3.2. Update Report on Cammeray Dam and North Sydney Olympic Pool Sustainability Practices

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ATTACHMENTS: Sustainable Design Report, Waste Management Plan

PURPOSE:

To provide a report on Cammeray Dam and North Sydney Olympic Pool as noted in the minutes of the last meeting on 11 April, 2022.

EXECUTIVE SUMMARY:

This report provides an update on two council projects, including the Cammeray Dam stormwater harvesting system and the sustainability design practices incorporated into the North Sydney Olympic Pool redevelopment.

FINANCIAL IMPLICATIONS:

This report is for information purposes only and there are no financial implications.

RECOMMENDATION:
1. THAT the update report on Cammeray Dam and North Sydney Olympic Pool is received and noted.

LINK TO COMMUNITY STRATEGIC PLAN

The relationship with the Community Strategic Plan is as follows:

1. Our Living Environment
1.4 Public open space and recreation facilities and services meet community needs

2. Our Built Infrastructure
2.1 Infrastructure and assets meet community needs

BACKGROUND

At the last Environment Reference Group meeting held on 11 April 2022, it was resolved that an update report be provided on two Council projects. These projects include the Stormwater Harvesting System at Cammeray Dam and the impacts of the Western Harbour Tunnel, and the sustainability design practices included in the North Sydney Olympic Pool redevelopment. Progress updates were sought by relevant Council staff and have been presented below.

CONSULTATION REQUIREMENTS

Community engagement is not required.

DETAIL

<u>Cammeray Dam</u>

Work has begun on the Cammeray Dam as part of the Transport for New South Wales (TfNSW) Western Harbour Tunnel project (WHT). To date, the dam has been shut down and dewatering will start soon.

Since Council were made aware of the fact that the WHT works would have an impact on the stormwater harvesting system (Cammeray Dam) consultation has been ongoing with TfNSW with regards to the Dam replacement and the impacts of it being offline.

TfNSW have consulted with Council staff in depth regarding the design of the Dam as well as the plant and equipment required to make the system operational. Essentially it will be replaced like for like within the newly reconstructed Cammeray Golf Course. Council staff did try to get the new dam built larger than the original but unfortunately available space within the course wouldn't allow for it. It will therefore be rebuilt basically the same size as what was removed. The Dam location will be much closer to the existing GPT (within 100m or so) which will be an improvement as it won't take as long to pump water to the dam. It will also be in an overland flow area so will catch runoff in rain events which the current dam position doesn't allow for.

With regards to the plant equipment, it is understood that TfNSW will be replacing the existing pumps with new ones. They will be reusing the existing UV system as it is still in good condition, as well as the telemetry hardware and the existing dam aerator. The plant will be housed in a new shed (adjacent to the new Dam) that will have improved access around the facility as well as within the shed itself to allow for ease of maintenance and repairs.

In the 20/21 FY, 25170 kL of recycled water was used from the stormwater harvesting system. Whilst the system is offline Council will have to revert to utilising the backup potable water systems at each oval. TfNSW will be covering the costs for the water use until the system is back online. We have had to install a new system at the croquet court as it was solely run from the Dam. The costs for this are being paid for by TfNSW ($35K).

At this stage TfNSW are advising us that the line from the GPT to St Leonards Park(SLP) will not be affected so we can continue to use the system for irrigation purposes there. If that changes, they will be required to install a town water top up into the tanks at SLP as there is currently not a backup for that. The same rules would apply here in terms of water use and construction costs.

TfNSW have been advised that Council would like the new stormwater harvesting system up and running by November.

North Sydney Olympic Pool (NSOP)

Principles of Environmentally Sustainable Design (ESD) have been embedded into the redevelopment of the North Sydney Olympic Pool (NSOP) with the design relying substantially on the use of renewable energy harvested onsite, or immediately adjacent to the pool. By not using gas as the primary heating source there has been a significant reduction in greenhouse gas emissions associated with the pool operations.

The current approach for the application of ESD principles to NSOP is governed by the Efficient Use of Resources Commitment (EURC) (see attachment 1) which specifies design responses to key objectives under the following areas:

- Energy Efficiency
- Passive Solar Design
- Thermal Mass and Insulation
- Water Conservation
- Water Management and Minimisation
- Stormwater Management
- Building Materials
- Adaptive Reuse of Buildings
- Green Roofs

In addition to the information listed in the EURC, below is a list of key sustainability measures included.

Area	Measures
Energy Efficiency	• 124kW solar PV system • Solar thermal heating (heat-absorbing panels are mounted underneath solar PV to cool the solar PV panels while harvesting the heat for pool heating. Cooling PV panels increases electricity output) • Water source heat pumps used for pool heating (harvest renewable heat energy from Sydney Harbour) • Air source heat pumps used for domestic hot water heating • Air source heat pumps for space heating • No gas to be used except if other heating system breakdown • Double glazing on entire glass facade • Wall and ceiling insulation • Thermal backed pool blankets for all pools to reduce evaporation and heat loss • Smart monitoring: Energy/Building Management System • Lighting all LED with smart lighting controls • Variable speed drives on all large motors and capability to switch off all mechanical equipment at night • Provision for future EV charging infrastructure has been created due to new substation being built (off Northcliffe St with adjacent car parking) • Provision has been made for battery storage (currently in discussion with ZEN energy to provide 2 battery powerpacks of 232 kWh - 58 kW power delivery) • Low global warming potential refrigerant gases are used where possible for space heating, pool heating and domestic hot water systems • Capability and capacity to run all electric commercial kitchens Recommendation to commercial tenants to not use gas
Water and Stormwater Management	• New 58,000L stormwater harvesting tank to be used for wash down of 50m pool concourse • 30,000L rainwater harvesting tank to be used for toilet flushing and irrigation • WELS 5/6 star rating toilets/showerheads/urinals • Programmable shower timers • All existing stormwater pipes have been upgraded • GPT (existing) to collect rubbish before entering Sydney Harbour
Waste Management	• Bin area allocation has shown consideration for food organics recycling (Alfred St Bin Store storage for 9x large bins/ Paul St – Designated area for 5x large bins) • Waste management plan attached (attachment 2)
Building materials	• Green concrete used where possible • Recycled, reclaimed and laminated timbers have been used where possible • FSC certified timber used • Salvaged and recycled bricks have been used • Reused steel grandstand brackets

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ESD report

1. INTRODUCTION

1.1. INTRODUCTION

Mott Macdonald Australia has been engaged by Brewster Hjorth Architects on behalf of North Sydney Council (NSC) to undertake the Environmentally Sustainable Design (ESD) for the redevelopment of North Sydney Olympic Swimming Pool (NSOP). For the project description, please refer to BHA's Development Application Report.

1.2. SITE CONTEXT

NSOP is a community facility owned and operated by NSC. The site lies wholly within the North Sydney Local Government Area and covers an area of approximately 7098m2. The site is bounded to the South West by Olympic Drive and Sydney Harbour, to the North by Paul Street and to the East by Alfred Street S. Figure 1 below shows a high-resolution aerial image of the existing site.

