4.0 ENVIRONMENTAL ASSESSMENT

4.1 INTRODUCTION

The following section addresses the key assessment requirements identified by the Director General as follows:

- Relevant EPIs and Guidelines
- Key Issues including:
  - Built Form and Urban Design
  - Environmental Amenity and Public Domain
  - Ecologically Sustainable Design
  - Transport and Accessibility
  - Soil and Water
  - Noise and Vibration
  - Hazards
  - Waste
  - Services
  - Heritage
  - Flora and Fauna
  - Staging
  - Development Contributions and/or Planning Agreements
  - Consultation.

The Draft Statement of Commitments pertaining to the assessment requirements identified above is set out in Part 5 of this report.

4.2 RELEVANT ENVIRONMENTAL PLANNING INSTRUMENTS AND GUIDELINES

4.2.1 Environmental Planning and Assessment Act (EP&A Act) 1979

Part 3A of the Act came into force on 1 August 2005. It established assessment procedures for various forms of 'major development' of state or regional significance.

Part 3A applies to the carrying out of development that is declared to be a project to be assessed under Part 3A of the EP&A Act 1979 by either:

- State Environmental Planning Policy (Major Development) 2005 (Major Development SEPP) or;
- An order by the Minister for Planning published in the NSW Government Gazette.

The Minister for Planning's approval is required for these projects and assessment is undertaken by the Department of Planning. The Project Application approval process provides for the Minister to undertake a coordinated, whole of government assessment of the merits of a project of significance to the state, and to recommend approval of the detailed aspects of the project.

4.2.2 State Environmental Planning Policy (Major Development) 2005

SEPP (Major Development) 2005 came into force on 25 May 2005 and was most recently amended on 31 July 2009. The SEPP defines development that is state significant development and is determined by the Minister for Planning.

Under Clause 6 of the State Environmental Planning Policy (Major Development) 2005, 'Identification of Part 3A projects', such significance can be established if:

(1) Development that, in the opinion of the Minister, is development of a kind:

(a) that is described in Schedule 1 or 2.

Within Schedule 1 of the SEPP (Major Development) 2005, Group 7 Clause 18 'Health and public service facilities, Hospitals', the definition is as follows:

(1) Development that has a capital investment value of more than $15 million for the purpose of providing professional health care services to people admitted as in-patients (whether or not out-patients are also cared for or treated there)."

Lifehouse conforms to the Group 7 Clause 18 class of development given capital investment value of the project is $230,350,000 (see Appendix J).

In March 2010 NSW Health requested that the Minister declare that Lifehouse is a 'Major Project' pursuant to Clause 6 of the SEPP. Concurrently a Preliminary Environmental Assessment was submitted to obtain the Director General's Requirements (DGRs).

Lifehouse was declared a 'Major Project' on 8 April 2010 under the EP&A Act, pursuant to Regulation 6 of the SEPP because it falls within Schedule 1, Group 7 Health and public service facilities, Clause 18 Hospitals. Also on this date, the DoP confirmed that Lifehouse was a 'Major Project' and provided the DGRs by which the project would be assessed.

This Project Application has been prepared in accordance with the matters outlined in the DGRs.

4.2.3 State Environmental Planning Policy No. 55 – Remediation of Land

SEPP No. 55 – Remediation of Land states that land must not be rezoned or developed unless contamination has been considered and, where relevant, land has been appropriately remediated.

The Site Auditor considers that the site will be suitable for the proposed hospital use when all fill material has been excavated and removed from the site. Upon completion of this work, the Site Auditor plans to issue a Site Audit Statement.

4.2.4 State Environmental Planning Policy No.33 – Hazardous and Offensive Development

SEPP No. 33 – Hazardous and Offensive Development came into force on 11 March, 1992 and provides clear definitions of hazardous and offensive industries where used in environmental planning instruments. It aims to facilitate development defined as hazardous and/or offensive, or potentially so, as defined in the SEPP by ensuring sufficient information is made available to the consent authority to assess whether development is hazardous or offensive, and in doing so impose conditions accordingly, taking into account measures proposed by the proponent to reduce or minimise any adverse impact to human health, life, property or to the biophysical environment.

The environmental assessment of The Chris O'Brien Lifehouse at RPA, as outlined in Part 4.3.8 of this report, has found that the development is considered not to be potentially hazardous or potentially offensive. Therefore, SEPP 33 – Hazardous and Offensive Development does not apply to this project.

4.2.5 State Environmental Planning Policy (Infrastructure) 2007

SEPP (Infrastructure) 2007 came into force on 21 December 2007 and aims to facilitate the effective delivery of infrastructure across the state. It includes the provision of infrastructure such as airports, schools, hospitals, roads and railways, sewer, stormwater, water, electricity and gas services, telecommunications, waste management, forestry, emergency services, group homes, parks, ports, waterways, research stations, travelling stock reserves, public buildings and correctional centres.

SEPP Infrastructure does not apply to Lifehouse as approval is sought under Part 3A of the EP& Act 1979 and the Major Development SEPP.

The demolition of the buildings previously on the site of Lifehouse included the Page Chest Pavilion and Brown Street Outpatients building. The work was carried out under a separate approval under SEPP (Infrastructure) to facilitate the construction of Lifehouse.

4.2.6 NSW State Plan and Sydney Local Action Plan

In March 2010, the NSW Government released the NSW State Plan, which is the fundamental policy document driving performance across the NSW public sector in seven key areas – transport, economy, education, health, environmental sustainability and climate change, community and public safety.

The NSW Governments' key priorities and targets for the delivery of health services include improving and maintaining access to healthcare, improving survival rates for people will potentially fatal or chronic illness, promoting healthy lifestyles, reducing preventable hospital admissions and improving outcomes in mental health. The NSW State Plan also indicates $2.4 billion investment over next four years in new medical equipment and technology and health facilities, some of which will be allocated to the RPA hospital.

The Lifehouse development addresses the NSW Governments' key priorities to improve and maintain access to healthcare and improve survival rates for people with potentially fatal or chronic illness. This is recognised in the Sydney Local Action Plan which outlines the key priorities for the Sydney region within the framework of the NSW State Plan.

The Sydney Local Action Plan specifically identifies the Lifehouse development as a key component of the government's commitment to delivering improved access to health in the Sydney.

4.2.7 Sydney Metropolitan Strategy

In December 2005, the NSW Government released its Metropolitan Strategy for Sydney to 2031, entitled 'City of Cities: A Plan for Sydney's Future'. The Metropolitan Strategy is a broad framework to secure Sydney's position in the global economy by promoting and managing growth. Its primary aims are to enhance liveability, strengthen economic competitiveness, ensure fairness, protect the environment and improve governance. Seven key strategies have been developed addressing economy and employment, centres and corridors, housing, transport, environment and resources, parks and public places and governance and implementation.

The NSW Government is currently undertaking a scheduled five-year review of the Metropolitan Strategy. It has released a discussion paper entitled Sydney Towards 2036.

The development of Lifehouse is consistent with the Sydney Metropolitan Strategy as it will help to position Sydney's global competitiveness by providing world-class facilities in the cancer care, treatment and research.

4.2.8 Draft Sydney City Subregional Strategy

The Metropolitan Strategy's 'City of Cities' broad framework has been translated to the local level with the preparation of ten draft subregional strategies including Sydney City, East, South, Inner West, Inner North, North, West Central, North West and South West subregions.

The subregional strategy for Sydney City considers the planning of the subregion in five major precincts: Sydney Central Business District (CBD), Pyrmont-Ultimo, Sydney Education and Health (SEHP), City East and Redfern Centre. The Lifehouse site is located in the SEHP, which is identified as a major area for education, medical and other research and technology based jobs and includes a cluster of health services and medical and biotechnology research at and affiliated with Royal Prince Alfred Hospital and the University of Sydney. It is being promoted as offering world class education and health facilities and opportunities for renewal.

Lifehouse is consistent with the subregional strategy, as it will contribute to positioning the Sydney Education and Health Precinct as world class.

4.2.9 South Sydney Local Environmental Plan (LEP) 1998

Under the South Sydney LEP 1998, Lifehouse occupies an area zoned 5 – Special Uses (Hospital). The objectives of land zoned Special Uses include facilitating development to provide 'community facilities, services…'. The proposed development is permissible with consent under the current LEP.

The site is also subject to heritage conservation provisions. The Royal Prince Alfred Hospital Group of buildings is heritage listed, which includes King George V Memorial Hospital for Mothers and Babies, Administration Block, Gloucester House, Queen Victoria and Albert Pavilions, and the Resident Medical Officers' Quarters (formerly Nurses House).

4.2.10 City of Sydney Development Control Plans

Under the South Sydney LEP 1998, the following Development Control Plans (DCP) are applicable and have been considered in this Environmental Assessment:

- South Sydney Development Control Plan 1997: Urban Design;
- City of Sydney Access DCP 2004; and
- South Sydney DCP No. 11 Transport Guidelines for Development 1996.

Lifehouse is generally consistent with the objectives of these DCPs.

4.2.11 City of Sydney City Plan

The City of Sydney is currently preparing a new City Plan which will consolidate statutory planning controls within the LGA including land formerly within Leichhardt and South Sydney Council areas. The City Plan will include one consolidated LEP and one consolidated DCP.

Under the new City Plan, the site is likely to retain its special use zoning under the SP2 Infrastructure zone in the Standard Instrument – Principal Local Environmental Plan. The objectives for SP2 Infrastructure includes:

- To provide for infrastructure and related uses
- To prevent development that is not compatible with or that may detract from the provision of infrastructure.

The future zoning of the surrounding uses is also likely to be retained under the relevant zones in the Standard Instrument.

In 2007, the City of Sydney engaged the Government Architects' Office (GAO) to prepare an urban design study of the suburbs of Chippendale, Camperdown, Darlington, West Redfern and North Newtown. The western precinct of RPA was specifically identified as a 'significant site', for which a future character vision and key urban improvements are proposed. Recommendations for key LEP controls include zoning, height, FSR and heritage.

4.2.12 City of Sydney Cycle Strategy and Action Plan 2007-2017

In 2007, the City of Sydney prepared a strategy which aims to make cycling an equal transport choice for residents, workers and visitors by 2017. The strategy aims at creating and maintaining a safe and bicycle friendly environment, improving cycling safety, promoting the benefits of cycling and increase the number of trips made by bicycles in the LGA.

The City of Sydney, as part of its commitment to its 'Sustainable Sydney 2030' vision, has planned for a new cycleway that will run from King Street, down Missenden Road, crossing Parramatta Road to Lyons Road, where it will continue to Pyrmont Bridge Road. Works are to be completed by December 2010.

Lifehouse development is consistent with this strategy and action plan.

4.2.13 'A New Direction for Sydney South West' Health Service Strategic Plan Towards 2010', SSWAHS

SSWAHS has incorporated NSW Health's vision Healthy People – Now and in the Future into its own strategic plan – A New Direction for Sydney South West Health Service Strategic Plan towards 2010.

The vision is underpinned by four goals and seven strategic directions. The four goals are:

- To keep people healthy;
- To deliver high quality health services;
- To provide the health care people need; and
- To manage health services well.

The seven strategic directions are:

- Make prevention everybody's business;
- Create better experiences for people using the health system;
- Strengthen primary health and continuing care in the community;
- Build regional and other partnerships for health;
- Make smart choices about the costs and benefits of health services and health support services;
- Build a sustainable health workforce; and
- Be ready for new risks and opportunities.

