

12 Hassall Street

Environmentally Sustainable Design (ESD) for SSDA Report

Prepared for: Gurner Group

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Project:	12 Hassall Street
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Project Team	
Client	Gurner Group
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1. Introduction

1.1 Project Overview

This report has been prepared for Gurner Group and provides a list of Environmentally Sustainable Design (ESD) initiatives & recommendations to be considered for the proposed development to be located at 12 Hassall Street Parramatta NSW.

Following a review of the project brief, site location and architectural drawings, we propose the following areas of sustainability to be explored during the design, construction, and operation of the proposed development:

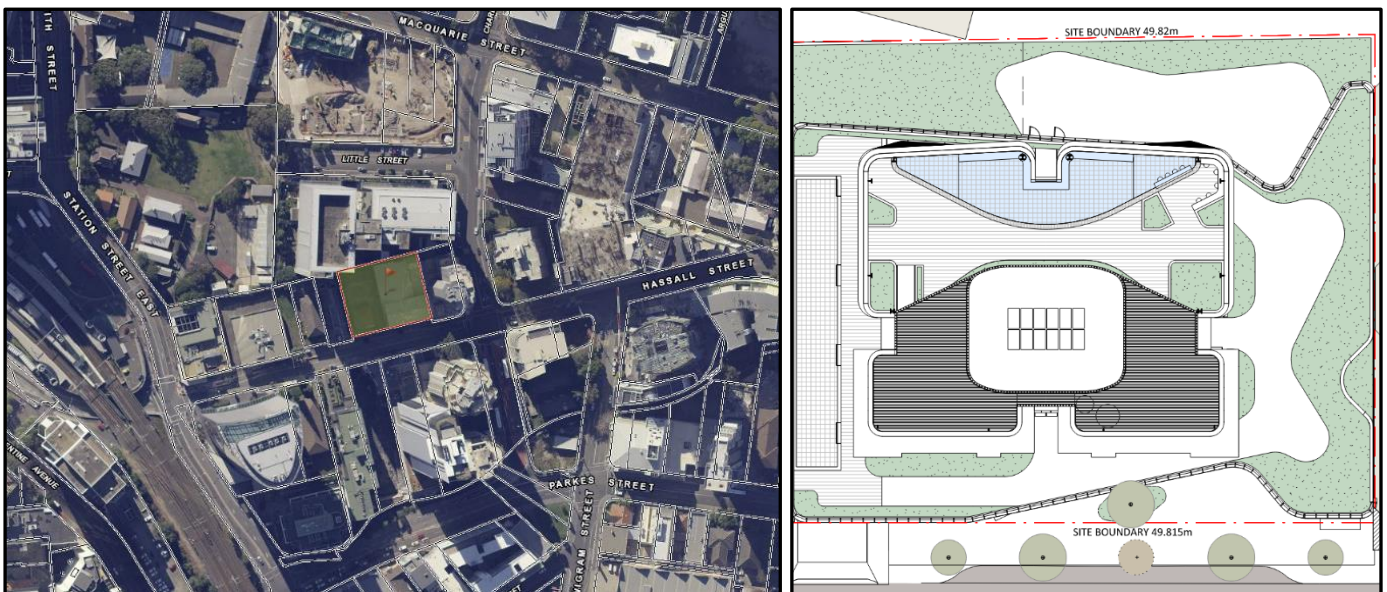
- > National Construction Code (NCC) 2019
- > Green Building Certification
- > Energy & Greenhouse Gas Emissions
- > Water Efficiency and Conservation
- > Healthy Indoor Environmental Quality (IEQ)
- > Best Practice Waste Management
- > Sustainable Transport

It is understood that this document is required for State Significant Development Application (SSDA) Approval and that the strategies and initiatives outlined in the report will be further developed during the project's Detailed Design stages.

1.2 Project Background

12 Hassall Street is proposed to be located in Parramatta's Central Business District and situated to the East of Parramatta Station and to the south of the Parramatta River.

