Green Star Report

for

Proposed Residential Age Facility

25, 25A, & 27 Bushlands Avenue
GORDON NSW

Ku-ring-gai Council

May 2017

Application Solutions
Level Two – 41 Rawson Street
EPPING NSW 2121

Telephone (02) 9868-4339 Facsimile (02) 9868-2655

Contents

Introduction

The proposed development comprises the construction of a residential care facility consisting of parking and storage facilities on the basement level; common areas and residential accommodation on lower ground floor, cafe and residential accommodation on ground floor and additional residential accommodation on the first floor.

The Sydney North Planning Panel Assessment Report requested further information to show the development could achieve a 4 Star Green Star Rating.

This report outlines planning that has been undertaken in the pre DA stage for achieving this.

Summary

Our assessment indicates that 45 points are achievable and that this development should achieve a 4 Star Green star Rating.

This report and attached score card matrix demonstrates how this should be achieved.

Green Star

The Ku-ring-gai DCP–Part 23 General Building Design and Sustainability requires a development with a floor area of between 2000 m² and 5000 m² to achieve a minimum 4 Stars under the Green Star Rating scheme.

To achieve this Application Solutions has been engaged to guide the Green Star process for this development. The accredited Green Star Professional working on the project is Mr Bill Liu.

A schedule of achievable Green Star measures has been prepared which is outlined in this report.

It should be noted that the Green Star process encompasses the full design cycle. Not all initiatives can be finalised as the project is at DA stage and prior to the detail design phase.

The Green Star Rating Scheme is a comprehensive sustainability rating tool. It covers the areas of:

- Management
- Indoor Air Quality
- Energy
- Transport
- Water
- Materials
- Land Use & Ecology
- Emissions
- Innovation

Each area has a number of specific performance requirements which are listed in the attached matrix.

The attached matrix is a scorecard of Green Star requirement being targeted for this development. It is an iterative document which will be, and has been and will continue to be, updated as investigation into each item progresses throughout the design development.

To achieve 4 Stars at least 45 points are required. As a contingency every effort is being made to target slightly more than the minimum requirement so that as the design develops, if any point can't be achieved, there will be sufficient margin to ensure 4 Stars will be achieved.

A more detailed breakdown of the points being targeted is provided below.

Management

A total of 10 points are being targeted in this section. This is made up as follows:

Accredited Professional	**1**
Services and Maintainability Review	**1**
Building Commissioning	**1**
Building Systems Tuning	**1**
Independent Commissioning Agent	**1**
Building Operations and Maintenance Information	**1**
Building User Information	**1**
Environmental Building Performance	**1**
Monitoring Systems	**1**
Formalised Environmental Management System	**1**
	10

Indoor Air Quality

A total of 15 points are being targeted in this section. This is made up as follows:

Ventilation System Attributes	1
Provision of Outdoor Air	1
Exhaust or Elimination of Pollutants	1
Internal Noise Levels	1
Reverberation	1
Acoustic Separation	1
General Illuminance and Glare Reduction	1
Surface Illuminance	1
Localised Lighting Control	1
Daylight	1
Views	1
Paints, Adhesives, Sealants and Carpets	1
Engineered Wood Products	1
Thermal Comfort	1
Advanced Thermal Comfort	1
	15

Energy

A total of 6.4 points are being targeted in this section. This is made up as follows:

15E.1	Comparison to a Reference Building Pathway	6.4
		6.4

Transport

A total of 5 points are being targeted in this section. This is made up as follows:

Performance Pathway	5
	5

Water

A total of 6 points are being targeted in this section. This is made up as follows:

Potable Water - Performance Pathway	6
	6

Materials

A total of 2 points are being targeted in this section. This is made up as follows:

Timber Products	1
Product Transparency and Sustainability	1
	2

Land Use and Ecology

A total of 3 points are being targeted in this section. This is made up as follows:

Ecological Value	2
Reuse of Land	1
	3

Emissions

A total of 2 points are being targeted in this section. This is made up as follows:

Light Pollution to Night Sky	1
Legionella Impacts from Cooling Systems	1
	2

Innovation

No points are being targeted in this section.

