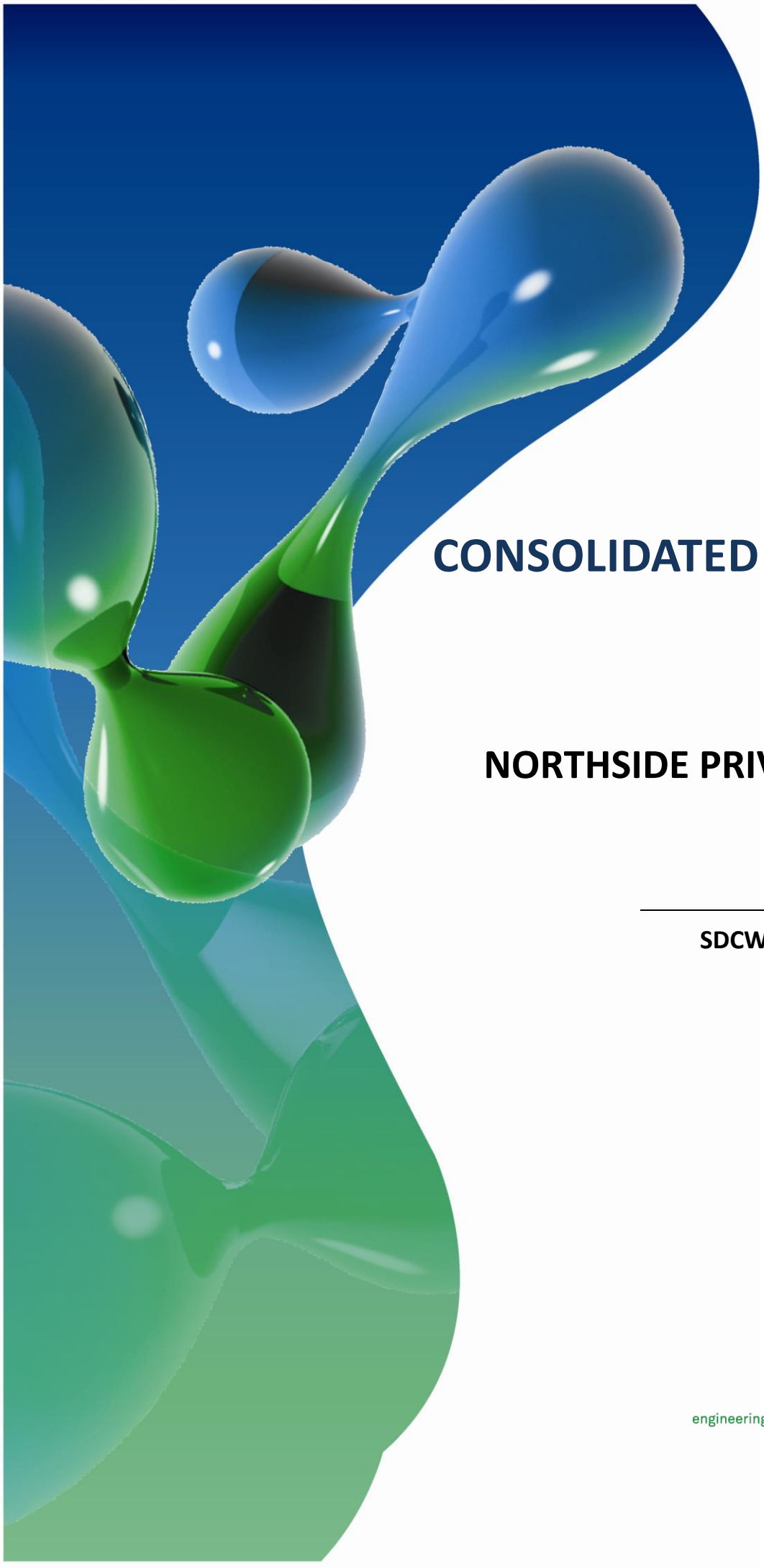


CONSOLIDATED ESD REPORT

NORTHSIDE PRIVATE HOSPITAL

Gosford, NSW

SDCW0101-Northside Private-Hospital ESD-RP002

Report Date: 28/07/2020

Umow Lai

engineering sustainable environments

REPORT AUTHORISATION

PROJECT: Northside Private Hospital

Gosford, NSW

Date	Rev	Comment	Prepared by	Checked by	Authorised by
29/03/19	0	Draft for comment	AC	DA	PE
30/08/2019	1	Final issue for SSDA submission	AC	DA	PE
28/07/2020	2	Consolidated ESD Report	AC	DA	PE

Melbourne Office
10 Yarra Street
South Yarra VIC 3141
Australia
Tel: +61 3 9249 0288
Fax: + 61 3 9249 0299
Email: ulmelb@umowlai.com.au
Web: www.umowlai.com.au

Sydney Office
Level 7 657 Pacific Highway
St Leonards NSW 2065
Australia
Tel: +61 2 9431 9431
Fax: +61 2 9437 3120
Email: ulsyd@umowlai.com.au
Web: www.umowlai.com.au

Brisbane Office
123 Charlotte Street
Brisbane QLD 4000
Australia
Tel: +61 7 3210 1800
Fax: +61 7 3210 1799
Email: ulbris@umowlai.com.au
Web: www.umowlai.com.au

CONTENTS

1.0 INTRODUCTION

1.1 GENERAL

This ESD Report has been prepared by Umow Lai on behalf of Northside Private Hospital (the 'Applicant'). It accompanies an Environmental Impact Statement (EIS) prepared in support of State Significant Development Application SSD-10159 for the development of Northside Private Hospital medical precinct at Racecourse Road, Gosford, NSE (the 'Site').

