

Marsden Park Data Centre

ESD SSDA Report

Ecologically Sustainable Development (ESD) Report for
State Significant Development Application (SSDA)

Prepared for: CDC Data Centres

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Acknowledgment of Country

In the spirit of reconciliation, Stantec acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past and present, and extend that respect to all Aboriginal and Torres Strait Islander peoples.

Disclaimer

This report has been developed based on the Development level of information provided to Stantec. Stantec has taken every effort to ensure the information presented in this report is an accurate reflection of the development but cannot guarantee the final performance of the building. The content of the development, including systems, materiality and finishes is subject to final architectural and client approval and subject to change.

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1. Executive Summary

This Ecological Sustainable Development (ESD) report has been prepared by Stantec at the request of CDC Data Centres for the proposed construction of data centre campus located at 105-113 Hollinsworth Road, Marsden Park, 2765 NSW. The data centre campus consisting of one 79MW building and five 84MW buildings is proposed to be constructed at the site with a total GFA of 285,266 square meters, including 15,415 square meter GFA of office area.

The report provides an overview of the ESD principles including greenhouse gas emission reduction strategies (reflecting the Government's goal of net zero by 2050), water sensitive urban design and material resource management, which will be implemented across the development and will form part of the project's State Significant Development Application SSD-70889211 (SSDA) submitted to the Department of Planning, Housing and Infrastructure.

Information contained within this report has been prepared in direct response to the Planning Secretary's Environmental Assessment Requirements (SEARS) for Marsden Park Data Centre, State Environmental Planning Policy 2022 (Sustainable Buildings), and the Blacktown City Council Growth Centre Precincts Development Control Plan (DCP) 2010 (2022 Amendment). The table below outlines how the development intends to respond to the relevant ESD SEARs requirements within this report.

Table 1: ESD SEARs requirements

SEARS requirements – Marsden Park Data Centre	
Climate Change	Response location within this report
Including the preparation of a Greenhouse Gas Mitigation Plan and a Climate Change Adaptation Plan in accordance with the relevant EPA requirements	Refer to GHG Assessment report and GHG Mitigation Plan in SSDA submission
SEARS requirements – Marsden Park Data Centre	
Ecologically Sustainable Development (ESD)	Response location within this report
A description of how the proposal will incorporate the principles of ecologically sustainable development in the design, construction and ongoing operation of the development	Section 4
Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards.	Section 5.1.1
If Chapter 3 of SEPP (Sustainable Buildings) 2022 applies, include: - demonstration of how the development has been designed to address the provisions set out in Chapter 3.2(1) - provision of a NABERS Embodied Emissions Material Form to disclose the amount of embodied emissions attributable to the development in accordance with section 35BA of the EP&A Regulation.	Section 4 & 5 Attached in SSDA submission

In accordance with the above, and in alignment with CDC's ESG strategy the project intends to implement best-practice sustainability design initiatives such as:

- The development's electricity demand is to be met using electricity to ensure that the development is future-proof as the electrical grid progressively decarbonises



- Purchasing electricity that is 100% backed by renewable electricity sources for both customer IT electricity and overhead electricity to run the data centres. CDC currently achieves this by purchasing Large-scale Generation Certificates (LGCs)
- High performance building envelope, strategic shading, and rationalised window to wall ratios of occupied zones.
- High COP of chillers, fans and pumps to reduce operational energy use and therefore greenhouse gas emissions.
- Water sensitive urban design principles including:
 - rainwater harvesting and reuse for irrigation, toilet flushing and washdown
 - selection of native & drought tolerant landscaping;
 - strategic stormwater volume and pollutant discharge control.
 - selection of water efficient sanitary fixtures including toilets, taps and urinals
- Air cooled chillers to significantly reduce the usage of potable water for primary cooling purposes.
- Specification of sustainable, certified, low-carbon content equipment and materials.

The impacts of these sustainability strategies on energy, GHG emissions and water consumption of the proposed data centre campus were estimated and summarised below:

Table 2: Summary of estimated **Energy, GHG Emissions** and **Water** reduction

Resource	Benchmark (Market average performance)	Proposed	% Improvement compared to Benchmark
PUE	1.61	1.3	
Data centre Facility energy (kWh/yr)	2,670,512,897	1,268,534,212	52%
GHG emission throughout project life cycle (tCO ₂ -e)	1,656,663	829,627	52%
		1,173	99% including purchase of renewable energy
Date Centre Water Use (l/kWh)	1.8	0.01	Nearly 100%

Resource	Benchmark (Market average performance)	Proposed	% Improvement compared to Benchmark
Office NABERS Target	4.5	5.5	22%
Office energy (kWh/year)	1,558,242	956,822	39%
Office Water Use (kL/year)	15,750	2,307	85%

- Agreement to rate the operational energy and water performance of the commercial office components of each building against NABERS upon the achievement of at least 70% occupancy within the office space. The performance targets shall be aligned with the SEPP requirements as follows:
 - 5.5-star base building NABERS Energy for office space only.
 - 3-star NABERS Water for office space only.



2. Introduction

2.1 Purpose

The purpose of this Ecologically Sustainable Development (ESD) report is to support a project's State Significant Development Application SSD-70889211 (SSDA) submitted to the Department of Planning, Housing and Infrastructure. This report directly responds to Secretary's Environmental Assessment Requirements (SEARs) for Marsden Park Data Centre and Blacktown City Council Growth Centre Precincts DCP 2010 (2022 Amendment) by providing a description of how the proposed development will incorporate the principles of ecologically sustainable development (ESD) into the design and ongoing operation of the data centre. Consideration has been given to the design initiatives included for the proposed development, or recommendations for further evaluation which relate to ESD principles.

2.2 Project Overview

2.2.1 Site context

The site is within the Blacktown local government area (LGA). The proposed development is located in a logical and highly accessible location along the Hollinsworth Road corridor which provides the site with direct access to Marsden Park town centre. The proposal is consistent with the vision set out for Marsden Park Industrial Precinct and the North West Growth Area.



Figure 1: Aerial map of the site and surrounding context - Source: Urbis (2023)

2.2.2 Description of proposed development

The development proposed comprises of 6 new data centres each containing 12 'data halls' and a FOH office area for on-site users. Each data centre is coupled with a bank of 20 standby generators to ensure uninterrupted operation of the facility. The site neighbours other light industrial or commercial zones to the East and West with residential streets to the South.

The overall site is bound by:

- Hollinsworth Road North-West of the site
- Langford Drive to the East
- Industrial Developments to the North and South-West.
- Undeveloped land to the South of the Site

Property Title	Marsden Park Data Centre
Address	105 -113 Hollinsworth Rd, Marsden Park NSW 2765
Number of storeys	4
Building Description	Data centre and Office
ABCB Climate Zone	Zone 6
Building Class	Class 7b (data storage) and Class 5 (office)

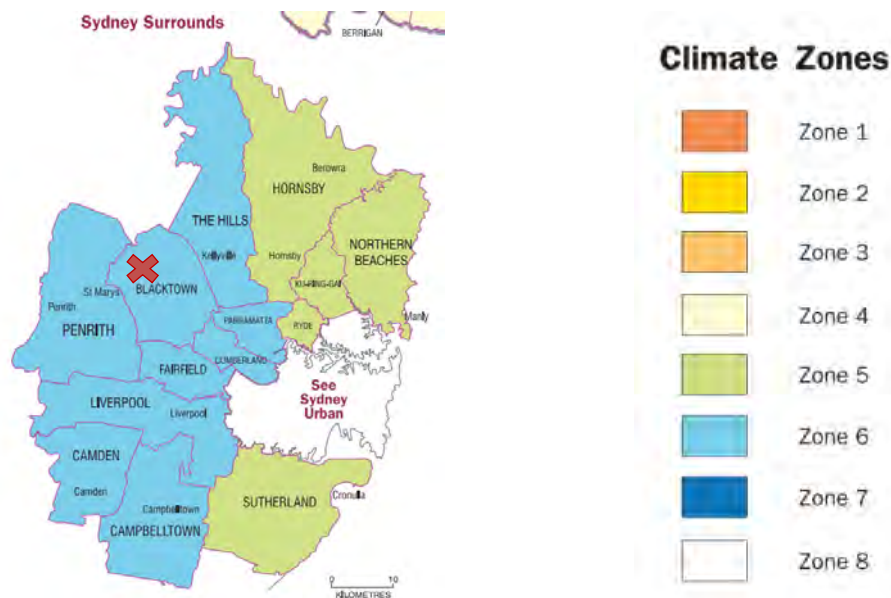


Figure 2: Climate zone map and location of development (abcb.gov.au)

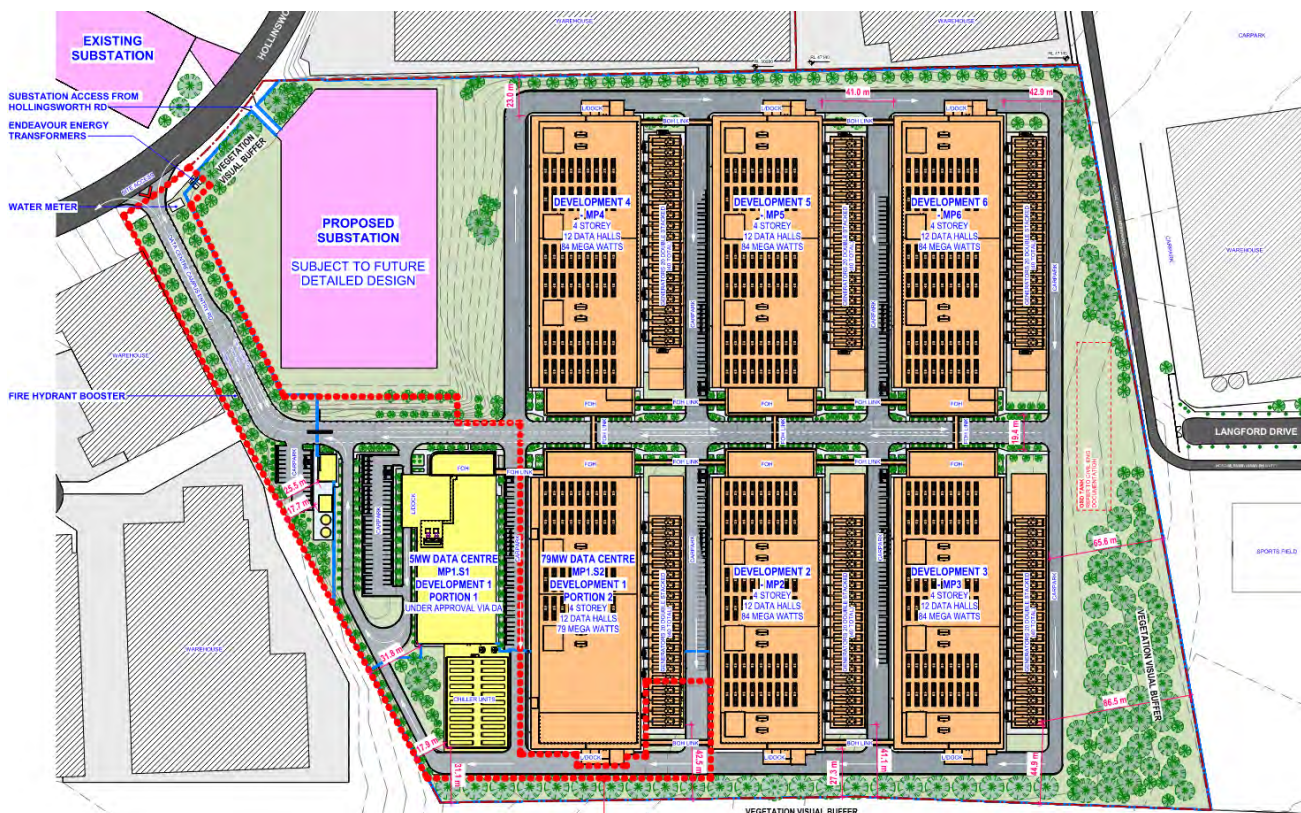


Figure 3: Campus site plan - Source: EJE Architecture (Dated 09 September 2024)

2.3 SEARs and DCP requirements relevant to this report

Table below identifies the SEARs and Development Control Plan (DCP) requirements which are relevant to this development application and indicates the location within the report where each requirement is addressed.

SEARS requirements – Marsden Park Data Centre	
Climate Change	Response location within this report
Including the preparation of a Greenhouse Gas Mitigation Plan and a Climate Change Adaptation Plan in accordance with the relevant EPA requirements	Greenhouse Gas Mitigation Plan and a Climate Change Adaptation Plan will be addressed in a separate report in the submission.
SEARS requirements – Marsden Park Data Centre	
Ecologically Sustainable Development (ESD)	Response location within this report
A description of how the proposal will incorporate the principles of ecologically sustainable development in the design, construction and ongoing operation of the development	Section 4
Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards.	Section 5.1.1
If Chapter 3 of SEPP (Sustainable Buildings) 2022 applies, include:	

- demonstration of how the development has been designed to address the provisions set out in Chapter 3.2(1) - provision of a NABERS Embodied Emissions Material Form to disclose the amount of embodied emissions attributable to the development in accordance with section 35BA of the EP&A Regulation.	Section 4 & 5 Attached in SSDA submission
DCP Requirements 6.5 Ecologically sustainable development 6.5.2 Controls	Response location within this report
1) A Site Water Management Plan must be prepared in accordance with Appendix F.	Section 5.6
2) Development Applications are required to demonstrate consideration of: - measures that will reduce waste and conserve water through water recycling; - measures to minimise run-off and stormwater generation; - implementing total water cycle management by including measures that reduce consumption of potable water for non-potable uses, minimise site run-off and promote stormwater re-use; - utilising recycled materials and renewable building resources; - promoting biological diversity through appropriate retention, planting and maintenance of indigenous flora of the area; - implementing a waste management strategy that promotes the overall reduction of waste levels. - and promoting the achievement of the 60 percent waste reduction target for New South Wales; and - implementing energy conservation measures that include reducing energy consumption and increasing inherent energy efficiency through design and materials selection, and adopting energy management plans.	Section 5.2 Section 5.3 Section 5.6 Section 5.1.2
3) Development Applications are required to demonstrate that consideration has been given to promoting ecologically sustainable transport by complementing and reinforcing the development and use of the existing and planned integrated public transport, pedestrian and cycling networks servicing the site.	Section 5.1.2
4) Roof stormwater should be collected in tanks or street level reticulation which would serve as a retention system. The water in the retention system would be available for use for non-potable uses such as the watering of landscaped areas and use in toilet and hot water systems.	Section 5.2
5) Consideration should be given to the feasibility of any measures to substitute grid-source power with environmentally sustainable alternatives such as tri-generation (green transformers), co-generation (i.e. recovery of waste energy) or photovoltaics.	Section 5.1.2
6) New commercial buildings must achieve a minimum 4-star Green Star rating from the Green Building Council of Australia. Refer to the 'Green Star – Office as Built v3 Technical Manual'.	N/A

7) New industrial and light industrial buildings must achieve a minimum 4-star Green Star rating from the Green Building Council of Australia from such time that an Industrial Tool has been adopted	N/A
8) Development shall incorporate water efficient fixtures such as taps, showerheads, and toilets. The fixtures must be rated to at least AAA under the National Water Conservation Rating and Labelling Scheme. Where the building or development is water intensive (i.e. high-water user), specific water conservation objectives must be resolved with council	Section 5.2
9) Appropriate use of energy efficient materials during construction is to be demonstrated.	Section 5.3
10) Development should incorporate energy efficient hot water systems, air-conditioning, lighting and lighting control systems.	Section 5.1.2

3. Sustainable Design Framework

In pursuit of the ecological design principles, the development located at 105 Hollinsworth Rd, Marsden Park NSW 2765 will pursue excellence benchmarked from a number of sources. These include best practice design initiatives from the following regulatory frameworks:

- NSW Environmental Planning and Assessment Act 1979;
- NSW Environmental Planning and Assessment Regulation 2021;
- NSW Environment Protection Authority (EPA) Climate Change Policy 2023;
- NSW Department of Planning, Industry and Environment (DPIE) Net Zero Plan Stage 1: 2020-2030
- Planning Secretary's Environmental Assessment Requirements (SEARS) – Marsden Park Data Centre;
- State Environmental Planning Policy (Sustainable Buildings) 2022;
- Blacktown City Council Growth Centre Precincts Development Control Plan (DCP) 2010 (2022 Amendment), and;
- NCC 2022 Section J.