Appendix 1 – Available Green Star Points

CATEGORY / CREDIT	AIM OF THE CREDIT / SELECTION	CREDIT CRITERIA	POINTS AVAILABLE
Management			
Green Star Accredited Professional	To recognise the appointment and active involvement of a Green Star Accredited Professional in order to ensure that the rating tool is applied effectively and as intended.	Accredited Professional	1
Commissioning and Tuning	To encourage and recognise commissioning, handover and tuning initiatives that ensure all building services operate to their full potential.	Environmental Performance Targets	-
		Services and Maintainability Review	1
		Building Commissioning	1
		Building Systems Tuning	1
		Independent Commissioning Agent	1
Adaptation and Resilience	To encourage and recognise projects that are resilient to the impacts of a changing climate and natural disasters.	Implementation of a Climate Adaptation Plan	2
Building Information	To recognise the development and provision of building information that facilitates understanding of a building's systems, operation and maintenance requirements, and environmental targets to enable the optimised performance.	Building Operations and Maintenance Information	1
		Building User Information	1
Commitment to Performance	To recognise practices that encourage building owners, building occupants and facilities management teams to set targets and monitor environmental performance in a collaborative way.	Environmental Building Performance	1
		End of Life Waste Performance	1
Metering and Monitoring	To recognise the implementation of effective energy and water metering and monitoring systems.	Metering	-
		Monitoring Systems	1
Construction Environmental Management	To reward projects that use best practice formal environmental management procedures during construction.	Environmental Management Plan	-
		Formalised Environmental Management System	1
Operational Waste	Performance Pathway	Performance Pathway - Specialist Plan	1
		Prescriptive Pathway - Facilities	-
Total			**14**

Indoor Environment Quality			
Indoor Air Quality	To recognise projects that provide high air quality to occupants.	Ventilation System Attributes	1
		Provision of Outdoor Air	2
		Exhaust or Elimination of Pollutants	1
Acoustic Comfort	To reward projects that provide appropriate and comfortable acoustic conditions for occupants.	Internal Noise Levels	1
		Reverberation	1
		Acoustic Separation	1
Lighting Comfort	To encourage and recognise well-lit spaces that provide a high degree of comfort to users.	Minimum Lighting Comfort	-
		General Illuminance and Glare Reduction	1
		Surface Illuminance	1
		Localised Lighting Control	1
Visual Comfort	To recognise the delivery of well-lit spaces that provide high levels of visual comfort to building occupants.	Glare Reduction	-
		Daylight	2
		Views	1
Indoor Pollutants	To recognise projects that safeguard occupant health through the reduction in internal air pollutant levels.	Paints, Adhesives, Sealants and Carpets	1
		Engineered Wood Products	1
Thermal Comfort	To encourage and recognise projects that achieve high levels of thermal comfort.	Thermal Comfort	1
		Advanced Thermal Comfort	1
Total			**17**

Energy			
		Comparison to a Reference Building Pathway	20
Peak Electricity Demand Reduction	Performance Pathway	Performance Pathway - Reference Building	2
Total	-		**22**

Transport			
Sustainable Transport	Performance Pathway	Performance Pathway	10
Total			**10**

Water			
Potable Water	Performance Pathway	Potable Water - Performance Pathway	12
Total			**12**

Materials			
Life Cycle Impacts	**Performance Pathway - Life Cycle Assessment**	Comparative Life Cycle Assessment	6
		Additional Life Cycle Impact Reporting	1
		Concrete	0
		Steel	0
		Building Reuse	0
Responsible Building Materials	To reward projects that include materials that are responsibly sourced or have a sustainable supply chain.	Structural and Reinforcing Steel	1
		Timber Products	1
		Permanent Formwork, Pipes, Flooring, Blinds and Cables	1
Sustainable Products	To encourage sustainability and transparency in product specification.	Product Transparency and Sustainability	3
Construction and Demolition Waste	**Percentage Benchmark**	Fixed Benchmark	-
		Percentage Benchmark	1
Total			**14**