The purpose of this ESD Report is to outline the measures that are proposed to be implemented to minimise consumption of resources, energy and water, and to demonstrate that the project would meet or exceed minimum building sustainability and environmental performance standards.

The sustainability initiatives proposed for the development including water and energy efficiency initiatives are in addition to the minimum compliance requirements of the BCA (i.e. Section J).

As a result of the sustainability initiatives discussed within this report, the Northside Private Hospital development is expected to achieve a high level of environmental sustainability.

1.2 PROJECT DESCRIPTION

The following aims and objectives have been identified as forming the basis of the proposed development of the subject land to accommodate the proposed private hospital:

- Deliver a new private hospital to meet the significant demand that exists in the Central Coast;
- Design the site to create a high-quality hospital for both staff and patients;
- Respond to the current and projected growth of Gosford and the Central Coast with the delivery of a private hospital;
- Ensure minimal environmental impact; and
- Ensure development is compatible with surrounding development.

The proposal seeks approval for the redevelopment of the site to construct Northside Private Hospital. Specifically, the proposed private hospital would include; medical suites, in-patient units, general practitioner clinics, radiology rooms, intensive care unit and operating theatres. Further to this, the proposed private hospital will incorporate ground floor retail units and associated mezzanine level, ground floor and basement car parking. The proposed private hospital would comprise of 24,844m² of gross floor area (GFA).

1.3 REFERENCED STANDARDS

This report has been undertaken with reference to the following:

- Clause 7(4) Schedule 2 of the Environmental Planning and Assessment Regulation 2000 (EP&A Regulations)
- NCC 2019 Building Code of Australia – Volume 1
- Gosford City Centre Development Control Plan 2018 (GCC DCP)
- SEARS & CSIRO Requirements

1.4 SOURCE DOCUMENTATION

The project's architectural documentation has been used in preparation of this report. Inputs have also been coordinated with all relevant Consultants.

1.5 LIMITATIONS OF THIS REPORT

Due care and skill has been exercised in the preparation of this report.

The purpose of this ESD Report is to outline the measures that are proposed to be implemented to minimise consumption of resources, energy and water, and to demonstrate that the project has been assessed against a suitable accredited rating scheme, as detailed within the EIS. It should be read in conjunction with the current project documentation and specific applications may vary during the design development of the project.

No responsibility or liability to any third party is accepted for any loss or damage arising out of the use of this report by any third party. Any third party wishing to act upon any material contained in this report should first contact Umow Lai for detailed advice which will take into account that party's particular requirements.

2.0 CUSTOM SUSTAINABILITY RATING

2.1 CERTIFICATION

When assessing the suitability of sustainability certification schemes, each project must be assessed on a case by case basis. Certification schemes were predominately created for office buildings and have since been expanded to other sectors. As such, there are certain sectors and areas where the overlap between the certification scheme and the proposed development do align perfectly.

As can be seen in the healthcare sector, there are very few formally certified Greenstar projects - yet this does not mean healthcare buildings are not vying for high environmental performance. Healthcare projects often face substantial budget constraints due to the significant cost of equipment and fit out. As the Green Building Council has demonstrated, the extra over for achieving Green star is in the region of 0.5 – 2%[1] of the project budget - depending on the targeted rating. In a commercial context this is a cost that can be reclaimed by higher rental yields and improved productivity in workforce performance. However, in a healthcare context, this is a cost that must be absorb by the project team, which could be spent on the wellbeing of patients in care.

2.2 SUSTAINBILITY STRATEGY

With this in mind Northside are intent on demonstrating high levels of sustainability through a custom process for this Project. A process that will incorporate sustainability initiatives and ensure governance is upheld but at a reduced cost of certification to ensure the money is allocated to initiatives rather than the process.

It is the intent for this project to adapt the Green Star framework and to demonstrate compliance (functionality constraints considered) via an independent sustainability professional review process. Verification of the targeted initiatives will be achieved through a two-step process via an independent suitable qualified professional.

The process will incorporate a review of design and sign off that the initiatives are included; followed by a subsequent review of the final documentation at Practical Completion (PC), to ensure the initiatives have been embedded in the project.

The strategy is outlined in the following section.

[1] Green Star in focus: The business case

3.0 SUSTAINABLE FRAMEWORK

This framework identifies the project pathway to sustainable performance. Specifically, the key principles underpinning the sustainability initiatives in the design and operation of Northside Private Hospital.

Several environmental initiatives have been considered in shaping a best practice design:

- Project Sustainable Navigation
- Wellbeing of Occupants
- Resource Efficiency: Energy
- Resource Efficiency: Water
- Infrastructure & Accessibility
- Materials
- Urban Ecology
- Emissions
- Innovations

3.1 ENVIRONMENTAL INITIATIVES

3.1.1 PROJECT SUSTAINABLE NAVIGATION

This aspect encourages the adoption of practices and processes that enable and support best practice sustainability outcomes throughout the different phases of a project's design, construction and its ongoing operation. It also promotes practices that ensure a project will be used to its optimum operational potential.

