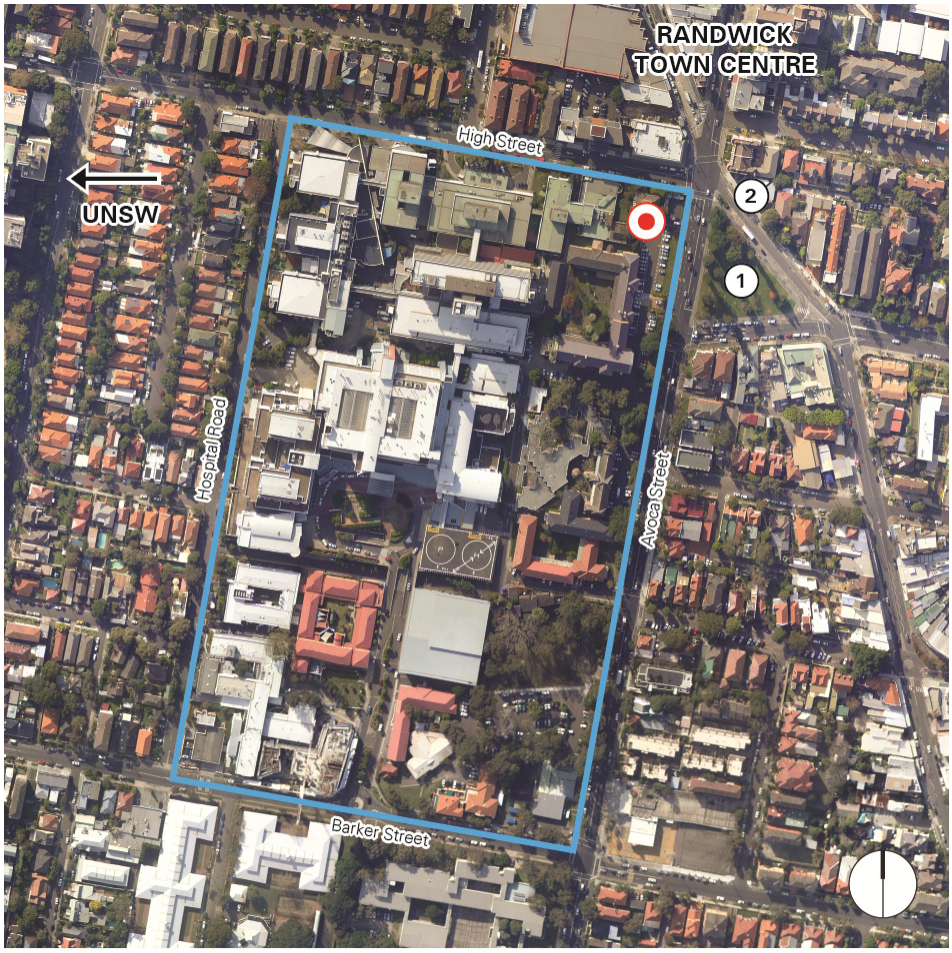

The Site
Randwick Health Precinct
1. High Cross Park
2. Randwick Lodge

Figure 9 – Surrounding development

Figure 10 – Randwick Town Centre looking north

Figure 11 – Shops and medical facilities on the northern side of High Street

Figure 12 – Two-storey commercial building with ground floor retail uses on High Street

Figure 13 – High Cross Park and residential development on the eastern side of Avoca Road

3.0 Proposed Development

This chapter of the report provides a detailed description of the proposed development. Plans are included at **Appendix B**.

This EIS seeks approval for the Stage 1 works of the CCCBDC. The Stage 1 works will have a gross floor area of 1,598m^2 and will be located in the north - eastern quadrant of the POWH Campus. Specifically, the works involve the following:

- Bulk excavation works;
- Provision of a new treatment area at Level 1 (underground);
- Installation of 3, with the capacity of 4 Radiotherapy Bunkers;
- Construction of a staff access tunnel to connect the new treatment area to the existing Building 3 lift and hospital;
- Demolition of existing at grade car park area (fleet vehicles parking site); and
- An open fire stair at the north-east corner of the site.

Figure 14 outlines the proposed works in context to the existing site.

The Stage 1 works will be a like for like operation in association with existing Building 3. There will be no additional bunkers proposed for the POWH Campus.

Following the Stage 1 works, the balance of the project will be completed at Stage 2. These works will be subject to a separate SSD approval process. The location and site context of Stage 1 and Stage 2 is provided at **Figure 15** and **16**.

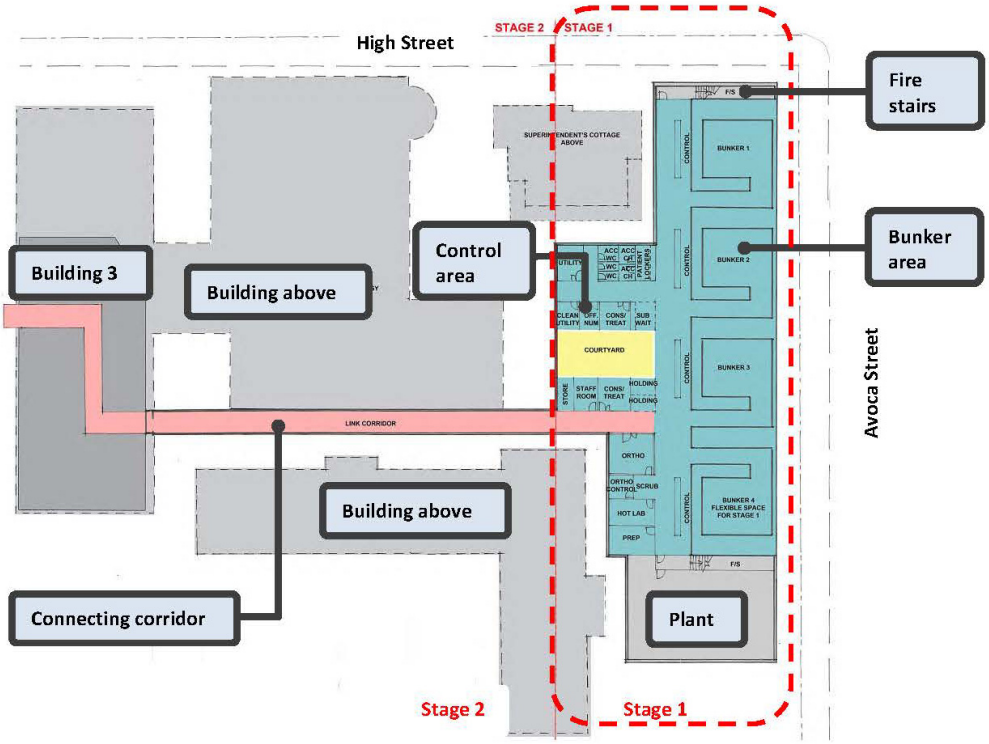

Figure 14 – Stage 1 works and connecting corridor.

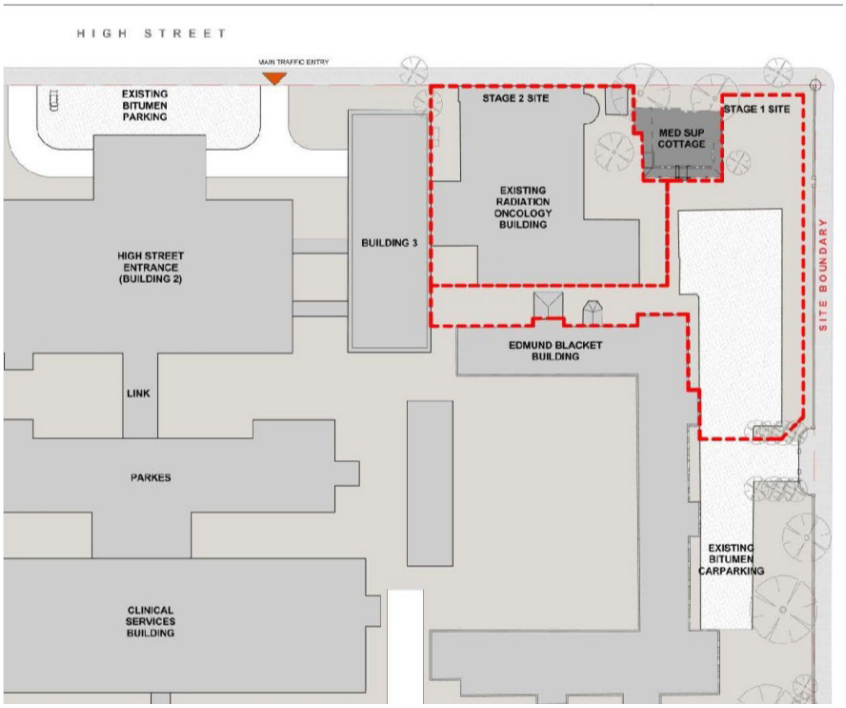

Figure 15 – Stage 1 works in relation to Stage 2

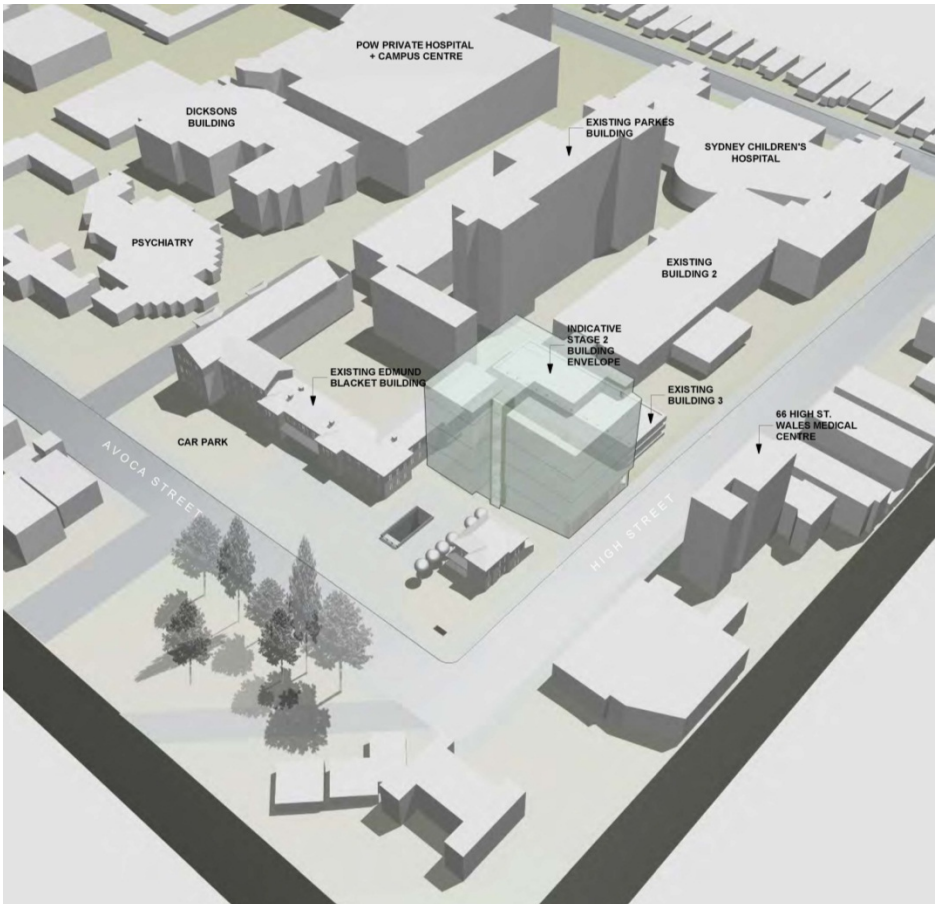

Figure 16 – Stage 2 indicative height and levels

3.1 Building Functionality and Operation

The Stage 1 and Stage 2 Radiation Oncology will ultimately accommodate the following functions:

- Radiotherapy planning;
- Radiation therapy;
- Brachytherapy;
- Medical physics;
- Minor procedures requiring anaesthetic support; and
- Radiation research training, including demonstration facility in the research bunker.