Land Use & Ecology			
Ecological Value	To reward projects that improve the ecological value of their site.	Endangered, Threatened or Vulnerable Species	-
		Ecological Value	3
Sustainable Sites	To reward projects that choose to develop sites that have limited ecological value, re-use previously developed land and remediate contaminate land.	Conditional Requirement	-
		Reuse of Land	1
		Contamination and Hazardous Materials	1
Heat Island Effect	To encourage and recognise projects that reduce the contribution of the project site to the heat island effect.	Heat Island Effect Reduction	1
Total			**6**

Emissions			
Stormwater	To reward projects that minimise peak stormwater flows and reduce pollutants entering public sewer infrastructure.	Reduced Peak Discharge	1
		Reduced Pollution Targets	1
Light Pollution	To reward projects that minimise light pollution.	Light Pollution to Neighbouring Bodies	-
		Light Pollution to Night Sky	1
Microbial Control	To recognise projects that implement systems to minimise the impacts associated with harmful microbes in building systems.	Legionella Impacts from Cooling Systems	1
Refrigerant Impacts	To encourage operational practices that minimise the environmental impacts of refrigeration equipment.	Refrigerants Impacts	1
Total			**5**

Innovation			**10**
Innovative Technology or Process	The project meets the aims of an existing credit using a technology or process that is considered innovative in Australia or the world.	Innovative Technology or Process	10
Market Transformation	The project has undertaken a sustainability initiative that substantially contributes to the broader market transformation towards sustainable development in Australia or in the world.	Market Transformation	
Improving on Green Star Benchmarks	The project has achieved full points in a Green Star credit and demonstrates a substantial improvement on the benchmark required to achieve full points.	Improving on Green Star Benchmarks	
Innovation Challenge	Where the project addresses an sustainability issue not included within any of the Credits in the existing Green Star rating tools.	Innovation Challenge	
Global Sustainability	Project teams may adopt an approved credit from a Global Green Building Rating tool that addresses a sustainability issue that is currently outside the scope of this Green Star rating tools.	Global Sustainability	
Total			**10**

Appendix 2 – Green Star Certification

greenstar Developed by the Green Building Council of Australia

The Green Building Council of Australia certifies that

Bill Liu

has obtained the following qualification

Green Star® Accredited Professional

The Green Star® Accredited Professional qualification recognises advanced knowledge, experience and competency in the application of the Green Star® rating tools.

Sep 2010 - Sep 2012
Jul 2016 - Jun 2017

GSAP Training

Design & As Built (Feb 2008)

Romilly Madew
Chief Executive
Green Building Council of Australia

greenstar ACCREDITED PROFESSIONAL

Appendix 3 – Green Star Score Card

Green Star - Design & As Built Scorecard

ANHF 澳華療養院基金 Culturally Appropriate Aged Care Since 1980

NORTH SHORE RCF
No's 25, 25A & 27 Bushlands Avenue, Gordon,
NSW 2072

application solutions
your sustainability partner

Phone: 9868 4339
Email: info@applicationsolutions.com.au

boffa robertson group
architecture, health and aged care planning, project management

Suite 7, Level 1 Epica, 9 Railway Street
Chatswood NSW 2067
AUSTRALIA
Tel. (02) 9406 7000
Fax. (02) 9406 7099
Email : brgroup@brgr.net