The Project will include the following initiatives:

1. The Project team will establish ongoing environmental performance targets relating to its consumption of energy and water, production and recycling of waste, and to the ongoing maintenance and improvement of good indoor environmental quality. Furthermore the hospital will monitor and report on nominated targets to ensure consequential outcomes.
2. During design and documentation, the Project team will review the design for its ease of maintenance for all building services and building fabric.
3. Comprehensive pre-commissioning and commissioning activities will be performed for all nominated building systems.
4. Post completion the project will undergo a 12 month period of building tuning, with minimum quarterly meetings, to optimise the buildings systems.
5. Building user guides will be produced by the Contractor to help users interact effectively with the buildings, optimising building performance and user comfort. The Guides will include guidance on all sustainability attributes of the site, and also information on maintenance requirements.

6. Building services will include metering on all major energy and water-consuming equipment, providing the facility manager with information on system performance and allowing them to closely manage efficient use of resources on site.
7. A systematic and methodical Environmental Management plan will be formalised for implementation during the construction phase by the Contractor. In addition to this the contractor will implement on-site staff wellbeing practices.
8. The design will include infrastructure for operational waste management, the separation of waste streams and considerations for end of life disposal. A waste management consultant has been appointed to manage these aims.

3.1.2 WELLBEING OF OCCUPANTS

This aspect aims to encourage initiatives that enhance the comfort and well-being of occupants. Issues such as air quality, thermal comfort and acoustic comfort are addressed within these initiatives. The 'Wellbeing of Occupants' aspect recognises that buildings are designed for people and that a holistic approach should be taken where reductions in energy use and occupants' health and wellbeing are not pursued to the detriment of each other.

The Project will include the following initiatives:

1. Closely controlled mechanical ventilation will be provided throughout the hospital. The systems performance will be optimised through the provision of demand controlled ventilation linked to occupancy. In-takes and exhausts will follow best practice guidelines to avoid unwanted recirculation.
2. The project will address noise in enclosed spaces by reducing noise levels to no more than 5dB(A) above the satisfactory levels provided in Table 1 AS/NZS 2107:2000 and mitigation reverberation. Noise transmission will be through detailed acoustic separation.
3. Light fittings shall be selected, where possible, such that glare is controlled or reduced and where required glare from sunlight will be reduced through a combination of blinds, screen, fixed devices, or other means. Occupants will also have the ability to control lighting in the spaces through manual lighting controls.
4. All habitable areas will be extensively daylit, delivered by a façade providing high levels of daylight and views for patients.
5. All paints, sealants, adhesives, floor coverings and composite timbers used internally will meet low VOC (Volatile Organic Compound) emissions limits, as specified in Greenstar credit 13.1.
6. Any engineered wood products will meet low formaldehyde limits, as specified in Greenstar credit 13.2.

3.1.3 RESOURCE EFFICIENCY: ENERGY

The Energy aspect aims to promote a project's reduction of operational energy consumption below a comparable standard-practice building. Such reductions are directly related to reduced greenhouse gas emissions, lower overall energy demand as well as reductions in operating costs for building owners and occupants.

The Project will include the following initiatives:

1. Good passive design features will be incorporated into the proposal to achieve measurable impacts on both building services strategies and the thermal comfort of occupants. These features will include:
    a. High-performance glazing
    b. Insulation levels which exceed minimum Section J requirements
    c. Attention to detailing reducing the impact of thermal bridging
    d. Appropriate solar control via shading devices
2. LED lighting, which offers life cycle cost advantages and reduced annual energy consumption, shall be utilised wherever possible A high percentage of lighting will be controlled either through occupant detection, daylight controls or time clock controlled to meet BCA Section J6 requirements.
3. A mechanical ventilation strategy will provide closed control of the internal environment. Demand controlled ventilation will respond to the needs of occupants, conserving energy when zones are not in use by running at a lower capacity. Heat recovery will allow incoming air to be pre-tempered so less energy is required to bring it to delivery temperature. The system is further controlled by constructing an airtight building fabric. This prevents unwanted infiltration and humidity entering the building zones and the building fabric which can be degraded over time via interstitial condensation.
4. Indirect evaporative cooling shall be considered as part of the HVAC strategy employed in the proposal. Indirect evaporative cooling provides an excellent solution for pre-cooling of outside air for traditional HVAC systems and can be easily combined with heat recovery technology. By providing pre-cooling to traditional HVAC systems, significant reductions in chiller energy consumption can be achieved.
5. Active systems such as chillers will be optimised in a number of ways Firstly, by re-using the heat rejected as part of the cooling process to satisfy a requirement for heat elsewhere in the building. This increases the combined systems seasonal energy efficiency ratio (SEER) through seasons where areas of the hospital require heating and cooling simultaneously. Secondly, systems will be sufficiently sized to run at an efficient operating margin, with sufficient capacity to account for the increasingly likelihood of climatic events such as heatwaves. However, care will be given not to oversize systems as this can lead to an decrease in the operating performance.
6. The domestic hot water system (DHW) will be low–emission, utilising one or any combination of the following technologies (to be selected during detailed design):
    a. Natural gas with solar pre-heat
    b. Natural gas with high-efficiency condensing boilers
    c. Heat-pump technology. Heat-pumps utilising refrigerants with a lower global warming potential (GWP) (e.g. CO_2) will be preferred over those using conventional refrigerants.
7. The project will investigate the inclusion of solar photovoltaic (PV) arrays to supplement energy consumption and reduce ongoing operating costs. It is proposed the available roof space is reviewed and a suitable PV system be assessed for feasibility in detailed design stage.