3.1 NSW Environmental Planning and Assessment Act 1979

"Section 4.15 Evaluation (1) Matters for consideration—general" states the following:

In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application—

(1) the provisions of—

- a) any environmental planning instrument, and
- b) any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Planning Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved), and
- c) any development control plan, and
- d) any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4, and
- e) the regulations (to the extent that they prescribe matters for the purposes of this paragraph),
- f) (Repealed)

that apply to the land to which the development application relates,

- (2) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,
- (3) the suitability of the site for the development,
- (4) any submissions made in accordance with this Act or the regulations,
- (5) the public interest.



3.2 NSW Environmental Planning and Assessment Regulation 2021

Section 193 “Principles of ecologically sustainable development” under division 5 “Environmental impact statements” of the Environmental Planning and Assessment Regulation 2021 states the following:

- (6) The principles of ecologically sustainable development are the following-
 - g) the precautionary principle,
 - h) inter-generational equity,
 - i) conservation of biological diversity and ecological integrity,
 - j) improved valuation, pricing and incentive mechanisms.
- (7) The precautionary principle is that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty, should not be used as a reason for postponing measures to prevent environmental degradation.
- (8) In applying the precautionary principle, public and private decisions should be guided by—
 - a) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and
 - b) an assessment of the risk-weighted consequences of various options.
- (9) The principle of inter-generational equity is that the present generation should ensure the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.
- (10) The principle of the conservation of biological diversity and ecological integrity is that the conservation of biological diversity and ecological integrity should be a fundamental consideration.
- (11) The principle of improved valuation, pricing and incentive mechanisms is that environmental factors should be included in the valuation of assets and services, such as—
 - a) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement, and
 - b) the users of goods and services should pay prices based on the full life cycle of the costs of providing the goods and services, including the use of natural resources and assets and the ultimate disposal of waste, and
 - c) established environmental goals should be pursued in the most cost effective way by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

3.3 NSW Environment Protection Authority (EPA) Climate Change Policy 2023

Climate Change Policy 2023 describes the causes and consequences of climate change in NSW and outlines EPA’s commitment to deliver on the statutory objectives and duty to address climate change and the Strategic Plan 2021–24 commitments. It states:

“We adopt and support the delivery of the NSW Government’s Climate Change Policy Framework, including the:

- Net Zero Plan Stage 1: 2020–2030



- Net Zero Plan Stage 1: 2020–2030 Implementation Update
- Net Zero Plan Implementation Update 2022
- Climate Change Adaptation Strategy
- Waste and Sustainable Materials Strategy.

Our climate change policy and the associated action plan (Climate Change Action Plan 2023–26) complement, support and build on the foundations set in those documents.

Our Strategic Plan 2021–24 identifies climate change and ecologically sustainable development as two of our key focus areas.

We are committed to:

- taking action to reduce greenhouse gas emissions, mitigate climate change impacts and build greater environmental and community resilience aligned with the principles in the NSW Net Zero Plan
- championing sustainable approaches to mitigate the cumulative impacts of industry on local communities and environments.”

3.4 NSW Department of Planning, Industry and Environment (DPIE) Net Zero Plan Stage 1: 2020-2030

The Net Zero Plan Stage 1: 2020-2030 is the foundation for NSW’s action on climate change and goal to reach net zero emissions by 2050.

It outlines the NSW Government’s approach to protect our future by growing the economy, creating jobs and reducing emissions over the next decade. The plan aims to strengthen the prosperity and quality of life of the people of NSW, while helping to achieve the State’s objective to deliver a 70% cut in emissions by 2035 compared to 2005 levels.

The plan supports a range of initiatives targeting energy, electric vehicles, hydrogen, primary industries, technology, built environment, carbon financing and organic waste.

3.5 Planning Secretary’s Environmental Assessment Requirements (SEARS) – Marsden Park Data Centre;

Ecologically Sustainable Development (ESD)

- (1) a description of how the proposal will incorporate the principles of ecologically sustainable development in the design, construction and ongoing operation of the development
- (2) demonstration of how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards
- (3) if Chapter 3 of State Environmental Planning Policy (Sustainable Buildings) 2022 applies, include:
 - demonstration of how the development has been designed to address the provisions set out in Chapter 3.2(1)
 - provision of a NABERS Embodied Emissions Material Form to disclose the amount of embodied emissions attributable to the development in accordance with section 35BA of the EP&A Regulation.



3.6 State Environmental Planning Policy (Sustainable Buildings) 2022;

3.2) Development consent for non-residential development

- (1) In deciding whether to grant development consent to non-residential development, the consent authority must consider whether the development is designed to enable the following—
 - a) the minimisation of waste from associated demolition and construction, including by the choice and reuse of building materials,
 - b) a reduction in peak demand for electricity, including through the use of energy efficient technology,
 - c) a reduction in the reliance on artificial lighting and mechanical heating and cooling through passive design,
 - d) the generation and storage of renewable energy,
 - e) the metering and monitoring of energy consumption,
 - f) the minimisation of the consumption of potable water,
- (2) Development consent must not be granted to non-residential development unless the consent authority is satisfied the embodied emissions attributable to the development have been quantified.

3.3) Development consent for non-residential development

- (1) In deciding whether to grant development consent to large commercial development, the consent authority must consider whether the development minimises the use of on-site fossil fuels, as part of the goal of achieving net zero emissions in New South Wales by 2050.
- (2) Development consent must not be granted to large commercial development unless the consent authority is satisfied the development is capable of achieving the standards for energy and water use specified in Schedule 3.
- (3) For the purposes of subsection (2), development is capable of achieving a standard specified in Schedule 3 if there is a NABERS commitment agreement in place to achieve the standard.

3.4) Development consent for non-residential development

- (1) This section applies to non-residential development that is declared to be State significant development by State Environmental Planning Policy (Planning Systems) 2021, section 2.6(1) and specified in that policy, Schedule 1, sections 13–15.
- (2) In deciding whether to grant development consent to development to which this section applies, the consent authority must consider whether the development will minimise the use of on-site fossil fuels, as part of the goal of achieving net zero emissions in New South Wales by 2050.

Schedule 3: Standards for energy and water use for large commercial development.

- (1) Energy Use;
 - The standard for energy use for development for the purposes of prescribed office premises is a 5.5 star NABERS energy rating.
- (2) Water Use;
 - The standard for water use for large commercial development is a 3 star NABERS water rating.



Schedule 4: Dictionary.

Large commercial development means non-residential development that involves—

- (a) the erection of new prescribed office premises, prescribed hotel or motel accommodation or prescribed serviced apartments, or
- (b) alterations, enlargement or extension of prescribed office premises, prescribed hotel or motel accommodation or prescribed serviced apartments, if the development has a capital investment value of \$10 million or more

Prescribed office premises means office premises with a net lettable area of at least 1,000m².

3.7 Blacktown City Council Growth Centre Precincts DCP 2010 (2022 Amendment);

6.5 Ecologically Sustainable Development.

(1) 6.5.1 – Objectives;

- a) To improve energy efficiency through the design and siting of buildings;
- b) To ensure that developments are environmentally sustainable in terms of energy and water use, and management of waste and discharge
- c) To encourage the utilisation of materials and construction techniques with low energy inputs in their production for construction energy systems.

(2) 6.5.2 – Controls;

- (1) A Site Water Management Plan must be prepared in accordance with Appendix F.
- (2) Development Applications are required to demonstrate consideration of:
 - i. measures that will reduce waste and conserve water through water recycling;
 - ii. measures to minimise run-off and stormwater generation;
 - iii. implementing total water cycle management by including measures that reduce consumption of potable water for non-potable uses, minimise site run-off and promote stormwater re-use;
 - iv. utilising recycled materials and renewable building resources;
 - v. promoting biological diversity through appropriate retention, planting and maintenance of indigenous flora of the area;
 - vi. implementing a waste management strategy that promotes the overall reduction of waste levels.
 - vii. and promoting the achievement of the 60 percent waste reduction target for New South Wales; and
 - viii. implementing energy conservation measures that include reducing energy consumption and increasing inherent energy efficiency through design and materials selection, and adopting energy management plans.
- (3) Development Applications are required to demonstrate that consideration has been given to promoting ecologically sustainable transport by complementing and reinforcing the development and use of the existing and planned integrated public transport, pedestrian and cycling networks servicing the site.



- (4) Roof stormwater should be collected in tanks or street level reticulation which would serve as a retention system. The water in the retention system would be available for use for non-potable uses such as the watering of landscaped areas and use in toilet and hot water systems.
- (5) Consideration should be given to the feasibility of any measures to substitute grid-source power with environmentally sustainable alternatives such as tri-generation (green transformers), co-generation (i.e. recovery of waste energy) or photovoltaics.
- (6) New commercial buildings must achieve a minimum 4-star Green Star rating from the Green Building Council of Australia. Refer to the 'Green Star – Office as Built v3 Technical Manual'.
- (7) New industrial and light industrial buildings must achieve a minimum 4-star Green Star rating from the Green Building Council of Australia from such time that an Industrial Tool has been adopted
- (8) Development shall incorporate water efficient fixtures such as taps, showerheads, and toilets. The fixtures must be rated to at least AAA under the National Water Conservation Rating and Labelling Scheme. Where the building or development is water intensive (i.e. high-water user), specific water conservation objectives must be resolved with council.
- (9) Appropriate use of energy efficient materials during construction is to be demonstrated.
- (10) Development should incorporate energy efficient hot water systems, air-conditioning, lighting and lighting control systems.

3.8 NCC 2022 Section J

The project will be required to demonstrate compliance with the National Construction Code (NCC) 2022 Section J – energy efficiency provisions.

Section J outlines minimum performance requirements including:

- Maximum greenhouse gas emissions (GHG) levels;
- Minimum thermal envelope performance for building elements such as walls, floors, roof and external glazing;
- Minimum performance requirements for building sealing;
- Maximum lighting power densities for internal lighting design;
- Minimum performance levels for building air-conditioning and ventilation systems;
- Minimum requirements for energy and water metering;
- Minimum requirements for energy and water data collection; and
- Minimum access for maintenance requirements.

The proposed performance standards for Section J 2022 will outline the thermal performance requirements for code compliant façade designs, meaning consideration must be shown for the amount of exposed glazing included within the façade design.

The development will need to seek to optimise energy efficiency & thermal performance via design elements which improve the building façade performance including façade design, thermal envelope, HVAC system selection and lighting design.

The development must be provided with sufficient electrical allowance to support Electric Vehicle (EV) parking infrastructure as applicable under part J9D4.



4. Project Design Response

The development aims to mitigate potential environmental impacts through application of best practice design and construction processes through the ESD commitments and initiatives outlined in the following Section. The documented initiatives to be implemented – which are the basis for the response to the Sustainable Design Frameworks outlined above include:

- Electrification of non-emergency infrastructure and systems;
- Project design Power Usage Efficiency (PUE) of 1.3 exceeds both Australian and global best practice for PUE
- Rainwater harvesting and reuse for irrigation, toilet flushing and washdown
- Smart metering
- Best practice façade thermal performance;
- Solar gain reduction through strategic design;
- Efficient Heat rejection/management systems for the occupied offices and data halls;
- Energy efficient lighting systems (internal and external) and lighting controls;
- Explore opportunities to reduce embodied carbon/other emissions associated with the construction and manufacture of materials;
- Explore opportunities to embed circularity principles including responsible procurement, efficient use and end of life treatment for consumed resources;
- Ample access to natural daylight where possible within occupied office spaces;
- Low VOC paints for reduced indoor pollutants
- Provision of electric vehicle charging bays;
- Water efficient fixtures and fittings (WELS rating);
- Selection of native & drought tolerant landscaping;
- Application of Water Sensitive Urban Design (WSUD) principles;
- Waste management plan including strategies for construction and operation;
- Implement best practice procedures and operational guidelines to ensure appropriate monitoring of systems control networks

Contractors will also be requested to provide and abide by an Environmental Management System to be in accordance with NSW Environmental Management Systems Guidelines or similar standard. This places value on environmentally responsible building practices to ensure responsibility is held for the environmental management of the building site as they complete their associated works. Once the new development is activated, a detailed handover package should be coordinated to ensure clear operational procedures and targets are defined with the building owner. This will be in accordance with the sustainable strategies adopted by the development and will be distributed to the tenants to ensure environmental impacts associated with operational processes are minimised through operation.



5. ESD Opportunities & Initiatives

The following section addresses the Greenhouse Gas Emissions, Energy Efficiency and Ecologically Sustainable Development aspects in response to the Sustainable Design Frameworks (as per Section 0) for the project. It highlights best practice sustainable design principles and aligns with elements from existing sustainability tools employed across industry to develop a set of metrics for the development.