Core Points Available	Total Score Targeted	
100	49.4	Four Star

CATEGORY / CREDIT	AIM OF THE CREDIT / SELECTION	CODE	CREDIT CRITERIA	POINTS AVAILABLE	POINTS TARGETED	COMMENTS
Management				14		
Green Star Accredited Professional	To recognise the appointment and active involvement of a Green Star Accredited Professional in order to ensure that the rating tool is applied effectively and as intended.	1.0	Accredited Professional	1	1	*Engagement of Application Solutions Pty Ltd - Accredited Green Star Professional - Bill Liu*
Commissioning and Tuning	To encourage and recognise commissioning, handover and tuning initiatives that ensure all building services operate to their full potential.	2.0	Environmental Performance Targets	-		*See General Notes*
		2.1	Services and Maintainability Review	1	1	
		2.2	Building Commissioning	1	1	*Documented targets for the environmental performance of the project must be set. The document must be prepared by the design team at the design phase stage and must outline at least the following items:* *- Description of the basic functions, operations, and maintenance of the nominated building systems* *- The targets for the project energy and water consumption, and energy and water budgets for all nominated building systems* *- Description of how energy, water and aspects of indoor environment quality are metered and monitored.*
		2.3	Building Systems Tuning	1	1	
		2.4	Independent Commissioning Agent	1	1	
Adaptation and Resilience	To encourage and recognise projects that are resilient to the impacts of a changing climate and natural disasters.	3.1	Implementation of a Climate Adaptation Plan	2		
Building Information	To recognise the development and provision of building information that facilitates understanding of a building's systems, operation and maintenance requirements, and environmental targets to enable the	4.1	Building Operations and Maintenance Information	1	1	
		4.2	Building User Information	1	1	
Commitment to Performance	To recognise practices that encourage building owners, building occupants and facilities management teams to set targets and monitor	5.1	Environmental Building Performance	1	1	
		5.2	End of Life Waste Performance	1		
Metering and Monitoring	To recognise the implementation of effective energy and water metering and monitoring systems.	6.0	Metering	-		*It is a minimum requirement of this credit that project teams must provide accessible metering to all energy and water common uses and major uses, and to energy and water sources provided by the project.*
		6.1	Monitoring Systems	1	1	
Construction Environmental Management	To reward projects that use best practice formal environmental management procedures during construction.	7.0	Environmental Management Plan	-		*The project team must develop and implement a project-specific best practice EMP to assist the Principal/Head Contractor and its service providers manage environmental performance, conditions and impacts arising from excavation, demolition and construction. The EMP must cover environmental impacts arising from construction*
		7.1	Formalised Environmental Management System	1	1	
Operational Waste	Performance Pathway	8A	Performance Pathway - Specialist Plan	1		
		8B	Prescriptive Pathway - Facilities	-		
Total				**14**	**10**	

10

Indoor Environment Quality					
				17	
Indoor Air Quality	To recognise projects that provide high air quality to occupants.	9.1	Ventilation System Attributes	1	1
		9.2	Provision of Outdoor Air	2	1
		9.3	Exhaust or Elimination of Pollutants	1	1
Acoustic Comfort	To reward projects that provide appropriate and comfortable acoustic conditions for occupants.	10.1	Internal Noise Levels	1	1
		10.2	Reverberation	1	1
		10.3	Acoustic Separation	1	1
Lighting Comfort	To encourage and recognise well-lit spaces that provide a high degree of comfort to users.	11.0	Minimum Lighting Comfort	-	
		11.1	General Illuminance and Glare Reduction	1	1
		11.2	Surface Illuminance	1	1
		11.3	Localised Lighting Control	1	1
Visual Comfort	To recognise the delivery of well-lit spaces that provide high levels of visual comfort to building occupants.	12.0	Glare Reduction	-	
		12.1	Daylight	2	1
		12.2	Views	1	1
Indoor Pollutants	To recognise projects that safeguard occupant health through the reduction in internal air pollutant levels.	13.1	Paints, Adhesives, Sealants and Carpets	1	1
		13.2	Engineered Wood Products	1	1
Thermal Comfort	To encourage and recognise projects that achieve high levels of thermal comfort.	14.1	Thermal Comfort	1	1
		14.2	Advanced Thermal Comfort	1	1
Total				17	15

All lights in the nominated area are flicker-free and accurately address the perception of colour in the space.