3.1.4 INFRASTRUCTURE & ACCESSIBILITY

This aspect facilitates a reduction in the dependency on private car use and promote the use of alternative means of transport to reduce overall greenhouse gas emissions.

If reliance on individual motor vehicle transportation is to be reduced, it is necessary to maximise alternative transportation options, such as the use of mass transport options, cycling or walking, and the selection of sites that are close to a large number of amenities.

The Project will include the following initiatives:

1. The site is highly accessible by various bus routes with the closest being less than 5 minutes' walk. In addition the site is in close proximity to a number of community services such as Gosford railway station.
2. Infrastructure allowances will be made for low emission vehicles and electric vehicle charging.
3. Active transport facilities such as bicycle parking, showers and lockers will be available on site for occupants and visitors.

3.1.5 RESOURCE EFFICIENCY: WATER

Water efficiency facilitates the reduction of potable water consumption through measures such as the incorporation of water efficient fixtures and building systems and water re-use.

Reductions in operational water consumption may be achieved through the maximisation of water efficiency within the project.

The Project will include the following initiatives:

1. The proposal includes rainwater harvest and re-use. During concept design, the re-use of harvested rainwater within the cooling towers has been discussed and will be investigated further in subsequent stages. Due to the retention / detention requirements for the site, large volumes of water are available. Water will also be reused for the flushing of toilets throughout the building.
2. All bathroom fixtures (toilet pans, urinals, hand basin taps and showers) will meet or exceed the following minimum WELS ratings:
    a. Basin taps and urinals to be equal to or more than 5 Star WELS
    b. Showers to be equal to or more than 3 Star (>6.0 but <=7.5L/min) WELS
    c. Toilets to be equal to or more than 4 Star WELS
3. Landscape areas will be irrigated using sub-soil drip irrigation with wherever practical automated control to limit unnecessary irrigation

3.1.6 MATERIALS

Materials aims to address the consumption of resources within a building construction context, by encouraging the selection of lower-impact materials. Additionally, it involves absolute reductions in the amount of waste generated or the recycling of as much of the waste generated as possible.

The Project will include the following initiative:

1. A minimum 90% of all construction waste generated will be diverted from landfill by either re-use or recycling.

In addition the following options are being explored and may also be incorporated:

2. A high percentage of PVC products used in the project including those in all formwork, pipes, flooring, blinds and cables shall meet the *Best Practice Guidelines for PVC in the Built Environment*, published by the Green Building Council of Australia.

3. A high percentage of timber used in building and construction will be from a reused source or certified by a forest certification scheme.

3.1.7 URBAN ECOLOGY

Urban Ecology facilitates the reduction of negative impacts on the sites' ecological value as a result of urban development; rewarding projects that minimise harm and enhance the quality of local ecology.

The Project will include the following initiatives:

1. The total proposed works are contained within the existing site and the site's current ecology will be improved through well-considered landscape design.
2. Re-using previously developed land to minimise development on greenfield sites.
3. Rooftops that will contribute to a cooler microclimate through the use of light coloured roof materials to reduce the 'Heat Island Effect'. Green terraces are also proposed throughout the building which further reduce the heat island effect and provide a green refuge for occupants.

3.1.8 EMISSIONS

Emissions help to assess the environmental impacts of 'point source' pollution generated by projects. Negative impacts commonly associated with buildings might include increased stormwater discharge and pollutants entering the public sewer or disturbances to native animals and their migratory patterns as a result of light pollution.

The Project will include the following initiatives:

1. The lighting design shall be compliant with AS1158: Lighting for Roads and Public Spaces and AS4282: Control of the Obtrusive Effects of Outdoor Lighting. This would be achieved through control of upward light output ration (LOR) or control of direct illuminance.
2. Stormwater design will ensure post-development peak event discharge rates do not exceed pre-development rates.
3. Landscape solutions will be applied to achieve a high level of stormwater performance across the site, improving water quality prior to discharge from the site.
4. Best practice legionella control will be present for the water based heat rejection systems. avert impacts associated with harmful microbes in building cooling systems.

3.1.9 INNOVATIONS

Facilitating innovation helps spread innovative practices, processes and strategies that promote sustainable communities and cities.

Wellbeing – Elements of the WELL standard are to be included within the propose design to enhance well-being and aid patient recovery. Roof terraces will be design in-line with the requirement of WELL V2 “Restorative Spaces”. Furthermore, the use of natural materials and plants to incorporate biophilia into the internal spaces. The benefits of biophilia have been demonstrated through various studies to improve patient recovery (e.g. “Totaforti. 2018. Applying the benefits of biophilic theory to hospital design”)