Lifehouse development recognises these goals in light of its proposed contribution to the SSWAHS.

4.2.14 Airports Act 1996 and the Airports (Protection of Airspace) Regulations 1996

Part 12 of the Airports Act 1996 and the Airports (Protection of Airspace) Regulations 1996 provide for the protection of airspace at federally-leased airports. Under Section 182 of the Act, a controlled activity is an activity resulting in an intrusion of the airport's protected airspace that is, penetration of either the Obstacle Limitation Surface (OLS) or the Procedures for Air Navigation Systems - Operations (PANS-OPS) surface on either a permanent or temporary basis.

The Sydney Airport Master Plan 2009 was approved by the Australian Government on 19 June 2009 to guide the future development and operation of Sydney Airport and includes the current and future OLS associated with Sydney Airport.

Lifehouse constitutes a controlled activity under the Airports Act 1996, as it penetrates the OLS for Sydney Airport.

Consultation with Sydney Airport Corporation Limited (SACL) has been undertaken to ensure Lifehouse complies with the height requirements set by the Civil Aviation Safety Authority (CASA) and that potential impacts on airspace, radar and aircraft be minimised.

4.3 KEY ISSUES

4.3.1 Introduction

The full description of Lifehouse is contained in Part 3 of this report.

The following section focuses on the assessment requirements set out in the DGRs. The key headings addressed in this section are as follows:

- Built Form and Urban Design
- Environmental Amenity and Public Domain
- Ecologically Sustainable Design
- Transport and Accessibility
- Soil and Water
- Noise and Vibration
- Hazards
- Waste
- Services
- Heritage
- Flora and Fauna
- Staging
- Development Contributions and/or Planning Agreements
- Consultation

4.3.2 Built Form and Urban Design

The DGRs state that the following must be addressed:

- *Consideration of the height, bulk and scale of the proposed development within the context of the locality (detailed envelope/height, FSR and contextual studies should be undertaken to ensure the proposal integrates with the local environment, and that the form, layout and siting of the buildings achieve optimal design and amenity outcomes; and*
- *A detailed description of the design quality with specific consideration of the façade, massing, setbacks, building articulation, use of appropriate colours, materials/ finishes, landscaping (including street trees), safety by design and public domain (including an assessment against the Crime Prevention Through Environmental Design Principles)*

Height, Bulk and Scale of the Development

Lifehouse has a block edge building envelope which is built to the extremities of the site and is penetrated by a central atrium. The envelope sits on a ground storey 'plinth' and is articulated into a three main volumes or quadrants, with the upper two storeys set back from Missenden Road. While the building envelope of Lifehouse is distinct from the surrounding building envelopes of similar height, which feature multiple setbacks and less site cover, it is considered that the scale, orientation and frontage of Lifehouse fits within the local built form context.

The height of Lifehouse is ten storeys with the upper two storeys set back. Lifehouse will take the place of the previous Page Chest Pavilion and General Outpatients' Buildings within the streetscape. The existing buildings surrounding the Lifehouse vary in height considerably and include:

- West of Missenden Road:
  - Seven storey King George V Administration building, on the northern side of Salisbury Road;
  - Two storey Heart Research Institute building, on the southern side of Brown Street;
  - Two storey Radiation Oncology building located at the rear of the site on the corner of Susan Street and Salisbury Road;
  - Two storey Engineering Services building at the rear of the site on Susan Street; and
  - Six storey residential flat building on the southern side of Carillon Avenue (outside RPA).
- East of Missenden Road:
  - Three storey Administration building, flanked by the Victoria and Albert Pavilions which are of the same height;
  - Three storey St. Andrews College; and
  - Five storey RPA Medical centre on the southern side of Carillon Avenue (outside RPA).

Lifehouse will be approximately 2 storeys taller than the previous Page Chest Pavilion and 1 storey taller than the King George V Administration building (refer to Figures 25 and 26). By setting back the upper two storeys, Lifehouse will reinforce the 7-8 storey 'street wall' along the western side of Missenden Road that in past was established by the now demolished Page Chest Pavilion. The perceived impact of height on Susan Street is reduced by simplifying the western façade into paired floors. Visual impacts are further demonstrated in the View Analysis in Section 4.3.3 of this report.

The proposed height of Lifehouse penetrates the OLS for Sydney Airport as shown in the Sydney Airport Master Plan. Consultation with SACL has taken place to ensure compliance with the relevant legislation outlined in Section 4.2.14.

Local Built Form Context

The existing surrounding built form is characterised by a diverse range of buildings, varying in height, function and age. This has been described in detail in Sections 2.4 and 2.11 of this report.

Lifehouse fits into the existing development pattern of the western precinct as well as the streetscape pattern on Missenden Road. It maintains some of the key design principles and relationships to the surrounding streets and buildings that were established by the previous Page Chest Pavilion and Brown Street General Outpatients building, including:

- Continues the vision of providing specialised hospital services in the western precinct;
- Similar height and scale to the King George V and Queen Mary buildings, which also responds to the E block in the eastern precinct;
- Building form defines the street, which is a distinctive characteristic of the building arrangement in the western precinct;
- Frontage to Missenden Road and architectural contribution to the existing streetscape character;

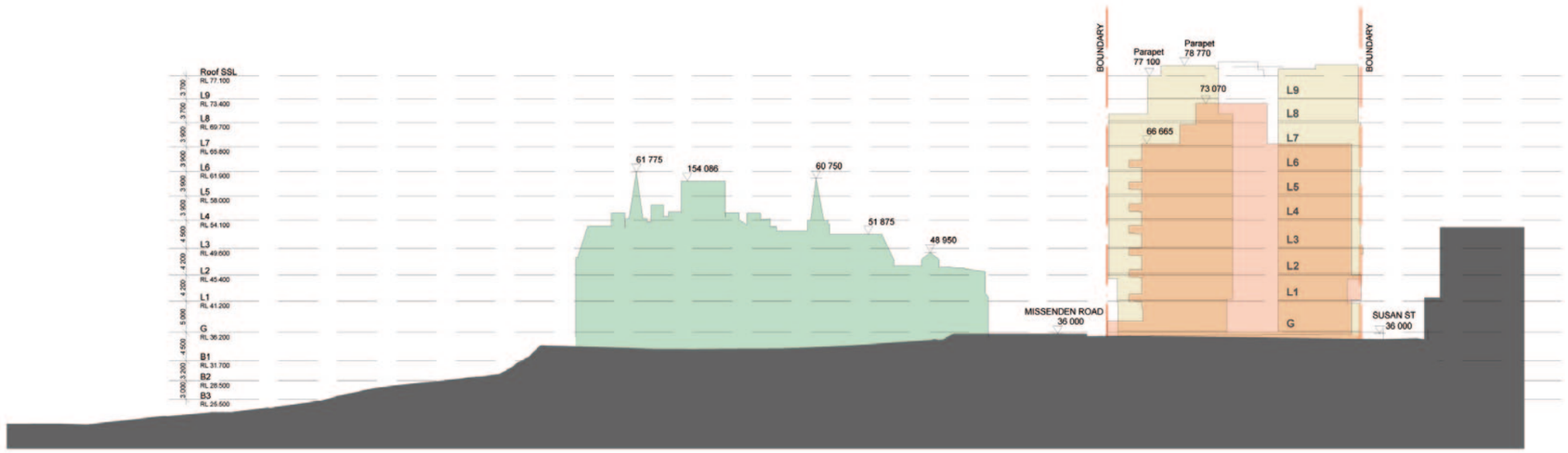


FIGURE 25: Cross through Lifehouse and St Andrews College *Source: Rice Daubney*

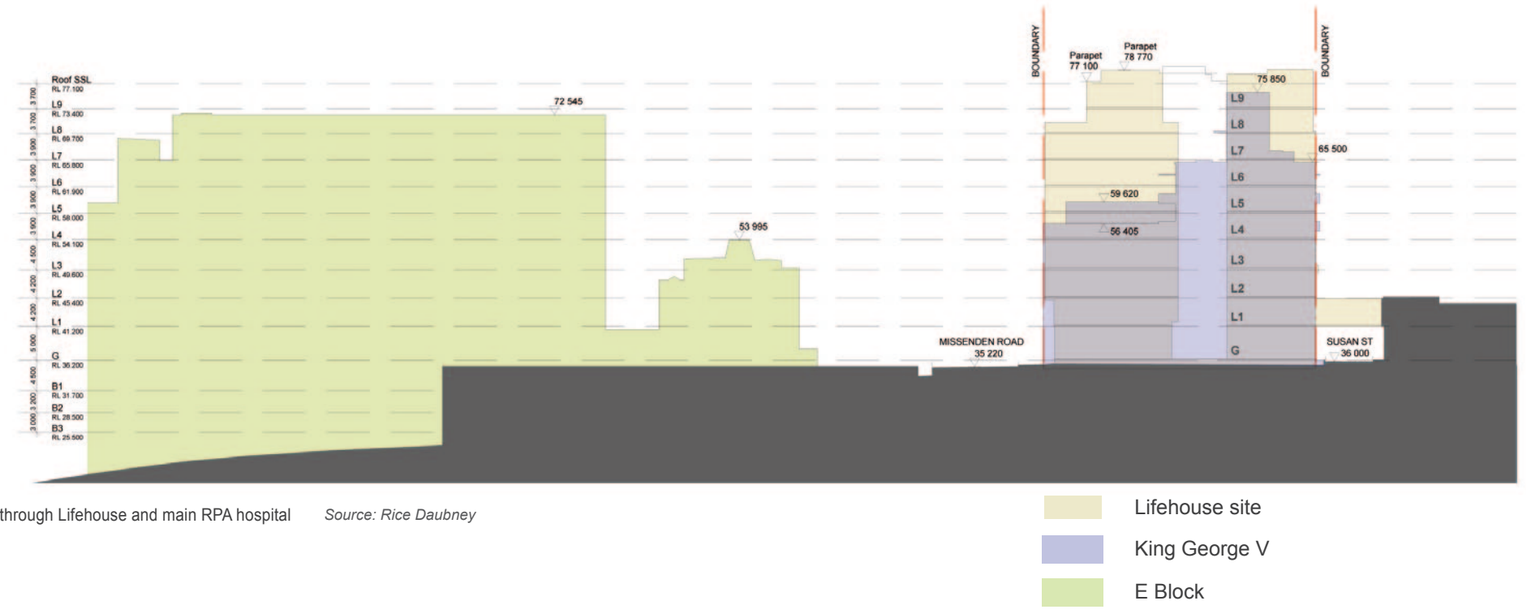


FIGURE 26: Cross through Lifehouse and main RPA hospital *Source: Rice Daubney*

- Zero setback to Missenden Road continues to define vistas along Missenden Road; and
- Views over University Sydney to CBD to the north east and district views to the west are maintained.

Lifehouse represents a new phase of development in the evolution of the RPA campus. Lifehouse will need to be reflected in the future built form context to be established by the new LEP controls currently being prepared by the City of Sydney.