The planning and the treatment modalities in the radiation oncology will comprise:

- Initially three, (with the capacity for four) linear accelerators;
- A research bunker;
- Control areas;
- Superficial X-Ray;
- Orthovoltage unit;
- Brachytherpary / procedure room;
- Two Chemotherapy / simulation rooms;
- Support spaces - unisex and accessible toilets, NUM office, and patient change booths.

The proposed bunkers (at Level 1) will be 6m below ground level. The treatment space within the bunkers will be suitable for Elekta and Varian machines. The bunkers will be constructed with a wall thickness of 300mm to provide flexibility for neutron door capabilities. Allowance has been made for steep stud wall linings in front of the mass concrete wall construction, which provides a consistent standard of wall finish and permits convenient reticulation of services.

The installation of the staff access tunnel will link the existing Building 3 to the west running east to the new Level 1 bunkers and radiation treatment area. The tunnel will be underground and the floor level will match the RL of the proposed Level 1 slab. There will be a level difference from Building 3 to Level 1 of 2.3m, which will be balanced by using a temporary ramp.

Once the Stage 1 works are completed and commissioned, the existing Radiotherapy and Oncology Department can be decommissioned and demolished to allow Stage 2 (CCCBDC) works to commence construction in due course. An indicative envelope of the building is provided at **Appendix B**.

3.2 Site Preparation / Bulk Earthworks / Remediation

The works will involve an excavation to a depth of approximately 6 metres and the demolition of existing concrete footpaths, asphaltic concrete, bitumen surfaces and grassed areas.

Groundwater was recorded during geotechnical investigations undertaken previously on site. The excavation works will therefore intersect the recorded water table, as such excavation works may need to be dewatered through sump and pump techniques.

During the excavation process, a management regime will be employed around the perimeter of Edmund Blacket Building and the Superintendent's Cottage to ensure their protection. The excavation around these buildings will be sawcut to the heritage walls, provided that the footings of these buildings are bearing on adequate material. This will be confirmed during excavation and some local underpinning of the footings may be required.

A Phase 1 Contamination Report was undertaken by Douglas Partners (included at **Appendix E**).The report confirms that there is generally a low risk of soil or groundwater contamination within the site.

Tree removal will be required to facilitate the development. It is proposed to remove 12 trees on the development site, which also includes the site of the Stage 2 works. These trees are identified for removal within the Arborist Report prepared by Moore Tree Consulting included at **Appendix F.**

3.3 Landscaping and Public Domain

The overall landscape design scheme for the public and staff open space will be incorporated in the Stage 2 design.

The Stage 1 works proposes space for two courtyards. These courtyards will not be finalised with planting, as the construction works will be carried out on above the courtyard spaces during the course of the Stage 1 and 2 works. When all work has been completed, the Stage 2 design will provide the relevant seating and planting providing a functional courtyard used as a pleasant outlook and natural source of light to the underground built form.

3.4 Access and Parking

Vehicular and Pedestrian Access

The proposed Stage 1 development will close access Gate No. 6 on Avoca Street and the Heritage Gate, located north of Cuthill Street on Avoca Street, to pedestrians for the duration of the construction works. Pedestrian will be redirected to alternative entries along Avoca Street.

As the staff car park will be closed, during the construction of the Stage 1 works, all staff or visitor vehicles will be restricted access from Gate 6. However, service vehicle access will continue through Gate 6.

Parking

The proposed development does not incorporate any staff, patient or visitor car parking, noting that only staff presently park on or near the development site. The POWH Campus provides approximately 2,240 car parking spaces on-site and the development will utilise the existing multi-deck car parking facility operated and managed by a third party.

There is an existing car park located immediately adjacent to Edmund Blacket Building with access off Gate 6 via Avoca Street. The car park area is designated as a staff car park and most of the cars parked at this location are owned by the hospital. Most of the staff arrive at the car park and leave the car park for outside works after a short period of time.

Approximately 59 of staff parking spaces, north-east of the Edmund Blacket building will be temporarily lost as a result of the construction of the development but the majority of which will be reinstated upon completion of the Stage 2 works.

3.5 Water Cycle Management

The development site is located on land that is partly impervious in nature. The site consists of car parks, driveways, footpaths and some areas of permeable landscaping. The existing drainage systems located in the vicinity of the development site include:

- A drainage system discharging to the north into High Street drainage system;
- A drainage system discharging to the south through the existing car park located to the east of the Edmund Blacket Building; and
- A drainage system discharging to the south west of the Edmund Blacket Building.

A new drainage system will be provided to service the Stage 1 works and will have capacity to serve the Stage 2 development. The proposed drainage system will be located immediately within the boundary of the Avoca Street road reserve. The drain will run from north to south along the Stage 1 works and will collect flow from the Stage 1 paved areas. The drain will discharge to the existing hospital system at the southern end of the car park.

A second drainage run will be provided between the Edmund Blacket building and the proposed Stage 1 underground bunker. This drainage run will connect into the proposed drainage system that runs within the eastern site boundary and will in turn connect into the Council drainage system.

The site is not subject to flooding or overland flow issues.

3.6 Environmentally Sustainable Development

The Stage 1 building has incorporated Environmental Sustainable Development (ESD) strategies and principles as defined in clause 7(4) of Schedule 2 of the EP&A Regulations.

The environmental performance of the development will be assessed by using the NSW Health's Engineering Services and Sustainable Development Guidelines (TS11) and Section J - Energy Efficiency of the Building Code of Australia 2010.

In particular, the proposal will achieve ESD principles on an integrated design process with the intention of delivering:

- Lower operating costs for energy, water, waste and maintenance;
- Improved indoor Environmental Quality;
- Extended life through inherent flexibility and 'future-proofing';
- Electrical services with efficient lighting, lighting control and energy metering.

The ESD initiatives and principles will be further developed during the construction and the operation of Stage 2 building works.

3.7 Infrastructure and Services

Water and Sewer

There is an existing 225mm Sydney Water Corporation sewer main located between the Edmund Blacket Building and the proposed development site (including the Stage 2 works) which has adequate capacity to service the overall building works.

Sydney Water Corporation water mains are located within Avoca Street and High Street. The 300mm diameter water main located within Avoca Street has adequate capacity to service the works.

Power, Electricity and Telecommunications

Consultation with Ausgrid and Telstra respectively confirms sufficient electrical and telecommunications infrastructure will service the proposed works.

The Stage 1 works involve no permanent changes to external lighting other than safety lighting to the two fire escape wells in the north eastern and south eastern corner of the site at Level 1.

3.8 Waste Management

3.8.1 Operational Waste

General waste produced by the development will be disposed of in accordance with NSW Health and Infection Control Universal Precautions and held in bins in Disposals awaiting collection by the POWH staff.

3.8.2 Clinical Waste and Hazardous Materials

The clinical waste will be bagged and sharps contained clearly identified by yellow colour coding in accordance with the POWH Waste Management Plan.

The cytotoxic waste will be bagged and the sharps will be contained in a mobile waste bin within a secure area clearly identified by purple colour coding in accordance with Workcover guidelines. The waste will be transported via purple mobile waste bins and held in a secure area awaiting collection by the POWH staff and off-site disposal.

The Stage 1 works has been estimated to produce 0.5 tonnes of clinical waste, with an estimated rate of up to 20 vehicle movements of clinical waste per annum. An assessment of these hazardous materials and the compliance with the relevant Australian Standards and Guidelines is provided at Section 6.14 of this report.

3.8.3 Radioactive Waste

No radioactive waste will be generated by the development through the linear accelerators or the orthovoltage unit. These units generate x-rays by accelerating electrons into a target material, rather than by containing a radioisotopes source. An existing delivery and exchange scheme accredited by the relevant authorities will continue.

3.8.4 Construction Waste

The management of the site during the construction will be by the head contractor and is to be determined.

It is predicted that a construction timeframe of the Stage 1 works will be approximately 20 weeks and will generate approximately two x $10m^3$ bins per week.

3.9 Staging

As described previously, the CCCBDC will be separated into 2 stages, which will include:

- Stage 1 works – bulk excavation, construction of a new radiation bunkers and underground tunnel connecting to the existing Building 3 (Radiation and Oncology Building). The works will allow concurrent and ongoing use of Building 3; and
- Stage 2 works – the decommissioning of Building 3 and operation of Stage 1 works and the construction of the remainder CCCBDC building.

The construction of the works is staged to allow seamless operation of the facility.

4.0 Consultation

During the course of the design of the building, a series of internal and external consultations have been undertaken with stakeholders. The user groups include:

- Allied Health;
- Standard Rooms;
- Chemotherapy Infusions;
- Patient Services / Welcome / Interaction;
- Radiation Oncology; and
- Whole facility.

These meetings outlined the design of the proposal and discussed the user groups needs and concerns that were incorporated in the design of the project.

Relevant public authorities were notified and consulted during the design process, (such as Sydney Water), to confirm existing services capacities. In addition, the project team consulted with Randwick City Council and the Heritage Office to provide an outline of the project. The fundamental purposes of these meetings were to inform the authorities of the proposed development and to take into consideration of any key concerns of the project at that stage prior to being requested to provide input into the DGRs.