NORTHSIDE HOSPITAL: GREEN STAR EQUIVILENCY PATHWAY

New South Wales	Green Star Design & As-Built Credit	v1.3 Available Points	4 Star Target	Optional for Consideration	Compliance Requirements & Comment	Client	Design Team	Contractor	Cost Impact	Integral Comment
MANAGEMENT		**14%**								
1.0	Green Star Accredited Professional	1	1	-	Requires a Green Star Accredited Professional (GSAP) to be engaged for all stages of the project.		Y		Negligible	ESD consultant engaged already
2.0	Environmental Performance Targets	-	Complies	-	Targets for energy and water consumption to be set and documented. E.g. 25% improvement on min DTS Energy Performance. 50% potable water reduction than typical hospital building.	Y			Negligible	No cost to developing targets internally
2.1	Services and Maintainability Review	1	1	-	FM staff to review design during design stage and prior to construction. FM to consider commissionability, controllability, maintainability, fit for purpose and safety.	Y			Negligible	This would be done by hospital as good practice
2.2	Building Commissioning	1			Pre-commissioning & commissioning must be undertaken to CIBSE, ASHRAE and/or AIRAH standards/guidelines. Now also requires air tightness testing. This is largely standard practice now for upper tier builders, with the exception of airtightness testing. point not targeted due to air tightness requirement		Y	Y	Low	Commissioning activates primarily negligible cost, with exception of airtightness testing.
2.3	Building Systems Tuning	1	1	-	Requires formal 12month building tuning period with minimum quarterly tuning meetings and recommissioning. Differs from normal DLP activities.	Y	Y	Y	Moderate	Excellent initiative to ensure building is optimised for energy/water/IEQ performance. Cost associated with additional consultant/contractor time.
2.4	Independent Commissioning Agent	1		Y	Requires engagement of ICA to lead/coordinate commissioning & building tuning activities	Y			Moderate	ICA represents additional consultant and cost to project (e.g. $35k to $50k).
3.1	Implementation of a Climate Adaptation Plan	2		-		Y	Y	-		
4.0	Building Information	1	1	-	Involves developing package for occupants about building functions, initiatives to enhance energy efficiency, and O&M Information package and a Building Log Book. Intent to provide central point of information for those managing the facility.		Y	Y	Negligible	Generally included within Contractor scope as best practice hand-over materials for hospitals operation team.
5.1	Environmental Building Performance	1		-	Require the hospital to commitment to set, measure and report on Environmental Performance targets set through Credit 2.0.	Y			Negligible	No cost to developing targets internally
5.2	End of Life Waste Performance	1	1	-	Commitment to set demolition waste reduction targets for at least 80% of GFA and monitor end of life and interior fit outs or base building component.	-	-	-		
6.0	Metering	-	Complies	-	Metering to be provided to monitor building energy and water consumption. Sub-metering must be provided to all major energy/water/gas demands (more extensive than minimum compliance). Excluded as it is unlikely the design has incorporated the level of sub-metering required		Y	Y	Low	Allowance above base Section J metering
6.1	Monitoring Systems	1	1	-	Requires strategy for how to monitor and use data from collected from BMS. Cloud based technology platforms can be applied for utility management and benchmarking.		Y	Y	Low	Base functionality provided by BMS, however dedicated cloud platforms are better suited.
7.0	Environmental Management Plan	-	Complies	-	A comprehensive project-specific Environmental Management Plan (EMP) must be in place for construction. To be included in Head contractor clauses/specification.			Y	Negligible	Good site practice anyway.
7.1	Formalised Environmental Management System	1	1	-	Formalised, systematic and methodical approach to planning, implementing and auditing the EMP to ensure conformance to EMP. To be included in Head contractor clauses/specification. Requires ISO14001 certification for the head contractor.			Y	Negligible	Expected of responsible contractor
7.2	High Quality Staff Support	1	1	-	Contractor required to implement on-site staff wellbeing practices and enhance site workers' knowledge on sustainable practices through educational programs			Y	Negligible	Higher tier contractors likely to have site practices which are consistent with the requirements.
8B	Operational Waste	1	1	-	Requires on-site waste recycling system which are consistent with best practice requirements. Requires engagement of Waste Consultant		Y		Negligible	Integrated with hospital waste management practices.
	Category Total	14	**9**							