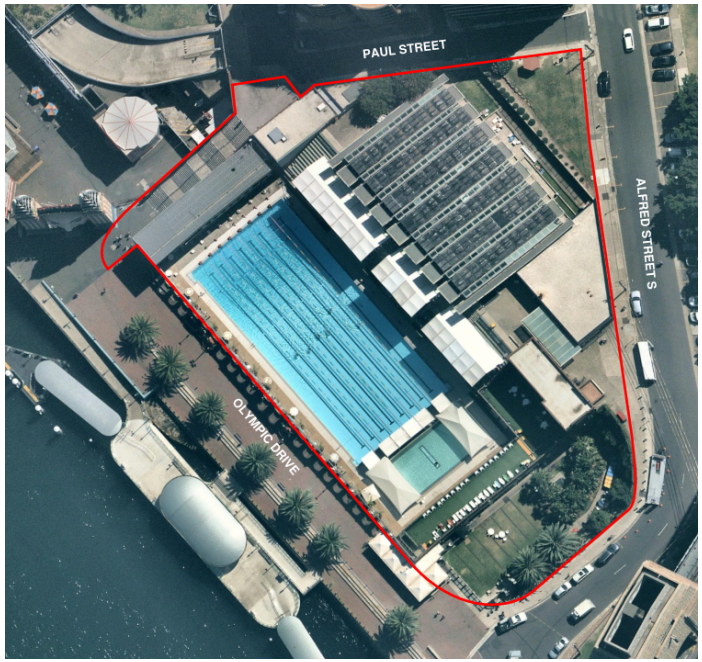

Figure 1 - Aerial image of North Sydney Olympic Swimming Pool (Source: Nearmap)

1.3. PROPOSED DEVELOPMENT

NSOP is an iconic facility on the shore of Sydney Harbour and has significant cultural and heritage value. Since its construction in the 1930s, the changing nature has resulted in changes of its users demands. The proposed development consists of:

- New 50m pool
- New family leisure pool + sunshade
- Upgrade existing 25m pool to 8 wide lanes
- New free form water play area
- Upgrade existing change facilities
- New gym in the grandstand above change facilities (600m2)
- Full refurbishment of existing grandstand with roof shade structure – maintaining current capacity 1200.

Figure 2 – An Architectural rendering of the redeveloped North Sydney Olympic Pool.

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2. ESD APPROACH

2.1 APPROACH TO ESD ON NSOP REDEVELOPMENT

Mott Macdonald Australia has been engaged by Brewster Hjorth Architects on behalf of North Sydney Council (NSC) to undertake the Environmentally Sustainable Design (ESD) for the redevelopment of North Sydney Olympic Swimming Pool (NSOP). This report is provided to outline the stormwater management strategy for the site.

The current approach for the application of ESD principles to NSOP are as below:

- Application of the Efficient Use of Resources Commitment Table as specification by the North Sydney Council (NSC), specifying where the project is demonstrating compliance against commitments; and
- Application of specific Green Star (GS) Design and As-Built credits which assist in demonstrating compliance with the above-mentioned Efficient Use of Resources Commitment Table and drive genuine outcomes on the project, resulting in a self-assessed GS Rating.

At this stage, the project is aiming to achieve a self-assessed 4 Star GS Rating, given future collaboration with council and the delivery contractor.

2.2. BACKGROUND AND CONTEXT

Application of a certified GS Design and As-Built Rating is not being pursued as the project does not meet the Gross Floor Area (GFA) minimum requirement by guidelines for the requirements of the certified Green Star Design and As-Built Rating.

The project is utilising the GS self-assessed Design & As-Built Rating using v1.2 of the rating tool, this method involves the delivery partner applying the principles of the GS Rating Tool to the design and construction of the works to meet the intent of individual credits, without the collection of evidence or submission to a third party for verification.

Please refer to the Green Star & ESD Considerations Technical Note written on 30 July 2018 for the initial assessment of ESD initiatives to be applied on the project, and consideration of the application of Green Star.

3. SELF-ASSESSED GREEN STAR RATING

3.1 Introduction to the Green Star Design and As-Built Rating Tool (v1.2)

The GS Design and As-Built Rating Tool (v1.2) is one of the many tools under the GS Rating Scheme coordinated by the independent body the Green Building Council of Australia (GBCA). The tool sets to provide a framework to measure overall sustainability principles applied to the design and construction of a building, measuring the benefits throughout the building's operation.

A preliminary introduction to the tool is as follows:

1. Green Star is a point system where buildings get a certain amount of points for the application of sustainability initiatives in design and construction.

2. There are 30 credits (each with subsequent sub-credits) in which you can earn points e.g. showing reductions in potable water demand as aligned with Credit 18 'Potable Water', the project can achieve up to 12 points in a performance pathway (Figure 3). Some key credits include an option to demonstrate compliance through a prescriptive pathway (application of specific initiatives) or performance pathway (demonstration through modelling). Performance pathways usually result in more point available, with the total points average out for the final score.

3. The amount of points the project earns, denotes the rating of the project. For example, if a project collected 50 points then it would be equivalent to a 4 Green Star Building (Figure 3)

Category	Available Points
Management	14
Indoor Environment Quality	17
Energy	22
Transport	10
Water	12
Materials	14
Land Use and Ecology	6
Emissions	5
Total	100%

% of available points	Rating	Outcome
Less than 10	Zero Star	Assessed
10 - 19	One Star	Minimum Practice
20 - 29	Two Star	Average Practice
30 - 44	Three Star	Good Practice
45 - 59	Four Star	Australian Best Practice
60 - 74	Five Star	Australian Excellence
75+	Six Star	World Leadership

Figure 3 – Application of Green Star Point System.

3.2 SELF-ASSESSED RATING

A certified GS Design & As-Built rating required the submission of a Submission Template (ST), supporting evidence, scorecard and As-Built Building Services and Architectural Drawings to the GBCA to verify the rating of the building. The NSOP Redevelopment is not gaining a certified rating, therefore the following approach is proposed to demonstrate that an 'equivalent rating' has been met.

1. A scorecard will be developed which details the credits targeted and the associated number of points (and subsequent 'rating') the project could achieve. Please see Appendix A for the preliminary scorecard for the NSOP Redevelopment.

2. Design and delivery partners will include technical specifications and apply initiatives to meet the intent of each credit outlined in the scorecard. Please see Appendix B for the preliminary technical specifications for the NSOP Redevelopment currently being applied.

3. Associated 'evidence' will be referenced within the scorecard to demonstrate compliance with meeting the intent of the credit.

Unlike a certified GS Rating, the self-assessed rating for NSOP redevelopment does not include the compilation and submission of the ST and associated evidence. Subject to further discussion with key stakeholders, the development and submission of a ST and evidence for key credits can be provided.

3.3 BENCHMARKING AND MODELLING

The GS Rating Tool utilises a series of publicly available calculators and guides to assist projects measure performance against 'Business as Usual' (BAU) practices for key areas, this includes Greenhouse Gas (GHG) reductions, potable water use and ecological value. These calculators and guides are reviewed and updated, therefore representing an adequate 'benchmark' for performance. Key benchmarking levels are listed below:

- GHG Emissions – guidance and modelling from the GBCA Energy Consumption and Greenhouse Gas Emissions guideline and GBCA Greenhouse Gas Emissions calculator, the project will be assessed predominately off the National Construction Code (NCC) Section J minimal compliance for building envelope and building services performance.
- Potable Water – guidance and modelling from the Potable Water guideline and the Potable Water calculator which specifies BAU potable water use practices (e.g. WELS rating for fixtures and fittings) and calculation methods.

For resources consumption for specific pool systems, current proposal is to measure against the current practices of the existing facility.

Please Note: The current v1.2 of the GS Rating Tool uses the 2016 Section J parameters, the project is assessing the impacts of changes to 2019 revision.