5.0 Director-General's Environmental Assessment Requirements

On 23 February 2011, the Director-General of the Department of Planning issued the requirements for the preparation of the Stage 1 and Stage 2 Environmental Impact Statements. A copy of the DGRs is included in **Appendix A**.

Table 1 provides a detailed summary of the individual matters listed in the Stage 1 DGRs and identifies where each of these requirements has been addressed in this report and the accompanying technical studies.

Requirement	Location in Environmental Assessment	
General		
The EIS must meet the minimum requirements in Schedule 2 of the Environmental Planning and Assessment Regulation 2000, specifically: ▪ Specification in clause 6; and ▪ Specifications in parts (1) and (4) of clause 7.	Pages i, ii, iii	
Statement of Validity	Page i	
Quantity Surveyor's Certificate	Appendix C	
Site Analysis	Section 2.0	
Description of the Proposed Development	Section 3.0	
Assessment of the Key Issues	Section 6.0	
Conclusion and Justification	Section 7.0	
Mitigation Measures	Section 8.0	
Key Issues	**Report**	**Technical Study**
1) Environmental Planning Instruments (EPIs); and 2) Policies, Guidelines and Planning Agreements ▪ Relevant EPIs, policies and guidelines	Section 6.0	-
3) Built Form and Urban Design ▪ Details of the Stage 1 building form including a conceptual representation of the overall development to demonstrate its relationship with the future Stage 2 works.	Section 6.1	Appendix B
4) Ecologically Sustainable Development (ESD) ▪ ESD principles within Schedule 2 of the Environmental Planning and Assessment Regulation 2000 incorporated in the design, construction and ongoing operation phases; ▪ In accordance with *NSW Health's Engineering Services and Sustainable Development Guidelines (TS11)*	Section 6.3	-

Requirement	Location in Environmental Assessment	
5) Noise and Vibration ▪ Acoustic investigation ▪ Noise generated at all stages of construction and during operation including the new radiotherapy bunker and cumulative impact of all plant equipment operating simultaneously. ▪ Identify residential effects properties.	Section 6.4.2	Appendix I
6) Transport and Accessibility (Construction and Operation) ▪ Accurate details of daily vehicle movements including emergency vehicles (if applicable) ▪ Access and parking ▪ Access arrangements during stages of construction; ▪ Details of service vehicles ▪ Provide a draft Construction Traffic Management Plan	Section 6.5	Appendix J
7) Heritage ▪ Impact of the proposed Stage 1 development on heritage significance on any heritage items / conservation areas ▪ Consideration of adjacent heritage items ▪ Consideration of archaeological potential of the area and potential impact of the proposal.	Section 6.6, 6.7 and 6.8	Appendices H, K and L
8) Landscaping ▪ Addressing potential impact on adjacent / nearby trees in Significant Tree Register ▪ Provide Tree Survey	Section 6.9	Appendix F
9) Operational Management ▪ Noise from plant and equipment ▪ Radiation, chemical and biological hazards ▪ Emergency evacuation procedures ▪ Ongoing operation of hospital services throughout the construction period ▪ BCA Standards	Section 6.10 Section 6.11	Appendices I, M, O, P
10) Waste	Section 6.13	-
11) Infrastructure and Utilities	Section 6.15	Appendices Q, R, S

Requirement	Location in Environmental Assessment	
12) Hazards	Section 6.14	Appendix G
13) Sediment, Erosion and Dust controls (Construction and Excavation)	Section 6.16.1	Appendix T
14) Stormwater Drainage	Section 6.16	Appendix T
Plans and Documents ▪ Transport and Traffic Impact Assessment ▪ Heritage Impact Assessment & Statement of Heritage Impact ▪ Construction and Operational Waste Management Plan ▪ Hazards Impact Assessment ▪ Noise Impact Assessment ▪ Stormwater Concept Plan ▪ Staging Plans ▪ Building and Fire Safety Report; and ▪ Survey Plan to AHD	Section 6.19	Appendices B, D, G, H, I, J, K, L, O, P and T.

6.0 Environmental Assessment

This section of the report assesses and responds to the environmental impacts of the proposed development. It addresses the matters for consideration set out in the DGRs (see Section 5.0).

The Mitigation Measures at Section 8.0 complement and support the findings of this section.

The DGRs require the following legislation, strategies and planning instruments, which are relevant to the proposed development to be addressed:

- EP&A Act;
- NSW State Plan (NSW 2021);
- Metropolitan Plan for Sydney 2036;
- Draft East Subregional Strategy;
- State Environmental Planning Policy Infrastructure 2007 (SEPP Infrastructure) ;
- State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33);
- State Environmental Planning Policy No. 55 – Remediation of Land (SEPP 55);
- Randwick Local Environmental Plan 1998 (Consolidation);
- Randwick Health Campus Masterplan Principles Review (2008);
- Randwick Education and Health Specialised Centre Discussion paper and Precinct Plan;
- Council's Section 94 contribution plan;
- NSW Groundwater Policy Framework Document – General; and
- NSW Groundwater Quality Protection Policy.

Table 1 – Planning Issues

Instrument/Strategy	Comments
Strategic Plans	
NSW State Plan (NSW 2021)	NSW 2021 is a 10 year plan to rebuild the economy, return quality services, renovate infrastructure, strengthen our local environment and communities and restore accountability to Government. A section of the Plan is devoted to the delivery of Health, and a key component of this is to restore confidence in the public health system by rebuilding hospitals and health infrastructure. This will help reduce hospital waiting times and help to establish a healthier community. The proposed development is evidently consistent with the goal of the State Plan. The Plan identifies a number of targets to encourage the higher use of public transport. The proposed development will not have an impact on the existing number of staff or patients to the site, therefore the existing public transport facilities will still operate at a good level of service and the hospital will continue to encourage the higher use of public transport for staff and visitors.

Instrument/Strategy	Comments
Metropolitan Plan for Sydney 2036	In December 2010, the NSW Government released its Metropolitan Plan for Sydney 2036. The Metropolitan Plan provides commentary and direction for the next 25-30 years at a regional level on issues such as land use, economic development, jobs, transport, innovation, centres and corridors, and residential areas within Sydney. The Metropolitan Plan sets the planning context for the provision of suitable health facilities in Sydney. Major health facilities are to be clustered around existing health precincts. The DA is consistent with the Strategy in that it will: ▪ contribute to important social infrastructure within the region; ▪ will address the current needs and future projected demand; and ▪ ensuring that the development of the new Comprehensive Cancer Care Blood and Disorder Building is provided with the chance for a well-designed, functional and attractive building in the context of the Hospital site.
Draft East Subregional Strategy	The draft East Subregional Strategy was released in July 2007 and was a key part of the implementation of the then 2005 Metropolitan Strategy. The Subregional Strategy is intended to guide land-use planning until 2031 in the Randwick, Botany Bay, Waverley and Woollahra local government areas. The proposed development is consistent with a key relevant direction of the Draft Subregional Strategy, being to consolidate and strengthen the Randwick specialised health centre.
State Legislation	
EP & A Act	The proposed development is consistent with the objects of the EP&A Act, particularly for the following reasons: ▪ it promotes the social welfare of the community; ▪ it allows for the orderly and economic development of land; ▪ it is development for public purposes and will facilitate the delivery of community services; and ▪ opportunities for public involvement and participation will be provided. The proposed development is consistent with Division 4.1 of the EP&A Act, particularly for the following reasons: ▪ the development promotes significance through medical services and stimulates social welfare of the community; and ▪ the development has been evaluated and assessed against the relevant heads of consideration under section 79C.
EP&A Regulations	The EIS has addressed the specification criteria within clause 6 and clause 7 of Schedule 2 within the EIS. Similarly, the EIS has addressed the principles of ecologically sustainable development through the precautionary principle (and other considerations), which assesses the threats of any serious or irreversible environmental damage.
SEPP 33	A SEPP 33 Preliminary Assessment Report has been prepared by SKM and is included at **Appendix G**. The report concludes the development will trigger the threshold for a Preliminary Hazard Assessment (PHA) due to additional levels of potential clinical waste and the current level of radioactive usage produced by the Stage 1 works.

Instrument/Strategy	Comments	
	The PHA concludes that only a very low level of risk is anticipated. Further detail is provided at Section 6.14 of this report.	
SEPP 55	A Preliminary Phase 1 Contamination Investigation Report has been undertaken to assess the potential for contamination of the development site based on the past and present site use (refer to **Appendix E**). Based on limited sampling, the preliminary results indicate that the site is generally at a low risk of soil or groundwater contamination and therefore satisfies the requirements of SEPP 55. The existing ground condition is appropriate for he proposed hospital use.	
SEPP (Infrastructure)	The aim of this Policy is to facilitate the effective delivery of infrastructure across the State, including providing for consultation with relevant public authorities about certain development during the assessment process. The proposed development does not trigger consultation with the Roads and Maritime Services (RMS) under the provisions of Schedule 3 of the SEPP as the proposed Stage 1 development does not generate 100 or more beds with access from a Classified Road.	
Local Planning Instruments and Controls		
Randwick Local Environmental Plan 1998 (consolidation)	Clause 17 – Zone 5 Special Uses	Development for the purposes of Hospitals is permissible with development consent. The proposed development is considered consistent with the objectives of the zoning in that it will allow for a range of community uses to serve the needs of residents, workers and visitors. There are no development standards in the LEP which pertain to the development or the site. Specifically, the LEP does not set height or FSR controls for the zone.
	Clause 37A – Development in Special Use Zones	Under clause 37A (Development in Special Uses Zone) the Council may only grant consent to the development of land within Zone No 5 if it is satisfied that the proposal is compatible with the character of the locality and will not adversely affect the amenity of nearby and adjoining development. It is considered that the proposed Stage 1 works will not detract from the character of the hospital site. The works will be wholly contained within the hospital site and will not be viewed from the surrounding area.

Instrument/Strategy	Comments	
	Clause 40 - Earthworks	The Stage 1 works involve extensive bulk excavation works. Clause 40 requires consideration to ensure the drainage and soil stability issues of the proposal on existing surrounding development and any future development. The proposal is supported with a Structural Engineering Report which outlines the stability of the ground and proposes mitigation measures to support the future development and the existing development.
	Clause 40A – Site Specific Controls	Clause 40A of the LEP requires a site specific DCP for a site area consisting more thatn 10,000m^2. However, clause 40A(4) allows the waiver of a site specific DCP if the proposed development is minor in nature or is ancillary to the current use of the land, or adequate guidelines and controls are in place. The proposal is considered consistent with the clause to waiver the site specific DCP as the proposal is situated on a small part of the Hospital Campus, and does not consist of an area more than 10,000 m2. Further, it should be noted that the Hospital Campus has an existing Masterplan for development, which provides guidelines and controls to the site.
	Clause 43 – Heritage Conservation	Before granting consent to development within a heritage conservation area or in the vicinity of a heritage item, the consent authority must consider the effect of the proposed development on the heritage significance of the heritage item or heritage conservation area. A Heritage Impact Statement (HIS) is included at **Appendix H** with this report. The HIS assesses any likely impacts of the proposal to the Edmund Blacket buildings and other surrounding heritage items.