There are several ESD opportunities and initiatives that should be implemented in the project. The following recommendations are to be read in conjunction with all other design documentation prepared. Stantec note that the design is in its very early stages, and the following concepts will be considered going forward.

Fundamental to the success of improving the ESD outcome for the project is a strong design philosophy. Early adoption of ESD design features and initiatives will lead to a better integrated design outcome and will result in:

- Lower operational energy demand;
- Promote greater indoor environmental quality;
- Reduce the requirements for artificial lighting & power;
- Optimise the efficiency of HVAC systems;
- Improve building occupant comfort; and
- Improve the project's capacity to deliver a responsible development.

5.1 Greenhouse Gas Emissions & Energy Efficiency

A variety of greenhouse gas emission reduction and energy efficiency measures are applicable to the proposed development and should form part of the initial design and operation plan. The final strategy will account for aspects such as sustainability, operational feasibility, architectural intent and site-specific appropriateness.

The energy efficiency strategy follows the hierarchy pyramid (figure 4). Best practice energy conservation dictates that in the first instance demand is reduced. This has a much greater benefit to the overall long-term sustainability of the site compared to reliance on grid renewable energy or carbon offsets. As such, the focus will be on the elements that provide the greatest impact and return on investment.

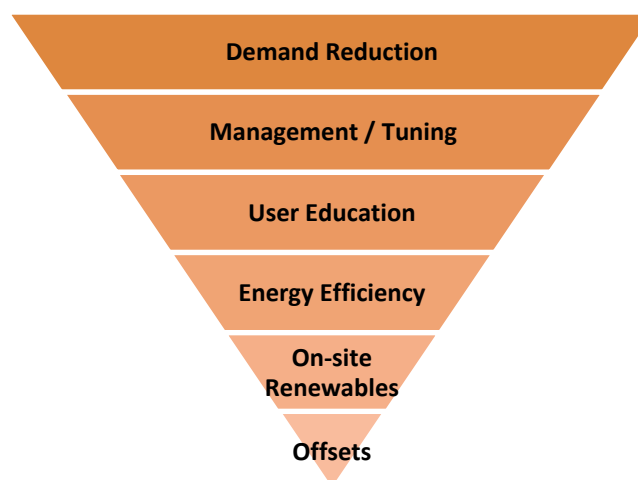


Figure 4: Energy efficiency strategy hierarchy

5.1.1 Design PUE

Project design Power Usage Efficiency (PUE) of 1.3 exceeds both Australian and global best practice for PUE. The design PUE is approximately equivalent to NABERS Energy for Data Centres 5 Star benchmark. A NABERS Energy for Data Centres rating of 3 stars is considered market average, whereas 5 Star represents superior performance. As such this development will exceed relevant industry data centre performance standards.

5.1.2 Base Building NABERS Energy Rating for office

Project contains office space large than 1,000 m² NLA and will target Base building NABERS Energy rating of 5.5 Star benchmark for office portion only. A NABERS Energy for office rating of 4.5 stars is considered market average, whereas 5.5 Star represents superior performance.

5.1.3 Energy Efficiency Measures

Energy efficiency measures which should be applied across the development to reduce operational energy consumption include:

- **Electrification** – 100% of the development's non-emergency infrastructure and systems will be electric. This will ensure the development is future-proof as the electrical grid progressively decarbonises. This aligns with the Australian Public Service Net Zero Policy.
- **Architecture** – Buildings are to be designed to deliver comfort, practicality, connection to the outside through views while considering energy conservation through strategic architectural form. The development will also offer fresh air and daylight access to occupants in many forms throughout habitable spaces. The development should adopt an optimized window to wall area to balance solar heat gain and daylight exposure. Light coloured façade and roof finishes (SRI>64) should be specified pending reflectivity implications (<0.45 Absorptance) to reduce solar heat gain through the building envelope. Different design strategies are applied to the office spaces and the data centre component to achieve the most sustainable outcomes and meet each space intent.
- **High Performance Building Fabric** – Insulation should be installed to minimize undesirable heat/energy flows into/out of the thermal boundary of conditioned spaces. Thermal bridging should also be mitigated to minimize the loss of energy from the thermal boundary. To improve energy performance window systems should consider; double glazed systems, low-E glass coatings, thermally broken or low thermal conductance frames and operable windows for improved thermal comfort and ventilation control.
- **High quality light and views** – Focusing on the wellbeing of the occupant to achieve daylight comfort and healthy indoors office spaces with high quality views to nature and the outside.
- **Shading and Blinds** – Design of external shading and use of internal blinds will reduce direct solar heat gains, control radiant heat and increase comfort through glare reduction without compromising the connection to the outside.
- **Efficient HVAC System** – Selection of efficient HVAC systems with high COPs, appropriately sized to meet the needs of internal loads. HVAC systems will require adequate efficiency, with economy cycle and monitoring/control integration for temperature band fluctuation to promote energy efficiency in the design. Legionella risks may be eliminated by opting for air-based HVAC systems.
- **Efficient IT Equipment (CDC Infrastructure)** – The proposed development will utilise highly efficient IT equipment, surpassing the standard equipment commonly used in the data centre industry. This includes selecting energy star qualified equipment, optimising power distribution units, improving battery charging, and implementing UPS systems. By reducing energy consumption for CDC Infrastructure IT equipment, this development will improve energy efficiency.
- **Efficient DHW Systems** – Providing high efficiency air source heat pump for domestic hot water systems to service end of trip facilities.
- **Water Efficient Fixtures and Fittings** – Selection of low-flow showers and taps, to reduce hot water demand across the development associated with showering, sinks and hand basins.



- **Efficient Lighting Systems** – Providing high efficiency LED and fluorescent lighting with lighting controls including timing, occupancy and daylight sensors to reduce the demand on the lighting system.
- **Energy Efficient Appliances** – Specifying high energy star rated refrigerators/freezers, dishwashers, etc Targeting 1 star below the maximum star rating for the applicable appliance e.g.
 - Dishwashers – 3.5 stars (4.5 stars is the maximum)
 - Fridge/freezers – 5 Stars (6 stars is the maximum)
- **Smart Energy Metering and Monitoring** - Metering shall be designed to meet metering guidelines as outlined under the current National Measurement Regulations. A detailed monitoring system should be installed to help with early identification of excessive energy use and points of potential failure. Hydraulic plant and equipment shall be monitored for faults or failures. The automatic monitoring system must be capable of:
 - Collecting data from all meters
 - Alert to any fault or failures of primary building systems
- **Sustainable Transport:** Dedicated and site-specific transport plan including suitable provision for low-carbon modes of transport to be utilised by the occupants. The following options to support low-carbon transport as outlined in Transport Impact Assessment report are being proposed:
 - Providing EV charging provisions to NCC requirements
 - Provide lockers and bicycle parking spaces for employees and visitors

5.2 Water Efficiency

5.2.1 Water Usage Effectiveness

The design data centre facility will target a Water Usage Effectiveness (WUE) of 0.01 because the design of mechanical system is 100% air cooled to minimise the water usage. WUE is an industry recognized metric representing the ratio of total data centre facility water consumption (L), to the IT equipment energy consumption (kWh). To achieve this target the facility will optimise water efficiency through several water conservation strategies. The following water-saving measures are being considered for the development:

- Monitoring water withdrawal, consumption, and disposal across the building using multi-layered metering strategies.
- Deploying high-efficiency equipment that can achieve a balance between energy consumption and water consumption.
- Water efficient fittings for toilets, taps, showers and irrigation.
- Developing an integrated water management plan.

5.2.2 NABERS Water Rating for office

The project contains office space larger than 1,000 m² NLA and will target a 3 star NABERS Water for offices rating as per requirements of State Environmental Planning Policy (Sustainable Buildings) 2022. Each office will be rated after one year of operation and at least 70% occupancy has been achieved.



5.2.3 Potable Water Saving Measures

A variety of water efficiency measures can be applied to the proposed development. Best practice water efficiency measures implemented to reduce water consumption may include:

- **Water efficient fixtures and fittings (WELS rating):** By implementing low-flow water fixtures, the consumption associated with amenities can be reduced. This includes taps, wash basins, WCs, Urinals, showers and supplementary water uses.
- **Rainwater harvesting and reuse:** One (1) 22.5KL concrete Rainwater tanks will be installed per building with a surface area of 10.5m², and tank depth of 2.2m each. Adopting the water demand rates, the site achieves the 80% reuse target set within Part J, Section 4 of the Blacktown Council DCP. Refer to the Stormwater Management Plan by Civil consultant. It is proposed that reuse will be used for the toilet flushing, urinal flushing, washdown and irrigation of a limited area of the soft landscaped areas within the site.
- **Water use metering and monitoring:** Which can identify leaks aiming to avoid significant water loss due to leakage
- **Selection of native & low water plants / trees:** Native plants which have adapted to thrive in the Australian environment and are typically more resilient than their exotic counterparts. Low water demanding species will reduce further irrigation demand. Refer to Landscape architect report.
- **Irrigation:** sub-soil irrigation systems should be favoured with a time clock to water planter beds/substrate at night. Doing so can significantly reduce water lost to evaporation and hence overall water demand.
- **Integrated water management plan (IWMP)** has been developed by the project team to integrate water monitoring and management for the facility. Refer to the IWMP report for details.



Figure 5: Illustration of WELS rating label

5.2.4 Water Sensitive Urban Design (WSUD)

A site Water Management Plan must be prepared for the development per the Blacktown City Council Growth Centre Precincts DCP. Water conservation should be prioritized by adopting WSUD principles which:

- Maintain the natural water balance;
- Make more efficient use of water resources by conserving water, particularly potable (drinking) water;
- Reduce general flood risk;
- Reduce erosion of waterways, slopes and banks;
- Control stormwater and waste water pollution and improve water quality in waterways and groundwater;
- Integrate stormwater management with water supply and wastewater treatment; and
- Integrate stormwater treatment into the landscape so as to maximise the visual and recreational amenity of urban development.

The following stormwater control measures have been proposed to be adopted across the development to meet the stormwater strategy objectives:

- **Gross pollutant traps** are proposed to be used as a means of primary stormwater flow treatment before discharging into the proposed bioretention basin.
- A **Bio-retention systems** is proposed for the development to filter and remove pollutants from surface water runoff as it flows through the vegetation layer and underlying filter media.

- An **Underground onsite detention tank** has been proposed for the site that will treat flows via storm filter medium devices and controlled within the tank. Flow control is added by using orifice plate in the minor event (5% AEP) and an overflow weir in the major event (1% AEP).

5.3 Reduced Environmental Impact Materials

In accordance with the project's sustainability principles, the development should investigate the use of responsibly procured materials with respect to the following initiatives:

- **Reduce carbon concrete** procurement for concrete used in the project to mitigate upfront carbon emissions during the construction phase.
- **Circularity Principles:** CDC aims to achieve a Zero waste to landfill certification (in operations)
- **Steel sourced** from manufacturers who are members of the Australian Steel Institute Sustainability Charter for sustainable and energy reducing steel manufacture.
- **Best practice PVC** plastics in formwork, piping, cables and conduits. These materials have a reputation for damaging the environment in their production, both upstream and downstream of the manufacturing process. PVC certification demonstrating Best Environmental Practice (BEP) is preferred.

5.4 Indoor Environmental Quality

Indoor Environment Quality (IEQ) has been defined as a key sustainable building category to improve indoor environments for building occupants, which in turn improves their overall wellbeing. Consideration to improving indoor environmental quality will be a vital step within the development's design process.

The proposed development seeks to improve the overall IEQ for building occupants by addressing the following elements:

- Glazing to wall ratio should be selected to maximise access to daylight while prioritising the thermal performance necessary to achieve the targeted energy consumption outcomes.
- Low Volatile Organic Compound (VOC) – Selection of internally applied paints, carpets, adhesives and sealants used on site with low volatile organic compound (VOC) content.
- Low Formaldehyde Emission Wood – Selection of internally applied engineered wood products from low formaldehyde emission products.

5.5 Building Management

In line with industry recognised best practice frameworks, the project design and built form will seek to respond to the ongoing environmental challenges of urban development and ensure the project implements a range of ESD initiatives aimed at improving ongoing building management.

Through specific contractual commitments and documented design intent the project proposes to address environmental management & building operational performance through the following initiatives.

- **Building Commissioning & Tuning Procedures:** Prior to practical completion and 12-months post practical completion. By implementing this via project contract documents the project ensures operational efficiency & building operation is optimised in accordance with the intended building design.
- **Smart Metering:** Smart metering will provide relevant data to ensure the efficient use of systems & management by building staff. This will provide detailed information about the project energy & water use and profile on a regular basis through an accessible platform. This information will aid in the understanding of the development usage profile so that adjustments can be made to improve performance and manage supply and demand trends, aiming to reduce operating costs. This supports operational efficiency and facilitates detection of systems failures.



- **Building Management Control System:** A Building Management Control System (BMCS) with automatic intelligent controls for infrastructure equipment and systems will be used. This allows plant efficiency to be optimised. A BMCS also allows equipment and energy consumption to be monitored, facilitating troubleshooting efficient operations.

5.6 Waste Management

In order to facilitate sustainable waste management in accordance with the principles of Ecologically Sustainable Development; waste minimisation and resource recovery, easy access to waste systems, pollution prevention associated with waste management practices will be taken into consideration as part of waste management strategy.

The development aims to increase on-site recycling and resource optimisation through adoption of the Waste Management Hierarchy with the ultimate goal of reducing waste going to landfill, which is in line with *The Waste Avoidance and Resource Recovery Act, 2001* and the *NSW Waste Avoidance and Resource Recovery Strategy 2014-21*. The waste management strategy will adhere to targets outlined within the Blacktown City Council Growth Centre Precincts DCP requirement of the achievement of the 60 percent waste reduction target for New South Wales.

The key objectives for the management of waste generated by the demolition, construction and operation will include:

- Minimise waste generation on site;
- Segregate waste on site to increase recycling potential;
- Store wastes on site appropriately to prevent cross-contamination and/or mixing of different waste streams;
- Segregate hazardous waste for appropriate treatment and disposal, where applicable;
- As appropriate, investigate the source of waste streams and undergo analysis of the operational waste generation profiles to identify opportunities to reduce waste generation.

The waste management plan will include actions to minimise waste during construction and operation. By implementing these actions (and specifically the waste hierarchy) the development will assist in achieving the government's waste targets.