Figure 1: Proposed Development Site and Site Plan

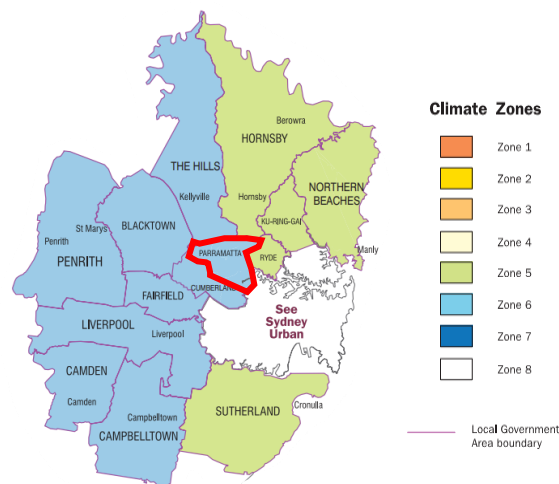


The proposed development is located within Climate Zone 6 (mild temperate), as identified by the Australian Building Codes Board (ABCB) and consists of the following NCC Classification Types:

Table 1 NCC Classifications

Space Usage	NCC Class	Compliance Criteria
Car Parking	Class 7a	-
Retail	Class 6	NCC Section J
Commercial	Class 5	NCC Section J
Residential Apartments	Class 2	BASIX

Figure 2: ABCB Climate Zone Map



1.3 Relevant Policies & Guidelines

The following Planning Policies and Guides have been referenced as part of the project's Environmentally Sustainable Design (ESD) approach:

- > National Construction Code (NCC)/Building Code of Australia 2019
- > City of Parramatta Local Environmental Plan (LEP) 2011
- > 12 Hassall Street Design Competition Brief
- > Planning Secretary's Environmental Assessment Requirements (SEARs)

1.4 Sustainability Targets & Objectives

The proposed development will be designed to achieve the following Sustainability targets:

- > **NCC 2019** - Section J, Energy Efficiency Compliance
- > **5 Star Green Star** Buildings Rating
- > **4.5 Star NABERS** Office Energy (Base Building) Rating
- > **10 point increase** above the minimum Energy and Water BASIX targets

2. Secretary's Environmental Assessment Requirements (SEARs)

Projects that have been identified as State Significant Development (SSD) are applied particular requirements by the NSW Government.

These requirements are established to minimise the project impact on the environment and ensure the design addresses any risks due to development.

The following requirements are stipulated by the Planning Secretary in the assessment of the SSDA:

- > Identify how ESD principles (as defined in Division 5 Environmental impact statements – the Act, ss 4.12(8), 5.7(1) and 5.16(2) of the EP&A Regulation 2021) are incorporated in the design and ongoing operation of the development.
- > Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards.
- > Demonstrate how the development minimises greenhouse gas emissions (reflecting the Government's goal of net zero emissions by 2050) and consumption of energy, water (including water sensitive urban design) and material resources.

The principles of ecologically sustainable development stated in the EP&A Regulation 2021 are as follows:

- 1) The principles of ecologically sustainable development are the following –
 - a) The precautionary principle,
 - b) Inter-generational equity,
 - c) Conservation of biological diversity and ecological integrity,
 - d) Improved valuation, pricing and incentive mechanisms.
- 2) 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.
- 3) 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.
- 4) 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.
- 5) 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.
- 6) 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.

The sustainability targets set for this project demonstrate compliance with the SEARs.

By adhering to the frameworks of Green Star, NABERS and BASIX, the environmental impact of this project is not only reduced upfront but will continue to reduce emissions over its operational life.

This project will exceed the industry standard and is well placed to be resilient against future shocks and stresses, thus not disadvantaging future generations.

The subsequent section in this report outlines the initiatives to be considered in design to ensure the SEARs and sustainability targets are met.

3. Environmentally Sustainable Design (ESD) Opportunities

3.1 General

This section outlines Environmentally Sustainable Design (ESD) design measures, in line with the City of Parramatta's Council DCP, 12 Hassall Street Design Competition Brief and SEARs, including additional opportunities that are to be considered during the detailed design stage of the project.