3.4 INPUT FROM SCARBOROUGH COUNCIL

The Scarborough Beach Redevelopment in Western Australia was awarded a certified 6 Green Star Rating for the project using v1.1 of the Green Star Design & As-Built version of the tool. Key findings from discussions with the GS Assessor for the project are as follows:

- Being a geothermal pool, the project was able to have a significant contribution from GHG reductions to the overall rating (up to 22 points), this is one of fundamental reason the project secured such a high GS Rating; and
- The project developed a supplementary guideline for the use of the GBCA GHG Calculator to consider additional energy requirements not usually within the scope of works of Green Star buildings. This guide has been requested from the GS Assessor to apply to the NSOP Redevelopment.

The GS Assessor provided the results of a financial transparency evaluation on the application of individual credits in the GS Design and As-Built Rating Tool, information is available on request.

3.5 LIMITATIONS

Doing a self-assessed rating against the GS Design & As-Built Rating Tool must consider the following limitations:

- The project will not be able to internally or externally market or advertise a Green Star Rating or equivalent, this is as the project is not gaining a certified rating or any evidence verified for compliance by the GBCA.
- The project will have no interactions with the GBCA or equivalent to clarify interpretation of the GS Rating Tool, additional the role of clarifying Technical Clarification (TCs) and Credit Interpretation Request (CIRs).
- The GS Design & As-Built has been developed specifically for residentially and commercial buildings, therefore there are aspects of the NSOP Redevelopment which are not captured (or gain points for), specifically regarding operations for the pool systems. In these situations, the project will work to re-define the use of the tool to fit the scope of works. This additionally means that the GS credits are focussed on the enclosed (indoor) spaces of the redevelopment)
- As many initiatives and associated benefits being applied to the project do not get any 'reward' in points under the GS Design & As-Built tool, these will be 'assessed' under the Innovation credits as would be the process in a certified rating.

4. DEMONSTRATING COMPLIANCE

4.1 EFFICIENT USE OF RESOURCES COMMITMENT TABLE

The Efficient Use of Resources Commitment (EURC) table specifies design responses to key objectives under the following areas:

- Energy Efficiency;
- Passive Solar Design;
- Thermal Mass and Insulation;
- Water Conservation;
- Water Management and Minimisation;
- Stormwater Management;
- Building Materials;
- Adaptive Reuse of Buildings; and
- Green Roofs.

The project proposes utilising individual GS credits to assist in demonstrate compliance with objectives outlined in the EURC table as is outlined in Appendix C.

4.2 SELF-ASSESSED GREEN STAR RATING

As outlined in Section 3.2, the project will provide a complete GS Design & As-Built Scorecard (v1.2) showing where the project has assessed itself meeting the intent of the credit as per the Green Star Submission Guidelines.

In addition to this, the project will be able to extract key data which (in the absence of reference to the Green Star Rating Tool) can be shared internally and externally to celebrate ESD outcomes.

5. DEMONSTRATING COMPLIANCE

5.1 APPLICATION OF TECHNICAL SPECIFICATIONS

The technical specifications outlined in Appendix B are the initial specifications developed to apply the principles of the GS Rating Tool to the design and development of the project, these are currently being integrated into design. The ESD Team will continue to work with the design team to integrate and record the ESD initiatives into design for associated costing and continued development, this includes:

- Inclusion of initiatives in drawings and design reports;
- Preliminary water modelling to stablish a water balance of the facilities; and
- Inclusion of requirements in Furniture, Fixtures and Equipment (FFE) Schedules and Technical Specifications.

Resulting ESD Reports will include initiatives applied directly to meet the intent of GS credits and the EURC table.

5.2 COLLABORATION WITH KEY STAKEHOLDERS

Key aspects of the project require collaboration with the end user and the delivery contractor, especially in regard to sustainability in management, sustainable procurement, selection of low-embodied materials and operational savings. An ESD focussed workshop to confirm initiatives and applicability during operational phase is required for endorsement of progress to date and continued application of ESD.

APPENDIX A

Green Star - Design & As Built Scorecard

Project:	North Sydney Pool Redevelopment
Targeted Rating:	4 Star - Best Practice

Core Points Available	Total Score Targeted
98	50.5

CATEGORY / CREDIT	AIM OF THE CREDIT / SELECTION	CODE	CREDIT CRITERIA	POINTS AVAILABLE	POINTS TARGETED
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
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	-	
		2.1	Services and Maintainability Review	1	
		2.2	Building Commissioning	1	
		2.3	Building Systems Tuning	1	
		2.4	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.	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 optimised performance.	4.1	Building 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.	5.1	Environmental Building Performance	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	-	Complies
		6.1	Monitoring Systems	1	1
Responsible Building Practices	To reward projects that use best practice formal environmental management procedures during construction.	7.0	Environmental Management Plan	-	
		7.1	Formalised Environmental Management System	1	
		7.2	High Quality Staff Support	1	1
Operational Waste	Prescriptive Pathway	8A	Performance Pathway - Specialist Plan	-	
		8B	Prescriptive Pathway - Facilities	1	1
Total				14	4

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	
		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	-	Complies
		11.1	General Illuminance and Glare Reduction	1	1
		11.2	Surface Illuminance	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	-	Complies
		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	
Total				**17**	**12**

Energy				**22**	
Greenhouse Gas Emissions	A. Prescriptive Pathway	15A.0	Conditional Requirement: Prescriptive Pathway	-	Complies
		15A.1	Building Envelope	1	1
		15A.2	Glazing	1	1
		15A.3	Lighting	1	1
		15A.4	Ventilation and Air-conditioning	1	1
		15A.5	Domestic Hot Water Systems	1	1
		15A.6	Accredited GreenPower	5	
		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	-	
Peak Electricity Demand Reduction	Prescriptive Pathway	16A	Prescriptive Pathway - On-site Energy Generation	1	1
		16B	Performance Pathway - Reference Building	-	
Total				**11**	**6**

Transport				**8**	
Sustainable Transport	Prescriptive Pathway	17A.1	Performance Pathway	0	
		17B.1	Access by Public Transport	3	2
		17B.2	Reduced Car Parking Provision	0	1
		17B.3	Low Emission Vehicle Infrastructure	0	
		17B.4	Active Transport Facilities	1	1
		17B.5	Walkable Neighbourhoods	1	1
Total				**5**	**5**

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

Materials				**14**	
		19A.1	Comparative Life Cycle Assessment	0	
		19A.2	Additional Life Cycle Impact Reporting	4	

Life Cycle Impacts	Prescriptive Pathway - Life Cycle Impacts	19B.1	Concrete	3	1
		19B.2	Steel	1	
		19B.3	Building Reuse	4	2
		19B.4	Structural Timber	4	
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	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	
Construction and Demolition Waste	Percentage Benchmark	22A	Fixed Benchmark	-	1
		22B	Percentage Benchmark	1	0.5
Total				**12**	**6.5**

Land Use & Ecology				**6**	
Ecological Value	To reward projects that improve the ecological value of their site.	23.0	Endangered, Threatened or Vulnerable Species	-	Complies
		23.1	Ecological Value	3	1
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	-	Complies
		24.1	Reuse of Land	1	1
		24.2	Contamination and Hazardous Materials	1	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	1
Total				**6**	**4**

Emissions				**5**	
Stormwater	To reward projects that minimise peak stormwater flows and reduce pollutants entering public sewer infrastructure.	26.1	Stormwater Peak Discharge	1	1
		26.2	Stormwater Pollution Targets	1	1
Light Pollution	To reward projects that minimise light pollution.	27.0	Light Pollution to Neighbouring Bodies	-	Complies
		27.1	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.	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	1
Total				**5**	**4**