5.7 Climate Resilience

Climate Change in Australia have the potential to change the future amenity and wellbeing of the built environment. Natural disasters such as bushfires, floods, drought, dust and strong wind constitute threats to buildings in operation, and the long-term effects of climate change are likely to increase the frequency of such events. It's paramount to future-proof building design and improve its adaptability and resilience to long-term climate change effects. **In response to Climate Change, the following design solutions are recommended to be implemented in the development to improve the project's resilience against climate hazards:**

Climate Variable	Proposed Design Solutions
Extreme Temperatures	• Light-coloured roof with high solar reflective index (SRI) and other finishes selections to mitigate urban heat island effect • Provide a mixture of high-performance glazed façade systems and external shading. • Passive design elements incorporated into the design such as shading, orientation and insulation. • HVAC systems efficiently designed to maintain indoor comfort during peak conditions. • Landscape areas across the site
Water	Water Conservation: • Preferential use of drought tolerant and native plants • Provide subsoil irrigation system to improve watering effectiveness • Recycled water from rainwater tank for irrigation, toilet flushing and washdown • Install water-efficient fittings • Water efficient HVAC systems to avoid the use of water for primary cooling Flood Mitigation: • Provide safer access routes that are above the peak flood levels. • Provide multiple access routes to the site. • Provide early warning system for a risk of a flood. • Increased drainage considered for the development to reduce roof and surfaces flooding. • Increased building entrance height. • Design assessment to mitigate post development probable maximum flood (PMF) level. • Incorporate best practice maintenance strategies for stormwater system. • Install additional power sources such as back-up generators or battery storage above the flooding heights.
Energy	• Design for energy efficiency and grid resilience • Install additional power sources such as back-up generators or battery storage located above the flooding heights.

Fire	• Provide additional filtration for carbon filters and smoke removal. • Provisions of compliant fire and life safety design of the building to protect fire and life safety strategy (e.g., provisions of exits and egress, fire sprinkler and hydrant systems, smoke hazard management, etc.). • Provide multiple access routes to the site.
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A Climate Change Adaptation Plan is recommended to be developed to further assess the projected climate risks for the site. This will allow for early mitigation for any elements found to be at high-risk to be designed for long-term safety, security, and operation.

5.8 First Nations Engagement

The development will work closely with local aboriginal community to celebrate the culture and heritage in alignment with CDC values:

- Opportunities for indigenous employment and skills training will be provided. CDC currently employ the early works builder, BY Group, which is a supply nation indigenous member. They provide a large portion of the early earthworks and site establishment in the project.
- Local indigenous plantings will be integrated in the implementation of design.
- Aboriginal knowledge will be represented in the creation of design.
- The diversity of Aboriginal culture will be respected by following community specific cultural protocols, such as the Welcome to Country and smoking ceremony performed at the sod-turning event.

5.9 Diversity, Equity, and Inclusion

The development will contribute to diversity, gender equity and inclusion through the following measures:

- CDC have a DEI Champions committee to promote and support the development of a diverse and inclusive workplace.
- The building's design and construction will be able to be navigated and enjoyed by stakeholders of diverse ages, genders, and physical and mental abilities. This applies to common spaces, bathroom facilities, and amenities provided within the building.
- Equal access to the building and diverse wayfinding will be provided by the building design.



6. Energy Consumption Reduction

The proposed project's main energy consumption are the data centre facility operational energy inclusive of the office space operational energy. By implementing the energy efficiency initiatives outlined in Section 5 of the report, the following outcome of energy reduction can be achieved:

- The proposed data centre facility is designed for **52%** reduction of operational energy use compared to a benchmark market average (PUE 1.61) colocation data centre.
- The proposed office spaces can achieve **39%** significant reduction of operational energy use compared to a benchmark market average (4.5-star NABERS) Office base building.

The detailed estimated energy demand and reduction for the project when the whole campus is operational are presented below:

6.1 Data Centre Energy Reduction

The proposed CDC data centre design facility design PUE is 1.3 through the best practice of building services design. The facility energy including building services energy is estimated using PUE and a maximum IT Capacity of 499MW.

The estimated operational energy reduction of the data centre is summarised below:

Item	Benchmark (Market average)	Proposed	% Improvement compared to Benchmark
PUE	1.61	1.3	
Facility energy (kWh/yr)	2,670,512,897	1,268,534,212	52%

Note: IT Loads are excluded from this calculation as the data centre is intended for co-location and CDC is not responsible for its customers ITC equipment.

6.2 Office Energy Reduction

The proposed office space design NABERS target is 5.5 Star through the best practice of integration of architecture and building services design. The estimated operational energy reduction of the office space is summarised below:

Item	Benchmark (Market average)	Proposed	% Improvement compared to Benchmark
NABERS	4.5	5.5	22%
Office energy (kWh/year)	1,558,242	956,822	39%

The office base building energy including building services energy is estimated using NABERS reverse calculator. A summary of the NABERS reverse calculator input is attached in Appendix A.



7. Greenhouse Gas Emission Reduction

This section summarises GHG emissions reduction quantities through the following mitigation measures. This GHG assessment uses location based approach to estimate Scope 1 and 2 emissions. Projected emission factors for Australia's grid electricity have been retrieved Emission factors reported for NSW in the latest Australian National GHG accounts factors report from DCCEE 2023, Australia's emissions projections 2023. The operational throughput has been based on the projected utilisation forecast for the development.

The detailed information can be found from GHG emission assessment report and mitigation report.

Resource	Benchmark	Proposed	% Reduction compared to Benchmark
PUE	1.61	1.3	
Scope 1 and Scope 2 GHG emissions (tCO ₂ -e)	1,656,663	829,627	52%
Mitigation scenario: Scope 1 and Scope 2 GHG emission (tCO ₂ -e)	1,656,663	1,173	99% including purchase of renewable energy

7.1 Avoid

Motion sensors and lighting timers will be installed and controlled via BMS to avoid use of energy in office spaces when these are unoccupied.

7.2 Reduce

A combination of active and passive design strategies will be implemented to reduce energy consumption throughout the development.

High performance building fabric will aim to reduce heat ingress, improving thermal comfort and reducing air conditioning load.

Reduce emissions, by using more efficient technologies and processes

Efficient mechanical and electrical services design will aim to reduce PUE and office operational energy consumption.

CDC's water efficient HVAC design aims to reduce emissions by reducing water pumping requirements and embodied carbon in hydraulic services infrastructure.

7.3 Substitute

Investigate the use of reduced-emission raw materials and energy sources such as renewable energy.

- Purchase of renewable electricity – for example LGCs
- Reduced embodied structural materials – for example steel, concrete and blockwork
- Certified sustainable products, equipment and materials– services equipment, ceiling tiles, insulation, carpet, vinyl and paints

7.4 Offset

Consider the purchase of verified high-integrity carbon offsets to reduce residual emissions in alignment with CDC's Net Zero Carbon target.



8. Water Consumption Reduction

The water use by the data centre cooling system is negligible compared to conventional data centre HVAC designs based on evaporative cooling systems. The proposed project has taken a deliberate approach to design and implement a closed-loop cooling system, which does not use water for primary cooling. Therefore, water consumption for Marsden Park Campus is mainly driven by the potable water use serving the office area of the campus.

By applying water efficiency initiatives in Section 5 of the report, the following outcome of water reduction can be achieved:

- The proposed data centre facility can achieve close to **100%** reduction in operational water use compared to a benchmark market average colocation data centre.
- The proposed office spaces can achieve **85%** reduction in operational water use compared to a benchmark market average (3-star NABERS water) Office.

8.1 Data Centre Water Reduction

The proposed CDC data centre facility design WUE is 0.01 through the innovative closed-loop cooling system design. The estimated operational water reduction of the data centre is summarised below:

Resource	Benchmark (Market average performance)	Proposed	% Improvement compared to Benchmark
WUE	1.8	0.01	Nearly 100%
Water Use l/kWh	1.8 l/kWh	0.01 l/kWh	Nearly 100%

8.2 Office Water Reduction

The estimated operational water demand and reduction for Project are tabled below:

Resource	Benchmark (3 Star NABERS Water)	Proposed	% Reduction compared to Benchmark
Office Potable Water Usage (kL/year)	15,750	2,307	85%

The benchmark water consumption is determined by NABERS reverse calculator (<https://www.nabers.gov.au/rating-tools/our-calculators/setting-targets-using-reverse-calculators>). A summary of the NABERS reverse calculator input is attached in Appendix B.

The proposed water consumption is based on the latest Green Star Potable Water Calculator. A summary of the Green Star Potable Water Calculator input is attached in Appendix B. Note landscaping water use will be offset by rainwater collection as demonstrated in attached Green Star Potable Water Calculator.



9. Conclusion

Ecologically Sustainable Design is to be a driving consideration in the ongoing development of the Marsden Park Data Centre Campus. The proposed development will incorporate ESD initiatives - which are aligned with CDC's ESG Strategy and the requirements of the applicable regulations - to seek to reduce greenhouse gas emissions, potable water consumption and material resource use of the site. These constitute the sustainability response from the project to the site applicable sustainable design frameworks, as listed within section 0 of this report.

The ESD initiatives outlined in this report are intended to be used as a design guide for the development. The specific initiatives that will be implemented across the development will be determined throughout the upcoming stages and will be subject to feasibility analysis. The initiatives shall be designed to comply with the guidelines set out by the relevant authorities and driving requirements.

CDC's commitment to long-term sustainability and mitigating environmental impact is evident of the holistic approach taken to planning and early design. Proposed initiatives for consideration cover a holistic range of sustainability categories including:

- Energy & Greenhouse gas emissions reduction
- Water Efficiency
- Sustainable Certified and Reduced Environmental Impact Materials
- Indoor Environment Quality
- Building Management
- Waste Management
- Climate Resilience

We trust this report provides sufficient overview of the project's commitment to environmentally sustainable design, greenhouse gas emission reduction and energy efficiency for the proposed development.



Appendix A Energy Consumption Assumptions



Rating details

What type of rating would you like to estimate?

☒ Energy

☐ Water

What type of building?

☒ Office

☐ Hotel

☐ Shopping centre

☐ Data centre

☐ Residential aged care and retirement living

☐ Apartment building

What is the postcode of the building?

2765

What is the scope of your rating?

☒ Base building

☐ Whole building

☐ Tenancy

Enter the star rating you wish to achieve

4.5

Stars (Energy)

Building details

What is the floor space of the building?

Enter the total net lettable area of office space within the building.

 m²

How many hours per week is the building occupied?

Use the standard business hours of the building.

 hours

Energy use

What is the Percentage of Electricity in the total Energy Consumption?

Enter the percentage of office energy use that will be met through electricity.

 %

What is the Percentage of Gas in the total Energy Consumption?

Enter the percentage of office energy use that will be met through gas.

 %

What is the Percentage of Diesel in the total Energy Consumption?

Enter the percentage of office energy use that will be met through diesel.

 %

Results

Benchmarking factor at 4.5 stars NABERS Energy:	84
Maximum Benchmarking Emissions at 4.5 Stars NABERS Energy:	1,402,418.6 kgCO ² -e/year
Benchmarking Emissions Intensity at 4.5 Stars NABERS Energy:	90.978 kgCO ² -e/m ² .year
Energy Intensity at 4.5 Stars NABERS Energy:	363 MJ/m ² .year
Reporting Emissions for this office – Scope 1, 2 and 3:	1,137,516 kgCO ² -e/year
Reporting Emissions for this office – Scope 1 and 2:	1,059,604 kgCO ² -e/year

Maximum Allowable Energy Consumption:

Target Max Electricity:	1,558,242 kWh per annum
Target Max Gas:	0 MJ per annum
Target Max Diesel:	0 L per annum

Rating details

What type of rating would you like to estimate?

☒ Energy

☐ Water

What type of building?

☒ Office

☐ Hotel

☐ Shopping centre

☐ Data centre

☐ Residential aged care and retirement living

☐ Apartment building

What is the postcode of the building?

2765

What is the scope of your rating?

☒ Base building

☐ Whole building

☐ Tenancy

Enter the star rating you wish to achieve

5.5

Stars (Energy)

Building details

What is the floor space of the building?

Enter the total net lettable area of office space within the building.

 m²

How many hours per week is the building occupied?

Use the standard business hours of the building.

 hours

Energy use

What is the Percentage of Electricity in the total Energy Consumption?

Enter the percentage of office energy use that will be met through electricity.

 %

What is the Percentage of Gas in the total Energy Consumption?

Enter the percentage of office energy use that will be met through gas.

 %

What is the Percentage of Diesel in the total Energy Consumption?

Enter the percentage of office energy use that will be met through diesel.

 %

Results

Benchmarking factor at 5.5 stars NABERS Energy:	NaN
Maximum Benchmarking Emissions at 5.5 Stars NABERS Energy:	861,140.2 kgCO ² -e/year
Benchmarking Emissions Intensity at 5.5 Stars NABERS Energy:	55.864 kgCO ² -e/m ² .year
Energy Intensity at 5.5 Stars NABERS Energy:	223 MJ/m ² .year
Reporting Emissions for this office – Scope 1, 2 and 3:	698,480 kgCO ² -e/year
Reporting Emissions for this office – Scope 1 and 2:	650,638 kgCO ² -e/year

Maximum Allowable Energy Consumption:

Target Max Electricity:	956,822 kWh per annum
Target Max Gas:	0 MJ per annum
Target Max Diesel:	0 L per annum

Appendix B Water Consumption Assumptions



Potable Water, Performance Pathway (18A) - All projects, except Hotels & Residentials

Links to - Project information:	Building occupancy, areas, and operation	Water systems checklist	Rainfall data		
Links to - Water systems:	1. Sanitation	2. Whitegoods	3. Heat rejection	4. Washdown	5. Landscape irrigation
	6. Swimming pools	7. Fire protection systems	8. Process cooling		
Links to - Reclaimed water sources:	Reclaimed water sources	Rainwater collection	Greywater collection	Blackwater collection	Stormwater and off-site reclaimed water supply
Links to - Results:	Total water demand for each system	Total water demand per month	Potable water results	Domestic hot water	Discharge to sewer

Weighted Points Achieved

11.2

Instructions:

Enter information into light blue cells

For details on what information is required and how this information is used to calculate the reduction in potable water consumption against the Standard Practice Benchmark, please refer to the Green Star - Potable Water Calculator Guide, available from the GBGA website.