NORTHSIDE HOSPITAL: GREEN STAR EQUIVILENCY PATHWAY

New South Wales	Green Star Design & As-Built Credit	v1.3 Available Points	4 Star Target	Optional for Consideration	Compliance Requirements & Comment	Client	Design Team	Contractor	Cost Impact	Integral Comment
INDOOR ENVIRONMENTAL QUALITY		**17%**								
9.1	Ventilation System Attributes	1	1	-	Ventilation system design must meet best practice requirements with regards to intakes and exhaust locations	-	-	-	Negligible	Good design practices
9.2	Provision of Outdoor Air	2			1 point awarded for increase of 50% on AS 1668 minimum OA requirements or CO2 sensors are installed to prevent CO2 concentrations from exceeding 800ppm. 2 points available for 100% increase or not exceeding 700ppm		Y		Low	Nat vent must meet the requirements of AS 1668.4-2012 for quantity of air supplied.
9.3	Exhaust or Elimination of Pollutants	1	1	-	Exhausting pollutants from print/photocopy equipment, cooking equipment, and carpark vehicle exhaust through dedicated exhaust systems. Print/photocopy must be isolated in enclosed spaces.		Y		Low	Good design practice. Check if the staff office will have ptining/photocopying as currently there isn't a dedicated room
10.1	Internal Noise Levels	1	1	-	Acoustic Consultant to confirm. Internal ambient noise levels no more than 5dB(A) above the statisfactory levels provided in Table 1 AS/NZS 2107:2000.		Y		Low	Confirm if requires acoustic systems beyond minimum requirements
10.2	Reverberation	1	1	-	Acoustic Consultant to confirm. Requires mitigation of reverberation in accordance with Australian Standard		Y		Low	Acoustic Consultant to confirm.
10.3	Acuostic Separation	1		-	Acoustic Consultant to confirm. Partition between spaces should achieve a weighted sound reduction index (Rw) of at least 45.		Y		Negligible	Acoustic Consultant to confirm.
11.0	Minimum Lighting Comfort	-	Complies	-	Pending lighting design. Lights to be flicker free and address perception of colour in the spaces.		Y		Negligible	Good lighting design and fitting selection
11.1	General Illuminance and Glare Reduction	1	1	-	Pending lighting design. Lighting levels will comply with best practice guidelines (AS 1680.2.4) and glare is eliminated.		Y		Low	May require alternative fitting selection
11.2	Surface Illuminance	1		Y	Surface reflectacne of ceiling to be at least 0.75 (matt white) and ceiling area to have at least 30% illuminance of light on the working plane	-	-	-	-	Dependant on finish specification and lighting design
11.3	Localised Lighting Control	1	1	-	Consideration of lighting control provisions within individual spaces		Y		Low	Requires further review of credit criteria in context of a hospital.
12.0	Glare Reduction	-	Complies	-	Limited extent of glazing.		Y		Low	
12.1	Daylight	2		Y	Requires space to achieve good levels of daylight. Requires daylight modelling.		Y		Low	Modelling costs to verify
12.2	Views	1	1	-	Determine if glazing at high level is prohibited of views		Y		Negligible	No cost
13.1	Paints, Adhesives, Sealants and Carpets	1	1	-	Internally applied paints, adhesives, sealants and carpets meet stipulated Total VOC Limits. Refer to Green Star Design and As-Built guidelines for limits.		Y	Y	Negligible	Standard industry practice now and contributes to conducive learning environments.
13.2	Engineered Wood Products	1	1	Y	All engineered wood products meet stipulated formaldehyde limits or no new engineered wood products are used in the building. Refer to Green Star Design and As-Built guidelines for limits. Includes particleboard, plywood, fibreboard etc.		Y	Y	Negligible	Standard industry practice now and contributes to conducive learning environments.
14.1	Thermal Comfort	1	1	Y	Verification of thermal comfort performance required through the application of thermal comfort modelling.		Y		Moderate	Requires additional engagement of thermal comfort modelling by ESD consultant.
14.2	Advanced Thermal Comfort	1		-	90% Occupant satisfaction	-	Y	-		
	Category Total	17	**10**							

NORTHSIDE HOSPITAL: GREEN STAR EQUIVILENCY PATHWAY

New South Wales	Green Star Design & As-Built Credit	v1.3 Available Points	4 Star Target	Optional for Consideration	Compliance Requirements & Comment	Client	Design Team	Contractor	Cost Impact	Integral Comment
ENERGY		**22%**								
15A.0	Conditional Requirement	NA	Complies	-	Requires minimum Deemed-to-Satisfy (DTS) requirements of Parts J1 (building fabric) and J2 (glazing) of Section J to be exceeded by 5%.		Y			
15A.1	Building Envelope	1	1	-	Nominal increase of 10% over Section J minimum R-Value requirements for building fabric.		Y			
15A.2	Glazing	1	1	-	Requires 10% improvement on minimum Section J Glazing U-Value and SHGC requirements.		Y			
15A.3	Lighting	1	1		Lighting power density is 10% less than maximum allowed in Section J. Automated lighting control systems (occupant detection, daylight, time switches) provided.		Y			
15A.4	Ventilation and Air Conditioning	1	1		The space is naturally ventilated or 10% improvement on Section J efficiency requirements for fan, pump, water heater and air conditioning equipment.		Y			
15A.5	Domestic Hot Water	1	1	-	Domestic Hot Water to be powered by electric heat pump. Can be powered by natural gas but this is least preferrable option.		Y			Electric water heaters are not conditional to achieving this credit
15A.7	Accredited GreenPower	5		Y	Requires ongoing purchase of green power energy premium.	Y				
15A - New credits	Optional Prescriptive Point: Transition Plan	1		Y	Requires to reduce fossil fuel use and develop a transition plan to phase them out. Project teams need to publicly commit to a transition plan and show it has been developed, demonstrating how the building will transition away from the use of fossil fuels.	Y				
	Optional Prescriptive Point: Fuel Switching	1		Y	Required to demonstrate that a percentage of energy required by the building annually is generated by on site renewable solutions; OR Other points have been achieved in the pathway		Y			Achieved via PV system on site.
	Optional Prescriptive Point: Onsite Storage	1		Y	• A renewable energy storage procurement and use strategy has been developed and demonstrates that the storage is sized to match the requirements of the building and that value will be provided to the project; • The stored renewable energy is used to reduce the peak electricity demand; and • The onsite storage must be set up to receive renewable energy (onsite or offsite)		Y			
	Optional Prescriptive Point: Vertical Transport	1			Required that the energy associated with lift machinery or other vertical transportation meets: • The minimum lift energy efficiency is class B in accordance with ISO 25745-2; and • The minimum lift idle and standby energy performance level is 1 in accordance with ISO 25745-2. • The minimum escalator energy performance is class A+ in accordance with ISO 25745-3. Where projects have both lifts and elevators installed, all three criteria must be met.					
15E	GHG Emissions Reduction - Modelled Performance	20		Y	Requires energy modelling to demonstrate reduction in energy consumption and GHG emissions of the propsed building as compared to a reference building. Points are awarded based on efficient building services, PV renewable energy generation.		Y		Moderate	
16A	Peak Electricity Demand Reduction - On-Site Energy Generation	2		-	Requires to reduce total peak electricity demand by 15%. Achieved through the application of passive design features, efficient building services and embedded generation.					
	Category Total	**36**	**5**							
TRANSPORT		**10%**								
17B.1	Access by Public Transport	3	1	-	Based on accessibility of the site by public transport. The site is well served by public transport.		Y		Negligible	Product of site characteristics
17B.2	Reduced car Parking Provision	1	1	Y	Requires consideration of additional on-site carparking.	-	Y	-	Negligible	
17B.3	Low Emisson Vehicle Infrastructure	1	1	Y	Requires provision of electric vehicle charging infrastructure and/or dedicated car share spaces.	-	Y	-	Moderate	Cost of chargers to be considered
17B.4	Active Transport Facilities	1	1	-	Requires bicycle parking, access to showers and lockers on site for occupants/visitors.		Y		Moderate	
17B.5	Walkable Neighbourhoods	1		-	The site does not achieve a good walk score	-	Y	-		
	Category Total	**7**	**4**							