Form, Layout and Siting

The form, siting and orientation of Lifehouse have been directly informed by the constraints of the site boundary, with a north-south axis and long frontage to Missenden Road. In addition to maintaining the urban design elements of the local built form context, optimal urban design and amenity outcomes are achieved in the following ways:

- Provision of ground floor retail along the main frontage will also serve to activate the street and provide passive surveillance;
- Central atrium permits daylight into the building;
- Articulation of building mass into south, north and western quadrants, highlighted by the use of different cladding systems for each, reducing the appearance of scale of the development; and
- Setback of upper two storeys reflects the prevailing height of the adjacent King George V building.

Design Quality

The following provides a concise description of the architectural design quality of Lifehouse. A detail description is provided in Appendix C.

Façade

Lifehouse uses a variety of façade systems to articulate the building mass in a manner that reduces the visual impact of bulk and scale as well as respond to the different aspects of each elevation:

- The eastern face takes advantage of daylight into each floor plate, whilst using sunshades to control heat gain;
- The western façade utilises insulated concrete panels as a heat sink;
- The north façade uses a mix of both east and west facades to take advantage of day light penetration into the floor plate but offering shading and thermal mass by using precast concrete panels as sun shading and cladding; and
- The south façade is predominantly glazed with some solid elements reflecting the use/function of interior spaces, and vertical blades that shield the south western sun and re-direct interior views towards St. Andrew's College.

Materials and Colours

Materials selected for the external facades are primarily natural products providing a practical low maintenance finish for the building. The colour palette is a warm grey. Grey tinted glass, anodised aluminium screens, grey metal cladding form the dominant materiality, as shown in Figure 29.

The conscious selection of contemporary materials has been used to avoid competing with the solid masonry and concrete facades of the surrounding heritage buildings.

Further details are provided in Appendix C.

Setbacks, Articulation and Massing

The majority of Lifehouse will be built to the boundary, apart from:

- The ground floor along Salisbury Road, which will be set back approximately 4.5m from the north-eastern corner of the boundary to provide breakout space at the drop off area;
- The upper two floors, which will be set back 6m from the Missenden Road boundary; and
- The eastern façade, which will project 400mm over the boundary.

The building mass will be articulated through the use of differentiated façade systems, as mentioned in previous sections.

FIGURE 27: Lifehouse eastern facade

Source: Rice Daubney

FIGURE 28: Proposed facade systems

Source: Rice Daubney

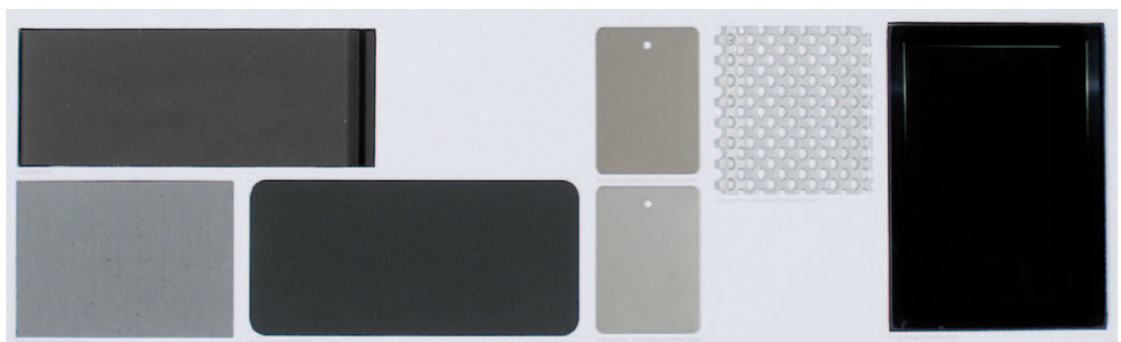


FIGURE 29: Proposed facade materials

Source: Rice Daubney

FIGURE 30: Wall climbers on Eastern elevation

Source: Turf Design

FIGURE 31: Ground floor landscape plan

Source: Turf Design

Landscape Design

Streetscape Elements

Missenden Road

Missenden Road is currently subject to an upgrade program proposed by the City of Sydney Council, which will involve traffic calming, footpath improvements, pavement widening, tree plantings, improved lighting. A cycle lane is proposed on the eastern side of the Missenden Road, opposite the Lifehouse. The levels and kerb alignment of the public domain upgrading for Lifehouse will involve limited modification and streetscape materials will be in accordance with the City of Sydney's proposal. Details on the Missenden Road upgrade program are in Section 4.3.3 of this report.

The southern extent of the Missenden Road frontage will feature a soft setback featuring a combination of groundcovers and climbers, shown in Figure 30. A setdown in the basement level will provide sufficient soil volume for plant growth. Minor retaining walls will be located immediately within the property boundary to maintain consistent footpath crossfalls.

At the northern Missenden Road frontage, public footpath paving extends to the building, providing seamless access into the building.

Salisbury Road

The building frontage to Salisbury Road will match the treatments for Missenden Road, continuing into Susan Street, up to and including the entry to the Radiation Oncology building. The vehicle setdown area will be defined by bollards with paving to match City of Sydney paving.

Susan Street and Brown Street

Concrete paving and kerbs on Susan and Brown Streets will be maintained on the western and southern sides respectively.

Landscape Elements

Courtyards

Lifehouse will feature a family of sunken landscaped courtyards comprising an outer landscape wall, large garden areas featuring species such as native Livistonia Palms, Cyathea tree ferns and viola/ fern understory and some with shallow water pools. Light coloured paving will assist in reflecting light from each courtyard floor. Simple, robust and strongly horizontal seating benches will be located as required.

Main Entry Element

In keeping with the courtyard 'family' the main entry will be flanked by a small garden featuring a corten steel trough containing water, ferns and herbaceous planted in a white pebble surround.

Roof Garden

Level 8 includes a central terrace featuring a small central garden platform with seating positioned as appropriate for small family groups. The terrace is flanked by non-accessible green roofs made of native grasses and lawn offering an outlook for adjacent rooms on Levels 8 and 9. Adequate provisions will be made for access and maintenance. Garden containers of flowers and herbs on private balconies of selected Level 8 and 9 patient rooms provide an immediate connection with nature.

FIGURE 32: (Top) Northern courtyard and Main Entry element, (bottom) Eastern Courtyard and (right) Southern Courtyard *Source: Turf Design*

Crime Prevention through Environmental Design (CPTED) Assessment

Lifehouse is to create and maintain a welcoming environment for all patients, staff and visitors within the facility whilst ensuring the safety and security of its people and assets.

The planning and layout of the site and building will contribute significantly in providing a physically secure facility and surrounding area. Factors such as site perimeter protection, lighting, entry and exit points, pedestrian traffic patterns and flows, locking hardware, and the location of staff stations, reception points, visitor services and loading docks will all assist to provide layers of security for the building perimeter.

Lifehouse incorporates the four key principles of CPTED as described in Table 5:

Surveillance	A combination of natural, formal and mechanical surveillance measures will be incorporated in Lifehouse. • Natural surveillance is achieved through: – Concentrating public circulation zones around the central atrium allow sightlines to differing activities on each level; – Open floorplates from Ground to Level 2, with link bridges connecting east and west floorplates and waiting areas and meeting spaces spanning this void allowing for a level of transparency; – Ensuring courtyard spaces can be viewed from adjacent rooms, the breakout space at the lower ground floor and from the street; and – Visual access to landscaped zones on the upper levels is provided by a number of patient rooms. • A Closed Circuit Television (CCTV) system will be monitored from the Security Control Room on Ground Floor and provide surveillance of access corridors, entry points, main reception areas, waiting rooms, lift lobbies, car park and the loading dock area. • Security lighting will be provided to exterior building entry points, loading dock areas, emergency exit points and other nominated high-risk areas. • Security staff will be employed to provide human surveillance.
Access Control	• Natural access control will be achieved through the separated circulation system. • Controlled access to restricted medical, administration and services areas, as well as security sensitive areas such as pharmacies, research areas and plasma banks will be achieved through the use of card readers and electronic key pads. • The basement car park access will be controlled by swipe cards, boom gates and after hours security grilles. • Loading docks will have security screens and will be monitored by CCTV linked to the security office. • Intrusion detection system and alarms will be used to alert security staff of unauthorised intrusions.
Territorial reinforcement	The perimeter of the site is defined by the building on the east, west and southern sides. On the northern side, bollards define the public/private interface on Salisbury Road.
Space Management	Lifehouse will be well used and effectively maintained.

TABLE 05: CPTED principles employed in Lifehouse

4.3.3 Environmental Amenity and Public Domain

The DGRs state that the following must be addressed:

- *Consideration of the impacts of the project on solar access, acoustic privacy, visual privacy, views and wind impacts;*
- *Details of the measures to be implemented to achieve a high level of environmental amenity; and*
- *A public domain review that includes the existing footway, street trees, kerb/gutter, lighting, stormwater and other services, taking into consideration the proposed entry and exit points for pedestrians and vehicles.*

Solar Access and Overshadowing

A series of shadow diagrams have been prepared to indicate the overshadowing impacts on neighbouring properties from Lifehouse during summer, winter and equinox at 9am, 12 midday and 3pm.

The shadow impacts resulting from the previous Page Chest Pavilion and Brown Street General Outpatients building are demonstrated to provide a benchmark in addition to the shadow impacts for Lifehouse.

As shown in Figures 33 to 38:

- There will be minor shadow impacts on St Andrews College during the equinox afternoon period (Figure 34).
- The northern facing units of the apartment buildings between Brown Street and Susan Street on the southern side of Carillon Avenue will experience a short period of overshadowing during the winter morning period (Figure 36); and
- Minor overshadowing will occur on the apartment building at the south-western corner of Carillon Avenue and Missenden Road in the winter afternoon period (Figure 36).

Visual and Acoustic Privacy

The buildings adjacent to Lifehouse do not present any visual or acoustic privacy issues as they accommodate functions including administration, research, health services and engineering which do not incorporate habitable rooms.