Instrument/Strategy	Comments
Randwick Education and Health Specialised Centre Discussion paper and Precinct Plan	This discussion paper has been prepared to inform Randwick City Council's preparation of a comprehensive LEP and DCP. It investigates and provides strategies to accommodate and direct growth in ways that enhance the Centre and surrounds. The Randwick Health Campus will strengthen its role as a centre of excellence in health services. The campus will need to plan for an additional 21% growth in floor space requirements for health services to 2031. The proposed Stage 1 development is consistent with the use criteria defined in the discussion paper as follows: ▪ it is consistent with the core role of the campus as a health service facility; ▪ its use satisfies the Heritage Precinct principles; ▪ the development encourages the specific provisions for redevelopment of the Campus at the ground and first floors for health, medical and related uses adjacent the Randwick Junction; and ▪ the development seeks to improve the access and connection to the Campus from the Randwick Town Centre and provide clear pedestrian links within the Campus.
Randwick Health Campus Masterplan Principles Review (2008)	The Randwick Health Campus Masterplan was prepared by Cite Urban Strategies in consultation with Randwick Council and the NSW Health to highlight the importance of the Masterplan principles. It is noted that the site is located within the Heritage Precinct in the Masterplan document. The document highlights the key focus to provide strong and logic legibility for the zoning of the site, such as locating all mental health functions in one sector and all research facilities in a separate sector. The proposal seeks to amalgamate the Cancer and research facility which is consistent with the Masterplan.
Council's Section 94 Contribution Plan	The relevant contributions plan for the site is the Randwick City Section 94A Development Contributions Plan, effective since July 2007. The plan allows for a waiver from contributions to be considered for a variety of uses, including public hospitals (clause 11.2). The proposed development will clearly provide a public benefit by facilitating an important public future service, being the Comprehensive Cancer and Blood Disorder Centre for POWH. Therefore an exemption to the developer contributions is appropriate, under the Section 94A Plan and consistent with the Department's Circular D6 which applies to Crown Developments. Numerous other recent projects on the POWH site have been fully exempted from payment of contributions.
NSW Groundwater Policy Framework Document – General; and **NSW Groundwater Quality Protection Policy**	The NSW Groundwater Policy Framework Document and NSW Groundwater Quality Protection Policy are general documents that deal with the risk assessment and management of groundwater to reduce potential sources of contamination to the water table. The excavation of the works will be subject to these policies to mitigate and respond to the requirements of the Groundwater Policies.

Draft Randwick Local Environmental Plan 2012 (Draft LEP)

The draft Randwick LEP 2012 is currently on exhibition until 2 April 2012. The POWH site falls within the zone of SP2 Infrastructure (Health Service Facility) which permits Hospital development with consent. The draft Randwick LEP 2012 does not provide a FSR development standard; however, a maximum height on the perimeter of the site has been incorporated as a new control. These height limits are a maximum of 24m on the north (High Street) and south (Barker Street) boundaries, and 18m on the east (Avoca Street) and west (Hospital Road) boundaries. The Stage 1 development works are located underground; therefore the height control does not apply to or affect these works in anyway.

The Stage 2 indicative building envelope has a potential height of approximately 38.6m (including the plant level) to the boundary at High Street and therefore part of the envelope applies to the current draft maximum height control of 24m under the draft LEP. The draft Randwick LEP 2012 is still subject to review and does not hold current status or weight. Therefore the applicable controls are found in the LEP 1998, noting there is no height control for the Campus. Should there be any variation to the height controls of the Stage 2 building, this will be assessed within the future Stage 2 EIS assessment.

6.1 Built Form

The Stage 1 built form comprises a single level basement facility for Radiation Oncology Treatment including four radiotherapy bunkers, orthovoltage room, and support spaces. The functional operation of the bunkers requires key delivery of the first stage of the CCCBDC which will meet the specific demands of cancer treatment.

The Stage 1 works will be linked to Level 1 of the future Stage 2 building. The conceptual building envelope of Stage 2 is provided at **Appendix B**. At this point, the Stage 2 development will provide the extension of the Level 1 Radiology Oncology, new accommodation on Level 2, 'Meet and Greet' and Consulting Suite, Consulting suites and Ambulatory Care. The roof of Stage 1 will be developed as a vehicular arrival point for the CCCBDC and will re-establish limited on-grade hospital parking accessed via the Gate 6 entry off Avoca Street.

The design of the indicative Stage 2 envelope has been set by a number of factors including heights, setbacks, and spatial relationship to surrounding buildings and heritage buildings in the vicinity of the site. The Randwick Local Environmental Plan 1998 does not set any height, floor space or setback controls for the Prince of Wales Hospital Campus. In addition, there is no Randwick Development Control Plan (DCP) which sets height, floor space or setback limits for hospital buildings. In this instance DCPs do not apply to SSD applications and such controls would not be a relevant determination of future built form.

In absence of any statutory or policy height limits for the site, the indicative Stage 2 building envelope is a result of careful consideration of its context, responding to the necessary setbacks from adjacent buildings (Superintendent's Cottage / Edmund Blacket Building) while relating to the precedent building height, such as the neighbouring 10-storey 'Parkes' building and the 8 storey office building across High Street. **Figure 17** indicates the relationship of the proposed building height to surrounding buildings.

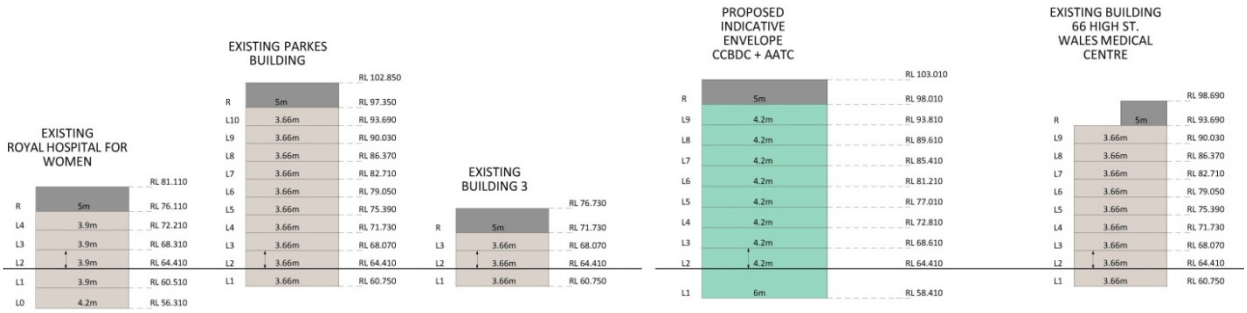

Figure 17 – Proposed Stage 2 envelope in context to surrounding buildings

The setback design of the CCCBDC building provide a ground plane space between the Stage 2 envelope and surrounding heritage buildings allowing courtyard space and circulation around the buildings as well as providing natural light into the Stage 1 CCCBDC Level 1 underground bunker. The upper floors provide the footprint required at Level 2 and Level 3 for the CCCBDC Meet and Greet and Consulting facilities.

The Stage 2 building footprint and conceptual design has the flexibility to be separated into two distinct areas, with a central circulation zone. The building has been designed to take advantage of views through the precinct from High Street to the Edmund Blacket Building and allow the Edmund Blacket Building and the Superintendent's Cottage to be viewed as a complementary set of buildings in their heritage context with a sympathetic curtilage.

The Stage 1 works have a crucial relationship to the operation of the overall development. The works will allow the ongoing operation of the existing Building 3 Radiotherapy Department, whilst delivering the key services of cancer treatment during the construction and the operation of the Stage 2 building. The proposed Stage 2 building form has been shaped in response to the clinical function of the CCCBDC and the response to patient needs and comfort through maximising view opportunities, natural light and courtyard open space.

6.2 Solar Access & Overshadowing

Shadow diagrams prepared by Rice Daubney at **Appendix B** illustrate the indicative shadows of the Stage 2 envelope. Minimal shadow impacts to surrounding land uses result from the proposed conceptual Stage 2 CCCBDC development.

The diagrams indicate that the building will not result in any overshadowing impact to surrounding land uses or heritage buildings during the mid-summer period. However, Avoca Street in part, a small section of the south western corner of High Cross Park, and the northern wing of the Edmund Blacket building will be overshadowed within the12pm to 3pm afternoon period in mid –winter.

Given that the proposed indicative envelope responds to the height and spatial context of the surrounding buildings, and will not result in the loss of solar access for nearby residents, the overshadowing caused by the proposal on the surrounding site will not result in an adverse impact.

6.3 Ecologically Sustainable Development

The environmental performance of the development has been assessed by using NSW Health requirements (TS-11); Clause 7(4) of Schedule 2 of the EP&A Regulations; Environmental Performance Guide for buildings; and Section J of the Building Code of Australia 2011. The initiatives and targets relate to the following aspects of the proposed development:

- Energy efficient electrical services;
- Mechanical services;
- Hydraulic services;
- Improved indoor Environmental Quality;
- Extended life through inherent flexibility and 'future-proofing' ;
- Electrical services with efficient lighting, lighting control and energy metering.
- Structural design; and
- Initiatives during construction and operation.

The fundamental ESD features considered in the proposed design include:

- Energy – Conservation and on-site generation;
- Materials – Reuse, Recycle and possess low embodied energy;
- Indoor environmental quality – adequate ventilation, day lighting and reduction of volatile organic compounds;
- Water – Rainwater harvesting and reuse; and
- Waste minimisation – during construction and operation, waste management strategies will be implemented to reduce the amount of waste going to landfill.

Furthermore, the proposed development is consistent with the five accepted principles of ESD described below.

Precautionary Principle

If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

The proposal is supported by environmental studies and technical reports which conclude that there are no environmental constraints that preclude the development of the site in accordance with the proposal, subject to appropriate management in future planning, design, construction and operational stages. It is considered that through adherence to the mitigation measures outlined in Section 8.0 the proposal will not result in serious impact to the environment.

Integration Principle

The integration principle holds that decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations. The design of the building has been development to integrate the short and long term effects of economic, environmental and social considerations for the acute health services to the Hospital.