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		1
Market Transformation	The project has undertaken a sustainability initiative that substantially contributes to the broader market transformation towards sustainable development in	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	10	
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	30E	Global Sustainability		1
Total				**10**	**2**

TOTALS	AVAILABLE	TARGETED
CORE POINTS	98	47.5
CATEGORY PERCENTAGE SCORE		48.5
INNOVATION POINTS	10	2.0
TOTAL SCORE TARGETED		50.5

APPENDIX B

GS Design and As-Built Credit (v1.2)	Design Requirements	Notes/Next Steps	Benefits/Costs
3.0 Adaptation and Resilience	• Stormwater modelling to account for increased rainfall intensity in future events over the asset lifespan.	• Climate change consideration recorded from modelling considerations on similar projects in surrounding areas i.e. % increase in rainfall intensity to be collected from figured used on projects in surrounding area. • Confirmation of Climate Change consideration in stormwater modelling e.g. what % increase in rainfall intensity is being accounted for. • Suggest undertaking full Climate Change Risk Assessment to identify any other risks associated with forecast climatic conditions.	• **Demonstrates compliance with EURC Table** • Future proofing and reduces risk of additional future costs to upgrade the stormwater system in future to cope with increased rainfall intensity due to climate change.
6.0 Metering and Monitoring	• Installation of accessible metering, including sub-metering for each distinct room 'use' e.g. the Admin/Creche area and Gym on GF require separate sub-metering. • Non-utility metering (including sub-metering) must meet and be commissioned to the most current Validating *Non-Utility Meters for NABERS ratings protocol*, issued by the NSW Office of Environment and Heritage • If a single item exceeds 5% (or 100kW) of the total energy use it must be independently metered. • Where a common water use consumes 10% of the projects water use it must be independently metered.	1. Include sub-metering for each distinct 'room use' within the design.	• Allows NSOP to actively measure water and energy uses in all areas, so if exceedances in utility uses are recorded management can determine the 'cause' and undertaken any necessary measures to reduce consumption.

8B Operational Waste	• Provision for the following waste streams:
	  ○ General waste to landfill;
	  ○ Recycling facilities (as is accepted by waste collection service; and
	  ○ One additional waste stream e.g. organics, e-waste, batteries etc.
	• Dedicated waste storage area with sufficient space for at least one collection cycle of all waste streams.
	• Access to waste collection areas must adhere to best practice third party guidelines.
		• Look at contract and council requirements regarding waste management streams.
		• Determine waste streams most applicable to services within NSOP.
		• Confirm current space proofing for waste storage area could fit store one cycle of all waste streams.
			• **Demonstrates compliance with EURC Table**
			• Reduce risk of waste 'overflow' at NSOP, so members of the public and staff do not risk interacting with rubbish or disposal process.
			• NSOP be able to collaborate with local council to coordinate various more waste streams.

9.1 Ventilation System Attributes	• The building ventilation systems must be designed to comply with ASHRAE Standard 62.1:2013 regards to minimum separation distances between pollution sources and outdoor air intakes (Table 5.5.1). • All new and existing ductwork that serves the building must have been cleaned in accordance with the recognised Standards		• **Demonstrates compliance with EURC Table** • Increase the thermal comfort of staff and members of the public attending the facility, facilitation healthier internal environments. • Increase overall wellbeing and health of internal occupants.

GS Design and As-Built Credit (v1.2)	Design Requirements	Notes/Next Steps	Benefits/Costs
	• Existing or new ventilation systems must be designed for adequate maintenance access	1. ESD Consult to discuss with relevant teams. *Please Note: Due to the nature of the works, the project is focussing on just the 'primary' spaces of building, these are areas in which an individual will be for an extended period e.g. a staff member's office. The application to 'Secondary Spaces' (spaces used to supplement the Primary Spaces) is not being applied. This is in contrast to requirements in the GS rating tool however has been discussed as best for project outcomes.*	
9.2 Provision of Outdoor Air	• Outdoor air is provided at a rate 50% greater than the minimum required by AS 1668.2:2012		
9.3 Exhaust of Elimination of Pollutants	• All kitchens must be ventilated in accordance with AS 1668.2:2012. A separate exhaust system must be provided for the kitchen exhaust. The kitchen must be physically separated from the adjacent spaces or have an opening no larger than an area of 2.5m2		
10.1 Internal Noise Areas	• - Internal ambient noise levels in the nominated area are no more than 5dB(A) above the lower figure in the range recommended in Table 1 of AS/NZS2107:2016. • - Compliance demonstrated by noise measurement and documentation provided by a qualified acoustic consultant and in accordance with AS/NZS 2107:2016, testing to be undertaken in 10% of all Primary and Secondary spaces. *Please Note: Compliance will require procurement of qualified acoustic consultant for both relevant design considerations required for noise mitigation, and resultant modelling.*		• Reduce risk of disturbance between multiple facilities, encouraging members of the public freedom to use each space without disturbance from surrounding or outside noise.
10.3 Acoustic Separation	• The partition between the spaces should be constructed to achieve a weighted sound reduction index (Rw) of: ○ At least 45; for all partitions which are: ▪ fixed without a door; and/or ▪ glazed partitions without a door. ○ At least 35; for all partition types that contain a door.		
11.0 Minimum Lighting Comfort	• Flicker-free lighting refers to luminaires that have either: ○ A minimum Class A1 & A2 ballast for all fluorescent lighting; ○ Electronic ballasts for all High Intensity Discharge (HID) lighting; ○ Electronic drivers that feature 12-bit or greater resolution for all Light-emitting Diode (LED) lighting; or ○ High frequency ballasts for all other lighting types, including incandescent (incl Halogen, dichroic (e.g. low-voltage downlights), and High-Intensity Discharge (e.g. metal halide, low/high pressure sodium). • Light sources must have a minimum Colour Rendering Index (CRI) of 80, unless the project team can demonstrate that, in a particular area, the activity is not impeded by a		• Increase overall wellbeing and health of internal occupants. • Increase ability for occupants and members of the public to concentrate and spend extended periods of time in internal areas.