GENERAL

Building occupancy, areas and operation

Space type description	Area (m ²)	Peak days of operation (remaining days assumed off-peak)	Occupancy profile	Maximum design occupancy used in water use calculations (m ² /person) (Enter manually OR use default)		Percentage of building users who occupy the space continually for periods greater than one hour.
				Proposed Building design occupancy (m ² /person)	Default design occupancy (Not applicable for residential areas)	
Offices (6 buildings)	15,415	5 days a week	Class 5, Class 7 Class 8 or Class 9a	10	Office (10m ² /person)	60%
		Please Select	Please Select		Please select	
		Please Select	Please Select		Please select	
		Please Select	Please Select		Please select	
		Please Select	Please Select		Please select	
		Please Select	Please Select		Please select	
		Please Select	Please Select		Please select	
		Please Select	Please Select		Please select	
		Please Select	Please Select		Please select	
		Please Select	Please Select		Please select	
		Please Select	Please Select		Please select	
Non occupied areas		n/a	n/a			
TOTAL AREA	15,415					

Water systems checklist Please provide responses to the following questions. Detailed inputs will be requested further on in the calculator .

WATER USES - ALL QUESTIONS MUST BE ANSWERED

1. Sanitation

Are fixtures and fittings provided for building occupant sanitation?	Yes
Does the project provide for sports activities?	No
Have showers been installed for positive activity use?	Yes

2. White Goods

Does the project include any dishwashers or washing machines?	No
---	----

3. Heat rejection

Does the project utilise water based heat rejection (building cooling)?	No
Does the project have cooling towers?	No
Does the project contain any other water cooled systems that are not conventional	No

4. Wash Down

Does the project include washdown areas?	Yes
--	-----

5. Landscape Irrigation

Are there any landscaped areas within the project?	Yes
Are any irrigation systems included in the project?	Yes

6. Swimming Pools

Are there any swimming pools within the project?	No
--	----

7. Fire Protection System

Does the project include a fire protection system?	No
--	----

8. Process cooling

Does the project include any water based process cooling?	No
---	----

WATER REUSE - ALL QUESTIONS MUST BE ANSWERED

9. Water Reclamation

Does any water collection, reclamation and/or reuse occur on the project site?	Yes
Does the project include rainwater capture and reuse systems?	Yes
Does the project include greywater capture, treatment and reuse systems?	No
Does the project include blackwater capture, treatment and reuse systems?	No
Does the project include other stormwater reuse or an off-site supply of non-potable water?	No

Rainfall data

Select the average rainfall data location for the project	Sydney (1996 - 2005) (mm)
---	---------------------------

1. SANITATION

Water demand from sanitation fixtures and fittings (Annual water demand from fixtures and fittings is calculated using assumed usage rates based on the space types and occupancies entered above. See pages 10-13 of the Green Star - Potable Water Calculator Guide for further details.)

TOILETS		Water efficiency used in calculations (L/flush)	Percentage of each type	Proposed Building water demand (kL/year)	Standard Practice Building water demand (kL/year)
Description	Water efficiency (Enter manually OR nominate WELS Star Rating) Manufacturer's data (L/flush) WELS Star Rating selection				
Toilets (32 per building)	5 Star	3.0	100%		
Enter description>	Select star rating				
Enter description>	Select star rating				
Enter description>	Select star rating				
Enter description>	Select star rating				
Enter description>	Select star rating				
Enter description>	Select star rating				
Enter description>	Select star rating				
Enter description>	Select star rating				
Enter description>	Select star rating				
Enter description>	Select star rating				
Total			100%	1,084	1,458

(The Standard Practice Benchmark is based on 3 StarWELS rated toilets)

URINALS

Are urinals installed?	Yes
Would urinals normally be installed in the building type?	Yes

(Note: if "No" is selected, the project team should provide justification within the short report as to why the standard practice building does not have urinals.)

Urinals on auto timer

Enter average L/flush	
Enter number of urinals on autotimer	

Percentage of total number of Urinals	
---------------------------------------	--

Description	Water efficiency (Enter manually OR nominate WELS Star Rating)		Water efficiency used in calculations (L/min)	Percentage of each type	Proposed Building water demand (kL/year)	Standard Practice Building water demand (kL/year)
	Manufacturer's data (L/min)	WELS Star Rating selection				
Urinals (12 per building)	0.0	Waterless	0.0	100%		
<enter description here>		Select star rating				
<enter description here>		Select star rating				
<enter description here>		Select star rating				
<enter description here>		Select star rating				
<enter description here>		Select star rating				
<enter description here>		Select star rating				
<enter description here>		Select star rating				
<enter description here>		Select star rating				
<enter description here>		Select star rating				
			Total	100%	0	0

(The Standard Practice Benchmark is based on 3 Star WELS rated urinals)

INDOOR TAPS						
Description	Water efficiency (Enter manually OR nominate WELS Star Rating)		Water efficiency used in calculations (L/min)	Percentage of each type	Proposed Building water demand (kL/year)	Standard Practice Building water demand (kL/year)
	Manufacturer's data (L/min)	WELS Star Rating selection				
Taps (24 per building)		5 Star	6.0	100%		
<enter description>		Select star rating				
<enter description>		Select star rating				
<enter description>		Select star rating				
<enter description>		Select star rating				
<enter description>		Select star rating				
<enter description>		Select star rating				
<enter description>		Select star rating				
<enter description>		Select star rating				
<enter description>		Select star rating				
<enter description>		Select star rating				
			Total	100%	631	789

(The Standard Practice Benchmark is based on 4 Star WELS rated taps)

SHOWERS - OCCUPANTS		
Shower demand by occupants (reference)	5%	For residential buildings: Enter 100% for both "reference" and "current" shower demand For other building types: Use the reference and proposed building bicycle accommodation percentage from the Sustainable
Shower demand by occupants (current)	2%	Transport Calculator, or percentages determined under 17.B.4 'Active Transport Facilities' criterion to determine the number of building occupants that are likely to shower each day.

Description	Water efficiency (Enter manually OR nominate WELS Star Rating)		Water efficiency used in calculations (L/min)	Percentage of each type	Proposed Building water demand (KL/year)	Standard Practice Building water demand (KL/year)
	Manufacturer's data (L/min)	WELS Star Rating selection				
Shower (8 per building)		3 Star	9.0	100%		
-enter description-		Select star rating				
-enter description-		Select star rating				
-enter description-		Select star rating				
-enter description-		Select star rating				
-enter description-		Select star rating				
-enter description-		Select star rating				
-enter description-		Select star rating				
-enter description-		Select star rating				
-enter description-		Select star rating				
			Total	100%	156	391

(The Standard Practice Benchmark is based on 3 Star WELS rated showers)

SHOWERS - SPORTS FACILITIES	
Indicate the number of people expected to participate in sporting activities each day. (Use an average based on weekly figures if required)	
Indicate the number of days/year that the sports facilities are in use	

Description	Water efficiency (Enter manually OR nominate WELS Star Rating)		Water efficiency used in calculations (L/min)	Percentage of each type	Proposed Building water demand (kL/year)	Standard Practice Building water demand (kL/year)
	Manufacturer's data (L/min)	WELS Star Rating selection				
Enter description		Select star rating				
Enter description		Select star rating				
Enter description		Select star rating				
Enter description		Select star rating				
Enter description		Select star rating				
Enter description		Select star rating				
Enter description		Select star rating				
Enter description		Select star rating				
Enter description		Select star rating				
Enter description		Select star rating				
Enter description		Select star rating				
Enter description		Select star rating				
Enter description		Select star rating				
			Total	0%	0	0

(The Standard Practice Benchmark is based on 3 Star WELS rated showers)

RESULTS: WATER DEMAND FROM FITTINGS

	Proposed Building Water demand (kL/year)	Standard Practice Building water demand (kL/year)
Toilets	1,384	1,458
Urinals	0	0
Indoor Taps	631	789
Showers - Occupants	156	391
Showers - Sports Facilities	0	0
TOTAL	1,881	2,638

2. WHITE GOODS

Water demand from washing machines

The project team is to provide documentary evidence in accordance with the water calculator guide and technical manual to substantiate the number of cycles per year. Otherwise, leave blank and a default value will be applied.

WASHING MACHINES									
Description	Water efficiency (Enter manually OR nominate WELS Star Rating)		Machine capacity (kg)	Water efficiency used in calculations (L/kg)	Number of each type	Number of cycles per year (leave blank if unknown)	Proportion of water per cycle that is sourced from DHW (%)	Proposed Building water demand (kL/year)	Standard Practice Building water demand (kL/year)
	Manufacturer's data (L/kg)	WELS Star Rating selection							
				Total	0			0	0

Water demand from dishwashers

[illegible]

				Total	0			0	0

3. HEAT REJECTION

This section requires outputs from the energy simulation undertaken for Conditional Requirement and Greenhouse Gas Emissions (Credit 15).

GENERAL INFORMATION

Proposed Building	
Site elevation (m above sea level)	
Maximum combined cooling tower air flow (L/s)	
Peak building cooling load (kW)	

Standard Practice Building	
Select one of the following building types:	
Standard Practice HVAC system type assumed for Energy and Water Category	
Maximum combined cooling tower air flow (L/s)	
Peak building cooling load (kW)	

Water demand from cooling towers The project team has indicated that there are no water based heat rejection systems included in the project. Please complete the Standard Practice cooling load.

Please enter the average air temperature, relative humidity and heat rejection load for the standard practice building.

EVAPORATION				
Month	Proposed Building monthly cooling load (kWh/month)	Average dry bulb temperature (°C)	Average relative humidity (%)	Standard Practice Building monthly cooling load (kWh/month)
January				
February				
March				
April				
May				
June				
July				
August				
September				
October				
November				
December				

Enter the total monthly cooling load (in kWh) for all zones conditioned by the Standard Practice HVAC system below.

Visit the Bureau of Meteorology's website to obtain average dry bulb and relative humidity data relevant to your site:
<http://www.bom.gov.au/climate/data/index.shtml#bookmark<20>

DRIFT

	Proposed Building	Standard Practice Building
Condenser Water Δt (°C)		
Drift coefficient (%)		

(as per the requirements of the Greenhouse Gas Emissions Calculator Guide)
(as required in AS3666.1 clause 4.4)

BLEED

	Proposed building	Standard Practice Building
Cycles of concentration		

Standard practice cycles of concentration

Proposed Building					Standard Practice Building			
Month	Evaporation (kL)	Drift (kL)	Bleed (kL)	TOTAL kL/month	Evaporation (kL)	Drift (kL)	Bleed (kL)	TOTAL kL/month
January				0	1,850	3	370	2,223
February				0	1,114	2	223	1,339
March				0	1,211	2	242	1,455
April				0	630	1	126	757
May				0	365	1	73	439
June				0	219	0	44	263
July				0	238	0	46	287
August				0	319	1	64	383
September				0	446	1	89	536
October				0	1,039	2	208	1,249
November				0	1,093	2	219	1,313
December				0	1,420	2	284	1,707
Total (kL/year)	0	0	0	0	9,944	17	1,989	11,950

Water demand from heat rejection systems that are not conventional cooling towers

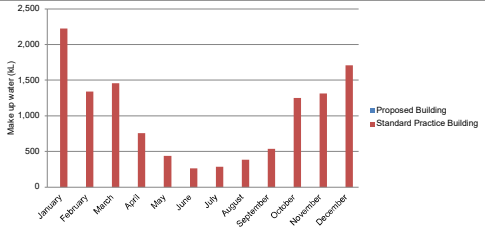
THE PROJECT TEAM HAS INDICATED THAT

Please proceed to following section.

Month	Water demand per month (kL/month)
January	
February	
March	
April	
May	
June	
July	
August	
September	
October	
November	
December	
Total make up water (kL/year)	0

RESULTS: WATER DEMAND FROM HEAT REJECTION

Month	Proposed Building (kL)	Standard Practice Building (kL)
January	0	2,223
February	0	1,339
March	0	1,455
April	0	757
May	0	439
June	0	263
July	0	287
August	0	383
September	0	536
October	0	1,249
November	0	1,313
December	0	1,707
Total make up water (kL/year)	0	11,950



4. WASHDOWN

Washdown hoses

Description	Hose Flowrate (L/min)	Number of Hoses	Average daily use (minutes)	Proposed consumption (kL/day)	Standard Practice consumption (kL/day)
Hose Taps 20	12.0	20	5	1	1
Hander description>				0	0
Hander description>				0	0
Hander description>				0	0
Hander description>				0	0
Hander description>				0	0
Hander description>				0	0
Hander description>				0	0
Hander description>				0	0
Hander description>				0	0
Total				1	1

5. LANDSCAPE IRRIGATION

(The irrigation requirement for the site is calculated for each month of the year, for each landscaped 'zone' in the site (a zone being a landscaped area that has the same soil type, irrigation system and as far as possible, types of plants). Please see pages 17-22 of the Green Star- Calculator Guide for further details.)

Evaporation losses (L/day)	
Water discharged to sewer (L/day)	
Percentage of open loop process cooling water demand sourced from non-potable (reclaimed) water	

Reclaimed water sources

	Percentage of fittings/systems connected to the following water sources
--	---

Water fittings / systems	Percentage of fittings/systems connected to the following water sources				Waste water only (This column must be completed - enter a figure between 0% and 100% for each water system)
	Rainwater	Greywater	Blackwater	Stormwater recycling or other off-site reclaimed water	
Toilets	100%				0%
Urinals	100%				0%
Indoor taps					100%
Showers - occupants					100%
Showers - sports					100%
Laundries					100%
Dishwashers					100%
Heat rejection					100%
Washdown					100%
Landscape irrigation	100%				0%
Fire protection systems					100%
Swimming pools					
Process cooling					

- Where fittings or systems are supplied with water from more than one source, it is assumed that they are first supplied with water from any greywater and blackwater systems, followed by rainwater, stormwater and off-site reclaimed water systems.

- If there is insufficient rain/grey/black water to service the indicated percentage of each water use, mains water will be applied by the calculator to make up the difference.

Note: The demand for reclaimed water from water uses assessed under other credits will be met before any water uses assessed under the Potable Water Credit.

Note: The demand for reclaimed water from water uses assessed under other credits will be met before any water uses assessed under the Potable Water Credit.

Month	Water demand (kL)		
	<Enter description of any other uses of rainwater or re-used water>	<Enter description of any other uses of rainwater or re-used water>	<Enter description of any other uses of rainwater or re-used water>
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

If reclaimed water is not used for these end uses, leave these cells blank.

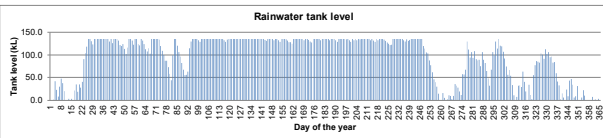
When reclaimed water is used, enter the total demand for each month regardless of whether it is fully or partially met by the reclaimed water supply. In the table below, the percentage of the demand met by reclaimed water/connected to the reclaimed water supply is entered.