NORTHSIDE HOSPITAL: GREEN STAR EQUIVILENCY PATHWAY

New South Wales	Green Star Design & As-Built Credit	v1.3 Available Points	4 Star Target	Optional for Consideration	Compliance Requirements & Comment	Client	Design Team	Contractor	Cost Impact	Integral Comment
WATER		**12%**								
18A	Potable Water - Performance Pathway	12	5	-	Fixtures to meet minimum WELS ratings: taps (6 *), urinals (6 *), toilets (5 *), showers (3 *), rainwater harvesting, avoidance of water-based heat rejection, efficient landscape irrigation system and fire system test water harvesting (TBC fire protection system).		Y		**Negligible**	Perscriptive pathway credits targeted bar fire system water harvesting
	Category Total	**12**	**5**							
MATERIALS		**14%**								
19	Life Cycle Impacts	7		-	Not claimed.	-	-	-		
20.1	Structural and Reinforcing Steel	1		-	Not claimed.	-	-	-		
20.2	Timber Products	1	1	-	Requires timber used in building and construction to be from a reused source or certified by a forest certification scheme. To be confirm if this was included in the specification.			Y	**Low**	Generally attainable based on proactive management of sub-contractor material procurement.
20.3	Permanent Formwork, Pipes, Flooring, Blinds and Cables	1	1	-	Requires materials to have no PVC and have an Environmental Product Declaration, or PVC to meet bet practice guidelines for PVC. To be confirm if this was included in the specification.			Y	**Low**	Generally attainable based on proactive management of sub-contractor material procurement.
21	Product Transparency and Sustainability	3				-	Y	-	**Low**	Environmentally friendly building materials covered in the design brief
22B	Construction and Demolition Waste	1	1	-	Requires reducing construction waste going to landfill by reusing or recycling 90% of the waste generated during construction.			Y	**Negligible**	Good contractor practices
	Category Total	**14**	**3**							
LAND USE & ECOLOGY		**6%**								
23.0	Endangered, Threatened or Vulnerable Species	-	Complies	-		Y			**Negligible**	Product of site characteristics
23.1	Ecological Value	3	1	Y	Points awarded where the ecological value of the site is improved by the project. Assumed one point achieve, however verification required via Ecological Value Calculator.					Landscape design to be confirmed around Sports Hall
24.0	Sustainable Site	-	Complies	-			Y		**Negligible**	Product of the site characteristics
24.1	Reuse of Land	1	1	-	Available where 75% of the site was previously developed.					
24.2	Contamination and Hazardous Materials	1		-	Awarded where the site, or an existing building, was previoulsy contaminated and the site has been remediated in accordance with best practice remediation strategies. To be confirmed by geotechnical engineer.					
25.0	Heat Island Effect Reduction	1	1	-	Generally requires appropriate selection of roof materials, selection of hardscape treatment and extent of landscape/tree coverage. Would require conscious review of site landscape/hardscape.		Y		**Low**	Dependant on material selection / landscape design proposals
	Category Total	**6**	**3**							
EMISSIONS		**5%**								
26.1	Stormwater: Reduced Peak Discharge	1	1	-	Civil Engineer to confirm. Post-development peak event discharge from site does not exceed the pre-development peak event discharge.		Y		**Moderate**	Pending comment from Civil Engineer. Requirements may align with minimum council requirements.
26.2	Stormwater: Reduced Pollution Targets	1	1	-	Civil Engineer to confirm. All stormwater from the site meets specified Pollution Reduction Targets.		Y		**Moderate**	Pending comment from Civil Engineer. Requirements may align with minimum council requirements.
27.0	Light Pollution to Neighbouring Bodies	-	Complies	-	Pending lighting design. Project to comply with AS 4282:1997 Control of the Obtrusive Effects of Outdoor Lighting		Y		**Negligible**	Product of good lighting design
27.1	Light Pollution to Night Sky	1	1	-	Pending lighting design. It can be demonstrated that a specified reduction in light pollution has been achieved.		Y		**Negligible**	Product of good lighting design
28.0	Legionella Impacts From Cooling Systems	1		-			Y			
29.0	Refrigerants Impacts	1		-	Not claimed. Exceptionally challenging credit to achieve.	-	-	-		
	Category Total	**5**	**3**							

