1 level provides access for service vehicles from a new southern service access road to be constructed using existing service vehicle access to the University Oval No.1. The basement is also serviced by a further northern access road linking through to Parramatta Road. The basement contains a loading dock, the BSN (animal house), the Bio-Bank (refrigerated storage), substation, chillers and other plant along with a Gas Storage Room.

The north and south access roads to the basement are linked by a service road within the basement. This service road also provides connection to cars and bicycles in the basement 2 level.

The roof level of the building is designed to accommodate 3 linked seminar rooms for specialist research presentations, a staff cafe and administration offices.

Major air plant and up to 200 fume cupboard exhausts occupy the majority of the proposed plant rooms at the roof level. The form of the plant rooms has been designed to integrate with the massing of the vertical risers at other end of the laboratory blocks.
The building has the following areas and populations proposed.

2.7.2_Achieving a high standard of architectural design, materials and detailing appropriate to each building and its location

The CODCD has been designed to be of a standard appropriate to the status of Sydney University, that is a minimum 50 year design life, The quality of the building must be such that is capable of attracting the highest quality researchers from around the world.
Accordingly the innovative design for such a research building, with unique levels of natural day lighting, visual connectivity between floors and visibility from the "through-site link" displaying the research activity within the building will assist in achieving this.

The detailed concept design, is by HASSELL, who have won over 200 major architectural design awards in Australia, reflects an exceptionally high standard of design.
The building's materials have been selected to respond to the adjoining

Typical Floor Plan

02____Site Analysis

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 is to include a fritted patterning, designed to break down the scale of the façade into smaller elements. The fritted pattern reflects the sandstone patterns and tonal changes of the historic St John College.

2.7.3_The Form and massing and external appearance of the proposed built form and how it will improve the quality and amenity of the public domain.

The form of the building is derived from the constraints of the site, the functions within the building and the development of a research precinct to include the existing Centenary Institute, the existing schools of Medicine and Veterinary Science and the RPA Hospital.

CODCD Elements and Area Schedule

Building Elements and Areas	
• Research Areas, including:	25 974 m²
○ wet and dry research labs	
○ research offices	
• Education Areas, including:	4 610 m²
○ teaching labs	
○ group learning	
○ teaching staff offices	
• Ancillary Support Areas, including:	4 526 m²
○ amenities (inc. café)#	
○ administration, stores, supplies and waste areas;	
Total Areas	
Useable floor area	35 110 m²
Gross floor area (excluding parking)	44 814 m²
Building footprint area	5 534 m²
Parking	7 114 m²
Other paved area (hardstand and roads)	10 282 m²
Landscape area	4 273 m²
Heights	
No. of levels above ground	7
No. of levels below ground (basements)	2
Maximum height	RL 61.5
Parking	
Car parking spaces	200
Loading spaces	2 Trucks plus Sally Port
Bicycle parking	125