All shadow diagrams sourced from Rice Daubney

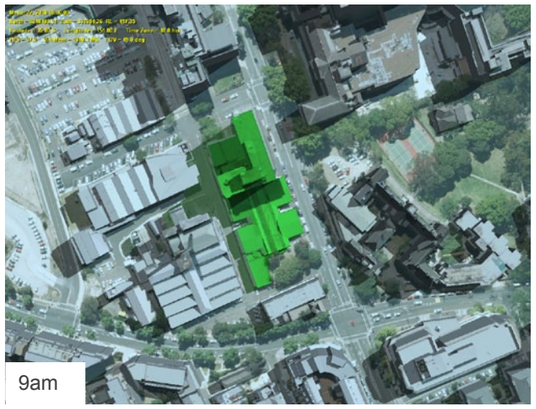


FIGURE 33: Existing Equinox - 9am, 12pm and 3pm

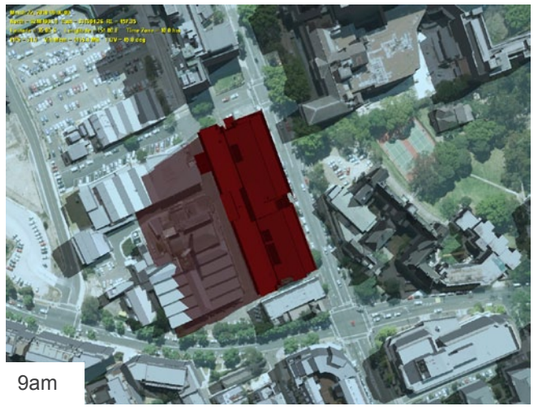


FIGURE 34: Proposed Equinox - 9am, 12pm and 3pm

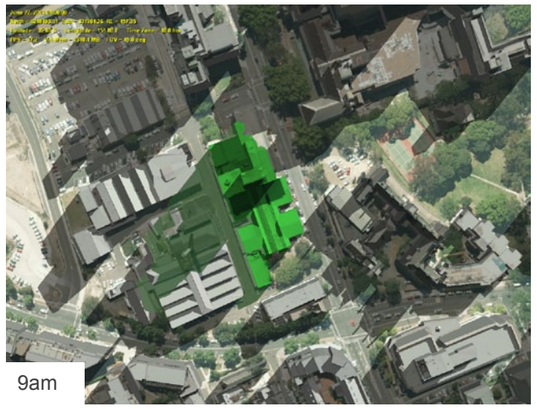


FIGURE 35: Existing Winter - 9am, 12pm and 3pm

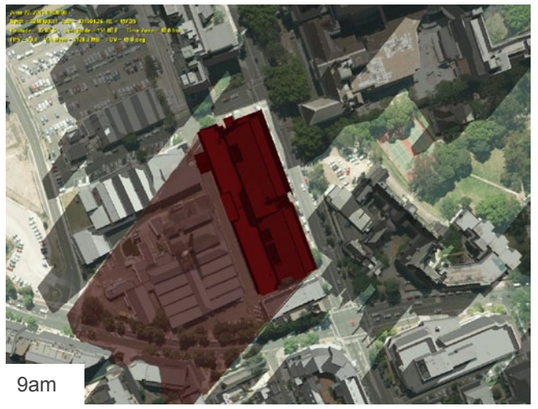
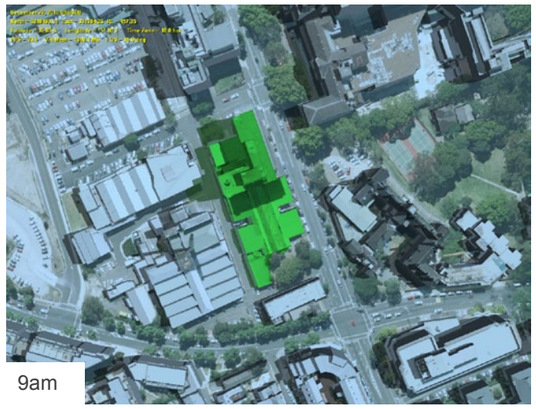
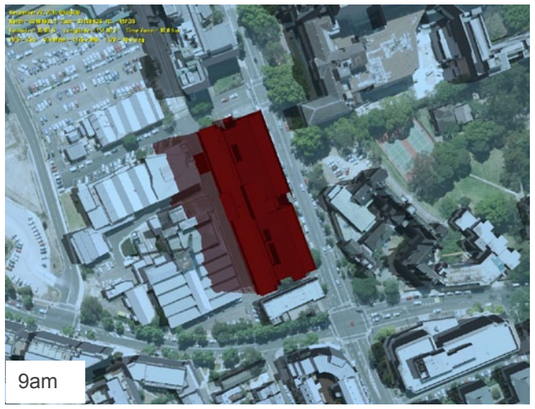
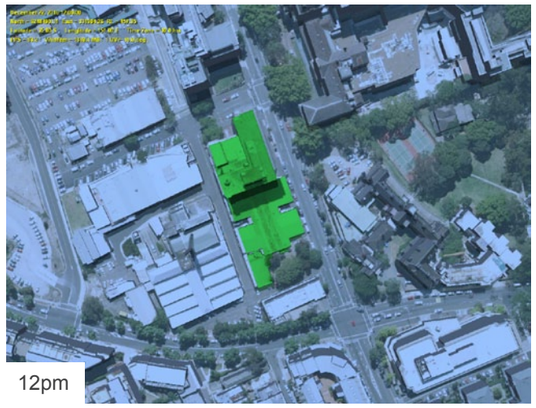


FIGURE 36: Proposed Winter - 9am, 12pm and 3pm

All shadow diagrams sourced from Rice Daubney







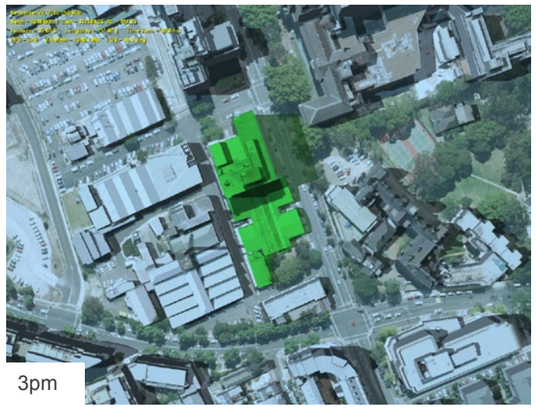


FIGURE 37: Existing Summer - 9am, 12pm and 3pm

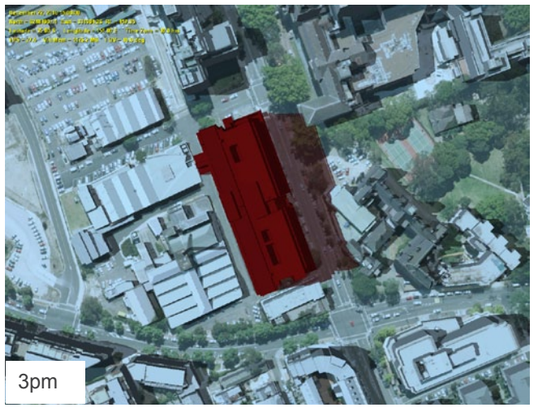


FIGURE 38: Proposed Summer - 9am, 12pm and 3pm

Views Analysis

Figures 27 to 30 demonstrate the potential visual impact of Lifehouse from the following key areas.

Carillon Avenue

Looking east, visual impact of Lifehouse is screened to some extent by the mature street trees. The presence of Lifehouse will impact on the landmark nature of the Boiler House smoke stack. Refer to Figure 39.

Missenden Road

Looking south, the Lifehouse continues the street wall established by the King George V. The vertical emphasis on the narrow façade makes reference to comparable devices on the King George V building. Refer to Figure 40.

Looking north, Lifehouse presents as a landmark building, signifying the southern gateway into the RPA campus. The building height appears responsive to the apartment building in the foreground and the King George V building in the background and reinforces the western street edge. Refer to Figure 41.

Susan Street

The presentation of the western face of Lifehouse on Susan Street is balanced against the building edge of the King George V building. The hard edge reinforces the industrial laneway character of Susan Street. Refer to Figure 42.

Surrounding properties

Lifehouse will impact on the skyline when viewed from the upper levels of the apartment buildings along Carillon Avenue.

Views from Lifehouse

The upper levels of Lifehouse will enjoy significant views over the existing RPA campus and the University of Sydney to the city skyline to the east. To the north the existing King George V building will be the dominant element, as will be the landmark smoke stack of the Boiler House to the west.

The western views from the upper levels will extend across the inner west of Sydney out towards the mountain zones in the distance. These views, whilst to the west, will be shaded and easily visible from the upper in-patient levels of Lifehouse. To the south the views will be across Newtown.

FIGURE 39: Carillon Avenue looking east (existing and proposed) *Source: Rice Daubney*

FIGURE 40: Missenden Road looking south (existing and proposed) *Source: Rice Daubney*

FIGURE 41: Missenden Road looking north (existing and proposed)

Source: Rice Daubney

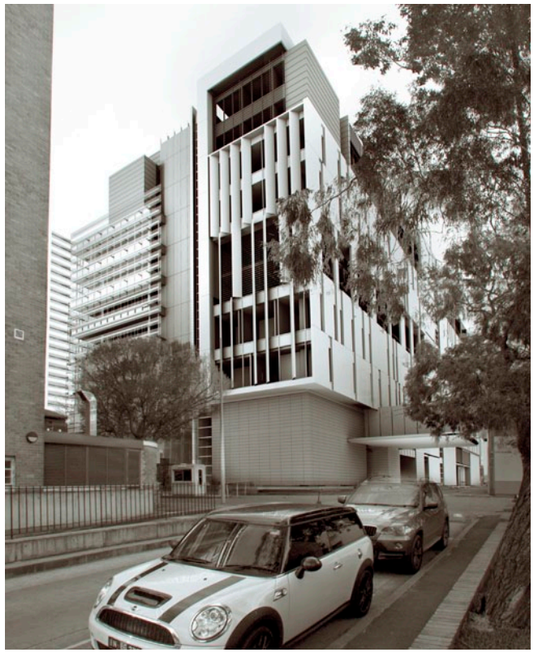
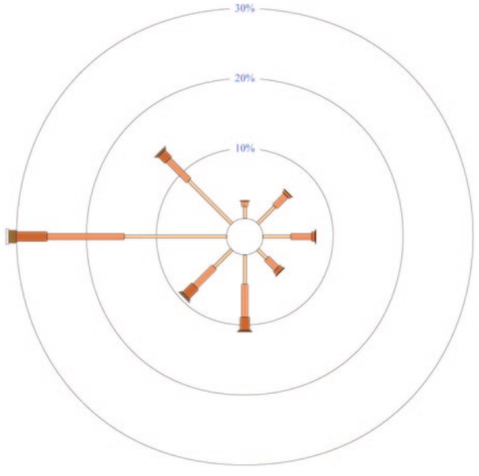


FIGURE 42: Susan Street looking south (existing and proposed)

Source: Rice Daubney

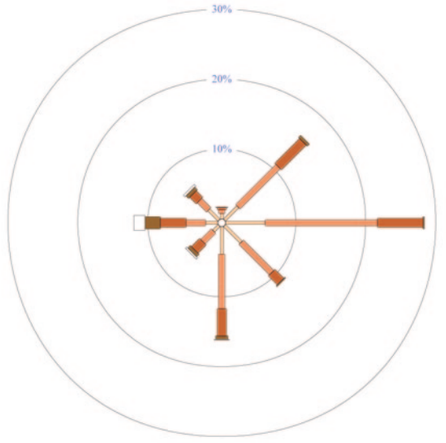


9am annual wind rose for Sydney Observatory Hill

Wind Impact

The morning winds are influenced by the katabatic flow from the Blue Mountains across the Sydney Basin. The most significant morning winds affecting the site year round are westerly, while the afternoon winds are easterly, north easterly or southerly. Annual wind roses for Observatory Hill are presented in Figure 43.

Wind impacts have been assessed in relation to helicopter operations at the RPA helicopter landing site on the eastern side of the campus and is provided in Appendix C. The qualitative assessment concluded that Lifehouse will not generate significant turbulence and that lee side disturbances are unlikely to affect the present landing site or at least not to a greater extent than was the case prior to the demolition of the Page Chest Pavilion.



3pm annual wind rose for Sydney Observatory Hill

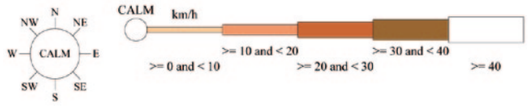


FIGURE 43: Annual wind roses for Sydney Observatory Hill *Source: BOM*

Public Domain Review

The public domain interface of Lifehouse is limited to Missenden Road, which is the only public road serving the site.