Intergenerational Equity

The principle of inter-generational equity holds that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations. The proposal has been development to directly benefit current and future generations in that it contributes to the acute health services of the community without causing significant impact to the environment.

Biological Diversity

Under the biodiversity principle, the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making.
The development site does not contain any threatened or vulnerable species, populations, communities or significant habitats. Construction and ongoing operations of the facility will be managed in accordance with the Mitigation Measures, ensuring no significant indirect impacts on the surrounding environment.

Valuation and Pricing of Environmental Resources

Under this principle, improved valuation, pricing and incentive mechanisms and environmental factors should be included in the valuation of assets and services. The cost of infrastructure and measures to ensure an appropriate level of environmental performance on the site has been incorporated into the cost of development. In addition, the level of waste will be appropriately managed during the construction and the operation of the development. These measures have been incorporated into the cost of development.

6.4 Construction and Operation Noise and Vibration

A Noise and Vibration Impact Assessment Report has been prepared by Acoustic Logic and is included at **Appendix I**. The report considers the impact of noise and vibration to surrounding receivers during the construction and ongoing operation periods of the development.

6.4.1 Construction Noise

The report uses the Australian Standard AS2436:1981 *"Guide to noise control on construction, maintenance and demolition sites"* for guidance of noise levels and criterion controls. The following construction activities that may be sources of construction noise have been identified:

- Demolition of existing buildings;
- Removal of infill material;
- Excavation of soft sand and stone; and
- Construction of the proposed Stage 1 works for the CCCBDC development.

Based on the site location of the Stage 1 works, the potential affected receivers which may be affected during construction activities include the adjacent areas within the POWH site and surrounding residential areas.

The report recommends the following measures to ensure the impact of construction noise is minimised:

- The drafting of a noise management plan outlining all reasonable and feasible mitigation methods for the reduction of noise impact;
- The assessment of high impact equipment such as rock-hammers and piling equipment for lower noise producing methods of construction and excavation;

- The implementation of a complaints handling register and community consultation system;
- Education of workers (builders and contractors) in effective noise reducing techniques and site etiquette; and
- Operation of machinery in a quiet and efficient manner (i.e. turn off equipment when not in use).

The recommended construction noise goals to be used in the effort of minimising noise from construction related activities are set out in Table 1 of the Acoustic Logic report. The noise criteria for the resultant noise from construction activities are aimed at maintaining comfort levels within the surrounding residential dwellings.

6.4.2 Noise and Vibration

The excavation and demolition activities are the primary source of vibration generating sources. The vibration criteria associated with the Stage 1 works should not exceed the following standards set out below for the level of vibration criteria in order to ensure no architectural or structural damage to surrounding buildings and human comfort is maintained at the potentially affected receivers. The standards that have been used to measure the level of vibration are:

- German Standard DIN 4150-3 (1999-02): "*Structural Vibration – Effects of Vibration on Structures"*; and
- British Standard BS 6472:1992 "Guide to Evaluation of Human Exposure to Vibration Buildings (1Hz to 80Hz).

The above standards are widely used in association with construction activities within Australia. Tables 2 and 3 of the Acoustic Logic Report identify the recommended criteria for vibration impacts under the above Standards. The report concludes that the identified residential and commercial receivers are unlikely to be affected by and exceed the recommended criteria. However, as part of the construction program, vibration monitoring will be required to ascertain specific levels from individual plant items impacting receivers within the POHW Campus. Further, excavation in rock should be undertaken by using rock saws as opposed to pneumatic hammers and if piling is required, the use of augured vibro or auger piling should be used rather than impact piling.

The above recommendations have been incorporated within the mitigation measures outlined in Section 8.0 of this report.

6.4.3 Operational Noise

The Stage 1 works of the CCCBDC will be designed such that all operation noise during operation of the completed Stage 1 works will comply with the relevant Department of Environment, Climate Change and Water (DECCW) and Council noise level criteria.

The Stage 1 works include both temporary and permanent plants associated with the development. All plant noise levels will be designed to comply with the relevant noise level criteria.

Detailed plant selections have not been incorporated at this stage, as such a mechanical noise assessment will be conducted once plant selections and service drawings are finalised as part of the construction certificate. Based on similar developments, acoustic treatments are both possible and practical using treatments such as lining of ductwork, acoustic silences, variable speed controllers, time switches and acoustic screens.

6.5 Transport and Accessibility (Construction and Operation)

A Traffic Assessment Report has been prepared by Aurecon and is included at **Appendix J**. The report assesses the traffic impacts of the proposed development on the surrounding road networks, and the proposed traffic volumes, generation and parking.

6.5.1 Traffic Generation

A survey of the peak hour traffic volumes were undertaken on the following intersections:

- Avoca Street / High Street / Belmore Road; and
- Avoca Street / Cuthill Street.

The intersections' level of services were generally assessed as being acceptable during the morning and afternoon peak hour periods. These intersections are expected to continue at a an acceptable level of service during the construction and operation of the Stage 1 works, as it is envisioned that approximately five construction vehicle movements are expected to occur during peak periods and with only minimal amount of staff and patient numbers to increase, which in turn would have minimal impact to the traffic generation during peak periods.

6.5.2 Access

Service Vehicle Access

The existing cancer service vehicle movements and arrangements via Hospital Road will be maintained during the construction and operation of the Stage 1 development. All existing loading docks will be used for the new facility. There will be no increase in service vehicle movements for the Stage 1 development and construction works.

No changes to the emergency vehicle access during the construction and the operation of the Stage 1 development is proposed. The existing emergency vehicle access via High Street will be used and patients will be transported via the proposal tunnel connecting Building 3 and the Stage 1 development.

Construction Vehicle Access

The existing Avoca Street access arrangement at Gate 6 will accommodate Medium Rigid Vehicles entering and exiting the site. A High Rigid Vehicle will require multiple turns to turnaround with the car park and will need to reverse within the site and leave in a forward direction. The report recommends the following traffic management measures for the safety of staff, road users and visitors for the POWH:

- A Roads and Maritime Service (RMS) certified Traffic Controller should be present to manage traffic when trucks are reversing into and on the site and existing the site;
- A sign posting plan needs to be development to ensure pedestrian, construction vehicles, hospital traffic and other traffic are kept away from the construction area;
- The transporting of excavation materials to use tipper trucks to ensure turning movements within the site and access to the site without significant delays to other vehicles; and
- Remove the median and gatehouse located on the Gate 6 access of the POWH and replace with painted median to accommodate construction vehicle turning paths. The removal of the boom gates at the entrance to the car park in front of the Edmund Blacket Building is also required.

6.5.3 Parking

During the construction and operation of Stage 1 works, 59 car spaces will be temporarily lost within the staff car park in front of the Edmund Blacket Building and the majority of these spaces will be re-instated and replaced at a later stage following completion of Stage 2.

The report concludes that the parking loss is minimal compared to the overall parking spaces of some 2,240 provided on the hospital Campus. The loss of parking will impact staff vehicles only; it will not have an impact on the patients and visitors to the hospital. The report recommends the following measures to reduce the impact of lost staff parking:

- Provide alternative locations for the staff vehicles on a nearby off-site location (subject to separate party agreement);
- Allow staff to park hospital-owned cars at their home during night; and
- Undertake a detailed car parking study to assess the car park utilisation and to identify the locations where the removed parking spaces due to the construction and operation of the facility could be replaced.

6.5.4 Public Transport, Pedestrians and Cyclists

As the increase in traffic movement is predicted to be marginal during the construction and operation of the Stage 1 works, the proposed construction and operation activities would not impact the bus movements in the vicinity of the POWH.

The pedestrian access on Gate 6 on Avoca Street will be closed during the construction and operation of Stage 1 works. Pedestrians will be redirected to other pedestrian access points on Avoca Street and High Street. Cycle access will also be redirected to Gate 7 on Avoca Street. The diverted routes for pedestrian and cyclists will not impact the circulation of pedestrians and cyclist within the Campus site, as Gate 6 will only be temporary closed, and access along Avoca Street will still remain.

6.5.5 Draft Construction Traffic Management Plan

The Traffic Report includes a Draft Construction Traffic Management Plan (TMP). The Draft TMP has been prepared in association with the requirements of the *Road Act 1993*, *Occupational Health and Safety Act 2000* and the Australian Standard 1742-2009: Manual of uniform traffic control devices – Part 3, Traffic control for works on roads, Standards Australia.

The Draft TMP seeks to manage construction vehicle movements accessing and exiting the site through the course of the day. The following details of construction activities will take place for the duration of construction of the Stage 1 and Stage 2 projects:

- Construction vehicle access to the site would be via Gate No. 6 on Avoca Street and should be minimised during the morning and afternoon peak periods where possible;
- A 'Construction Zone' restriction will take approximately 14 months from August 2012;
- The staff car park area in front of the Edmund Blacket Building will be used for the construction vehicle access to the site. The car park will be closed during the construction of the development;
- Proposed construction hours are Monday to Friday 6.30am to 6pm and Saturday 7am to 4pm. Generally, no work will be undertaken on Sundays and Public Holidays;

- Approximately 5 deliveries of plant and material will occur during the morning peak period and 5 deliveries during the afternoon peak period;
- Delivery vehicles will predominately consist of medium rigid and concrete trucks. Deliveries to the site will take approximately 30 minutes, with some deliveries requiring longer time periods;
- All neighbouring properties are to remain accessible for both vehicle and pedestrian activities;
- Construction staff will be recommended to utilise public transport to access the site as parking availability is limited within and immediately adjacent to the POWH site;
- The number of construction vehicles will not exceed 20 vehicle trips per day; and
- All section of the road including kerb and footpath which may be damage by construction vehicles are required to be rectified at the cost of the contractor / developer following completion of construction period.

The measures provided above will be included into the Mitigation Measures at Section 8.0 of this report.

6.6 European Heritage

A Heritage Impact Assessment (HIA) has been prepared by Worley Parsons and is included at **Appendix H**. The HIA assesses the impact of the development on the surrounding heritage items and conservation areas.

The HIA was prepared with reference to the relevant legislative and statutory conservation planning controls including the relevant provisions of Randwick LEP 1998 and the requirements of the NSW Heritage Manual's '*Statement of Heritage Impact Guidelines.'*

As described in Section 2.2 of this EIS the development site is located within the High Cross Heritage Conservation Area, is located what is known as the 'Heritage Precinct' in the Hospital Masterplan. The site is also location within proximity to four heritage listed items identified within Randwick LEP 1998. These items include:

- Edmund Blacket Building;
- Catherine Hayes Hospital;
- Superintendent's Residence (Cottage); and
- Prince of Wales Hospital Gate and Fence.