GS Design and As-Built Credit (v1.2)	Design Requirements	Notes/Next Steps	Benefits/Costs
	lower CRI. The project team shall support their justification by ensuring their selection complies with the guidance provided in Table 7.2 in AS 1680.1:2006.		
12.0 Visual Comfort	• 40% of Primary and Secondary spaces receive high levels of sunlight. • Calculated using the GBCA Hand Calculation Guide (refer Section 2.0).	• Use the most up to date architectural drawings to assess the current % of sunlight. *Only applicable for Primary and Secondary spaces (incl. gym, offices, café, creche and meeting rooms)*	
13.1 Paints, Adhesive, Sealants and Carpets	• 95% of paints, adhesives, sealants and carpets meet stipulated 'Total VOC Limits', • Stipulated limits outlined in p.128-129 of Green Star Design and As-Built (v1.2) Submission Guidelines	• Include in technical specifications for interior finishes. • Include in any Fixtures, Furniture and Equipment (FFE) schedules. • Include in any relevant Design Reports and drawings.	• **Demonstrates compliance with EURC Table** • Increases the health and wellbeing of internal occupants and members of the public. • Supports sustainable and responsible procurement of healthy products. • Requirement to be costed by primary contractor and sub-contractor responsible for internal fit out.
13.1 Engineered Wood Products	• 95% of all engineered wood products meet stipulated formaldehyde limits • Stipulated limits outlined in p.130-131 of Green Star Design and As-Built (v1.2) Submission Guidelines	• Include in technical specifications for interior finishes. • Include in any FFE schedules. • Include in any relevant Design Reports.	
14.1 Thermal Comfort	• 80% of all occupants in the space are satisfied with the thermal comfort for 95% of the nominated area and 98% of the year.	• Potentially for internal pool, but could push extremes of size of mech plant unnecessarily.	•
15A.1 Building Envelope	• Roof and ceiling, walls, and flooring construction achieves a 15% increase on the minimum required R-values specified in J1.3, J1.5 and J1.6	• Confirm with design and include in relevant design reports. • Include in any relevant technical specifications and schedules for insulation.	• **Demonstrates compliance with EURC Table** • Reduce overall operational energy demand for the structure. • Reduces operational energy costs and significantly reducing the GHG impact throughout the life of the project. • Potential to have a 'payback' period which demonstrates operational savings versus initial cost.
15A.2 Glazing	• For vertical glazing, the total energy used for each orientation and each storey is not greater than 85% of the total allowance according to the Australian Building Codes Board glazing calculator or the calculated aggregated air-conditioning energy value as defined in part J2.4 of the NCC; and • Where there are roof lights, the SHGC and total U-Value of these roof lights exceed the requirements of section J1.4 by 15%.	• Include in technical specifications for windows and glass fittings. • Include in any FFE schedules. • Include in any relevant technical specifications and schedules for windows.	
15A.3 Lighting	• The actual installed aggregate illumination power density is 30% less than the maximum illumination power densities defined in Table J6.2a;	• Confirming with relevant lighting design team, include in relevant Design Report. • Include in technical specifications for lighting • Include in any FFE schedules.	

GS Design and As-Built Credit (v1.2)	Design Requirements	Notes/Next Steps	Benefits/Costs
	• Automated lighting control systems, such as occupant detection and daylight adjustment, are provided to 95% of the Primary and Secondary area; and • For Class 5 and 9a buildings only, the size of individually switched lighting zones does not exceed 100m2 for 95% of the nominated area.		
15A.4 Ventilation and Air Conditioning	• The HVAC systems comply with the following conditions: ○ The installed fan motor power and pump power, is at least 15% less that the maximum 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 minimum as defined in Table J5.4b; and ○ The required minimum energy efficiency ratio for packaged air conditioning equipment and refrigerant chillers is at least 15% higher than that specified in: ▪ NCC Tables J5.4d and J5.4e; or ▪ MEPS, where Section J does not apply to the equipment capacity.	• Confirm with mechanical engineer / building services on most effective method of integrating into design.	
15A.5 Domestic Hot Water System	Domestic hot water systems are powered by one of the following heat sources: • Renewable Energy (which may include electric/gas boost); • Natural Gas; • Electric heat pump (minimum COP 3.5 under design conditions); or • Waste heat or heat recovered from another process	• Design is for renewable (hybrid solar pv) with gas boost and harbour water heat rejection (waste heat) for the pool. • To be recorded in Design Reports and Drawings.	
16.1 Peak Electricity Demand Reduction	• The use of on-site electricity generation systems reduces the total peak electricity demand by at least 15%	• 1. Establish current proposed kW system for roof plan. • 2. Undertake preliminary modelling to determine annual generation capacity. • 3. Determine when peak energy demand assessment is applicable to be undertaken (can be done using the GBCA GHG Tool.	• **Demonstrates compliance with EURC Table** • Public demonstrates responsible construction practices. • Reduces operational energy costs and significantly reducing the GHG impact throughout the life of the project. • Potential to have a 'payback' period which demonstrates operational savings versus initial cost. • Energy security to both NSOP and wider grid demand.

GS Design and As-Built Credit (v1.2)	Design Requirements	Notes/Next Steps	Benefits/Costs

17B.4 Active Transport Facilities	• Secure bicycle facilities for 7.5% of total regular occupants, with associated end of trip facilities.	• Based on the following assumptions:
		  ○ Total Occupants of 1311 at one period of time (peak period);
		  ○ Staff consist of 5% of Total Occupants; and
		  ○ The building is considered a NCC Class 3 to 9 building (non-residential).
		• = 35 hoops will be required.
		• Additional considerations are below:
		  ○ Facilities can be provided within the building's boundary, or outside. If the facilities are outside the site boundary, they must be under the control of the building owner and be accessible to all building occupants and visitors (depending on the users being served by those facilities); and
		  ○ Secure bicycle parking is defined as that which is in accordance with AS 2890.
		Please note: Current planned gym facilities (i.e. showers) are suitable for 'end of trip' facilities.
			• Reduces congestion, traffic and parking demand in the surrounding areas.
			• Allows for increases visitors to the facility.
			• Promotes health and wellbeing of staff members who want to take active transport options to workplace.

18B.1 Sanitary Fixture Efficiency	• All fixtures are within one star of the below WELS ratings:
	  ○ Taps – 6 Star
	  ○ Urinals – 6 Star
	  ○ Toilet - 5 Star
	  ○ Showers - 3 Star (> 4.5 but <= 6.0)**
	  ○ Clothes Washing Machines – 5 Stars
	  ○ Dishwashers – 6 Stars
		• Include in technical specifications for fixtures.
		• Include in any FFE schedules.
		The 3 star (>4.5 but <=6.0) requirement relates to Range F which is specified for both High Pressure and Low Pressure Showers as per Table 3.1 and Table 3.2 respectively of the AS NZS 6400-2016 Water Efficient Products standard.
		For showers, within one star of this Category F WELS rating means showers must be either 3 star (6.0 but <=7.5), 3 Star (> 4.5 but <= 6.0), 4 Star (>6.0 but <=7.5) or 4 Star (> 4.5 but <= 6.0).
			• **Demonstrates compliance with EURC Table**
			• Reduces operational costs through reduction of water utilities.

18B.2 Rainwater Reuse	• Based on GFA of indoor space, a rainwater tank at a minimum size of 32kL must be installed for reuse on site. or • Installing tank suitable for end uses (e.g. toilet flushing and/or irrigation), and using the modelling pathway to earn points.	• Modelling pathway to be taken • It is estimated that there will be an approximate 45% to 55% of potable water saving for flushing fixtures achieved using rainwater sourced from a 15,KL tank installed on L2 adjacent to gym amenities on site.	• **Demonstrates compliance with EURC Table** • Best practice for new commercial and residential buildings. • Reduces operational costs through reduction of water utilities for water flushing.