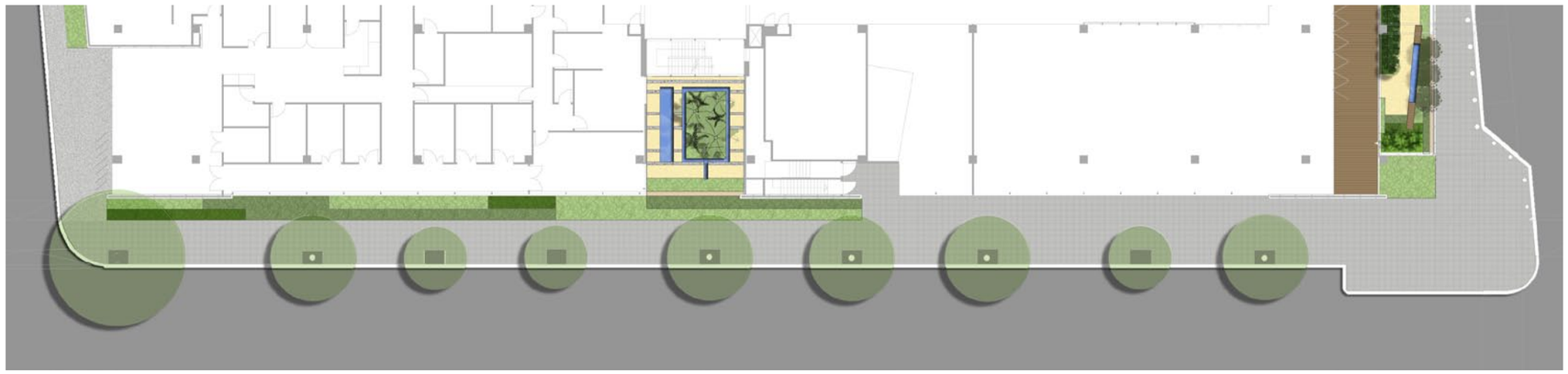
Missenden Road is currently subject to an upgrade program proposed by the City of Sydney Council, which will involve traffic calming, footpath improvements, pavement widening, tree plantings and improved lighting. Key features include:

- A separated, two-way cycleway along the City side of Missenden Road and Lyons Road;
- Major traffic calming measures including making Missenden Road and Lyons Road a 40km/hr zone;
- Raising the road surface at the entrances to Longdown, Campbell and Aylesbury Streets to calm traffic and increase pedestrian safety;
- Widening the footpath on the western side of Missenden Road at King Street;
- Creating shared footpaths along Carillon Avenue for both pedestrians and bike riders;
- The loss of 37 on street parking spaces along Missenden Road and Lyons Road and retaining six on street parking spaces dedicated for doctors;
- Relocating eight trees and replacing ten unhealthy trees. As part of the project an additional 38 trees will be planted providing environmental benefits and adding to the aesthetic appeal of the streetscape; and
- Distinctive road and footpath pavements between Grose Street and Salisbury Road to calm traffic in the hospital precinct.

The target completion date for the works is December 2010.

Lifehouse has been designed to integrate with the proposed upgrade works and support the proposed improvements to the public domain.

Figure 44 illustrates the proposed Lifehouse streetscape elements, which incorporates City of Sydney's upgrade proposal.



Source: Turf Design

FIGURE 44: Streetscape elements on Missenden Road

4.3.4 Ecologically Sustainable Design

The DGRs state that the following must be addressed:

- *A detailed description of how the development will incorporate ESD principles in design, construction and ongoing operation phases of the development;*
- *A description of the measures that would be implemented to minimise water and energy consumption*
- *Consideration of any infrastructure management requirements, such as licenses and/or any air emissions from co or tri-generation facilities;*
- *An assessment against a suitably accredited rating scheme to meet industry best practice.*

There will be a strong focus on design and engineering solutions that complement passive design outcomes and reduce reliance on artificial means of heating, cooling, ventilation and lighting, while providing desirable levels of thermal, acoustic and visual comfort.

ESD Principles and Design Measures

The design of the new facility will incorporate the following ESD principles in the following manner described in Table 6.

Sustainable management initiatives including the following:

- Requirement to include quarterly commissioning (as part of Defects Liability for Handover) will be specified for tuning the building system to suit the seasonal requirements;
- Development of management plans such as Environmental Management Plan, Waste Management Plan, Construction Air Quality Plan and Sustainable Procurement Guide; and
- Building User Guide will be provided as part of the handover.

The feasibility for the provision of co-generation plant is currently being assessed.

Green Building Council of Australia - Green Star Assessment

To benchmark the environmental performance of the facility against industry best practice, Green Star Healthcare v1 tool is being used to assess the building development throughout the design process. Lifehouse will be undertaking a self assessment with the aim of achieving a minimum 4 star rating.

Green Star Healthcare v1 has been utilised as the framework for the project. A Green Star Action Plan has been prepared that provides the basis to track the Green Star credits, design progress and responsibilities and actions for the design team.

ESD Principles	Lifehouse Design
Maximise natural daylight penetration	• The central atrium of the full height of the building will permit daylight access into the building core • High performance floor to ceiling glass façades • Lower level open floorplates
Reduce solar gains	• Glass façades will be shaded by horizontal louvres and/or mesh screening, reducing glare • Central atrium is oriented along a north-south axis • The amount of glass on the west elevation will be limited to 30%
Maximise natural ventilation	• Central atrium will provide for natural ventilation • Openable windows will be provided in inpatient units on Levels 8 and 9
Utilise sustainable materials	• Concrete structure will incorporate 15-20% recycled aggregates • Materials with low level Volatile Organic Compounds (VOCs) will be selected • Timber supplies will be supplied from sustainable sources where possible
Promote sustainable transport	• A green travel plan will be implemented, providing comprehensive travel advice for walking, cycling and public transport. It could facilitate initiatives such as car sharing and subsidies for public transport tickets. • Investigation into the provision of a dedicated staff and visitor shuttle bus service • Cyclist facilities including bicycle parking, lockable storage and shower facilities are to be provided on basement levels.
Maximise water efficiency	• Potable water use will be minimised using the following measures: • Rainwater harvesting from the roof to provide for toilet flushing, irrigation and cooling towers. The storage tank will provide for at least 50% cooling tower demand and fire test water. • Provision of low-flow taps and fittings (minimum 3 WELS rated) • Different water uses, including hot water plant, sterilisation plants, kitchens, cooling towers and mechanical systems, will have separate meters that will be monitored by the Building Management System (BMS)
Maximise energy efficiency	• After-hour energy consumption, undetected leakage, thermal loss and circulating pump energy will be minimised through the use of a zone control system driven by a programmable logic control (PLC) system that will shut down zones in the building that operate during normal 9am to 5pm business hours. The hot, cold and warm water systems can utilise this partial shutdown system. • A thermal storage system for chilled water will be provided using the fire water tank system to reduce peak cooling demand. • Fan-coil units and openable windows will be provided in in-patient units to reduce reliance on air-conditioning to provide thermal comfort • Energy efficient lighting will be provided with automated after-hour controls. Lighting design will provide a maintained illuminance of not greater than 25% above the minimum illuminance levels recommended in AS standard AS1680.2.5. • Small bore pipes will be specified to save many litres of wasted hot and warm water at no added capital cost, saving waiting time of doctors and nurses when hand-washing between patients.

TABLE 06: ESD in Lifehouse

4.3.5 Transport and Accessibility

The DGRs state that the following items must be addressed:

- *Provide a Transport and Accessibility Impact Assessment prepared in accordance with the RTA's Guide to Traffic Generating Developments and making reference to the Metropolitan Transport Plan – Connecting the City of Cities, NSW Planning Guidelines for Walking and Cycling, and the Integrated Land Use and Transport policy package, considering the following issues:*
- *An estimate of the trips generated by the proposed development, including a breakdown of vehicle types.*
- *Traffic generation including:*
  - *daily and peak traffic movements likely to be generated by the project*
  - *the impact on the safety and capacity of the surrounding road network and nearbyintersections, including the cumulative impacts (accounting for other recently approved developments in the area) and with consideration of any future plans available for Missenden Road such as Council's proposed cycle route; and*
  - *the need and provision of upgrade, road improvement works, or funding (if required);*
- *Parking, access and loading dock arrangements , in accordance with relevant Australian Standards and including appropriate levels of onsite car parking having regard to local planning controls, RTA guidelines and high public transport accessibility of the site (note: the Department supports reduced parking provision, if adequate public transport is available to access the site.*
- *Measures to promode sustainable means of transport including public transport usage and pedestrian and bicycle linkages in addition to addressing the potential for implementing a location specific sustainable travel plan;*
- *Demonstrate how users of the development will be able to make travel choices that support the achievement of relevant State Plan targets;*
- *Detail the existing pedestrian and cycle movements within the vicinity of the site (including the links to other RPA buildings) and determine the adequacy of the proposal to meet the likely future demand for increased public transport and pedestrian and cycle access;*
- *Identify measure to mitigate potential impacts for pedestrians and cyclists during the construction stage of the project; and*
- *Provide an assessment of the implications of the proposed development for non-car travel modes (including public transport, walking and cycling).*

Lifehouse at RPA is well served by a number of major roads, including Missenden Road, Carillon Avenue, Parramatta Road and King Street, which provide good access for staff and patients arriving via private vehicle. The site is well located for patrons arriving via public transport, with Newtown train station within approximately 20 minutes walk and a significant number of public bus services operating near Lifehouse. Both King Street and Parramatta Road are a prominent part of the inner-west bus network.

The site is well situated to cater for people arriving by either walking or cycling, as strong walking connections are provided through the Sydney University Campus and also the RPA precinct.

Current Journey to Work data for the RPA precinct indicates approximately 13.1% of full time workers arrive either via walking or cycling. As a comparison, across the entire Sydney region this figure is only 4.8%.

It is anticipated that Lifehouse at RPA will attract in the order of 56,000 outpatients in its opening year and up to approximately 84,000 outpatients by 2016. Following completion of Stage B1 works, the maximum number of staff on site is forecast to be 818, representing an increase of 295 to the existing situation. The majority of these staff and researchers are already employed within RPA and will move from the Gloucester House into Lifehouse.

As the proposed development is well connected to existing public transport infrastructure networks, limited on-site parking of 100 spaces is to be provided. As mentioned, the majority of staff in the first stage of the project already work within the RPA precinct so it is anticipated that they will continue to park in the existing staff car parks in and around the RPA precinct. The on-site car park will service both senior staff/visitor parking, as well as loading vehicles, and be controlled via swipe card access to prevent unauthorised entries. The low amount of on-site parking will serve to increase the attractiveness of public transport to the site and reduce the traffic impact on the local road network.

An analysis of forecast additional traffic generated by the proposed development indicates that peak traffic generation does not coincide with the commuter peak hours, reducing the overall impact on the surrounding road network. At the completion of Stage B1 of the development an additional 1466 daily traffic movements are forecasted, comprising:

- 619 staff vehicle movements;
- 777 patient/visitor vehicle movements;
- 50 service vehicle movements; and
- 20 potential Lifehouse shuttle bus movements.

Of these, approximately 122 vehicles are forecasted to add to AM peak hour (8am – 9am) traffic and 128 vehicles are forecasted to add to PM peak hour (5pm to 6pm) traffic.