3.2 Section J Compliance: Energy Efficiency

The proposed building will be designed in line with the NCC 2019 Section J Energy Efficiency provisions and will consider energy efficient building services and optimized façade performance.

In addition to this, the heating, ventilation, and air-conditioning systems will be developed with a view to minimize the operational energy consumption of the proposed development, whilst providing the building occupants with a thermally comfortable space.

Compliance will be achieved in line with the minimum Deemed-to-Satisfy (DTS) provisions as follows:

- > All window and insulation selections will meet DTS compliance with Parts J1 to J3, establishing the minimum performance requirements for the building fabric
- > All building services will meet DTS compliance Parts J5 to J8, and establish the minimum performance for mechanical and electrical systems (including fan and pump efficiency), lighting and ancillaries

3.3 NABERS Ratings (Office Base Build)

3.3.1 NABERS Energy

The project will explore achieving a **4.5 Star NABERS Office Energy Rating** for the base building design. This will be achieved in line with the ESD strategies provided in the report and will consider the following performance measures:

- > High-performance building façade
- > Energy efficient HVAC selections
- > Energy efficient lighting designs
- > Improved operations and control of the nominated building systems

Further design verification and modelling will be undertaken following the project's SSDA approval. This is required to provide confidence that the proposed building design will support the achievement of the 4.5 Star NABERS Energy target.

Please note: The maximum energy target defined in the 12 Hassall Street Design Competition Brief is 140 kg/m² of CO₂. It is expected the project will achieve this in line with the 4.5 Star NABERS Office Energy rating.

3.4 Water Efficiency & Conservation

The project will explore achieving a **maximum water target of 0.65 kL/m² per year** for the base building design. This will be achieved in line with the ESD strategies provided in the report and will consider the following performance measures:

- > A reduction in potable water use, through the installation of highly efficient fittings and fixtures. To prevent water waste, potable water flows will be reduced in line with the WELS certified taps, showers, and toilets
- > A selection of highly efficient whitegoods (such as dishwashers in break out points) will be considered in line with a water efficient WELS Star rating
- > Ongoing rainwater capture and storage will be explored. The project team will undertake a rainwater capture assessment during the detailed design to confirm roof run off areas are feasible
- > Where feasible rainwater re-use will be considered for landscape irrigation to all green areas and landscaping surrounding the development and within the site boundary
- > The provision of low water or drought resistant and native planting for all green spaces.
- > Well designed and controlled cooling towers. We will also explore the feasibility of using recycled rainwater for cooling towers top up
- > Opportunities to provide fire protection systems that ensure test water is either collected, stored and re-used or recirculated
- > Consideration towards a second pipe for future non-potable water supply
- > Water Sensitive Urban Design Techniques will be explored to help manage stormwater run-off and pollution.

Further potable water calculations and modelling will be undertaken following the project's SSDA approval. This is required to provide confidence that the proposed building design will support the achievement of the maximum potable water target.

3.5 Sustainable Management Practices

The project team will consider opportunities to deliver best practice environmental management initiatives across the design and construction of the project.

The design team will explore:

- > Opportunities to set environmental targets, including a commitment to monitor and measure the buildings environmental performance, such as energy, water, waste or indoor environmental quality
- > Independent commissioning activities including the provision of a 12-month building tuning service for the projects nominated systems (following practical completion)
- > Development of an owner's Building Users Guide, ensuring access to select building user information for all tenants and building occupants
- > Development of a best practice Environmental Management Plan (EMP) and formalised management system for implementation during the demolition and construction phases of the project

3.6 Energy & Greenhouse Gas Emissions Reduction

The project team will consider opportunities to reduce the buildings greenhouse gas emissions impact, through the development of energy saving or energy generating design measures.