--	--	--

Water system	Rainwater	Greywater	Blackwater	Stormwater recycling or other off-site reclaimed water	Mains water only (This column must be completed - enter a figure between 0% and 100% for each water use)
<Enter description of any other uses of rainwater or re-used water>					
<Enter description of any other uses of rainwater or re-used water>					
<Enter description of any other uses of rainwater or re-used water>					

100

Rainfall collection area (m2)		10,678
Run-off co-efficient	Flat roof with gravel	0.8
Storage capacity (kL)		135
Rainwater tank reliability %		77%



100

Water system	% discharge water collected for re-use
Toilets	
Urinals	
Indoor taps	
Showers - occupants	
Showers - sport	
Washing machines	
Dishwashers	
Cooling tower bleed +other heat rejection	
Washdown	
Fire protection systems	
Swimming pools	
Process cooling	

--	--	--	--

[illegible]

100%

Water system	% discharge water collected for re-use
--------------	--

Other sources e.g. Chiller condensate, cooling tower washdown or sewer mining etc.

Stormwater and off-site reclaimed water supply

WATER DEMAND SUMMARY

Total water demand summary for each system and per month

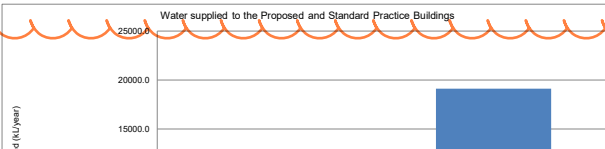
System	Proposed Building (kL)	Standard Practice Building (kL)
Toilets	~1,000	~1,500
Urinals	~0	~0
Indoor taps	~500	~500
Showers - occupants	~0	~200
Showers - sports facilities	~0	~0
Washing machines	~0	~0
Dishwashers	~0	~0
Heat rejection	~0	~12,000
Washdown	~500	~0
Landscape irrigation	~3,500	~3,500
Swimming Pools	~0	~0
Fire protection systems	~0	~0
Process cooling	~0	~0

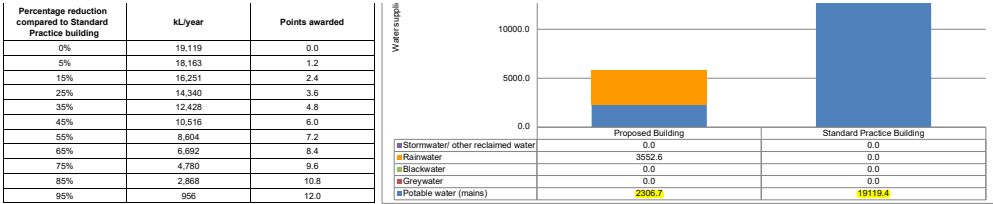
Month	Proposed Building (kL)	Standard Practice Building (kL)
January	750	3100
February	400	1850
March	550	2100
April	200	1000
May	200	700
June	200	550
July	200	550
August	200	650
September	550	1200
October	700	2000
November	800	2200
December	1150	3000

POTABLE WATER RESULTS

Percentage reduction in Potable Water Consumption compared to the Standard Practice Building	88%
Points Achieved - General	11.2
Points Achieved - Fire protection systems	N/A
Points Achieved - Process cooling	N/A

POINTS ALLOCATION





Outputs from this calculator required for Ene-Conditional Requirement and Credit 15: Greenhouse Gas Emissions.

The annual domestic hot water usage figures determined in this calculator must be used in the energy modelling required for Ene-Conditional Requirement and Credit 15: Greenhouse Gas Emissions to estimate the domestic hot water energy requirement of the Proposed and Standard Practice Buildings. For more details see the Green Star - Greenhouse Gas Emissions Calculator Guide, available www.gbca.org.au.

The estimates of annual hot water consumption usage of the Proposed Building are based on the water efficiency of the fittings entered into this calculator. The estimates for the Standard Practice Building are based on the Standard Practice Building's fittings - for further details see the Green Star - Potable Water Calculator Guide, available www.gbca.org.au.

NOTE: THESE FIGURES CAN ONLY BE USED IF THE 'Building input, areas and operation' and 'Water consumption due to fittings' sections of THIS CALCULATOR are COMPLETED.

	Proposed Building	Standard Practice Building
Annual Domestic Hot Water Usage (kL/year)	998	690

DISCHARGE TO SEWER

SEWERAGE REDUCTION DUE TO WATER RECYCLING

Percentage reduction in discharge to sewer compared to Standard Practice Building

85%

An innovation point may be claimed for a 90% of greater reduction in flow to sewer

Innovation Point Achieved	0
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RAINFALL DATA

The average rainfall data for the location selected in the General section is shown below (white shaded cells). The project team may supply their own data (see Potable Water calculator guide) by selecting 'User defined' as the location and entering the data in the blue column of the table.

10 YEAR AVERAGE RAINFALL DATA

Day	User defined (mm)	Melbourne (1998 - 2007) (mm)	Sydney (1996 - 2005) (mm)	Brisbane (1997 - 2006) (mm)	Adelaide (1996 - 2005) (mm)	Hobart (1996 - 2005) (mm)	Perth (1997 - 2006) (mm)	Darwin (1998 - 2005) (mm)	Canberra (1997 - 2006) (mm)	Mackay (1991 - 2000) (mm)	Townsville (1994 - 2003) (mm)
1 Jan	0.0	0.0	0.0	1.0	0.0	1.7	0.0	22.6	0.0	11.3	0.0
2 Jan	0.0	0.0	0.0	1.1	0.0	1.7	0.0	21.9	1.0	10.9	0.0
3 Jan	5.5	0.0	5.5	3.2	0.0	1.5	0.0	30.4	0.0	26.8	0.0
4 Jan	0.9	1.1	0.9	2.0	0.0	1.0	0.0	20.0	1.4	20.0	1.6
5 Jan	1.4	1.1	1.4	3.7	0.0	4.3	1.2	8.8	2.1	37.4	3.8
6 Jan	4.1	0.0	4.1	1.7	0.0	0.7	0.0	15.1	0.0	6.0	12.0
7 Jan	5.2	0.7	5.2	4.2	0.0	2.0	0.0	4.9	4.4	9.8	11.7
8 Jan	2.0	1.0	2.0	0.6	1.1	3.0	0.0	6.8	1.2	4.0	3.4
9 Jan	1.0	0.0	1.0	1.2	0.0	0.0	0.0	9.4	1.0	16.4	0.0
10 Jan	0.5	0.0	0.5	7.7	0.0	0.0	0.0	20.0	0.0	4.0	10.0
11 Jan	0.0	1.1	0.0	1.1	0.0	0.0	0.0	11.4	0.0	10.0	39.0
12 Jan	1.0	0.7	1.0	1.4	0.0	1.0	0.0	16.1	0.7	18.4	10.0
13 Jan	0.0	0.0	0.0	1.4	1.2	0.0	1.0	20.0	0.0	7.8	10.0
14 Jan	1.0	0.0	1.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	1.0
15 Jan	0.7	0.0	0.7	1.4	0.0	0.0	1.0	10.0	0.0	0.0	1.0
16 Jan	3.1	0.0	3.1	11.7	0.0	0.7	0.0	16.1	1.0	6.0	1.0
17 Jan	4.7	0.0	4.7	1.9	0.0	0.0	1.1	10.1	4.1	7.3	2.4
18 Jan	1.2	0.0	1.2	5.7	0.0	0.0	0.0	15.0	2.4	5.4	2.4
19 Jan	4.7	0.7	4.7	0.0	0.0	0.0	0.0	8.0	0.0	1.3	4.0
20 Jan	2.3	0.0	2.3	1.0	2.0	0.0	0.0	10.0	0.0	0.0	0.0
21 Jan	4.6	0.0	4.6	0.0	1.4	1.4	0.0	20.0	0.0	3.0	1.0
22 Jan	9.0	1.4	9.0	0.0	2.4	0.0	0.1	14.0	1.0	0.0	0.0
23 Jan	4.7	1.0	4.7	0.0	0.0	0.0	4.7	10.4	1.2	0.0	1.1
24 Jan	4.8	0.0	4.8	0.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0
25 Jan	7.9	0.0	7.9	7.0	0.0	4.0	0.0	11.7	2.4	0.0	0.0
26 Jan	3.1	1.0	3.1	0.1	0.0	0.0	0.0	14.0	0.0	4.4	0.0
27 Jan	2.6	0.0	2.6	0.7	0.0	0.0	0.0	20.0	4.0	0.0	0.0
28 Jan	2.3	1.0	2.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29 Jan	5.5	2.0	5.5	10.7	0.0	1.7	0.0	10.7	2.0	0.0	0.0
30 Jan	9.4	0.0	9.4	4.1	0.7	0.0	0.0	0.0	0.0	1.1	4.0
31 Jan	13.7	0.7	13.7	5.2	0.0	1.1	0.0	0.0	0.0	0.0	0.0
1 Feb	7.5	0.0	7.5	10.0	0.0	0.7	0.0	7.0	0.0	0.0	0.0
2 Feb	7.6	0.1	7.6	10.7	0.0	1.1	0.0	0.0	0.0	0.0	0.1
3 Feb	2.6	11.0	2.6	10.7	0.0	1.0	0.0	14.7	0.0	11.0	0.0
4 Feb	6.5	0.0	6.5	0.0	0.7	0.4	0.0	0.0	0.0	0.0	0.0
5 Feb	13.3	0.0	13.3	0.1	0.0	1.2	0.0	0.7	10.0	20.0	21.0
6 Feb	6.6	0.0	6.6	1.1	0.0	1.4	0.0	21.0	0.1	0.0	0.0
7 Feb	2.1	1.0	2.1	0.0	4.0	4.4	1.0	10.0	1.0	0.0	0.0
8 Feb	1.3	4.0	1.3	0.4	0.0	0.1	0.0	11.7	4.0	0.4	0.0
9 Feb	7.5	0.0	7.5	10.1	0.7	7.0	0.0	20.7	0.0	10.0	0.1
10 Feb	0.9	2.2	0.9	0.1	0.0	0.0	0.0	17.0	0.0	11.0	10.7
11 Feb	3.1	1.0	3.1	1.4	0.0	0.0	0.0	17.0	0.0	0.0	0.0
12 Feb	9.9	0.0	9.9	1.4	0.0	0.0	0.0	21.0	2.1	16.0	1.0
13 Feb	6.3	2.1	6.3	1.0	0.7	1.0	0.0	20.0	4.1	0.0	0.0
14 Feb	1.5	0.0	1.5	0.0	0.0	0.0	0.0	20.1	1.0	7.1	22.2
15 Feb	0.8	0.0	0.8	4.7	0.0	1.4	0.0	10.0	0.0	10.0	24.0
16 Feb	1.7	4.1	1.7	0.0	0.0	2.0	0.0	0.4	0.0	20.0	12.0
17 Feb	2.4	0.7	2.4	0.0	0.0	0.0	0.0	24.7	0.0	0.0	17.1
18 Feb	0.7	0.0	0.7	0.7	0.0	0.0	0.0	21.0	1.0	10.1	21.0
19 Feb	0.6	0.0	0.6	1.1	0.0	0.0	0.0	11.0	0.0	0.0	12.0
20 Feb	3.6	0.0	3.6	1.4	0.0	1.0	0.0	0.0	0.0	0.1	4.0
21 Feb	6.2	0.0	6.2	0.0	2.0	0.0	0.0	0.0	3.0	0.0	0.0
22 Feb	2.4	1.1	2.4	1.0	1.0	1.0	1.1	14.0	4.0	0.0	0.0
23 Feb	1.5	0.0	1.5	0.0	0.0	0.0	0.0	17.4	1.0	18.4	4.1
24 Feb	0.9	1.0	0.9	11.4	0.0	1.0	0.0	17.4	0.0	15.1	12.2
25 Feb	11.0	0.0	11.0	0.0	0.0	0.0	0.0	10.0	0.0	20.7	0.0
26 Feb	3.6	7.1	3.6	2.0	0.0	0.7	0.0	21.0	0.0	10.4	10.0
27 Feb	0.5	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	12.4	10.1
28 Feb	1.6	0.0	1.6	4.1	0.0	0.0	0.0	16.0	1.1	0.0	12.0
1 Mar	5.3	0.0	5.3	3.4	0.0	1.4	0.0	10.2	0.0	17.0	11.4
2 Mar	1.9	0.0	1.9	7.0	0.0	0.0	0.0	40.0	0.7	0.0	0.0
3 Mar	1.4	1.0	1.4	0.0	0.0	1.0	0.0	20.0	2.7	10.0	0.0
4 Mar	1.0	0.0	1.0	4.0	0.0	0.0	0.0	20.1	0.0	10.0	7.7
5 Mar	1.1	1.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0
6 Mar	3.1	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	11.7	0.0
7 Mar	0.9	0.0	0.9	10.0	1.0	0.0	0.0	7.0	0.0	2.0	0.0
8 Mar	7.6	0.0	7.6	1.7	0.0	1.0	0.0	0.0	0.0	0.0	0.0
9 Mar	7.9	0.0	7.9	1.1	0.0	1.0	0.0	11.7	0.0	16.4	3.7
10 Mar	6.7	0.7	6.7	0.0	0.7	0.0	1.0	7.0	1.0	0.7	0.0
11 Mar	8.0	0.0	8.0	0.1	0.0	0.0	1.0	0.0	1.7	4.0	1.0
12 Mar	5.3	0.0	5.3	4.1	0.0	0.0	0.0	10.0	0.0	4.0	0.0
13 Mar	2.2	1.0	2.2	1.4	0.0	1.0	0.0	0.1	1.0	4.0	4.0
14 Mar	0.0	0.0	0.0	0.4	0.0	0.0	0.0	7.3	0.0	0.1	0.0
15 Mar	1.1	0.0	1.1	0.0	0.0	0.7	0.0	7.1	0.1	0.7	0.0
16 Mar	1.2	0.0	1.2	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0
17 Mar	0.9	0.0	0.9	1.0	1.0	0.0	0.0	0.0	4.0	0.0	0.0
18 Mar	0.9	0.0	0.9	0.0	1.0	0.1	0.0	0.4	0.0	10.0	10.0
19 Mar	0.0	0.0	0.0	0.0	2.0	0.0	0.0	10.0	0.0	11.7	0.0
20 Mar	0.0	0.0	0.0	1.1	0.0	2.0	0.0	0.0	0.0	27.0	0.0
21 Mar	0.6	1.0	0.6	0.0	2.0	7.1	1.1	10.0	2.0	1.0	0.0
22 Mar	8.8	2.4	8.8	0.0	0.0	2.0	0.0	0.0	0.0	3.0	0.0
23 Mar	11.0	4.7	11.0	0.0	0.0	2.0	2.0	10.0	0.0	2.7	0.0
24 Mar	8.4	4.0	8.4	0.1	1.0	0.0	0.0	0.0	0.0	0.1	10.0
25 Mar	0.6	0.0	0.6	0.0	0.0	1.0	0.0	0.4	0.0	4.0	0.7