Glare from sunlight through all viewing facades in the nominated area is reduced through a combination of blinds, screens, fixed devices, or other means.

15

Energy					
				22	
Greenhouse Gas Emissions	E. Modelled Performance Pathway	15A.0	Conditional Requirement: Prescriptive Pathway	-	
		15A.1	Building Envelope	-	
		15A.2	Glazing	-	
		15A.3	Lighting	-	
		15A.4	Ventilation and Air-conditioning	-	
		15A.5	Domestic Hot Water Systems	-	
		15A.6	Building Sealing	-	
		15A.7	Accredited GreenPower	-	
		15B.0	Conditional Requirement: NatHERS Pathway	-	
		15B.1	NatHERS Pathway	-	
		15C.0	Conditional Requirement: BASIX Pathway	-	
		15C.1	BASIX Pathway	-	
		15D.0	Conditional Requirement: NABERS Pathway	-	
		15D.1	NABERS Energy Commitment Agreement Pathway	-	
		15E.0	Conditional Requirement: Reference Building Pathway	-	
		15E.1	Comparison to a Reference Building Pathway	20	6.4
Peak Electricity Demand Reduction	Performance Pathway	16A	Prescriptive Pathway - On-site Energy Generation	-	
		16B	Performance Pathway - Reference Building	2	
Total				22	6.4

Five alternative pathways to demonstrate reductions in building GHG emissions. Using 15A can achieve max 5 points, using 15E can achieve max 20 points. Hence I suggest to *15% increase on the minimum required R-values specified in J1.3, 1.5 and 1.6*
Where the glazing complies with: A) *for vertical glazing, the total energy used for each orientation and each story is not greater than 85% of the total allowance according to ABCB glazing calculator or aggregated AC energy value and* ***B)*** *Where there are roof lights, the SHGC and total U-Value of these roof lights exceed the requirements of J1.4*
Where lighting complies with: *The actual installed aggregate illumination power density is 30% less than the max illumination power densities defined in table J6.2a. Automated lighting control systems are provided to 95% of the nominated area.*
The HVAC system comply with: *The installed fan motor power and pump power is at least 15% less that the max fan motor power and pump power defined in tables J5.2 and J5.4a. The thermal efficiency of the installed water heater is 15% more than the required min as defined in Table J5.4b. The required min energy efficiency ratio for PAC and refrigerant chillers as defined in Tables J5.4d and J5.4e*

One point is awarded where domestic hot water systems are powered by one of the following: Renewable Energy, natural gas, electric heat pump or waste heat.

One point is awarded where a pressurised building air leakage test is carried out.

The proposed building green house gas (GHG) emissions are less than those of the equivalent Benchmark Building, which is 10% improvement on the reference building. The reference building is one that achieves minimal compliance with the NCC Section J 40% of greenhouse gas emissions reduction (proposed building relative to benchmark building)

6.4

Transport						
				10		
Sustainable Transport	Performance Pathway	17A.1	Performance Pathway	10	5	
		17B.1	Access by Public Transport	0		
		17B.2	Reduced Car Parking Provision	0		
		17B.3	Low Emission Vehicle Infrastructure	0		
		17B.4	Active Transport Facilities	0		
		17B.5	Walkable Neighbourhoods	0		
Total				10	5	

Water						
				12		
Potable Water	Performance Pathway	18A.1	Potable Water - Performance Pathway	12	6	
		18B.1	Sanitary Fixture Efficiency	0		
		18B.2	Rainwater Reuse	0		
		18B.3	Heat Rejection	0		
		18B.4	Landscape Irrigation	0		
		18B.5	Fire System Test Water	0		
Total				12	6	