The report assesses the impact of the Stage 1 works in relation to the visual impacts on the High Cross Heritage Conservation Area, the setting of the Edmund Blacket Building, the Superindendent's Cottage and the sandstone and wrought and cast iron picket fence constructed to the Avoca Street frontage of the Edmund Blacket Building.

The proposed works are not considered to adversely impact on either of the two heritage-listed buildings (Edmund Blacket and Superindendent's Cottage) in relation to their existing setting and spatial relationships or the heritage items and conservation areas in the immediate vicinity. All of the principle works associated with construction will be below the surface and the construction hoardings around the buildings will be temporary.

In relation to the Gate along Avoca Street, the report recommends the dismantling in sections (at each joint), with each section numbered with a plan to be prepared for re-assembling and re-erection at an appropriate point at the completion of the Stage 2 works.

The proposed indicative building envelope for Stage 2 has also been assessed to address any potential issues of the building on the heritage listed items. The proposed indicative building envelope has been formulated by the form and scale of the Parkes Building on its south western corner and the commercial building on its northern edge on High Street as well as the Design Principles informed by the Conservation Policies of the Conservation Management Plan (CMP).

The indicative envelope takes into account the spatial relationships of the proposed envelope with the Edmund Blacket Building, Superintendent's Residence and the open space setting which constitutes the context and setting for Stage 2. It also has regard to the relationship of Stage 2 in its completed form with the heritage items and heritage conservation areas in the vicinity. As can be seen from **Appendix B,** an important aspect of the indicative envelope is that it preserves those spatial relationships. In this respect, the report concludes the envelope is appropriate and is supported on heritage grounds.

6.7 European Archaeology

Casey and Lowe has provided an assessment of the European Archaeology of the development site. The report is included at **Appendix K.**

The report indicates that there was no substantial known occupation within the study area until 1858 and the main structures of the Superintendent's Residence and the Edmund Blacket Building are still extant. The Stage 1 development area has the potential to contain remains of well / cisterns, cesspits and rubbish pits, however the impacts in this area appear to be limited due to making of a bitumen car park. These remains if found or in existence have the potential to be of local significance only.

The report makes the following recommendations:

- An archaeological research design and appropriate methodology will need to be written to guide any archaeological program for the site;
- Testing to determine the presence or absence of archaeological remains may be undertaken but not removed prior to the approval of the SSD application by the Minister of Planning and Infrastructure. A report outlining the results of the testing will be required;
- A S140 application to the Heritage Branch, OEH could be undertaken to apply for works to excavate, record and remove the remains prior to the SSD approval;
- A report is to be written outlining the results of the archaeological program. Should artefact deposits be found, catalogue and analysis is to be established as part of the archaeological reporting in accordance with the Heritage Council guidelines; and
- A qualified archaeologist that holds a permit under the Heritage Council will need to direct the archaeological program.

It should be noted that a s139 permit under the *Heritage Act 1977* is not required for an SSD application, therefore a s140 application to the Heritage Branch will not be undertaken for these works.

The above measures are further addressed within the Mitigation Measures in Section 8.0.

6.8 Indigenous Heritage

Mary Dallas Consulting Archaeologists has provided a preliminary Aboriginal Archaeological Assessment Report which is included at **Appendix L**. The report assesses the development site to have low Aboriginal archaeological significance due to the rarity of archaeological evidence located within the broader dune and swamp landscape of the eastern suburbs. The survival of any such remains will be intimately linked to the location of previous historical disturbance, particularly of service infrastructure and cannot be determined accurately without removal of the car park asphalt, service trenches and overlying fill layers.

The report recommends the best means of establishing the survival or otherwise of deposits with Aboriginal archaeological potential, through the archaeological monitoring of the removal of the service infrastructure through phase of the Stage 1 works. This monitoring process would provide an appropriate opportunity to confirm whether any original soil horizons are present, their level of intactness and lateral extent, and likely archaeological potential.

Should no deposits with archaeological potential be found during this monitoring process, there would be no requirement for any additional Aboriginal archaeological works. However, if deposits with archaeological potential are identified, further investigations in a manner appropriate for the level of significance of the deposit should be undertaken.

A methodology for the monitoring and investigations is to be devised in accordance with the results of the archaeological monitoring of service infrastructure removal. This should be developed in conjunction with any proposed Historical archaeological excavations and in consultations with the La Perouse Local Aboriginal Land Council and according to applicable guidelines and industry best practice. These recommendations have been addressed within the Mitigation Measures in Section 8.0.

6.9 Tree Removal

An arborist report has been prepared by Moore Trees arboricultural services and is included at **Appendix F.** The report provides an assessment of all trees located either within or adjacent to the proposed development footprint and includes measures to protect trees to be retained.

The report identifies 20 trees in the location of the CCCBDC development site, including the development site of the Stage 2 works. It is noted that the report only takes into account the trees that fall under the Randwick Council Tree Preservation Order (TPO) 2005. No tree or shrub under the height of six (6) metres has been considered in accordance with the TPO. On August 2007 Council adopted a Significant Tree Register which identifies and recognises the important of significant trees in the Randwick landscape, and guides their management to ensure their protection for future generations. The only trees on this Register near the site are located to the south of the site's boundary, and will not be affected by the proposed works.

Of those 20 identified trees, 12 trees are required to be removed to facilitate the development (refer to **Figure 18**). The report confirms that that the trees are not significant and removal is warranted. Proposed re-planting will be incorporated within the overall landscape design at the Stage 2 development for the CCCBDC.

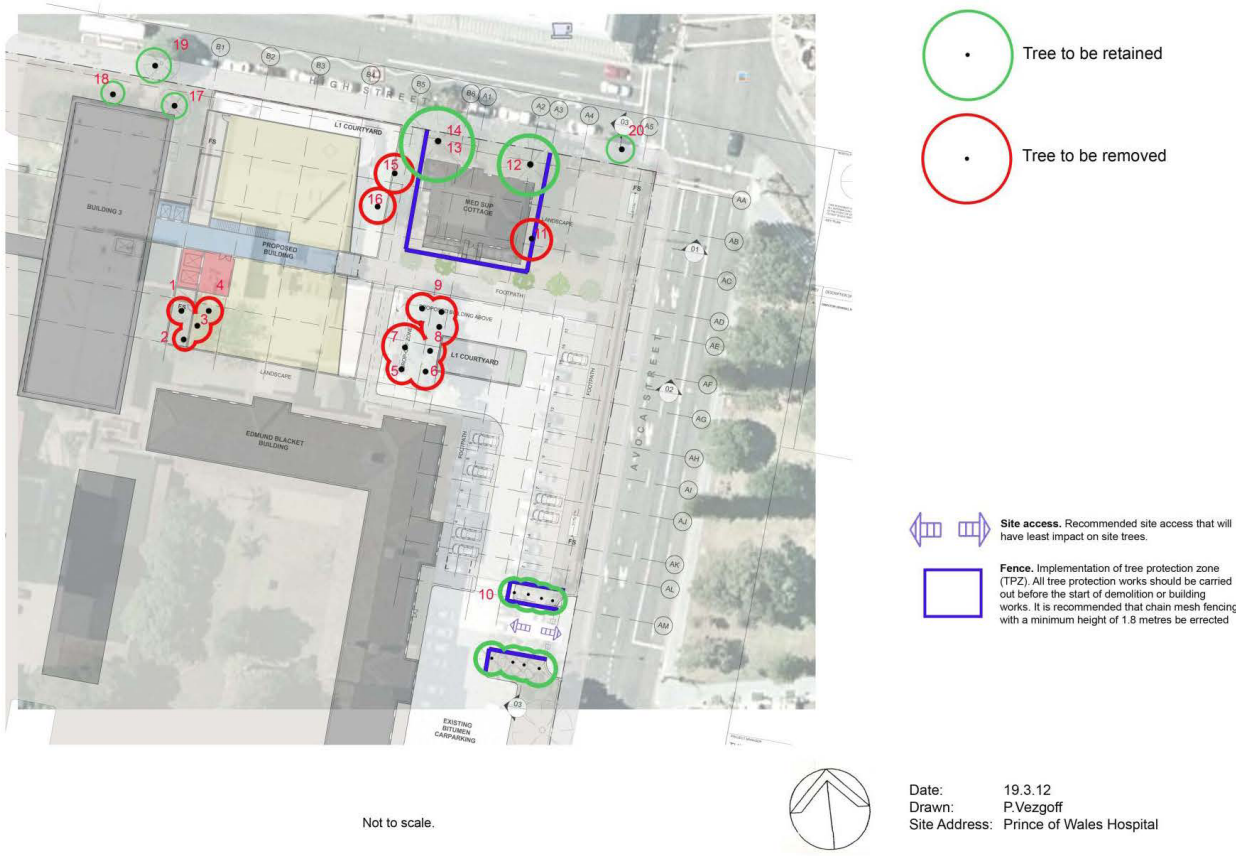

Figure 18 – trees proposed for retention and removal

Eight trees are required to be retained. A group of mature Bangalow Palms create a formal entry to the staff Hospital car park and will require protection fencing during works (trees marked as 10 within the report). Further, the report recommends the three trees (marked 12, 13 and 14 within the report) located between the stone building and the boundary fence during works also require tree protection fencing as specified within the report.

Protective fencing for the retained trees has been incorporated within the Mitigation Measures in Section 8.0 of this report.

6.10 Operational Management

DGR No. 9 requires the details of the operational management of the Stage 1 works in relation to noise from plant and equipment, radiation, chemical and biological hazards, emergency and evacuation procedures and the lighting and signage associated with the development. Noise assessment has been considered and an assessment is provided at Section 6.3 of this report. The other matters are considered below.

In addition, the DGR requires the ongoing operation of the hospital services on the site to be appropriately relocated during construction of Stage 1 and identifying how the development will be appropriately amalgamated on site prior to Stage 2 works commencing.

6.10.1 Radiation, Chemical and Biological Hazards

Radiation Services Group has provided an assessment report on the Radiation Shielding and design goals for the proposed linear accelerator bunkers, orthovoltage room and the Hot Lab. The report is included at **Appendix M**.

The linear accelerators and orthovoltage units are artificial x-ray sources, only generating (as opposed to storing) ionising radiation while in operation. In addition, the Hot Lab will be used to store and dispense short-lived radioisotopes intended for medical uses. As these will be stored in appropriately shielded containers which allow the lab itself to be occupied, the dose-rates to the external area from sources within the Hot Lab will be negligible.