26 Mar	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
27 Mar	1.2	0.5	0.5	1.2	0.5	0.5	0.5	0.5	0.2	0.5	1.0	0.5	0.5
28 Mar	0.0	0.0	0.0	0.0	1.1	0.0	0.2	0.3	2.2	0.0	1.5	0.0	0.7
29 Mar	0.0	1.5	0.0	0.0	2.0	0.0	0.4	0.0	2.5	0.7	0.0	0.7	1.5
30 Mar	0.0	1.0	0.0	0.0	1.1	1.5	0.0	0.0	4.0	1.5	0.0	1.1	0.0
31 Mar	2.4	0.0	2.4	0.0	1.7	0.0	0.0	1.7	4.0	0.0	7.2	0.0	0.0
1 Apr	1.8	1.5	1.8	0.0	3.7	0.0	1.2	0.4	2.2	0.0	0.0	3.0	1.0
2 Apr	7.0	0.0	7.0	0.0	0.0	0.0	1.3	0.0	0.0	1.0	0.0	2.0	0.0
3 Apr	2.7	0.0	2.7	3.2	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0	6.1
4 Apr	2.0	0.0	2.0	1.1	0.0	0.0	1.7	0.0	0.0	0.0	0.0	7.0	10.7
5 Apr	3.3	1.0	3.3	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.72
6 Apr	3.3	1.0	3.3	0.0	1.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0
7 Apr	2.2	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	1.0
8 Apr	0.5	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0
9 Apr	0.0	0.5	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.5	0.0	4.0	0.0
10 Apr	15.5	0.5	15.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	10.2	0.0
11 Apr	19.4	0.1	19.4	0.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	7.0	0.0
12 Apr	1.0	0.2	1.0	0.4	0.0	0.0	0.1	0.4	10.0	0.0	0.0	4.0	0.0
13 Apr	1.0	2.7	1.0	0.7	1.7	2.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
14 Apr	3.5	2.7	3.5	1.0	1.5	1.0	0.0	0.0	1.5	0.0	0.0	0.0	1.5
15 Apr	2.1	0.2	2.1	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
16 Apr	1.2	1.0	1.2	0.0	0.0	1.2	0.0	1.0	0.0	0.0	1.0	10.3	0.0
17 Apr	1.5	0.0	1.5	0.0	0.0	0.0	0.0	1.0	0.0	1.1	0.0	0.0	0.0
18 Apr	11.4	0.0	11.4	0.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	0.0	1.0
19 Apr	1.2	0.0	1.2	0.0	0.0	0.0	0.1	0.0	0.0	2.0	0.0	4.2	0.0
20 Apr	2.7	1.7	2.7	0.0	2.5	0.7	0.7	0.0	0.7	0.1	0.0	0.0	0.0
21 Apr	4.7	1.7	4.7	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
22 Apr	3.9	4.0	3.9	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.1	0.0	0.0
23 Apr	7.3	3.0	7.3	0.7	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.1	1.0
24 Apr	3.2	0.2	3.2	2.0	0.7	0.0	0.0	0.0	1.1	0.0	0.0	4.0	1.0
25 Apr	0.0	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
26 Apr	0.0	1.0	0.0	1.1	0.0	1.0	1.0	2.1	4.0	1.0	0.0	0.0	1.0
27 Apr	1.5	0.0	1.5	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0
28 Apr	0.0	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
29 Apr	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
30 Apr	3.5	0.0	3.5	2.3	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.7
1 May	4.4	0.5	4.4	2.0	0.4	0.0	0.0	1.0	0.0	1.1	0.0	7.0	1.5
2 May	6.1	1.1	6.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0
3 May	4.5	1.0	4.5	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	2.0	0.0
4 May	2.5	0.0	2.5	0.7	1.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0
5 May	5.9	1.3	5.9	0.0	0.0	0.0	1.0	0.0	2.0	2.0	0.0	7.1	0.0
6 May	17.9	1.7	17.9	2.1	0.0	0.0	1.1	0.0	0.0	0.0	0.7	0.0	0.0
7 May	5.1	1.0	5.1	1.2	0.0	1.0	1.0	0.0	0.0	1.1	0.0	0.0	1.0
8 May	3.7	0.0	3.7	0.0	0.7	0.0	0.0	1.0	0.0	1.0	0.7	0.7	1.0
9 May	5.9	0.0	5.9	0.0	1.0	0.0	1.0	0.0	0.1	4.0	0.0	0.0	0.0
10 May	1.9	1.1	1.9	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11 May	8.6	0.0	8.6	0.0	0.0	0.0	0.0	4.7	0.0	0.0	0.0	2.0	0.0
12 May	3.6	0.0	3.6	0.0	0.0	2.5	0.0	0.1	0.0	0.0	0.0	2.0	0.0
13 May	3.9	0.0	3.9	0.0	0.0	1.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
14 May	7.2	0.0	7.2	1.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0
15 May	9.0	1.0	9.0	2.1	0.7	0.0	0.0	2.1	1.0	1.0	0.0	1.0	2.0
16 May	6.8	1.0	6.8	0.1	1.0	0.0	0.0	0.1	0.0	1.5	1.0	1.0	4.0
17 May	8.7	0.0	8.7	4.1	1.0	1.0	0.0	2.0	2.0	2.1	1.0	2.0	0.7
18 May	6.2	1.0	6.2	0.7	4.0	4.0	0.0	1.0	0.0	0.7	2.0	0.0	0.0
19 May	15.5	0.0	15.5	0.0	0.0	0.0	0.7	0.0	0.0	1.7	0.0	0.0	0.0
20 May	4.4	1.0	4.4	0.0	1.0	0.0	0.7	1.0	0.0	0.7	0.0	0.7	0.0
21 May	1.1	2.0	1.1	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22 May	0.7	1.0	0.7	1.2	0.0	4.2	1.0	1.0	0.7	0.0	0.0	0.0	0.0
23 May	0.8	0.0	0.8	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24 May	1.0	0.7	1.0	0.0	4.0	0.0	0.0	2.1	1.0	0.0	0.0	0.0	0.0
25 May	4.2	0.0	4.2	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	1.0
26 May	7.1	0.0	7.1	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27 May	1.5	0.7	1.5	0.0	1.5	1.0	1.0	1.0	1.0	0.0	0.0	1.0	1.0
28 May	0.0	1.7	0.0	0.0	1.7	0.0	1.1	4.0	0.0	0.0	0.0	0.0	0.0
29 May	10.4	1.0	10.4	2.0	1.0	0.0	0.0	0.7	0.0	0.0	0.0	1.0	0.0
30 May	2.1	0.0	2.1	1.1	0.0	0.0	0.0	1.0	0.0	0.0	0.0	4.0	0.0
31 May	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 Jun	0.6	0.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 Jun	3.1	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 Jun	4.4	0.0	4.4	2.0	4.0	1.0	0.0	0.0	2.0	0.0	1.0	1.0	0.0
4 Jun	2.2	0.0	2.2	1.0	1.0	0.0	0.0	2.0	0.0	0.0	1.1	0.0	0.0
5 Jun	0.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
6 Jun	0.0	1.1	0.0	2.0	0.7	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0
7 Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 Jun	0.0	0.0	0.0	0.7	2.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0
9 Jun	0.0	1.0	0.0	1.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
10 Jun	3.3	0.0	3.3	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0
11 Jun	1.3	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12 Jun	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13 Jun	3.4	0.0	3.4	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14 Jun	2.8	1.0	2.8	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
15 Jun	3.6	1.0	3.6	1.0	4.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	1.0
16 Jun	1.3	2.1	1.3	0.0	1.0	0.0	0.0	2.1	0.0	1.0	0.0	0.0	0.0
17 Jun	0.0	0.0	0.0	2.0	0.0	0.0	1.0	2.0	0.0	0.0	0.0	0.0	0.0
18 Jun	4.7	0.0	4.7	0.0	1.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
19 Jun	2.0	1.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
20 Jun	0.7	0.0	0.7	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21 Jun	0.6	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22 Jun	0.7	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23 Jun	0.3	0.7	0.3	0.0	0.0	1.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0
24 Jun	2.1	0.7	2.1	2.1	1.0	1.0	1.0	0.1	0.0	0.0	0.0	0.0	0.0
25 Jun	4.4	0.0	4.4	0.0	0.0	1.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0
26 Jun	5.9	0.0	5.9	1.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
27 Jun	5.1	0.0	5.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28 Jun	0.0	2.3	0.0	2.7	0.0	2.3	1.0	0.0	0.0	0.0	0.0	0.0	0.0
29 Jun	1.0	1.0	1.0	4.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
30 Jun	3.0	1.0	3.0	7.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0
1 Jul	10.5	1.0	10.5	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 Jul	6.5	0.0	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 Jul	4.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 Jul	3.4	0.0	3.4	0.7	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 Jul	4.2	0.0	4.2	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	1.0	0.0
7 Jul	1.4	1.0	1.4	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0
8 Jul	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9 Jul	0.0	0.7	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	1.0	0.0
10 Jul	1.7	1.0	1.7	0.7	1.0	0.0	0.1	0.0	0.0	0.0	0.0	0	