GS Design and As-Built Credit (v1.2)	Design Requirements	Notes/Next Steps	Benefits/Costs
18B.4 Landscape Irrigation	• Either: ○ drip irrigation with moisture sensor override is installed, or ○ where no potable water is used for irrigation.	• ESD Consultant to determine degree of post-development of landscaping and irrigation requirements. • Include in Landscape Design Report and Drawings.	• **Demonstrates compliance with EURC Table** • Best practice for new commercial and residential buildings. • Reduces operational costs through reduction of water utilities. •
18B.5 Fire System Test Water	• - The fire protection system does not expel water for testing; or • - The fire protection system includes temporary storage for 80% of the routine fire protection system test water and maintenance drain-downs for reuse on-site calculated on the basis that any single zone is drained down annually. • - If sprinkler systems are installed, each floor must be fitted with isolation valves or shut-off points for floor-by-floor testing	• 1. Confirm with mechanical engineer / building services on most effective method of integrating into design.	• **Demonstrates compliance with EURC Table** • Best practice for new commercial and residential buildings. • Reduces operational costs through reduction of water utilities.
19B.1 Life Cycle Impacts- Concrete	• Specify to contractors Portland cement content is to be reduced by 30% measured by mass across all concrete use in the project compared to the Green Star reference Case • Specify to contractors to investigate if at least 50% of mix water for all concrete use in the project is reclaimed water (measured across all concrete mixes in the project).	• Structural Engineer/Durability Specialist to record in Design Reports and drawings opportunities in the scope of works for high SCM concrete or geopolymer concrete (e.g. kerbside mixes, pavements, non-structural elements). • Including in contractor and supplier agreements, monitoring and tracking system to be developed during construction phase.	• **Demonstrates compliance with EURC Table** • Reduction of Portland cement significantly reduces the embodied GHG impact of the project, while also demonstrate best practice construction practices and supporting sustainable procurement of waste products for reuse, • Supports sustainable and responsible procurement. • Opportunity to form partnerships with local business and initiatives to promote. • Requirement to be costed by primary contractor and sub-contractor responsible for internal fit out.
19B.3 Life Cycle Impacts – Building Reuse		• 1. ESD Consultant to determine with design team on relevance to scope of works.	
19B.4.1 Life Cycle Impacts – Structural Timber			
20.1 Structural and Reinforcing Steel	• 95% of the building steel (by mass) is sourced from a Responsible Steel Maker; and ○ For steel framed buildings, at least 60% of the fabricated structural steelwork is supplied by a steel fabricator/steel contractor accredited to the Environmental Sustainability Charter of the Australian Steel Institute (ASI); ○ For concrete framed buildings, at least 60% (by mass) of all reinforcing bar and mesh produced using energy-	• Structural Engineer to record in Design Reports and drawings • Include as a requirement in contractor and supplier agreements, monitoring and tracking system to be developed during construction phase.	

GS Design and As-Built Credit (v1.2)	Design Requirements	Notes/Next Steps	Benefits/Costs
	reducing processed in its manufacture (measured by average mass by steel maker annually.		
20.2 Timber	• 95% (by cost) of all timber used in the building and construction works is either: ○ Certified by a forest certification scheme that meets the GBCA 'Essential' Criteria for forest certification; or ○ Is from a reused source.	• Structural Engineer to record in Design Reports and Drawings. • Include as a requirement in contractor and supplier agreements, monitoring and tracking system to be developed during construction phase. • Include in technical specifications and any FFE schedules for finished wood products.	
21.1 Product Transparency and Sustainability	• 3% of all materials used in the project meet transparency and sustainability requirements under one of the following initiatives: ○ Reused products; ○ Recycled content products; ○ Environmental Product Declarations; ○ Third-party certification; or ○ Stewardship programs.	• Determine list of key materials/products with opportunities in procurement. • Including in contractor and supplier agreements, monitoring and tracking system to be developed during construction phase. • Include in technical specifications and any schedules for finished wood products.	
22.1 Construction and Demolition Waste	• At least 90% of the waste generated during construction and demolition has been diverted from landfill.	• Including in procurement and relevant contracts for deconstruction/demolition activities.	• **Demonstrates compliance with EURC Table** • Reduce volume of waste to landfill. Additional opportunity to form local partnerships for reuse of recycling.
23.1 Ecological Value 24.1 Heat Island Effect		• ESD Consultant to discuss further with the design team – predominate focussed on mapping the Ecological Value of the site pre and post development using the GBCA Ecological Calculator	• Promotes selection of any landscaping materials which support local biodiversity initiatives. • Reduces high heat impacts to members of the public.
26.1 Stormwater Peak Discharge	- Post development peak ARI event discharge from the site does not exceed the pre-development peak ARI event discharge. - Modelling to a 1 year ARI even	• Confirm the post development peak discharge rate current council and project requirements.	• **Demonstrates compliance with EURC Table** • Future proofing and reduces risk of additional future costs to upgrade the stormwater system. • Reduces risk of negative impact to receiving water bodies.
26.2 Stormwater Pollution Targets	• Stormwater discharge from the site meets specified pollution reduction targets (% of the typical urban annual load), including: ○ 80% TSS ○ 85% Gross Pollutants ○ 30% TN ○ 30% TP	• Determine current modelled pollution reduction levels (MUSIC modelling). • NSC requires greater reductions so will exceed those targets. Potential for innovation credits under Improving on Green Star Benchmarks (30C)	

GS Design and As-Built Credit (v1.2)	Design Requirements	Notes/Next Steps	Benefits/Costs
	○ 60% Total Petroleum ○ 90% Free Oil		
27.0 Light Pollution to Neighbouring Bodies	• The project complies with AS 4282:1997 Control of the obtrusive effects of outdoor lighting. • For Class 3 to 9 buildings (non-residential), the values in Column 3.C	• ESD consultant to work with lighting team	• Reduces impacts if operation to surrounding commercial and residential bodies.
27.1 Light Pollution to Night Sky	• Control the upward light output ratio (ULOR) • Control of direct illuminance	• ESD consultant to work with lighting team	

APPENDIX C

NORTH SYDNEY COUNCIL

EFFICIENT USE OF RESOURCES COMMITMENT TABLE - COMMERCIAL

Compliance key: ✓ = compliant or committed to compliance

X = not compliant or not committed to compliance (comment required)

N/A = not applicable (comment required)

PART A: INFORMATION AVAILABLE AT DEVELOPMENT APPLICATION STAGE			
Objectives	**Provision**	**Compliance**	**Comment**
Energy efficiency			
1. To ensure that developments minimise their use of non-renewable energy resources. 2. To ensure that buildings are designed such that the air conditioning plant meets performance requirements, while minimising energy usage.	The development has been designed so that it will not reduce the energy efficiency of buildings in the vicinity.	✓	Further investigation required, intend to comply.
	Mechanical space heating and cooling systems have been designed to target only those spaces which require heating and cooling, not the whole building.	✓	Enhancement of mechanical space heating and cooling systems are being focused in the 'primary spaces' of the building as defined in the Green Star Submission Guidelines as 'all areas where a person is expected to work, or remain for an extended period of time'
	Car parking areas have been designed so that electric vehicle charging points can be installed at a later time.	X	Not within scope of works
Passive solar design			
1. To ensure that the site layout and building orientation allows for maximum solar access and are adapted to local climatic conditions and prevailing site characteristics.	Site layout and building orientation are adapted to local climatic conditions and prevailing site characteristics, such as existing overshadowing, planting and slope.	✓	Further investigation required, intend to comply.
	The long axis or length of the building is oriented to the northerly aspect.	✓	Further investigation required, intend to comply.
	East and west facing glazing is minimised and fully shaded at noon at the summer solstice.	✓	Further investigation required, intend to comply.