The design team will explore:

3.6.1 Building Fabric Design

- > Provision of high-performing double-glazed windows system with thermally broken frames to help reduce heat loss in winter and heat gain in summer
- > Provision of appropriately placed external shading devices to reduce solar gain in summer without adversely affecting in winter
- > Provision of high levels of insulation to the external walls, roof, and exposed floors that form part of the building envelope
- > Window to wall ratios that balance daylight access with thermal comfort and energy efficiency
- > Minimal west facing glazing in commercial areas to reduce cooling load

3.6.2 Heating, Ventilation, & Air Conditioning (HVAC) Design

- > Highly efficient water-cooled VRV system
- > Provision of outside air to all occupied spaces, exploring opportunities to provide increased fresh air provisions to occupants, optimising their indoor health and wellbeing. Outside air flow rates can be monitored by the building control system and opportunities for CO₂ sensors will be considered
- > The utilisation of CO₂ sensors is intended to control the amount of outside air supplied by air handling units to space with variable occupancy. Where CO₂ levels are lower than the set point, the volume of outside air is reduced. Potential energy saving can be achieved through avoiding unnecessary conditioning of high outside air volumes

3.6.3 Metering & Monitoring Strategy

- > The project will consider a site-specific metering strategy to monitor and provide feedback on distinct energy use and water consumption within the building.
- > The metering strategy will aim to monitor the following major systems:
 - Incoming electrical mains supply
 - Incoming gas mains supply
 - Incoming water mains supply
 - Separate meters to distinct areas and uses
 - Lighting systems
 - Air conditioning systems
 - Large individual equipment loads that exceed 5% of the total energy use (or over 100kVA)
 - Large water use that consumes more than 10% of the total water uses
- > Smart Metering: Opportunities to incorporate smart meters within the building design. This will allow for assessment and evaluation of the building energy and water consumption at hourly intervals. This will provide ongoing feedback in real time to the facilities management (daily) for monitoring and tenant billing purposes.
- > NABERS Metering: Where a NABERS rating is considered, the project team will ensure that meter and monitoring requirements are aligned with the required NABERS protocols. The intention will be to provide the facilities team with useful data to evaluate base building and tenancy energy use and costs

3.6.4 Lighting Design

- > Opportunities to deliver electric lighting that has been designed for energy efficiency and occupant comfort and will encourage well-lit spaces that are fit for purpose
- > High efficiency LED lights to provide adequate lighting levels with minimal energy expenditure
- > Careful design of daylighting controls to adjust electric lighting in response to daylight levels without causing undesirable noticeable switching effects or interactions
- > Use of sensors including motion and occupancy sensors to ensure lighting is automatically switched off when not required
- > Whole of life considerations such as maintenance costs and access for easy maintenance in practice will also be considered

3.6.5 On Site Renewables

- > There is limited roof area but we will look to maximise the opportunity for solar photovoltaic (PV)
- > We will explore the system size and capacities that can be generated from specific orientations to the north, west and east to avoid overshadowing
- > We will consider a combination of different options, layouts and orientations to optimise performance whilst considering the constrained space and aesthetics of the project

3.7 Healthy Indoor Environmental Quality

The project team will consider design initiatives that support the provision of a healthy, activated and comfortable indoor environment that focuses on improving the health and wellbeing of its occupants:

The design will explore:

- > Façade configurations that provide optimal levels of natural daylight to the office spaces
- > Glazing selections that allow for high levels of Visual Light Transmission (VLT), flooding the space with useful daylight levels throughout the day
- > Glare mitigation measures through optimising the design for fixed or operable shading devices (including blinds) appropriate to the space
- > The ventilation system will be designed to mitigate the entry of outdoor pollutants and will provide access points for ease of maintenance and cleaning. The project will ensure that all relevant ductwork will be cleaned prior to occupation and use
- > Strategies will be investigated to remove pollutants from the conditioned space directly to the outdoors. Examples of this may include separate kitchen and toilet exhausts and where applicable pollutants from photo copiers and Multi-functional devices (MFD). Additional Filtration options (above the minimum requirements) will be also be considered as part of the design
- > HVAC operational strategies will be investigated to provide Improved levels of thermal comfort. Where possible the project team will seek to meet the Predicted Mean Vote (PMV) thermal comfort values for occupant satisfaction
- > Responsible material selections will be considered to minimise exposure to harmful indoor pollutants such as Volatile Organic Compounds (VOC's), formaldehyde from engineered wood and PVC
- > Single aspect apartments face north for maximum daylight access