A system of weighting factors is used to account for the different rates of radiation generated by different uses, allowing an 'equivalent dose' to be calculated. The metric measure for radiation dosage is measured in Sieverts (Sv) and is the equivalent dose that regulatory authorities use when specifying dose-limits to limit the potential negative effects of radiation equipment.

For the Stage 1 works, the Office of Environment and Heritage (NSW EPA) dose-rate limitations have been applied which set a dose limitation for members of the public of 1mSv per year (/yr). Typically, a person within Australia is subject to doses of approximately 1 to 2 mSv/yr from naturally occurring 'background' radiation.

The shielding design for the radiation barriers within Stage 1 have been designed to achieve a goal of 0.5mSv/yr which is half the allowable dose-rate for members of the public. The shielding for the bunkers' controlled areas (areas predominately occupied by radiation workers) have been designed with a goal of 2mSv/yr assuming a conservative full occupancy at all times. The prescribed dose limitations are provided in **Table 2** below which demonstrate that the proposed linear accelerator bunkers will not produce any significant level of radiation (even with all four future bunkers operational concurrently).

Table 2 – Radiation shielding design goals

	EPA Prescribed Dose-Limit	Project Design Goal
Members of the Public	1mSv/yr	0.5mSv/yr
Occupationally Exposed Persons	5mSv/yr	2mSv/yr

The design of the linear accelerator bunkers and orthovoltage rooms employs concrete construction. Steel will be used for this project to strategically reduce the space consumed by the bunker shielding. This will reduce the height of the primary shielding barriers, which will in turn reduce the required excavation depth.

The radiation bunkers will be adequately shielded and as evident from **Table 2** above, the design goals will produce less than half the allowable dosage rate that is set by the NSW EPA. Further, the design of the bunkers and linear accelerator bunker shielding has been design to comply with the guidelines of the U.S. National Council on Radiological Protection.

Further detail on the chemical and biological hazards in association with the development is further discussed in Section 6.14 of this report.

6.10.2 Lighting and Signage

NDY has provided a statement (refer to **Appendix N**) that details the lighting requirements for the proposed development. The statement confirms the design of all new outdoor and emergency lighting for the CCCBDC will comply with the relevant Australian Standards for pedestrian area lighting and the control of the obtrusive effects of outdoor lighting.

Further, way-finding signage will be installed with the proposed development and will be designed in regards to the following objectives:

- Provide efficient and effective guidance around the hospital and its site with improved amenity for patients, visitors and staff;
- Will be fully integrated with each development stage in planning, design and construction phases;
- Give a clear identity and character to the hospital and be sympathetic to architectural and interior design;
- Comply with all relevant requirements in legislation and government policies;
- Provide a clear identity for all users of the facility, including persons with disabilities;
- Comprise durable, vandal resistant and minimal maintenance materials and elements;
- Include temporary signage during the construction period; and
- Be equal to and consistent with the coordinated way-finding and signage existing on the Campus site.

6.10.3 Emergency and Evacuation Procedures

In accordance with the POWH Operational Policies, in an event of an emergency or security situation, staff will be trained to call 777. The security response to the 777 call will be in accordance with the SESIH PD067 Security - people and property and the NSW Health PD2005_339 Protecting People and Property; NSW Health Policy and Guidelines for Security Risk Management in Health Facilities; and the Randwick Hospitals Campus – Critical Operations Standing Operating Procedures.

All emergency exits will be clearly identified with exit doors and stairs will be appropriately alarmed. As part of the Stage 2 works, a duress alarm will be included as part of the design of the permanent nurses' station in the Stage 2 building.

6.10.4 Operation of the Hospital During Stage 1 Construction

The CCCBDC Stage 1 works involves the establishment of a new Radiotherapy / Oncology department on Level 1 (Underground) and associated links to existing Buildings 2 and 3. The below grade Level 1 accommodation (linked to existing Building 3) includes four (4) bunkers along the north eastern site line. Three bunkers will be fitted out with linear accelerator machines (1 new and 2 existing). The empty fourth bunker provides for machine replacements over time and also to provide capacity for new technologies to be introduced easily in the future.

The Stage 2 works involve the excavation and construction of the remainder of Level 1, and the construction of a nine-level building plus roof plant level above.

The project has been staged appropriately to allow the continued operation of the current hospital services with minimum interruption. This has been achieved through continuing the operation of the existing Radiotherapy Department (Building 3) and providing an underground passage to connect the existing Building to the new bunkers. Once the construction of Stage 2 CCCBDC commences, the existing radiotherapy bunkers within Building 3 will be demolished.

During Stage 1 it is proposed to use the control console for Bunker 4 as a temporary nurses' station / work area until Stage 2 works is complete. The decanting and allocation of office space will be determined by operational need; only those staff who need to be located in / adjacent to the treatment areas in order to carry out their work will be re-located within Building 3 during Stage 1, in proximity to the treatment areas. The staff that do not require co - location with cancer services, may be assigned temporary office space outside the current cancer services precinct during the construction of Stage 2.

6.11 Building Code of Australia

A Preliminary Building Code of Australia (BCA) Report has been prepared by McKenzie Group Consulting and is included at **Appendix O**. The report reviewed the preliminary architectural plan and assesses the compliance of Level 1 and the tunnel with the BCA 2012. McKenzie Group confirms that the proposed development is classified as Class 9a (Hospital) and will be capable of providing the relevant deemed to satisfy criteria, subject to the following matters:

- The travel distance from the bunkers to point of choice exceeds 20m;
- Travel distance from the plant room, making allowance for plant room fit-out exceeds 20m;
- Travel distance to required exits exceeds 40m.

The above matters will require further detailing such as architectural design specifications and services design and verification from a suitably accredited fire engineer prior to the issue of the Construction or Crown Certificate. In addition, the recommendations of the BCA report have been incorporated within the mitigation measures outlined in Section 8.0 of this report.

6.12 Fire Engineering

A Fire Engineering Brief has been prepared by NDY (**Appendix P**) which assessed the Fire Engineering design approach for the Stage 1 development. The report notes the non-conformance design in relation to the travel distances in the bunker area. The exceeded distance is considered reasonable in this instance as the bunkers will be well managed and operated by trained staff.

The report makes the following recommendations for the key Fire Engineering components in the design:

- Automatic fire detection;
- Automatic fire suppression ;
- Mechanical air handling system;
- Building occupant warning system;
- Emergency lighting;
- Exit signs;
- Fire hydrant system;
- Portable fire extinguishers;

- Emergency training for staff;
- Management procedures – procedure emergency evacuation procedures in an event of a fire.

The above measures have been included within the Mitigation Measures at Section 8.0. With these measures implemented in the design of the Stage 1 development, the building will provide an adequate level of fire safety systems for the use and the function of the building.

6.13 Waste

The following indicates the procedures to be implemented to manage waste through the construction and operational phases of the development. A detailed Waste Management Plan as part of a Construction Management Plan will be prepared prior to the commencement of works, (as reflected in the Mitigation Measures at Section 8.0). It should be noted that that construction waste will be handled according to industry best practice and operational waste management will be incorporated into the POWH existing systems.

6.13.1 Operational Waste

The existing hospital currently generates a number of streams of general waste. The Stage 1 works will not generate any new streams of waste, rather more waste will be generated in each of these existing streams.

All general waste will be bagged in accordance with Infection Control Universal Precautions and held in bins in Disposal rooms awaiting collection by POWH staff. Clinical waste will be bagged and sharps contained, clearly identified by yellow colour coding in accordance with Universal Precautions, and held in a secure area until collected by POWH staff.

Cytotoxic waste will be bagged and sharps contained in a mobile waste bin within a secure area clearly identified by purple colour coding in accordance with Workcover guidelines for the management of Cytotoxic substances.

Patients receiving cytotoxic drugs whilst in the radiation oncology treatment area and/or building 3 will be escorted with a cytotoxic spill kit and related waste will be managed in accordance with:

- POWH Cytotoxic Medication Administration and Handling Business Rule.
- Workcover NSW, Cytotoxic Drugs and related waste risk management guide 2008.
- Randwick Hospitals Campus - Critical Operations Standing Operating Procedures (COSOPs).

The frequency of waste collection by POWH Cleaning Services may need to be reviewed during the operation of Stage One, and increased to two collections per day depending on need.

6.13.2 Construction Waste

No major demolition is required to accommodate the Stage 1 works. Any material that cannot be recycled or reused will be disposed to an approved landfill facility. A Construction Waste Management Plan will be prepared by the proponent prior to the commencement of construction works.

Waste will be minimised during construction and that generated will be separated to maximise recycling. The highest waste production period will be during the construction of the structure. This will be approximately 20 weeks and will generate approximately two by $10m^3$ bins per week.

6.14 Hazards

SKM has provided a Preliminary Hazard Analysis Assessment in accordance with *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development* (SEPP 33) (see **Appendix G**). SEPP 33 requires an assessment of hazardous materials undertaken as a Preliminary Hazard Analysis (PHA) that involves a screening method based on the quantities of dangerous goods on a site, the storage and transportation of the waste or dangerous goods to assist in determining if a development is likely to be a potentially hazardous industry.

The assessment identified the classes and quantities of all dangerous goods and waste to be transported, used, stored or produced by the Stage 1 proposal. Table 1 within the report lists the quantities of dangerous goods associated with the Stage 1 works.

The report indicates that there will be no additional radioactive waste generated by the proposal, and an assumption of 0.5 tonnes clinical waste produced, stored and transported to the site. When comparing these types, quantities and storage of dangerous goods and waste against the General Screening Threshold Quantities provided in Tables 2 and 3 of the report, the Stage 1 development falls within Class 6.2 (Clinical Waste) and Class 7 (All waste i.e. Radioactive waste) of the screening threshold.

Accordingly, Clause 12 of SEPP 33 triggers the need for a Preliminary Hazard Analysis (PHA) to demonstrate the proposed waste generation, storage and transportation complies with the Australian codes and Health requirements.

The report concludes that given the existing POWH procedures in place, the inherent risk of dangerous goods and waste to the community is regarded as low. However, the SEPP 33 guidelines prepared by the DoPI requires the proponent contact the DoPI for advice on the frequency of transport movements, and the quantity of wastes stored as a result of the Stage 1 works. This has been undertaken as part of the submission of this EIS.

6.15 Infrastructure and Utilities

Electrical and Telecommunications

The electrical service works required for Stage 1 development include power systems, lighting, emergency lighting and illuminated exit signage, Uninterrupted Power Supply (UPS), emergency power generator and clocks.

NDY has prepared an Electrical and Telecommunications statement (refer to **Appendix Q**) that confirms there is sufficient electrical infrastructure for the site to be serviced.