	Natural light access has been optimised through limiting the internal depth of the building to reduce the amount of energy used to run artificial lighting.	✓	Further investigation required, intend to comply. Compliance demonstrated through GS Credit 12.1 Daylight and 12.2 Views.
	The landscaping plan submitted with the development application shows how the landscaping contributes to energy efficiency by providing substantial shade in summer, especially to west-facing windows and open car park areas, and admitting winter sunlight to outdoor and indoor working areas.	✓	Further investigation required, intend to comply.
	North facing pergolas are proposed to shade walls and windows (deciduous vines will be trained over the pergola to provide effective cooling in warm weather).	✓	Further investigation required, intend to comply.
	The fixed louvers of the north facing pergolas are spaced and oriented so that a line between the top of one blade and the bottom of the next makes an angle of 70°.	✓	Further investigation required, intend to comply.
	Louvres are angled to correspond to the lowest altitude angle the sun reaches at noon in winter (31° in Sydney).	✓	Further investigation required, intend to comply.
	South facing glazing has been kept to a minimum to reduce winter heat losses.	✓	Further investigation required, intend to comply. Glazing to be required as per GS Credit 15A.2
	The building has been designed to include a north facing roof where a solar hot water system or collector can be installed.	✓	Further investigation required, intend to comply.
Thermal mass and insulation			
1. To achieve more even, year-round average temperature, making the building more comfortable for occupants and resulting in less demand for artificial heating or cooling.	Flooring is designed to absorb heat from the winter sun to maximise natural heating.	✓	Compliance to be demonstrated through achievement of GS Credit 15A.1 Building Envelope and 15A.2 Glazing.
	To maximise natural cooling, thermal mass is protected from summer sun with shading and insulation. The design allows for cool night breezes and air currents	✓	

	to pass over the thermal mass, drawing out all the stored energy.		
	Masonry walls and insulated walls and ceilings have been incorporated to contribute to the effectiveness of thermal mass.	✓	
	The roof, walls and floor, incorporate thermal insulation.	✓	
	Awnings, shutters or doubleglazing are proposed to be incorporated to minimise heat loss/gain.	✓	
Water conservation			
1. To minimise the use of potable water. 2. To encourage the reuse of grey water, rainwater and stormwater.	The development is designed so that stormwater runoff will be collected and reused for subsurface irrigation.	✓	Compliance to be demonstrated through achievement of GS Credit 18B.2 Rainwater Reuse.
	The development is designed to incorporate a water efficient irrigation system.	✓	Compliance to be demonstrated through achievement of GS Credit 18B.4 Landscape Irrigation.
	A reporting system is proposed for the development to inform/educate occupants about the buildings water consumption.	✓	Further investigation required, intend to comply with GS Management Category Credits.
Waste management and minimisation			
1. To minimise material usage and waste during building, construction and demolition. 2. To minimise the level of waste during operation reduce new building material usage and minimise volume of demolition materials.	The building has been designed to encourage waste minimisation (e.g. source separation, reuse and recycling).	✓	Compliance to be demonstrated through achievement of GS Credit 8B Operational Waste.
	The garbage room has been designed to provide adequate recycling systems.	✓	Compliance to be demonstrated through achievement of GS Credit 8B Operational Waste.
	The proposed development incorporates materials with long lives and low maintenance needs.	✓	Further investigation required, intend to comply.
	Contractors and sub-contractors employed to undertake proposed construction works and waste removal will be educated about the waste objectives of the development.	✓	Further investigation required, intend to comply.

	The storage of any hazardous waste materials will be adequately secured.	✓	Further investigation required, intend to comply.
Stormwater management			
1. To mimic pre-development or natural drainage systems through the incorporation of WSUD on-site. 2. To protect watersheds by minimising stormwater discharge and maximising stormwater quality. 3. To minimise off-site localised flooding or stormwater inundation.	The development has been designed to ensure that, as a minimum, post-development stormwater discharge rates will be less than pre-development stormwater discharge rates.	✓	Compliance to be demonstrated through achievement of GS Credit 26.1 Stormwater Peak Discharge and 26.2 Stormwater Pollution Targets.
	The development has been designed to ensure that, as a minimum, post-development stormwater quality will be improved from pre-development levels.	✓	
	On-site stormwater detention, including the use of grass swales and detention basins, has been incorporated to minimise and filter stormwater runoff.	✓	
	Impervious surfaces have been minimised.	X	Due to scope of works the degree of impervious surface may be increase, further investigation required to calculate pre-development and post-development comparison.
Building materials			
	Products with the least life cycle impact have been favoured.	✓	

1. To encourage the use of materials which have a low environmental impact during their life cycle. 2. To encourage the use of toxin free material to minimise the health impact of materials used indoors. 3. To maximise the energy efficiency of buildings.	The development has been designed to ensure the following types of building materials will be used: (a) materials which are sourced from renewable and abundant resources; (b) materials which are durable; (c) locally manufactured materials and produced; (d) materials with a low embodied energy content; (e) salvaged and/or recycled materials; (f) timber used be obtained from certified sustainable sources; (g) materials with a high recycled content (>50%); (h) low volatile organic compound (VOC) emitting materials; (i) mechanical fixings instead of adhesives and glues, wherever possible; (j) when using Medium Density Fibreboard, ensure that it has a low formaldehyde content; (k) materials which are non-toxic including toxin-free floor finishes.	✓	Compliance to be demonstrated through achievement of GS Credit 13.1 Paints, Adhesives, Sealants and Carpets, 13.1 Engineered Wood Products, 19B.1 Concrete, 19B.2 Steel, 20.1 Structural and Reinforcing Steel and 20.2 Timber Products.
	The development has been designed to ensure the following materials will be avoided: (a) copper, chrome, cadmium, lead, mercury, cyanide, and formaldehyde; (b) materials, sealants and adhesives containing PVC; (c) wood treated with CCA; (d) solvents.	✓	
	The development has been designed to incorporate physical termite barriers (made of granite or stainless steel) instead of chemicals.	✓	Further investigation required, intend to comply.
	The development has been designed to incorporate lighter coloured materials and finishes on the main external parts of the building.	✓	Further investigation required, intend to comply.
Adaptive reuse of buildings			
1. To encourage the adaption and reuse of buildings.	The development has been designed so that existing buildings are reused in preference to demolition.	✓	Compliance to be demonstrated through achievement of GS Credit 19B.3 Building Reuse.

	Buildings have been designed to encourage adaptable office floorspace to accommodate changing occupier requirements.	✓	Further investigation required, intend to comply.
Green roofs			
1. To provide accessible roof space providing increased amenity for the occupants and visitors of the building. 2. To improve the aesthetics and amenity of the urban environment (this particularly relates to the appearance of the roof when viewed from surrounding buildings). 3. To provide space to accommodate renewable energy production. 4. To improve stormwater management by controlling both the quality and flow of stormwater. 5. To increase biodiversity by the use of plant material, and in particular to promote food production where appropriate. 6. To protect the building structure by increasing its thermal protection which will also help to reduce internal heating and cooling requirements	As the proposed development involves the creation of new roof space, a roof plan has been submitted that demonstrates how the new available roof space contributes to the achievement of at least three of the above objectives. The roof plan illustrates those parts of the available roof space to be used as a green roof immediately after construction of the proposed works. Applicants are encouraged to install green roofs immediately after construction. Applicants are advised to consult the North Sydney Council Green Roof and Wall Resource Manual for technical guidance on the design, construction and maintenance of green roofs.	X	Not in scope of works.