The intersection of Salisbury Road and Missenden Road (the latter provides access to the Lifehouse site) will continue to operate at an acceptable Level of Service B during both the morning and evening peak hours. As the forecast peak traffic generation does not coincide with the commuter peak hours, the overall impact on the surrounding road network is considered to be minimal.

Implementation of a green travel plan by Lifehouse will reduce the reliance on private vehicles for Lifehouse staff and patients. The provision of a Lifehouse shuttle bus is being investigated to promote green travel. It is envisioned that the current 80% mode split (private vehicle to public transport) generally applicable for RPA staff would decrease significantly as a direct result of these measures. Research staff already use a significantly lower proportion of private vehicle transportation at only 25%.In addition, the proposed Missenden Road cycleway will dramatically increase the attractiveness of cycling as a mode of transport for people accessing the site.

A detailed construction traffic management plan will be prepared at the construction stage of the project. The plan will detail a series of measures to mitigate potential impacts for pedestrians and cyclists during the construction stage of the project.

During the demolition of the existing buildings (separately approved under SEPP Infrastructure), Council has approved the use of access from Carillon Avenue up Brown Street and existing onto Missenden Road. It is anticipated that similar arrangements will be utilised for construction.

A detailed Transport and Accessibility Impact Assessment Report is provided in Appendix D.

4.3.6 Soil and Water

The DGRs state that the following items must be addressed:

- *Proposed erosion and sediment controls during construction;*
- *Stormwater management during operations, with details of the proposed stormwater infrastructure and connections to Council's system, and incorporating Water Sensitive Urban Design measures;*
- *Consideration of the potential for flooding (with consideration of climate change), contamination, acid sulfate soils and salinity impacts;*
- *Identify whether groundwater would be encountered during excavation, whether dewatering would be required and, if it is likely to be encountered, the existing groundwater quality and an assessment of the potential impacts on groundwater including degradation; and*
- *An assessment of the feasibility of installing infrastructure for rainwater collection and re-use.*

Two geotechnical investigations of the site have been undertaken:

- In October 2009, an initial investigation was carried out in relation of the demolition works involving the Page Chest Pavilion and Brown Street Outpatient Building, to which a separate approval applies; and
- In June 2010, a second investigation was carried out to provide supplementary advice and recommendations specifically for Lifehouse, to complement the information obtained from the initial geotechnical investigation.

The full geotechnical reports are provided in Appendix E.

Erosion and Sediment Control

Temporary sediment and erosion control measures will be designed to be incorporated into the construction works and sequencing of the project to ensure that the proposed construction activities on site do not pollute local drainage systems nor have a detrimental effect on downstream waterways.

A concept Sediment and Erosion Control Plan has been provided in Appendix E.

Flooding and Stormwater Management

The site is located at a high point within the local drainage catchment and is therefore not affected by flooding or external overland flow paths. Provision will be made for the safe conveyance of storm flows via overland flow paths within the development site for storm events up to the 1 in 100 year ARI storm event. Adequate freeboard will be provided within defined overland flow paths within the development site to allow some protection from overland flows generated from storm events larger than a 1 in 100 year ARI event.

A large roof area is available for rainwater catchment. Rainwater collected from roof areas will be harvested and surface water drainage will discharge into the stormwater system onsite.

Rainwater down pipes will be located in the central services risers and will connect to the rainwater harvest tank adjacent to the onsite storm water detention (OSD) tank. Remote downpipes serving balconies will connect directly to the OSD.

The rainwater harvesting tank will be located at a low level to provide for toilet flushing, cooling tower use and general utility use, such as hosing down paved areas and limited irrigation. It will providing for at least 50% cooling tower demand and for fire test water. Any overflow from the tanks will be connected to the onsite storm water system.

Surface stormwater drainage for the site will be designed to collect and convey stormwater drainage via a conventional piped stormwater drainage system for storm events up to and including a 1 in 20 year Average Recurrence Interval (ARI) storm event.

On-site stormwater detention (OSD) will be provided in accordance with Sydney Water's requirements.

Harvested water will be filtered and dosed before use within the building. Surface stormwater pollution control devices will be incorporated into the site stormwater drainage system to assist with the removal of sediment, oils and hydrocarbons from stormwater runoff from the road and car park areas.

A concept Stormwater Drainage Concept Plan showing the OSD and discharge/connection point has been provided in Appendix E.

Contamination

An Environmental Site Assessment (ESA) was coordinated by Aargus Pty Ltd in October 2009. The assessment involved collecting background site information and historical data, development of a conceptual site contamination model, fieldwork and laboratory testing.

The site was assessed against the National Environmental Projection Council (1999) National Environmental Protection (Assessment of site contamination) Measure (NEPM). With respect to human health, the analytical results were also assessed against risk based health investigation (HIL) guidelines appropriate for industrial and commercial development (HIL 'F').

The main findings of the investigation were:

- Only a thin layer of fill is likely to cover the site with thicknesses ranging between 0 and 0.7m. Fill materials within the south eastern portion of the site are classified as General Solid Waste
- Most potential contaminants of concern were measured at concentrations below the soil acceptance criteria appropriate for hospital land use
- Elevated levels of petroleum hydrocarbons and PAHs were found in some of the fill materials that contained ash and/or bitumen
- No evidence of contamination found in the underlying natural clay soils

Based on the results of the investigation, it was considered that the risks to human health and the environment associated with soil contamination at the site are low and hence the site considered suitable for ongoing use and the proposed development.

In May 2010, a review of the ESA was undertaken by a NSW DECCW Site Auditor in preparation for a Site Audit.

The Site Auditor was generally satisfied with the ESA, with exception of the following:

- A number of data gaps were identified however these could be readily be addressed by copies of the relevant assessments being provided to the Auditor for review as part of the site audit work.
- The investigation was not able to meet the DQOs for data completeness and data representativeness because the Page Chest Pavilion and Brown Street General Outpatients Buildings had not been fully demolished (which was subject to a separate approval under SEPP Infrastructure), limiting the area of the site that could be tested. Two of the six boreholes were located within the south eastern portion of the site (Boreholes 5 and 6) and the remainder were located on roadways surrounding the site.
- The old roadbase and ash material in the fill layer should not be recycled as roadbase material, since it contains elevated PAH concentrations that are much higher than modern bitumen mixes and which significantly exceed NEPM 'D" criteria. The Site Auditor considers suggest this could be a result of coal tar being used in the old bitumen and recommends this material be disposed at a suitably qualified licensed landfill in accordance with DECCW requirements.

The Site Auditor considered that the site will be suitable for the proposed hospital use when all fill material has been excavated and removed from the site given that there is a risk of other unknown fill material being found at the site. Upon completion of this work, the Site Auditor proposes to issue a site audit statement.

Acid Sulfate Soils and Salinity

Laboratory testing for chlorides, sulfates and pH found soil conditions to be non-aggressive, and therefore no impacts from acid sulphate soils and salinity.

Groundwater

Groundwater will be encountered during excavation, given that the groundwater level was measured at 13.98m (~RL 23.02) below existing ground surface level at Borehole 8 (located at the middle of the Missenden Road frontage of the site) and the proposed basement excavation is expected to be in the order to 14.0m deep.

However, due to the very slow recharge rate of the monitoring well, it is anticipated groundwater infiltration will be minor only and that dewatering of the excavation will be adequately handled by appropriately located sumps within the base of the proposed excavation, which would be intermittently pumped to remove collected groundwater.

Lowering of groundwater levels outside the site perimeters could adversely impact existing foundation conditions of adjacent structures, underground services and roads, due to settlement.

To ensure that lowering of the groundwater table will not result in such impacts, the following needs to be considered if inflow rates encountered are significant:

- Assessment of the rates of ground water inflow;
- Installation of a cut-off wall, such as a contiguous reinforced concrete retaining wall within the site boundaries or around the basement excavation, socketed into the underlying shale bedrock;
- Lowering of the groundwater level by pumping prior to excavation; and
- Alternatively, install a watertight permanent retaining wall.

Consideration should be given to ground water movements subsequent to the installation of the cut off wall and long term affects of the changes.

4.3.7 Noise and Vibration

The DGRs state that the following items must be addressed:

- *A quantitative assessment of the potential construction, operational and traffic noise impacts of the project.*

Design of the Lifehouse will be conducted in accordance with noise criteria and guidelines set from relevant Australian Standards, and the NSW DECCW's Industrial Noise Policy, Environmental Noise Criteria for Road Traffic Noise (ENCRTN), Assessing Vibration Guideline, and Interim Construction Noise Guideline.

A noise survey was taken from the Level 8 balcony of the King George V building to establish the current ambient noise levels in the vicinity of the subject site. The results of the survey revealed the Rating Background Level noise is between 3-4dB less than the industrial average of 56dB$_{LAeq}$ during the day, 54dB$_{LAeq}$ in the evening and 48dB$_{LAeq}$ at night. Background noise levels have formed the basis for the establishment of the noise criteria set out in the following subsections.

Construction

Construction noise and vibration impacts are expected to be associated with:

- Construction equipment used on site; and
- Construction-related traffic.

The project specific noise targets for residential noise-sensitive receivers of airborne construction noise are shown in Table 7.

Effective management of the construction process to minimise noise, including selection of equipment, work practices and work methods, will be necessary to minimise the noise impact of the construction works on surrounding areas. The guidance of the NSW DECCW Interim Construction Noise Guideline will be followed in assessing noise impacts and formulating noise mitigation measures to control construction noise impacts from Lifehouse.

A construction noise assessment will be undertaken as part of preparation of a Construction Noise and Vibration Management Plan for the Lifehouse development.

Time period	Noise affected level, dB LAeq(15min)	Highly noise affected level, dB LAeq(15min)
Standard work hours (Monday to Saturday)	6dB	75dB
Non-standard work hours		
Daytime	56	51
Evening	56	51
Night time	45	43

TABLE 07: Project specific noise targets for construction

Operational Noise

Noise impacts on the community from the development when operational are expected to be from the following sources:

- Plant and services equipment associated with the new facilities;
- Operational noise from the site (e.g. deliveries, unloading); and
- Traffic noise from the site on public roads.

Operational noise levels from the Lifehouse development are expected to meet the criteria listed in Table 8 via the incorporation of appropriate noise mitigation into the design of the development.

The project-specific noise criteria for mechnical plant noise levels is:

- Residential receivers: 38 dB(A).
- Hospital wards: 48 dB(A).
- Commercial receivers 65 dB(A).

Traffic

Traffic noise impacts on surrounding residents are expected to be negligible. The predicted increase in traffic numbers on Missenden and Salisbury Roads during morning and evening peak periods is predicted to result in an approximate increase in noise levels of less than 1 dB(A) for Missenden Road, and an increase of 1 dB(A) for eastern Salisbury Road, which is less than the 2dB(A) increase in traffic noise levels from a project of this type allowable under the ENCRTN.

Noise Sensitive Receiver	Time Period	Intrusiveness Criterion	Amenity Criterion	Limiting Criterion
Residential Receivers	Day	57	58	57
	Evening	56	44	44
	Night	50	38	38
Hospital Wards	Noisiest			
	1 Hour	N/A	48	48
	Day	N/A	65	65
Commercial Receivers	Evening	N/A	65	65
	Night	N/A	65	65

TABLE 08: Project specific criteria for operational noise

4.3.8 Hazards

The DGRs state that the following items must be addressed:

- *An assessment against SEPP No. 33 – Hazardous and Offensive Development*
- *A description of the measures to be implemented to manage hazards and risks associated with the storage and use of hazardous materials and particularly from the operation of chemotherapy apparatus and other potentially hazardous apparatus.*

Dangerous goods

Dangerous goods identified to be present at Lifehouse include:

- Cryogenic liquefied nitrogen;
- C1 combustible liquid (diesel for the emergency generator set);
- Flammable liquids (in very small quantities only);
- Class 6.1 cytotoxic drugs (with small quantities of active ingredients);
- Cytotoxic contaminated waste; and
- Class 6.2 infectious substances.