Materials						
				14		
Life Cycle Impacts	Performance Pathway - Life Cycle Assessment	19A.1	Comparative Life Cycle Assessment	6		
		19A.2	Additional Life Cycle Impact Reporting	1		
		19B.1	Concrete	0		
		19B.2	Steel	0		
		19B.3	Building Reuse	0		
Responsible Building Materials	To reward projects that include materials that are responsibly sourced or have a sustainable supply chain.	20.1	Structural and Reinforcing Steel	1		
		20.2	Timber Products	1	1	
		20.3	Permanent Formwork, Pipes, Flooring, Blinds and Cables	1		
Sustainable Products	To encourage sustainability and transparency in product specification.	21.1	Product Transparency and Sustainability	3	1	
Construction and Demolition Waste	Percentage Benchmark	22A	Fixed Benchmark	-		
		22B	Percentage Benchmark	1		
Total				14	2	

Land Use & Ecology						
				6		
Ecological Value	To reward projects that improve the ecological value of their site.	23.0	Endangered, Threatened or Vulnerable Species	-		
		23.1	Ecological Value	3	2	
Sustainable Sites	To reward projects that choose to develop sites that have limited ecological value, re-use previously developed land and remediate contaminate land.	24.0	Conditional Requirement	-		
		24.1	Reuse of Land	1	1	
		24.2	Contamination and Hazardous Materials	1		
Heat Island Effect	To encourage and recognise projects that reduce the contribution of the project site to the heat island effect.	25.0	Heat Island Effect Reduction	1		
Total				6	3	

The Green Star water calculator will be used to provide support for the points claimed. The water calculator will be be used by the hydraulic consultant as part of the detailed design stage

At least 95% of all timber used in the building and construction works is either: Certified by a forest certification scheme or is from a reused source

3% of the total project value is represented by compliant products that meet one of the following initiatives: Reused products / recycled content products / Environmental product declarations - third party certification or Stewardship programs

2 points for relative improvement of ecological value

75% of the site was previously developed land

Emissions					
				5	
Stormwater	To reward projects that minimise peak stormwater flows and reduce pollutants entering public sewer infrastructure.	26.1	Reduced Peak Discharge	1	
		26.2	Reduced Pollution Targets	1	
Light Pollution	To reward projects that minimise light pollution.	27.0	Light Pollution to Neighbouring Bodies	-	
		27.1	Light Pollution to Night Sky	1	1
Microbial Control	To recognise projects that implement systems to minimise the impacts associated with harmful microbes in building systems.	28.0	Legionella Impacts from Cooling Systems	1	1
Refrigerant Impacts	To encourage operational practices that minimise the environmental impacts of refrigeration equipment.	29.0	Refrigerants Impacts	1	
Total				5	2

Innovation					
				10	
Innovative Technology or Process	The project meets the aims of an existing credit using a technology or process that is considered innovative in Australia or the world.	30A	Innovative Technology or Process	10	
Market Transformation	The project has undertaken a sustainability initiative that substantially contributes to the broader market transformation towards sustainable development in Australia or in the world.	30B	Market Transformation		
Improving on Green Star Benchmarks	The project has achieved full points in a Green Star credit and demonstrates a substantial improvement on the benchmark required to achieve full points.	30C	Improving on Green Star Benchmarks		
Innovation Challenge	Where the project addresses an sustainability issue not included within any of the Credits in the existing Green Star rating tools.	30D	Innovation Challenge		
Global Sustainability	Project teams may adopt an approved credit from a Global Green Building Rating tool that addresses a sustainability issue that is currently outside the scope of this Green Star rating tools.	30E	Global Sustainability		
Total				10	0

TOTALS	AVAILABLE	TARGETED
CORE POINTS	100	49.4
CATEGORY PERCENTAGE SCORE		49.4
INNOVATION POINTS	10	0.0
TOTAL SCORE TARGETED		49.4