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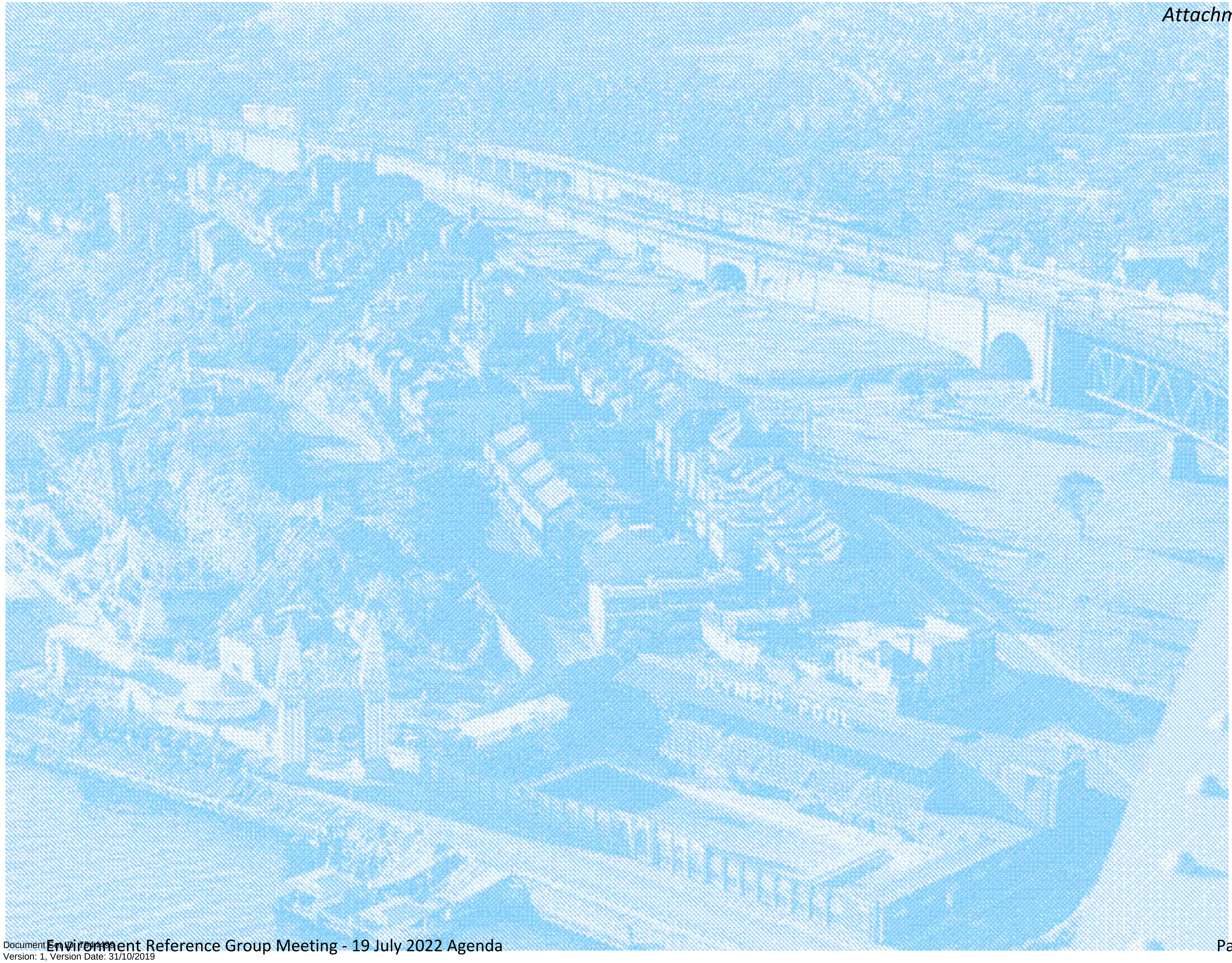


operational waste management plan

OPERATIONAL WASTE MANAGEMENT PLAN

Waste services have been designed in accordance with the NSC Waste Services requirements as outlined in the current DCP 2013 Appendix 3 Waste Handling Guide.

The uses and functions of the site are largely the same as the existing facility, however the extent of the facilities and services is greater than current uses and the calculation of waste generation calculation has been carried out for the expected usage arising from the upgraded design based on the DCP Table B-2.10

The calculations are attached in Table 1 below

The calculations of volume of waste generation and required bin storage are indicated along with the location and size of the waste storage areas indicated on the general floor plans

GENERAL WASTE AND RECYCLING

Waste management for general waste and recycling are proposed to be by designated bin storage managed by centre staff.

Waste generated by the L3 aquatic facilities, shop and café as well as the Gym and plant areas on L1 and 2 will utilise the general waste room located adjacent to the new secure loading area accessed from Paul Street.

Waste collection services will be given access to this secure loading area to avoid waste bins being parked on the street for collection.

Waste generated by the L1 aquatic facilities, kiosk, Creche and Ripples café will utilise a new secure waste enclosure facing onto Alfred Street, near to the egress gates to Alfred street.

Waste collection services will be given access to this secure storage area to avoid waste bins being parked on the street for collection.

These proposed waste arrangements are a significant improvement on the current system of a large number of 240 litre bins being stored in general access areas on site and moved to the roadway at Alfred street and Olympic Drive for collection.

These proposed waste arrangements are a significant improvement on the current system of a large number of 240 litre bins being stored in general access areas on site and moved to the roadway at Alfred street and Olympic Drive for collection.

REFRIGERATED WASTE

It is proposed to incorporate a new refrigerated waste room to assist in the management of trade waste for the restaurant and café tenancies. This waste point is located at L3 adjacent to the general waste storage.

GREASE ARRESTORS/TRADE WASTE

Grease Arrestors/ Trade waste for the existing Food tenancies are serviced by Grease arrestor and storage pits accessed at the Paul Street.

It is proposed to maintain the general location of these services and provide an enlarged pit of approximately 3,000-5,000ltre capacity to service the new L3 café kiosk.

Waste Management Calculation

brewster hjorth architects

NAME		AREA (m2)	WASTE GENERATION	WASTE PER DAY (m3)	WASTE PER DAY (L)	NO. OF BINS (240L)
Areas L1	**office area**					
	life guard office	9	0.01-0.03 m3/ 100m2			
	first aid	8				
	admin	80				
	creche	73				
	TOTAL	170		0.051	51	0.21
	shop area					
	change amenities	336	0.1-0.2m3/100m2			
	TOTAL	336		0.672	672	2.80
	catering					
	ripples terrace	45	0.3-0.6m3/100 meals			
	ripples dining	81	assuming ripples cafe			
	TOTAL	45	serves 250 meals per			
			total 250 meals	1.5	1500	6.25

total 240L bins required	9.26	**240L waste bins provided**	**5**
total 240L bins provided	9	**240L recycle bins provided**	**4**

NAME		AREA (m2)	WASTE GENERATION	WASTE PER DAY (m3)	WASTE PER DAY (L)	NO. OF BINS (1100L)
Areas L2& 3	**office area**					
	swim school	9	0.01-0.03 m3/ 100m2			
(including L1 gym)	first aid	10				
	TOTAL	19		0.0057	5.7	0.01
	shop area					
	reception	21	0.1-0.2m3/100m2			
	retail/ entry	188				
	customer service	6				
	fitting room	4				
	gym	471				
	spin room	107				
	program/	257				
	change amenities	228				
	TOTAL	1282		2.564	2564	2.33
	catering					
	kiosk servery	41	0.3-0.6m3/100 meals			
	kiosk kitchen	9	assuming kiosk serves			
	internal eat area	119	100 meals per day			
	outdoor seating	132				
	existing kitchen	86	assuming existing			
	existing	122	restaurant serves 300			
	TOTAL	387				
			total 400 meals	2.4	2400	2.18

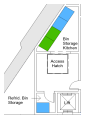
total 1100L bins required	4.52	**1100L waste bins provided**	**3**
total 1100L bins provided	5	**1100L recycle bins provided**	**2**

L1 rubbish area	floor area (m2)	height(m)	volume (m3)	volume (L)
	7.5	2.1	15.75	15750
L3 rubbish area	floor area (m2)	height(m)	volume (m3)	volume (L)
	18	5.7	102.6	102600

Legend
general waste
recycled bins

L1 Waste Area
9 x 240L Bins

L3 Waste Area
5 x 1100L Bins



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