In consultation with Ausgrid, the current electrical strategy requires no additional temporary works for the Stage 1 development outside of that required for temporary builder's power supplies.

The communications services for the development involve the construction of a new Main Communication Room (MCR). This room will additionally serve as the MCR for the future Stage 2 building.

Security Systems will include Electrical Access Control and CCTV coverage. These systems will form an extension of the existing site-wide security system and will be integrated to allow for monitoring from the existing Security Control Room.

NDY has advised that Telstra has not been contacted as the communications services will be derived from the existing hospital infrastructure.

Natural Gas

NDY has also prepared a statement that assesses the gas supply to the site (provided at **Appendix R**). The statement confirms a new supply of natural gas to the CCCBDC development will be proposed from a separate authority infrastructure connection from an adjacent gas authority supply network. NDY has had preliminary discussions with Jemena and it is understood that the locations for gas will be connected either from High or Avoca Streets.

Water

As described in Section 3.7 of this EIS, the existing 200mm diameter water main located within Avoca Street to the east of the development site is available for connection and has sufficient capacity for the development. SPP has prepared a statement, included at **Appendix S,** which confirms consultation with Sydney Water Corporation.

In regards to the wastewater sewer main, the existing 225mm diameter sewer main located to the south of the development and within the hospital campus is available for connection and has sufficient capacity to serve the development. However, the location of the Stage 1 development conflicts with the location of a section of this sewer main. This section of the sewer main can be disused with minor alterations to the existing house drainage services from the Edmund Blacket Building and the Superintendent's Cottage.

6.16 Water Cycle Management

The Structural Engineering Report prepared by Sinclair Knight Merz (SKM) (refer to **Appendix T**) addresses the water management and stormwater drainage for the Stage 1 development site. The system includes the following elements:

- Provision of a new drainage system (as described in Section 3.5 of this report) to discharge into Council's drainage system, with limited flows to the system, not requiring a significant adjustment to the existing system;
- On-site detention to balance the pre and post development flows;
- The provision of suitable water quality devices such as rainwater tanks and Gross Pollutant Traps for on-going water quality;

As previously described, the site is not identified as being flood prone land. Accordingly, further flood investigations are not required to be undertaken. It should be noted that the Stage 1 habitable buildings are located underground and all habitable areas will be located at a minimum of 300mm above the 100 year ARI overland flood level.

6.16.1 Sediment, Erosion and Dust Controls

The SKM report details the measures and procedures to minimise and manage the generation and off-site transmission of sediment, dust and fine particles and provides a concept erosion and sediment control plan included at **Appendix T**. Further to the SKM report, the preliminary Construction Management Plan will address the guidelines and policies for *Managing Urban Stormwater – Soils & Construction Volume 1 2004 (Landcom).*

The nature of the excavation in the sandstone will require dust control, likely through the use of sprinklers. Groundwater will require a sedimentation tank before the water is discharged to the Council drainage system.

No works are proposed to encounter the regional water table during excavation works; as such no water will be excavated from the water table. The only water removed from the development site will be water entering the site through seepage of the rock face.

As no water will be extracted from the water table, an aquifer interference approval is not required under section 91 of the *Water Management Act 2000*.

6.17 Structural Design

The Structural Engineering Report by SKM (**Appendix T**) assesses the Stage 1 structural design.

The proposed structure of the underground radiation bunkers and associated clinical areas, together with the underground tunnel access, comprises of the following structural materials:

- Reinforced concrete roof slab with steel plates for radiation shielding;
- Reinforced concrete and core-filled;
- Reinforced masonry walls;
- Ground bearing reinforced concrete base slap and localised pad strip footings bearing onto rock;
- Heavy section reinforced concrete bunker elements housing the Linear Accelerators; and
- Reinforced concrete ground bearing base slap, blockwork walls and reinforced concrete columns and rood slab for the access tunnel.

The design of the structure incorporates drained cavities to the perimeter of the building to assist in the waterproofing of the structure. Where the building layout and site constraints allow, this cavity is to be a minimum of 800mm wide to allow for access and maintenance. This 800mm width will also allow for access for the erection of formwork for the construction of the concrete walls. Where the 800mm is not achievable, a 300mm wide drained cavity is proposed with access panels in the adjacent walls to allow maintenance.

In addition, the proposed excavation of the rock around the boundaries of heritage buildings will be further investigated at the time of excavation to assess if the required support of the buildings.

6.18 Contamination

A Preliminary Phase 1 Contamination Report prepared by Douglas Partners (refer to **Appendix E**) presents the findings of potential contamination of the site based on past and present site use.

Based on limited sampling, preliminary results indicate that there is generally a low risk of soil or groundwater contamination within the site and is considered generally suitable for the proposed development. However, given the limited nature of the investigations, the report makes the following recommendations:

- Any filling or natural soils / bedrock requiring removal from the site must be initially waste classified in accordance with the *NSW Waste Classification Guideline* (2009). This should preferably be completed *ex situ*;
- A hazardous materials inspection should be carried out on the buildings to be demolished and / or renovated as part of the project; and
- Upon demolition of the existing buildings, an inspection of the ground surface should be carried out be a qualified occupational hygienist or environmental consultant to assess the potential for asbestos contamination.

These recommendations are incorporated as Mitigation Measures with Section 8 of this report and will be undertaken on site where relevant.

6.19 Construction Management Plan

A preliminary Construction Management Plan (CMP) will be provided by the managing contractor on the development site. The CMP will provide measures to control and mitigate potential impacts by undertaking the following:

- Operations of site management in accordance with legislative requirements, hours of construction works and appropriate fencing;
- Mitigation measure to minimise amenity and environmental impacts through noise, dust management, odour control, vibration management and soil and erosion control;
- Appropriate waste management procedures;
- Traffic management for construction vehicle movements accessing and exiting the site; and
- The implementation of NSW Groundwater Policy Framework and Groundwater Quality Protection Policies.
- *Approved Methods for the Modelling and Assessment of Air Pollutant in NSW (EPA;*

The details of the hours of operation for construction and the recommendations of the draft Traffic Management Plan and Sediment and Erosion Plan will be included in the Mitigation Measures at Section 8.0 of this report.

6.20 Social and Economic Impacts

The Stage 1 CCCBDC project including bulk excavation works, four new underground radiation bunkers at Level 1, the construction of a staff access tunnel to connect the new treatment bunkers to the existing Radiotherapy building and an open fire stair at the north east corner of the site will have a positive impact to the social and economic benefits for the region, including:

- Improving the quality of cancer and blood disorder treatment service facilities available to the public within the Metropolitan region;
- increase in equitable and affordable access to radiotherapy treatment services;
- Improved healthcare and quality of life outcomes;
- Increased employment during construction and operation; and
- Increased education and training opportunities.

7.0 Conclusion and Justification of the Proposal

The Environmental Impact Statement (EIS) has been prepared to consider the environmental, social and economic impacts of the proposed Stage 1 Comprehensive Cancer Care and Blood Disorder Centre (CCCBDC). The EIS has addressed the issues outlined in the Director-General's Requirements (**Appendix A**) and accords with Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* with regards to consideration of relevant environmental planning instruments, conceptual above ground built form, social and environmental impacts including traffic, noise, construction impacts and stormwater.

It is considered the project warrants approval for the following reasons:

- The proposal is consistent with the principles of ecological sustainable development as defined by Schedule 2(7)(4) of the *Environmental Planning and Assessment Regulation 2000* (refer to Section 6.21);
- The area and shape of the site allows for the provision of a new CCCBDC hospital building that meets the special design requirements for specialised cancer treatment and blood disorder care whilst not resulting in any significant adverse impacts on surrounding buildings and taking advantage of decanting existing services to the new building with minimised interruptions to the hospital;
- The development will not have a significant impact on the traffic generation or the patient and visitor parking and provides a draft Traffic Management Plan to appropriately manage construction vehicle operation;
- The environmental investigations of the site and soil conditions demonstrate that the proposed use and design of the building is suitable for the site.
- The development will not generate a significant impact on the general waste and hazardous waste to the Hospital; and
- The provision of a new and modern hospital building will further support and strengthen the medical services for the area.

Given the planning merits described above, and significant public benefits proposed, it is requested that the Minister approve the application.

8.0 Mitigation Measures

The collective measures required to mitigate the impacts associated with the proposed works are detailed in **Table 3** below. These measures have been derived from the previous assessment in Section 6.0 and those detailed in appended consultants' reports.

Table 3 – Mitigation Measures

Mitigation Measures
Traffic and Access (Construction and Operation) ▪ Traffic, access servicing and layout arrangements are to be in accordance with the Traffic Report by Aurecon (March 2012). ▪ The draft Traffic Construction Management Plan is to be finalised and recommendations are to be employed.
Geotechnical and Contamination ▪ Detailed design is to incorporate the recommendations of the Phase 1 Contamination Assessment (prepared by Douglas Partners March 2012). ▪ Detailed excavation design is to incorporate the recommendations of the Structural Engineering Report (prepared by SKM March 2012).
Operational Management ▪ Detail design must incorporate the noise attenuation measures outlined in the Acoustic Report prepared by Acoustic Logic. ▪ Detail design must incorporate the measures for radiation mitigation outlined in the Radiation Report prepared by Radiation Services Group March 2012.
Heritage ▪ Works must incorporate the recommendation of the Heritage Impact Statement prepared by Worley Parsons March 2012. ▪ Excavation works must incorporate the recommendations of the European Archaeological Assessment report prepared by Casey and Lowe March 2012, however it is noted that a s139 permit under *Heritage Act 1977* and a s140 application to the Heritage Branch will not be required for a SSD application. ▪ Excavation works must incorporate the recommendations of the Aboriginal Archaeological Assessment report prepared by Mary Dallas Archaeologist.
Building Code of Australia (BCA) / Fire Statements ▪ The recommendations of the BCA and Fire Compliance Statements or Crown is to be employed before detailed design and the release of a Construction Certificate.
Construction Noise and Vibration ▪ The recommendations of the construction noise and vibration report prepared by Acoustic Logic March 2012 are to be employed.
Stormwater ▪ The recommendations of the Structural Engineering Report prepared by SKM March 2012 are to be employed for stormwater control.

Mitigation Measures

Construction Management Plan

- A Construction Management Plan is to be prepared by the Managing Contractor prior to the works commencing on site. Measures to control sediment and erosion control, noise, odour tree protection and construction waste are to be implemented.

Ecologically Sustainable Development (ESD)

- The Stage 1 works and detail design must incorporate the Environmental Sustainable Design Principles.