- > Where spaces are naturally ventilated, the façade and layout encourage cross ventilation
- > Acoustic treatment with consideration to the type of activity proposed within the space
- > Amenity rooms to promote mindfulness, inclusivity and exercise
- > Nature inspired design interventions

3.8 Waste Management Practice

The project will consider a site-specific waste management strategy designed to address demolition, construction and operational waste generated.

The design will explore:

- > Development of a construction waste management plan in line with best practice guidelines. The project will look to reduce the total amount of waste being sent to landfill when compared against a typical building of its type
- > Development of an operational waste management plan in line with best practice guidelines that will include initiatives that:
 - Identify the waste streams relevant to the different operational components of the building (i.e., retail or office areas), and the individual roles responsible for implementation
 - Set diversion from landfill targets and/or targets for reducing total materials generation (general waste materials and recyclable/reusable materials), as well as monitoring and measurement procedures for waste and recycling streams by weight
 - Outline methods for encouraging the separation of waste streams, such as bins, storage areas, or recycling facilities in public areas as required
 - Identify storage areas for all waste streams and outline best practice safety and access requirements for their collection
 - Identify safe methods for vehicle access and transfer of waste
 - Incorporate a review process to assess the success of the Operational Waste Management plan and make improvements, based on operational experience.

3.9 Sustainable Transport

The project is located at the heart of Parramatta and is surrounded by good levels of public transport access and connection (such as Parramatta Train Station). To complement this, the project team will consider opportunities to reduce the use of personal car use and promote active transport alternatives.

The design will explore

- > Opportunities for providing parking spaces for low emission vehicles, such as electric car spaces and infrastructure
- > Provide secure bicycle storage and parking for the building occupants and visitors
- > Provide active transport facilities, including end of trip showers and lockers to promote healthy commuting for the office and retail occupants

4. Green Building Certification

4.1 Green Star Strategy

The project team will consider an opportunity to target a 5 Star Green Star Buildings Certification in line with the proposed ESD strategies outlined in the previous subsections of this report.

Based on a review of the current design documentation, an initial Green Star Assessment using the Green Star Buildings tool has been undertaken. The following potential credits and preliminary scores have been identified:

Table 2 Indicative Green Star Strategy & Points

GS Category	Available Points	Targeted Points
Responsible	17	9
Healthy	14	7
Resilient	8	2
Positive	30	9
Places	8	5
People	9	5
Nature	14	2
Leadership	0	0
Total	100	39

4.1.1 Energy and Carbon

The project will explore a 20% reduction in upfront carbon emissions and 20% reduction in energy use when compared to a reference building. The following initiatives are to be explored:

- > Provide a fully electric building that uses heat pumps for domestic hot water except where gas is provisioned for cooking in retail tenancies
- > Develop a high-performing façade to reduce the demand on HVAC systems (improving energy efficiency) whilst providing health and wellbeing benefits to occupants and visitors (e.g., daylight and views).
- > Provide electric LED lighting that has been designed for maximum energy efficiency and occupant comfort. We encourage well-lit spaces that are fit for purposes with effective daylighting controls and sensors.
- > Develop a Zero Carbon Action Plan that must cover all energy consumption, procurement, and generation.
- > 100% of electricity under the control of the building owner is to be sourced from renewables (on-site or off-site).

4.1.2 Water

The project is to target a 15% reduction in potable water when compared to a reference building through the following water initiatives:

- > Reduce potable water use, through the installation of highly efficient fittings and fixtures. To prevent water waste, potable water flows will be reduced in line with WELS certified taps, shower and toilets.
- > Provide ongoing rainwater capture, storage and re-use for plant irrigation and toilet flushing to common spaces.
- > Provide low-water, native plants to reduce the irrigation required whilst providing high levels of indoor and outdoor greenery.
- > Develop Water Sensitive Urban Design (WSUD) initiatives to help manage stormwater run-off and minimise pollution going to natural waterways.