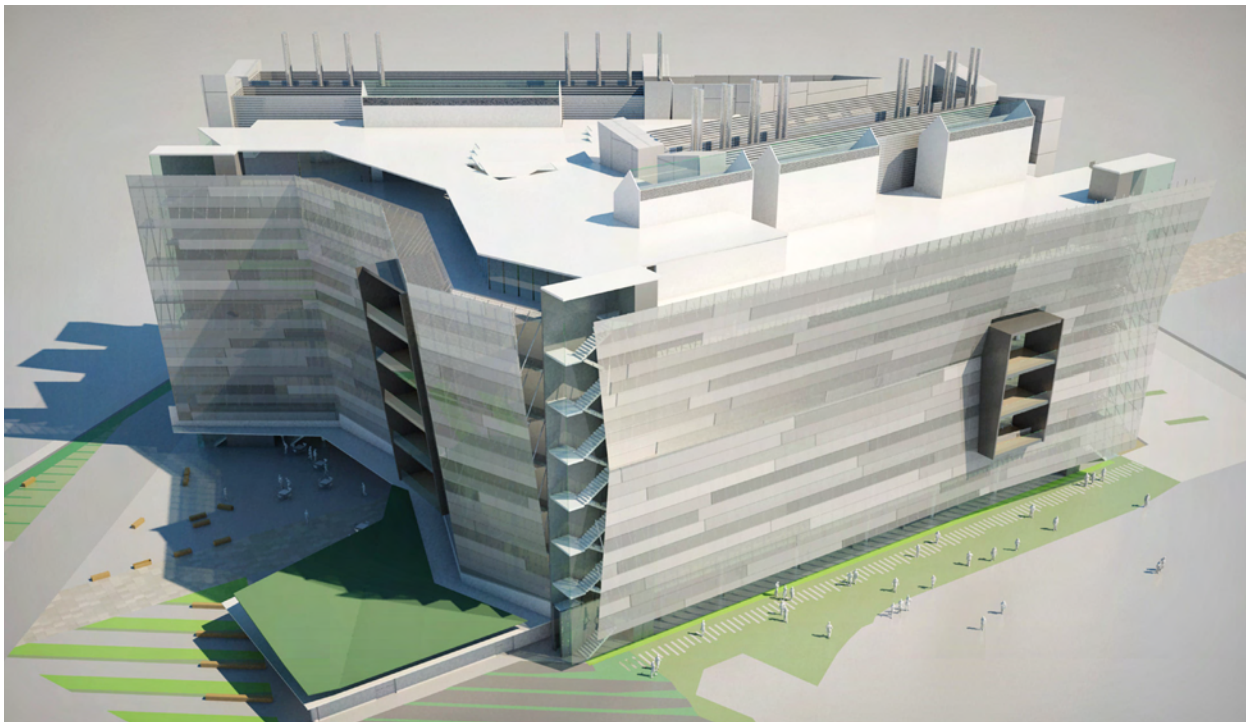
Aerial View of the Project

02____Site Analysis

	Forecast Population per floor	
Basement 2	varies	Carpark
Basement 1	18	BSU, Bio Bank plus sores
Ground	780	Includes 300 person auditorium located outside the building line
Level 1	564	Includes 300 person wet teaching labs and 4X40 computer labs
Level 2	198	Dry and Wet Research Labs
Level 3	219	Dry and Wet Research Labs
Level 4	165	Dry and Wet Research Labs
Level 5	165	Dry and Wet Research Labs
Level 6	165	Dry and Wet Research Labs
Level 7	237	Dry and Wet Research Labs
	2511	**Total possible population**

The building form relates to a number of site, brief and environmental issues that combine to inform the outcome.
The requirement for this building to be a physical link between the hospital sites and the university led to the formation of a continuation of John Hopkins drive into the building from the west, connecting to the ovals and the university beyond. It is envisaged this will entice students and researchers to move through the building promoting opportunities for casual interaction along the way.
This ideal was a formative part of the idea of splitting two of the laboratory stacks across an accessible atrium.

It was also important to form two entrances of different character – one to the west that spoke about links to the RPA, and the hospital sites on that part of the precinct – and one to the east that was about the University's public and student access to and through the building. Each of these was given a different but equal character.
To the west, there is a need to identify the 'Tertiary' or shared



Aerial view of the project from the North East

02____Site Analysis

specialist spaces that would be used not only by the CODCD, but by the RPA and Centenary researchers and students as well. The tertiary laboratory elements are therefore expressed as a tower, sculpted to enhance the entry to CODCD, as well as the Centenary building forecourt.

With the expression of offices or 'dry space' being wrapped around the North and Eastern parts of the building – it was important to express this in the façade. The shape of this form of 'dry space' creates a public space and entry to the building on the North east corner. Further reinforcing the entry and the creation of a new plaza at the junction of Grose Farm Lane and the ovals, is the location of the single storey 300 seat auditorium. The Auditorium further reinforces this space as an important part of the new master plan for this area – connecting as it does to the new north south walkway between Vet Science and Blackburn.

The façade has been developed as a 'ribbon' that 'binds' the composition together. This façade also serves an environmental role – acting as a screen to the office space behind, reducing radiant heat and glare.
In contrast to the translucency of the North and East facades, the ends of the lab spaces and the tertiary building have been developed as more solid vertical objects; precast panels cover these elements and help identify them as markers to the labs – or as a marker to the entry along John Hopkins Drive.

The south facade of the building faces the Centenary Institute. This has been designed to be more transparent. Due to its orientation it needs only vertical shading – the intention being to increase visual connectivity between the two buildings as they will be working closely together. At ground level between the two buildings – a new landscape plaza is designed to enhance researchers movements between the buildings as well as providing a further pedestrian connection between the hospital side and university side of the precinct.

The building has been designed as a bridge between the University Campus and the Hospital, as well as reinforcing movements and connectivity between Vet Science and Medicine. To achieve this, the atrium is seen as an internal street, that allows free passage – thus the buildings sits on this new through site link, accommodating this pedestrian movement. The design promotes casual meetings and interactions taking place and the ability to see into the labs and office spaces as you pass through. The new amenity and meeting space of the plaza reinforces the collaboration and knowledge sharing which underpins this project.

The Centenary Institute, which will also be occupying some floors of the CODCD are to be linked by way of two aerial bridges at their Levels 5 and 3, as well as a link to the basement level. Such collocation, however, has resulted in the loss of views. A landscape courtyard is proposed between the Centenary Institute and the CODCD to provide a local view to those central rooms with view loss

View of the internal atrium and through site link