No radioactive wastes of Class 7 (radioactive substances) are to be generated or kept in the building.

Based on the quantities of goods listed above and in accordance with the screening method for determining potentially hazardous development, the provisions of SEPP 33 do not apply to Lifehouse. Further, Lifehouse does not propose to accommodate any activities which require a licence pursuant to the Chapter 3 of the Protection of the Environment Operations Act hence it is not potentially offensive development.

Therefore, SEPP 33 – Hazardous and Offensive Development does not apply to Lifehouse as it is considered not to be potentially hazardous or potentially offensive.

Notwithstanding, the design of the facilities for the receiving, storage, handling and use of hazardous materials, and the proposed operations of the Lifehouse at RPA activity, will be in accordance with the relevant codes and standards.

Radiation hazards

Diagnostic and clinical treatment radiation equipment will be present and used in Lifehouse. Shielding requirements for imaging equipment is make/model dependant. A radiation consultant will provide shielding requirements for the internal structure and that surrounding it. The design will be developed so as to fully comply with the relevant Australian Standards.

Adherence to the relevant standards and those in relation to dangerous goods safety, ensures that the facilities and activities of Lifehouse will be in accordance with best-practice achievable for a biomedical clinical facility, and will secure an acceptable level of safety.

4.3.9 Waste

The DGRs state that the following items must be addressed:

- *Identify, quantify and classify the likely waste streams to be generated during construction and operation;*
- *Describe the measures to be implemented to minimise, reuse, recycle and safely dispose of this waste;*
- *Describe the measures to be implemented to manage the disposal of nuclear waste; and*
- *Describe the measures to be implemented to manage the disposal of contaminated and potential contaminated biological and sewage waste.*

Construction Waste

A Waste Management Plan (Construction) (WMP) will be prepared as part of the Construction Environment Management Plan (CEMP). In addition to describing the objectives of the plan, the WMP will detail the involvement of the waste contractor and any other specific requirements as identified during the pre-planning of demolition and construction works. Waste streams likely to be generated, including those that may that contain dangerous goods and hazardous substances expected to be created during construction will be addressed as part of the preparation of the WMP (Construction).

Wherever practicable measures will be implemented to minimise, re-use, and recycle any construction and demolition wastes. Where this is cannot be reasonably achieved, wastes will be disposed of responsibly and in full compliance with all statutory requirements, using licensed waste transport and waste disposal contractors with fully compliant documentation to prove due diligence has been exercised over the transport, custody and disposal processes.

The preparation of a WMP (Construction) within the CEMP is included in Part 5.0 Draft Commitments of this report.

Operational Waste

Waste streams from operations are described in the Table 9.

No nuclear waste streams are to be generated by, or emanate from, Lifehouse facilities or its operations.

Sewage discharge quality and contaminated biochemical waste

Lifehouse will discharge sewage to the Sydney Water Corporation system. Clinical operations are known to discharge e-coli and other pathogens present in any human excrement, but at potentially higher levels than domestic sewage. Treatment of pathogens in the hospital sewage system is not required by Sydney Water, given that public health safeguards incorporated within the design rules for sanitary drainage systems are sufficient to manage this hazard.

There are some exceptions to the above for the treatment of sewage potentially containing viral haemorrhaging diseases, highly infectious water borne diseases, radioactive isotope Iodine 131, or from laboratories and laundry waste, but these are not relevant to Lifehouse.

Type	Lifehouse Qty/month	Measures
General waste		
General waste from the Lifehouse facility collected from specific departments daily by Lifehouse hotel services.	21 tonnes	A general waste compactor will be located in the loading dock. It will be exchanged on an as-needs basis and be transported to landfill.
Recyclable Waste		
Low density polyethylene sheet (pallet wrapping), paper, cardboard, commingled plastic, glass and aluminium cans and bottles	4.8 tonnes	Appropriately colour coded bins will be located in departments. Recyclables will then be transported to the loading dock storage area for collection and appropriate disposal.
Confidential waste		
Lockable bins of confidential records and patient information	12 bins (240 L/bin)	These bins will be located in each department generating confidential waste. As bins are filled they will be conveyed to the Ground Floor for pick up by that then shreds and recycles this waste.
Contaminated waste including sharps and Clinical Waste		
Contaminated (clinical) waste collected in colour coded bins (yellow with an orange lid) held in the departments	850 kg	Maximum stored inventory based on accumulating maximum 2 days waste is 56 kg. Assume at worst all wastes classified as Class 6.2 infectious waste
Sharps containers (yellow)	1970 L (155 kg)	Assumes a waste density based on a 240 L bin containing ~ 20 kg waste Maximum accumulated inventory assuming 2 pick-ups per week –is 20 kg Assume at worst all wastes classified as Class 6.2 infectious waste
Sharps container (grey)	560 L (47 kg)	Assumes a waste density based on a 240 L bin containing ~ 20 kg waste Maximum stored inventory based on 2 days accumulation is ~ 4 kg Assume at worst all wastes classified as Class 6.2 infectious waste
Cytotoxic Waste Waste material including sharps contaminated with a cytotoxic drug	610 L/month (50 kg)	Cytotoxic waste will be collected in colour coded bins (purple bins with purple screw top lids) held in the departments generating the waste. These will be collected daily and stored in a separate enclosure in the Ground Floor loading dock for collection. This waste is then collected (also daily) for incineration Maximum stored inventory based on 2 days accumulation is ~ 4 kg Assume at worst case all cytotoxic waste is classified as dangerous goods Class 6.1 PG II
Chemical Waste Other than cryogenic gas, a small quantity of flammable liquid, the diesel fuel in the generator fuel tank, cytotoxic drugs and wastes and infectious wastes, no other dangerous goods are kept in quantities above a fraction of Minor Storage limits.	Nil	There is no requirement for chemicals to be stored and used. It is not expected that any chemical wastes will be generated or stored
Trade Waste Plumbing and Drainage Waste from fixtures and equipment that generate non domestic waste (sewage) are considered Trade Waste discharges.	Not quantified	Trade waste and sewage will be discharged to a Sydney Water asset pipeline in Susan Street. Discharge will be subject to quality standards that will be the subject of a trade waste agreement to be entered into by Lifehouse.

TABLE 09: Identified waste streams and measures to manage disposal

4.3.10 Services

The DGRs state that the following items must be addressed:

- *The capacity of utilities including water, sewer, stormwater, gas, power and telecommunications infrastructure that will service the project.*

The utilities outlined in Table 10 will have the capacity to service Lifehouse. Appendix H provides further detail.

Service	Brief Description
Mechanical Services	Includes: • Central chilled water plant • Central hot water heating system • Central natural gas steam • Central chilled water and hot water variable air volume and constant volume handling systems • Dedicated exhaust systems These services will be controls by a Building Management System (BMS) and will be acoustically treated to meet the site boundary noise level requirements. Smoke control will be provided by a fire engineered smoke management system.
Medical Gases	Medical gases supply for Lifehouse will be shared with the existing RPA supply from their loading dock and reticulated through the RPA tunnel network. Medical air and suction will be provided from dedicated plant located on Level 8 of Lifehouse. The medical gases will be designed to comply with AS2896.
Electrical Services	Includes: • Electrical supply from a new 11kV sub station. Implementation of a co-generation plant is also being considered. • Sub-mains • Switchboards • Distribution switchboards • Power factor correction • Standby Power • UPS supplies • Lighting, including artificial, external and emergency • Lighting protection
Communications	Includes: • Site Infrastructure and Reticulation • Communication Rooms, including a Main Communications Room and a main Building Distributor
Communications (cont.)	• Wireless Networks (wire local area networks) • MATV/Radio System • Master Clock System • Call Systems
Hydraulic Services	Includes: • Sewer, connecting to the Sydney Water Corporation system • Sanitary plumbing • Trade waste plumbing • Potable cold water • Hot and warm water systems • Rainwater harvesting
Fire Services	Includes: • Combined fire sprinkler/fire hydrant system • Fire hose reel system • Smoke detection system • Sound system and intercom system for emergency purposes • Fire extinguishers • Passive fire prevention • Fire safety management
Lifts	Two lift cores will be provided, one for public access and the other for staff.
Security	Includes: • Electronic Access Control System (EACS) • Intrusion Detection System (IDS) • Closed Circuit Television (CCTV) System • Video Intercom System • Duress Alarm System • Security Lighting

TABLE 10: Utilities to service Lifehouse

4.3.11 Heritage

The DGRs state that the following items must be addressed:

- *Consideration of any potential impacts on:*
  - *Aboriginal Heritage; and*
  - *Heritage items listed in State and/or local legislation*

Aboriginal Heritage

The site proposed for the Chris O'Brien Lifehouse was once part of the land occupied by the Gadigal. Evidence of Gadi occupation has been found within the Sydney area in the form of stone artefacts, rock art and rock shelters with archaeological deposit.

There is no documented evidence detailing the Gadigal occupation and use of the land in the RPA hospital site. A search of DECCW's AHIMS Register indicated that there are no known Aboriginal sites within the grounds of RPA, including the subject site. Archaeological assessments and excavations undertaken as part of recent development proposals within the vicinity of RPA have provided limited evidence of occupation in the form of stone artefacts. However, it is considered that the impact of post contact development would have destroyed any evidence which may once have existed on the subject site.

The first Colonial use of the area was agricultural, with industrial and residential buildings being constructed soon after in 1841. Hospital use of the land commenced in 1882 with the western side of Missenden Road acquired for hospital construction and the then existing residential buildings demolished. The General Outpatients building was constructed on the southern side of the subject site and the Page Chest Pavilion on the northern side of the subject site. Both buildings, which have since undergone a separately approved demolition process, contained basements. The impact of the construction of residential buildings and then hospital buildings with basements and underground tunnels would have destroyed any evidence of Aboriginal occupation that may once have existed on the site.

It is therefore considered that the construction of the Chris O'Brien Lifehouse will not have a negative impact upon the physical evidence of Aboriginal occupation.

Heritage Items listed in State and/or local legislation

A Statement of Heritage Impact has been prepared and is included at Appendix I. The assessment is based on architectural drawings as well as a Conservation Management Plan for RPA prepared by the Heritage Group, State Projects, Department of Public Works & Services in 1997.

RPA Hospital opened in 1882 and built a reputation as a leading hospital in NSW, incorporating the theory of innovative medical practice in its design and operation. Its potential for integrated expansion was constrained by Sydney University. From 1936, a development phase of the hospital began on the western side of Missenden Road which set a pattern of buildings approximately ten storeys high, reinforcing the alignment of Missenden Road.

Lifehouse is situated in the vicinity of a number of heritage listed buildings, including:

- King George V Memorial Hospital, a local heritage item located north of the Lifehouse across Salisbury Road;
- St Andrews College in the University of Sydney, which is a local heritage item within the Sydney University conservation area, located directly across Missenden Road;
- The Administration Block and Victoria and Albert Pavilions, which are state heritage items located across Missenden Road to the north-east; and
- The Engineering Services building (formerly the Boiler House) a local heritage item located to the west of Lifehouse.