4.1.3 Materials

The project is to reduce its environmental impacts through good materials selections through the following responsible materials initiatives:

- > Select timber for joinery and finishes that is certified by a forest certification scheme (FSC) and has a Chain of Custody (CoC) certificate. Alternatively, selecting timber from a reused source in order to reduce the energy embodied in timber production and conserve existing forests.
- > Where feasible, reuse or recycle materials from the existing buildings on-site demolition and strip out, and where possible explore its use within the new building design.
- > Ensure the buildings structure, envelope, systems, and finishes are comprised of responsibly selected products.

4.1.4 Occupant Health and Wellbeing

The building is to provide a healthy and comfortable space for occupants through the following potential occupant health and wellbeing initiatives:

- > Develop a fresh air strategy that ensures that occupants have access to additional 50% fresh air as per Australian Standards, thereby improving air quality and hygiene, whilst providing a thermally comfortable space.
- > Provide ventilation systems that are designed to be easily cleaned and to have a high degree of filtration to prevent smells, dust, pollen, and bushfire ash entering the building.
- > Minimise occupant exposure to harmful indoor pollutants such as Volatile Organic Compounds (VOCs) and formaldehyde from engineered wood through the responsible selection of materials and finishes.
- > Provide a visually comfortable space through façade design to facilitate good daylight access and best practice artificial lighting.
- > Provide glare mitigation measures through optimising the design for fixed or operable shading devices (including blinds) appropriate to the space use.
- > Ensure that the building and acoustic design delivers acoustic comfort to the building's occupants through high levels of insulation to walls, roof, and floorings.
- > Develop an outdoor and indoor green plant strategy dedicated to providing an improved sense of biophilia and connection to nature.
- > Provide amenity spaces that promote mindfulness, inclusivity and exercise

4.1.5 Places and People

Explore the creation of great places for occupants through the following initiatives:

- > Ensure access for cyclists, bike parking, showers and changing facilities to encourage Active Transport Options.
- > Develop and implement a Sustainable Transport Plan.
- > Prioritise transport options that reduce the need for private fossil fuel powered vehicles such as car share and EV charging spaces.
- > Provide a building design that encourages walking and is inclusive and accessible to a diverse range of people with different needs.
- > Ensure that that construction facilities and equipment provided are gender inclusive and install on-site policies that increase awareness of discrimination, bullying, physical health, and mental health.
- > Celebrate Indigenous culture as part of the building design

4.1.6 Building Verification and Handover

The project is to ensure that the building has been optimised and handed over to deliver a high level of performance in operations through the following initiatives:

- > Develop a metering strategy to monitor building performance. Where feasible, opportunities to provide smart metering should be explored.
- > Set environmental performance targets for all nominated building systems that can be measured and reported against during operation.
- > Ensure the building has been commissioned per a recognised standard before practical completion.
- > Ensure the building has a tuning process that includes quarterly adjustments and measurements for at least the first 12 months after occupation.
- > Provide operations and maintenance information for all nominated building systems, building logbook and building user information.

4.1.7 Resilience

The project is to ensure that the building has considered the risks to the performance of the building in the short and long-term through the following:

- > Develop a project-specific climate change risk and adaptation assessment for the building where all extreme and high risks identified must be addressed.
- > Minimise the Heat Island Effect of the building by adopting strategies such as vegetation, water bodies, and careful selection of roofing and hardscaping elements.

4.1.8 Biodiversity and Nature

The project is to ensure that the building minimises its impacts to nature through the following initiatives:

- > Provide outdoor lighting that minimises light pollution to neighbouring bodies and to the night sky.
- > Protect local waterways and reduce the impacts of flooding and droughts by reducing average annual stormwater discharge rates and meeting stormwater pollution reduction targets.

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