27 Jul	2.9	1.7	2.9	2.5	2.5	3.8	3.0	3.9	2.1	3.9	3.0
28 Jul	1.9	1.3	1.9	-2.2	4.6	2.5	2.9	3.2	1.1	2.5	-0.7
29 Jul	6.1	1.7	6.1	3.1	2.1	1.1	0.0	3.9	1.2	0.5	3.9
30 Jul	3.4	2.0	3.4	0.0	1.8	1.3	12.0	0.0	0.0	0.0	0.0
31 Jul	0.0	1.3	0.0	0.0	0.0	1.1	2.9	0.0	0.0	0.0	0.0
1 Aug	1.3	1.8	1.3	0.0	1.9	0.0	2.7	0.0	0.0	0.0	0.0
2 Aug	0.0	0.0	0.0	0.0	2.7	1.8	0.7	0.0	0.0	0.7	0.0
3 Aug	0.0	0.7	0.0	0.0	1.9	0.0	4.5	0.0	0.0	0.0	2.1
4 Aug	1.7	2.3	1.7	0.0	2.9	1.5	4.7	0.0	3.9	2.9	0.0
5 Aug	0.5	1.1	0.5	2.9	2.9	1.5	3.2	0.0	2.9	1.9	0.0
6 Aug	6.1	0.0	6.1	2.5	1.6	0.7	4.0	0.0	1.3	0.0	3.8
7 Aug	13.9	0.0	13.9	0.0	2.4	2.3	5.5	0.0	2.1	0.0	4.0
8 Aug	13.7	1.2	13.7	0.0	2.9	1.3	1.7	0.0	0.0	1.3	0.0
9 Aug	0.8	2.1	0.8	-2.2	2.4	1.9	0.5	0.0	2.0	0.0	-0.7
10 Aug	0.0	2.4	0.0	0.0	0.7	1.7	2.9	0.0	3.5	0.0	0.0
11 Aug	0.0	0.0	0.0	0.0	3.9	0.5	0.0	0.0	0.0	0.0	0.0
12 Aug	0.0	1.8	0.0	0.0	1.3	0.0	1.4	0.0	1.8	0.0	0.0
13 Aug	0.5	1.8	0.5	0.0	1.3	4.8	2.7	0.0	1.8	0.0	0.0
14 Aug	1.1	1.1	1.1	0.0	1.2	1.7	0.0	0.0	4.0	0.0	0.0
15 Aug	6.1	1.9	6.1	0.0	2.9	4.1	0.4	0.0	1.9	0.0	0.0
16 Aug	5.5	1.6	5.5	0.0	1.9	0.0	2.2	0.0	0.0	2.0	2.4
17 Aug	3.5	1.7	3.5	0.7	0.0	2.8	0.3	0.0	1.9	0.0	0.0
18 Aug	6.6	1.5	6.6	0.0	0.0	2.8	6.4	0.0	2.1	0.0	0.0
19 Aug	10.7	0.0	10.7	1.0	1.1	1.4	2.3	0.0	0.0	0.0	0.0
20 Aug	6.6	1.8	6.6	0.0	1.3	1.5	1.3	0.0	0.0	0.7	0.0
21 Aug	2.5	0.0	2.5	1.0	0.4	1.0	0.9	0.0	0.7	0.0	0.0
22 Aug	0.0	1.9	0.0	-2.2	0.5	2.2	0.7	0.0	3.6	0.0	-0.7
23 Aug	0.7	0.0	0.7	0.0	1.4	2.4	0.0	0.0	1.1	0.0	0.0
24 Aug	1.5	3.2	1.5	1.1	3.5	3.0	5.2	0.0	4.1	2.0	0.0
25 Aug	0.0	1.2	0.0	0.0	1.2	0.8	3.5	0.0	1.3	0.0	0.0
26 Aug	1.2	1.2	1.2	1.7	1.2	1.4	1.7	0.0	1.1	0.0	0.0
27 Aug	3.5	3.3	3.5	3.3	0.0	0.8	3.4	0.0	4.0	0.0	0.0
28 Aug	2.7	1.3	2.7	2.4	2.2	0.0	0.4	0.0	0.9	3.9	0.0
29 Aug	1.8	0.0	1.8	3.9	0.0	0.0	7.0	0.0	1.0	2.7	2.1
30 Aug	3.0	0.5	3.0	0.0	2.9	1.5	0.0	0.0	0.0	13.2	13.8
31 Aug	1.7	2.7	1.7	1.3	1.4	1.3	3.0	0.0	2.5	3.3	12.3
1 Sep	13.3	1.5	13.3	4.5	1.6	0.7	7.5	0.0	5.6	2.7	3.2
2 Sep	3.8	0.0	3.8	1.6	3.3	0.0	0.0	0.0	3.9	0.0	1.0
3 Sep	2.5	0.0	2.5	0.4	2.0	1.9	3.1	0.0	3.6	2.0	0.0
4 Sep	0.0	2.0	0.0	0.0	2.9	0.9	2.2	0.0	1.0	0.0	0.0
5 Sep	1.8	2.0	1.8	0.0	0.9	1.9	0.0	0.0	4.3	0.0	0.0
6 Sep	1.5	1.2	1.5	0.7	4.1	0.0	7.3	0.0	0.0	0.0	0.0
7 Sep	2.2	1.0	2.2	0.0	1.7	2.8	4.0	0.0	0.0	0.0	0.0
8 Sep	0.0	0.0	0.0	0.0	0.0	0.8	3.4	0.0	1.0	0.4	0.0
9 Sep	1.2	0.0	1.2	0.0	2.0	0.0	1.7	0.0	3.1	0.0	0.0
10 Sep	0.0	1.9	0.0	0.7	1.2	2.0	1.9	0.0	1.3	3.3	0.0
11 Sep	0.5	0.0	0.5	0.1	0.0	1.3	4.8	0.0	3.4	0.0	0.0
12 Sep	1.7	3.5	1.7	2.1	1.7	0.5	1.8	0.0	3.8	0.0	0.0
13 Sep	1.3	1.2	1.3	0.0	1.0	0.0	1.6	0.0	3.1	0.0	0.0
14 Sep	0.0	0.0	0.0	0.0	2.3	1.9	1.3	0.0	2.4	0.0	0.0
15 Sep	0.0	0.0	0.0	0.0	1.9	3.7	4.0	0.0	1.8	1.1	0.0
16 Sep	0.0	1.2	0.0	0.0	2.5	3.4	0.0	0.0	0.5	0.0	0.0
17 Sep	2.5	1.9	2.5	1.0	2.0	1.9	2.1	0.0	6.8	0.7	0.0
18 Sep	1.2	0.0	1.2	0.0	0.5	3.5	0.7	0.0	1.3	0.0	0.0
19 Sep	0.0	0.0	0.0	0.0	1.8	2.4	0.0	0.7	0.0	0.0	0.0
20 Sep	0.0	1.0	0.0	0.0	1.2	0.8	1.9	0.0	2.3	0.0	0.0
21 Sep	1.9	0.0	1.9	2.8	0.7	1.8	2.4	0.0	2.7	0.4	0.0
22 Sep	1.7	0.0	1.7	0.0	0.0	1.0	0.7	0.0	0.7	2.1	0.0
23 Sep	0.9	0.5	0.9	0.0	2.9	2.0	2.4	0.0	0.0	0.0	0.0
24 Sep	1.7	1.8	1.7	0.0	2.9	2.9	1.2	0.7	0.0	2.7	0.0
25 Sep	4.8	1.9	4.8	5.5	3.0	2.8	1.4	0.0	1.0	0.0	0.0
26 Sep	2.0	1.1	2.0	0.0	1.6	0.0	0.6	0.0	1.0	0.0	0.0
27 Sep	2.0	3.0	2.0	2.4	0.0	0.0	2.2	0.0	3.9	0.0	0.0
28 Sep	1.4	1.7	1.4	2.7	1.1	1.0	0.8	0.0	3.0	0.7	0.0
29 Sep	1.6	2.1	1.6	0.0	1.0	1.9	4.7	0.0	4.0	0.0	0.0
30 Sep	7.3	2.7	7.3	0.0	2.0	0.0	3.2	0.0	0.0	2.5	0.0
1 Oct	2.7	1.3	2.7	0.7	2.5	1.8	2.0	1.7	0.0	2.4	0.0
2 Oct	3.9	1.9	3.9	0.0	1.2	1.9	0.6	0.0	4.3	0.4	1.0
3 Oct	10.0	2.2	10.0	0.0	4.1	0.1	0.0	0.0	4.0	0.0	0.0
4 Oct	0.7	1.1	0.7	0.0	0.0	0.8	1.3	0.0	2.0	1.3	0.0
5 Oct	0.6	0.0	0.6	0.0	0.0	0.7	0.7	0.0	1.9	0.0	0.0
6 Oct	4.1	1.9	4.1	0.0	2.0	1.8	3.2	1.0	2.0	0.0	0.0
7 Oct	1.2	1.3	1.2	2.4	2.9	3.3	2.4	0.0	1.4	0.0	0.0
8 Oct	4.5	2.6	4.5	4.6	1.9	2.3	3.6	0.7	2.0	0.0	0.0
9 Oct	0.0	0.0	0.0	0.0	1.7	1.9	2.3	0.0	0.0	1.2	0.0
10 Oct	2.4	3.3	2.4	0.0	1.9	0.6	7.2	0.0	0.0	1.4	4.5
11 Oct	2.9	1.9	2.9	0.0	1.3	3.0	0.0	0.0	1.1	0.0	1.8
12 Oct	1.0	1.0	1.0	0.5	0.0	6.2	1.2	0.0	0.0	0.0	4.1
13 Oct	6.4	0.0	6.4	0.0	1.0	4.8	3.1	0.0	0.8	4.1	0.0
14 Oct	0.7	1.3	0.7	4.5	0.7	2.8	2.0	1.2	2.8	0.0	0.0
15 Oct	1.9	1.9	1.9	4.8	0.0	1.9	0.0	0.0	0.0	0.0	0.0
16 Oct	0.0	2.1	0.0	2.5	1.2	0.0	3.6	0.0	0.0	1.2	0.7
17 Oct	0.8	0.0	0.8	1.3	0.0	0.0	0.5	0.0	0.0	1.3	0.0
18 Oct	0.8	0.5	0.8	3.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0
19 Oct	6.9	0.0	6.9	5.4	4.0	1.3	0.0	0.7	4.0	0.0	0.0
20 Oct	7.2	2.8	7.2	5.5	3.0	2.1	0.0	0.0	4.6	0.0	0.0
21 Oct	1.9	0.0	1.9	1.9	1.0	1.0	1.2	0.0	0.0	0.0	0.0
22 Oct	6.3	2.7	6.3	2.1	0.0	1.9	2.3	2.0	0.5	0.0	0.0
23 Oct	0.9	1.1	0.9	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0
24 Oct	5.4	1.9	5.4	0.0	0.7	0.0	0.0	2.3	1.9	1.9	0.0
25 Oct	1.0	3.6	1.0	5.0	0.7	0.0	0.5	2.6	2.6	1.4	0.0
26 Oct	2.5	4.5	2.5	8.2	0.0	3.3	0.0	1.1	2.8	1.8	7.8
27 Oct	1.3	1.3	1.3	1.7	0.0	0.0	0.0	0.0	0.0	0.0	3.2
28 Oct	1.0	3.7	1.0	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29 Oct	0.0	3.1	0.0	0.0	0.7	0.0	1.1	0.0	0.7	1.6	4.5
30 Oct	0.0	0.5	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31 Oct	3.9	1.8	3.9	0.0	0.7	2.1	0.5	4.7	0.0	0.0	4.8
1 Nov	1.8	0.0	1.8	2.5	2.0	3.8	2.2	1.3	1.6	3.5	0.0
2 Nov	0.9	1.6	0.9	0.0	0.0	0.0	0.0	4.5	0.0	0.0	0.0
3 Nov	0.0	2.9	0.0	0.0	0.7	2.4	0.0	2.1	3.1	1.0	0.0
4 Nov	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.0	3.8	0.0	0.0
5 Nov	1.5	0.0	1.5	7.3	2.4	1.2	0.9	3.2	0.0	0.0	0.0
6 Nov	4.4	4.4	4.4	2.3	1.9	1.8	0.0	1.7	2.4	0.0	1.3
7 Nov	3.3	1.5	3.3	4.6	3.4	4.8	0.0	2.6	0.7	3.7	0.0
8 Nov	2.9	3.3	2.9	3.7	2.4	0.8	0.0	4.1	7.4	1.8	3.9
9 Nov	7.2	1.8	7.2	3.7	0.0	1.3	0.0	0.1	1.2	0.0	3.0
10 Nov	0.0	0.0	0.0	1.3	1.0	0.0	1.1	10.1	0.0	0.0	1.8
11 Nov	0.8	1.1	0.8	1.3	2.9	0.7	0.4	0.0	0.4	0.0	0.0
12 Nov	0.0	0.5	0.0	2.1	0.7	2.7	0.0	4.8	2.0	0.0	5.1
13 Nov	4.6	3.7	4.6	0.0	0.0	2.7	0.0	0.0	0.0	0.0	1.7
14 Nov	0.8	3.1	0.8	2.2	0.0	2.3	0.0	1.8	3.1	2.3	0.1
15 Nov	0.9	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16 Nov	7.1	0.0	7.1	3.8	0.0	1.4	0.0	8.1	0.7	10.0	3.2
17 Nov	5.8	0.0	5.8	3.3	0.0	0.0	2.8	0.4	0.0	8.4	1.4
18 Nov	4.4	1.0	4.4	4.1	0.0	2.0	1.6	0.0	1.0	10.9	4.1
19 Nov	3.1	0.0	3.1	0.0	0.0	1.2	2.5	0.5	16.6	4.8	4.8
20 Nov	3.9	0.0	3.9	1.8	0.0	0.0	0.0	1.7	0.0	1.0	3.8
21 Nov	5.7	0.7	5.7	4.9	0.0	0.0	0.0	7.1	2.8	3.8	0.5
22 Nov	1.8	1.8	1.8	0.0	0.7	2.8	0.0	3.7	2.8	1.8	1.9
23 Nov	2.2	1.8	2.2	3.6	1.0	2.3	0.0	2.3	2.0	4.0	4.0
24 Nov	5.8	0.5	5.8	3.7	0.0	1.5	0.0	0.4	0.1	10.4	3.1
25 Nov	2.0	0.0	2.0	0.0	0.0	1.8	0.0	0.0	1.0	2.3	0.0
26 Nov	3.8	0.0	3.8	0.0	1.7	3.8	1.0	0.0	0.0	6.8	1.6

27 Nov	1.9	1.4	1.9	1.3	0.5	1.2	0.6	16.5	1.5	0.7	6.7
28 Nov	3.5	1.5	3.5	2.4	0.0	1.5	1.4	5.4	0.0	2.2	4.1
29 Nov	1.7	0.0	1.7	1.7	0.0	0.7	0.9	5.3	0.0	0.5	0.1
30 Nov	3.4	0.0	3.4	1.4	0.0	1.3	0.0	4.6	1.1	0.0	1.0
1 Dec	1.7	0.0	1.7	2.7	0.0	0.7	0.0	2.7	0.0	1.4	0.0
2 Dec	2.5	0.7	2.5	0.0	0.7	1.4	0.0	1.3	1.4	2.4	0.0
3 Dec	3.6	0.0	3.6	1.4	1.3	0.7	0.0	3.9	0.0	4.0	0.0
4 Dec	0.8	0.0	0.8	0.6	0.0	0.0	0.0	9.7	0.0	4.2	0.0
5 Dec	2.4	0.7	2.4	3.2	0.0	1.0	0.0	3.7	1.4	0.0	0.2
6 Dec	1.3	0.0	1.3	3.7	0.0	0.5	0.0	15.7	0.0	6.4	0.1
7 Dec	0.0	4.7	0.0	6.0	1.3	0.0	0.0	0.0	1.5	1.5	0.0
8 Dec	3.4	1.7	3.4	1.5	0.0	0.5	0.0	7.1	1.0	1.1	0.0
9 Dec	1.6	0.0	1.6	0.3	1.3	1.5	0.0	27.1	2.9	0.0	1.3
10 Dec	5.7	0.0	5.7	10.1	0.0	1.6	0.0	20.2	4.1	4.0	1.2
11 Dec	5.0	0.0	5.0	0.3	1.0	0.9	0.0	0.7	0.0	11.5	0.0
12 Dec	3.1	1.4	3.1	0.2	0.0	0.5	0.0	4.4	2.3	0.5	0.0
13 Dec	1.3	2.0	1.3	2.0	0.0	2.0	0.0	2.0	0.0	1.1	4.9
14 Dec	1.6	1.2	1.6	1.3	0.0	0.0	0.0	0.2	0.0	1.0	0.0
15 Dec	4.3	0.7	4.3	4.1	0.0	0.0	0.0	3.4	2.0	0.0	3.5
16 Dec	0.0	1.7	0.0	4.0	0.0	0.0	0.0	0.0	0.7	4.2	0.7
17 Dec	0.7	0.7	0.7	4.1	0.0	0.0	0.0	3.7	0.0	1.0	0.7
18 Dec	1.3	0.0	1.3	0.2	2.4	1.9	0.0	0.1	0.0	7.3	0.2
19 Dec	3.2	1.5	3.2	2.7	0.0	0.0	0.0	5.9	0.0	4.0	7.2
20 Dec	1.8	0.0	1.8	0.0	0.0	0.7	0.0	6.0	0.0	11.1	0.7
21 Dec	0.6	2.0	0.6	0.0	0.7	2.0	0.0	0.0	0.0	7.0	1.7
22 Dec	0.0	3.1	0.0	0.0	0.0	0.7	0.0	0.0	1.0	4.7	11.4
23 Dec	0.0	2.4	0.0	0.0	1.0	0.0	0.0	12.0	0.0	0.7	10.5
24 Dec	0.0	0.0	0.0	0.2	0.0	0.0	0.0	20.1	1.0	7.0	0.0
25 Dec	1.5	0.0	1.5	4.4	0.0	4.0	0.0	16.5	0.0	1.0	0.1
26 Dec	0.6	1.0	0.6	1.0	0.0	1.0	0.0	17.9	0.0	0.0	0.0
27 Dec	0.0	0.0	0.0	10.0	0.0	0.3	0.0	11.0	0.0	11.3	12.0
28 Dec	0.5	1.4	0.5	0.0	0.0	1.2	0.0	0.0	1.3	2.4	0.0
29 Dec	1.0	1.0	1.0	11.7	0.0	0.0	0.0	20.0	1.0	11.5	0.7
30 Dec	0.0	0.0	0.0	2.7	0.0	0.0	0.0	15.0	1.1	7.0	0.0
31 Dec	0.0	0.0	0.0	10.7	0.0	0.0	0.0	11.0	0.0	0.0	0.0

Rating details

What type of rating would you like to estimate?

- ☐ Energy
- ☒ Water

What type of building?

- ☒ Office
- ☐ Hotel
- ☐ Shopping centre
- ☐ Residential aged care and retirement living
- ☐ Apartment building

What is the postcode of the building?

2765

What is the scope of your rating?

- ☒ Whole building

Enter the star rating you wish to achieve

3

Stars (Water)

Building details

What is the floor space of the building?

Enter the total net lettable area of office space within the building.

15415

m²

How many hours per week is the building occupied?

Hours each week with occupancy levels of 20% or more (hrs/week).

hours

Results

Maximum Water Consumption at 3 Star NABERS Water:

15,750 kL/year

Water Intensity at 3 Star NABERS Water:

1.022 kL/m².year

Design with
community in mind

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