The Lifehouse is generally consistent with the strategies outlined in the Royal Prince Alfred Hospital Conservation Management Plan, 1997. Detailed discussion on conformity and recommendations are provided in Appendix I.

The Lifehouse fits into the pattern of development on the western side of Missenden Road in terms of its ten-storey scale, orientation and function. While the new building's footprint is larger than that of the previous buildings on this site, although of similar vertical, care has been shown to enhance the nineteenth-century street pattern. Instances of this include expanding Salisbury Road to to its former width that addressed the projecting gable front of the Victoria Pavilion in a symmetrical fashion. Susan Street's industrial laneway character is respected by locating car parking and loading entry and egress along this street, while the other facades of the building address pedestrians.

Lifehouse will include an interpretive display representing the medical and political career of Sir Earle Page and the operation of the Page Chest Pavilion to provide a physical reminder of the site's cultural and scientific history.

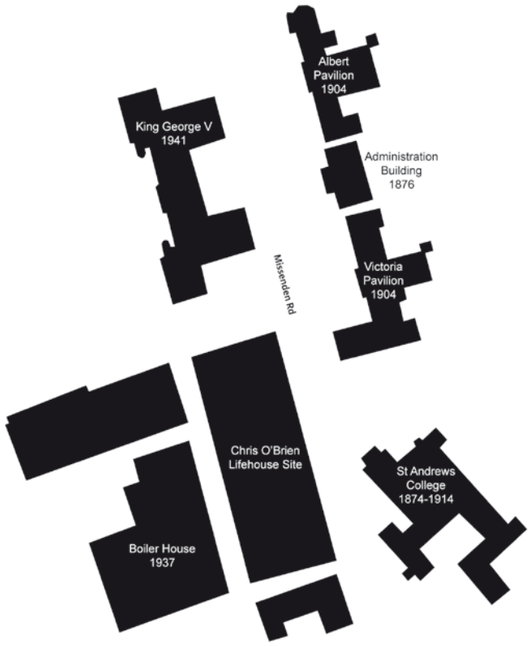
Potential Impact on Heritage Listed Items

The impact of Lifehouse on the King George V Memorial Hospital is considered to be negligible since the scale of Lifehouse is comparable to that of the King George V. Lifehouse will have a similar alignment to Missenden Road that continues a theme of development reinforcing the vista of Missenden Road through the RPA precinct. It adopts a contemporary architectural language of bold horizontal shading elements facing Missenden Road which make reference to the streamlined horizontal emphasis of the King George V balconies. The horizontal emphasis softens the impact of the slightly taller scale of the proposed building. The massing of the proposed building addressing Salisbury Road reflects the King George V's theme of a protruding breakfront section of the building providing a two-sided sense of enclosure to a small landscaped public space.

The impact on the Victoria and Albert Pavilions and the Administration Building is considered to be negligible since the Lifehouse is of a similar scale to the Page Chest Pavilion previously on the site and while there is a clear contrast in scale between these buildings, the distance between them and the scale of each is sufficient that the heritage significance of the Victoria Pavilion would not be adversely affected.

It is considered that the heritage significance of St Andrews College would not be reduced as a result of the Lifehouse development because the significant setting of the College is its parklands landscape facing Sydney University.

Overall, the proposal presents minimal impact on the heritage significance of the State and local listed items described above.



Source: Conybeare Morrison

FIGURE 45: Heritage listed items in vicinity of Lifehouse

4.3.12 Flora and Fauna

The DGRs state that the following items must be addressed:

- *Consideration of potential impacts on any flora and fauna.*

The existing Camphor Laurel tree on the unbuilt portion on the south eastern corner of the site is considered a weed species and will be removed to facilitate the development of Lifehouse over the entire site.

As part the landscape strategy, native species such as Cabbage Tree Palm (Livistonia australis), Rough Tree-ferns (Cyathea australis) and voila/fern understory will be established in the landscaped courtyard spaces.

Separately to Lifehouse, City of Sydney's proposal to upgrade Missenden Road will provide opportunities to improve flora and fauna habitat within the vicinity of Lifehouse by relocating eight trees and replacing ten unhealthy trees and planting an additional 38 trees. The aim is to increase habitat areas and facilitate the movement of fauna.

4.3.13 Staging

The DGRs state that the following items must be addressed:

- *Details of any proposed staging, the extent of the works proposed for each stage and the predicted timing for each stage.*

Lifehouse will comprise a single construction contract for the entire 42,000m^2 (approximately) project. The fit-out of the individual spaces will occur in two stages against a a specific time programme.

Stage A will include the comprehensive fitout of approximately 26,000m^2 of the total project with the residual 16,000m^2 left as shell space. Stage A is programmed for completion in early 2013.

Stage B1 will include fitout of the 16,000m^2 including following important areas:

- In-patient accommodation on Levels 8 and 9;
- The intensive care unit on Level 7;
- Major expansion to operating rooms on the Interventional floor on Level 3; and
- Expansion to the fit-out of the Diagnostic Imaging department on Level B1.

The Stage B1 fitout is programmed to occur and be finally completed and operational by 2016.

Building functionality will be maintained around all non fitted-out shell spaces in accordance with BCA standards.

4.3.14 Development Contributions and/or Planning Agreements

The DGRs state that the following items must be addressed:

- *A review of the project against the relevant contributions plans and any existing planning agreements relevant to the projects; and*
- *The likely scope of any planning agreement and/or developer contributions to be made.*

City of Sydney Contributions Plan 2006

City of Sydney's Contribution Plan (CP) 2006 is a baseline contribution plan which levies developer charges on a schedule of rates based on the location of the development site (eg. Western Precinct, Eastern Precinct or Southern Precinct). The precincts reflect factors including development characteristics, administrative boundaries and geographic factors. Lifehouse is located in the Western Precinct.

In June 2009, City of Sydney's Contributions Rates were revised (refer to Table 11). The revised rates represent a reduction from those published in the CP 2006 and reflect a ministerial direction to City of Sydney to delete contributions towards the cost of Council admin buildings, library book stock or IT resources.

Summary of Works

The Western Precinct Summary Works Programme is below:

Public Domain Strategy	Estimated Total Cost
New Open Space	$50, 445, 319

The works identified in the CP relate to capital works in Glebe, Erskineville and Newtown, as well as the future upgrade of Victoria Park. Very few of the identified works are to be provided in the vicinity of Lifehouse and of those there would be little, if any, benefit to Lifehouse.

Subsequent to the CP 2006 summary works programme, planning commenced for the Missenden Road Cycle Path in 2008, which is due for completion in 2010 (refer to Section 4.3.3). As a general development levy and because Lifehouse will have frontage to Missenden Road, it is understood that Council is requesting contributions from Lifehouse.

Contribution Type	Per Resident	Per Worker	Bedsits and One Bedroom dwellings	Two Bedroom Dwellings	Three or more Bedroom Dwellings	Residents of a Non-Private Dwelling*
Community Facilities	$ 388.18	$ 77.64	$ 504.63	$ 737.54	$ 1,009.26	$ 138.69
Public Domain	$ 748.45	$149.69	$ 972.98	$ 1,422.05	$ 1,945.96	$ 748.45
New Open Space	$ 6,144.52	$ 1,228.90	$7,987.88	$ 11,674.60	$ 15,975.76	$ 6,144.52
Accessibility	$ 61.43	$ 12.29	$ 79.86	$ 116.72	$ 159.72	$ 61.43
Management	$ 66.42	$ 13.28	$ 86.35	$ 126.20	$ 172.69	$ 66.42
Total	**$ 7,409.00**	**$ 1,481.80**	**$ 9,631.70**	**$ 14,077.11**	**$ 19,263.39**	**$ 7,159.51**

*Residents of a Non-Private Dwelling are not charged for Childcare.

TABLE 11: Western Precinct Summary Contributions Rates (from 7 June 2009)

Likely Scope of Developer Contributions

According the schedule of rates in Table 11, the applicable rate for Lifehouse is $1,481.80 per worker. On completion of Stage B1 it is anticipated that there will be a total of 1230 full time employees at Lifehouse. However, given that hospitals operate on a shift-work basis, it is arguable that the per worker contribution rate should be applied to the maximum number of staff on site at any one time on a typical weekday, 818 staff. On this basis the total contributions payable to Council would be $1,212,112.40.

However, Council's policy on merit exemptions to development contribution clearly applies to Lifehouse. Lifehouse is a non-profit benevolent charity, reliant on the provision of funds from a number of sources including Commonwealth and State Governments, philanthropic trusts and corporate and general public donations, and will provide a distinct community benefit. In this regard,

Under Section 2.14 of the CP, Council may consider, on the individual merits, a case for exempting the following types of development from the levying of development contributions:

- *Developments which provide a distinct community benefit on a not-for-profit basis including but not limited to: fire stations, police stations or police shop fronts, ambulance stations and the like;*
- *Development by or for non-profit organizations which provide a distinct community benefit including but not limited to: the provision of childcare services, outreach services or the like, on a cooperative or not-for-profit basis;*

Accordingly, Lifehouse is seeking merit exemption from the development contributions identified.

Nevertheless, Lifehouse supports the proposed Missenden Road upgrade and cycle works. Lifehouse is committed to reducing the reliance on car travel and the upgrading of Missenden Road will assist in achieving those objectives.

On that basis, Lifehouse will commit to construct the Missenden Road public domain to a standard equal to the design prepared by Council.

4.3.15 Consultation

The DGRs state that the following items must be addressed:

- *The consultation process and the issues raised must be described in the Environmental Assessment.*

A schedule of consultation is provided in the table below:

Date	Consultant	Details
23/11/2009	Capital Insight	Department of Planning Project Briefing
30/11/2009	Capital Insight	Phone discussion with City of Sydney Council regarding Missenden Road Cycleway Design
21/12/2009	Capital Insight /Rice Daubney	City of Sydney Council Meeting
21/01/2010	Capital Insight	Engagement of ASP3 - Ennerserve
28/01/2010	Sinclair Knight Merz, Capital Insight and Rice Daubney	Energy Australia meeting regarding basement substation location.
5/02/2010	Sinclair Knight Merz	Meeting with Energy Australia regarding basement substation.
10/03/2010	SCP	Correspondence with Sydney Water regarding on-site detention requirements.
25/03/2010	Capital Insight /Rice Daubney	City of Sydney Council Meeting
5/05/2010	Sinclair Knight Merz, Capital Insight and Rice Daubney	Energy Australia meeting regarding basement substation location.
10/05/2010	Capital Insight /Rice Daubney	City of Sydney Council Meeting
12/05/2010	Capital Insight, Rice Daubney and Arup	City of Sydney Council Meeting - Missenden Road Cycleway
28/05/2010	Capital Insight/ Rice Daubney	Meeting with Sydney Airport Corporation Limited with regards to Civil Aviation Safety Authority height requirements
3/06/2010	Sinclair Knight Merz and Capital Insight	Energy Australia meeting regarding basement substation location.
7/06/2010	Sinclair Knight Merz	Correspondence with Sydney Water regarding Requirements for water and sewer
3/06/2010	Capital Insight	Telstra - registration of project

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