NORTHSIDE HOSPITAL: GREEN STAR EQUIVILENCY PATHWAY

New South Wales	Green Star Design & As-Built Credit	v1.3 Available Points	4 Star Target	Optional for Consideration	Compliance Requirements & Comment	Client	Design Team	Contractor	Cost Impact	Integral Comment
INNOVATION										
30A	Innovative Technology or Process			-	Passive water treatment systems + Onsite renewable energy	-	Y	-	Moderate	
30B	Market Transformation			Y	Potentially Soft landings if ICA engaged	-	-	-	Moderate	
30C	Exceeding Green Star Benchmarks			Y	1) If 15E pursued, can we achieve over 12 points through passive design strategies? 2) Civil engineer to confirm if project can improve on pollution reduction targets. 3) Construction and demo waste reductions to 5Kg/sqm of GFA		Y		Moderate	
30D	Innovation Challenge	10		Y			Y			
30E	Global Sustainability			-		-	-	-	-	
	Category Total	10	**0**							
TOTAL			**42.0**							

Northside Private Hospital

Section J Advice V1

28.07.2020

Author
Andy Cook, Senior Consultant

Reviewed & Approved
David Arnott, Associate

INTEGRAL
CONSULTING ENGINEERING

SECTION J – WHOLE DEVELOPMENT

Window to Wall Ratio (WWR)

The average WWR for a typical façade is approximately 25-30% when all levels are averaged. The lower WWR allows the selection of high-performance glazing which doesn't compromise visible light transmittance.

Façade Thermal Performance

The façade performance has been split into two levels. The Lower Ground & Ground Floor and the subsequent Upper Levels. Early calculations indicate the following performance values are required:

Lower Ground / Ground
Total System U-value 4.5 W/m^2.K.
Total System Solar Heat Gain Coefficient 0.6.

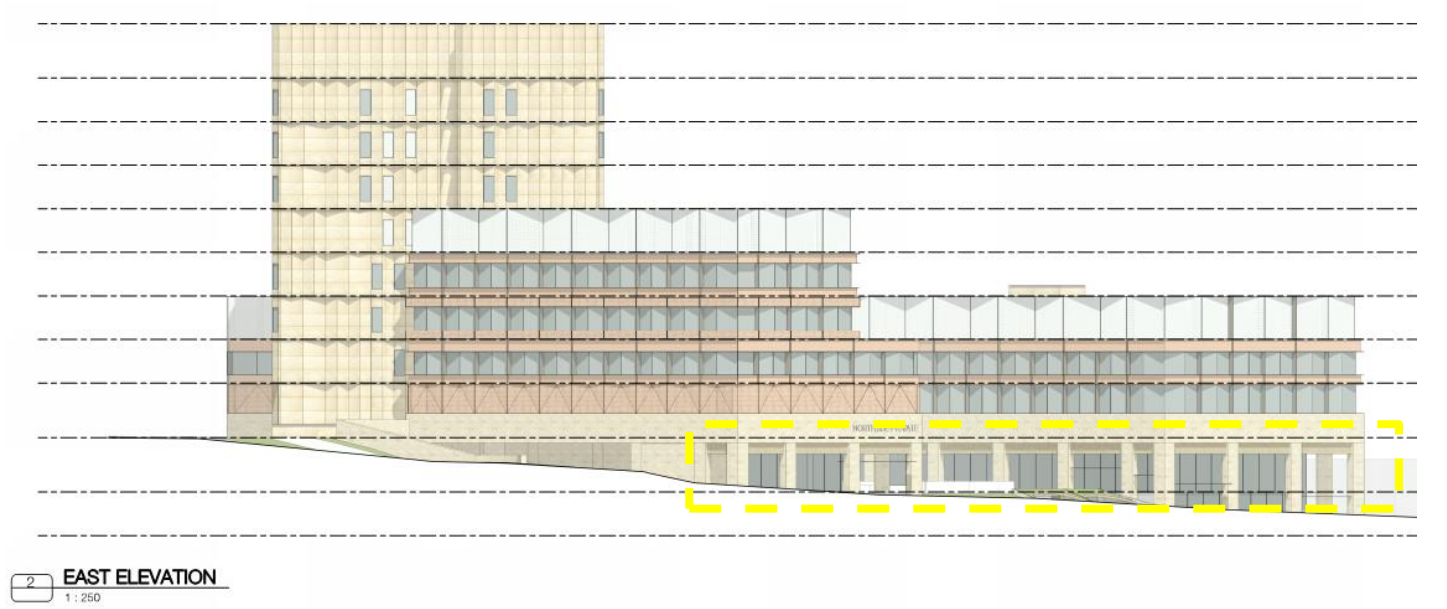
Upper Levels
Total System U-value 4.5 W/m^2.K.
Total System Solar Heat Gain Coefficient 0.35

Walls & Roofs

As Section J 2019 now includes requirements for thermal bridging, calculated to standard AS/NZS 4859.2, additional insulation is required for compliance. For example, we are seeing insulation depths of R 3.5 (e.g. 120mm of mineral wool insulation) being required to deliver an R 1.6 wall.

Minimum Wall R-value:	R 1.4
Minimum Roof R-value:	R 3.7
Minimum Floor R-value:	R2.0

Solar Absorptance of the upper surface of the roof must be less than or equal to 0.45.



Yellow dashed lines indicate windows with a higher solar heat gain coefficient